Edoardo Favari

Project Management

Leading Change in the Age of Complexity

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Leading Change in the Age of Complexity

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Dedicated to Ettore and Elisa,
my most beautiful project

Foreword

Edoardo Favari and I have something in common. We share the passion for projects and appreciate the change they bring to individuals, organisations and society.

To successfully manage projects, managers and their teams need literacy in methods and processes. But in today's projects, they are asked to go beyond. They need to create a holistic understanding of the project in its context, lead individuals, teams and stakeholders and their expectations to achieve or even co-create the purpose desired.

This book has it all.

It is experience based as well as theoretical grounded; it is informative as well as passionate; it is comprehensive as well as easy to read.

This book offers students and future project managers the essentials to manage and lead projects successfully. Established project managers will especially like the myths provided to reflect and advance their project management knowledge.

This book invites you to manage projects holistically to create purpose.

Share with us the passion for projects!

Prof. Dr. Martina Huemann

Preface

> *Experience without theory is blind, but theory without experience is mere intellectual play*
>
> *[Immanuel Kant]*

Genesis and Methodology

Writing this book was, like most things we do every day, a project.

At the beginning, the plan was to put together a booklet for my students, because just providing them with presentation slides shown during classes was not enough from my perspective. It seemed to me a pretty easy task at that time. When the pamphlet was almost ready, the Project Management Institute announced the willingness to review the PMBOK—the international standard for project management—in a revolutionary manner, so I stopped the publishing of the pamphlet and joined the review team of the PMBOK 7th edition. That opportunity allowed me to deepen various perspectives, and it was the catalyst to read many books and papers about topics not exactly in the mainstream of project management. In the meanwhile, the COVID-19 pandemic started, and I personally experienced a change in managing projects due to the large use of virtual presence and remote cooperation tools, and the permanent need for change, resilience and sustainability that, in this new Millennium, all organizations face; project management have a pivotal role in allowing organizations to continuously adapt to a changing business environment. At the end of that journey, I reviewed the manuscript to overcome the division between waterfall and agile practice and integrating more hybrid approaches. In addition, I widened the space given to personal and interpersonal soft skills. And, for the second time, I felt the book was ready for publishing.

One day, a former student of mine who was following a master’s degree in a well-known university, contacted me for clarification on a formula that his project management professor showed during classes. It was a formula for parametric estimation of the cost of an investment using a fractional exponent. In principle the formula was correct, but I asked the student to try to figure out what the director of a company’s department might say if he

suggested to him or her to apply a formula with a fractional exponent. A fractional exponent!

This led me to realize the need to write a project management book to fill the gap between theory and daily practice, in the language spoken in companies, and talking about everyday problems, often mundane but critical to project success, that are encountered in companies. I don’t like books written just for students—may be very complex and theoretical—and books written only for professionals in a simple-stupid way. I tried to find a balance between the needs of both groups because project management is the same thing if you are a student and a professional.

So, I started adding concrete examples of “Myths” and “Bad Ideas”, discussing daily problems occurring during real project management, often humble but dramatically affecting the project's performance. Many renowned books on project management discuss the troubled examples of astonishing and extraordinary projects (Manhattan Project, Apollo Program, COVID-19 Vaccine development, etc.) that make us dream, but that are not comparable to what ordinary project managers face daily. A useful book on project management must help ordinary project managers to deal with their ordinary projects, and prepare students to deal with the kind of projects that they will be asked to manage in reality. And this is, in the end, what I tried to do with this book.

It is not trivial to balance the need for a pragmatic and ordinary language, and the discussion of the matter—sometimes ironic—with the maintenance of the high theoretical standard and comprehensive dissertation requested for an academic level textbook. So, remembering the precept of Immanuel Kant above, I talked about my book with colleagues and friends in the field—professional project managers, executives and academics. The final result is, according to me, the best possible trade off.

Obviously, this book represents my personal perspective on what project management is, and what the best practice is to survive when navigating in troubled waters of (complex) projects: there is a lot of content based on my 20 years experience in managing large international projects in infrastructure, industrial and IT sectors, and also a lot from the debate I constantly have with students and executives when teaching at university and business schools. Any feedback would be most welcome and appreciated. Happy reading!

This Book Is Peculiar

The perspective of this book is peculiar compared to most of the project management books and challenging for any type of reader. It is the result of my personal experience in being in parallel a professional project manager, managing large international complex projects for 20 years, and a project management lecturer and researcher teaching international students and practitioners. It is not a research book: you will find several quotations and references to other books and papers, but the content and its organization are mainly based on my personal experience and elaboration.

In fact, during my working life, I had the opportunity to manage large infrastructure projects (railways, highways, metros) in many countries across Europe, Asia and Northern Africa. Moreover, I managed industrial projects such as new plants development and existing plants revamping with complex global supply chains, Research and Development projects of a large variety of new products and services involving team members and stakeholders from many countries worldwide, or organizational projects such as PMO implementation in a wide range of business areas including non-profit and social foundations. Moreover, just after getting my M.Sc. and before the Ph.D., I started teaching both at the academic and professional levels—I feel this is a crucial piece in the creation of my perspective about project management: I held classes in many countries all over Europe, and I am teaching every semester to students from all over the world, from bachelor to master, from post-graduate to executives, and the debate during lectures is enriching as much me as the students because I put myself as a servant leader assuming that, if anything is unclear, is very likely my fault.

Today, I like challenging myself by managing the most complex projects or programs I can find. These are the ones where, inevitably, every single concept included in this book becomes of critical importance for the project development and any difference between what is stated “in theory” and what is done “in practice” represents a high risk against the project success.

The Rise of the Project Economy, or Why This Book Is Relevant for You—Whoever You Are

The twentieth century was the era of Efficiency and Operations Management, focused on “Running the Company” with the highest productivity. The twenty-first century is and will be the age of Change and Project Management: the temporary part will be operations occurring from one project to another. In fact, Project Management is about change: changing your and your customers’ organization through projects development and their outcomes.

Since the beginning of this Century, we have had 2 major global financial and economic crises, the COVID-19 Pandemic and the Ukraine war. Moreover, the environmental situation seems to be continually deteriorating as well as political unsteadiness. Do you think there will be an end to instability? I don’t. It seems we are now at the core of the “age of complexity”.

This “new normal” affects both our working and personal lives. Companies can no longer entrust maintaining a stable business with minor adjustments time after time: markets continuously ask for new products with new features, supply chains continuously face disruption and need to be redefined, and new norms and regulations need to update your products and production methods. Similarly, in our personal lives, we must be prepared to change our company and our job title many times in our lives—a “job for life” in the same organization all lifelong has become a bedtime story—and this requires all of us to change our behavior and constantly update our skills and perspective. To change anything you need to manage projects. And this book is about project management.

As my friend Paula said “Project Manager is a short job title for a huge role” and, unfortunately, today we have no choice other than being project managers, even if we don’t officially have that job title in our working and personal environment. So, you had better learn and apply all the teachings in this book, and more.

Welcome to the Projectized world!

How to Read This Book

This book has essentially been divided into three parts.

The first part is Chap. 1, in which I have provided principles and background concepts that are needed for any project manager to be effective and wise in what he or she does. It is the most theoretical part of the book, and its sections can sometimes seem to be disconnected: the reader must trust in me while reading, as the big picture will become clearer in further reading.

Chapters 2–4 in the second part of the book represent the project management continuum: in this part, I have included all the processes, practices, methods, tools and practical examples needed by a project manager in his/her everyday work.

Chapter 5 comprises a substantial amount of material not directly belonging to the Project Management domain, but relevant for project managers managing projects in modern organizations.

From my perspective, a project manager, able to master all the content of this book, is ready to survive in managing projects in this age of complexity.

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Last but not least, my wife Elisa.

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1. Principles and Background Concepts

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Abstract
In this first chapter I have collected the basic concepts that are necessary for a project manager to be able to understand all the situations that may arise while managing projects based on general knowledge, partly philosophical, partly notional, and partly based on fundamental principles. All of them are necessary to be a competent project manager. For example, if I find myself working in contexts where the principle of sustainability is not understood, when mentioned, executive management look at me as a know-it-all. Nevertheless, managing projects without awareness of, for example, the principle of sustainability would make me less effective, regardless of the context, because my ignorance makes me reactive on the topic and, at the end of the day, I won't actually be able to govern and implement it. The same applies to the rest of the contents of this first chapter, which are the most theoretical of the whole book, but which are the basis for understanding the following chapters, which include the practical knowledge of project management, and the fifth chapter, which talks about the world around it. It is very common for organizations that are not very effective in project management to be lacking in the theoretical superstructure, that is considered as something without any real practical implications. Nothing could be further from the truth: this first chapter prepares the foundations for everything very concrete that follows.

1.1 Projects: Think Before You Do, Check While You Are Doing

By failing to prepare, you are preparing to fail. (B.Franklin)

There is no company, even the smallest and most modest, that does not have at least one person with the words “project manager” on their business card, without the unfortunate person ever having had any training or read a book on project management (or even only the back cover). Although there are companies that have developed a significant culture of project management internally, in my experience the majority of companies continue to call company firefighters “project managers,” i.e., homeless employees who spend their days either on the phone or wandering from one office to another, or between the customer and the suppliers, putting out fires, in an absolutely reactive and unplanned way. The project manager should aspire to something else, even though firefighting will always remain in the project manager’s DNA. The project manager should not be the colleague who has the brightest ideas, who amazes us with extemporary problem-solving gimmicks, or who opens the umbrella when it rains: instead, he or she should have a methodical attitude, use logical-rational tools and models, and ultimately apply what is known as the Deming cycle: PLAN, DO, CHECK, ACT (Fig. 1.1).

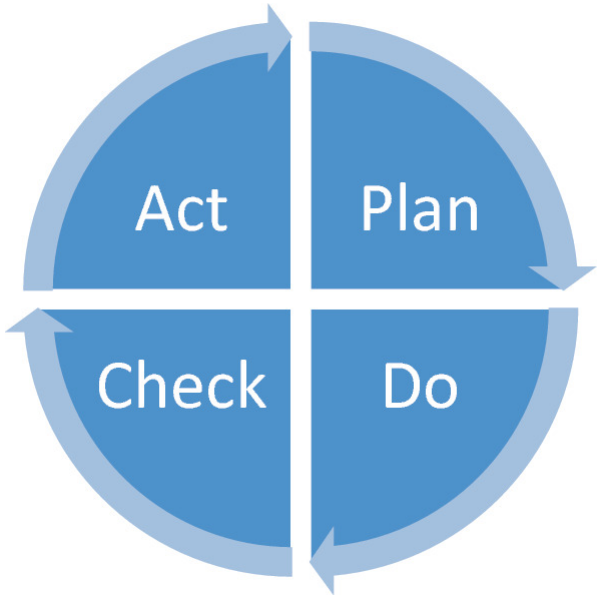

Fig. 1.1 The Deming (PDCA) cycle

The Deming cycle, first expressed in the 1950s and considered by some to be excessively simple, conveys basic concepts which, however, if applied, greatly improve the operating environment in which they are used. In particular, it tells us to think about things before doing them (Plan, Do), to check, along the way, if what happens is similar to what we had thought (Check), and, if necessary, to take corrective action (Act).

As with most management tools, the difficulty is not in understanding the structure or logic behind the model, but in overcoming the laziness and inertia of the organization and getting it to move from great proclamation at the coffee machine to the concrete application.

Often, a successful company can be distinguished from one that lives off its bad organization only by the fact that the successful company not only declares things, but also puts them into practice. A company that continuously and structurally applies the Deming cycle cannot but have continuous benefits, reducing waste, improving operating costs, reducing employee stress, and improving customer perception. What is unacceptable is not managing the project and navigating by sight: a professional project manager always knows where he or she needs to go, where he or she is, and where he or she is going.

I have experienced countless times that, after a productive discussion in a company on the importance of the planning and on a general agreement on the method, I was told:

> Dear Edoardo, everything you've told us is very interesting and we all agree that planning is crucial for the success of a project, but here at home, when a project starts, we're already behind schedule, and we don't have time to plan because we have to start working immediately.

This perception is very common. I like to *point out*, when this happens, that the same companies that do not have time to plan at the beginning, but somehow find the time, at the end of the project, to redo things three times, because, not having planned, working with blinkers and without thinking, at the end of the project the result is not acceptable to the customer, and has required rework, causing costs, stress and loss of reputation. Evidently there was time, but out of laziness and indulging in the anxiety that is normal at the beginning of a new project, they preferred to rush headlong into

execution, when it would have been wiser to stop at the beginning to plan—the bare minimum—to make sure they got it right the first time. **Thinking things through first is preferable to redoing them after execution: it costs less, takes less time, causes less stress, and you don't risk losing your reputation with the client.**

Obviously, one must apply a principle of economy: one must plan the minimum necessary to get to the end well the first time. One should not write one more line of a plan than the minimum needed to meet the criterion of economy. I don't want to be misunderstood: planning is not in itself a good thing to be pursued, and the more I plan the better: planning costs money, **and I must therefore plan as little as possible, until the benefit that planning gives me outweighs the effort of planning**. Planning is about clarity, but in many cases we feel that it is never enough. Finding the balance point is sometimes not easy, and certainly the solution is never not to plan at all.

Every year, the Project Management Institute publishes a report titled "Pulse of Profession" where it analyzes trends in the project management profession. Specifically, in the 2018 report, it was calculated that given a project budget, 9.9% is wasted on disorganization. The significance of this figure is that 10% of our project budget is sacrificed to our disorganization, due to unclear objectives, confusion, inadequate tools, demotivated employees, etc. When I present this figure in courses, I like to ask the audience if they think that the figure (9.9% which we can round up to 10%), if it were true, is worrying or tolerable. Very often I hear from participants that their perception is that, in the organizations where they work, the "tax on disorganization" is much higher. Moreover, such a percentage is comparable to the profit that a commercial organization can generate: to think that we sacrifice a large part of our operating margin for disorganization is indeed disconcerting. If you are a (project) manager, dealing with organizational issues is an unavoidable duty, because what is asked to managers is to follow the efficiency and effectiveness of operational action and therefore, even if a minimum of disorganization is to be budgeted for, reducing it from 10% to a few points is absolutely possible and necessary, and is done by applying the few simple rules set out in this book.

1.1.1 What Is a Project (and What Is Not)?

In order to be good project managers, a key moment is the essential question: what is a project?

The definition of project that the PMBOK gives, and also the most used, is:

> A project is a temporary initiative aimed at creating a product, service, or result with unique characteristics. [PMBOK 7th, page 4]

This definition is useful not so much to show off academic and didactic knowledge, but to understand what the perimeter is of a project and what is not, and therefore where I can apply the body of knowledge of project management and where, instead, it would not make sense.

A project has the characteristic of being temporary, therefore it has a beginning and an end. Activities that do not have a defined end are not projects.

The project is undertaken to create something that has characteristics of new, that has never been done before, at least not in that way or with those specific characteristics required by the customer. This does not mean that every time I carry out a project I start from a *tabula rasa*, but I can make use (and fortunately!) of the experiences made previously on similar projects, but it is certain that the final result of each project is something unique.

Activities that aim at something unique but have no defined time horizon are often among the most harmful to organizations. R&D projects done “in spare time” that last 8 years instead of 8 months (I have in mind several cases I’ve come across) have problems and waste resources instead of creating value precisely because they violate the most trivial definition of a project.

A corollary of this definition is that a project is characterized step by step by different development phases. To break a project down into its elementary parts (see WBS in Chapter 2) and then run all of its parts simultaneously in parallel would be reckless (although I have several such stories in my consultant’s diary as well).

Another corollary is that a project is, by its very nature, a vehicle for change and innovation in the organization that carries it out. This aspect is often seen in a rhetorical way because we have lived for many decades abusing the terms like: “Change management”, “Innovation” and

“Transformation” by certain press and politicians. In reality this concept is essential to be understood and digested by any person who wants to live in the world of project management (whether a project manager or a project team member): project management requires innovation! We are not talking about product innovation, which is often the purpose for which a project is undertaken, but about innovative solutions that the project team, facilitated by the project manager, must find to deal with the problems that, little by little, the project will encounter (and note that there has never been a project, in the history of mankind, that has not faced problems).

There are also other definitions of a project. I really like the one Andrew Davies used in his “Projects: a Very Short Introduction”:

> The combination of people and other resources gathered in a temporary organization and process to achieve a specific goal.

Examples of Projects

Examples of projects that a project manager may come across within an organization are:

- Managing a contract that your organization has signed with a customer outside the organization. This type of project involves managing both the Client and external suppliers and resources within the company.
- Carry out a research and development project for new products/services that your organization wants to offer its customers in the near future, including its industrialization.
- Expansion of a production site, or construction of a new production site.
- Establishment of a branch of your organization in a new country in which it does not currently operate (often developed by business development departments).
- Acquire a new company and integrating it into your organization, upgrading its processes to those already in place.
- Capability building of skills, knowledge, tools or equipment.
- Undertake organizational change or improvement projects, even related to regulatory and compliance issues, of existing processes, both production and administrative, including both core and support functions.
- Installation of new software in the company, such as a new CRM or ERP, where the impact on the organization and the actual number and impact

on internal stakeholders (usually managed by ITC departments) is often underestimated.
- Outsourcing the products or services previously made in-house.
- Implement a training plan that creates new skills identified as important for the development of internal resources (usually Human Resources area).
- Rebranding and creating communication materials, such as brochures, websites, promotional videos, or organizing the organization's participation in fairs and public events (marketing area).
- Set up an organized commercial action, which is not based only on visits to known customers, but identifies and follows new customers, larger or in new market sectors, with complex actions based on many intermediate steps (sales area).

Often organizations focus their project management efforts and techniques only on the first type, while the others are not coordinated by project managers, but are left to the "common sense" and experience of someone in the offices where the activities fall. This approach denotes a serious immaturity in the management of projects in the companies that fall into it: any business initiative that has the characteristics of a project, deserves to be managed according to the principles of project management, otherwise the goals that have been set will not be reached, or they will be reached with much more time and effort (and related costs). Obviously I don't want every project to be managed in the same way: large projects based on contracts with demanding customers deserve a greater effort of project management, while internal and smaller projects need more limited attention: the main mistake is, as usual, not to face the problem, and entrust everything to common sense and good will.

On the other hand, projects are not those that do not have characteristics of temporariness and uniqueness, and therefore belong to the field of Operations Management. This is the case, for example, of the mass production of automobiles or pharmaceuticals, in which there was a previous project phase (see the list above) in which the moment was conceived (uniqueness and temporariness), but then, once "industrialized", it was passed on to mass production, that is, of pieces that were all the same and for an indefinite period of time.

1.1.2 Etymology

The etymology of some terms widely used in project management, I believe, can be useful to guide one's action as a project manager.

The term **project** comes from the medieval Latin verb *pro-jacere*, which means to shoot forward, and was used for arrows and javelins, or even in the famous phrase of Julius Caesar when he crossed the Rubicon on his way to Rome "*alea jacta est*" (the die has been cast), but it is also used with the meaning of looking ahead and foreseeing. The origin of the word leads us to reflect on what is the task of those who are about to embark on a project, namely, to foresee it (as far as possible) and prepare for it before tackling it.

Manager, nowadays used with a very courtly meaning, has actually a very concrete origin: it comes from the Latin *manu agere*, that is "to lead with the hand", and was used for carters or herdsmen who, in difficult passages, would get off the cart or the horse and lead the animals by standing in front of them. This etymology alone, I think, could be of great inspiration to many managers: being in the front line is also the role expected by a (project) manager and, to be a good one, you can look for some characteristics typical of the herdsman.

The term **plan**, which is the basis of any traditional approach to project management, and which is mentioned dozens of times in the PMBOK (there is a plan for every step of the project) comes, quite simply, from the Latin word *planum*, meaning flat. The whole meaning of the word suggests the purpose of the plan: that is, to put in 2D, in two dimensions, on a sheet of paper, the 3D reality that we expect in the project. What I mean is that the plan must not be something abstract and theoretical but must contain almost only concrete instructions on what to do, goals and milestones once the project has started. I often see situations where plans are not even sketched out or are made at the beginning to give an appearance of professionalism, but then are forgotten in a drawer and management based on "common sense" is allowed to triumph. Plans should always be written down (it is forbidden to work without a written plan!), and since it costs a lot of effort to write them down, you should make sure that you write as little as possible, and only things that are relevant and can be of help to those who will carry out the project. It is better to avoid writing theoretical parts and/or parts that nobody will read: the plan must be concrete, and every word must be of help to at least one member of the project team.

Method comes from the ancient Greek word *méthodos*, composed of *odós* “road” and the prefix *meta* “straight”, which means that whoever is a (project) manager must know the methods, and therefore the theory and literature of management and organizational disciplines, because only in this way can he be certain of taking the shortest routes and making the best use of the resources assigned to him by his organization. Not knowing the methods, so being the kind of manager who relies only on his own personal experience and common sense, means being a ship captain who relies only on the maps he has built himself and on his own intuition, while someone who knows the methods is someone who, in addition to his own experience, also knows the maps that many before him have built, so he can make use of the experience of many others besides himself. If you were a ship owner, who would you entrust your ship to?

The word **control**, which is used in many contexts outside of management, comes from the Latin word *contrarotulus*: in the Middle Ages, when a contract was drawn up, most people could not read or write, so the notary transcribed the notices what was said between the parties, writing the *rotulus*. Another notary did the same, writing the *contrarotulus*. In case of disagreement between the parties, the *rotulus* was read, and in case of further disagreement the *contrarotulus* was also read: if the versions of the *rotulus* and *contrarotulus* coincided the matter was clarified, otherwise… This aspect leads us to reflect again on the importance of having a “*rotulus*”, which we call a plan, and of an activity of comparison, during the course of the project, of control, which helps us to understand and cross-check if what is happening is at least similar to what we had initially promised to do and, if not, to decide on countermeasures.

To understand the meaning of the term **stakeholder** we must go back to the times of the North American frontier, when, in some cases, the allocation of land took place through competitions in which a number of contenders greater than the number of plots of land competed to be the first to plant their spikes in the desired land, thus claiming ownership. Only those who enrolled in a special register and received a stake, which allowed them to take part in the competition, could compete. Whoever held the stake, and therefore had the right to claim the land, was the *stake-holder*.

1.1.3 The History

Mankind has been executing projects since the very beginning: just think of the great works of antiquity such as the pyramids and the public works of the Roman Empire, or the great military campaigns of Alexander and Caesar, the Great Wall of China, and then the great cathedrals and military enterprises of the Middle Ages, and so on up to modernity. However, no one in the past has left any trace of specific models and methods for project management, leading to the assumption that the profession of project manager did not exist as such, and that project management was actually delegated to the collaboration of technicians, or to the leadership of one or a small team with almost absolute decision-making power.

If, by the history of project management, we mean the search for historical findings of specific models and methods for project management, we must, however, turn to the last hundred years or so.

Some, like A. Davies, start by observing the great projects of the past, such as the construction of the Erie Canal, which in the nineteenth century allowed the connection of the great Laurentian lakes with the Hudson River and therefore with New York, and the Manhattan Project, which in the Forties of the twentieth century led to the realization of the first atomic bombs, as precursors of some of the methods that are today adopted in a systematic manner.

The first artifact specific to project management is the bar chart, which can be traced back to 1917 by engineer Henry Gantt. It is a diagram in which you find the list of project activities in a column on the left, and with the schedule on the right-hand side.

All other contributions to the project management profession are to be found in the post-World War II period. The term “project management” first appeared in 1953 in the American defense and aerospace industry. The context was the growing concern about the nuclear threat, and the consequent necessary acceleration of missile development programs in the United States. So, in 1953, the Martin company would be the first to implement project-based organization, organizing itself according to a matrix. In 1957, the DuPont Corporation developed the Critical Path Method (CPM), in 1958, the US Navy, as part of the Polaris project, developed the Program Evaluation Review Technique (PERT), and in 1962, the US Department of Defense developed the Work Breakdown Structure (WBS) method: these three methods, although evolved over the decades, are still perfectly in use in modern project management. The WBS

represents the tree-like decomposition, from top to bottom, of the project scope, down to the atomic level of activities. The PERT represents the awareness of the logical links between project activities, and the Critical Path Method focuses on chains of critical activities, having no margin, have the characteristic that the unit delay (one day-one hour-one minute) has exactly the same impact on the execution time of the entire project. They are not complicated models, and simply represent a rationalization, often linearization, of the activities that make up the project. Today, the effectiveness of project management action cannot be based on these alone, but they certainly remain the basis for understanding the profession, regardless of the industry of reference and the complexity of the projects managed.

By the end of the 1950s, the new figure of the project manager with the specific role of integrator in complex initiatives (Harvard Business Review, 1959) was emerging, at least for insiders.

The second half of the 1960s also saw the birth of professional associations: IPMA (International Project Management Association) in 1965 and PMI (Project Management Institute) in 1969: these two are still the largest project manager associations worldwide.

At the end of the seventies it was clear that the project management profession had to have some kind of certification to attest the practitioners' skills and that, therefore, a reference text—a *corpus*—was needed to collect all the knowledge needed for the profession. Thus in 1983 the first "PMI Body of Knowledge" (by the Project Management Institute) with 6 knowledge areas was born. In the 1987 edition it became Project Management Body of Knowledge (PMBOK, as it is still called today) and the knowledge areas of risk and procurement were added, while the knowledge area of integration was added in the 1996 edition. The soft skills and the special competence area for stakeholders were added only in the 2000s.

The method of Earned Value Management dates back to 1989. It is a method of quantitative and integrated monitoring of the state of the project, of comparison between the planned baseline and the real progress in percentage terms, and with the possibility of making forecasts on expected performance. Whoever manages a project without using this simple but very effective method should not qualify as a project manager.

At the end of the nineties, an ontological divergence takes place: thanks to the agile project management movement, it is formalized that the traditional techniques, collected until then in the Body of Knowledge, are sometimes not effective in managing the project.

This is the case of specific types of projects, where the level of uncertainty is very high, such as some software development projects, research and development projects amongst others. It has finally come into focus that, besides the traditional predictive techniques, in which the project is planned from the beginning over the whole-time span and the project plan has the ambition to foresee all the phases until completion, there are also adaptive techniques, that is, able to adapt in a more flexible way to the change of scope or context in the projects. The agile manifesto (www.agilemanifesto.org), of enormous historical value in the project management debate, has actually created a serious misunderstanding among the easy-going and superficial practitioners in the world: you still hear people professing to apply "agile" because they don't have time to plan, or because there is too much mess in their organization (an MIT professor once told me that "agile" is the way we say when we wait until the last moment to do things). These people, as I'll say again later, show that they have still not grasped the real sense of agile or project management: agile actually has methods and is tightly planned, but over a shorter period than an ordinary project. In the first twenty years of our century, traditional project management and agile project management were seen by most as two opposing schools, where the more austere and orthodox project managers leaned towards traditional and predictive methodologies, while the more unstructured and naïve leaned towards agile. Today, the situation is moving towards a reasonable reconciliation, and as of 2021 PMI requires new PMP-certified project managers to be equally familiar with the two methodologies: traditional and agile are two sides of the same coin, and an effective project manager must be able to understand in which project phases it is necessary to apply one or the other technique.

In 1998 ANSI (American National Standard Institute) adopts the PMBOK as a standard and in 2015, ISO (International Organization for Standardization) issues the ISO 21500 standard "Guidance on project management".

The twenties of this Century will be remembered as the years of integration of the predictive and adaptive methodologies thanks to the new

PMBOK 7 structure and PMP 2021, and the implementation of very complex global projects with virtual presence that will (almost) nullify the problems of teams operating remotely. The big topic emerging—and probably leading the debate in the next decade—is the value distribution and the pressure for projects to address grand challenges, and what does this means to how we define project performance. The “old school” saw stakeholder claims as project risks, anti-value, but now we see them as value distribution, even if this new approach has major implications when we assess the feasibility of capital investments and not all the investors are aligned with this paradigm.

Will there still be a need for real project managers in the coming decades, or will the process integration work behind projects be fully automated? I don’t think anyone can answer this question today. Let me therefore maintain a romantic and partly Luddite position: machines and artificial intelligences will probably be able to automate and integrate, better than humans can do and in a not too distant future, the more mechanical parts of the project management process, but the human part of the process, that of relations with the multiple interests of stakeholders and that of process innovation, which is also the most enjoyable, will always remain a human competence: being a project manager, in the future, will be more and more enjoyable!

1.1.4 The Waves of Project Management

S. Lichtenberg, in 1989, published an article stating that the project management paradigm changes over the years. Today we refer to the waves of project management starting with the first wave, which is the one born from the rational paradigm based on the application of tools and methods, the second wave, which is the one based on the use of information systems that use logical networks, and the third wave, which is project management focused on the “human” aspects of relationships. Some are beginning to talk about a fourth wave that is coming, which is oriented towards measuring the social impact of projects even for profit-oriented organizations [Morris et al., 2009].

1.1.5 Why Can’t We Do It Like Before

Consider how all the great projects of the nineteenth century, for example, the great infrastructural works (railways, waterways), industrial plants, new

steam engines, were completed without specific tools or techniques for their management. It would be worth asking whether it would not be enough to study as the forerunners did, without Gantt and WBS, and save yourself the reading of the rest of this book. The definitely legitimate question is: if in the past projects of impressive complexity were completed in a short timeframe and without the use of the elaborate project management tools that are discussed in almost all modern books on the discipline, wouldn't it simply be easier to study what they did in the past and do as they did, instead of spending many hours reading about complex models and tools that need to be understood by project managers and then explained to technicians and other project stakeholders? Or, perhaps, has something changed?

My answer is that things have changed. A lot! Today we have more need for project management including our daily projects even if they are much more modest than those we study in history books. Firstly, projects that have made project management history are often public and strategic projects, with budget constraints that are secondary when compared to on-time delivery and final product quality. Today, no project, not even public projects, has this kind of budget flexibility, including those that apply agile and adaptive project management models. Secondly, the complexity of projects, even with the same budget or scope, is certainly growing: the very high and frequent number of connections to which the civilization of ITC has accustomed us is incomparably greater than that experienced by the projects of the past: we are anthropologically different, in fact today we all feel authorized to give and expect feedback in a very short time, when in the past (even only at the beginning of the twenty-first century) this was not the case. In addition, many projects make use of large databases (big data), which further increase the complexity of management.

In short, today more awareness is needed by project managers to manage projects: once, on small projects, it was enough to be good technicians guided by "common sense" and reactive to problems. Today, this attitude is a guarantee of failure, frustration, both personal and within the team, and general dissatisfaction of the stakeholders. **Today, if you manage a project, you have to be a project manager**.

1.2 Inspiring Metaphors

1.2.1 The Project Manager and the Hamster

I like to think that the deity of (project) management is the hamster. I find it a very fitting metaphor: the hamster in its cage runs all day, has a lot of problems, but at the end of the day it is at exactly the same point from which it started, in fact the hamster runs in a wheel (not that it has any choice—it is the only way it knows how to run since it was born). We, on the other hand, have the choice not to end up like the hamster, i.e. not to work all day, laboriously, and discover at the end of the day that the work we did was (in whole or in part) useless, that the documents need to be reworked or redone from scratch, or that the objects we made need to be reworked or thrown away and rebuilt from scratch. This is when we (or have our collaborators) run around in never ending circles. I believe that all of us—including myself—have, on more than one occasion in our lives, compared ourselves to a hamster, and maybe we still do. It is clear that it is not acceptable to end up like a hamster, and that any (project) manager must do their best to eliminate hamsters from his organization, not by firing them (a hamster is often generated by bad organization, so it is often not to blame for its nature), but by aiming at efficiency in operations. Too often in fact, clumsy managers entrust employees with tasks by meeting them on the stairs or at the coffee machine, without a formal moment, even just five minutes for a minimum of investigation of what is requested, only to complain, at the end, when the resulting work does not satisfy them, that “a little common sense was enough”. The principle of “common sense” is a great enemy of (project) management: in fact, since it cannot be formalized and changes from person to person, it generally causes misunderstandings, false expectations and, in general, stress and discontent. In addition, denouncing someone’s lack of “common sense” is tantamount to calling them a fool, creating a lack of trust in the project team and thus undermining their chances of success.

Let’s think about it: in which situations can we compare ourselves to the unfortunate hamster, when, at the end of the day we realize that we have worked in vain and that we have to throw away everything we have produced? (Take a few seconds).

For me it is extremely clear: it is when the objectives are not clear, when we work even though we do not have the full picture of what the goal of the initiative we are pursuing is, the customer’s true needs, when we have not

spoken to all the stakeholders involved in the project, and so on. It is like moving through thick fog: sooner or later you are bound to crash.

In order to defuse the hamster it is necessary to clarify the ideas as much as possible from the beginning, and to dig every time a grey area is identified: planning activities basically serve as an antidote to the (poor) hamster, while intending to execute project activities without having properly planned (without having clarified the ideas enough) can only lead us to run round in circles.

Everyone has the right to have sufficiently and comfortably clear objectives, and the right to say, “I don’t understand” (at least once). If you are subject to tasks—or projects—communicated verbally on the stairs or at the coffee machine, my suggestion is to thank the task giver, retreat to your desk and write few lines or make a rough outline to frame the task, and then to create the condition to show it to your interlocutor and find a way to get it approved—or amended. If you are a manager yourself, don’t behave in a way that makes hamsters out of the members of your team, and if you see hamster phenomena occurring, ask yourself if you are not the cause (it is quite likely) and how you can make the hamsters turn into efficient and motivated employees.

PS I keep my hamster hanging above my desk in my office: it watches me every day, harried, and warns me not to end up like it.

1.2.2 The Conductor

The absolute best metaphor for what a good project manager’s approach to project management should be is that of the conductor, officially introduced in PMBOK 6 in 2017.

The conductor, like the project manager, coordinates different specialists in different disciplines, who are often divided into teams: The conductor has violas, cellos, violins, trumpets, clarinets, oboes, etc. teamed into strings, woodwinds, brass, etc. The project manager may have, for example, in an industrial project, mechanical, electrical, computer engineers, purchasers, assemblers, specialists.

They are in turn teamed, for example, according to the department they belong to: technical office, purchasing office, production, logistics.

One cannot expect the conductor, as well as the project manager, to be the best prepared specialist of all those with whom he/she works in all specific fields: the conductor cannot be at the same time the best violinist,

cellist, trumpeter, clarinetist etc., just as the project manager cannot be at the same time the best mechanical engineer, electrical engineer, computer engineer, buyer, fitter etc. If the requirement to be a conductor or a project manager was to be better than everyone else in one's profession, there would be no conductors or project managers! The competence required of two such figures is to have and transmit the overall vision, coordinate the various specialists, motivate them and orient them towards the final result. It happens very often that some long-time technician questions the project manager "because he/she doesn't know half as much as I do". I believe that all project managers are routinely exposed to this type of situation. It is clear that the project manager should not be intimidated in these cases, and should not try to compete technically with them, because he/she would lose and it would not be his/her job anyway: the project manager must demonstrate his/her competence in the added value of overview, coordination and planning, firmly believing in the importance of his/her function in the project, with great patience. My experience shows that even the most radical technocratic specialists, working with a project manager focusing on managerial aspects and leaving the technical part of the project to technicians, change their minds after just a few weeks.

There is no effective conductor who does not take responsibility for the result: if a violinist misses his or her cue, the conductor will not say to the complaining audience at the end of an act, "he's stupid, I can't get anything out of him, he's always making mistakes, he can't read music", but will apologize in person because someone in the orchestra made a mistake. In the same way, there is no effective project manager who does not apply the same approach: if something does not work on the project, and even if the analysis shows an individual error on the part of a team member, the project manager must apologize to the client/sponsor, and understand why the resource made a mistake: was the resource not prepared enough for the task at hand? Was the information unclear? Was there a lack of motivation? In all these cases, the project manager can find ideas to improve the project environment. I believe that **this attitude is the most important characteristic that successful project managers have in common**.

1.2.3 Fog

I like to say that project management is a great human initiative aiming to thin out the fog. It's a metaphor that I think helps to understand very well

much of what it takes to manage a project. It's very common to use the metaphor of navigation to refer to projects: the project is like a ship that has to get its cargo from one port to another, the plan is the route plotted on the map, and the captain is the project manager. To avoid the fog, you need to have very clear ideas before leaving the port, otherwise you risk crashing on the breakwater just in the port. The fog is thicker in a project when you start without clear ideas: planning is about make it clear. I have frequently experienced when involved in research and development and innovation processes that face serious problems of time, cost and quality, and when I ask to see the project charter or, in any case, a sketch document of the project scope, I am told that it has never been done and that the task of starting the project was given by a director/vice-president or similar on the stairs or at the coffee machine. I think it is clear to everyone that managing a project that started with an instruction given on the stairs by the general manager such as "develop a new machine that runs on 400 volts" is dramatically more difficult than managing the same project that started in a slightly more structured way such as "develop a machine with this power, this cycle time, that costs no more than 10.000 €; the prototype has to be ready for the July fair": in the first case the fog is very thick, and the risk of crashing against obstacles right away is very high, in the second case a simple sentence with some details allows us to lay the foundations for a project planning.

Myth: The Eel of the River Po Delta

The eels of the River Po Delta (Northern Italy) wallow in the mud and, when you try to catch them, they always manage to slip out of your hands. For me, this is the technique of many long-time project managers who, thinking they are smarter than the other people on the project, flaunt great confidence and competence, but then, when you ask about certain problematic issues, they provide patently fragmentary and incomplete information, or forward very long emails saying, "see below", insinuating that, if others don't understand, they are stupid or incompetent. To my surprise, this type of management is rewarded in some companies, especially in those where a Leviathan (see Chapter 3) has its lair. I'm not even going to say how deleterious this type of management is for the project: hiding the problems, and by not confronting them only makes things worse, and, with a snowball effect,

letting them emerge when they are now much bigger. The antidote to neutralize the eels is to collect information from the various stakeholders about the project problems, for example in an issue log, and then patiently deal with them one by one. Often, good project management is simply a matter of patiently and tirelessly searching for problems and clarifying and solving them.

1.2.4 The Magic (Iron, Golden) Triangle a.k.a. The Triple Constraint

It is a somewhat old-fashioned model that has been dropped from most project management texts and courses, but it still echoes in the discussions of some older project managers and, personally, I find it very useful for facilitating reflection and creating the right mindset in less experienced or structured project managers.

The magic triangle has the three project dimensions “time”, “costs and resources” and “quality” on its sides and its inner area represents the project scope. It represents the idea that these three project dimensions are bound together, and it is therefore not possible to modify one of them without affecting the other two in some way. For example, if I want to maintain the same quality by reducing time, I will have to increase resources and therefore costs. Or even, if the customer asks to reduce the time and is not willing to pay more, I can only intervene by agreeing to a reduction in the quality of the supply. These considerations, which are obvious when they are discussed, are often disregarded by project managers, who agree to reduce or extend the duration of projects “for free”, or increase quality without demanding anything in return. The triple constraint is criticized because it only takes into account three of the project dimensions, and many observe that the project manager should keep much more than this in mind when making decisions. Another limitation of the golden triangle is that it assumes quality for a fixed scope, and this perspective causes the project manager and the team not to be open to project changes and innovation—an unacceptable mindset in the age of complexity.

On the other hand, we have to deal with project and organization reality, and very often organizations measure the success of a project precisely by the congruence between the time-cost-quality forecast at the beginning and the final one.

Often, therefore, when you have to navigate the problems that arise during project execution, thinking about the magic triangle can help you make the best decision in the (little) time available (Fig. 1.2).

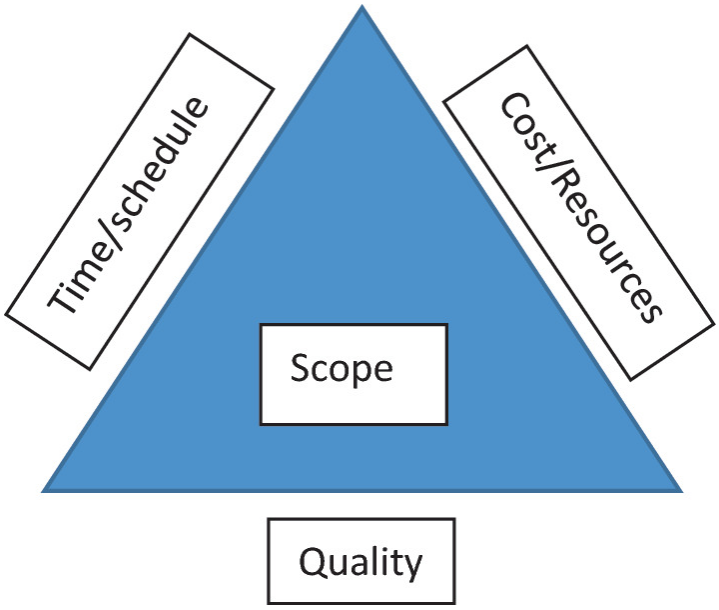

Fig. 1.2 The triple constraint aka the iron triangle of project management

1.3 Organizations, Environment and Projects

1.3.1 Project Based and Project Oriented Organizations

All organizations develop projects. While in the past there was a tendency to make a clear distinction between organizations that carried out projects and those based on serial production, today it is increasingly evident that all organizations have at least a share of their work based on project implementation, just as all companies have a share of their work based on recurring activities, for which the principles of project management do not apply but operations management and supply chain management must be addressed.

In particular, the literature distinguishes between project-oriented organizations (POO) and project-based organizations (PBO): POOs mainly do internal projects in order to innovate and realize their strategy, such as a bank or an organization like Starbucks. On the other hand, a PBO mainly does external projects for customers, so the content of these projects is mainly aimed at the realization of its customers' strategies, such as a

construction company, or a company that makes custom- made machines for customers, or that makes software or websites for customers. Project management is the essence of PBO, as it is crucial for POO to survive in the age of complexity.

1.3.2 Tactical and Strategic Level

In a military context, tactics is what makes it possible to win a battle, strategy is what makes it possible to win the war. Thus, tactics has a short-term view—the end of the battle—while strategy has a longer-term view—the whole war. Distinguishing whether and when our activities fall at the tactical or strategic level of our organization helps a lot in "taking the measure" of our own actions. Project management, within a project-based organization, falls at the tactical level, as the project manager's visibility is limited to the end of the project. In the company, the strategy is not in the individual projects, but in whoever manages the teams of projects, including those not yet started. Depending on the organization, this figure may be called a program or portfolio manager, or it may also be the division manager, product manager, even the executive vice presidents of specific portions of the business. Strategy in organizations is generally defined at the board level, cast through top executives, and must then be implemented through project execution. The tactical level of projects is used to execute the strategy, which would otherwise remain a nice dream written in a document and presentation for shareholders. However, this simple concept is very often disregarded in many organizations, not only the smaller ones, because the ability to move from the fine intentions of strategy to the concrete implementation requires a lot of determination and analytical skills that, in my experience, are quite rare to find.

1.3.3 Project, Programme, Portfolio

If projects are the basic brick on which project-based organizations are based, then a programme is defined as a team of projects linked together - e.g. because they share resources—which are managed in a coordinated way to achieve benefits and efficiencies not achievable by their individual management.

It is also common that some particularly complex projects are called programmes, for example if a complex and international team of contractors and suppliers all with substantial percentages of the scope of supply work

together to build a plant governed by a single contract. The set of all projects and programmes of a company or a division of a company constitute a portfolio, and the objective of those who manage it is to achieve the strategic objectives that have been assigned to the specific portfolio. See the Fig. 1.3 for more clarity.

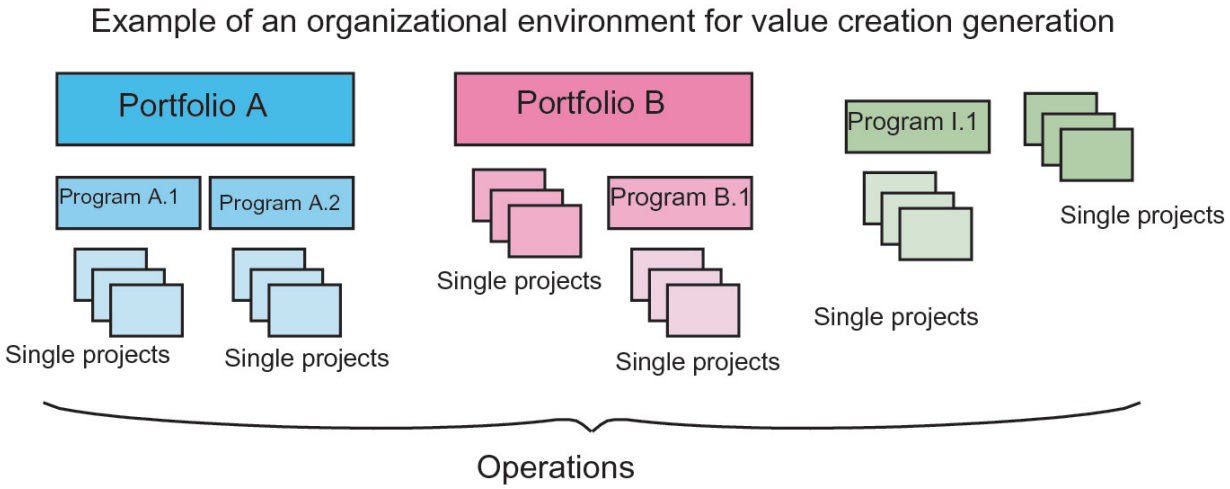

Fig. 1.3 Example of organizational environment: projects, programmes, portfolios and operations

1.3.4 Project Environment

Projects are developed within environments that can have a major influence on them, and there is no capable project manager who ignores this fundamental aspect. The internal and external environments can influence both the planning and the execution and control activities of the project. The influence that the environment has can produce a favorable, unfavorable or neutral impact. These aspects often represent constraints that the project manager and the project team must be very careful about during the planning phase and then throughout the life of the project.

1.3.4.1 Internal Environment

Environmental factors internal to the organization where the project is developed may arise from the organization itself or from other projects. Examples of internal factors that may impact are:

- Assets available for process management.
- Documentation as policies and processes.
- Resources such as databases, documents, metrics, historical project data precedents.

- Project knowledge and lessons learned.
- Organizational culture, structure and governance.
- Geographical distribution of facilities and resources.
- Available project infrastructure and software.
- Resource Availability.
- Capability of team members.

1.3.4.2 External Environment

Examples of environmental factors external to the project are:

- Regulatory framework, industry standards.
- Market conditions.
- Social and cultural influences and problems.
- Financial issues (exchange rates, inflation, political stability).
- Availability of databases and academic research useful in the project area.
- Physical environment: weather and working conditions at the location where the project is carried out.

1.3.4.3 Culture and Values

One crucial part of the project environment is related to the culture and value of each single stakeholders. Culture is generally defined as the system of values and behavior that people in a certain social group adhere to. As projects are run into organizations, the personal culture of each project team member and stakeholder is embedded in a social context of shared values, vision, values, norms, systems, symbols, language, assumptions, beliefs, and habits, goals, etc.—in one word, their culture. A company's culture has both formal representation (company mission, values etc.) as well as informal (such as beliefs, common practices, etc.). In addition, organizations operate in national contexts, and this also brings specific cultural features. All these cultural aspects affect the way the stakeholders interact with each other in the project. These aspects become more and more critical the more the project includes multiple organizations (company culture) coming from different national cultures (see international projects in Chapter 5).

1.3.4.4 Project Environment Level 0: "Natural" Project Management, i.e. Que Sera Sera …

The most common level in almost all SMEs and in several private—even if large—companies. It is a "natural" project management, based on "common sense", and is extremely stressful and characterized by a large part of the project activities being out of control in terms of time, costs and resources. It is purely reactive, so problems are never anticipated but resolved as and when they arise. Everyone working on the project has the constant feeling that everything is out of their control, visibility is only a few days or weeks ahead, the client has the distinct feeling that no one has a complete overview in terms of scope and schedule. Companies that rely on this management (or non-management) model are typically family-owned or independent SMEs—not part of teams and private companies, which show a predominant orientation towards the quality of their products/services, and which witness inexorably the erosion of the margin of their contracts as they progress because they cannot keep under control, for example, the hours of project staff or the costs of materials compared to what was budgeted. There is no risk management of any kind and no lessons learned or continuous improvement, so that project after project, the problems all recur in the same way. It is impossible for these companies to grow in relation to the size of their contracts, with large customers, and in global markets, unless they evolve to the next level. Many SMEs are born and thrive by remaining in this condition, absorbing inefficiencies and tolerating higher operating costs by eroding the operating margin which, while it may be satisfactory for the owners, does not allow them to "make the leap" to listing on the stock exchange or becoming part of multinational teams. Being a project manager in these contexts is very tiring because the activity concentrates prevalently between that of the fireman who goes around the various departments putting out one fire after another, and that of the notary who takes note of what is happening without having any leverage to change things.

1.3.4.5 Project Environment Level 1: Linear Project Management, or "Tell Me What I Need to Do…"

This type of project management remains the cornerstone of any project-based organization. No organization can evolve to level 2 without having

passed through this level, because there are no shortcuts. Be wary of managers or consultants promising unstructured, agile and lean management tricks without first creating a project management culture of this type, which goes by several names: traditional, linear, rational, waterfall, plan-driven, first wave. This type of project management is based on the decomposition of the project (work breakdown) into work packages that can be more easily managed by a single person or business function. This type of management is what 99% of companies need, but because of laziness or habit it is not implemented, in favor of level 0, or because it is easy to fall victim to the chimeras of those who promise quick implementations of agile or lean methodologies, which take into account the fact that in the company, when an order comes in, “we are already late and we don’t have time to write any documents”. The cultural shift that every company must seek and every project manager must never tire of preaching at the cost of seeming like St. John the Baptist who preached in the desert even when no one was listening, is to understand the value of the planning, which is often confused with the activity of design instead of the activity of thinking about how the project will unfold in its entirety, from start to finish, even if it will last three years, without focusing only on the most imminent phases (then we’ll see… Gasp!).

1.3.4.6 Project Environment Level 2: Mature Project Management

It is the most advanced and effective, but it is also very rare to come across and requires that the organization has gone through the previous levels of project management, because it requires a deep understanding of project management mechanisms by, at least, the project managers and the front lines of the company. In international literature it refers to what is called the “third wave”. It is based on hybrid techniques that are tailored to the type of project, choosing from time to time the best mix between predictive and adaptive techniques. In this context, applying the principles of sustainability and servant (and, more broadly, value-based and responsible) leadership is not seen as a fad, but is part of the corporate culture, which understands its value for its shareholders.

To clarify this part, some example of which practices correspond to level 1 (PM1) and which to level 2 (PM2) can be, for instance, that a focus on an iron triangle that includes cost, schedule, and quality (the usual one)

is considered to be PM1, whereas your somewhat different triangle (which actually has four variables) cost, schedule, scope and quality would be PM2 if scope is related explicitly to well defined value(s). Similarly, managing stakeholders would be PM1, whereas managing for stakeholders' (values) would be PM2: a common way of framing stakeholder management is based on stakeholder register corresponds to PM1, while PM2 requires a richer model of stakeholder interests, and requires that the project manager considers the benefits in delivers and the costs it imposes on various stakeholders, and seeks not only a solution that is feasible, but also provides for a just and efficient distribution of costs and benefits.

The project manager who has the good fortune to work in such companies (there are not many in the world) can achieve the maximum in his/her profession, because he/she can apply all or part of the dictates of the PMBOK and, more modestly, of this book.

1.3.4.7 The Gardening Project Manager

An effective metaphor that helps me establish a serene relationship with the project environment is that of the gardener. The project manager must care for the project as a gardener does for the garden he cultivates. As Michael Pollan notes in his "Second Nature," a good gardener:

- Observes the *genius loci*, that is the peculiarities of the place where he or she has to intervene, and adapts his/her approach according to it: a nice lawn can be a good solution for a garden in Rome, but it will probably be very problematic if applied in Timbuktu; vice versa, a desert garden with succulent plants will be ideal for Albuquerque but would not survive a winter in Vancouver.
- Knows that no technology or artificial solution can definitively win against the forces of nature: DDT was not a definitive victory against insects and glyphosate against weeds. It is necessary to observe how the surrounding environment behaves, take advantage when possible, and counteract it when necessary by applying solutions similar to those that are already in place (such as introducing ladybugs and other insects instead of DDT to counteract harmful insects).
- Never stops collecting data on what's going on: if a part of his/her orchard is shady and damp and doesn't grow peach, plum and other fruit trees well, there's no point in clearing the edges, creating drainage and

replacing the soil: it’s probably much more profitable to plant blackberries or raspberries, or a mushroom patch.
- Knows that weather forecasts are not always reliable and seasons are often unpredictable, so he/she prepares his/her garden to withstand heavy rains when the weather is good, and gathers enough water before drought.

Like the gardener, the good project manager must:

- observe the *genius loci* in which the project develops,
- avoid thinking that the mere application of new technologies and tools can in itself solve all the problems that the project ecosystem manifests,
- going along with the environmental conditions as far as possible is the best way of allowing (project) managers to flourish,
- prepare for the unexpected before it happens.

One final warning: the gardener can consider him/herself in a position of authority to the plants, exactly as some project manager considers him/herself to the project team. Nontheless the gardener, exactly like the project manager, becomes effective only when realizes that he or she is a facilitator and an enabler for the plants (his/her stakeholders) to unlock their potential value.

1.4 Project Life Cycles and Phases

The project life cycle is defined as the set of phases that a project goes through from its initiating to completion. A phase is a set of project activities that are logically related and culminate in one or more deliverables or results.

In general, in project management, we refer to five models of the life-cycle, even though the specific life-cycle is unique for each specific project.

1.4.1 Traditional Life Cycle (Waterfall, Predictive, Plan-Driven)

It is the life cycle model of traditional project management, which is called “waterfall” in the literature, but also predictive, linear, plan-driven. It is based on successive phases that, in general, can only start when the previous phase has been completed. The project works for a certain amount of time at the end of which the final result is delivered to the client. There

are no feedback processes or iterations between phases. It is predictive, because in order to apply it, it is necessary to be in a position to predict with little approximation—and therefore with reasonable certainty—everything that will happen throughout the duration of the project. It is linear because it proceeds step by step. It is plan-driven because it is planned in detail from its inception, and the execution consists mainly of the implementation of the plan (Fig. 1.4).

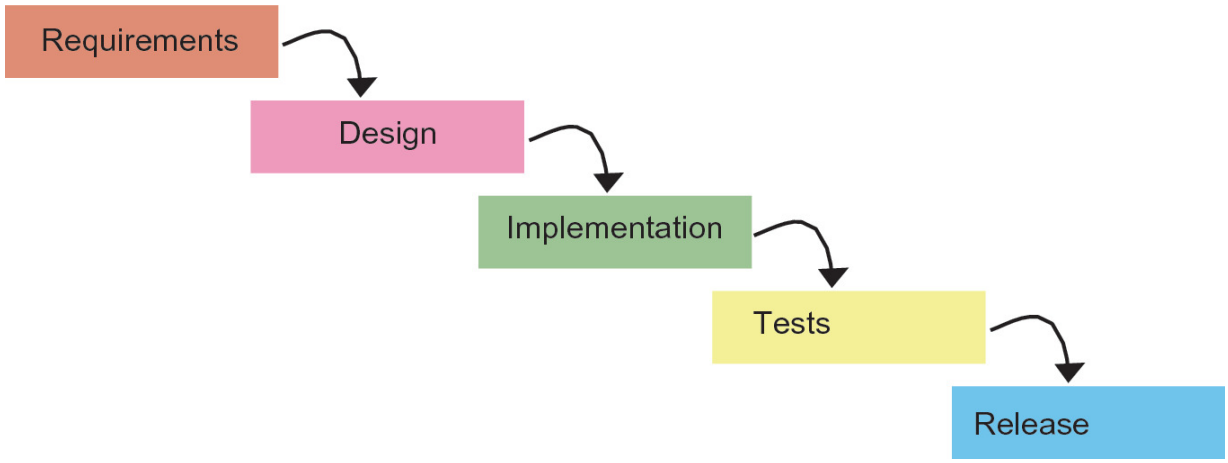

Fig. 1.4 Traditional or waterfall life cycle diagram

1.4.1.1 Knowledge Areas and Process Teams

PMBOKs from 1 to 6 represented project management processes divided into knowledge areas and process teams. This approach has been no longer used in PMBOK 7th (2021). If we refer to the PMBOK 6th, the 49 project management processes were teamed into 10 knowledge areas and 5 process teams.

In this model, knowledge areas are:

1. Integration
2. Scope
3. Schedule
4. Cost

5. Quality
6. Resource
7. Communication
8. Risk
9. Procurement
10. Stakeholder

Process teams are:

1. Initiating (project charter development including preliminary stakeholder identification)
2. Planning (up to baselines approval)
3. Executing
4. Monitor and control (in parallel with executing)
5. Closing project or a phase

This model, which is officially no longer in place, is actually still used in project management classes because is very intuitive for newcomers, and actually provides a clear picture on what happens during a project. On the other hand, I agree, it is too simplistic and can cause misunderstanding in some case. (Anyway, I suggest to project managers to be aware of it and use as a model to clarify with the team and stakeholders in some critical situations.)

1.4.2 Iterative Life Cycle

The traditional life cycle is the most intuitive, although it is not the only one possible. There are projects where there are iterations between phases, for

example a research and development project for a new machine: there will be a design phase, a prototype construction phase, a limited industrial series construction phase, and an industrialization and production phase. It may happen that, after the design and construction of the prototype, problems arise that require going back to the design phase, then back to the prototype construction. These comings and goings between phases are iterations, and characterize projects with iterative life cycles (Fig. 1.5).

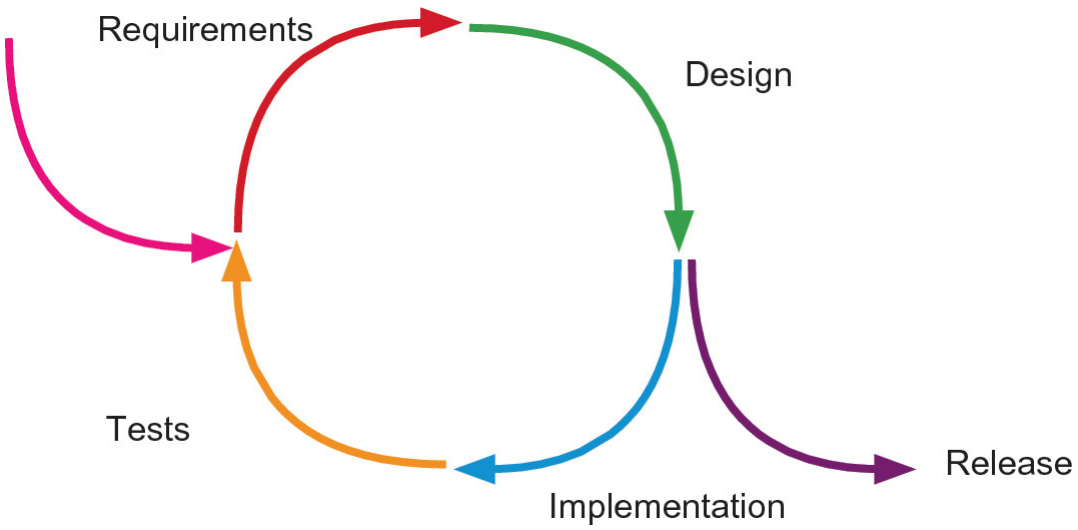

Fig. 1.5 Iterative life cycle

1.4.3 Incremental Life Cycle

Another possibility is to organize a project around phases, each of which corresponds to a “value” release to the end customer. By “value” release we mean a deliverable that is immediately usable by the final customer—that is itself saleable by the customer or that can realize part of the project results.

An example of this can be a project that implements a new software by releasing successive modules that can be used from the first release, such as a graphics software for which the 2D module is released first, then the 3D module, then the animation module; or in the world of construction, a skyscraper of which the first ten floors are released finished and put on the market, and then the second ten, and so on. The fundamental difference with the traditional approach is that, in the latter, the end result of the project is realized only at the end of all activities, while in the incremental life cycle it is realized by continuous “value” increments.

It is referred as Minimum Viable Product (MVP) the version of a product with the smallest collection of features that can be included in a product for customers (early adopters) to consider it functional.

The incremental life-cycle realizes a great advantage for the project's financiers, namely that it anticipates the cash return and partially self-finances during its realization, while a traditional project requires full funding for its realization, and the return of investment only begins at the end of all activities. It is desirable to try to implement this life cycle in any project, whenever possible, to make it more financially efficient (Fig. 1.6).

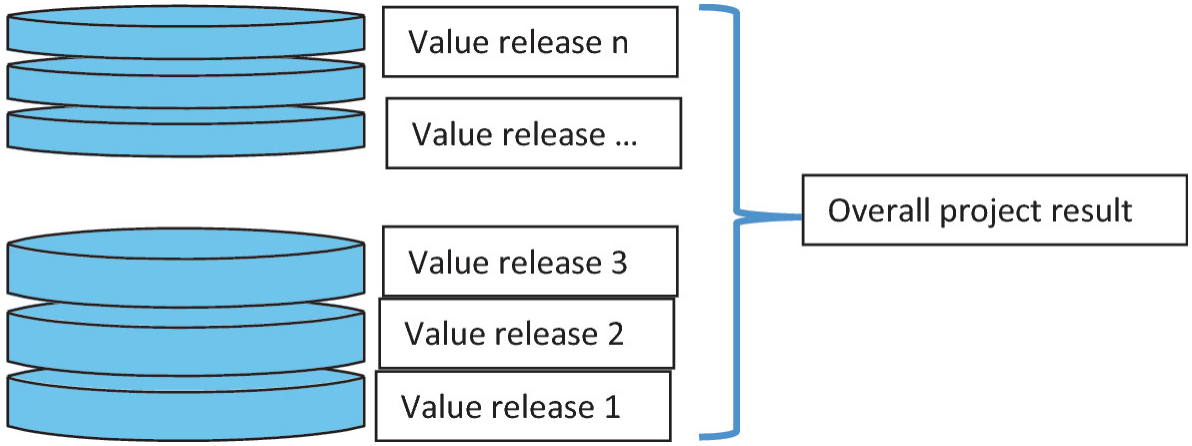

Fig. 1.6 Representation of an incremental life-cycle project

Stage Gates

Some projec**ts are** organized using stage gates. Stage gates are actually milestone (i.e. significant moments in the project's life cycle) with the additional feature of requiring a Go/NoGo decision to allow the project to go on with the next stage. These decisions are normally associated to specific checklist designed for each stage gate. This type of life cycle is very often used in Research and Development projects, in which requirements are typically unclear at the beginning of the project, and are clarified while the project progresses. So, having the most relevant stakeholders of the project together at the most significant moment of the project to assess if their expectations are met and, thus if the project can proceed with the next stage, is a very important assurance that the project is going in the right direction meeting even the most unclear requirements (Fig. 1.7).

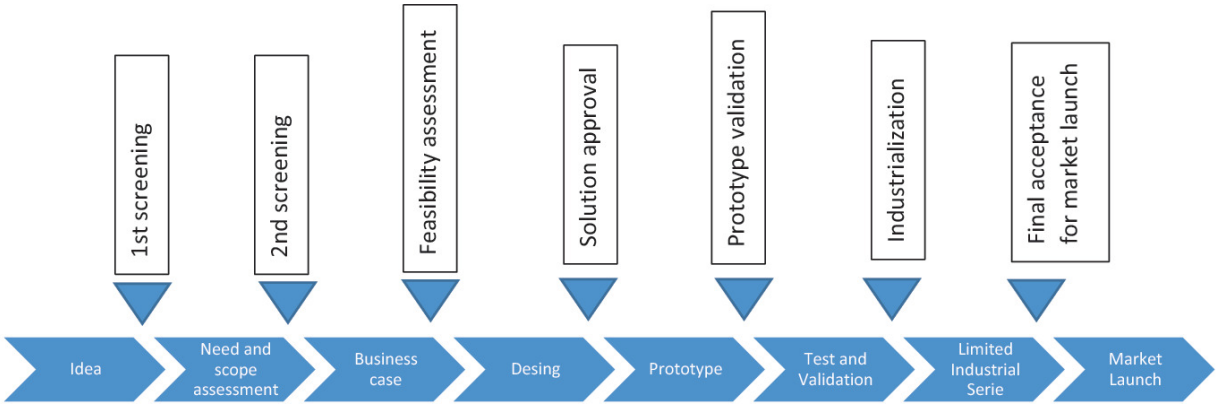

Fig. 1.7 Example of stage gate life-cycle for a new product development project

1.4.4 Agile Life Cycle

A project that adopts both an iterative and incremental life-cycle is called agile. They are also called change-driven and adaptive lifecycles, because they are specifically designed to give the client and the team as much freedom as possible to change the scope of the project and adapt to new needs that arise during implementation, needs that were impossible to foresee in the planning phase.

In literature, besides the iterative and incremental characteristics, the agile life cycle is characterized as “time-boxed” and “feature-based”. Time-boxed means that the duration of all iterations tends to be constant, i.e. the project will be organized in periods (called iterations or, in some cases, “sprints”) of a constant duration of, for example, two weeks: although it is obviously not mandatory to follow this rule, in practice it helps the team to have a constant pace and to maintain it. Feature-based is used in contrast to activity-based: in agile projects, the basis for defining the scope of the project is not the WBS (Work Breakdown Structure) with the activities, but a FBS (Feature Breakdown Structure) in which the work to be done is seen from the perspective of producing a final product that has the characteristics desired by the client.

1.4.5 Hybrid Life Cycle

A pure “predictive/waterfall” approach is generally considered not suitable for most of projects in the age of complexity as it is not fitting to a continuously changing environment. On the other hand, in most of cases it is not acceptable to implement a pure agile approach, without a well defined budget and time frame. For this reason, the preferred approach today is the

hybrid one, and a project manager is asked to be able to tailor the life-cycle to the specific project.

Projects that are mainly based on one of the above models, but have parts that adopt another one, are referred as “hybrid”. A classic case is a project which implements a traditional life-cycle, but which, within this, has parts managed in an agile way: it could be the case of the construction project of a new plant for the production of canned food, which is managed overall in a traditional way—with a Gantt chart representing all project activities—but the design phase is implemented in an agile way with releases of project documents every two weeks for six months, after which the procurement and construction phases begin, which have traditional features and last much longer than the design.

In my experience, teams over confident in agile practice end up being short-sighted because too much orientation to adaptability leads to inaccuracy in planning. On the other hand, teams too confident in the waterfall approach generally tend to have too much faith in their plans and when something does not go according to plan, instead of working towards re-aligning the plans, a scapegoat is found. The hybrid approach seems to me the best compromise. In addition, the principle of tailoring leads to hybrid approaches.

Myth: I Don’t Have Time to Plan, so I Use Agile

I hear this all too often from people who, out of unpreparedness or laziness, use the term agile to justify themselves when they don’t plan or wait until the last minute to do things. Agile is not the life-cycle I adopt when I have no time (or desire) to plan. As will be seen in the second part of the book, the project manager must be in a position to tailor a life cycle suitable for his/her project, not based on his/her willingness or not to plan, but on specific characteristics such as the purpose, the expertise of the project team and the environment in which the project is developed. This is not a choice a priori which, perhaps, reflects our nature (it is much cooler to say that we are “Agile” compared to saying that we are “traditional”), but of a selection based on an in-depth reflection, which more than anything else is the connotation of a project competent manager versus an improvised one.

1.5 Fundamental Principles

1.5.1 A Collaborative Environment Requires Trust, Trust Requires Ethics

A critical success factor for the effectiveness of project management is the presence of a climate of trust within the project team and stakeholders. A climate of trust based on shared ethical values of responsibility, honesty, respect and fairness, facilitates collaboration and lowers the level of conflict, making the project team more cohesive and productive. In this sense, the project manager is required to stick to a **stewardship** attitude. Generally everyone agrees on the importance of this aspect, but in the majority of cases it is simply ‘all talk and no action’ with things going differently, if not opposite, because people act with only their own interests. This attitude is definitely wrong, and it is an insurmountable obstacle for those who want to be a project manager. There is no project manager worthy of the name who is unable to manage and promote internal trust of the project team. If people do not trust each other it is impossible for them to work together.

When there is a lack of trust between the members of the project team, everyone is committed to protecting their individual interests and often hide relevant information, leading the project to failure or otherwise requiring much more energy than necessary to complete, often with disappointing results.

Trust improves the morale of the team. The metaphor of the team as an orchestra works well here: It is necessary to believe that the other members are playing their part to ensure the overall melody. Things are also very similar for a project team. Both the project managers and the team have to rely on each other for the project to succeed as a whole. Instead of hiding information from each other or blaming each other when problems arise, successful teams have the attitude, when there is a problem, to look for the source and a solution together, helping each other. So **trust provides speed**. Such situations are only possible when you effectively combine direct trust, which is based on the observed behavior of the members of your team, with indirect trust, i.e. in their competences and professionalism.

The qualities that make us trust the other people in the team include recognizing in them competence, transparency and professionalism. A

project manager who possesses all these characteristics inevitably has a more effective approach to project management. Once the project manager has established a climate of trust between the team members and the stakeholders, any mistrust in the decisions being made will disappear, and this will crucially affect the morale of the team and therefore ultimately increase trust.

On the contrary, lack of trust erodes the time and energy needed to consider the big picture and to make even the most insignificant decisions, as it raises suspicion about the smallest things that would normally not even be discussed. This, in turn, worsens the morale of the team by forcing members to adopt a defensive and less transparent stance. Promises, commitments and decisions are therefore often delayed or avoided, fearing that they might be criticized later in the project.

Trust in a project team therefore has two purposes. First, it enables members to concentrate on their task without having to worry about the security. Trust then creates a distraction-free environment, which also has a positive impact on people's overall emotional and mental well-being. This ultimately makes the team more productive.

The second function of a climate of trust is to enable people to rely on others. For a project manager and team member, it means working effectively in a collaborative environment where ideas and knowledge are shared openly and innovation of techniques and approaches can be easily experienced.

There is a nice story that is told to understand how trust is a fundamental issue in project management and in business in general: the story of trust in the coffee served at the coffee shop. In many coffee shops, to drink a good espresso, the customer approaches the counter, orders the coffee, you are served, and only after consuming it do you pay for it: the bartender trusts that, after consuming it, the customer will pay for the coffee, even if it is the first time the two meet. In highway service stations and large, crowded cafés, the process is the opposite: first the customer pays for the coffee, and only afterwards goes to the counter to get the coffee: in this case, it is the customer who trusts that, after paying for the coffee, someone will actually make it for him. If it were the case that in a coffee shop, neither the customer trusts the bartender (not agreeing to pay in advance) nor the bartender trusts the customer (not agreeing to be paid after the service), the paradoxical situation would arise whereby there would be

tools, materials, skills, and resources for making coffee, but no coffee would be served.

This story is not so far from reality: in my real working life, I found myself managing situations in which tools, materials, skills, and resources were there, but the project was not performing. It was the same case as the coffee shop paradox.

Therefore, the issue of fostering a climate of trust within the project team and the stakeholders must be a central point present in the effective (and worthy of its title) project manager. The project manager who finds himself/herself operating in a situation where one or more members of the team are not behaving ethically should address the problem with the highest priority: even a single, sporadic, unethical behavior can irreparably undermine the trust of the rest of the team. If the project sponsor or a top manager of the organization were to behave unethically, we should bear in mind that this would be a very high risk, because those who are unethical expect everyone, underneath, to flaunt “fair play” even if they behave as badly as they do, so they continually raise suspicions and pollute the project environment. My advice is to leave these organizations as soon as possible.

I hope I have given the idea of how the ethics that I propose for project management is not a deontological ethics, that is, that must be followed at all costs because it is the highest good and, perhaps, in the end you are admitted to the paradise of project managers: the ethics that I propose is an absolutely opportunistic ethics (eudemonistic for the passionate) [Aristotle], that is, following the ethics will allow the project manager to have immediate benefits in project management, with positive effects on the whole organization. Ethics pays off!

A project manager with a strong personal integrity leads the team to high standards by example.

Sometimes there are situations in which collaboration is very tough. It is the case, for example, of stakeholders that are ideological opponents, and do not want to collaborate anyway. Furthermore, situations in which the project environment (your organization) does not see the importance of value distribution among stakeholders can result to be difficult in collaborating with stakeholders, and more so if there is no financial slack. Or when suppliers, who evidence suggests may still find it tempting to behave opportunistically even under formal relational contracts. Managing these and other similar situations is not linear. On the trust angle, we say

you build trust if you have clear rules of the game (ethics), but have those clear rules takes time and effort.

As principles for ethical behavior, I recommend those developed by the Project Management Institute, which can be downloaded free of charge at https://www.pmi.org/about/ethics/code (address verified on Dec 1, 2022). The PMI Code of Conduct refers to four key virtues that a good project manager must apply in order to be recognized as "ethical" by the project team and stakeholders. To be fair, these very simple principles apply to any manager, and are principles of professional ethics that I would hope would be applied very widely. They are:

1. Responsibility

2. Respect

3. Fairness

4. Honesty

The ones above are ethical values. In my experience, hardly anyone disagrees to those values but often it is hard to implement them. It is an art of turn values into virtues, i.e. into day-to-day behavior. To be able to do this, a Project Manager needs to be aware: aware of what he or she is doing and how is doing it. This also involves emotions, feelings and needs.

1.5.1.1 Responsibility

Responsibility is our duty to take ownership for the decisions we make or fail to make, the actions we take or fail to take, and the consequences that result [PMI Code of Ethics, page 2].

Corollaries of this are:

- We respect the commitments we make and ensure that they are fulfilled. If we encounter problems, we immediately discuss them with our stakeholders.
- If we make mistakes, we admit it and immediately take the necessary countermeasures. If we become aware of errors caused by others, we

immediately discuss the matter with those concerned and/or the competent bodies.
- We only accept assignments that are consistent with our training and experience.
- We protect proprietary or sensitive information entrusted to us.
- We make decisions in the best interests not only of our organization, but also of society and the environment.

Myth: Pantagruel
La vie de Gargantua et de Pantagruel is a series of novels written by the French writer François Rabelais (1483–1553) in the first half of the 16th Century and tell the stories of two giants Gargantua (father) and Pantagruel (son). The latter has become paradigmatic for his attitude of gluttony.

In our working life, Pantagruel is that colleague/supplier/consultant accepting more and more assignments than he/she can manage, or assignments that he or she doesn't have the knowledge, skills and competencies—in the metaphor, filling their bellies of work and orders. They generally do so because they want to increase their consideration into the organization, or in the industry, or increase his/her salary or turnover.

Actually Pantagruels represent a serious problem for organizations, because they are always extraordinary bottlenecks, and they generally perform poorly, giving the justification that they are overloaded. Sometimes you cannot do without a Pantagruel, because he or she is actually the maximum expert in the field of your project or you don't have any alterative. In this case, you must be prepared for a significant activity of engaging, committing and expediting for this team member.

Being a Pantagruel is not ethical because it violates the principle of Responsibility.

1.5.1.2 Respect

Respect is our duty to show a high regard for ourselves, others, and the resources entrusted to us. Resources entrusted to us may include people, money, reputation, the safety of others, and natural or environmental resources. [PMI Code of Ethics, page 4].

Corollaries of this are:

- We always listen to the point of view of others, trying to understand possible differences of opinion before making decisions.
- If we have a conflict situation with a person, we always turn directly to them before anyone else, looking for a point of contact.
- We learn about the customs and habits of the various members of the team of work to avoid being unintentionally disrespectful.
- We respect the principles of ethics and professional conduct even when they are not reciprocated.
- We negotiate in good faith.
- We do not influence decisions for personal gain.
- We respect property rights.
- In general, we never act offensively to anyone.

1.5.1.3 Fairness

Fairness is our duty to make decisions and act impartially and objectively. Our conduct must be free from competing self-interest, prejudice, and favoritism. [PMI Code of Ethics, page 4].

Corollaries of this are:

- We are transparent in the decisions we make and make these clear to the team and our stakeholders.
- We give full access to information and facilitate it for all those who are entitled to it.
- We constantly reflect on our impartiality and objectivity.
- We do not make decisions based on gender, race, age, religion, disability, nationality or sexual orientation.
- We do not make decisions based on personal considerations such as favoritism, nepotism and corruption.
- We offer equal opportunity to equally qualified candidates.
- When we find ourselves in a situation where there is even a potential conflict of interest, we immediately communicate this to the stakeholders and refrain from participating in the decision-making process until, if applicable, a containment strategy has been agreed upon and implemented.

1.5.1.4 Honesty

Honesty is our duty to understand the truth and act in a truthful manner both in our communications and in our conduct [PMI code of ethics, page 6].

Corollaries of this are:

- We do what we can to determine the truth of the matter.
- Let us be truthful in our communications.
- We provide accurate and timely information to anyone who is entitled to it.
- Any commitment, implicit or explicit, we make in good faith.
- We work to create a climate in which everyone can calmly tell the truth, because this reduces fears.
- We are never misleading or deceptive to anyone, for example by making misleading or false statements, stating half-truths, giving information out of context or withholding information.

1.5.2 Involve Stakeholders

Stakeholders, by definition, are those interested in and by the project: individuals, teams or organizations that can influence, be influenced by, or perceive themselves to be influenced by the decisions, activities or outcome of a project. Stakeholders are those who can influence the project either directly or indirectly.

Stakeholders and their influence or interest in the project may vary throughout the project duration. There are stakeholders who are favorable to the project, others who are neutral, others who are unfavorable. The main focus must be on involving the unfavorable and neutral ones, explaining the reasons for the project, discussing the results, trying to understand what fears they do not support, trying, where possible, to make changes to the project so that they can also gather support.

A project manager must be aware of the power of each stakeholder, that is his or her ability to influence the behavior of other stakeholders of the project. The power of a stakeholder can be formal—when coming from formal roles—or informal—not clearly identified into formal roles. Typically, the hardest part of power to be identified is the informal, because it is generally motivated by personal ambitions and interests. Stakeholders with power can use it to influence the project in various ways. The project manager is requested to recognize this as a normal situation, and understand how power is distributed among the project, and work to influence and use

these informal personal interests of some stakeholder to ensure project success.

Stakeholder involvement relies heavily on interpersonal skills, including empathy, trust building, honesty, collaboration and respect. The advantage that the project and the project team have from appropriate stakeholder involvement is in broader and more widespread support for the project, knowledge of different points of view on the project, and in general greater resilience of the project.

Management of Stakeholders vs Management for Stakeholders

Stakeholder theories trace the difference between the more traditional management-of-stakeholders approach and the more recent management-for-stakeholders approach (Freeman et al., 2007; Huemann et al., 2016). These two approaches provide a different perspective. Stakeholder management views stakeholders as resource providers; and, in this context, the main objective of the project manager is to ensure that all stakeholders accept and respect the project as it is conceived. According to this perspective, the project manager is required to govern and shape the relationships between the various actors directly and indirectly involved (lenders, employees, customers, suppliers, third parties, etc.) to organize a series of resource exchanges with the ultimate goal of maximizing the return on investment for the shareholders of his or her organization. Scholars and practitioners have now realized how this approach is not optimal. In fact, if we consider stakeholders as mere cash cows, they will once or twice lend themselves to being “milked”, but in the medium term they will probably no longer be so involved and will change their attitude towards us, not only for individual projects, but for our organization in general. In short, such an attitude undermines the reputation of our organization in the medium term. Over time, therefore, the conviction has matured that it is convenient for (project) managers to pay attention to stakeholders in a perspective of deeper collaboration and convergence of interests, trying to create, through the project, value for both. This is the essence of the so-called management-for-stakeholders, an application of the project more holistic and integrated approach than the classic management-of- stakeholders. The new approach must aim at the best and fairest possible distribution of costs and benefits from project activities, and the creation of maximum value from the project for all stakeholders. It is an approach that

only requires you to be concerned about the costs and benefits that the project generates on other stakeholders, and to maximize value for them as well. It is not a good approach, but an awareness that there is also an interest in the shareholders of my organization if I apply management-for-stakeholders, because the value of the shares in the medium term will have a positive impact. This concept finds wide application in the principles of social sustainability, especially in those related to project leadership.

1.5.3 Value at the Heart of Project Management

The value generated by the project must be considered as the most important indicator of success. Since the different stakeholders have different views of the project value, the project manager has to put himself in the perspective of the different stakeholders. The value is focused on the results that the project deliverables generate. Sometimes the value is measurable financially or quantitatively, while other times it is more difficult because it is social or environmental benefits, so the evaluation can be both quantitative and qualitative. The project can generate value both during its execution, at the end and after its conclusion. The organization that decides to start a project should make explicit the expected value of the project in a business case so that the project manager and the team can calibrate their action.

It is in charge of the organization performing the project to assess if the way the project creates value is a good deal for it and for the stakeholders. For example, if I buy a property above market prices, I capture some value (I need a house), but I am also wasting my organization’s resources. Finding the trade-off in many cases is not trivial.

1.5.4 Holistic View and Systemic Thinking

A project is a complex system consisting of a number of interacting components which form a whole. Since it is impossible for even the best project manager to always keep track of every single project component, it is necessary to develop systemic thinking with a holistic view. This approach is often difficult for many of the team members because everyone is focused on executing their own parts of the project and losing sight of the whole. The parts of a complex system are constantly changing and require continuous attention from the project manager, with regard to both what is happening internally and externally to the project. Sometimes the project

has sub-projects, and thus becomes a system of systems. The systemic view can also be applied on a time level, for example, when a team develops the project in a way that generates value not only until the end, but also beyond, they are applying systemic thinking on a time horizon that transcends the project itself.

1.5.4.1 Ordo Idearum Est Idem Ac Ordo Rerum, or the Form Is of the Essence

In the first part of its Ethics Demonstrated in Geometrical Order, the Dutch philosopher Baruch Spinoza (1632–1677) affirmed the metaphysical unity, that is there is no separation between ideas and real things. I like thinking that this statement has also an operative implication (most philosophers would be horrified): if your workplace—or your computer desktop—is disordered, it is impossible that your ideas are ordered, and that you run your work activities with a structured method. It is never true when someone says "in my disorder I can find anything" for justifying a mess on his/her desk or computer files.

I also believe that keeping order in your workplace helps to improve one's working and thinking efficiency.

Keeping your documents in order has a positive impact on other team members and improves efficiency and cooperation. Quite the opposite if you are disorganized, e.g. in the way you manage files in a cloud space, resulting in serious delays of work activities, stressing team mates causing reworks and critical mistakes that can, for instance, affect a fundamental project release—I have in my mind many examples.

In conclusion: keep your workspace—physical and virtual—ordered and clear, and don't trust on the professionalism of those with a computer desktop full of obsolete files!

Myth: Fractal Thinking

A fractal is a geometric entity characterized by non-integer dimensions and by the property of reproducing the starting entity at any scale [Mandelbrot. 1977]. They also have the characteristic of having a dimension—capacity to fill space—fractional, non- integer, which continues to thicken without ever reaching the next unit. I often come across people who have a fractal approach to the analysis of problems: they cannot approach them in a holistic (comprehensive) way because

they get lost in analyzing specific cases without ever, in the end, abstracting by induction. This is the case of those people who, when talking about a general organizational problem that impacts the project, raise “yes buts” and start telling what happened to them in the past and how it is impossible to avoid it happening. Fractal thinking, which never concludes but creates more and more specific problems, is a huge obstacle to change and innovation, which are the lifeblood of projects. When a project manager encounters someone applying fractal thinking, he or she must do everything possible to defuse it, first trying to talk to them privately to see if a solution to their approach can be found, and then, if not, trying to bypass it in the project.

1.5.5 Leadership

Leadership refers to an individual’s ability to lead a team of people by influencing, motivating and enabling them to contribute to the success of the projects they are engaged in.

In an organization, a team leader is expected to be able to organize work in a way that enables team members to achieve the business goals set by the organization and, to do so, he or she defines them, communicates them effectively, and is able to motivate the team to achieve them.

The need for effective leadership is particularly necessary in the case of project management. In fact, unlike ordinary operational activities where roles and responsibilities are clearly fixed and stable, projects involve many people who are not used to working together and have different ways of approaching problems because they belong to different departments, organizations, functions, etc. In addition, projects generally accumulate more conflicting expectations than ordinary activities in an organization, and are normally subject to many attempts at influence. Furthermore, projects in general gather more expectations, even in contrast, than the ordinary activities of an organization, and they normally suffer from many attempts of influence by “heavyweights” (top managers, directors etc.).

For this reason, project managers, in order to be effective in project management, must make a special effort to develop effective leadership behaviors that allow them to manage the complexity behind the project. Several studies have shown how effective leadership is often behind the success of a project—from the smallest to the mega-projects—and how a

lack of leadership often leads projects, even the most modest ones, to failure or to results far below expectations.

It should also be kept in mind that all members of the team can and should exercise leadership to make the contribution they are asked to make work as well as possible, and to help clarify doubts and motivate colleagues. One could say that it is never possible to motivate someone else but just to inspire, as it is everyone's responsibility to motivate himself/herself from inside. Of course, the Project Manager and the team can work together to create an environment where everybody has an easier job to motivate oneself. Team members who wait for the work to be explained to them in detail and stand idly by until this happens are better off not being on board.

Leadership should not be confused with authority, also referred as positional leadership: the latter refers to a position of control that is formally assigned to a person within an organization and is generally thought of as the right to exercise power. Although the appointment as a project manager can be seen as an act that gives authority to the designated person, this is obviously not sufficient to give leadership to the project. Indeed, it is only through leadership that one can motivate the team towards a common goal, influence it to align its individual interests in favor of the common initiative and perceive the success of the team as one's own success.

An effective leader knows how to adapt his/her style to the specific situation (people, working environment, type of project, etc.), and adapts his/her actions to the individual team members and stakeholders. Only by adopting a professional and ethical conduct one can be a recognized and effective leader.

1.5.5.1 Little Task or Result?

If you search the internet, you will find many who rail against task-oriented or process-oriented employees, while there is great praise for those who are goal- oriented or outcome-oriented. In the grey remain the deliverable-oriented, output-oriented or result-oriented (the latter, by the way, enjoyed excellent press until a few years ago, while now they have fallen out of favor).

The fundamental concept is that a person working on a project will never be effective if he or she is simply focused on completing his/her task,

without worrying about whether his/her action is also effective and achieves the objectives that have been set. Phrases such as: “It was self-explanatory, but he keeps on making mistakes” or “he was copied in on ten emails and he keeps on saying he didn’t know anything about it” or “the spreadsheet I sent him had everything in it and he did the opposite” hide task-oriented attitudes. We all work by tasks and it is normal to follow processes and fulfil specific tasks, but the evolutionary leap that is required from all of us as project managers (but also as members of an organization in general) is to also ask ourselves if our daily actions are bringing the desired results and if not, to apply corrections to our daily work.

Task-oriented or process-oriented attitudes refer to people who do what they are asked to do without looking at whether the final result is as expected. The famous line “the surgery went perfectly, but the patient died” gives an idea of this scenario.

An evolution of this approach is the deliverable-oriented or output-oriented approach. It means being efficiency-oriented because, for any activity that the project develops, it is necessary to have in mind what is the deliverable that the activity must produce, and to concentrate all efforts in that direction. The criticism that has been levelled at this attitude in recent years is that, although it is better than the task-oriented attitude, it is too focused on the individual deliverables of the activities, and risks losing sight of the overall vision of what the project was started for.

The preferable attitude is therefore to have project managers and team members who are goal-oriented or outcome-oriented. In general, we can say that the breakdown into activities lets people think more in terms of tasks, so the project manager must look for a trade-off between decomposition and reconstruction to keep the team on results.

Have you ever been on a diet in preparation for the swimsuit season? Let’s say the dietician has given you a clear diet of what you have to eat every day at every meal. You start to follow it, but after two weeks you weigh yourself and realize that you haven’t lost an ounce. Or, in another scenario, you lose weight more or less as expected but when you look in the mirror you see yourself thin and saggy. In this scenario, what is the task-oriented attitude, what is the deliverable-oriented attitude, and what is the goal-oriented attitude? If you are task-oriented, you will blame the dietician because you actually followed the diet perfectly so you don’t understand why you have not lost weight. If you are deliverable-oriented you will be

satisfied if you lose weight, and the more weight you lose the more satisfied you will be (the deliverable of the "diet" project is weight loss). If you are goal-oriented, you will stop the diet if, even though you lose weight, your physical shape is not what you expected (if, even though you lose weight, the mirror gives you back an image of you as thin and sagging) and you will not overcome the purpose for which the diet was undertaken, that is, to pass the "swimsuit test".

I hope the example is enlightening, and represents to you the importance of the three attitudes:

1. Processes and tasks are always present and are necessary as long as they are tools to reach our goals (this paragraph is not meant to be a sermon against processes!).

2. Deliverables which, one after the other, contribute to the construction of the final project result are always essential and constitute the essence of the project).

3. However **it may not be sufficient to develop all the planned deliverables to make our project successful**; in fact it is only by always keeping in mind what the ultimate goal for which the project was initiated is that you can be really effective as a project manager.

1.5.5.2 Always Decide! (Problem Solving and Decision Making)

The issue of how to deal with and overcome problems and fluidity in decision making is a key issue that plagues most organizations. One can find many refined theories ranging from rational approaches to those more related to social sciences. I personally believe that the issue is very easily solved in most cases by applying a basic principle:

when a problem arises, it needs to be addressed immediately.

Besides, I know I'm in good company. Theodore Roosevelt's famous phrase:

> At any moment of decision, the best thing you can do is make the right choice, the second best thing is to make the wrong choice, and the absolute worst thing is not to decide.

But also James Gandolfini’s more pop phrase in The Sopranos:

A bad decision is better than no decision at all.

Often we hesitate to deal with problems and make decisions because we fear that if we talk about a problem with colleagues, they may take offence, or believe that the problem is a personal attack, or we ourselves fear that by admitting a problem we may be seen as the cause and therefore as incompetent. Another aspect that deters many from making decisions quickly is the feeling that they do not have enough information to decide, and they are afraid of not making a ‘perfect’ decision. But all managers know that it is never possible to make a decision with all the information you want, so any decision can only be “imperfect”: if we wait for perfection we will never decide. The attitude of postponing or not taking decisions, ignoring problems, slowly kills organizations, because problems are never tackled because of this mixture of modesty and fear, they remain latent under the embers, until at a certain moment they re-emerge and, with a snowball effect, become catastrophic. Creating a climate, in the project team, in which you can talk calmly about problems without fear of being judged incompetent, and indeed all collaborate to find a solution, is the key to effective project management, and this increases efficiency, trust between members—because there is no doubt that someone has a problem because they will talk about it, and therefore, in general, the effectiveness of project management. In addition, a constructively critical approach facilitates the adoption of innovative solutions in the project, which is the lifeblood of project management. The project manager, in order to facilitate the discussion of problems and constructive criticism, can begin in the early stages of the project to address the topic directly, or indirectly by demonstrating how problems should be addressed in the most fair and constructive way, and how when something is not working as expected it is good to talk about it constructively.

This may seem to be in contrast with the agile principle: “decide as late as possible”. This agile principle is actually meant to stigmatize an overly waterfall approach where everything has to be decided in the planning phase and then the plan uncritically executed. It is appropriate to decide as late as possible in the sense of identifying the deadline by which a decision

must be made, but then the decision must be made. It should not be seen as an invitation to always procrastinate.

For reaching consensus, you can consider several possibilities:

– Roman voting: basic “yes” of “no” using thumb up or down
– Fist of Five: more granular than roman voting, because each one can vote 5 with all the fingers, or 0 with the fist, or something in between
– Polling: hearing options and then vote
– Dot voting: each person allocates dots according to his or her preference

The solution to be chosen can be based on:

– Unanimity: Everyone agrees
– Majority: >50% of team support
– Plurality: the largest block in the team, even if majority is not achieved.

The main techniques that can be used to analyze problems and to assume solutions are set out in Part Three of the book in the chapter on Business Analysis.

1.5.5.3 The Cynefin Framework

The Cynefin framework was created by Dave Snowden in 1999 and it is used to aid decision-making. Cynefin is a Welsh word for habitat. The framework is based on five decision-making domains—clear (simple), complicated, complex, chaotic, and confusion (disorder)—that support managers to recognize the context they are operating in, and to make decision accordingly. It also helps managers becoming aware of what is really complex—and need effort to be decided—and what is not, and respond accordingly, not to waste energy or time in overthinking.

It is generally represented as in the Fig. 1.8.

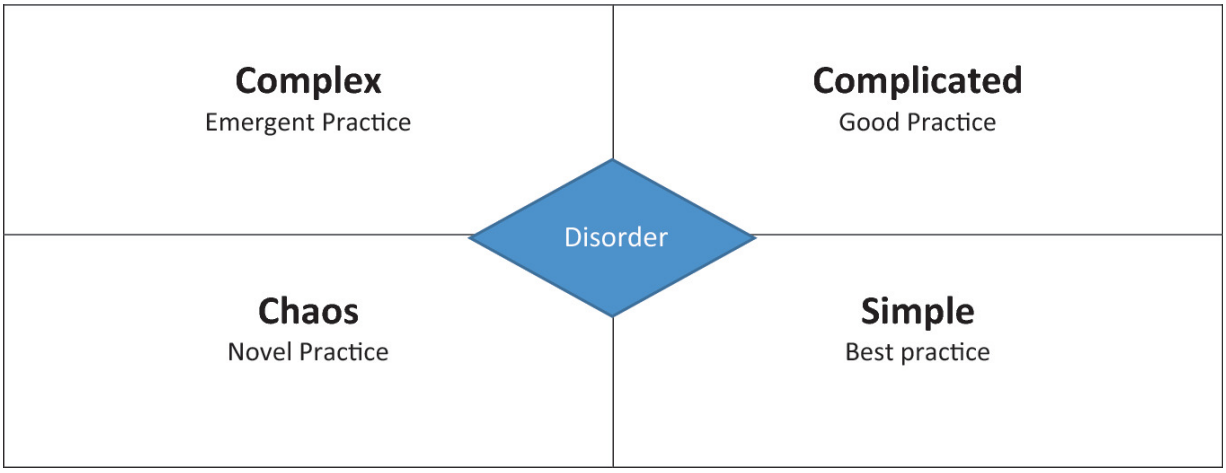

Fig. 1.8 The Cynefin framework

Bad Idea: The Barometer of Misfortune

I frequently find myself working with companies in which project managers acquire a custom of notary, just taking note of what team members do, without being able to lead the project or the team in any desired direction. This is generally due to the lack of project management culture in the company and particularly in its executives, to a general technocratic orientation, and to high financial margins—at least in the past—that left the company organization in a *laissez-faire* mood.

In this situation the project manager becomes the barometer of misfortune, in other words his or her only task becomes to take note of what is not going well, and communicate it to the company management and the customer, without being able to apply neither the minimum of leadership. This is actually a situation of no-project management (see "Project environment level 0: "natural" project management, i.e. Que sera sera …"). An essential part of being a project manager is leading the project in the direction requested by the project sponsor, the customer and the stakeholders. If not, there is no project management.

1.5.5.4 The Halo Effect

The halo effect is a well-documented cognitive bias that causes people to make an error in judgment that causes them to transfer the impression of one characteristic of someone or something to another characteristic that is unrelated.

People fond of ancient Greek culture remember the famous saying "*kalos kai agathos*", i.e. the correspondence between physical beauty and moral beauty: if a man is physically beautiful (*kalos*) he will also be morally beautiful (*agathos*), "beautiful and good" we would say, even if today it seems a strange attitude: you can be physically beautiful but stupid, or ugly and intelligent—they are two separate concepts, but the ancient Greeks made the mistake—halo effect—of making the two qualities coincide. A less educated, but often more understandable example, is that of the football coach: is the best possible coach for a team the best player? Obviously not: some great players are also great coaches, while others are mediocre. Some great coaches have had a very modest football background. Even in this case we see two completely disjointed aspects: a minimum of experience as a player does not impede a coach, but then the two qualities are not related. In the organizational and managerial context, the halo effect often manifests itself in the choice of managers, who are chosen on the assumption that the most experienced specialist is also the best leader for the team he or she has to manage, so the most experienced mechanical engineer becomes the head of the mechanical department, or the most experienced fitter the head of fitters. It may be that the most experienced specialist is also the best manager for the team, but this is often not the case: being a specialist and being a manager are two disjointed aspects. Too often the halo effect is applied in the selection of managers, with detrimental results for companies.

1.5.6 Complexity

Although the level of complexity of a project varies according to one's perception, and may depend on one's experience, knowledge, culture, point of view, and more [Gleick, 1987], complexity is believed to be the most challenging feature that project organizations, and their project managers have to manage today. The causes of the increasing level of complexity impacting contemporary projects can be identified in globalization, new technologies and increasingly fragmented supply chains. To best address the challenges of complexity, organizations must carefully calibrate their organizational structure, diligently analyze projects before approving them and then executing them, pay attention to their people by nurturing their talents and reducing turn-over rates, foster collaborative leadership models (servant leadership), work toward effective and open communication, and

promote flexibility, resilience, and critical thinking to facilitate the analysis of unexpected situations and the creation of innovation.

Some qualitative concepts from models describing the behavior of complex systems can help the project manager to govern projects, and, as is often said, to navigate the sea of complexity. The concepts I want to be aligned with are:

1. Systems

2. Non-linearity

3. Networks

4. Adaptation and resilience

5. Self-organization

1.5.6.1 Systems

Complex systems are types of systems that are composed of many and varied elements that are highly interconnected and have a strong capacity to adapt. A system is a collection of parts that perform collective functions.

A robotic production line is an example of a system since it consists of many functions that must coordinate through a conditional production system to collectively produce a product.

Ecosystems are examples of systems, composed of many individuals that are interdependent and interact to create a single system state. The ecosystem metaphor is very often used to describe complete project environments where adaptive/agile techniques are applied.

Social teams are examples of systems in which many individuals cooperate to achieve common results. This feature of complex systems ties into systemic thinking mentioned above.

1.5.6.2 Non-Linearity

Linearity is defined as the direct and linear relationship between a cause and an effect.

Nonlinearity is an effect that is caused by many interacting parts.

Nonlinear systems exhibit a disproportion between cause and effect, due to the complex set of interconnections within the system. This phenomenon is intuitively represented by the famous “butterfly effect”, according to which a butterfly flapping its wings in Russia can cause a war to break out in Europe many months later.

In addition to these bombastic metaphors, we can recognize non-linear behavior within our projects when a minor change request (a flap of the wings), causes a very impactful delay on critical activities and actually brings the project into crisis a few weeks/months later (war after months).

Non-linerarity is characterizing more and more our day-to-day business environment, and this is connected to planning and project management processes in general, because traditional plans are based on the assumption of linearity.

1.5.6.3 Networks

Complex systems are highly interconnected and are modeled as networks of relationships between nodes.

For example, the European transport system is a network composed of transport nodes (stations, ports, airports, and in general the points of origin of traffic) and roads, railways, sea or air routes, which connect them. Another, very different, example are financial systems, which are networks composed of many highly interconnected actors, acting and reacting to each other’s behavior through a very dense system of relationships.

One way to quantitatively define the complexity of a system is an index calculated as the ratio between the number of relations and the number of nodes within a system. This system, which is very crude but also very effective, is based on the assumption that all relations are equally valid, although this is hardly true.

Social Network Analysis

SNA studies networks of human relationships. A fundamental result of the SNA is a graph in which each node represents an individual member of the organization, and the arcs between the nodes the relations that (eventually) exist between one member and another. Furthermore, in the case of the networks of human relations, a person has many contacts, but not all the contacts have the same intensity: the strength of each contact is in fact different on the basis, for example, of the type of bond that exists between

the two (they phone each other several times a day, they write an email every month, etc.), of the history that binds them (they meet only in the company, they meet also outside, they were school friends, etc.), for which often, in the analysis of the networks, the SNA associates a weight to the types of bonds. Based on this representation, organizational considerations can be made about which members of the organization are central and which are marginal, and which possibly represent organizational bottlenecks. Organizational improvements can then be designed (Fig. 1.9).

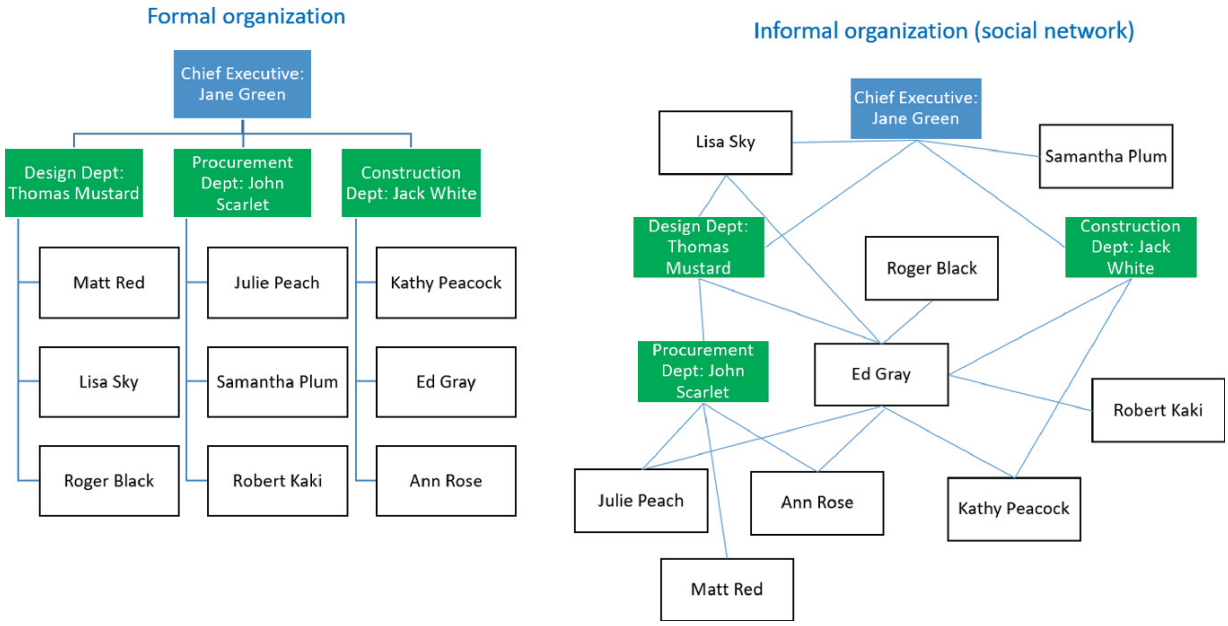

Fig. 1.9 Formal organization VS Informal organization (social network)

1.5.6.4 Adaptation and Evolution

The elements within a complex system have the ability to adapt and therefore evolve over time. Adaptation is the ability of a system to respond to changes in the environment in which it operates. When a system can adapt, it can evolve over time in response to the actions of others and environmental changes. This feature of complex system is the basis for implementation of agility.

1.5.6.5 Uncertainty/Unpredictability

Because of the complex set of interactions and adaptations that occurs within complex systems it is almost impossible to predict with certainty the future state of a complex system.

All the project management methodologies that are called agile/lean want to respond to the complexity of the systems in which they operate by implementing, in parallel with planning as far as possible, the ability of the project and the people who work on it to be “adaptive”, i.e. to be able to adapt as quickly as possible to changes in the scope of the project or the environment, thus achieving maximum resilience. All risk management strategies are also part of the techniques for maximizing project resilience.

1.5.6.6 Self-Organization

It consists of the creation of an overall system coordination level that emerges, without direct central control, simply from the interactions between the local levels of the system. In complex systems there is no central coordinator—no project manager, maybe just a servant leader. Orderly patterns emerge from below, without overall coordination: this behavior is very common in ecological and social systems, such as the flight of a flock of birds, in which birds can perform complex activities without a chief-bird leading them.

More and more firms are exploring self-organizations. In most cases self-organizations are enabled by the hidden hand of an authority. This is for sure the trend for project to be adaptive in the age of complexity.

1.5.7 Tailoring

A project manager, like a good tailor, has to sew the dress—out of metaphor, the organization—to his project, taking into account the context in which the project operates, the objectives of the project and of the organization developing it, the type of stakeholders involved, the management model of the organization and in general the project environment. Each project is unique, and for this reason, the project manager is required to develop a very strong “tailoring”, noting the differences between the various projects and building on what has been learned from previously managed situations. Keep in mind that this topic requires continuous adjustments, in fact the initial assumptions often do not consider the situations that then emerge during the execution, and also the needs of the project and its stakeholders almost always evolve during the project, so the organization must also evolve to take them into account.

In advanced organizations, there are project management procedures, sometimes very stringent, that leave little room for tailoring by the project

manager. However, the project manager must not give up and do everything possible to adapt the procedures to the context of the individual project, and work centrally to change the rigidity of the procedures.

Myth: The Feudal Company

The organization of power in the feudal period saw kings, vassals, lesser vassals (valvassors) and so on. The characteristic of this organization is that power was given from the upper level of the pyramid to the lower one, but could be taken back at any time and discretionally (don't judge me too harshly for this simplistic explanation, I am not a historian). In many cases the vassals had no land of their own and their estates were fiefdoms which they risked losing if the fiduciary link with the investor was broken. In my experience, many companies have an organization almost identical to the feudal one, i.e. the boss believes that his/her employees manage a share of the activities that actually remain his/her, and this happens at all levels (managing director with first lines, first lines with second lines, down to the most humble of employees). With this attitude, the boss believes that he/she can always intervene in the issues that one of his/her co-workers is managing, and it often happens that right in the most critical moments he or she interferes by talking directly with customers, suppliers, stakeholders, without being told to do so by his/her collaborator, only after which the collaborator discovers this and decisions which would normally have fallen to him/her have already been made. This attitude is very harmful for obvious reasons, as it:

- frustrates employees who perceive a lack of trust and become demotivated.
- generates great confusion in the organization because there are people making different decisions on the same issue in parallel.
- The decisions taken by the "bosses" in this case are often not the best ones because they are based on impressions gathered quickly and do not have the perception of the daily life experienced by the employees.
- Stakeholders, including customers and suppliers, are disoriented, and wonder who they need to talk to, thus worsening the company's reputation.

If you find that you are working in a feudal company, try to do as if you were a free commune: value the skills of those who work with you and keep order at least in the organization of your project.

Bad Idea: The Cows Annexing the Chicken Coop

It is very common that Small-Medium—and sometimes even large—Enterprises become part of multinational teams. When this happens, it must be borne in mind that each organization is unique and cannot be expected that others work—or may work tomorrow—just as we do.

This is what would happen if the cows on a farm noticed that the chicken coop is prosperous, and decided to annex it to their stable. Then, as soon as it is annexed, they start demanding that the activities of the chicken coop be integrated into those of the stable, and that the chickens eat grass and produce milk. It is obvious that we are heading for total failure: the various organizations, when they work well, must be understood and allowed to operate in their ordinariness, implementing an attitude of continuous improvement in order to improve all together.

Myth: Common Sense and Rudeness

It is very common to hear managers invoke common sense in the company as an antidote to rude behavior such as arriving late to meetings, bombarding staff with emails etc. These two issues are actually the attempt of clumsy managers not to face problems that they are likely themselves to contribute to generate in a decisive way. Common sense cannot be an organizational solution because it is subjective and the perspective on it can be different from person to person. Mentioning rudeness in the company is like referring to common sense: for example, complaining if people are not on time for meetings (and to top it off with those who are punctual) is not a constructive attitude: it is more crucial to wonder why this happens, such as overwork, or imbalances, and to correct the problem at the root (and this is the manager’s job).

Myth: The Innovative Manager Who Is Against Job Descriptions

This is a very common human type among managers who have taken advantage of the halo effect, i.e. who have been promoted as technical experts, even though they have no competence or interest in organizational and management issues: to justify their lack, they proclaim to be great innovators against the “obsolete” approach represented by organization charts and job descriptions, because people otherwise only do the indispensable minimum that is written in the job description, and do not talk to other colleagues because they rely on the organization chart. The disconcerting fact of these ostentatious innovators is that they do not propose an alternative way of organizing the company, but only claim that deconstructing is better and use the slogan of being “agile” or “lean”, suggesting that writing organization charts, job descriptions and policies is a symptom of moldy bureaucratic organizations. I want to be very clear: this is some of the biggest nonsense you can hear in the hallways of a company (and I’ve heard it all too often). The organization of a company must be thought out: project managers, but even more so all managers of any organization, in order to be worthy of the name, must set as their main theme the organization they want to give to their office/department/company. If this issue is avoided in favor of “emergencies” of a technical nature, the company is subject to a serious risk, because it is not really governed and risks discovering, at any moment, that it is working with serious losses and inefficiency, even to close down. Having organization charts, with a clarity of the functions that are represented through an essential job description, allows people to understand what their scope of activity is, consequently reducing the work stress represented by the anxiety (experienced by many project managers who find themselves working in organizations of this type) of not being able to cope with the amount of requests that come from all over the company. It is often said that the project manager is the “complement to 100” of the rest of the company, meaning that he must do everything that the rest of the company does not do: this is unacceptable. While this is part of the principle, which I absolutely support, that the project manager must have the holistic view and responsibility for the end result of the project, there must be an organization that supports this approach, and allows the project manager to know who to contact for what need. Obviously no organization chart, job description or policy will be perfect, there will always be gaps, but

these must be overcome by making it clear to employees that the norm is to cover the gaps, when they occur, and then, as gaps are found, to normalize them within the job description and policy with an attitude of continuous improvement. In many companies where the subject of organization charts, job descriptions and policies is not addressed or is addressed only marginally, we witness the fact that no one knows what their perimeter is, and everyone does everything, from the employees in the various offices/departments to the top managers: everyone is focused on managing ordinary emergencies (managers act only because they are considered smarter than their employees and have no idea what the difference in the task is between themselves and those they are supposed to coordinate), and no one is concerned with organizing the company to "pave the way" for the employees and make their work easier. To realize the famous motto "Work smarter, not harder! "it is not enough to say that you have to deconstruct, but you have to think about what is the best organization according to the resources and customers you work with. Moreover, what usually happens if you don't codify a minimum of the perimeter of each function is that, departments tend to become "polis", city-states, and deliberate in autonomy of policies that, however, are convenient for their internal functioning, but do not take into account the organization in which they act as a whole, causing serious inefficiencies in the organization, wasting energy, and, ultimately, making the projects almost ungovernable, crushing the function of the project manager to a notary of what happens in the company, and to a messenger of misfortune to the customer.

In all this chaos, which unfortunately is often the daily life of many SMEs (and not only), but the project manager also (and any manager) must apply himself to promote an organizational thinking that aims to a concrete reflection on the responsibility of each person active on the project, and to foster a culture of continuous improvement through 'lessons learned' sessions or similar. Sometimes it is also effective to have basic training on organizational project management issues given to both project managers and project team members by someone who demonstrates an understanding of the day-to-day problems that people face: this generally helps to break down the "silos" and a mutual understanding of the working method.

1.5.8 Achieving Quality in Processes and Products

Quality is the degree to which a set of intrinsic characteristics of a product, service or result meets requirements. Quality also includes the extent to which an organization succeeds in satisfying the stated or even implied needs of the customer. The product, service or project result (deliverable) shall be measured both for the quality of compliance with acceptance criteria and for its suitability for use.

There are many criteria on which the quality of a deliverable can be determined.

Among these:

- Performance
- Compliance
- Reliability
- Efficiency
- Uniformity
- Resilience
- Environmental Sustainability
- Social Sustainability

It is crucial that the acceptance criteria (and quality criteria in general) are clearly specified from the beginning of the project.

The quality of deliverables is generally controlled through inspections and tests, and the quality of project management processes through reviews and audits, but in both cases it is based on identifying and preventing errors and defects. The goal of quality activities is to minimize wasted resources and maximize the ability to deliver the correct deliverables as quickly as possible.

Addressing process quality in addition to deliverable quality allows for robust processes that enable, for example:

- Keeping costs under control
- Deliver outputs on time
- Deliver defect-free outputs
- Meeting stakeholder expectations
- Improve productivity
- Improve decision-making speed
- Improving the climate and motivation within the project team

- Implement a culture of continuous improvement

To be a successful project manager you must be able to give up on perfection. The project may fulfill its objectives and create value in the way we envisioned it during the planning process, but also in many other ways, and the project manager must continually consider and weigh the alternative paths the project may take despite the planning.

This is a principle that needs to be carefully understood because it is easily misunderstood and it is longly discussed during classes but, when internalized, it is of great help to the project manager and the management of the project scope. It is critically important that a project manager, once he or she has defined the project scope and the requirements for the expected product, service, or outcome, strictly adheres to these, and works with the project team to ensure that everyone is fully satisfied. On the other hand, the project manager must also ensure that the quality of the result does not exceed what is prescribed, because otherwise it would incur the phenomena that are defined as:

- **Gold plating**—increasing in quantity or quality the characteristics of the product, service or result.
- **Over design**—develop design beyond what is the prescribed or the ordinary quality in the specific industry.
- **Scope creep**—the viscous widening of the project scope: defines the phenomenon whereby the client requests to develop new functions, which are not contracted, and the team of developers executes these new requests without this being tracked in the project documents and, therefore, properly remunerated.

All three of these phenomena are very frequent—I come across them very often—and represent gifts to the end client and, from the perspective of the organization developing the project, an undue waste of unauthorized resources. The project manager who does not fight them or goes along with them, in order to “please” the client or because it is easier to go along with them than to embark on difficult discussions, perhaps having to hold discussions on contractual documents, actually violates the ethical principle of “respect”, i.e. the responsible and respectful use that the project manager must make of the resources entrusted to him or her by the organization for which he or she works. This is also linked to emotional maturity: If a

project manager is afraid, he or she will apply the ‘please’-strategy without even being aware of it.

Another principle to consider on the quality management is the “**just enough**”, that is the team must work to meet the minimum necessary of the client’s contractual requirements. Many inexperienced project managers criticize this approach as being too much contract-oriented, but experienced project managers know that it is the only approach that can be taken that respects both their own organization and those involved in the project such as clients and suppliers. If there is no clarity on the level of quality to be achieved, normally one is swallowed up by a vortex of gold-plating, except at a certain point to discover that the resources are no longer enough to complete the project and to begin fierce discussions with the client, who at the end of the project will most likely be dissatisfied. I would add that you need to think about the 9th principle of the agile manifesto, which states:

> Continued focus on technical excellence and good design enhances agility.

So the project manager, on the one hand, must pursue a “D” grade, which is the minimum essential—just enough—to meet the requirements imposed by the customer in the documentation and on the other hand, if he or she wants—and has to—have an agile organization with resilience and adaptation to complex situations, he or she has to pursue technical excellence. To steer this cart with two horses pulling in two opposite directions, the project manager must on the one hand know in detail the limits of the project delivery scope and remain firm—explaining the motivations—towards the client, and on the other hand support the project team in finding innovative solutions to present to the client that, if appreciated, can generate economic benefits or be the subject of change order. This type of approach, in my experience, is the one that holds on to everything and, in the final analysis, is most satisfying for all parties involved.

1.5.9 Get Ready for Risk, Uncertainty and the Unexpected

Risk, i.e. the uncertain event that has a positive or negative impact on the project, is a central element in project management. In fact, it can be said, without fear of exaggeration, that project management is itself a discipline

for managing risk and uncertainty. In fact, everything that is certain and predictable is what is of least concern in projects, and it does not require a great deal of skill and attention: if I clearly know the path I will have to take, all I must do is draft a plan and do what I have written in the plan.

A risk is, by definition, an uncertain event which, if it occurs, has a positive or negative impact on one or more project objectives. In projects, risks can have an impact only on individual activities (individual risks) or on the whole project (general risks). Risks which have a positive impact are called opportunities, while risks with a negative impact are called threats. Project teams must work from the beginning to identify as many risks as possible, although new risks may emerge at any time during the project, so risk management is a fundamental activity that continues throughout the project and involves all team members and stakeholders.

Not all organizations and projects have the same attitude towards risk, and the approach can be significantly different in each case. Risk appetite is the degree of uncertainty that an organization is willing to accept in view of a future benefit, and this parameter varies greatly from organization to organization, person to person, culture to culture, etc. It can be quantified by defining risk thresholds, i.e. the extent of variation that is deemed acceptable with respect to a project objective, and a tolerance around the threshold.

Effective project risk management allows teams to reduce overall project uncertainty, minimize negative impacts, and maximize positive impacts.

1.5.10 Adaptability, Resilience and Sustainability

Adaptability is the ability of an organization to adapt and respond to changing conditions in which it is used to operate. Resilience is the ability to absorb external impacts and quickly recover a new operating condition. These features can apply to systems and human beings as a leadership attitude. These are two characteristics to be developed in any project, because it is normal that a project encounters, at least in some of its development phases, problems and obstacles, and it is precisely in these critical cases that adaptability and resilience are of support to anyone working on the project. Sustainability is a broader concept that incorporates the first two and, if implemented, gives much greater benefits to the organization. A general recommendation that helps the creation of these

characteristics in the project is a focus not so much on the individual deliverables, but on the overall results expected from the project (being goal-oriented): this cultural approach allows the team to think of solutions even outside the initial project framework when problems arise.

3P Sustainability (People, Planet, Profit) or Triple Bottom Line

The 3P Sustainability (People, Planet, Profit), also called Triple Bottom Line (referring to the line that is drawn at the end of a summation before the final result in the organizations' balance sheets) is now universally considered as the only way in which one can effectively approach sustainability and, in my opinion, a fundamental competence for the effectiveness of any project manager's action on any kind of project, but only if purged from the great amount of do-goodism and misunderstandings that have been associated with it in the last decades. Sustainability awareness is said to have been born at the end of the 1980s in the fishing sector, when it was realized in various parts of the world that many marine species were being fished beyond their ability to reproduce (ecological sustainability problem, Planet) by large fishing boats armed by large companies that could only justify themselves if they fished large quantities of fish (financial sustainability problem, Profit), while local communities that had lived by fishing for generations in the same waters had no economic benefit or involvement (social sustainability problem, People).

Today, the United Nations has defined **sustainable development as a process that meets the needs of the present without compromising the ability of future generations to meet their own needs (generational equity)**. In other words, **sustainability is the characteristic of a process that can be maintained indefinitely with the same level of performance**. Today, many people confuse sustainability with ecology, because we often only talk about the "P" Planet, as it is easier, more intuitive and good-natured. In addition, many politicians and top executives use the guise of sustainability to create an aura of environmental and social commitment through misleading communication strategies, trying to divert the attention of investors and the public from the negative environmental and social impacts of their activities (the so-called "**green washing**").

The sustainability that every project manager has to govern his/her projects is based on the three pillars—the 3 P's—and is based on the

assumption that no project is sustainable if it does not embrace and balance all three pillars (the father of sustainability in triple bottom line is John Elkington, while for project management it is Gilbert Silvius). In practice, if a project aims only at financial sustainability, but does not consider social sustainability, which could be represented by an excessive workload within the project team or the involvement of the local community where the project is carried out, or does not consider environmental sustainability, for example by causing relevant polluting emissions that impact the area adjacent to where the project is developed, it cannot be considered sustainable. Similarly, if a project, in order to aim for environmental or social sustainability, loses sight of economic sustainability, in the medium term it will encounter problems that will lead to failure. As in a new triple constraint (or iron triangle), these are three competing objectives, but they must be managed as a whole in order to have a truly sustainable project. A project manager who knows how to harmonize these three pillars will be able to get the most out of the project and the most out of the organization that promotes it. But sustainability in project management is often problematic, because, while economic sustainability has a horizon compatible with that of the project, often the goals of environmental and social sustainability give their benefits in the medium term, and therefore are difficult to appreciate by the end of the project. For this reason, sustainability objectives must be evaluated within the organization's strategy, and included in projects as strategic objectives of the company, with a specific budget that is allocated by the business case of the project itself. If the project sponsor generically asks the organization's project managers to "think also about sustainability" without clear indications and budgets, he or she is not really addressing the problem, but using an attitude that can be configured as greenwashing. In fact, initiatives related to sustainability have costs, which bring medium-term benefits to the organization, but often not immediately visible within the project. For example, if I decide that the project must limit polluting emissions and experiment with new low-impact materials, the project will bear higher development costs than a project conducted with ordinary materials and emissions; however, the organization, once the project is completed, may boast of its worthwhile initiative and improve the perception that customers and stakeholders have of it, but if the focus remains on the project, it will

only be observed that the marginality of the project has been lower than for a similar project run in the ordinary way.

To implement sustainability within projects there are different ways. From a strategic point of view, an organization should identify its objectives through a sustainability plan/budget, which usually focuses on environmental and social issues, while the economic and financial budget keeps its classical tracks. For project managers who have a strong focus on sustainability, there is the Green Project Management certification which publishes the standard “The GPM P5 Standard for Sustainability in Project Management”. There are various corporate sustainability rankings developed by different organizations and consulting companies. To date, the most widely used is B-Corp. Once the sustainability goals of an organization have been defined, they must be implemented in individual projects. There are a number of sustainability protocols for building and infrastructure projects: the most widely used globally are LEED for buildings and Envision for infrastructure. Gilbert Silvius, in his “Sustainability in Project Management” proposes a questionnaire to determine the level of sustainability of a project in general.

For the good of the project and the company, I believe that the project manager should always consider the issue of sustainability, because pursuing 3P sustainability gives immediate benefits to the project, makes it more manageable and greatly increases the engagement of the project team, clients and stakeholders. Conversely, a project manager left alone can do very little if he or she does not have a specific spending budget for sustainability-related initiatives. The right approach, one that is effective and makes the best use of investment in sustainability, is to link the organization’s strategic sustainability goals (from the strategic plan or business plan) to the individual sustainability objectives of the project, weigh for each of these the benefits that will be generated by the project for the organization, evaluate the costs and then allocate a specific budget to be included in the project budget available to the project manager.

An example of benefits that can be considered by an organization for weighing up investments in sustainability are:

1. Financial benefits
    - Direct and immediate economic savings that come from applying principles of environmental sustainability such as reducing the use of

raw materials and energy during project development.
- Reduced operating costs including savings on the costs of fines and legal actions that under normal conditions could be required by public authorities or private parties due to the externalities generated by the project.
- Regulatory Compliance.
- Lower costs of obtaining capital.
- Increase in share value.
- Investment attraction.

2. Benefits for customers and stakeholders

- Increased satisfaction for customers and stakeholders.
- More innovation coming from listening more to the “voice of the customer”.
- Wider social benefits as employment in the community
- Increased market share due to general increase in demand for products that meet sustainability criteria.
- New products and services focused on sustainability.
- Best reputation.
- New market opportunities.

3. Operational benefits

- Process innovation, continuous improvement.
- Improved productivity by minimizing operational waste (e.g. lean thinking approach enhances sustainability).

4. Benefits at organizational level

- Employee retention, reduction in resignations and turnover and attraction of more qualified personnel.
- Improvement of relations with shareholders and stakeholders.
- Reducing the overall level of risk.
- Increased resilience and organizational learning.
- Improved decision-making processes.
- Increased brand value.

When sustainability is addressed during a project and a non-sustainable activity that needs to be changed is identified, it is not always possible to remove that activity from the project, or even change the way it is performed so that it no longer generates externalities, or the costs of changing it may not be sustainable by either the individual project or the organization. When a project team is faced with making choices on sustainability issues, it is important that they evaluate the options, always according to all three pillars, and keeping in mind what is called the mitigation hierarchy, where at the top is the most desirable strategy, and at the bottom is the least desirable. A project team, among the various options, must choose the one that ranks highest without undermining the overall sustainability of the project (Fig. 1.10).

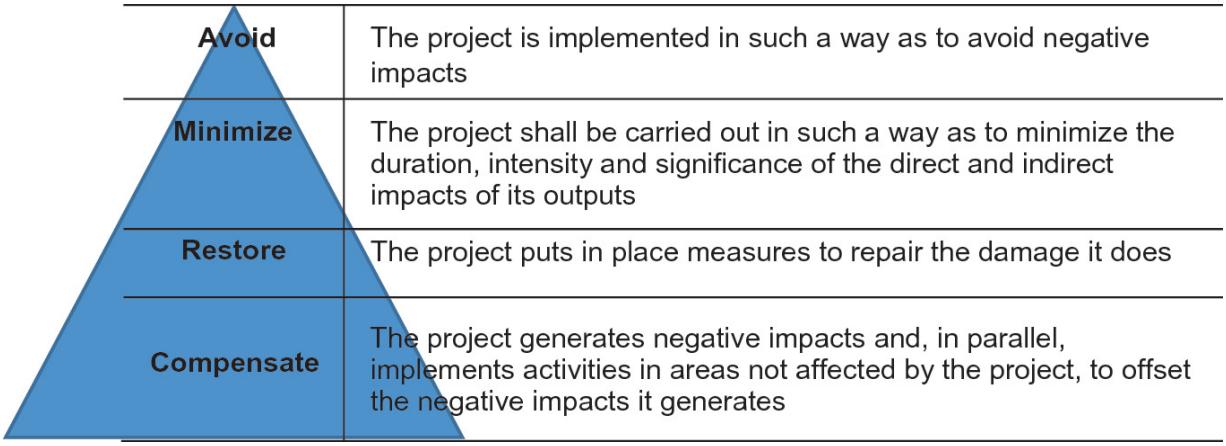

Fig. 1.10 Mitigation hierarchy: the most desirable strategies are at the top

1.5.11 Facilitating Change, Transformation and Innovation

Projects are agents of change and transformation in organizations as they, by definition, create something new. This concept applies both to projects specifically dedicated to organizational change and to projects developing a contract for a third party customer.

Change focuses on the execution of a pre-designed and mostly planned new status, while transformation seeks to develop a new business model enabling an organization to flourish with a long-term perspective. Therefore, transformation is much more unpredictable and can’t be planned and involves a significantly higher level of risk.

Change management in this sense is not to be confused with the process of project change management and control, which consists of approving or

rejecting changes to certain deliverables or baselines.

Change management and transformation management are one of the toughest issue for the project manager, because most team members and stakeholders, while paying lip service to new things, in reality tend to preserve the *status quo* to which they have been accustomed and, perhaps, thriving for years. Many long-term managers in an organization tend to behave in this way.

Project team members and project managers can work with relevant stakeholders to address the resistance and stress that change can generate, so as to maximize the likelihood that the changes, once adopted, will become part of day-to-day operations and the organization will not, after a short time, fall back to pre- project positions (the *status quo).*

Strategies to achieve this include clear and shared communication with respect to the vision of the future state and the motivations for the organization to move in that direction, the expected benefits and the positive impact on processes in general and on specific problems affecting stakeholders in particular. Often the sudden introduction of many changes is frightening and rejected, so it is recommended to introduce one change at a time and observe how often others can be introduced according to the propensity for change that the organization and the stakeholders show.

Myth: Our Company Is Different!

In all organizations there are those who say that it is impossible to put organizational theories (project management, lean, etc.) into their reality, because their company is different from all the others. The differences they usually mention are: the target market, the customers' demands, the types of tailor-made products that do not allow standardization neither of products nor of processes. They are usually people who have been working for many years in the same organization, or young people hired a few years ago who have been convinced by the former of the uniqueness of their situation. I'm not going to tell you how, although all organizations are in some respect unique, in fact organizational theories can be applied, without distinction, to all human organizations, from foundries to civil worksites, from software houses to humanitarian foundations. Those who make this statement are in effect looking for an alibi to hide the disorganization with which they manage their work, even worse if this is a manager: if I say that my situation is different, I

don’t have to make the effort to improve it, because it’s already perfect as it is. Convincing these people otherwise involves a lot of effort and requires setting them a good example for a long time.

1.5.11.1 Innovation

It is often believed that innovation is a concept relegated to research and development projects for new products or services. This is a serious mistake that a project manager must beware of: Innovation is something that every project must be deeply permeated by. Innovation is about identifying new ways to achieve a certain result. We can talk about process innovation or product innovation. It is possible to achieve innovation of a certain product using non-innovative processes, and it is possible to create an established product using innovative processes. It is this last case that I invite all project managers to refer to: always think about the most innovative way to carry out even the most ordinary project. If it is true that, by definition, every project is unique, it is obvious that not pursuing innovation in its execution will certainly lead to inefficiencies. *Looking for new ways often makes the members of the team more aware of the context in which the project develops even if feeling uncomfortable—because moving away from their comfort zone,* but it has a potential for gains that are certainly worth evaluating. Some people turn up their noses when innovation is mentioned because they are used to hearing it used as a pompous and contrived theme quoted by some researcher or CEO to appear up-to-date, even if there is nothing concrete. Innovation mannerism actually always fails.

The project manager must strive to create a working environment in which everyone is free to express their opinions and refute those of others —in a climate of mutual respect—and in which everyone is not offended when someone questions the way others work. To create such a working environment, the recipe is quite simple**: innovation needs freedom, and freedom is based on trust and transparency**. In my experience this is an issue that—in words—is pursued by many companies, but then, in reality, there are many issues that stifle innovation, such as granite procedures and Leviathans (see Chapter 3). Generally, in companies where the principles of continuous improvement are not applied in depth, innovation is stifled, and innovative projects (product and process) always struggle to get off the ground. Projects that do not enjoy a climate that facilitates innovation

almost always suffer delays and cost increases, and these organizations tend to blame inadequate project management, while in prevalent part problems arise from a stifling climate.

Myth: Quintus Fabius Maximus "The Delayer"
Quintus Fabius Maximus is a famous Roman consul who was appointed as dictator by the Roman senate during the Second Punic War against Carthaginians. His surname "*cunctator*" (literally "the delayer") is referred to his strategy not to fight against Hannibal's army in an open field, but to weaken them with minor skirmishes and ambushes. In my life I have met many Quintus Fabius Maximus: I refer to managers that agree in principle to organizational changes according to good management principles, but in practice they never implement anything saying that "they didn't find the time to" or "they don't have enough collaborators to". This attitude, that can seldom be really justified by lack of time and/or resources, cannot be tolerated in the middle-long term: you have to fight Hannibal sooner or later! Quintus Fabius Maximus is a heavy hinderer of any innovation, and a great obstacle for project management. When you face one, you have to patiently explain the motivations of the change needed, and the urgency. If he or she still delays the implementation, the only strategy is to escalate.

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2. Processes and Practices for Preparing and Carrying Out the Work

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Abstract
This chapter is dedicated to the rational part of project management, and covers all the processes and practices that historically have represented project management itself since the first standards were released in the 80s and 90s of the last century. Despite the ever increasingly importance given to interpersonal skills and people management (Chapter 3), the content of this chapter still represent the pivotal knowledge for any project manager in any industry.

I made an effort to integrate waterfall and agile approaches together, as project management is actually a single discipline—managing temporary and unique endeavors—and it is not separated into traditional and agile: a project manager must know how to choose and tailor the best approach according to the project in general and to each specific phase.

2.1 Plan and Manage Scope

The “scope” of the project represents the perimeter within which the project must remain in order to be realized. This aspect of the project is very often neglected or taken for granted, thus causing the project team to forget to develop some parts, or, on the contrary, following the extemporaneous

requests of some stakeholders by developing parts not included in the project scope or requirements (gold plating, scope creep, overdesign).

The baseline of the scope of work is one crucial aspect that the project manager needs to know in very high detail because the whole team refers to him or her for this issue in order: to know perfectly well, according to the agreements to which the project refers (contract, order, or other) what is due and what is not due and then, if so, to negotiate further if required. All members of the project team will always be relieved to see the project manager being able to clarify for them whether or not requests from the client or other stakeholders should be met, and which document to refer to in support of the position. If the project manager, from the beginning of the project, has doubts about the project scope, the first thing to do is to try to clarify and ask questions to the project sponsor (in the case of project with a third party based on a contract, this could be a colleague from the commercial department who negotiated the bidding phase), possibly going to clarify with the client. If it is not possible to clarify satisfactorily from the beginning, the risk of "scope unclear" must be added into the risk register, and the strategies for managing such a situation (that is not unusual) include ensuring that the project execution strategy has an appropriate level of adaptability to deal with this type of problem should it arise, and estimating an appropriate contingency budget to manage the situation, in case.

Identifying and confirming the understanding of the project scope is always the first step when you are appointed as a project manager. The artifact that will follow—WBS or product backlog—will become the baseline for all subsequent planning, management and control activities.

You will be able to assign a duration and a cost to them and build a budget, to analyze their associated risks and determine a contingency, to identify the resources needed and build a plan for managing them, etc.

Bad Idea: Try Telling Him That!

In my experience projects often have grey areas which are often identified late in the project. When this happens, the authority of the project manager can be significantly strengthened only when problematic areas are discussed openly and personally with the customer and the stakeholders involved, keeping the discussion calm, professional whilst always ensuring the results which are due to be delivered by the project team will be carried out as agreed. An opposite attitude, which

discredits the project manager and generates frustration in the whole team is when, faced with such a situation, the project manager disappears from radar for a few days and delegates the team member most exposed to the matter to, “Try to tell him that!”, proposing a compromise solution (lose-lose, see conflict management) which, even if accepted, will be of no satisfaction to anybody. In these cases team members are prone to postpone resolving problems which will, inevitably, become gangrenous and emerge when now they will have become enormous.

2.1.1 Break Down the Work to Be Done: Work Breakdown Structure and Backlog

To represent the scope of the project in a structured and effective way, you can develop two artifacts in general: the Work Breakdown Structure (WBS) and the Backlog, the former normally most used in the context of traditional and waterfall projects, while the second in agile contexts, although there may be exceptions. In the past, depending on the orientation, there were project managers who always used the WBS and never the backlog, and vice versa. Today this attitude is no longer acceptable, and a project manager must be able to understand when the purpose of a project can be more effectively represented by one or the other artifact.

2.1.1.1 Requirement

The term “requirement” means a condition or characteristic necessary in a system, product, service, or result needed to satisfy an agreement or other formally imposed specifications.

I would like to focus on the last three words: “formally imposed specifications”: I obviously do not want to wish for a bureaucratic formalism, but to point out how and according to my experience very often —project requirements are not actually made explicit, but are given as obvious and implicit, based on common sense, and then not really transmitted to the project team, and this can only cause delays, rework and cost increases on the project. We are again talking about clarity: if I have those requirements in a formal way, they are more transparent, traceable and easy to cross-check. Whether the project is being developed in a traditional or agile environment, it is critical to do the most thorough job

possible in requirements tracing. Tools such as the Requirement Traceability Matrix (RTM) are often critical so that you don’t discover at late stages that you are actually betraying the expectations of some stakeholders. In some markets, a contract annex called the User Requirements Specification (URS) is used by the contracting organization to express the high-level requirements of the product or service it intends to procure from potential contractors. The ideal situation for a project is when, at the start, the requirements are already all clear and mapped out—in essence the work has been done in the feasibility stage (business analysis). Depending on the markets and the type of project, it is possible to go more or less in depth in the feasibility stage with respect to the requirements of the final solution: for example, if the project is the construction of a new road—which is a very consolidated market with little innovation—I will be able to express most of the requirements from the very beginning; on the contrary, if the project consists in developing a new drug, or installing an ERP system in a large organization, the project itself will consist in exploring and deepening the requirements, and the approach to use should be oriented towards agile methodologies as much as possible.

In jargon we talk about requirements capture because it is often necessary to go to every single stakeholder and, with a lot of patience and maieutic skills, extract expectations and see how to make them fit into the project. It is always better to try to include as many requirements as possible in the project—respecting other constraints——to get the support of as many stakeholders as possible. A method like the MoSCoW can be used, which teams the requirements that stakeholders declare for a certain project (born in the software field) in:

- Must Have
- Should Have
- Could Have
- Won’t have

So that we can prioritize the requirements and the order in which they will be developed and satisfied during project execution.

2.1.1.2 Deliverable, Output, Outcome, Benefits

A project manager can only be truly effective when the entire architecture of the project is deliverable-oriented. A deliverable is defined as an item,

tangible or intangible, that is produced as a result of a project activity.

The deliverable may be for the entire project or for a single phase or activity. It is critical that early in the project, the project manager leads the team to break the work down into activities that all have clear and defined deliverables, and that these also serve as input for subsequent activities. A project that does not have clearly identified deliverables will certainly run into thick fog and will face very significant inefficiencies.

While deliverables, of which output is generally considered synonymous, are easy to identify and therefore allow to measure the progress of the project, the results or outcome of a process or project may include deliverables but have in general a wider scope because they characterize the benefits and value that the project has to achieve also after its conclusion and, in this sense, are sometimes more difficult to measure and determine. The approach we are talking about here is result-oriented rather than deliverable-oriented, so that projects that are more strictly industrial or that have physical outputs tend to be deliverable-oriented, while those, for example, of organizational change or in general in agile contexts, are more result-oriented.

2.1.1.3 Models, Methods and Artifacts

A **model** describes a thought representation to explain a process, structure or phenomenon. Models give us a schematic, rational and simplified representation that we need to understand how something works in the real world. They represent a specific context and include the relationships between the various parts. Models can provide examples of our behavior and indicate approaches to problem solving or meeting our needs in specific cases. Models reflect simplified, small-scale views of reality and present scenarios, strategies or approaches to optimize work activities in general.

A **method** is an established practice and, therefore, generally considered the most effective way of achieving project effects, results or deliverables. Many methods used in project management are also used in other disciplines.

This is not to claim that there are methods that are exclusive to project management, but, as is normal, all the methods you will find in this text represent the adaptation to the needs of a project context of methods that are generally used in other disciplines, such as interviews, focus teams, checklists and so on.

In jargon, we refer to **artifacts** as project documents in general. Examples of artifacts are: the Project Charter, the Business Case, the Requirements Traceability Matrix, the Stakeholder Register, the Risk Register, etc. Artifacts are typically "living" documents, i.e. updated periodically throughout the project. Artifacts are typically "living" documents, i.e. they are updated periodically throughout the course of the project to track changes in the project scope or changing environmental conditions. They have the dual purpose of aligning and involving everyone in the project team and among the stakeholders. In fact, their shared drafting helps to clarify the objectives, and to monitor the performance of the project as it progresses, in order not to lose sight of the initial objectives.

The PMBOK describes many dozens of templates, methods, and documents that can be used to best manage the project: in this book I have chosen to describe the bare minimum that I believe is reasonably essential for an average project manager.

2.1.1.4 Baseline

This is the approved version of a project plan—and annexes—used as the basis for comparison with the actual project progress measurement and related forecast. The most important are scope, schedule and cost baselines.

2.1.1.5 Work Breakdown Structure

The WBS is an upside-down tree structure that is developed from top (top-down) and represents the whole and sole scope of the project, the perimeter inside of which are all the activities which, when completed, ensure that the project is complete. Anything that is outside of WBS simply is not to be done because it is not part of the project. It is a hierarchical decomposition of the work to be done in which, at each further level of decomposition, corresponds a greater level of detail of activities. The breakdown must continue until it reaches the level of the work package, which must have the characteristic that it can be well managed by a single person. Beyond the work package, the decomposition can continue up to the activity level (according PMBOK the identification of activities actually occurs during schedule management), which has the characteristic of being able to be carried out (and not managed, mind you!) by a single person. Many projects do not break-down beyond this level. In some cases, when activities are

particularly complex, it is possible to break them down to the level of individual tasks.

The decomposition work must be as accurate as possible from the earliest stages of the project, in fact waiting to reach the right level of detail of the scope causes risks in the definition of the scope whose impact becomes higher and higher as the time of the project passes.

Some non-obvious features of the WBS and its elements include:

- **Uniqueness**, or rather the fact that there must be only one WBS on a project, and not, for example, one WBS for the design department, one for purchasing and one for manufacturing: each component of the project team will have its own work package to manage, but these must be able to be composed in a single final structure that is, precisely, the WBS, and that will remain the common reference for the entire project team and stakeholders throughout the duration of the project.
- **Exhaustiveness**, i.e. it has to cover all the products, services and results that the project has to achieve and, therefore, work that is not covered by the WBS is not part of the project scope.
- **Stability**: as the WBS is the baseline of what is to be done, it is essential that it is clear from the start and is not revised during the course of the project (unless there are changes/additions to the contract or agreements in general). If it is often necessary to revise and integrate the WBS in a project, this is a clear indication of poor project management.
- **Simplicity**: the structure of the project must be clearly defined in the easiest and most intuitive way possible for all members of the team, and all members must be able to understand it. It must define detailed work packages and activities that can be assigned to a single manager and that allow, in the execution phase, to measure the progress of the work.

The last aspect mentioned, i.e. that the activities of the WBS should allow the measurement of project progress, deserves a closer look because it is one of the most crucial—or harmful, depending on—aspects of project management. When breaking down a project, it is always essential, even if it is very common to forget, to ask whether the item at the last level of the breakdown (work package, activity or individual task) makes it possible to establish unequivocally whether it has been completed and, in the case it is something that could have a significant duration (a few weeks at least), whether it is possible to establish a percentage of progress. If the last level

of decomposition is generic and not sufficiently specific, it will not really be possible to measure progress and, consequently, the project manager will not be able to establish with certainty whether the project is progressing in line with the schedule or not. To succeed in this seemingly difficult ambition, you simply need to choose activities that are deliverable-oriented, i.e., that clearly define what deliverable(s) are expected at the end. If, for example, you have an activity called “mechanical design”, you must put yourself in the condition of defining the associated deliverables, which could be, for example: 10 tables, a 3D model, a technical report and a list of materials. If the activity was “marketing” the deliverables could be: a product brochure, updated website pages, a press campaign. Etc.

There is no “correct” or unique way to build the WBS for a given project: there are different degrees of freedom that are available to the project manager, the team and the stakeholders to give the WBS the representation that is most comfortable for everyone. The most “canonical” procedure for developing the WBS of any project is to draw a rectangle at the top center of the sheet and write the name of the project in it. The first breakdown is the most strategic and characterizes the next steps. The team has to decide whether to do a breakdown:

1. By category of activity (e.g., design-supply-production-installation).

2. By product structure (e.g., if the project develops a vehicle, engine-transmission-car body-interior-etc.).

3. By organizational structure, i.e. teaming the activities according to the departments that will develop them (often resembling to 1., because the “design” is usually developed by the dedicated department, etc.).

4. By cost structure used in the company: it is typical in large companies, where the project structure must reflect that used for management control

5. For the structure of the contract: if the contract is well written and divided into sections with a payment linked to deliverables, developing the WBS according to the contract can be advantageous because of the ease of managing the work and consequent payments.

6. For the geographical areas where the work is carried out: if the project is international and involves different sites with different specialties, activities can be teamed at the first level of decomposition according to this logic (for example: Milan site, Chicago site, Bangalore site).

7. By phases: if the project is divided into phases, you can choose to break down the activities according to the phase in which they are executed.

Sometimes the proposed project is too large to manage as a whole, and it is better to break it down into several separate projects to be managed as a program. This is the case of projects involving several suppliers or teams working independently until late in the project when their work then needs to be integrated. In a research and development project for a new product, for example, the technical and engineering work is often almost independent of the marketing work until the final launch phase (Fig. 2.1).

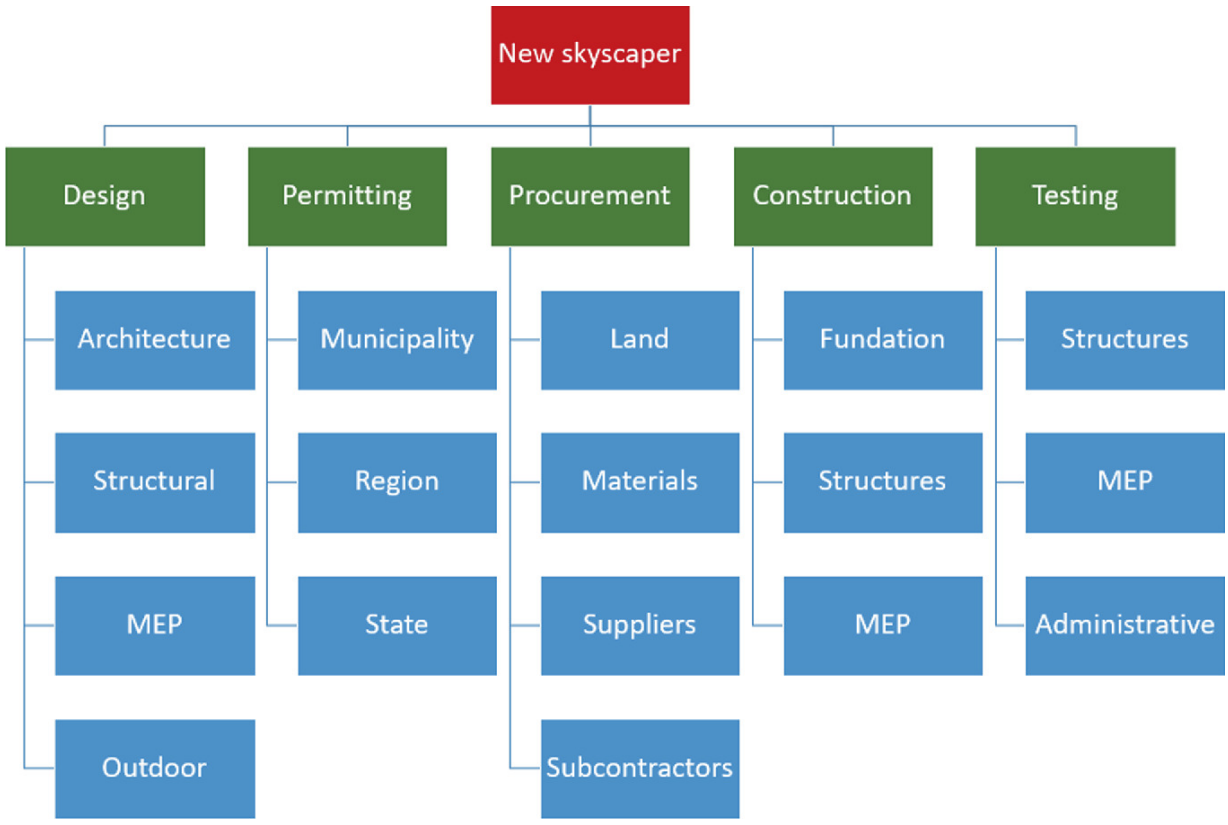

Fig. 2.1 Example of high-level WBS for the Engineering, Procurement and Construction (EPC) project of a new high-rise building

Feature Breakdown Structure (FBS) and Backlog

The agile approach to scope management is, inherently, much less structured and constraining than a traditional project management context. As discussed earlier, this approach is the wisest in contexts where the project scope and requirements of the final product cannot (by its very nature, and not due to laziness of the project team) be completely clarified since the beginning and part of the project actually consists of "exploring" the requirements. For this reason, the Customer typically expresses high-level requirements (sometimes referred as User Requirement Specification or URS) or is even called to tell User Stories, which the team then elaborates and represents in an FBS which, as pointed out in its name, does not claim to define all the work to be done as the WBS does, but to define what the final characteristics of the product of the project to which the team must aim will be. The User Stories are not the technical specifications of the final product, but are constructed by asking the final users of the product to express the needs they wish to be satisfied by the new product. The classic formulation of a user story includes:

1. who (user who expresses it),

2. thing (need to be met),

3. because (the reason, problem or opportunity, that generates the need).

The FBS is a tree structure like all other project management Breakdown Structures, and has the advantage of being an effective communication tool with the client, which helps mutual understanding and work organization. As in the WBS, the elements of the FBS are broken down enough to be reasonably estimated in terms of effort and duration using agile methodologies, and are then fed into the overall project backlog (Product backlog) and the various sprints. Some people in agile projects prefer not to represent the FBS and go directly to the backlog: personally, I am against this approach, because I believe that an FBS, as well as the WBS, have the great merit of giving a holistic graphical view of the project scope, and help the project team and stakeholders to focus on the project in its entirety and, subsequently, to plan it reasonably.

The Product Backlog is an Agile artifact (in particular of the Scrum methodology) that consists of a list of activities (Product Backlog Item)

ordered by priority, i.e. the highest item will have to be the first to be developed by the team (so of maximum priority), and so on, and represents the scope of the project. The “owner” of the Backlog is the “Product Owner”, who is therefore also responsible for determining the priority level of the various items. As expected for an agile artifact, the Product Backlog can be continually revised and reordered by the Product Owner based on the changing needs the project faces (Table 2.1).

Table 2.1 Example of few lines of a Product Backlog

Product Backlog: new online sales portal					
ID	User story	Priorities	Release	Iteration	Status
1	As a user, I want to be able to access my account statement in 3 clicks maximum	Must	1	1	Done
2	As an administrator, I need to be able to see access statistics from the main page	Could	2	TBD	Planned
3	As a user, I do not want my credit card information stored.	Must	1	2	Doing
4	As a user I have to be able to leave comments at the end of each use	Should	3	TBD	Planned

Myth: The Blob

It is unfortunately very common that in many companies (from SMEs even to big ones) there is little attention to the analytical definition of the project scope. This manifests itself, in the case of projects based on contracts awarded by a third-party client, in the fact that the commercial office defines an offer on its own model, which however is not traceable to anything that happens in the subsequent phases of the project, making it impossible to define clearly:

- the scope initially offered and, consequently, any change in the scope of supply causes very long times to be analyzed and defined, and often causes conflicts with the customer.
- When activities are detailed, trace them back to a cost line in the pre-entry.

- Time and cost baseline management is almost impossible or, in the best case, extremely cumbersome.

A scope defined in an arbitrary way in the very early stages of the project has negative consequences on the whole time span of the project, and I like to call it “big-blob”, like the famous movie “Blob: the fluid that kills”: when you have it on your desk, no matter how you turn it, you can’t break it down, you can’t tell the difference between one part and another, you can’t tell if the budget is enough, too high or too low (you can tell at the end of the project, which is a very high risk), every now and then a little bit of it drips out and no one knows why, etc. When a contract is based on a blobbery there is nothing more to do, because by now the bad structure has been agreed, written in the contract or in its annexes, and has become the basis of the project: the best thing is to involve a project management expert from the bidding phase onwards, who will help to define a clear scope of work that can be easily used in the execution phase. When a project manager finds himself managing a contract based on a block, he must try to create a WBS that allows him to interface as much as possible with what was established in the initial scope, and possibly share the new representation of the scope with the client, for mutual benefit. It is never convenient to sign contracts in which the scope is vague because, even if legally this allows, sometimes, to have advantages to ask for contractual integrations (change order), in reality it provokes in the customer a great sense of dissatisfaction for the distance between the expectations and what is then realized, with consequent high level of conflict in the management of the project, slowness, loss of marginality, and customers who, at the end of the project, have no desire to work again with this organization.

Project managers working in these organizations should promote the creation of standard WBSs for the projects (as mentioned above, even significantly different projects from the same organization always combine in a very significant way, so they can be represented with WBSs that, at least at the second or third level, have the same structure). The WBS can be detailed as the project progresses.

In the contract negotiation phase it can have only a couple of levels, then it can be integrated as the work progresses: in this way it will be much easier to manage the project keeping time under control, cost and all the other critical parameters.

Bad Idea: While I'm Doing the WBS Do I Already Start Doing the Gantt?
When a team develops the WBS it has a natural tendency to start ordering the activities based on which it believes will be developed before and which after, and to assign the resource that will have to run it. This attitude, however, is very spontaneous, and must be avoided at all costs: when you develop the WBS you must forget about all other aspects (time, costs, resources) and only abstract the purpose of the work that the project will have to develop. Only at a later stage, which could be as little as a quarter of an hour, can the other aspects of the project be taken into consideration. This is not for a logical exercise, but because if I start to impose time or resource constraints in the WBS, I will lose the possibility of having flexibility, based on the progress of the project in time, to add or reduce resources, or to change the order of performance of activities, etc. **When developing WBS, forget about time!**

2.2 Plan and Manage Schedule

Once the scope of the project has been defined, the team can move on to schedule activities. It is the common practice to address schedule after scope, even if it is not mandatory: in fact you could address cost and resources for example, or even other areas. But, according to my experience, the schedule part of the project is the second addressed in planning, just after the scope definition. In any case, it must be kept in mind that planning is an iterative process, and the various parts it composes are continually revised in a rebound game that ends only when the work team and the stakeholders feel sufficiently confident of the goodness of the level of planning achieved and baptize it as a "baseline".

Practice dictates that when dealing with the schedule, the first step is to break down the WBS or backlog elements to the last decomposition level, if necessary. In some cases, what comes out of the scope planning activities is already sufficient, in other cases it may be useful to further break down some elements to make them more manageable and controllable.

There are several formats that can be used to represent a project's schedule, and each one better suits to the different types of projects and situations:

- Gantt (bar) Chart
- Milestone Chart
- Project Schedule Network Diagram with Dates
- Roadmap
- Task board
- Kanban board
- Burndown chart

2.2.1 Project Logic Network Diagram

The next step of schedule planning consists in identifying logical relationships between activities by creating the network diagram or logical network of the project. This is because the activities in a project are very interrelated to each other, and it is necessary to establish from the beginning which elements should be developed before others. For example, in an engineering project, design must be developed before construction, and construction must be completed before acceptance. These seemingly obvious constraints can be many hundreds/thousands in the reality of projects, and if they are not analyzed and formally tracked, they risk creating paradoxes especially in the more advanced and critical phases.

Logical relationships can be of four types:

- **Finish-to-Start** (this is the most common): Activity B cannot start unless Activity A, called the predecessor, is first completed. For example, the construction activities (successor) cannot start unless I have first completed the design activities (predecessor).
- **Finish-to-Finish**: Activity B cannot finish until Activity A is finished. For example, the electrical installation cannot be completed until the plaster or drywall installation is complete because I could not lay the cables.
- **Start-to-Start**: Activity B cannot start until Activity A has started. For example, as in the previous case, the activity of laying the electrical system cannot start until the installation of plaster or drywall has started.
- **Start-to-Finish**: Activity A cannot start unless Activity B is first finished. For example, the demolition of the old road can no longer begin unless the testing of the new road built to replace it is first completed.

We can then encounter two situations that characterize some of the relationships logic:

- **Leg** (planned delay): where a logical constraint, for example End-Start, sees a delay of some units of time. For example, the concrete pour of the second floor must start 28 days after the end of the concrete pour of the first floor.
- **Lead** (planned advance): as above, only the constraint is advance. For example, machine assembly activities can start two weeks before the completion of the procurement of materials.

When the logical relationships have been defined for all project activities, they can represented into the logical network diagram (Fig. 2.2).

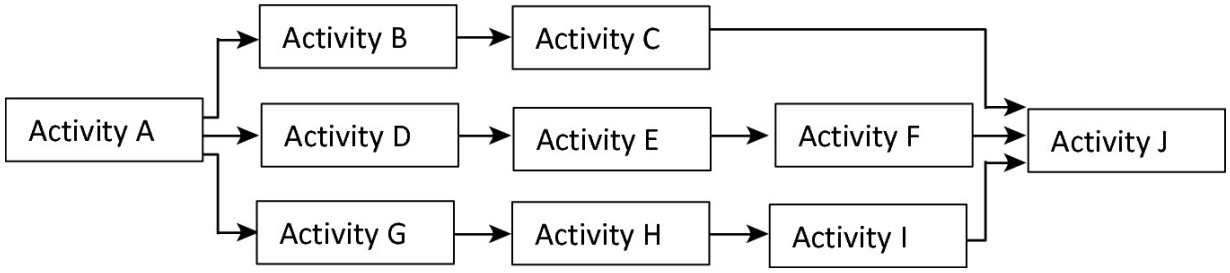

Fig. 2.2 Example of a design logic network before the critical path is processed (CPM)

Activity Dependencies can be also classified as follows:

– Mandatory: it is based on the inherent nature of the work to be performed or it is contractually required. In principle, cannot be removed.
– Discretionary: not mandatory, and based on the best-known practice or expectation on how the work will be developed. It can be removed in case the project is to be fast-tracked (see fast-tracking).
– Internal: based on input coming from the project team.
– External: coming from outside the project and generated by non-project activities.

Myth: "Links Are Better to Put on than Not!"
When analyzing the logical links between activities, extreme care must be taken to be careful to link the activities that can only be carried out in that logical sequence. If you recklessly introduce a lot of discretionary links because you are simply imagining that a certain activity will be performed before another, you are introducing constraints in the project plan that will result in stiffening the entire execution. And each constraint represents a project risk!

If, for example, the project consists of renovating an apartment, and I constrain the activities of the painter (predecessor) and the locksmith (successor) with end-to-start because, according to the information I have, they will work one in a certain week and one in the next, what can happen in the execution phase is that the painter encounters problems and delays his intervention and, given the constraint I have established, this also delays the window fitter, who instead could intervene independently in the planned week without having to wait for the painter's intervention. In most projects, this caution saves hours of analyzing the schedule in search of the error in the links.

2.2.2 Duration Estimate and Critical Path Method (CPM)

The next step to get a satisfactory schedule for a project is to analyze the degrees of freedom that logical relations allow us. To do this, first of all, it is necessary to assign a duration to the activities.

Estimates are a critical aspect of project management, very often understated and poorly addressed. They are necessary in the planning phase, when baselines have to be estimated quantitatively (estimating the duration or cost or resources needed to complete a certain activity). Estimates play a key role in project management as accurate estimates allow for effective decision making, while insufficiently accurate estimates lead to sub-optimal decisions and therefore, represent a very high risk of not being able to achieve the results for which the project was undertaken.

In order to base your plan on sufficiently accurate estimates, you need to use models, whether you are working in a traditional (waterfall) context or in an agile context. One myth I often hear is—sorry for repeating—that agile projects are not planned, and so, very often, there are self-styled project managers who claim that because their projects are very complex, they do not plan and apply agile. This is some of the most terrible nonsense you can come across in project management: as shown in the second part of this book, agile project management is absolutely carefully planned, and in some parts the planning is even more rigid than traditional project management: the statement that when I don't have time to plan I apply agile can only be made by someone who has understood nothing about project management, neither traditional nor agile.

My experience is that estimates are often made very superficially for two, often related reasons: laziness, because accurate estimates require careful analysis of project activities and interfacing with all stakeholders, and unpreparedness of the project organization and the PMO, who should provide project managers with historical data bases to make better estimates.

To estimate the duration of an activity there are several methods, which differ in mode and level of accuracy. The following methods can be found in the literature:

- **Expert opinion**: this is the most used but also the riskiest, because the expert to whom you ask for an estimate must be both an expert in the technical aspects of the activity we are going to analyze, and an expert in providing estimates. The "experts" are often influenced by their own opinion about the project and the activity, and tend to underestimate the activities they like, and underestimate the activities they dislike (I note that it happens to me too when I am the expert interviewed).
- **Analogous** estimation: it consists in finding a project very similar to the one you are about to approach and you use the historical data of the previous project as an estimate for the new one. The accuracy of this approach is limited and makes it usable only for a rough order of magnitude estimate in the very early stages of the project, while in later stages it is better to use other methods. The reason for this is that even the same project, developed at different times, may follow different paths so activities may last differently, so using a past project, however very similar, and relying on this for estimates is riskier than ever.
- **Parametric** estimation: when applicable, it is the most accurate, because it is based on historical data of completed projects but, unlike analogous estimation, it corrects them through significant parameters, thus being able to use projects that are not exactly similar. For example, if the project is to build a 10 km road, I can also use a project for a 2 km road, create a parameter per kilometer of road, and then estimate the time for a 10 km road by multiplying the parameter by 5. In this case, the risk lies in using purely linear parameters: while for road construction times this approach is probably effective, the same cannot be said for the design and procurement phases, which are likely to increase less than linearly with respect to construction times, so there would be a risk of

overestimation. Again, the game is to identify parameters at appropriate decomposition level for the purpose we want to achieve.

- **Three-value** estimation (most likely, optimistic, and pessimistic): You identify three values for the activity you are analyzing, i.e., an optimistic duration, a pessimistic duration, and a probable duration, and then you can simply average them, or give more weight to the most probable duration and thus make a simple weighted average.

$$t = (t_{Ott} + T_{pess} + T_{prob})/3 \quad \text{simple average}$$

$$t = (t_{Ott} + T_{pess} + 4\text{-}T_{prob})/6 \quad \text{weighted average (weight 4 for } T_{prob})$$

- **Bottom-up** estimation: if I am not confident in estimating an activity, one approach I can use is to break it down further, at which point I estimate the duration of the more detailed activities, and then by aggregation determine the duration of the starting activity.

It should be noted that the accuracy of the estimates should improve from the project initiating phase, where the reference document is the project charter, to the detailed planning phase. In the early phases it is acceptable to use a rough estimate (Rough Order of Magnitude or ROM) in which the level of precision should be between 25 and +75%, and refine it up to a range of −5 to +10% in the detailed planning phase [PMBOK7, p. 55]. Absolute accuracy is generally not attainable a priori and the “true” value can be record only at the end of the project. These parameters highlight that estimates:

- have to be very precise, well beyond what I normally find in the projects in ordinary contexts;
- it is better to give the stakeholders and the sponsor a slightly higher estimate than to give a lower one and then have to correct it upwards, otherwise there is a very real risk, in order to keep them happy at the beginning of the project with a lower estimate, to lose them soon after in the start-up phase of the project, just when their support is most important.

In agile context, specific techniques are used, that are not deterministic like the ones used in waterfall contexts, such as:

- Planning poker (or Scrum poker), using a pack of cards with Fibonacci numbers to vote on user stories.

- Story Pointing, using a relative measure such as numbers in the Fibonacci sequence or T-shirt size.

One aspect that any project manager must deal with during the business analysis phase—which in a company often coincides with the sales phase—is the optimistic bias, i.e. the tendency to underestimate time and costs, and to overestimate the return on investment. Carefully developed estimates tend to neutralise even this type of cognitive bias.

A project whose planning is based on arbitrary and inaccurate estimates, even if well-constructed in terms of general tools, will be impossible to manage and subject to continuous changes and risks. Inaccurate estimates, in fact, make project management totally senseless.

When dealing with the schedule, it is important not to confuse the following terms:

– **Duration**: quantity of time needed to an activity to be completed.
– **Elapsed** time: the quantity of calendar days from the day of start to the day of completion of an activity, disregarding any stop occurred during its execution.
– **Effort**: quantity of man hours needed to complete the activity.

Bad Idea: I Know It's Going to go Wrong, and so I double My Estimate…

It is very common for team members to confuse the completion time of their assigned tasks with contingencies, i.e. extra time that may be needed to make up for problems already faced such as rework, supplier delays, quality issues, etc. It is essential that the project manager intercepts these over-cautious drifts that exaggerate project times and increase estimates out of all proportion. For each activity there must be an estimate of duration in case everything goes well and, separately, an estimate of the extra time needed to intervene in case problems arise, which must be noted in the risk register.

Once all the activities in the logical network have a duration, it is possible to study the critical path of the project, which is constituted by the critical activities, i.e. those activities that have no margin for their execution and that, if they are delayed by one unit of time (one day, one hour, one minute) cause an equal delay on the whole project.

The critical path method begins by identifying the constraints of the earliest start and the latest finish dates of the project. The constraint of the earliest start of the project is typically represented by the date before which the project cannot start, represented usually by the availability of resources, permits of construction, production areas. The latest date is the time after which the project cannot be completed, usually the beginning of penalties, or a constraint such as a trade fair where a new product is to be presented (Fig. 2.3).

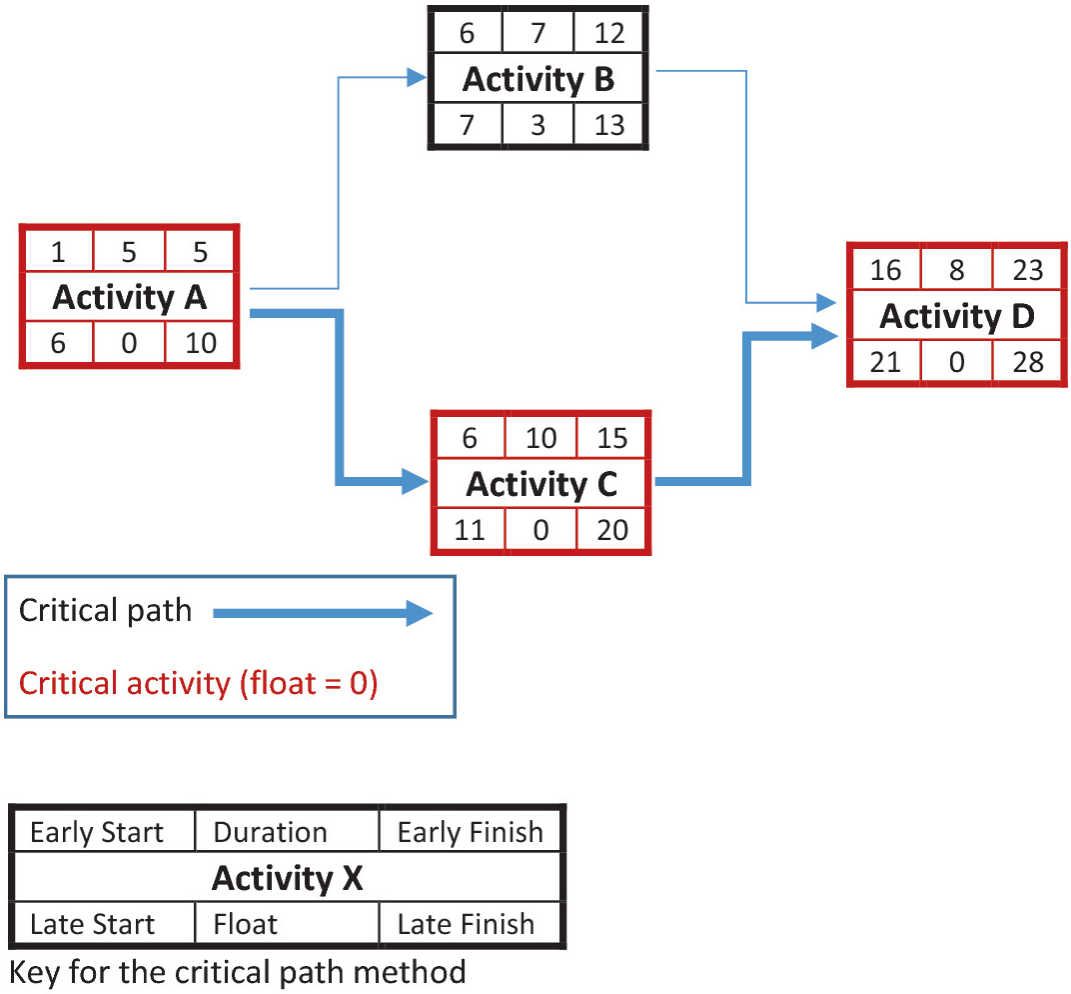

Fig. 2.3 Example of a Critical Path Method (CPM) network

At this point, starting from the first activity of the logical network, whose early start date is the earliest start date of the project as a whole mentioned above, you sum to it its estimated duration and so calculate the early finish date of that activity. Then, adding one unit to the early finish

date of the first activity, you calculate the early start date of the second(s) activity(ies), and so on up to the last project activity. The early finish date of the last project activity also represents the early finish date of the project itself.

The “late” dates are determined backwards, starting from the last activity in the project, whose late finish date is the latest finish date of the project mentioned above. Then, you subtract the duration of that activity and calculate the late start date of that activity. Then, you subtract one unit to the late start of the last project activity and determine the late finish date of the second to last activity(ies), and so on until the first project activity, where you calculate the late start of it and of the entire project.

After this exercise, it is possible to determine the earliest and latest start and finish dates of all project activities and, by observing which activities have a float and which do not—and are therefore critical activities by definition -you can study the critical path of the project.

Please consider that the term “float” can be used with two different senses:

– **Total float** is the amount of time an activity **can be delayed from its early start date without delaying the project finish date**.
– **Free float** is the amount of time that an activity **can be delayed without delaying the early start date of any successor**.

2.2.3 Gantt Chart

The majority of projects are managed using a Gantt chart. While this artifact represents the traditional approach, i.e., it plans the project and all its activities from start to finish in a deterministic manner, it is often implemented in project using a hybrid life-cycle, or even in purely agile projects, although, in the latter case, it loses much of its usefulness. It is a time schedule in which the tasks and work packages are listed on the left side of the sheet—it is actually the WBS put in the column—with associated basic information such as duration and start and end dates, and on the right side of the sheet there is a calendar in which each task is represented by a bar whose length is proportional to the duration of the task placed at the point on the calendar where it is to be expected to be carried out. When necessary, links between activities are also represented with arrows connecting the bars. The rhombuses are the **milestones**, i.e., elements that are actually null activities, representing key moments in the

project life cycle, used to represent the achievement of an important project goal. For example:

- end of the executive design,
- arrival of all critical components,
- go-live the new site, etc.

Milestones are typically divided into internal and external: the latter coming from the environment outside the project team (customer, supplier, other company departments, etc.) and the first are those defined by the project team in order to better plan and control the project.

Bars related to elements incorporating others (e.g. work packages incorporating activities) are represented differently (it is common to use rectangular bars for individual activities and thinner lines with start and end marks as arrows for higher levels). When the Gantt chart is approved, it becomes the schedule baseline for the project that can be used during project execution to measure progress and reflect on corrective actions if deviations occur (Fig. 2.4).

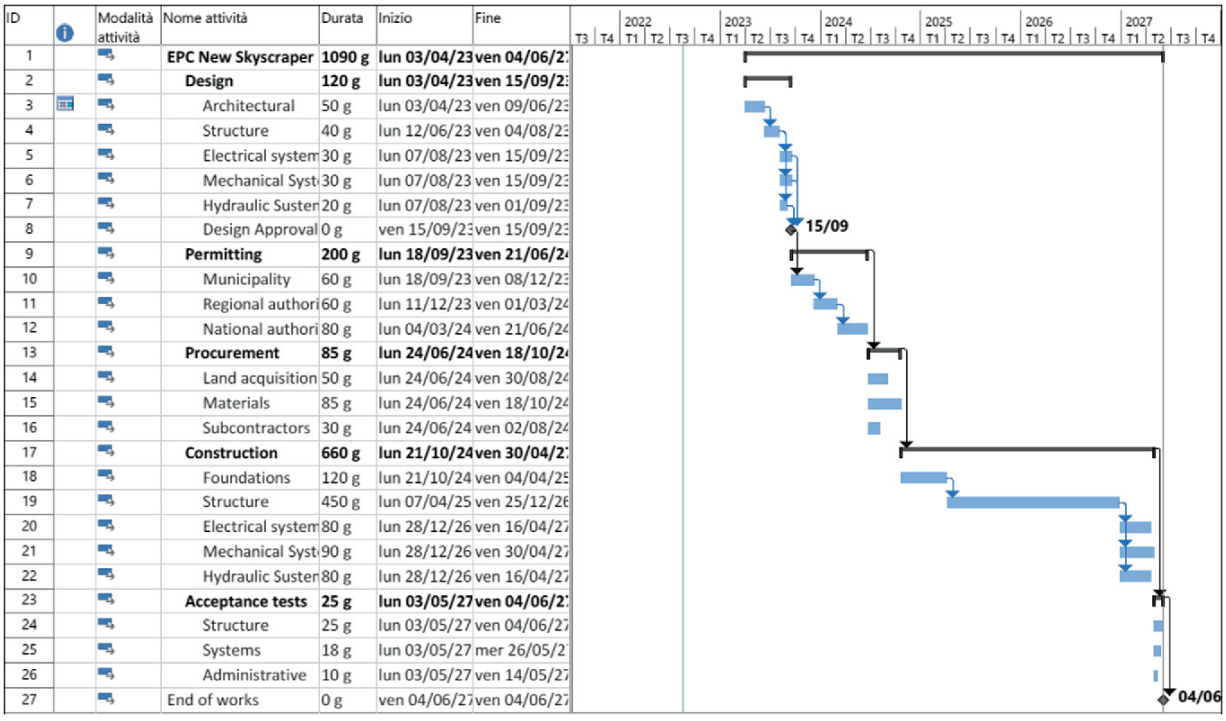

Fig. 2.4 Example of a high-level Gantt diagram for the design and construction (EPC) of a new skyscraper

When placing tasks in the Gantt calendar, keep in mind that there are degrees of freedom. It is often the case that scheduling programs such as MS Project and Primavera leave the field open, but they normally implement ASAP (as soon as possible) scheduling, which is not always the most appropriate. In fact, some tasks may be better planned as late as possible (ALAP), while others are planned somewhere in between. Planning later or on the critical path always generates a risk of delay on the following activities and should be carefully evaluated on a case-by-case basis.

If it is necessary to reduce the duration of the project or a phase of the project, you can consider two strategies:

- **Crushing**, which consists in increasing the resources in an activity in order to reduce its duration.
- **Fast-tracking**, i.e. putting in parallel two activities that were previously carried out in series, even with a discretionary link. It is not applicable, obviously, to those activities linked with mandatory links.

The first strategy increases costs because when doubling the resources you never accomplish to double the work output—you create some inefficiency—the second increases risks because if the activities are in series, in case the first activity face any problems, these can be recovered during the execution of the second, while if the activities are in parallel this can happen no more.

Myth: The Project Manager Who Wanted a Child ASAP

A very common joke about project managers goes like this:

> A Project Manager is a person who believes that 9 women can deliver a baby in one month.

Actually, I have witnessed a situation in which a project manager, very confident on digital tools, almost made the same mistake as the joke. Moral: beware of crushing!

Bad Idea: Long Bars

The Gantt chart is one of the basic tools for dialogue in the project between all parties involved and must be effective, immediately

understandable, and easily identify the critical path and measure of progress.

I very often see Gantt who have almost none of the characteristics above, and which are created to clear the consciousness or, that is the same, to fulfill a generic contract request. These Gantt's are fairly easy to identify, because they are often characterized by long bars across the calendar, many weeks or even months long. **A long bar in the Gantt almost always represents an unmanaged, black box activity** that does not take into account links to other activities and does not provide an effective measure of progress.

Myth: The Gantt Carved in Stone and Signed in Blood

In many disorganized realities it is common to hear expressions such as "Now we are going to carve this Gantt in stone", or, equally, "Sign it in blood". These expressions are indicators of bad organization and lack of training both in general and in project management. No Gantt should be carved in stone or signed in blood, i.e. no Gantt can be unmodifiable. In this case, it is important to explain the difference between Gantt baseline and Gantt actual. The baseline can be (reasonably) set in stone, meaning that it must be clear to everyone working on the project what the plan is and the direction everyone is headed**.** The fact that what happens next is a little different from what I had planned is normal. What is not normal, on the other hand, is to discover only at the end of the project, or at least too late, that I am far from the baseline: if every project must allow for a fair level of flexibility to adapt to the changing conditions of the project and the environment where it is developed, it is not acceptable that there are substantial parts of the project that are not monitored for the most varied reasons (undefined baseline and milestones, laziness of the actors, because "it's not that simple!"). The project manager should not ask for the Gantt to be set in stone, but neither should he accept to have black boxes of which he has no visibility in any part of the project.

2.2.4 Agile Project Planning

In the context of agile projects, the approach to planning is significantly different from that of traditional projects, because the latter want to be predictive and deterministic, and generally use the Gantt chart in which

everything from the first to the last day of the project is depicted. In agile projects, on the other hand, what is sought is maximum adaptability to changes in requirements, priorities of functionalities and the context in general. For this reason, in the preliminary phases (start-up or envision phase), a product roadmap is created, in which the number of value incremental releases will be realized by the project is represented and, for each release, which elements of the backlog will be developed and a high-level completion goal is assigned. Capital error is, instead, consider that in the context of agile projects, planning could not occur at all (I think I've written it more or less in all the chapters, but, believe me, *repetita juvant*) (Fig. 2.5).

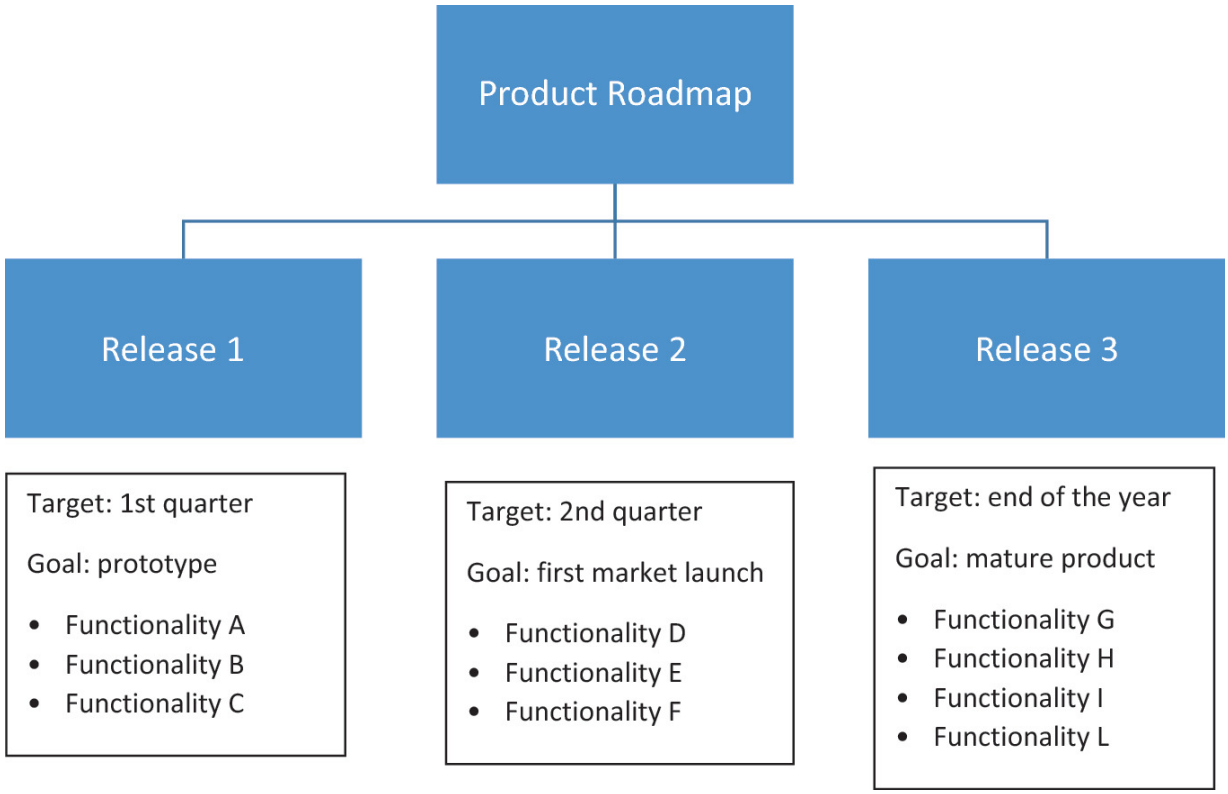

Fig. 2.5 Example of a product roadmap

The next step is the planning of the first incremental release, while—and this is the big difference from the traditional approach—you don't plan subsequent releases, at least not right away: projects that have the characteristics to be managed with the agile approach don't allow a long-term planning on which you can have a reasonable level of confidence, so also planning the other releases would be simply useless.

In order to plan a release, which normally has a horizon between one and three months, it must be divided into iterations. Applying the principle that an agile project must be time-bound, we have to decide what the constant duration of all the iterations will be: usually two–three weeks, but there is absolute freedom. Each iteration must be such as to allow the development of an appropriate number of intermediate functionalities/deliverables that contribute to the incremental release at the end of all iterations. Remember that the incremental release of "value" to the customer occurs not at the end of each iteration (which instead develop functionality or intermediate deliverables for internal project use), but only at the end of a release as a whole.

The next step is to analyze the parts of the Product Backlog that are related to the release we are planning, break them down further if necessary to a level that allows us to estimate the amount of work needed to complete them, and then distribute them over the individual iterations, with the alley that the sum of the hours worked for single iteration must not exceed the total work of the resources that work on it (indeed, in general it is recommended not to exceed 85% of the available man-hours in order to leave a little bit of stock to manage the eventual problems that will emerge during the execution).

When all iterations have been "populated" with backlog elements, the planning can be considered complete and the project can start. The flexibility lies in the fact that, as the project progresses, it is possible to reverse the elements between one iteration and another, or even introduce new ones, in a very immediate and unstructured way compared to the traditional approach, which instead, while allowing planning changes at any time of the project, always requires accurate assessments of the impact of the changes on all areas of the project. An element of extreme rigidity of the agile method, on the other hand, lies in the armoring of the iteration in progress: it is forbidden to modify the backlog—elements and order—and to relocate the members of the project team until the iteration is completed, while outside the iteration in progress there is maximum freedom: this rule is very understandable by anyone who has worked in contexts of great uncertainty, because the daily changes of priorities generate very high stress in the members of the project team.

Unlike projects managed in a traditional way, in which the planning phase is very limited and relegated to one or a few moments of the project,

in agile projects it is an ever-present activity, even if it would be wrong to say that it is constant because it is limited to specific moments that are much more frequent if compared to the case of traditional project management. We also speak of **rolling wave** planning, meaning that the planning is progressively elaborated at a very detailed level for the activities that are close to being developed, while the aspects further away in time are planned at a high level, perhaps stopping at a higher level of the WBS without breaking it down. As the work progresses, the activities that become forthcoming are deepened (Figs. 2.6 and 2.7 and Table 2.2).

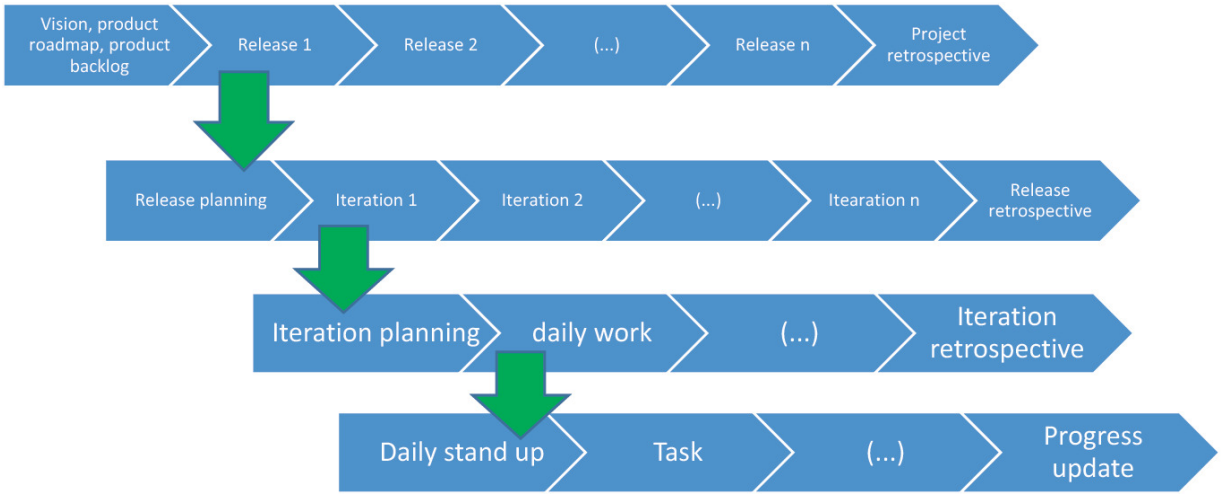

Fig. 2.6 The various planning levels on which an agile project is organized

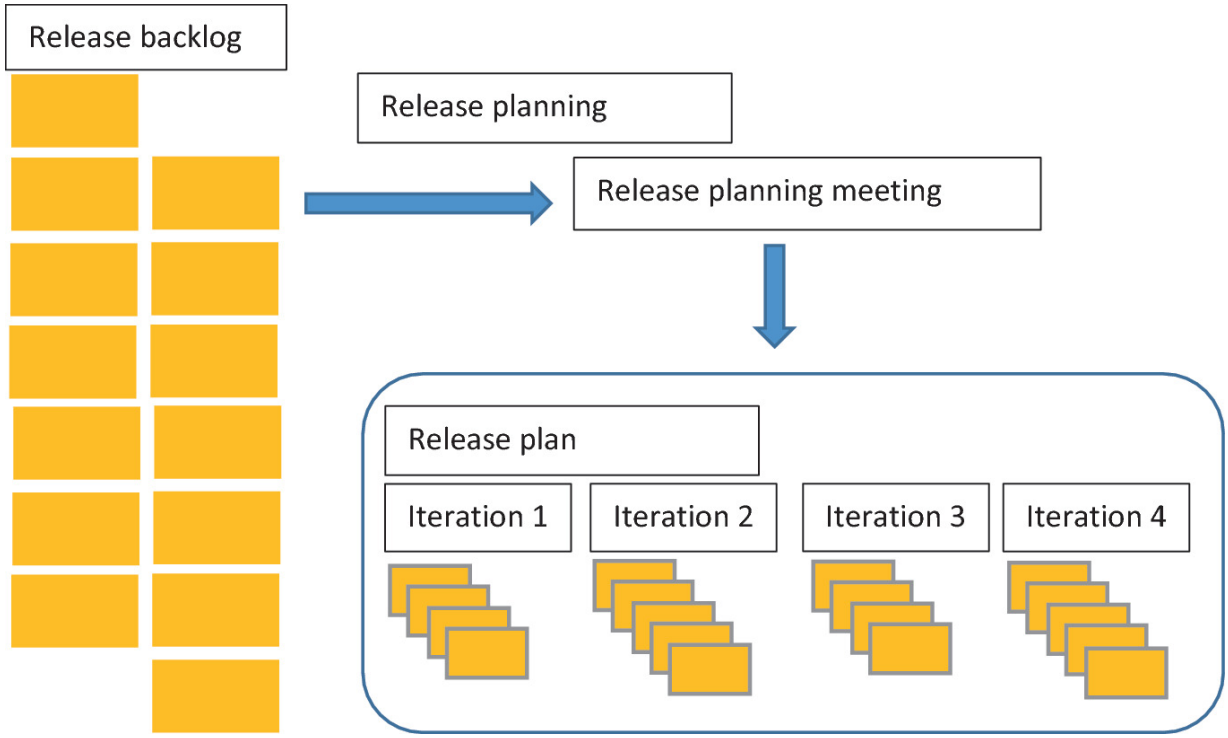

Fig. 2.7 Release planning, from the release backlog to individual iterations

Table 2.2 Traditional vs. agile planning

	Traditional planning	**Agile planning**
Life cycle	Waterfall	Incremental + Iterative
Definition of the scope	WBS	Product Backlog
Master schedule	Gantt (bar) chart	Roadmap
Delivery of project result	At the end of the project	Many times along the project
Master schedule	Gantt (bar) chart	Roadmap
Scheduling	All the project long	Rolling wave (…)
Weekly management	Meeting(s)	Scrum/Kanban boards
Quality		Definition of Done (DoD)
Team	PM + core team	PM + core team + Product Owner
Communication	When needed	Ceremonies
Progress report	S-curve	Burndown chart

2.3 Plan and Manage Costs, Budget and Resources

In this section, we discuss the items that make up the cost baseline and then the project budget. In principle, it is very simple: starting from the individual items of the WBS or backlog, assign each a value of certain costs and a value for contingency funds related to risks (which will be discussed in the section on risk management), and by aggregation (bottom-up) you get to define the cost baseline. To arrive at the budget, the management reserve is added to this amount.

For estimation techniques, please refer to the section of the schedule management paragraph. The difficulty I personally find in managing the budget in projects I am assigned is often related to the fact that the baseline on which I measure the performance of the project has already been eroded at the start. In fact, it is very frequent that, during the commercial phase, an offer is made to the final client and this is taken as the baseline. This offer normally has two types of defects:

- **Optimistic bias** and **strategic misrepresentation**: the commercial part of the organizations, often supported by the management, tends to underestimate (more or less) the costs and risks of the projects it would like to acquire, and for this reason the cost and contingency items of the baseline are lacking at the beginning. If this is done unconsciously or in good faith, we talk about optimistic bias. Otherwise, if it is somehow a planned and systematic distortion of fact done in response to incentives, it is called strategic misrepresentation.
- **Extras (scope creep)** granted in the negotiation phase: during the negotiation phase that goes from the acceptance of the first offer by the client to the signing of the final contract between the parties, the client tends to ask for extras, which are generally granted, in whole or in part, by those who follow the negotiation in order to sign the contract. These are often small things, but when added together they can have an impact of even a few percentage points on the contract gross margin.

The recommendation is that the project manager, when nominated, immediately focus on identifying these types of deficiencies in the budget and ask to reapprove a new cost baseline that includes these issues, even if many parts of the company tend to minimize them because they are uncomfortable or because the approval cycle has already been completed and it would be unfortunate to have to repeat it for so little. What usually happens is that everyone forgets about these “little things” as the project

progresses, but when the gross margin turns out to be less than the declared one when it has been acquired it will tend to be charged to the project manager's mismanagement (Fig. 2.8).

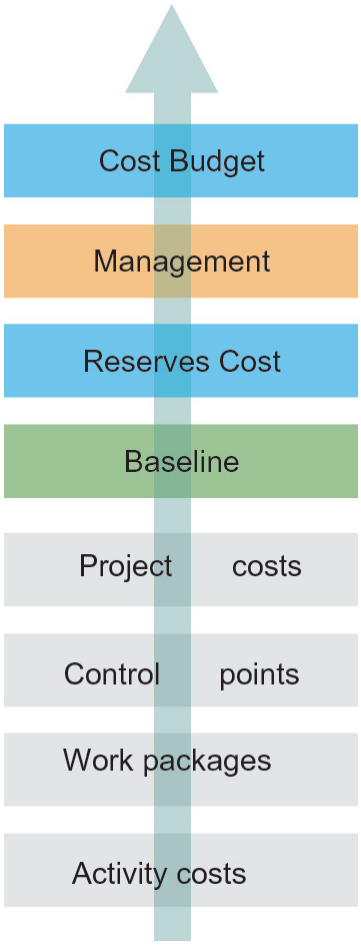

Fig. 2.8 Creation of the project budget by aggregation

2.3.1 Costs, Prices, Change Order Management

The costs in a project are typically categorized as direct and indirect, where **direct costs** are directly connected to the specific project, while **indirect costs** are those involved with maintaining and running the organization performing the project. Costs can also be categorized as fixed and variable. **Fixed costs** stay the same regardless of production output, and may include lease and rental payments, insurance, overheads. **Variable costs** may include labor, commissions, and raw materials, and increase with use, typically paid per unit rates such as Length, Square, Cubic, Weight, Power, Time.

In principle, the project manager should not deal with commercial activities, because these require feasibility analyses and choices that fall outside the scope of project management in the classical sense. However, it is a very common practice that the project manager is asked to manage the change orders during the execution of the project, which consists in the identification of one or more technical solutions to overcome a problem that has been identified, in the definition of the impacts on the project (costs, time and other), and then in the formalization of an economic offer to the client. This type of management transcends what the PMBOK strictly calls "Integrated Change Management," because it includes activities that fall into the commercial sphere, such as determining the sales price. In an ideal context, the project manager should stop at defining the new scope and the new costs and impacts that the change causes. The consequent price determination should be in the commercial sphere, which in turn should confront the company's financial requirements to determine what impacts there could be due to the change order (typically a delay of a few months in reaching the payment milestones could throw off a quarterly report if we are talking about listed companies, or the balance sheet: not always an increase in the project scope and in the selling price of the project have positive effects from the organization perspective).

I feel this is an opportune moment to introduce some basic themes that are usually included in sales and financial manuals:

- **Avoid creating false expectations**: a temptation that anyone who approaches a commercial relationship has is to comply with all the client's requests in order to close the sale, even if these requests are irreconcilable (for example, to have the top of the range product at a low price and in a very short time). I constantly find myself managing projects in which I apply what is written in the contract but the client complains that during the contract negotiation "other things were said", and then when I investigate with the person who negotiated the offer I discover that it is true. Allusions such as "in the contract we write like this but then we will be flexible" generate expectations in the client that can only create discontent, and in the medium-term lead to losing the client or, alternatively, to ruining the project. When we find ourselves negotiating a contract with a client we must be very clear in making the client understand what we mean by what is written in the offer. If you find yourself managing a project where you feel that the client has

different expectations than those defined in the contract, immediately discuss the issue with your client, looking for the right way to align the expectations with those defined in the contract, otherwise the conflict and the level of client disappointment will continue to grow as the project develops, and the project is unlikely to be successful from either the client's or your organization's perspective.

- **Avoid tag shock**: tag shock is the phenomenon generated when a customer, interested in an item (for example, a dress in a shop), scrutinizes it carefully and, when he/she has almost decided to buy it, picks up the tag to see its price, and he/she is shocked because it is much higher than what they expected, and abandons the purchase. The Project Manager (like any salesperson), must prevent this phenomenon from occurring, not necessarily by keeping the price low, but by patiently explaining to the customer the rationale for the price. Also in this case, transparency allows the same customer who does not accept a change order of a few tens of thousands of euros to be satisfied with a variant of over a million (I speak from numerous direct experiences): the difference lies in listening to the customer, knowing how to involve him or her in the choices, and explaining the rationale and value of what is being proposed.
- **Be aware of the difference between margin and mark-up**. There is a lot of confusion, and in many circles they are used synonymously, but care must be taken. The formulas are as follows:

$$\text{Margin} = [(\text{PRICE} - \text{COST})/\text{PRICE}] * 100$$

$$\text{Mark-up} = [(\text{PRICE} - \text{COST})/\text{COST}] * 100$$

The two values differ significantly. If we calculate one and the other in a situation where a good or service costs me €100 and I sell it for €200, here's what happens:

$$\text{Margin} = [(200 - 100)/200] * 100 = 50\%$$

$$\text{Mark-up} = [(200 - 100)/100] * 100 = 100\%.$$

This difference, if not clarified (I've heard CFOs get confused), can lead to very serious misunderstandings, so much so that you could end up selling underpriced, or, at any rate, lowering the margin of your project if you apply the markup instead of the margin in the determination of the

sales price of a variant (or any other sale in the company). In unstructured realities, this misunderstanding is very frequent. The solution is not to involve people who do not have specific training (project managers!) in the determination of the sale price, thereby leaving this task to the dedicated functions (sales management) or, alternatively, create spreadsheet templates where, by entering the costs and other basic parameters, the price is automatically calculated.

2.3.2 Earned Value Management

> Without data you're just another person with an opinion.
> —W. Edwards Deming

Deming's famous phrase perfectly represents the purpose of Earned Value Management (EVM), which is to give the project manager the dignity of being able to quantitatively express the performance of the project when someone asks, "how is it going?". Project managers who are not able to express the percentage of project progress at a certain date by comparing it to a baseline, in my humble opinion, should not be called project managers. The project manager worthy of this name always knows how to answer those who ask "how is the project going?" at any time, for example "the project progress to date is 55% compared to a planned 67% and we are putting in place actions to catch up". If the answer instead is along the lines of "more or less okay, there are a few problems, but don't worry we'll make it" it is not that of a project manager.

EVM in fact represents the fundamental way in which the integrated monitoring and control of a project can be carried out, since it:

- Integrates time, scope, and required resources into a single baseline.
- Quantitatively measures and shares performance and progress of the project.
- Allows to forecast the final result.

Earned Value consists of three key elements:

- PV (Planed Value, sometimes referred to as "Budgeted Cost of Work Scheduled" or BCWS): planned value of the project at the current date, how the project is performing today, how many things I had to do until today. It also coincides with the planned cost.

- AC (Actual Cost, sometimes referred as “Actual Cost of Work Performed” or ACWP): costs actually incurred up to today’s date, so how much I have spent so far.
- EV (Earned Value, sometimes referred as “Budgeted Cost of Work Performed” or BCWP): total value (deliverables/project outcomes) produced as of today’s date.

For example, if my project is to deliver 100 cakes in 10 days, and today is the end of day 3 and I’ve delivered 27 but used ingredients to make 34:

PV = 30 cakes assuming linear execution of 1/10 of the supply scope per day)
EV = 27 cakes
AC = 34 cakes

These three elements can be represented in a Cartesian plane where on the ordinates there is a percentage value of the project progress (in some cases there is a monetary value related to the total project budget or Budget At Completion, BAC) and on the abscissae the project time, from the initial T_0 to the final T_f. Since in general projects start slowly (planning and design phases), then express the maximum in the central part of the execution time (main activities such as procurement, manufacturing, software code development etc.), and then slow down again in the final phases (testing, commissioning etc.), the resulting Earned Value curve has a shape resembling an “S”, so it is called “S-curve” (Fig. 2.9).

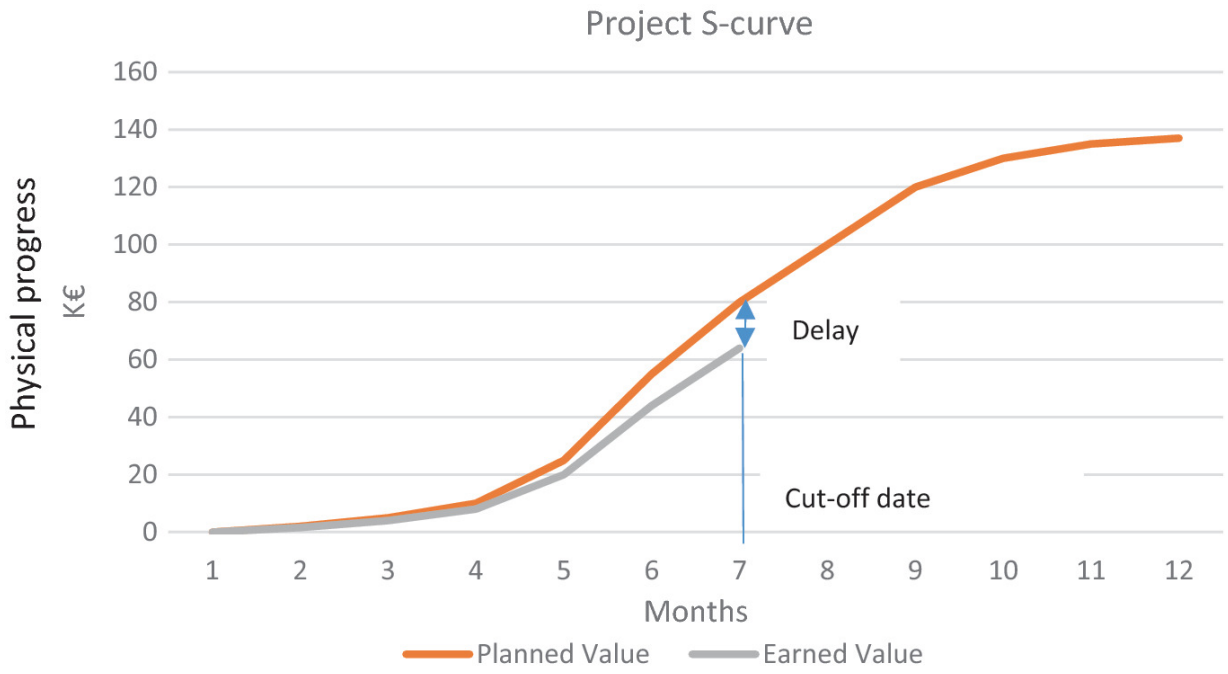

Fig. 2.9 Example of "S" curve during a project execution

The S-curve is a powerful visual tool for project management, which allows the project team and the stakeholders to have a shared point of view on the project, reference values which are shared by all. So everyone understands the progress of the project, any problems and thinks about how to solve them.

Using the three fundamental values of the EVM, the following figures and indicators can be calculated:

Physical Progress

Φ_p = PV/BAC percentage of progress the project should have had as of today

Φ_A = EV/BAC percentage of actual progress that the project has reached at today's date

Deviation Indices

Schedule Variance (SV) = EV − PV

Cost Variance (CV) = EV − AC

0 ☺ if the project is ahead of schedule or is costing less

Performance Indices

Schedule Performance Index (SPI) = EV / PV
Cost Performance Index (CPI) = EV / AC
1 ☺ if the project is ahead of schedule or is costing less

Forecasts

Estimate to Complete (ETC) = [BAC − EV]/CPI − estimated cost to complete the remaining project activities.
Estimate at Completion (EAC) = BAC/CPI − update of project budget to current situation
EAC = AC + ETC
Variance at Completion (VAC = BAC − EAC) − variation of expenditure compared to original budget

Bad Idea: How Much Do You Want Me to Write?
Measuring progress by asking people to declare a percentage is extremely risky: doing so, in fact, people (including me when asked) tend to give estimates, optimistic or pessimistic depending on, but not objective, besides the fact that we all tend to declare problems and delays in the last measurement cycle (if progress is measured on a weekly basis, everyone tends to declare a delay in the last or penultimate week, when the delay causes the maximum impact on the project). This phenomenon is particularly pronounced in the design activities of engineering departments, and in procurement activities. It is quite common to see month long bars called “mechanical preliminary design” or for the procurement of critical or long sourcing parts: these bars should be broken down into at least 3–4 parts. The deliverables/milestones that characterize those activities should be identified, given a weight, and then made measurable.

For example, the mechanical design activity of a machine may be decomposed, in:

- three-dimensional (3D) design,
- graphic tables,
- technical report,
- BOM.

You can assign a weight to each element that is proportional to the number of hours or cost over the total activity. For example, if the

mechanical design activity has a budget of 1000 h and the three-dimensional design activity requires 300 h, I would attribute 30% progress only when the 3D design is completed. The same approach applies to critical, long-supply parts. The breakdown in this case can be done by milestones by assigning a conventional weight to each, for example:

- confirmation of the order to the supplier (10%),
- procurement of materials from the supplier (20%),
- Factory Acceptance Test (FAT) (50%),
- arrival of the material at our site (20%).

In this way it is possible to monitor in a semi-quantitative way the progress of often problematic activities, and to create relevant links between the activities thus decomposed, to determine the critical path and, when necessary, to find strategies to reduce the project time easily representable in the Gantt, as for example to launch the assembly activities of our machine not at the arrival of the material from the supplier, but after the testing in the factory: the long bars do not allow this type of representation. In these cases what happens is that the project team ceases to consider the Gantt relevant and manages the project off-the-cuff.

Myth: It's Not That Easy!

I often find myself being asked to measure the progress of activities according to defined deliverables or weighted milestones, and I hear the company functions I'm trying to monitor in this way responding with condescension: "It's not that simple!" This statement is always false, as well as indicative of someone who does not have control over his/her activities and does not manage to lead them back to a measurable scheme. In reality it is (and must be) always easy to measure the progress of activities, the key is to be clear about which deliverables or milestones are significant, give a conventional weight to each one, and you're done. The enemies of this easy and immediate approach are those colleagues who say that "you never know" "every time is different" etc.. This is also never true and is a sign of organizational confusion: each project is unique by definition, but the effort to outline the work to be

done and create a “sensible” monitoring system can always be made. If, along the way, gaps are discovered, it will always be possible to correct the course, which is always better than groping around without knowing where the project is!

2.4 Plan and Manage the Quality of Products/Deliverables

This area deals with product quality and process quality. The project manager is normally not responsible for quality within the organization or within the team, but still has to keep an eye on the variables because he/she is responsible for the final result. In fact, also for quality, the Project Manager has to know the general coherence of the quality plan and/or the tools that are implemented for this area, and see if they are complete, coherent or if they are missing some parts, and if so, take action to fill them. It is necessary, therefore, for the project manager to evaluate:

- compliance with internal project, organizational or external requirements,
- compliance with regulatory or legal requirements that the project must meet,
- The “cost of quality”—the cost to the project or organization of meeting the quality requirements, and check that these costs are included in the budget. The project manager should consider whether there are any less expensive ways to achieve the same level of quality, weighing the costs and benefits,
- that quantitative monitoring methods have been designed and implemented quality, and that they are verifiable through normal inspections (audits).

Some people see the world of processes as the opposite of the world of projects, because processes are homeostatic phases in organizations, while projects are transitional phases. This approach is absolutely wrong: if a project manager does not know the world of processes (operations management—“running the company”), he or she will not be able to manage his/her project effectively, because he/she will lack the understanding of many phenomena that influence his/her project. In addition, when a project starts, there are many activities that become

routine, for example the coordination of activities and the reporting to the client, which take on an absolutely operational connotation, and the project manager must be able to address the issue of efficiency from a process perspective (e.g. by applying the principles of lean thinking), otherwise inefficiencies may reach very high levels, frustrating the team to the point of sending the project into crisis.

Projects and processes are two sides of the same phenomenon, which is the governance of human organizations, and there cannot be a project manager, (nor an operations manager), worthy of this name, who does not know the principles of both approaches, and knows how to decide when to apply one approach or the other. The same goes for agile skills: even today there are purely "waterfall" project managers, with a solely traditional and linear approach, while others who have, by their "charter", an agile approach. Both are justified by the fact that their working environments deal with purely linear or agile logics: this is also a fundamental error, because no environment is purely linear or agile, and in all cases the project manager must be able to assess when the activities that are in progress require the application of predictive or adaptive and reactive techniques. Today, project managers are required to know the organizational disciplines as a whole, even if, obviously, everyone tends to specialize in the management of project types that have similar and recurring characteristics.

2.4.1 General Concepts

Quality Definitions

> Quality is the degree to which a set of intrinsic characteristics meets requirements. [ISO 9000]
>
> Other definitions of quality are:

- The will to do it right the first time.
- Absence of defects.
- The ability to meet the customer's needs.
- The best relationship between costs and benefits.

Quality and Grade

The grade is the category assigned to a product or service having the same functional use but different technical characteristics.

Precision and Accuracy

Precision is the consistency that the value of repeated measurements are teamed with a small deviation, while accuracy is the correctness of the measured value that is very close to the actual value.

Cost of Quality

It consists in the analysis of amount of money aimed at evaluating if requirements are met (Cost of conformance) against the cost of non-compliance (Cost of non-conformance) (Table 2.3).

Table 2.3 Cost of conformance vs. cost of non-conformance

Cost of conformance	Cost of non-conformance
Prevention costs (to build a quality product) • Training • Documentation • Equipment • "Time to do it right" **Appraisal cost** (quality assessment) • Testing • Loss due to destructive testing • Inspections	**Internal failure costs** (before the product leave the factory) • Rework • Scrap **External failure costs** (product at customer's) • Penalties • Warranty • Lost customers and business
Money spent during the project execution **to avoid failure**	Money spent **because of the failure**

Metrics

A metric is a description of a characteristic of a project or product including how to measure it. Defining effective metrics helps ensure that important things are measured and conveyed to stakeholders. The real value in choosing appropriate metrics is in being able to make the best decisions sooner.

Indicators and Thresholds

A motto of Galileo Galilei much loved by engineers is:

> Measure what is measurable, and make measurable what is not.

> Lord Kelvin's dictum is often quoted in management:
>
> If you cannot measure it, you cannot improve it.

It is difficult for anyone to disagree with these phrases. However, in our day-to-day business, we certainly disregard them very often, because of the difficulty in applying them, the resistance to this approach that most organizations show because measuring then implies control, and the laziness of many to detach themselves from business-as-usual. When I deal with this topic in the company I am told, in almost all cases, that in general it is important to measure and have indicators “but in our case it is impossible because our organization/market is too special to be able to find indicators to describe it”.

Resistance to quantitative approaches and, therefore, to a system of monitoring the status of activities, is often the result of a climate of lack of trust in the company, and therefore the fear that monitoring will trigger a continuous “witch hunt”. This situation is one of the most dangerous ones for a project manager, and it must be his or her continuous care from the early stages of the project and throughout the duration to work towards a climate of trust in the project.

As repeated in many sections of this book, a project manager worthy of this title must always be able to express, in a concise manner, the progress of the project against the plan. If the manager meets him in the hallway and asks, “How’s the project going?” he should never say phrases like, “More or less okay, but we’ll get there!” while making the “so-so” gesture with his/her hands, the only acceptable response is, “The project is at 37%, the plan says we should be at 43%, we’re meeting with the project team this afternoon to decide on a recovery strategy”. This approach, which is described in the section on Earned Value Management, is only possible if the project team has chosen and shared indicators of project performance, and is reflected in the measurement that is expressed. The same applies in all areas of process management and in the world of project quality. In order to give a certain and shared interpretation of the state of the activities, which nobody perceives as pretentious in blaming one team member rather than another, the team has to choose indicators and, another step often disregarded for fear or laziness, attention thresholds, which is a limit over or above in which a different approach is needed. There can also be a tolerance, that is the range of variation permitted around the threshold itself. For example, in the on-time-delivery indicators, a threshold can be established (for example, 5 days of delay) over which the issue can no longer be managed at project team level but an escalation to the project

sponsor or other top corporate executives is required. A tolerance of ±2 days can be also included.

Data vs. Information
For any (project) manager the subtle but crucial difference between data and information is of utmost importance. Data are the facts, figures or details that rarely are useful alone. For data to become information, data needs to be elaborated, put into context and synthesized. For example, several GPS positions are data, needed to track a route on a map (information).

Tolerance
The quantified description of acceptable variation for a quality requirement.

Key Performance Indicator (KPI)
Key performance indicators (KPIs) for projects are quantitative measures of values that represent the success of a project. There are two types, anterior and posterior:

- Leading KPIs: predict changes or trends in the project.
- Posterior KPIs (lagging): measure deliverables or events, thus providing information after an event has occurred. They are easier to measure than the front ones and can also be used to make correlation analysis between what happens in the project and environmental variables.

The most commonly used metrics measure the following project quantities:

- Deliverable
- Delivery times
- Performance compared to a baseline
- Costs and resources
- Value for business
- Stakeholder
- Forecast

2.4.2 Overall Quality Processes

The traditional representation of quality processes within a process, up to the PMBOK7, divided all quality-related activities into 3 teams.

2.4.2.1 Plan Quality

Plan Quality is the process, done in the planning phase, of identifying quality requirements and/or standards for the project deliverables, and documenting how the project will demonstrate compliance. It is traditionally represented into a Quality Management Plan, part of the Project Management Plan.

2.4.2.2 Manage Quality (Quality Assurance)

It is the process, done in the execution phase, of auditing the quality requirements and the results from quality control measurements to ensure appropriate quality standards and operational definitions are used. Quality audits, that is structured and independent verification to determine if project activities comply with organizational and project policies, processes, and procedures, belongs to this process.

2.4.2.3 Control Quality

It is the process of monitoring and recording results of executing the Quality Plan activities to assess performance and recommend necessary changes. It includes:

– data gathering from project execution activities
– data analysis
– data representation

Myth: Quality Is for the Quality Manager

A key mistake of the project manager is to lose interest in the processes because they are boring, bureaucratic, and not useful to the project. The project manager must have an overall view of the project, and this can't happen unless verifying the consistency and completeness of the monitoring and controlling processes that characterize it.

It is a common phenomenon that the person in charge of quality in the company is a person on the margins of the project, who is often used for the purpose of "producing paper" with little added value in the project: this type of approach represents a waste of resources in the sense intended by the "lean" approach briefly described above. I have experience that on almost all the projects on which I worked as a "flying doctor" to identify gaps in the control processes: for example, in a

railway project, I discovered that all the tracks were certified as straight tracks, including the switches, which instead, as you can imagine, are the critical points of a railway track, where it is easier for the train to deviate (derail) and which, given their complexity, undoubtedly require more in-depth and complex certifications. In another case, on a project for a large automation machine in the pharmaceutical field, I realized that the two main suppliers of equipment were designing separately and had their projects approved individually by the end customer, while the integration activity was generally expected at the end of the production phase, with potential risks of non-compatibility and heavy rework at the end of the project. The project manager, in order to have the holistic vision that must characterize him, must ensure that processes are consistent and coherent throughout the project and from the earliest stages: this approach allows to consistently reduce the level of risk, improve customer satisfaction and reduce team stress.

2.5 Integration of Planning Activities

The integration of all project plans and related activities is a fundamental task of the project manager, because it actually accomplishes what is commonly understood as project management, i.e. creating a holistic organization for the project and making it work by implementing its expected value. While in principle everyone generally agrees with this perspective on the importance of integration, in practice the difficulty of implementing it is very clear to anyone who has ever managed any project. In this case, my recommendation is to be inspired by the principles that govern self-organizing complex systems, i.e. to establish a few clear rules for the whole team and the stakeholders, writing as little as possible—but writing!—the project plans. These documents, like any other in the project, must respond to a principle of economy, i.e. you must not write one line of text more than is strictly necessary. Having established this, however, it is clear that it is a capital sin not to write anything, as unfortunately I often see in many organizations with which I work, because “everyone knows what they have to do and how to do it”. This part of project management highlights whether the project manager is a mannerist, i.e., one who merely complies with textbook behaviors or behaviors assumed in previous

projects (in the manner of others), or one who knows the principles of the discipline in a critical manner and knows how to apply them by contextualizing them with respect to the project, the project team, and the environment.

The documents that cannot be missing from any project are at least the project charter (also referred in other ways according to the industry) and the Project Management Plan (PMP).

2.5.1 Assumptions and Constraints

While managing projects, but also in our own lives, we are constantly making assumptions and defining constraints, to help us set a limit and, thus, focus our action.

An assumption, or hypothesis, is a condition which is assumed to be true even if it is not proven or documented by facts, while a constraint is a limitation to our project. Many of us make assumptions without being aware of it. Assumptions must be analyzed, while constraints must be made known. Managing assumptions and constraints is essential to be able to complete the project with as little effort as possible.

For example, we decide to go shopping at the Shopping center tomorrow afternoon. It normally takes us an hour by car to reach the Shopping center (assumption), so since we have a video conference meeting tomorrow that ends at 5 p.m. (constraint), we can get in the car 5.15 p.m. earliest and reach the Shopping center at 6.15 p.m.. The Shopping center closes at 7 p.m. (constraint) so I will have to complete all my shopping in 45 min (constraint). Furthermore, I find out that the balance on my credit card is 500 € (constraint). This example reminds us how assumptions and constraints are part of projects, even the simplest ones, and characterize them in a significant way. For each assumption and each constraint there is a risk. In our case: what would happen if my meeting goes over 5:00 p.m.? Or if there is a traffic jam on the road and it took me half an hour longer to get there? Or if there was a queue at some shops and my shopping took more than 45 min? What if all these things happen at once?

I hope I have made it clear how important it is to have clear assumptions and constraints in our projects. Assumptions and constraints are often present at an early stage and then, as the project progresses, they are reviewed and re-evaluated throughout the project. For those who read the PMBOK, assumptions and constraints are inputs to most of the

processes described. The project manager needs to identify and monitor them carefully, also because they are often not explicitly described in the initial project documents, and are considered obvious by several members of the project team.

2.5.2 Project Charter

The Project Charter is the first document that is drafted and that starts a project. It can take many different forms and many different names depending on the industry, but it must exist in some respect, otherwise the project will suffer drastically. This document has the characteristic of being the only one in the whole project that is not attributable to the project manager, in fact it is supposed to be addressed to the project sponsor—the very special stakeholder also referred as the initiator of the project—since it also contains the appointment of the project manager. The author of this document must be the project sponsor, i.e. the stakeholder who wanted the project to start most of all and who has the highest expectations of the impact of the execution and completion of the project and its results. The project charter is therefore an artifact issued by the initiator of the project that formally authorizes the existence of the project within the organization and gives the project manager the authority to draw on the resources (human and material) of the organization to start with planning activities.

As mentioned, this is a document that takes many different forms and names. In my experience a handful of pages (two to four) are sufficient, where all the **high-level information** about the project and the product, service or result that the project is to achieve is gathered, such as:

- Purpose and measurable objectives of the project.
- High level requirements.
- High level project description, limitations and key deliverables.
- Overall project risk.
- Most important project milestones.
- Pre-approved Financial Resources.
- List of key stakeholders.
- Project approval requirements and project exit criteria.
- Assigned Project Manager.

Myth: What's the Point of the Project Charter, Read the Contract!
Everyone deals with organizations that do not write anything like this, even under other names. These are generally organizations that work on a contract basis, and therefore assume that everything that should be written in the project charter is already written in the contract, or organizations that develop internal projects, for example in research and development or marketing, that arise from a line of minutes in a meeting or, even worse, from a word exchanged with some manager on the stairs or at the coffee machine. As you can well imagine, the lack of an artifact that directs the project from the beginning causes great problems because it starts without the objectives of the various stakeholders being clear and aligned, and it progresses at random with continuous stops due to clarifications that become necessary. Even though the project is the result of a contract, the information that is required for the project charter is different, because the project charter represents the perspective of your organization towards the project. For example, the contract does not write down the risks that our organization sees for the project, such as the client is a bad payer and needs to be monitored for financial solvency, or the client is strategic and we can give them something extra in order to become a recurring supplier, or that a key resource in the team will not be available for the first month of the project because they are completing another project. For this reason, no organization should avoid drafting a document, as lean as possible, that provides this basic information to the project manager and the team to get off to the best possible start.

2.5.3 Project Management Plan (PMP)

The project plan is traditionally considered the fundamental artifact that the project manager, with the support of the entire team and the involvement of all the stakeholders, draws up in order to establish a shared methodology for managing all aspects of the project. In a hierarchy of plans, any other plan or document that is used in the project must comply with the requirements and constraints contained in the project plan.

The Project Management Plan:

- Summarizes the critical elements of the project.

- It reflects the demands of stakeholders.
- Structures the relationships and flows between project actors.
- Identifies key meetings and critical milestones.
- It is a kind of “user manual” for the project.

The objectives of the project plan are a rigorous and structured management of the project, so that the various actors work in a coordinated and pro-active way, the tasks and division of labor between the actors is clear, and the risks are known and shared at team level. It must describe the strategy for implementing the work in a way that is clear and understandable to all those working on the project. Once drafted it should be shared with all stakeholders within the organization, and externally if necessary.

Example of an Index for an Industrial Project Management Plan

1. Introduction

2. General presentation of the project
    a. The customer

    b. The contract

3. Project Execution Strategy
    a. Project organization and structure

    b. Risk and opportunity management

    c. Change Management

    d. Design control

    e. Time management

    f. Cost control

g. Quality management

h. Project work process and communication

i. Performance measurement

j. Stakeholder management

2.5.4 Project Artifacts

Project artifacts are fundamental elements of project management. Often abound in the early stages because they become fetishes for flaunting a good level of project management, but then they are quickly neglected and become obsolete.

At the beginning of the project, it is crucial that the project manager facilitates the team to identify which artifacts are needed for the project. To figure out if a given artifact will be useful—value-added—to someone within the team, and if there is not an easier and quicker way to do the same with less effort (e.g. using a ticketing system instead of filling out a spreadsheet).

When a project team chooses to use an artifact, they must also decide who will be the maintainer, how often they will need to update it (daily-weekly-monthly), and when the other members of the team will be able to consult it (dedicated meeting, such as for issue log review, or the file is stored in a shared folder and then everyone can access it when they need it). Only those artifacts that are needed should be implemented and those that the project can reasonably update with its resources. It is a mistake to implement a lot of artifacts at the beginning and then abandon them along the way: it gives a very bad impression (which is also substantial) of mismanagement to the team and to the customers. The project manager has the task of checking that the update of all artifacts (even those for which he is not directly responsible) is constant and that the information contained is reliable.

According to PMBoK 7th there are 9 categories of project artifacts:

1. Strategy (such as business case, project charter, etc.)

2. Logs and registers
3. Plans
4. Hierarchy charts
5. Baselines
6. Visual data and information
7. Reports
8. Agreements and contracts
9. Other (such as bid documents, team charter, activity list, etc.)

2.6 Plan and Manage Procurement and Contracts

Most of projects need external resources (human or material) to develop their results, for various reasons, such as the unavailability of internal resources in the specific moment of the project execution, or the lack of specific resource inside the organization, or because the external resources are cheaper than internal, or other reasons again. If this is the case or your project, you need a plan of managing activities related to the procurement of these resources. Depending on the complexity (amount of resources, number of suppliers, value of the supply and innovative contribution of the supplied resources) this plan may consist of a simple order to a supplier, up to complex supply contracts with numerous annexes and clauses. If our organization buys a product or service, or if we sell it to a customer, the perspective changes, but the basic concepts and recommendations remain the same. Given a project, it is not automatic that certain parts have to be purchased from outside the organization. In fact, when planning and estimating activities, the dilemma of whether to do an activity internally, or to buy it externally (make or buy decision) often applies. The considerations

collected in this section apply both to cases where our organization or that of a client is leaning towards the “buy” of certain resources or services.

This area includes clearly defining the requirements of the products or services to be purchased, and identifying a plan to identify, communicate and negotiate the purchase with suppliers. Purchasing is anything but simple and straightforward, and the best approach must be identified on a case-by-case basis according to the type of good or service being purchased. An aspect that is often overlooked in this sector is the building of partnerships based on trust, rather than customer–supplier relationships where whoever takes the most from the other is better off. When negotiating a contract with a third party, strategies such as using the other party as a cash cow or a chicken for plucking are not sustainable even in the middle term. Transparency and fairness when dealing with negotiations help building trust with other parties, generate long term relationship, and result as a competitive advantage for all the parties involved in the project development.

Myth: The Purchasing Department or the Lawyer Must Write the Contract

A very frequent mistake that project managers make is to think that orders/contracts to suppliers or customers is the sole responsibility of the legal department or the purchasing or sales departments and, should one of these departments involve the project manager in the drafting of contracts, the latter complains with something like “but why are they asking me to do their job too!” In reality, of course, the responsibility for finalizing orders and contracts falls to other corporate structures (and thank goodness!) but these corporate structures are experts in negotiation and contractual clauses, certainly not in contract management. Who better than the project manager to imagine what problems the project might encounter during its execution, and suggest suitable clauses for their optimal management? In addition, when a project consists of a network of customers and suppliers, the contracts between the parties are a fundamental tool for risk management and, again, the project manager’s contribution will be crucial in identifying problems and possible solutions. As recommended in other parts of this book, it is not a matter of transferring to others (customers or suppliers), perhaps subtly, all the problems that the project may encounter, but of

anticipating these problems and defining together with the counterpart, in a shared way, a way to face and overcome them without ending up facing long discussions during the execution of the project.

A procurement process that is as complete as possible includes the following steps:

The contracting authority, i.e., the organization that wants to buy a product or service from suppliers, prepares a Request for Proposal (RFP) supplemented by a Statement of Work (SOW) and terms and conditions and any other documents necessary for those who will respond with a bid.

The process is to:

1. advertise the need in an appropriate manner,

2. meet the bidders and

3. make a decision.

Bid documentation may include:

- Request for quote (RFQ): used when the decision will be based primarily on the lowest price offered, and the technical solution is already fully defined in the technical documents.
- Request for Information (RFI): is used to collect information from the market before publishing the actual request for proposal. The advantage for the supplier who participates is to influence the technical specifications that will be attached to the next request for proposal and/or enter into a short list of suppliers who will be allowed to make an offer.
- Technical/Economic Request for Proposal (RFP): is used when the buyer is looking for proposals for complex supply scope, whereby offers are evaluated not only on the basis of the price offered, but also on the basis of the technical solution offered.
- Some specific industries have typical documents that characterize the bidding processes, but in general, in my experience, the above cases include the majority of what happens globally.

Once the bidding documents have been completed and published, there is normally a period of time for the publisher to respond to any questions

and requests for clarification from potential bidders. Bidders then complete their proposals by a defined date.

The choice of the preferred bidder is often based on a number of criteria such as previous experience, references of other similar supplies the bidder can present, price, delivery time, performance level of the proposed solution, and others. It is quite common that, after the receipt of offers from potential suppliers, a period of negotiation follows in parallel with the two or three of the best ones, until a final decision is reached. Aspects that are subject to negotiation can be price, payment scheme, place of delivery, intellectual property, penalties and much more.

2.6.1 Contracts

The area of purchasing from external suppliers is a critical area in the supply chain of a project, which is often represented with a long bar in the Gantt (3 months or so) with no intermediate milestones.

The long bars in the Gantt always represent unmonitored activities, and therefore they hide big risks involved.

When the negotiation phase is concluded and the parties reach an agreement, it is necessary to formalize it in writing. The type of contractual instrument changes depending on the amount of the supply, the clarity of the scope of the supply, and the level of risk of each organization involved.

Once the supplier has been selected, the documents used for the request for proposal are updated and included as attachments to the contract.

In the traditional project management frameworks, there are essentially three types of contracts.

2.6.1.1 Fixed Price or Lump Sum Contracts

These are contracts that must be used when the purpose is stable and well defined: the supplier commits to the supply of the whole purpose at a fixed price that is unobtainable; therefore he or she takes all the risk of possible extra costs not calculated in the offer phase. It is a bad contractual typology if used in an improper way in case of supply purposes not perfectly clear: sometimes it happens that an improvised customer asks for fixed cost offers when he or she does not have clear ideas about what is needed, with the result that bidders offer very high prices because they protect themselves against the risk (very high contingency) or they make competitive offers to acquire the contract, but then they immediately raise the tension level on the

contract and keep on asking for change orders. Either way, it is a disaster for project management. The project manager should advise against using these types of contracts at all costs if the product or service requirements are not perfectly clear in favor of the other typologies.

The PMBOK lists the following nuances that may be encountered in this type of contract:

- Firm Fixed Price (FFP): is the classic fixed price contract, in which the price is invariable.
- Fixed price with incentive fee (FPIF): the price offered is accompanied by incentives on specific objectives, such as a reduction in delivery time or an improvement in the performance of the product or service.
- Fixed price with economic price adjustment (FP-EPA): used for contracts with long time horizons, it provides for an adjustment of the price offered based on the trend of some financial parameters such as inflation or the trend of the price of raw materials.

2.6.1.2 Cost Reimbursable

In these contracts, the contractor is reimbursed for the actual costs incurred to the execution of the work, plus an additional fee.

The PMBOK lists three possible types of this type of contract:

- Cost plus fixed fee (CPFF).
- Cost plus incentive fee (CPIF).
- Cost plus award fee (CPAF).

2.6.1.3 Time and Material

In this type of contract, an hourly/daily/monthly cost is defined for the human resources employed (different according to the different profiles employed) and the materials supplied are reimbursed at cost price, plus a possible percentage to cover indirect costs. In this type of contract the risk is completely in the hands of the contracting authority.

There are other types of contracts that you may encounter, such as a Basic Ordering Agreement (BOA), or a framework agreement.

It is also possible to find hybrid arrangements, such as contracts in which the clearest part of the supply is managed with a fixed price, while other parts are managed with time and material rules.

2.6.1.4 NEC and FIDIC

NEC and FIDIC are standard forms of contract that are part of standard families for procuring works or consultancy services (FIDIC) and goods, works or services (NEC). Both have been designed for international use with a choice of governing law and language having their roots in common law jurisdictions, even if they have both been successfully implemented also in civil law contexts. International projects funded by Multilateral Development Banks are typically based on these frameworks.

In agile project, where the scope is not clear from the beginning by definition, specific forms of contract can be used, such as:

2.6.1.5 Capped Time and Materials Contracts

It works like a traditional Time and Materials contract, but the customer sets an upper limit on the maximum budget, so that the maximum amount of expenditure can be kept under control.

2.6.1.6 Target Cost Contracts

In this type of contract, supplier and customer agree on final price during negotiation, and include mutual cost savings if contract value runs below budget, and shared additional costs if it exceeds budget.

2.6.1.7 Incremental Delivery Contracts

It reflects the agile methodology approach, as the customers are entitled to review the contract during the project execution at pre-negotiated designated points, and can make required changes, continue or terminate the project at these points.

2.6.2 Common Law vs. Civil Law

When handling international projects, it is important to keep in mind whether your contract is subject to British law (Common law) or Continental law of Roman origin (Civil law). Generally, international contracts are negotiated on the basis of common law, so that almost only what is written in the contract is of any legal value, and if something is not written in the contract, there is no legal basis for it, but it must be the subject of further negotiation between the parties. In such a context, for example, force majeure clauses, if not defined in the contract, do not exist, and the supplier is obliged to fulfil its contractual obligations whatever

happens. In civil law, on the other hand, there is a hierarchy of laws and codes which also regulate issues which, possibly, are not specifically defined in contracts. It is not uncommon in international projects for the main contract to be based on common law and for contracts with suppliers to be based on civil law, with all the complications that this entails in the management of clauses of risk in the back-to-back mode.

Even when working under a common law framework, remember that there are so called “international binding rules” that stay valid even if not mentioned into the contract, such as rules regarding safety and competition.

Another aspect to be borne in mind in international contracts is that, in Anglo- Saxon culture, there is absolute equality between the customer and the supplier, who are seen as two parties who, for mutual convenience, enter into a contract with obligations for both. In the Latin culture and in many other cultures in the world, although the legislative framework maintains an equal vision between the parties entering into the contract, in reality the client normally presumes to have a position of priority over the supplier, while the latter is supposed to maintain an attitude of servile acquiescence towards the former. Usually the reason for this attitude is explained by the fact that it is the customer who pays, and if he or she is not satisfied can turn off the taps and stop paying. The project manager, even if working in a Latin or similar context, needs to be oriented towards the approach of the Anglo-Saxon culture, while maintaining an understanding for the cultural context in which they work. If, for example, the client is causing efficiency problems for the project because of delays in providing information or feedback in relation to the contract, the project manager is absolutely right if (and he or she must!) pointing this out to the client, possibly asking for compensation for the extra costs incurred. According to my experience, many project managers experience an ethical crisis and a lack of confidence in the project when they doubt whether to ask the client for compensation for the extra costs: it must not be like this, i.e. the project manager must face the client, explain the reason for what he or she is asking for, be in a position to provide a quotation the contractual clauses that justify the request, be open to listening to the client’s point of view and possibly reviewing his/her position, but in the end he must proceed as is correct with respect to the contract stipulated. If the project manager did not do so, he or she would be violating the ethical principle of respecting the resources

entrusted to him or her by the organization, i.e., he or she would be giving away value to the client outside of the stipulated agreements.

Myth: It's All Inclusive—Aka You Had to Think About It Before Signing

A bad practice in many organizations is to tend to transfer all risks to suppliers, without asking whether they are actually able to deal with them in the most effective way. This is the case when there are clauses in the agreements with suppliers or subcontractors that transfer the penalties of the main contract to them, without them actually being able, should the worst happen, to bear these costs, or when they put themselves in a position to meet the costs, "all-inclusive" clauses associated with vague scopes of work, in effect pushing the other party to take on an unlimited risk which, as such, it may not be able to bear. This attitude of "gleeful" risk transfer without actually analyzing the sustainability of this action by the other party usually makes the contract manager gloat, who, in case of complaints during project execution by the supplier who has to absorb unforeseen costs, says "he should have thought of that before signing!". The project manager must beware of these situations, because in reality this attitude is a childish way of not dealing with project risks, which are apparently transferred to a third party, but in reality remain in the belly of our organization without having been addressed and mitigated, thus with maximum probability and impact. What normally happens is that, if the risk emerges, the supplier initially tries to manage it by absorbing the costs but then, if they exceed a certain threshold that would be lethal for their company, they stop the execution of the activities asking for compensation or terminate the contract, and this causes much more serious problems to the project because replacing a supplier in the race is always extremely complicated, nor does the threat of legal action by us against the supplier have any effect in bringing the project back on track because the dispute would last a long time and the outcome would be uncertain for both sides, while on the other hand the supplier would be sure to bankrupt his/her company if he or she complied with the clause in the contract. It is definitely better to address and mitigate one by one all project risks, and to transfer knowingly only those that can be effectively and

reasonably managed by a third party better than we could do, otherwise it is better to keep them in one's perimeter and look for other ways.

Myth: We Work Well Only with the Small Suppliers
I frequently hear executives of (even large) companies saying a kind of "I cannot understand why, but we work better with the small suppliers than with the big ones, as the small ones are better at following our needs". Such a statement is a clear indicator of disorganization within the company the executive saying that works for. If a company is well organized and structured, and its executives are aware of what management strategy is to be implemented, the scope of work is clearly included into contracts, and the best type procurement is selected for each case. Companies feeling more comfortable with small suppliers/subcontractors are probably suffering from bad procurement and project management: the small ones are typically more flexible than the big ones because they are weak on contract management and are highly dependent on the contract with the big companies—so they are often not able to complain if something wrong occurs from the contracting company. On the other hand, small companies generally provide significantly less innovation and resource availability than the big ones, resulting in less resilience in managing their scope of work. A company that is mature in procurement management can work easily with small and big suppliers, depending on the situation.

2.7 Determine the Best Project Methodology and Practices for Your Project

In an outdated view, the project manager should have found the detailed guidance on how to manage the project written in the project charter and/or trained by the Project Management Office (PMO). Today—and I fully support this—the project manager is required to be able to **tailor the methodology** to develop the project by understanding whether the specific project, based on the scope, complexity and size, requires the application of traditional, agile or hybrid methodologies, whether there are contractual aspects to be defined more carefully, and whether the project needs to be

managed **in a predictive or adaptive manner**. In addition, it is necessary for the project manager to envision how he or she will **implement continuous process improvement** practices for the project, through "lessons learned" or retrospectives, stakeholder engagement, and risk management.

A case I often come across are design activities in engineering projects: imagining these kinds of activities as perfectly linear is a mistake: the long bar in the Gantt is extremely illusory and hides inside it many iterative and incremental aspects: the project manager who has understood this lesson knows that he or she will have to implement for that part of the project activities methodologies coming from the agile area—in a more or less explicit way depending on the awareness on project management that the project team members own.

Today, a project manager worthy of the name cannot avoid making (and knowing how to make) these kinds of considerations. If you feel that it is not clear how to do this, reread the paragraph in the book (Chapter 1) on life cycles.

2.8 Establish a Project Governance Structure

It is now universally accepted that the organization each project needs must be tailor-made. Even within the same performing organization, projects differ in size (quantity of products to be delivered, sales price, etc.), constraints (time pressure, level of technology and innovation needed, etc.), competence of the project team and number of available resources, etc. It is therefore fundamental that the project manager, together with the project sponsor, identifies from the beginning of the project the fundamental "rules of engagement" for that project. Each member of the team needs to know what his or her decision-making scope and that of their colleagues is, and it needs to be clear when a decision can be made independently, or at the team level, or when an escalation to top management is needed. To do this, simply define thresholds: for example, when a decision has an impact of up to 1 week and up to 10k €, it can be taken autonomously by the individual member, from 2 to 5 weeks or up to 50k € by the project manager, beyond that an escalation is necessary. Those with project management experience realize that not addressing this issue slows down the project.

This dramatically affects the project decision making process. In many organizations where I have worked the threshold for the team and the project manager is actually zero for everything, so any decision had to go through top management, causing delays and frustration in the project (this attitude is typical in the nun's management style [see "Lead a team"]).

Identifying different team of stakeholders with different tasks (core team, steering committee, stakeholder advisory board etc.) with appropriate recurring meetings usually helps the project governance. According to my experience, projects where the project manager meets colleagues, the customer or the suppliers "just when needed" and "upon request" are not actually managed, even the smallest ones.

2.9 Project/Phase Closure and Transitions

It is essential to divide the project into phases. Those who believe that the subdivision into phases is a frivolity relegated perhaps to agile projects or to larger projects, have not understood the value of clarity that the subdivision into phases has for the team members and for stakeholders in general. Going through a project phase with a frequency of 3–4 months, with clear deliverables, helps the team to focus on their work, reduces stress and scope creep and, in my experience, improves mood and overall motivation.

Often the technicians have difficulty in identifying the deliverables, including those that characterize their work: the project manager must help each team member to recognize his/her deliverable, and not drop the deliverable down from above), must collaborate with the members of the team in a schedule that meets the principle of "S.M.A.R.T.", must guide—if necessary—to the drafting of protocols that certify the passing of a phase or the achievement of a milestone. Many times I have had to manage contracts in which it was established that on a certain date a certain milestone would be exceeded, characterized by an attractive name and to which was associated a very relevant payment, for which there was no trace of what had to be done to certify its achievement; this attitude, according to my experience, is very widespread and causes a serious risk: generating conflicts and delays, linked to the clarifications of what is due to exceed the milestone itself and access to the associated payment. Creating even trivial protocols to share with the other party before reaching the milestone facilitates understanding and improves the team's mood.

Often, once a phase has been completed, there are tasks left to complete: conditional approvals of some project deliverable and punch lists to close. The project manager must champion the quick completion of these activities that, if neglected, can become heavy burdens that worsen the success of the rest of the project.

At the completion of the project, the activities related to organizational learning should not be neglected and are characterized by “lessons learned”, retrospective and post-mortem analysis of the project. If done just at the end of a project, lessons learned are not carried out for the good of the project, but for the success of the organization and its members, who will benefit from the outcomes of these activities in future projects. On the other hand, if these are done throughout the project, such as retrospectives at the end of each iteration/sprint or lessons learned at the end of each project phase, the value is also for the project itself. To develop lessons learned, dedicated meetings are normally used where the project manager acts as a facilitator and asks open-ended questions such as “what went well? what went wrong? what can be improved?”, then using problem solving techniques to identify improvement strategies, which are then collected in “lessons learned” and processed by the organization’s Project Management Office.

There is also often the formal closure of contracts with suppliers which, if not managed, generates zombies that lurk among the projects in the company. I like to remember how, in a project in which I acted as “flying doctor”, before my involvement there were more than 30 days of delay with a penalty of half a million euros per day of delay. My preliminary analysis revealed, among other things, that three teams of electricians were missing (about 30 people). I immediately started looking internally in my company, but there were none available; I then involved some temping agencies, but they found me very few units; I then went to my subcontractors who were already working on the project, but they had no resources except for one who told me: “Three teams? No problem, I have them and I can send them tomorrow morning. All you have to do is pay me this invoice”, and he produces an invoice for just over 10,000 euro relating to a project that had ended three years earlier, of which I was not the project manager. What had happened was that a colleague of mine, who had managed that project, had not completed an agreement with this supplier at the end of the project and the issue, which remained open, risked costing my company half a million euros a day. At that point I immediately paid the invoice, without even

being able to discuss it on its merits, because the impact of further delays was disproportionately high.

2.10 Keep the Level of Urgency Needed to Create Value

Among the most frequent and necessary tasks that the project manager is asked to manage during the project execution is to lead the team to manage activities according to urgency. This phenomenon happens both in projects managed according to the traditional methodology and in agile ones. History often repeats itself in the same way: the project is initially planned with the right care, so the priority of one activity over another is clear to everyone, as is the value stream that the project must generate. As time goes by, problems arise, risks arise, non-project related activities are added to the shoulders of team members which disrupt their performance, and people begin to flounder and feel that they cannot do all that is required of them, and that the project is getting out of hand. This—which I think has happened to everyone—occurs even when, in reality, the workload of the specific people, on careful analysis, does not seem to be so unbalanced. Often the question is dismissed with superficiality, saying a kind of “he always complains, even when he has nothing to do”. All this, among other things, is also linked to the issue of work-related stress, so it can also have legal implications if it is not sufficiently addressed.

The project manager, in his or her function of having the holistic view of the project, must be aware of how value is generated, for his/her organization and for the client, during the entire duration of the project, and work with the team so that the value flows in the easiest way and with the least friction for everyone.

In this sense, it is recommended to project managers to reflect, in the initial phases, if there are possibilities to include incremental practices to give more continuity to the generation of value, which is normally perceived positively by both the project executor and the client.

The project manager should help the team members to organize their work with the right level of decomposition: remember that often the team members are technical and do not have any management knowledge, so a suggestion on the right level of decomposition of their activities and tasks

can be helpful in the planning phases. Another support that the project manager can give is to identify milestones and deliverables for each phase: very often the team has the impression that an activity never has a definite end, and this often causes stress and gold plating.

While the project is running, the project manager is well advised to gauge the status of the various members during regular meetings such as the stand-up meeting and the weekly meeting, or by carving out/arranging face-to-face meetings with the members, and asking open questions such as "how is it going?" "are there problems?", questions that normally require an effort to listen afterwards but that allow you to understand if bottlenecks are appearing or if you are giving priority to less critical aspects of the project. Sometimes it turns out that the team has communication problems, or that they are using sub-optimal communication tools, or that the understanding of the project status is not shared: all of these issues are the responsibility of the project manager. The goal should always be to generate value for the project and the client.

2.11 Manage Communications

The management of project communication is a fundamental task for the project manager to lead the project to success. In fact, several researches point out that successful project managers spend about 75–90% of their time formally or informally communicating. If information flows between the team members and stakeholders in general are not thought and managed, the project cannot be considered as truly managed. Communication must be planned from the very beginning of the project and not left to chance or taken for granted: who will talk to whom, how and how often are questions to which the whole team must give a clear answer from the early stage. The aspects of communication have a characteristic that amplifies their complexity, namely that they must be tailored to the stakeholders, and for this reason there cannot be a communication strategy that is always the same to be applied to all the projects that we manage or of our organization, because the stakeholders change in every project, and for this reason the communication strategy must also be able to adapt. Depending on the type of project, you also have to define how formal or informal to be (e.g. using daily stand-up meetings without minutes being written every day or formal weekly project status reports sent to a defined

mailing list). The resulting communication plan, which can be a document of several pages or even just a presentation of a few slides, is one of the elements to be presented and discussed with all stakeholders from the first meeting.

Today, compared to only a few years ago, technological aspects are to be evaluated: Using virtual presence systems, video calls, ticketing, etc. allows to multiply the possibilities of interaction between team members and stakeholders, but increases the possibilities of interaction and, consequently, management complexity. In addition, some systems more than others require high-performance computers and high-performance internet connections that some stakeholders may not have and, therefore, may be marginalized from the project (Table 2.4).

Table 2.4 Types of communication within a project

Type	Formal	Informal
Verbal	Presentations Meetings Project reviews Demonstrations Brainstorming	Conversations Meeting or ambushes at the coffee machine or similar
Written	Reports Project documentation Progress report Dashboards Feasibility studies	Emails Instant messaging Social media contacts Minute of meetings not formally approved by participants

A fundamental aspect, on which everyone agrees but which is often disregarded in practice, is the need for transparency in communications, because it is one of the fundamental aspects on which trust between team members and stakeholders is based, and a lack of transparency is the aspect that most easily and quickly undermines trust in the project. Opaque situations of information not being shared with customers and/or suppliers or other stakeholders for no apparent reason tend to make them think we are hiding misconduct on our part. Whenever possible—and it is much more often than the average person thinks—information should be shared.

Another aspect that is often overlooked when communicating is that you must ensure that the message reaches its destination, i.e. activate a

feedback mechanism between the sender and the receiver. Listening silently to the other person is part of the communication process. It is very common to meet people who communicate uniquely without checking that what they have said has arrived and been understood. Statements such as “I told him, but he didn’t understand anything!” actually hide a problem in the way the person saying that communicates. **It is the responsibility of the communicator to ensure that the message reaches its destination and is understood!**

2.11.1 Sender-Receiver Model

Communication models are used to explain the way in which an input passes from the sender to the receiver, and serve to clarify ideas about all those phenomena that occur when what reaches the receiver’s mind is (significantly) different from what came from the sender. These situations, which in everyday life can make you smile, are critical aspects in projects that can cause serious degradation and even failure.

The following explanation is personal, not that of a language expert, so I can imagine that professionals in the field have a lot to laugh about. In my experience, however, the model I present is in practice very indicative of guiding people towards clarity when they need to communicate in a project.

What happens in us when we want to convey a message, is that we start from a level of the ideas that reside in our mind, and we select what we want to convey. Ideas do not have a linguistic dimension, because if they were recorded in a particular language, it would be impossible to translate from one language to another.

In order to pass from the dimension of ideas to the linguistic dimension, we must already make many choices that will have an impact on our communication. If, for example, the meaning of what I have to communicate refers to the physical entity of the city of Turin, I can refer to it by saying “Turin” or “the first capital of Italy” or “the city where the Juventus football team was established”: depending on how I choose to refer to Turin, the meaning of what I transmit and that is received by my interlocutors may vary. In addition, in the projects it is very common that the language used is not the mother tongue of the speaker and the listener (the most widely used lingua franca is undoubtedly English) so these phenomena of variation in the meaning of what is transmitted can be

amplified further depending on the level of knowledge of the language and culture of belonging.

Once the linguistic part has been selected, it is time to move on to the physical level: if I express myself orally, I will have to make my vocal cords vibrate. Again, the outcome can affect the final result of the communication: for example, speakers who have a strong, deep voice generally receive more attention and are more persuasive than those who have a weak voice (Fig. 2.10).

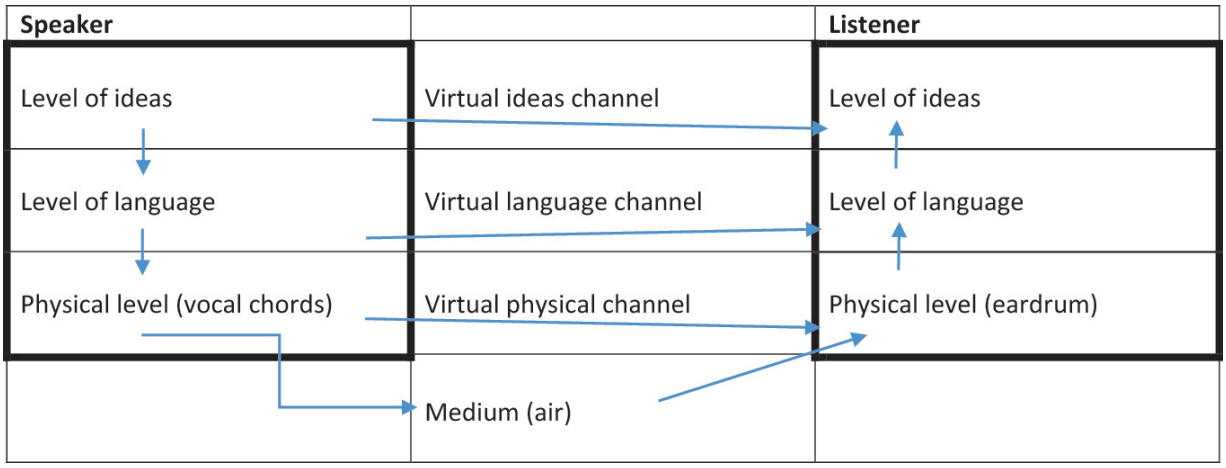

Fig. 2.10 Communication model

Once the physical layer of communication is completed, it is left to the medium of transmission: air in the case of oral communication, cables in the case of email, airwaves in the case of radio transmissions, etc. If the medium is disrupted, the effectiveness of the transmission can negatively affect the final message: think when you are speaking in a noisy environment, or when the quality of the internet or telephone connection is poor, how much more effort you have to put in to get a message across, and can even discourage the listener.

At this point, what happens is that the message makes the reverse journey in the listener, passing from the physical level (eardrum, eyes, fingers) to that of language, to that of ideas. The reconstruction of the idea that the sender wants to transmit to the receiver passes through all these steps (and the experts could probably mention even more), and each step has an impact on the message that reaches its destination. **The idea that eventually forms in the head of the receiver is always different from the idea in the head of the sender.** Even if I simply say “Turin”, the idea I

have of Turin is obviously different from the idea of anyone else, and some aspects I consider to be implicit in my communication could not be for others.

There is therefore no doubt that the responsibility for getting the message across as clearly as possible lies with the transmitter. Phrases such as “I explained it to him but he doesn’t understand”, as mentioned in other parts of the book, are meaningless, and only show how poor the person saying them is in terms of communication skills.

2.11.2 Implicit Content

An aspect that is often overlooked, and even difficult to identify when we are the ones delivering a message, is related to the implicit contents. If we think about it, there is always a part of the message that is not explicitly contained in what is being communicated, but which we nevertheless expect to get through. For example, if we stop someone in the street and say, “I’m out of gas”, what we expect is that our interlocutor will understand that we are asking him or her to take us to the nearest gas station, even if we don’t say so. Another example could be a sentence like “Giulia had a baby and got married”: what normally passes is a chronological precedence of having had the baby over getting married, even if it is not actually obvious. Again, if I say “Paul is poor, but happy” the listener normally assumes that my opinion is that those who are poor are generally sad, even if I am not expressing it directly. Examples of this kind can be numerous, include ironic expressions, and are called “conversational implicatures” in linguistics. It is evident that these aspects of language are very insidious because they risk sending very different messages than those intended by the transmitter. The situation becomes even more critical when a lingua franca is used that is different from the mother tongue of at least one of the two who are communicating, and when the cultural context of the communicator is significantly different.

When communicating in projects, and especially in international projects, the theme of implied content should always be evaluated with caution.

2.11.3 Communication Channels

Communication channels consist of the communication and propagation paths of information. Within a project, the most appropriate channels must

be chosen for each type of communication, both in the planning phase (choices such as “for meeting minutes, an email is enough” or “weekly reports should be collected in a dedicated project folder”) and in the executive phase, choosing between a phone call or an email or an ambush at the coffee machine as the case may be.

Phone calls (this applies both to the phone in the traditional sense and with the most disparate applications). Some people say, “I prefer to phone because we understand each other better and it’s quicker!”, and I admit that this is also the case for me, however, one must consider that when we call someone extemporaneously, we interrupt what they are doing, may be not give us proper attention or be annoyed in answering. Extemporaneous phone calls should be limited only to cases of utmost urgency, while, in general, it is best to agree on a phone call at a certain time slot so that everyone can be ready and available to discuss.

Phone calls should be as short as possible to get the message across: Let’s always try not to be the ones who keep others on the phone much longer than necessary, repeat the same concepts over and over again, or spend all day on the phone.

Ambushes and meetings. The same approach as for phone calls also applies to meetings in person: “ambushes” should be avoided, i.e. showing up at a person’s office unannounced or blocking people for work-related matters on the stairs, in the corridors, at the coffee machine, in the canteen, etc., except in cases of absolute urgency. Conversely, you need to avoid saying to someone passing in the hallway to attend an impromptu meeting.

Email. The abuse of email is the main cause of poor communication in many organizations. It must be clear that an email is a communication which, in general, does not have an urgent character, and which can be processed with priority that the recipient believes. Sending communications by email and getting angry if the recipient does not respond within an hour is an indication of poor communication: if there is urgency, other channels should be preferred (at least to explain the situation before sending the email). A terrible practice is to phone the recipient every time you send an email: it can only be done infrequently in cases of absolute urgency. We all receive many superfluous messages in our mailbox, not addressed to us, in which you are improperly copied, and/or that could have been avoided, for example, by a direct phone call between two of the people in address. When writing an email, it is essential to select the minimum number of recipients

both direct and in copy knowledge: bad practice is to always include the manager of the person to whom you write copy, which clogs the inboxes of half a company. It is essential to include only the people who are really interested in the message. Some companies have tried to limit the number of addresses you can write to, both as a recipient and as copy, to 5 or 7, and I think this is a reasonable number, except in the case of mailing lists agreed in advance for specific information (for example, the sending of the weekly or monthly project report). The practice to avoid is to set the request of read confirmation to all outgoing messages: it gives a bad image to whoever does it as a person who does not trust anyone. Another bad practice is to check as "important" all the messages: it won't actually be effective from the second time you do it, and, in addition, it might seem like an attempt to prevaricate over other colleagues' emails. In addition, email should not be used as a chat between two people, perhaps with ten others in copy, for simple communications: even in this case another channel should be sought. Last recommendation—but this is very obvious: never argue with someone via email with colleagues in copy, because it only creates embarrassment among colleagues and reports to all an unprofessional situation between the two disputants.

Instant messages and emoticons. They are an extremely informal mode of communication that some consider inappropriate for a professional context, while personally I don't think there is any reason to demonize it as long as it is destined to an appropriate use, and today it is widely cleared through customs.

Instant messaging can be used for immediate communication such as "can I call you/pass by?" or for a brief, again informal, report to a busy stakeholder, for example to report on the outcome of a sensitive client meeting. They have no formal value so any sensitive or important information should not go through such a channel.

Emoticons can be useful in the work environment, as long as they are used appropriately, because they add emotion to text messages that would otherwise be devoid of it. It is advisable to use only the main emoticons so as not to risk that our interlocutor may read a different meaning from the one we want to understand. The value of emoticons is to defuse certain phenomena. In this context, it is important to note that there is a lot of criticism, otherwise quite present in the working context, where, for example, you send an email to someone with absolutely professional

intentions presenting a situation, and the other person reads in it a criticism on a personal level, and this triggers an escalation of prickly answers and relational problems: sometimes it is enough to add the colon and the parenthesis at the end of a sentence to avoid these phenomena. And so on.

Bad Idea: I'll Call You Back!

Some people have the attitude of answering phone calls saying that they are currently busy—and they actually are—and that they will call back soon. But they rarely call back. When the caller phones them back the following day(s), they coldly apologize saying that they have been very busy. Every time!

This attitude causes a very sudden loss of trust from the other members of the project team up to a generalized disrepute to these "very busy" colleagues. And, according to the position of these people in the project, can cause significant impact on the progress of activities. Generally, the reaction of the team in the middle term is to do without him or her.

When a person feels to be structurally overloaded and of not being able to manage daily activities and interactions, they must ask for help and look, together with the team, for a redistribution of task between team members. Finding a few minutes to call back colleagues that need to speak to you must be normal: if, when calling back, you understand that the matter requires more than two minutes, schedule a meeting according to your calendar.

Myth: The Étoile

"Étoile" is the French for "star", and it is the title given to the first dancer in a classic ballet company, originally given to the first dancer of the Paris Opera House.

I refer as "*étoile*" those colleagues who, during project meetings, boast/announce how many "unread" emails they have—sometimes thousands—saying that everybody needs them, but they have too much to do to review them all. Étoiles are typically important members of your project team, maybe very good in technical matters, but not the same in managing activities.

The number of “unread” emails in the mailbox must be kept under control: having some 100s for a few days due to an extremely hard project phase can happen, but having some 1000s of unread emails structurally is an indicator of personal mismanagement, and a project manager must be aware that such a situation represent a significant risk for the organization, because within that large amount of unread emails you could miss an important and urgent one. As project manager, it is your duty to manage communication, and emails are an important part of it. So, you and everybody in your project team must find the time to review all the emails received, mark those that are just for your information as “read”, and categorize the ones requesting an action depending on the importance, and keeping them monitored in a backlog. You can also work with your colleagues and stakeholders to reduce the number of copied persons in emails.

If you have an *étoile* in your team, you have to work with him or her, in front or in the backstage, to normalize the situation of his/her emails until they reach a sustainable level for him or her and a safe level for your project.

I also found étoiles happiest on the telephone, spending most of their working day talking on the phone with just about anybody. This kind of étoile is a relevant risk for your project because long phone calls lack clarity, and the actions needed can be ambiguous and untraceable. For this kind of étoile you must insist on shorter phone calls and a more structured use of action plans/issue logs and similar software tools.

2.11.4 Intercultural Communication

When communicating with people from cultural backgrounds other than our own, we have to take into account that the message and the way it is transmitted is influenced by the culture of the transmitter, culture being everything that includes education, current knowledge, experience, language, thinking and communication styles, stereotypes and preconceptions of each person. In the same way, the same factors influence the way the receiver interprets the received information. Cultural differences can change the meaning between the communicator and the receiver in a very consistent way and can have very significant consequences in projects, as they can be the basis of serious

misunderstandings between team members and/or stakeholders. Keep also in mind that in virtual communication the risk for misunderstandings is even bigger than in face-to-face. The recommendation is to get informed about the origin of team members and stakeholders, and collect some information about culture-specific issues. In most cases this information are available on free resources on the web.

2.11.5 Visual Communication and Visual Management

On-sight communication and management techniques comprise a series of strategies that make it possible to provide information to stakeholders with great immediacy, thus enabling decisions to be made extremely quickly. They were born to counteract the distribution of information made through tables dense with numbers and (vaguely) understandable only to a few insiders, and that cause "oversights" even to these few insiders. The phrase that characterizes these contexts is that when they are told that the information is inaccessible even for those who, although technical, do not live the project day by day, they reply "but we know where to look". This approach, still widespread today, is a fundamental error of any organization, because it excludes the majority of the organization's internal stakeholders, not to mention external stakeholders, from understanding the performance of the project (or process). They fall into the techniques of visual management also the organization of the workplaces through the lean technique of the 5S, or the Management of the supplies through the *Kanban* techniques, but of which we do not deal here. Any project manager has to be concerned about the planning phase, to agree with stakeholders what key information is meaningful to the project, also agree on a level of granularity that is relevant to everyone, and how to represent it in a "dashboard". A project dashboard can include elements such as:

- Charts (histograms comparing planned with actual work packages of the project, or "pies" with the subdivision of activities by work phase, etc.).
- Diagrams (WBS, PERT, Gantt, organization charts, etc.)
- Drawings
- Schemes
- Ideograms
- Pictograms
- Data printouts (S-curve, burndown chart, etc.)
- Technical drawings

- Maps

The project dashboard is generally in an A3 format, easily printable, and is posted in an area where all team members and key stakeholders can see it. Today we are very oriented to abandoning the printed sheets, especially since it's increasingly common for team members to work remotely: in these cases, I recommend the project manager prepare those sheets and to share them during meetings as a base for discussion.

If you apply these basic principles of visual communication you will get immediate benefits:

- Project status available at a glance.
- Increase clarity, visibility and understanding of the project among stakeholders.
- Status and change information available in real time.
- Each stakeholder can use the information as and when they wish.
- Great transparency and increased trust on the project among stakeholders.

2.11.6 Meetings

Meetings are experienced although in different ways, as a time of stress in many organizations. Some organizations say they "do too many", while others complain that they hardly ever do any, and that more are needed. I have consulted in companies where the owner has forbidden employees to spend time in meetings. Since meetings are a critical part of project management work, a project manager must know how to organize and manage meetings in an exemplary manner. As we will see below, this is fairly easy and within the reach of anyone (even non-project managers), as long as you follow a few basic principles.

The first aspect to take into account is that any meeting is part of a process: there are no meetings that are born and die as meetings, but they always serve to inform and make decisions about something. When organizing a meeting, one must keep in mind the purpose for which the meeting is being convened, and then reflect, as with any other process, what inputs are needed, how the process will take place, and what the expected output will be.

Since a meeting takes-up participants' time, it must be clear that the benefit that the meeting brings must exceed the cost it generates—that is, at least, the time spent by the people attending multiplied for their hourly rate

plus the loss of production of these people due to their attendance at the meeting (Fig. 2.11).

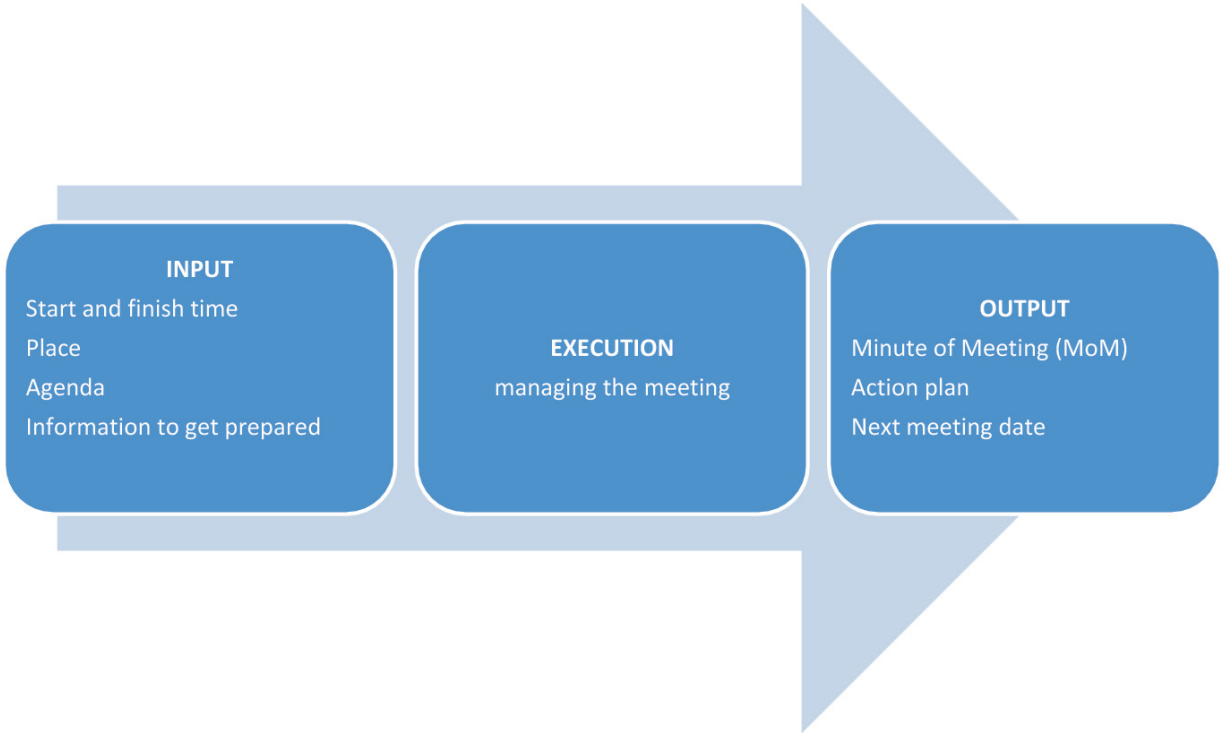

Fig. 2.11 The process of managing a meeting

When the project manager (or whoever the organizer is) calls a meeting, he/she should make sure that only the people who are strictly necessary are called, and that each person called is clear about what contribution is required of him/her, so that he/she can prepare. It is compulsory to go prepared to the meetings: if one of the participants takes a seat and asks "what shall we talk about?" it is better to adjourn.

If you are called to a meeting where it is not clear what contribution is expected, ask the organizer for clarification before the meeting occurs. If you are called to a meeting where you do not understand what contribution is expected, it is legitimate to ask the organizer for clarification and, if it is confirmed that your contribution is not required, to communicate that you will not participate and possibly read the minutes that will be sent. The organizer should also take care to send out the invitation reasonably in advance, with a general agenda if possible one week before and maybe a more detailed one a few days before, making sure in parallel that all participants have the necessary information to be able to arrive prepared. The convocation must contain a start and end time.

Always thinking in terms of process, the execution phase of the meeting requires that the organizer maintains leadership: those cases where participants look each other in the eye and ask “will you start?” again, point to mismanagement on the part of the organizer. **The meeting must be managed by the person who called it**. Running a meeting requires:

- Welcoming and thanking people for attending: depending on how often participants gather, this part may be more or less heartfelt, but it still needs to be there.
- Present the purpose of the meeting, topics that will be covered, and goals.
- It is mandatory to discuss all the items on the agenda that you sent previously, because if I sent four items on the agenda, but the meeting time ends before I can discuss the fourth, the participants who came to discuss the fourth item will have wasted time and, again, next time they will not come or will not prepare properly. For this reason:
  - It is not uncommon to see meetings where some participants “go off on a tangent” and take the discussion to something they think is important, but in doing so, again, waste the time of the other participants who have come and are prepared to talk about the items on the agenda. **The responsibility for keeping the discussion on track for all participants lies**, as you can imagine, **with the person organizing and leading the meeting**.
  - **The person who leads the meeting must be sure that all the participants have expressed their opinions**, because, if he/she has applied the principle of having invited only those from whom he/she expects a contribution, he/she must be sure that everyone has made that contribution. The phenomenon to be contrasted is that of participants who do not speak for the whole meeting, due to shyness or because they are not yet sufficiently familiar with the project team: these should be gently encouraged to bring their contribution, also to improve their integration within the team.
- Summarize the conclusions reached and decisions made at the end of each point and at the end of the meeting.
- At the end of the discussion, share and assign tasks with specific deliverables and dates: I have been involved in meetings where, at the end, the participants assumed that everyone had understood what the others expected of each other, and, as can be expected, at the next

meeting hardly anyone had met the others' expectations. It is essential that the organizer, in leading the meeting, tells everyone clearly what they are expected to do and by when, and that this is then recorded in the minutes.
- Leave space to answer any questions.
- **Respect start and end times**: It is good to arrive in the room, or to connect if the meeting is virtual, a few minutes earlier, and the coordinator should have an idea of how much time he/she can use for each agenda item. Meetings which start a quarter of an hour later to wait for all the latecomers, and which end half an hour late, again, waste the participants' time and cause inefficiency in the organization: for efficient management of the participants' time, **there must be confidence that the meeting will last exactly as planned** and that everyone will be able to make appointments in the time that follows without having to risk cancelling them or arriving late.

The output of a meeting is represented by the Minutes of Meeting (MoM), which have to be drafted by the organizer: bad practice is to see the drafting of minutes as a low-value activity so delegate it to the last of the trainees: what could the last one have understood?! **The minutes are the fundamental deliverable of the meeting, and**, always respecting the time of those who participated, **must be drafted with the utmost care by the organizer**. The form must be that of an action plan: avoid the kind of minutes taken at a condominium meeting, in which it is reported who said what and who replied how, but must contain, possibly in tabular form, a numbered list of issues discussed related to the points in the agenda, with the action that was indicated.

This will make it very easy for everyone to understand what contribution is required of them and for the organizer, at the next meeting, to check the progress of the actions or discuss any further problems that have arisen (Table 2.5).

Table 2.5 Example of Minutes of a Meeting

Date			
Participants			
Distribution			
ID	**Action**	**PIC**	**Due date**

1	To call the X supplier to ask for anticipation of shipment	EF	Sept, 23
2	To hire additional welders	AG	Oct, 30
3	To set the production facility 3 free for project activities	YG	Oct, 15
4	To inform the project sponsor about the increasing level of risk	MM	Sept, 21
5	Summon the next steering committee	JF	Sept, 30

In agile projects, 4 type of recurrent meetings are generally recommended:

- **Iteration/Sprint planning**: establish the desired outcome for the upcoming sprint, define what backlog items can be accomplished, and determine how to achieve each item, before the iteration starts
- **Daily Stand-up/Scrum**: ensure the project team has shared visibility of how the sprint is progressing, daily, max 15'
- **Iteration/Sprint review**: discuss and show the work completed, highlight accomplishments, and determine next actions, at the end of the iteration
- **Iteration Retrospective**: lessons learned from the last iteration, at the end of the iteration

I recommend that hybrid projects—and any kind of project, in general—take inspiration from this approach and establish regular meetings with the same purpose, maybe with different duration and/or frequency.

Biorhythm and Meetings

The same meeting, held at one time instead of another, can have a significantly different outcome. This phenomenon is linked to the biorhythm, so our physical and intellectual performance is different in different parts of the day. As a guideline, let’s keep the following in mind:

8.00–9.00, or in any case at the beginning of working hours, people are still “starting up” their cognitive processes, so don’t expect brilliant ideas in meetings convened close to this time.
9.30–11.30 during this period the attention and creativity of the team is normally at the highest level, and it’s an ideal time to meet and discuss.
11.30–12.30 Participants begin to get hungry, there is a buzz, attention wanes.
12.30–13.30 Hunger and drowsiness begin to prevail, it is inadvisable to organize meetings during the lunch break.

13.30–14.00 “eyelid drooping”: it is common to have drowsiness after lunch, the contribution that can be expected is limited.
15.00–17.00 the team is again at its peak; it is the ideal time for constructive meetings.
17.00–18.00 The participants start to look at their watches, some of them have to go home: this is a time frame that should generally be avoided—unless of course there is a particular urgency—because some participants might have personal commitments that cause them concern, and they will probably nod to any request as long as the meeting ends.

Myth: The Sunday Mass
Everyone periodically experiences a company “Mass”—those meetings where only one person speaks and at the end everyone is expected to say “amen”. It is a situation in which only one communicates and the others do not respond, probably because they are not given space to do so or because they know that their opinion won’t be considered, anyway. The Mass is a very serious problem of stakeholder engagement between the communicator and the other participants. If you find that you are the officiant, seriously question the effectiveness of your leadership!

Myth: The Conclave
The Conclave is the meeting—held in the Sistine Chapel when the Pope dies—where the cardinals of the Catholic Church lock down (*cum clavis*, literally “locked down”) until they are able to find an agreement on the name of the new Pope. The conclave can last weeks and no cardinal can leave the meeting room—the Sistine Chapel—until the agreement is reached.

Except for the case of the election of a new Pope in the Catholic Church and for matter of extreme and uncommon urgency, the type of meetings “let’s stay here until we’ve cleared everything up” are monstrosities and indicate a serious lack of management on the part of those requesting them. As mentioned above, meetings must start and finish at a specific time known to attendants and, for reasons related to human biorhythm, is recommended to last no more than 2 h maximum, preferably 1 h. In a company where conclave-like meeting are very frequent, the confusion explodes at any level because it is impossible to

schedule meetings if you cannot be sure if the resources will be available due to previous conclave with unknown end time. In addition, people asked to attend conclaves suffer a very significant stress if these occur at the end of their working time, affecting their private life because they are never able to commit on private activities such as shopping, taking the kids to school, playing a football match etc.

Mastery in managing meetings is always—with no exception—a litmus test of a manager.

2.11.7 Active Listening

Active listening is a listening technique that makes it as easy as possible for the speaker to express themselves and for the listener to receive as much information as possible. It is widely used, for example, in journalism by interviewers, and also by the most zealous sales managers. In project management there are various situation in which it is very useful for the project manager to be able to gather maximum information and points of view from the stakeholders.

The active listener must:

- stay silent
- smile
- nod
- maintain eye contact (do not look away while the other person is talking)
- take notes in a notebook
- maintain open body movements (e.g. avoid keeping your arms crossed)

These few rules make it very easy for people to communicate with each other. Try to put it into practice and you will see!

2.11.8 Negative Feedback—Talking About Problems

Negative feedback is, if well used and spread among team members and stakeholders, a very powerful tool for project success (and for the success of organizations).

A team in which there is ease in giving negative feedback has a much better chance to manage a project in the best possible way because, when there is a problem, it can be easily and immediately discussed and a shared solution sought. On the other hand, a team in which talking about problems

generates fear will always have great difficulties in managing projects, because if issues are not addressed, but left unresolved, they will manifest themselves sooner or later, and will do so with maximum power with a snowball effect, when they could have been addressed or even prevented with little effort if they had been seen as soon as they were on the horizon.

Here, I am pleased to quote Karl Popper with the theory of falsifiability: the power of modern scientific culture lies in the possibility of being exposed to refutation, to the attempt to demonstrate the falsity of statements. When a theory is formulated, it is valid until someone—some fellow scientist—falsifies it, that is, proves that it is wrong.

> The irrefutability of a theory is not (as is often believed) a virtue, but a defect. Every genuine check of a theory is an attempt to falsify it, or to refute it. Controllability coincides with falsifiability. (K. Popper, *The Logic of Scientific Discovery*, 1934)

In the scientific world, the practice of “peer review” is very common, i.e., in order for a scientific article to be accepted for publication in a journal or at a scientific conference, it must be reviewed and critiqued by at least two “peers”, two colleagues, who undertake to critique all aspects they consider weak in what the colleague has written. This, if done carefully and respectfully, is of great help to the writer.

Much more modestly, in the projects that we find ourselves managing on a daily basis as project managers, **we must view with great favor the attitude of those who, in a respectful and constructive manner, point out the weaknesses** (and there are always some!) **of our project plan** or of the other tools that, we presume, allow us to keep the project under control. An attitude I generally use when I get a lot of positive feedback is to ask the giver to tell me at least one thing that went wrong or could be improved. Many people have the attitude of saying only what goes well, carefully avoiding pointing out what doesn’t work, for “the peaceful life”. This attitude is extremely detrimental to the project (and to the implementing organization), because it becomes very difficult to identify problems and implement solutions. The project manager must stimulate an environment in which people feel comfortable giving negative feedback, with the cautions I will say in a moment. Obviously, people who continually give negative feedback in a destructive manner are also to be censured: we have

categorized these as “assholes” (see Chapter 3). The project manager should facilitate a climate in which people can talk about problems without feeling personally attacked.

The most universally used way to provide negative feedback at its best is to start with positive feedback, thus indicating that the negative feedback is not on all the person’s work, and that there are parts (often prevalent) of the work of the person we are dealing with that we appreciate and perceive as valuable. Only after the positive feedback, the negative is exposed, which must necessarily be circumscribed to a limited part of the work of our interlocutor. If you feel that your interlocutor is wrong across the board, you probably have a personal problem that you need to solve (see Ethics), and ask yourself if, by chance, you are not the asshole. Some people simplify this method by saying that it’s about “sugarcoating” the pill, so you “make a fool” out of the interlocutor, who may be all excited at first about the positive feedback, and then gets shocked and doesn’t expect the negative feedback. That’s not the spirit, because if done that way, it would be an unfair way to proceed.

Myth: The Drama King/Queen
It is not unusual to find managers who, when something goes wrong, gather all his/her unfortunate associates and start criticizing few of them publicly, with a kind of “I cannot believe, that after one year in your role, you still can’t manage this by yourself” “The company cannot afford this waste of resources!” and so on. The tone is generally sullen and dramatic. The drama king or queen is actually denouncing their incompetence as a manager: as the role of any manager is to enable their resources to do their job, the manager is supposed to identify any gaps in his/her resources competence sooner than “after one year” and to take corrective actions, if needed. The drama king/queen is often an asshole (see Chapter 3).

2.11.9 Reformulation Technique

A basic technique, very useful for limiting misunderstandings, is that of reformulation. It is used when dealing with very long discussions, perhaps not in our mother tongue, and we have the doubt of not having completely understood or of not being aligned with the expectations that the other

interlocutors have of us. The best thing to do is to rephrase what you have understood and ask for confirmation. The rephrased sentence should express what we have understood in our own words and should be short and accurate. The general pattern is like:

"If I understand correctly" + Summary + "Is this correct?"

If the answer you get is "yes" you can proceed, if it is "no" you have to ask to the other party on which point they did not understand each other, and continue until clarification.

2.11.10 Presentations

It is very common for a project manager to have to present in front of a larger or smaller team. To do this, it is common to use a medium that is projected or broadcast to the participants, created through programs such as MS Power Point and others. These media, which have the sole purpose of facilitating the understanding of the audience, often generate the opposite effect, i.e. to confuse and distract the participants. For this reason, some companies have even banned the use of these media during presentations, and there is even an international movement in this regard (anti Powerpoint party).

Without falling into the excess of banning these media, we can all see that the problem is concrete and exists: presentations in which complete texts are copied and pasted, perhaps with very small fonts, to the point of being illegible for those in the audience, or slides full of images that are not entirely relevant, are quite common to see, and often hide the insecurity of those who have to speak "on top" of them. When you put too much information on a slide, what happens is that the audience starts reading the text or looking at the pictures and stops listening to the speaker. A few simple rules should be used to package presentations that are useful for speech:

- Start with a table of contents to give an overview to the audience, gather interest, and give an idea of the duration;
- Show only the most important information and absolutely avoid reporting. all information about the project/document on the slides;
- Do not fill the slides with text, but include only the key words and little more: the speaker will then explain the meaning or present and discuss the conclusions;

- Do not include images that are not relevant or that are not immediately understandable to the audience to avoid distracting the audience;
- Avoid slides that are too densely populated with information, images, but keep them as slim as possible: few points and images to a minimum, the explanations will be made later by the speaker.

If these few basic rules are followed, no one in the audience will feel like joining the anti-presentation movement. However, this requires that we go prepared for our presentations. If the presentation is important—e.g. if it is a key step in the project with the client, or if it is a presentation of our project to the board of directors of our company—there is nothing wrong with a rehearsal with some members of the team or even alone after preparing it.

2.11.11 Stage Fright

If you suffer from stage fright: don't worry, it happens to everybody at least the first time, and it can be a fantastic source of potential energy. The antidote is—as usual in this book—to get prepared for it:

- Prepare for your presentation:
  - know all the content of your slides, and be able both to present it quickly and answer any in-depth questions
  - Consider practicing the presentation alone or with someone before the official event
  - Prepare for potential technical issues
- Physical preparation:
  - get some sleep (avoid working all night long on the presentation to improve it instead of sleeping)
  - dress in a way you feel comfortable
  - breathe correctly: it increases vocal capacity and reduces stage fright
- Mental preparation:
  - positive visualization can help: lie down before the presentation in a place where you won't be disturbed and think of a precise sequence of your future presentation from the audience perspective and then to your perspective

– arrive early in the presentation room, take your time to get used **to** it, check if there are any technological issues

Stage fright is universal, if harnessed, can serve as a performance enhancer and thus become a great asset for being effective in presentations.

Myth: "You Never Can Tell!"

In many organizations there is an inordinate use of conditional or doubtful forms: "we will do our best", "we will try to get everything done", etc. This attitude is a sign of disorganization, which is clearly perceived by the organization's external stakeholders (customer, suppliers and others) and which undermines the climate of trust in the project, which, as I never tire of repeating, is the most important aspect of the project and a (the) key factor in the success of the project.

This phenomenon is caused by the perceived non-robustness of the processes by members of the project team, resulting in a general uncertainty in everything that happens, with a sense of anxiety and inadequacy on the part of the project team. It is often associated with a lack of clear prioritizsation (or a method for resources to independently prioritise), which generates a dissipation of energy in pursuit of whatever issue ends up on the desk, in an almost entirely reactive manner.

When there is a high level of uncertainty and disorganization, the project manager must work immediately to keep the project under control in the Pareto way, i.e. by influencing the most relevant issues, particularly those in the eyes of the client and the internal project sponsor. This attitude creates trust in these two key stakeholders and normally, when support from them increases, the "air cover" increases and the project progresses more easily. Personally, I quickly set up an "issue log", which is usually fast populated with a hundred or so issues. I then select them, prioritize them, share them with the project team, and we divide them.

At this point it is necessary to avoid giving uncertain answers to stakeholders: it is necessary to give certain dates for deliverables, even the most modest ones. If there are problems or uncertainties (e.g. a piece of information is based on an estimate and it is not possible to reduce the uncertainty, or the event is conditioned by another event over which you have no control) it is good to share these aspects with the client,

explaining why a deadline or a piece of information is not perfectly determinable.

2.12 Assess and Manage Risks

> A risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on one or more project objectives. [PMBOK]

Risk management is one of the pivotal aspects of project management, because managing the uncertain aspects of the project is precisely the daily occupation of the project manager. If absolute determinism were to reign over the project, the figure of the project manager would not be needed, and the activities could be coordinated by software such as MS Project. But anyone who has worked in a project environment knows how much uncertainty exists, and how varied the sources of that uncertainty are. Uncertainty has to do with the complexity of the project as a system, and the greater the complexity, the greater the uncertainty to which the project is subjected, and the greater the need for a project management system that can predict complexity-related scenarios and deal with them as they occur. Being able to implement the characteristics of resilient systems is certainly healthy for the project manager: on the one hand, uncertainty has to be addressed a priori, but on the other hand, one has to prepare one's own organization to cope with unforeseen events with an adaptive (typical of agile systems) and resilient approach.

In many cultures there is a kind of superstitious modesty in talking about risks:

> if I don't talk about it, maybe it won't happen!

It is very common to hear from improvised project managers what is **known** as Murphy's law:

> Anything that can go wrong will go wrong.

Actually, not talking about risk makes Murphy's Law a reality: **if you do nothing to manage a risk, you make it as likely as possible to occur,**

while talking about it and thinking about possible solutions minimizes the probability of its occurrence. **Murphy's Law is, in fact, in our hands.**

A project manager who addresses risk in the structured way that is described below demonstrates mastery of the discipline, and differs abysmally from project managers-notaries, who take note of what happens and complain about what goes wrong at the coffee machine without having done anything to prevent it.

The lifecycle of risk management, whether on the level of project, program or portfolio risk management, but also in corporate risk management, is generally presented by the following seven steps:

1. Plan risk management.

2. Identifying Risks—The process of identifying and documenting the characteristics of individual risks and the overall risk causes of the project.

3. Perform qualitative risk analysis.

4. Perform quantitative risk analysis.

5. Planning Risk Responses—The process of developing options, selecting strategies, and agreeing on actions to address overall project risk exposure and managing individual project risks.

6. Perform risk responses.

7. Monitor risks.

2.12.1 Plan Risk Management

This is the crucial moment that is often overlooked or taken for granted, and consists of defining the methodology and acceptability thresholds that you will use for all subsequent phases of risk management.

The key elements that make up this first step are:

2.12.1.1 Risk Breakdown Structure

It is the structure that collects the risks by categories that are more and more detailed, up to the single risks. It can be represented as an inverted tree like the other breakdown structures, but it is also often represented in table form. In my experience, all organizations maintain the four classic risk areas at level 1:

1. Technical

2. Managerial

3. Commercial

4. External

Although in principle there is nothing to prevent an organization from changing or integrating this first level. In some case it is criticized as it works more as a prompt list than a breakdown structure. My personal position is that, even if it is used as prompt list, it is definitely useful for the purpose of identifying risks (Fig. 2.12).

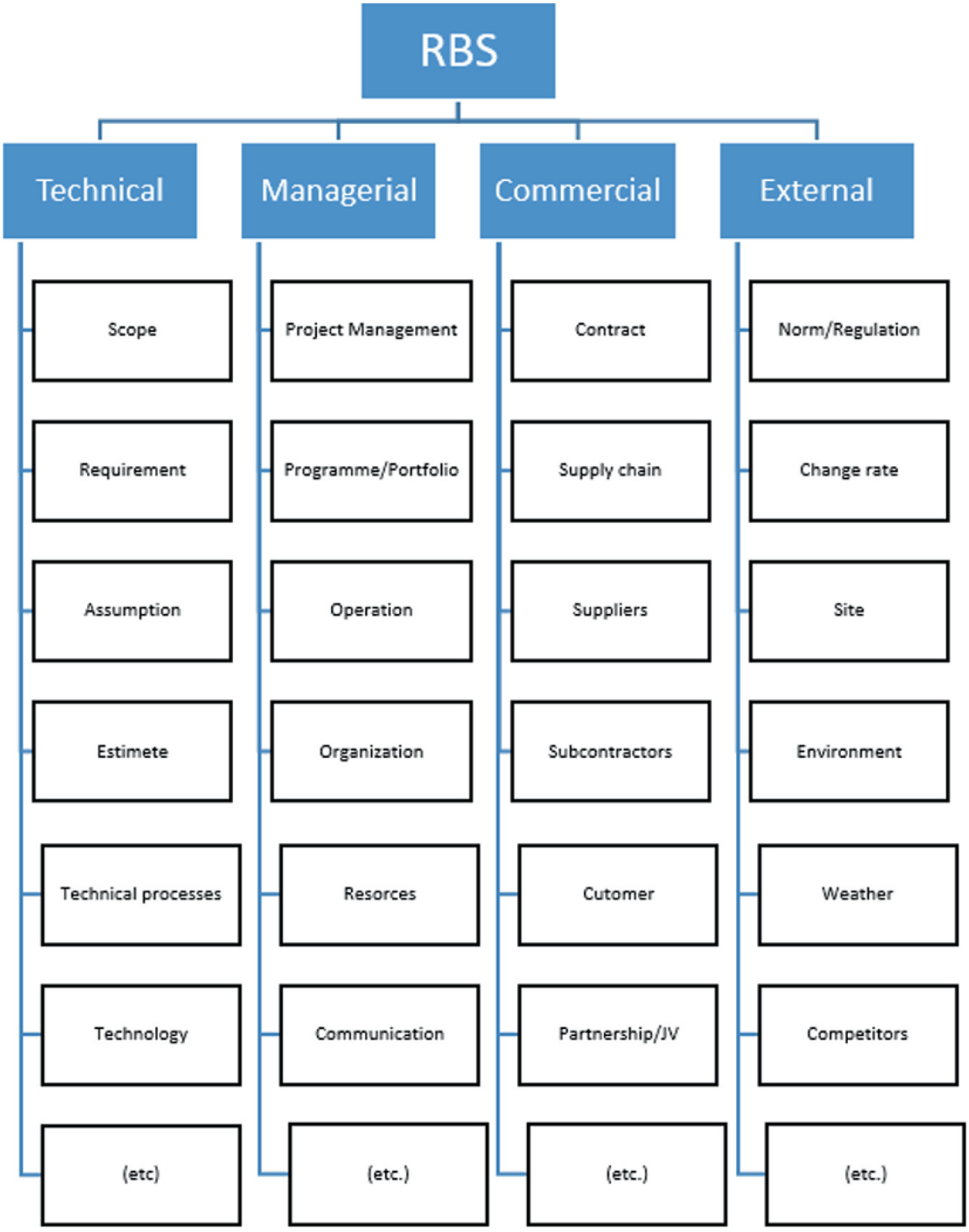

Fig. 2.12 Example of Risk Breakdown Structure

The second level of the RBS, however, must be implemented organization by organization with greater awareness, and alongside the

more standard types of risk, more specific risk categories must be developed for the projects that the individual organization develops. RBS level 3 is typically the level of individual risks. The RBS is normally developed by each organization once and for all as a template—it does not have to be developed from scratch for every project—so that new projects can be based on it.

2.12.1.2 Definition of Thresholds for Likelihood and Impact

A fundamental moment, which, if neglected or approached in a purely qualitative way, makes risk management completely lose its effectiveness, consists in defining the thresholds—the limit values—that make me consider a certain risk “high”, “medium”, “low” etc., and therefore guide me to take more or less relevant actions to mitigate and face it.

Generally this phase is tackled with a table like the one below. Bear in mind that the thresholds in the table, in particular those related to impact, must be reviewed for each individual project, because they are generally related to the duration and budget of the project itself: it is different to have a risk with an impact of 1M € and 6 months on a project with a budget of 10M € and a duration of 2 years, or on one that has a budget of 1M € and a duration of 4 months (Table 2.6).

Table 2.6 Example of a table for the definition of probability and impact thresholds

Scale	Probability (%)	Impact ± on project objectives		
		Time	Cost	Quality
Very high	>75	>3 months	>1M €	Very significant
High	51–75	2–3 months	501k €–1M €	Significant
Medium	26–50	1–2 months	251–500k €	Some kind
Low	11–26	1–4 weeks	101–250k €	Light
Very low	2–10	1 week	10–100k €	Very light
Nul	<1	<1 week	<10k €	No or negligible

2.12.1.3 Probability and Impact Matrix

This tool uses the combination of the probability and impact values of the individual risks—based on the thresholds defined in the previous step—and classifies them so as to establish in a clear and manageable way which of them require more or less detailed and structured responses. Normally three

thresholds are used: low, medium, high, where risks that fall into the “low” risk band are acceptable even possibly without implementing specific strategies, “medium” risks must be mitigated in some way, while “high” risks are unacceptable and normally require project abandonment unless a response strategy is found that moves them into the other two bands. This matrix, as well as the RBS, can be developed by an organization once and for all and then become a standard for all new projects (Table 2.7).

Table 2.7 Example of probability and impact matrix

		Impact				
		Low	**Minor**	**Moderate**	**High**	**Extreme**
Probability	Rare	Low	Low	Low	Medium	Medium
	Unlikely	Low	Low	Medium	Medium	Medium
	Moderate	Low	Medium	Medium	Medium	High
	Probable	Medium	Medium	Medium	High	High
	Very Likely	Medium	Medium	High	High	High

2.12.1.4 Risk Register

The operational document that actually represents the whole cycle of risk management is the risk log/risk register. It is a table where each line is noted a risk, and then, column by column, you give body to the various aspects that characterize it, so as to have all the elements necessary for effective risk management in a single document. Generally a spreadsheet is used (MS Excel or similar), although there are more sophisticated tools that are gaining ground.

The minimum features that are generally included are:

1. Name of the risk
2. Element of the WBS to which it is linked (activity, WP, overall project)
3. Description
4. Person in charge of management
5. Probability of occurrence
6. Impact (cost and time)

7. Classification (high, medium, low etc.)

8. Preventive action

9. Containment action (contingency)

Each organization is obviously free to add additional features that can help with better management (Table 2.8).

Table 2.8 Example of a risk register

ID	Description	PIC	Impact	Probability (%)	Rank	Prevention	Containment	Status
1	Delayed delivery of materials	AF	150k€	30	High	Transfer to subcontractor	Expediting	Open
2	Warehouse flooding	GG	57k€	65	High	Maintenance of outdoor areas	Pumps	Monitor
3	Late payments	EF	25k€	25	Medium	Credit assurance		Closed
4	Resignations	LL	8k€	14	Low	Benefits		Closed

When I got to this point I developed a methodology—I gave myself the fundamental rules with which I can concretely approach risk management.

2.12.2 Identify the Risks

Once the methodology has been defined, the next step that the project manager, together with the project team and the stakeholders, has to face is the identification of the risks, basically making a list in which the probability and the impact of each risk are estimated.

2.12.2.1 Known Knowns, Known Unknowns, Unknown Unknowns

The vast majority of risks are normally known, that are risks which are already understood, or rather that the project team knows that they could occur. The difference is that **known knowns** are those which you are fully aware of and can plan for in advance, instead **known unknowns** are those which you know they exist, but can’t accurately quantify their potential

impact. A minority but critical number or risk are **unknown unknowns**, that is the team has no idea that they exist and, consequently, no mitigation strategy can be prepared. The challenge, then, is to develop strategies –not specific—to be able to respond to those. Adaptability is perhaps the most important contingency when dealing with unknown unknowns.

In general, it is considered that the vast majority of risks in an organization are known (typically more than 90%) because they are recurrent situations in all the projects that the organization carries out, therefore the identification of risks can be efficiently carried out by bringing the project team and stakeholders around a table brainstorming, or interviewing stakeholders. In mature organizations, there are risk checklists that facilitate the task. For project or high-level risks and not specific to single activities the so called Prompt Lists can be used to facilitate brainstorming sessions, which are nothing else than tables with high level categories. The most famous prompt list is the one called PESTLE, acronym of Political, Economic, Social, Technological, Legal, External (environmental), but there are also TECOP and VUCA (Volatility, Uncertainty, Complexity, Ambiguity).

For each identified risk, always in this phase, the probability of occurrence, and the temporal and economic impact in case of occurrence must be estimated. For example, if the reference activity is digging a hole, and the identified risk is rain during digging activities, the probability will be the likelihood of rain during the period of the year in which you operate (rainy days in the specific month/total days of the month), the temporal impact is the number of days that a rainy day causes to activities (which could be longer than the rainy day itself, if, for example, I had to dry the excavation with pumps and/or had to wait for the ground to drain), the economic impact is the non-productive cost that I have to face in case of rain (loss in production, lay-offs, penalties for delays, etc.).). There are also other parameters that can be identified to improve risk management, for example detectability, i.e. how much earlier a risk can be detected than when it occurs.

Again, the accuracy of estimates is a critical issue that, if not addressed carefully, risks dwarfing any risk management efforts.

Any considerations related to strategies to be adopted to mitigate the probability or impact of the risk, or what to do in case the risk occurs, are

premature at this stage and should wait for the next steps (although it is not forbidden to start thinking about it at an early stage).

2.12.3 Qualitative Risk Analysis

Qualitative risk analysis consists of classifying the identified risks according to their severity. Often, a classification into three levels is sufficient: low, medium and high; in some cases, a few more levels are added. Obviously, this must be based on what was established in the methodological phase, in particular with regard to the probability and impact matrix. It is very common for the classification, instead of being based on what established into the Risk Management Plan, to decide on instinct. This attitude is clearly a failure because, due to haste and piety, it thwarts all risk management work. In particular, when one is not based on clear data, is extremely prone to optimism or pessimism (optimism bias), so the result of a qualitative risk analysis by hand is always very far from being objective. A widely used method for classifying risks is to multiply the probability of occurrence by the economic impact: this method has the advantage of being fast and based on quantitative data, and should be used by all project managers, although it should not be the only way in which they classify and should be combined with boundary considerations. This figure is also referred as the **Expected Monetary Value**.

$$\begin{aligned}\text{Risk(Expected Monetary Value)}[] = {} & \text{Probability of Accident}[\%] \\ & \times \text{Economic Impact}[]\end{aligned}$$

2.12.4 Quantitative Risk Analysis

Quantitative risk analysis is usually applied only to certain types of projects that make it necessary because of their intrinsic complexity (major or large or mega projects) or because of the catastrophic consequences that the failure of such projects would cause (oil or pharmaceutical projects) or in sectors that are strongly influenced by the external environment (financial and insurance). In general, most projects are satisfied with qualitative analysis and skip quantitative analysis. For those projects which apply quantitative analysis, it is necessary to decide whether to apply it to all risks in general or only to those which have reached a worrying classification in the qualitative analysis. The objective of this analysis is to study the consequences that the occurrence of a single risk has on the internal project,

so that different scenarios can be hypothesized and prepared for. The PMBOK speaks of “numerical quantification of the combined effect of individual risks or other sources of uncertainty on project objectives”.

There are texts and professionals specialized in this type of analysis. One of the most used methods for this purpose is the Monte Carlo method, which defines a probability distribution for each parameter characterized by an intrinsic randomness. For example, in a project where you are not confident about some estimates (duration or activity costs in most cases) it can be applied to analyze the possible scenarios that can be expected in the project, and therefore to establish what level of risk the project is operating under.

2.12.5 Planning Responses to Risks

Once the risks have been identified and classified, what remains to be done is to decide how to go about managing them. There are generally two types of approach possible: ex-ante, i.e. to be applied before the risk occurs, and ex-post, which must be implemented once the risk arises. For each risk in the register, it is necessary to think on both fronts. Often, it is possible to identify actions that cost little or nothing, which make it possible to significantly reduce the probability or impact of the risks. Other measures, on the other hand, involve expenses, even significant ones, and must obviously be weighed in terms of the costs and benefits involved.

Ex-ante measures can be of two types:

- Those of prevention/protection, aimed at reducing the likelihood or impact of the risks;
- The coverage ones, aimed at offsetting the original risk by assuming another risk.

Ex-post measures, on the other hand, are those actions implemented after the manifestation of the risk, and are measures of containment or harm reduction.

The project team has to go through the risks in the register one by one and identify the risks and decide which of the following strategies to adopt:

1. **Avoidance**: you identify a way in which the risk can no longer occur. For example, if you had to carry out mechanical assemblies of machinery, perhaps bulky, on an open yard incurring the risk of rain, you choose to equip yourself with an indoor area and carry out these

activities there. In this example, the strategy is not free, because you will have direct costs for renting the covering structure, I have indirect costs in the use of a structure that was already mine but had to be dedicated to something else.

2. **Transfer**: you find a third party better suited than your organization to manage that risk, and you make sure that if the risk arises, that third party will have to manage it. That's what happens, for example, when you take out insurance. It is also the case with back-to-back supply contracts, where the contractor's risk is transferred as is to a supplier.

3. **Mitigate:** is a strategy that, if implemented, does not eliminate the risk but reduces probability and/or impact. For example, in the case of the mechanical assemblies above, you cannot find a facility large enough and close enough to your project to be able to move the activities indoors, so you bring forward the activity from November to July: in this way you have reduced the probability of rain without eliminating it.

4. **Accept**: if the risk is of low magnitude you can decide to keep the situation as it is. This cannot apply to any risk, only those classified as "low". If a "high" risk does not allow for any other mitigation strategy, you may have to decide to abandon the project. For example, if the risk were that the client is financially unstable, and does not agree to pay in advance (elimination), or to make many close payments (mitigation) and cannot even give me a project bond (transfer), you would be forced to abandon the project because the impact of this risk would be the value of the project itself (of not getting paid once the project is completed).

5. **Escalation**: this means that when a certain risk or unforeseen event goes beyond the scope or magnitude of the project, the project manager must apply the escalation process, which means informing a top manager (identified a priori in the risk management plan) and deciding together with them what to do. Often, when implementing this process, many project managers feel guilty because it seems like they are trying to force the organization, even if escalation itself is not a bad thing. It is not the case that, when the other guy—a colleague or a stakeholder—is

bad, I escalate to go complain to his/her boss. It comes from a shared consideration that the perimeter of competence of the team is not sufficient to deal with a problem (or opportunity) that has arisen, and that therefore it is necessary to escalate, to move up the hierarchy, towards the person who holds the authority that we believe is necessary to deal with the problem.

Once this analysis is finished, I have to update the probability of occurrence and the impacts of the risks on which I decided to implement a mitigation strategy, because it is assumed that both have been reduced.

When there are several mitigation possibilities, the ways to choose can range from a SWOT analysis to a benefit/cost analysis to other more rational methods.

Strategies that require ex-ante activities generate project activities that end up in the WBS and all other deterministic tools (for example, taking out insurance or renting a warehouse, must be added into the WBS, Schedule and Budget).

For the part of the risks that I can't eliminate, I have to set aside a contingency fund to deal with them ex-post, in case they really arise.

2.12.5.1 Bubble Diagram

The risks, once the probability and the impact of each one have been defined, can be represented in a Cartesian plane where the abscissa is the probability and the impact is the horizon. A threshold is established which, in analytical geometry, is represented by a hyperbola branch of the equation:

$$\text{probability} \times \text{impact} = \text{constant}$$

and represents the threshold of acceptability of the risks: the risks that are beyond this curve in the plane are unacceptable: either a strategy is found to mitigate them (so, in the diagram, they move to the area below the curve) or the project must be abandoned because it is considered too risky for our organization. This diagram represents a visual method for managing strategies to deal with risks and can be useful for the team's work on risks (Fig. 2.13).

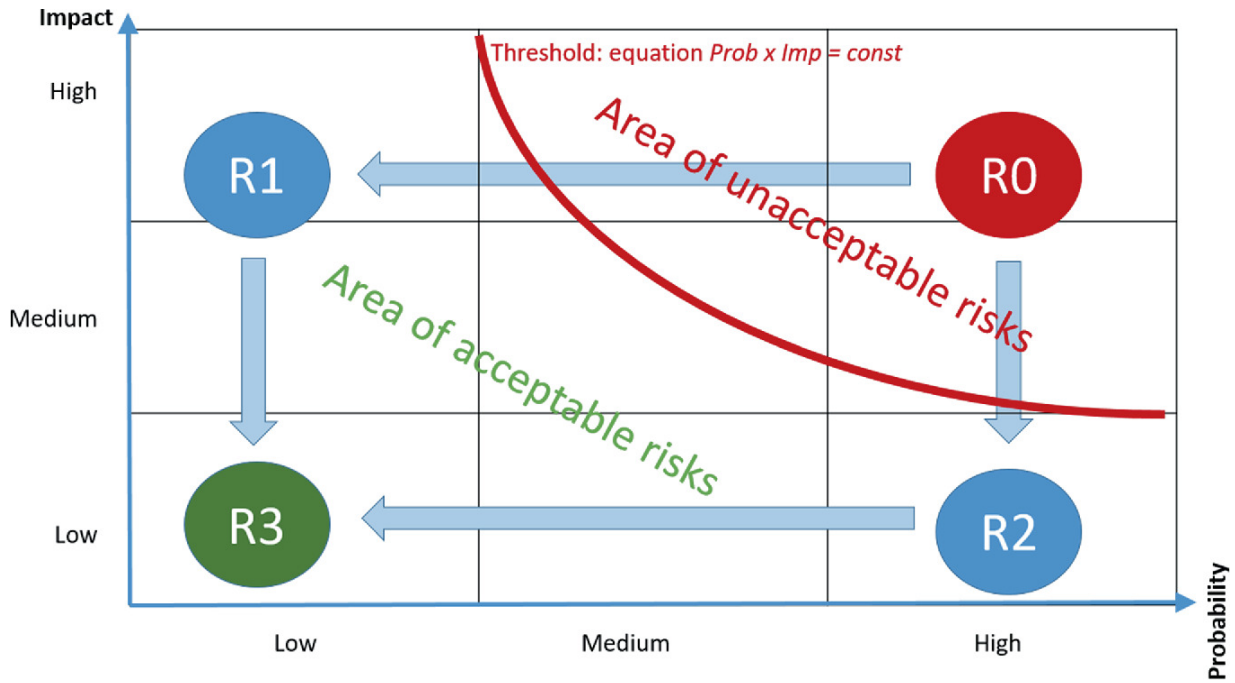

Fig. 2.13 Example of using bubble chart to determine project risk strategy

2.12.5.2 Contingency Fund

This fund has to be quantified carefully, because if it is too big it may become a burden for the project and the company, while if it is too small it may not be enough when it is needed.

In case we have a project with 10 identified risks, all with 10% probability, and all with an impact of 1000 €, of which we are sure that the estimates are correct, how much should the value of the fund be? If we have been accurate, you can see we will only need to refactor one of the risks, so I will need €1000 to manage it. This value also comes from the sum of probability x impact of all 10 risks. In general, it may well happen that two will occur, so it will be wise to set aside €2000. If I wanted to be very prudent, I could set aside 10,000 €, but this would obviously be an over-zealousness that would burden the management of the project. Generalizing, I can calculate the value of the project contingency fund by adding probability × impact (residual values, i.e. those recalculated after response planning) of each risk in the register, reasonably increasing the value thus found. It must be kept in mind that this method is vulnerable in the case where there is only one risk in the whole project, or—which is the same—there is only one risk with an impact much higher than that of the other risks (an order of magnitude or so): in this case the value of the fund

is equal to the impact of that risk, because otherwise, at the moment when that risk would manifest itself, it would cost me the whole impact.

2.12.6 Perform Responses and Monitor Risks

The operational activity of risk management must be meticulous and never stop until the project is completed. The most visible tools on the project manager's desk, besides the Gantt, are of course the risk log and the issue log.

2.12.7 Manage Project Issues: The Issue Log

An issue is a risk that has occurred. Any risk event that arises on the project and needs to be managed by the project manager or a member of the team falls under this definition. In an ideal world all risks would be entered in the risk register from the start of the project and then, as they become apparent, they would be entered as an "issue" in the issue register. **The 'issue' is therefore, by definition, a risk that has materialized.**

In the reality of the projects, it works in this ideal way only for the biggest risks, while in practice the issue log collects many questions, also very simple but in some way blocking for the project, that arise during the execution of the project and that do not pass first through the risk log. Because of this function assumed in fact, the issue log represents a fundamental tool in the operative management of the project, because it allows the project manager to keep everything that is happening on the project and that could in some way impact it under control. The issue log, which is in fact an action plan, is reviewed periodically by the project manager.

The frequency depends on the type and timing of the project, and can range from a maximum of two weeks to a minimum of one day—and all members of the project team who have tasks of their own are asked to update the rest of the team on the progress and any critical issues they are encountering, in order to receive support from other members if necessary. The issue log review greatly facilitates collaboration within the team, and has the function of teaching members to work together. In this dialectic, the project manager usually plays the role of facilitator and referee of the discussions, as well as normally being in charge of all the more delicate activities.

Also for the issue log a spreadsheet is generally used, which allows to easily apply search filters: those who do not have experience with it cannot imagine how easily it is populated with dozens of lines. Today there are applications that allow replacing the spreadsheet with more complete tools, such as ticketing systems inspired by the kanban world, for example MS Planner, Trello, JIRA and many others.

The minimum content that an issue log element must have are generally:

1. Description of the issue

2. Element of the WBS to which it is linked (activity, WP, overall project)

3. Action required for management

4. Person in charge of implementation

5. Classification of urgency (high, medium, low, etc.)

6. Expected date of closure

In the projects I manage, there is always (even if the name changes) a periodic meeting (often weekly) in which I keep an issue log with the project team: new issues are identified and the strategy and actions to resolve them are defined by entering them in the log, always with a person in charge and a deadline, and the issues recorded in the previous meetings are reviewed, interviewing the persons in charge on how the resolution is proceeding and whether help is needed from others in the team. This is a process, parallel to the project execution activities represented in the Gantt or other artifacts, the management of which is, however, of crucial importance to success, because managing the issues, most of them very modest, allows the team to work more easily, encounter fewer obstacles, and avoid the snowball effect that small problems not addressed in a timely manner can cause. Again, the project manager must be the champion of the issue log, always assessing whether the person in charge of an action is succeeding or needs support, always offering to handle the most burning

and delicate issues him/herself, and activating an escalation process if necessary.

2.12.8 Address and Remove Impediments, Obstacles, and Blockers for the Team

A key function of the project manager for the team is to lead the way, i.e., to solve problems, “roadblocks,” and “bottlenecks” before they occur or before they become critical. The project manager must “pave the way” for the team, and this applies to both traditional and agile project management.

The project manager needs to keep his or her antennae up at all times to catch potential roadblocks that are not fully or even partially addressed, which can slow down the work, decrease project performance and frustrate the team. In order to solve these types of problems, the project manager is expected to be able to act quickly due to his or her network of contacts and interpersonal skills, which must be cultivated by the person in the role. The presence of these types of barriers to work must be frequently monitored by the project manager, at least weekly, preferably daily.

2.13 Bringing and Keeping Stakeholders on Board

Stakeholder engagement is one of the most important tasks that the project manager must address to make the project successful. It is often largely under-appreciated or even left to chance, because it is considered, especially project managers with a technical background, to be a political frivolity or even something that is partly not required. In reality, it should be one of the project manager’s first concerns (both in terms of importance and chronology) and, if done with the right awareness, it can bring great benefit to project execution and teamwork. According to the process representation that has characterized all PMBOKs up to 6th edition, the knowledge area of stakeholder was one of the two, together with that of integration, to start in the initiating process team, i.e. from the very early stages of the project. This testifies to the fact that, even in an essentially waterfall context such as that of the first six PMBOKs, the importance of stakeholder engagement is paramount. It is therefore a serious mistake for a project manager to think

that this aspect of project management is limited or specific to agile or public projects.

The PMBOK states that “A stakeholder is an individual, team, or organization that may influence, or be influenced by, or have the perception of being impacted by a decision, activity, or outcome of a project” [PMBOK 7th, p. 8].

I also like the definition: “Each of the subjects directly or indirectly involved in a project or in the activity of a company.” borrowed from the Oxford Dictionary.

The concrete activity that a project manager is called to perform in this area is to identify each stakeholder—name and surname. Listing generic categories like “suppliers” or “customer” is a way to clear the conscience but not to go into the substance. For each identified stakeholder you have to be able to have a contact—email, phone number or similar—to be able to stay in touch and get attention in a timely manner, when needed. For each stakeholder you need to be able to categorize them in terms of their function in their organization and in the project, the type of influence and interest they have in the project. Very often I find myself hearing questions from fellow project managers asking me about the function of this representative of the client or of a large supplier, with whom they may have regular relationships: knowing whether a certain stakeholder is the project manager of your customer, or the engineering manager, or the global head of all the project managers or the purchasing department of the multinational client makes all the difference in managing a project. Cultivating professional relationships and mutual respect with the right stakeholders helps to create a project ecosystem with a degree of resilience that makes it easier to overcome crises: when there is a discussion about the scope of the contract —typically whether something is due or not—being able to make an escalation both within your own organization and—with due and proper caution—among the ranks of the right stakeholders of the other organizations involved in the project, can give a speedy resolution of issues with a great saving of energy and time in project management.

2.13.1 Stakeholder Register and Stakeholder Engagement Assessment Matrix

One tool or artifact that can be used for managing stakeholders relations during a project is the **stakeholder register**, which in its most basic and

common implementation consists of a table that can be attached to or directly integrated into the project management plan, in which it is listed each stakeholder with, for example:

- First and last name
- Role in the organization
- Power you can exercise over the project
- Impact the project will have on him
- Attitude towards the project
- Personal opinions
- Expectations regarding project results
- Proximity to the project
- Interest in the project
- Anything else that relates to the project
- Contact Information

There are also other much more articulated artifacts that are worth using in very complex projects with a very high number of stakeholders, so much so that it is impossible to list them all by name. The main mistake is ignoring this topic, leaving it to chance or to the informal relationships that arise as the project develops. Dealing with stakeholders from the beginning and in an orderly manner makes it possible not to forget anyone, to develop an optimal communication strategy involving the different levels of the organizations, and to be prepared to involve the right stakeholders at the most appropriate times in the project. As soon as someone falls, by definition (and not by choice), in the list of stakeholders, it is essential to involve them, even if they are against the project or a part of it: the purpose of stakeholder involvement is to have an open channel of communication with each of them, and therefore to have access to all of them in case of need and in a planned and regular way. What will happen to the project if, when there is a discussion about an activity, your most influential stakeholder does not respond to your phone call?

The **Stakeholder Engagement Assessment Matrix** is a tool comparing current and desired stakeholder engagement levels, useful for planning engagement activities (Table 2.9).

Table 2.9 Example of stakeholder engagement assessment matrix

	Unaware	Resistant	Neutral	Supportive	Leading
Stakeholder 1	C			D	
Stakeholder 2		C	D		
Stakeholder 3			C		D

Note C = Current engagement; D = Desired engagement

2.13.2 A Very Special Stakeholder: The Project Sponsor

The project sponsor is a person (often a top manager or executive) who has overall responsibility for the project. The main concern of the sponsor is that the project generates the value for which it was initiated, in terms of funding and alignment with the organization's strategic objectives. The project sponsor is the most important stakeholder as he/she plays a key leadership role in the project, through several lines of action:

- It helps the project manager and the team to focus the project and to face problems.
- supports the project within the organization, and promotes the results.
- is the recipient of escalations when issues arise that are outside the project manager's authority.
- in some situations, he or she can facilitate communication between the project team, the customer and stakeholders.
- In general, they "pave the road" for the project manager and the team to make project execution as smooth as possible.

This description shows how crucial this role is for a project. On the other hand, it is easy to imagine what can happen if the project sponsor becomes disinterested in the project we are managing, for example because priorities change in the company, or because he or she is displeased with the progress of the project. Without sponsorship, when a problem arises, the project manager will have no one to escalate, or to help him or her with top management or other stakeholders in resolving the issues, and the reputation of the project within the organization will be poor, affecting the support he or she can receive from other business entities.

A key recommendation is to immediately identify the person within the organization who has this role: it seems obvious but often it is not identified in the documents, or the person identified is not actually the project sponsor, or the project sponsor does not know that he or she is the project

sponsor. Once identified, the sponsor must be “cuddled”: I mean that the project manager must treat the relationship with the sponsor in a privileged way, making sure to keep the sponsor informed about the progress of the project in the most appropriate way (some sponsors prefer to receive monthly reports with well- structured charts, others prefer an informal update at the coffee machine from time to time, etc.). Since they are top managers, it is normal to expect that they can’t deal with our project on a daily basis, and respond to our emails immediately, but the project manager must be able to adapt to the different style of each sponsor in order to have them on board when needed.

Being a project sponsor is not trivial and can have a dramatic impact on a project’s success. **Most executives that find themselves covering the position of project sponsor** for the projects of their organization/divisions/departments **are not trained on project management** and risk being very ineffective as project sponsor causing all their projects to perform poorly as a direct result of their inexperience. As many executives have never been project managers, and, equally, have no time to attend full project management training, it is recommended that those people attend specific training to become effective as project sponsor.

2.14 Manage Project Changes

All projects, even those planned in the best possible way, are subject to changes in the scope that was initially imagined. In its early days, project management lived according to the axiom that changes in the project scope were always and only a result of poor planning: if you plan “well”, you will start only when you have clear ideas, and it will be enough to follow and implement what you planned. Such a situation is almost impossible in reality: being able to start if and only if everything in the project is perfectly clear is a condition that I personally have never experienced in my career. Traditional project management was born under this assumption of absolute rigidity of the project’s purpose, and this has caused strong criticism, so much so that when the agile project management movement was born, people began to define the traditional method as “plan-driven” as opposed to the agile method to which we are referring to as “change-driven”. Wisdom requires us to realize that the changes will occur, and therefore to get prepared for them.

When planning a new project, it is necessary to plan reasonably, and to accept without too much discomfort that a partially undefined part of the project remains. However, **the mistake lies in not planning how to handle the grey area**. During the project, for example, new requirements from the customer or end-users or, more generally, from stakeholders, may emerge which will require changes to the project scope: it is essential that the project team, including the end-customer, share a way of handling these situations.

Again, as with risk management, there is a tendency to not want to deal with the issue by hoping that nothing will happen, and, as with risk management, this attitude is absolutely detrimental to the project, because sooner or later a request for change will come.

In a traditionally managed project, I recommend carving out at least one paragraph or a small chapter in the project management plan dedicated to the topic, sharing with the client the (minimally formal) procedure for requesting and obtaining scope changes during project execution. The procedure could simply include a formal request for a change from the client with certain characteristics (including if the project execution can proceed while the offer for the new scope is being elaborated), and a formal response from the supplier that clearly identifies the impacts the change has on the project in terms, first and foremost, of time and cost. I also recommend agreeing on the level of transparency that is required in the presentation of change requests: whether it is acceptable for the client to be told succinctly that the change costs 100k € and delays the project by 1 month, or whether further breakdown is required.

In a project managed in an agile way, according to the level of de-structuring chosen, it will be necessary in any case to agree with the client how to manage the changes, and to clarify who has the power to ask for them (the Product Owner up to some specific threshold and, over it, is there an escalation process of some kind?). If not well managed, in an agile project you could run into “scope creep” phenomena in which the team develops parts of the project not initially planned and neglects others, only to discover that the budget to develop the rest is exhausted.

To best handle situations where change requests occur, my key recommendation is to be as transparent as possible, because it’s very easy to lose the customer’s trust through such a situation.

Normally, in the negotiation phase prior to the signing of the contract, times and prices are perfectly calibrated to the client's needs, who then fails to understand why even minor changes have a very significant impact on the project. It happens not infrequently that, in order to sign the contract, price conditions and implementation times are accepted that are clearly inadequate, and then the project is immediately managed with a high level of conflict linked to the continuous search for change orders, even small ones, which frustrates both the client and the project team, and which rarely leads to stakeholder satisfaction and is not sustainable even in the medium term.

Myth: Change Orders Dragon

There are project managers who set goals as a percentage of the project budget to present claims, aka change orders or variation orders, to the customer. Statements such as "we got this job wrong, we have to submit at least a 20% change order" are often heard. This phenomenon is more present in certain industrial sectors where the definition of detailed requirements a priori is particularly difficult, even if agile is not applicable because it violates several of the basic characteristics that a project must have to allow its application. The industries where I have observed this phenomenon are energy, pharmaceuticals, and innovative infrastructure, but it is an attitude that, even if not clearly expressed by the contractor's project manager, exists and is pursued in a creeping or naive manner. This attitude poisons the project to the core and is to be avoided for many reasons.

It is evident that, if the client asks for a modification of the scope of supply, or if, as the requirements are clarified with the client, characteristics or functionalities of the final product emerge that were not included in the initial offer, the request for an integration to the project scope is due, and the good project manager must identify it and explain it to the client, supporting it with objective data, allowing the client to evaluate the correctness in the most transparent way possible. The attitude of some project managers to "pass" modifications of the supply scope by giving them for free to the client is not acceptable—the project is not actually managed—because this behaviour, if not kept under control, tends to dis-educate the client and give him or her the impression that everything is due.

On the other hand, the dragon-like attitude of the change orders is evident in the daily requests for budget or time extensions. I have personally witnessed situations in which, faced with a half-day delay in the approval of a project document by the client on a project lasting over two years, a project manager replied that the project would be delayed accordingly: 4 h in a project lasting over 2 years, obviously to the dismay of the client. This attitude, if daily, obviously causes the customer's satisfaction to plummet, and the organization for which the dragon works will probably be taken off the supplier list, or marginalized, by the customer. But even worse, looking at the project, the problem lies in the fact that continuing to blame others causes the project team to stop bringing up problems to avoid being blamed for them (whether true or not), and, by leaving them dormant, the problems will emerge sooner or later anyway, but with a snowball effect, much larger and when they can now only be dealt with in maximum emergency, causing maximum cost and impact on the project.

When I find myself working in such an environment, I work hard to contain the dragon, working with the sponsor and other stakeholders to explain how that behavior causes a serious risk to the project: the project team must feel calm in being able to air the problems and seek the best solutions. It is never true that a change order dragon brings more profit to the organization it works for, because the loss of credibility with the customer and the effort the project team puts into working in a situation of constant conflict between customers and suppliers far outweighs the gains of a few extra percentage points on the project budget. An organization that harbors dragons is short-lived.

2.15 Address Knowledge Transfer for Project Continuity

Often considered by engineers as a frivolity of naïve project managers with little business focus, this issue comes out in full force every time there is a turnover or a new entry in the project team (and you will have experienced it firsthand when the new entry was you). What I always hear is "look at the documentation I've sent you, then we'll talk about it" and then the newcomer faces the project in a long agony which often lasts for months, in

which he or she doesn’t really understand what’s going on because no one explains it to him or her and little is written in the “documentation” about what he or she really needs to understand.

The first major aspect that a project manager has to take into account when dealing with this topic is that **knowledge is characterized by explicit and tacit elements**, and it is impossible to implement an effective knowledge transfer process in the project without addressing both aspects. While the explicit knowledge can be codified, documented and shared with others, the tacit knowledge is often difficult to articulate and share, and it includes experience, beliefs, culture and insights, and the context is essential for being understood.

For the explicit part, it is a good idea for the project manager to go over the knowledge needed for the project and think about where it is written: is there any project plan or document where it is collected? Is there any PM Office procedure? If not, the effort must be made to formalize this knowledge, always with an economic principle: write as little as possible, but write something! It is useful to know who, within the team, is responsible for a certain area (and therefore the repository of a certain knowledge): the project organization chart or a responsibility matrix helps enormously.

For the tacit part, it is necessary to organize mentoring and tutoring sessions between the new entry and those already present, in a more or less structured way: these activities require an investment of time by the resources of the team and the project manager *in primis*, but have the great value of putting the new members of the team in a position to be operational as soon as possible, therefore with a rapid return on investment. A calm working environment where trust reigns is the easiest context in which knowledge sharing can take place.

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3. People: Creating and Managing the Project Team and Stakeholders

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Abstract
This chapter is about people in projects: in addition to the processes and practices (Chapter 2) there is much that is needed for a project manager to be able to lead a project: establishing and governing the project team, and being able to bring stakeholders onboard. In this chapter, I have collected all the relevant attitudes that a project manager must know and apply in any kind of project, with several dig-deep into special practical cases related to my personal experience.

3.1 Build a High-Impact Team

The first act of a newly appointed project manager is to create the project team that will collaborate with him or her in the implementation of the project. The project team may have different characteristics depending on the people involved: **one works with what one has and not with what one would like!** It is obvious that the people you want to involve have the ideal characteristics that the project manager would like at the beginning of the project, but there is no doubt that a good project manager is the one who manages to organize a good team from the best available resources.

The first step for the project manager is to identify the desired profiles and the necessary skills, without setting limits because **the ideal candidate**

does not exist, considering both the necessary technical skills and the behavioral and transversal ones, and trying to have the right level of **redundancy** among the resources so that none is critical and indispensable, that is **avoiding single points of failure**. After this exercise, it is necessary to look for "real" people who can be part of the team. It is very common that it is difficult to find candidates who have all the required skills and, in the case of ad hoc hires, agree to work for a salary that is in line with the budget that has been planned. If we exclude extreme situations in which crucial resources for the project are not available—and this is an upstream planning error—in ordinary situations the project manager can accept more junior resources than ideal, and take charge, directly or with the support of specialists, of their training and growth (I would add that, in my experience, the best project managers take great pleasure in supporting and mentoring junior resources). In creating the project team, the project manager must also keep in mind the principles of **diversity and inclusion**, because, **in the interest of the project**, the multiplicity of points of view is always and for any project an asset because it is a vehicle for innovation in both technical and organizational solutions.

Once the team is assembled, the project manager must determine what the strengths and weaknesses of the team are, identify what weaknesses can be overcome with training, and define the ideal mechanisms for the team members to communicate and interact, taking into account the natural abilities and aptitudes of each individual. The building of a climate of trust between team members must start from the early stages of the project and remain a concern of the project manager throughout the project.

A next, more in-depth step is to share the responsibilities of each person, using for example a responsibility matrix such as RACI or RAM, which identifies the person in charge of each of the activities of the project —the best approach is to associate the responsibility matrix to the activities of the WBS, for example by integrating it in the Gantt diagram. One aspect to be clarified at this stage is the management of the interfaces between the activities and the different actors, and how each person's deliverables are passed on to the next person who must work on the project (e.g., how engineering must pass the documentation to production so that there are no gaps).

Throughout the duration of the project, it is important that the project manager keeps antennae open in order to identify gaps in competences—

perhaps not identified at the outset—and act accordingly, and also to always facilitate the sharing of information and knowledge through collaboration between the members of the project team, to promote team resilience.

3.1.1 Organizational Structures

Organizational structure is the form and type of relationships between the members of the project team and the rest of the stakeholders. The structure may be imposed from above or the project manager may be asked to define it together with the team members. In general, you can choose from the various possible structures presented below and tailor them to the context of your specific project. The structures generally represent roles, functions, or authorities of the team members.

Examples of organizational structures that can improve collaboration between the team members can be:

- Definitions of roles and responsibilities.
- Allocation of resources (internal and/or suppliers) to the project team.
- Subteams responsible for specific tasks or deliverables.
- Regular meetings on a particular topic (e.g., daily stand-up meeting, weekly project review, monthly steering committee, etc.).

The most commonly used types of organizational structures are:

- **Functional**: the project is coordinated by the functional managers, there is no project manager.
- **Projectized**: resources report hierarchically to the project manager.
- **Weak matrix**: the members of the project team, coming from different departments, coordinate democratically, there is no project manager.
- **Balanced matrix**: One of the members of the project team is responsible for coordinating the team, whose members come from different technical departments, for a share of its work.
- **Strong matrix**: the team, made up of technical resources from various departments, is coordinated by a professional project manager who comes from a specific department.
- **Simple**: unstructured situation, normally used for simple projects in small realities, where resources work side by side without specific coordination.
- **Virtual**: resources are scattered and connected in a non-hierarchical network.

- **Hybrid**: sum of multiple types (Figs. 3.1, 3.2, 3.3, 3.4, 3.5, and 3.6).

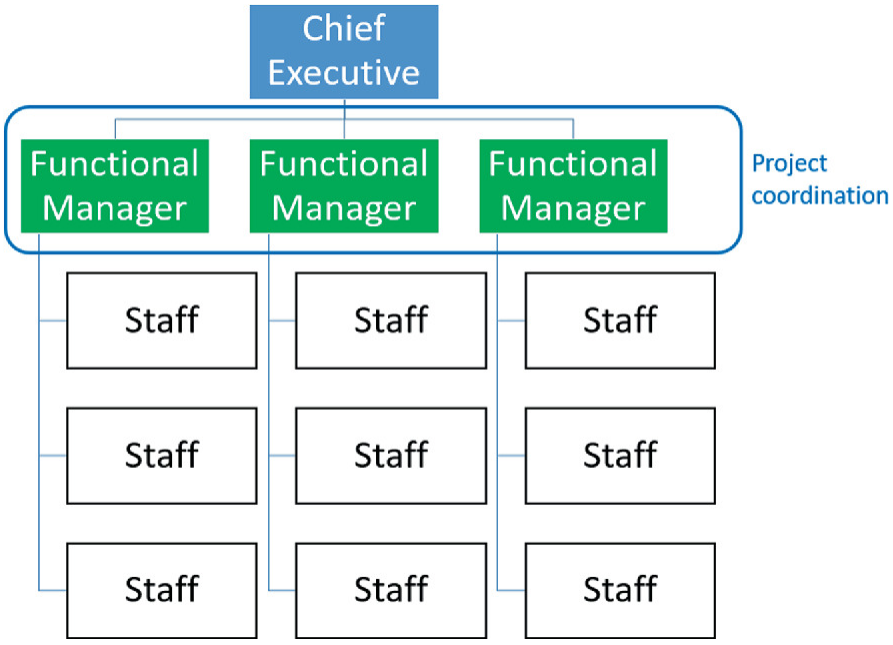

Fig. 3.1 Functional organization

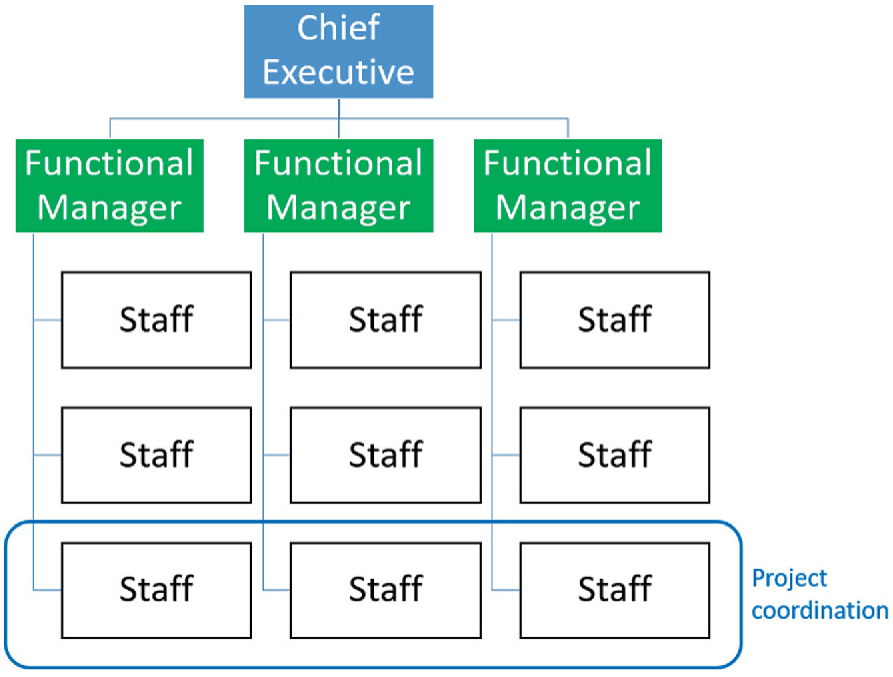

Fig. 3.2 Weak Functional organization

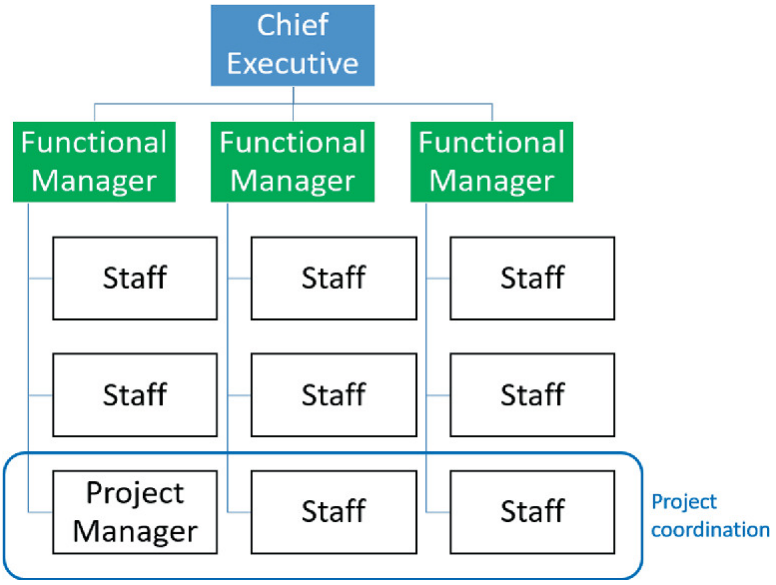

Fig. 3.3 Balanced matrix organization

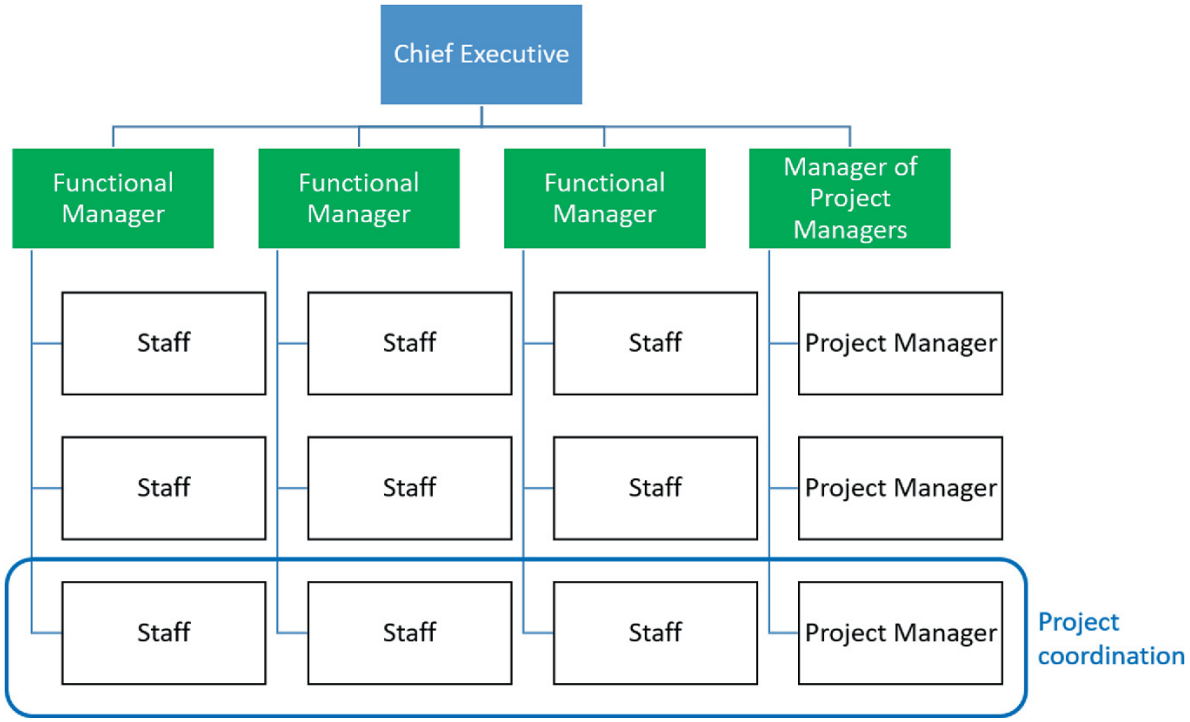

Fig. 3.4 Strong matrix organization

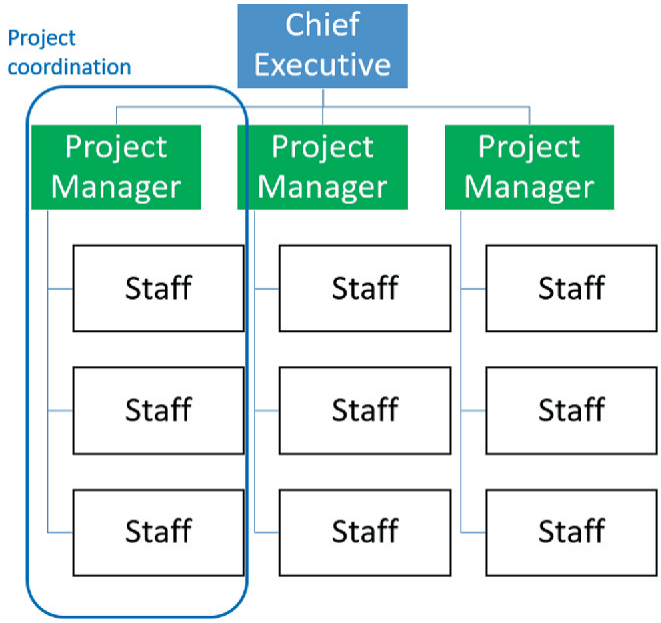

Fig. 3.5 Projectized organization

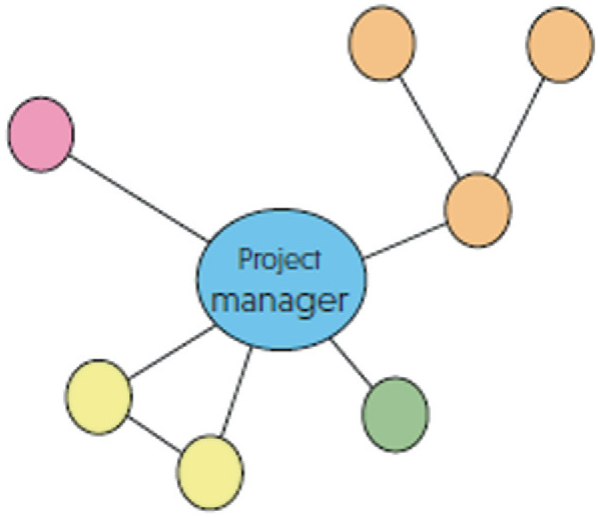

Fig. 3.6 Virtual project organization

A project team can include all or some of the following:

- **Project manager**, responsible for coordinating resources and achieving-project objectives, overseeing the entirety of a project, including budget, risk and stakeholder engagement.
- **Scrum master** helps ensure the team is successful in the delivery of the project work.
- **Team members**: these are the technicians who actually carry out the work.

- **Product Owner**: a function present only in agile work teams, it is a representative of the customer's representative and works closely with the team, participating in the daily activities. He is the owner of the backlog and decides on priorities and acceptance of releases (Fig. 3.7).

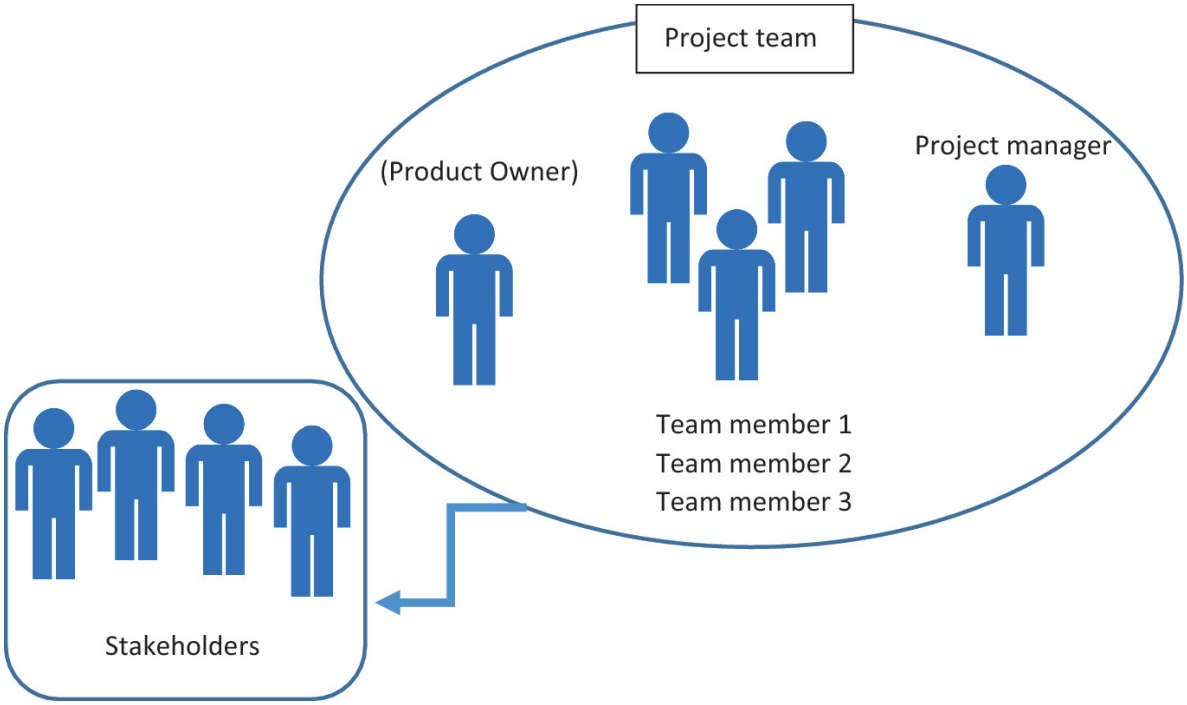

Fig. 3.7 Roles within a project team

Myth: Modern Organizations Must Be Flat!
I am often asked by executives if it is true that today's organizations must be flat and informal, and, as a consequence, talking about the structure to be given to an organization is a waste of time. Obviously, a very hierarchic organization is, in general, not the right answers to today's problems because it would have little resilience. On the other hand, the structure of the organization in place in the project and/or in the organization must be a recurrent topic in the mind of any (project) manager, because the form of the organization determines how communication flows and how stakeholders are able to interact, so it is of crucial importance.

Just saying that today's organizations must be flat, is a way to clear one's conscience when not addressing the problem. In some case a very flat organization can be the right answer, but it must be a careful choice following specific considerations, and it can't be the

definitive solution: other situations, or other projects, or other organizations, will require a non-flat organization, even today.

3.1.2 Responsibility Assignment Matrix (RAM) and RACI

The RAM is the responsibility matrix where you put in the first row at the top the names of the resources on the project, in the first column on the left the project tasks, and in the resulting cells you put an "X" where the row of the task meets the column of the resource responsible for executing it.

RACI is slightly more sophisticated: instead of the "X" we use the 4 letters that stand for "Responsible" (operational), "Accountable" (oversee), "Consult" and "Inform". Although in general RACI is the most recommended version, in my experience it is the "poor" version, i.e. RAM, which is the most effective. RACI is often used by managers who want to clear their conscience and blame others: "we did RACI, but things are not working anyway". RAM, in its simplicity, nails people to their responsibilities so that they cannot blame others for the activities they are in charge of (Table 3.1).

Table 3.1 Example of a RACI matrix

RACI	Sponsor	Project Manager	Product Owner	Team member 1	Team member 2	Team member 3	Team member 4
WP 1							
Activity 1.1	R	C	I				
Activity 1.2	C	A	R	C	C	C	C
WP 2							
Activity 2.1		A	C	R			
Activity 2.2		A	I		R		
Activity 2.3		A	I			R	
WP 3							
Activity 3.1		A	C		I	R	C
Activity 3.2		A	I		I	C	R

Myth: He Has Got an Organizational Mind!

A myth that one encounters in speeches about managers is that there are people with an organizational mind, alluding to the fact that certain individuals would be born with natural gifts that allow them to have the best ideas to manage organizations. Although there are people more oriented to the logical-rational thinking (in general, engineers and other technical profiles belong to this category) and others more suited to creative thinking, it is not true that people exist who are naturally gifted and able to manage teams and organizations. Organizations are complex entities and the methods of managing them can't be just intuited by people—not even the most intelligent—but it is necessary to study and reflect so as not to reinvent the wheel and to not commit the same mistakes already made by others, even by those who are very intelligent and talented.

Myth: With Us Only the Toughest Survive!

I often come across companies that justify their high staff turnover rate by saying that only the tough make it and that, in a sort of natural selection process, the slackers resign.

In reality, these situations are a serious indicator of disorganization and the inability of the company's management to deal with organizational problems. This behavior causes extremely high stress situations in employees (as well as, of course, unhappy customers). Organizational problems must be addressed without preconceived notions. If a group member resigns, he or she should not be seen as a traitor or a wimp, but a careful analysis of what caused it.

It has been calculated that the resignation of an employee costs a company between 20 and 80 k€.

Bad Idea: Are You Doing That?

It is not unusual to see project managers with the attitude of asking project team members to do everything, even and especially the rougher and more difficult tasks vis-à-vis customers, suppliers and other stakeholders, such as communicating a delay, putting their foot down on a situation, taking the minutes (MoM) of a meeting, etc.

This attitude quickly undermines the leadership of the project manager, and fuels the question in the team: “what does he do all day?” Every project has to “shovel guano”, and it is essential that the project manager does it himself or, if it is not possible because he does not have the appropriate skills, is on the front line when it has to be done.

It may help in this case to share a table of allocation of responsibilities with the team, in which the project manager column must contain at least 40 per cent ‘X’s.

Myth: We Must Bite the Bullet!

No project in the entire history of mankind has ever been carried out without facing problems. Even the most experienced project manager knows that a storm is on the horizon, even when it is not visible, and sooner or later it will hit. However, this does not authorize 110% management of the team indefinitely. It is clear that, when unforeseen events occur, the team needs to be available to stay an extra hour, to “work nights”, but this can take place for a limited number of days, and always with a recovery.

I have seen countless projects in which the team was generically urged to “grit their teeth” without a perspective that outlined an end to the critical period and a time for recovery. This attitude causes depression in the team and, in the medium term, generates corporate zombies, undead employees who are extremely stressed, have difficulty making the slightest decision and cannot plan. Besides the fact that these situations are borderline legal in most countries, they are extremely negative for the project performance.

The project manager must be attentive to monitoring the workload of the project team and, even when not the hierarchical leader of the resources, he or she must be proactive in reporting excessive or unbalanced workloads and in seeking support, asking to free up resources within the organization or to hire external consultants or new staff. A possible solution may also be to provide the person with a high workload with the necessary support.

One possible solution could be to provide the person with the very high workload with more efficient working tools. I usually approach these situations by asking the overloaded person what he/she would do if

he/she didn’t have problems with budget and decision-making power, and often the solution I’m presented with is quite easily feasible, especially if compared with the risk that we overload key resource represents for the project. The litmus test might be how serene a resource is about being able to take a day off: if they roll their eyes in anguish and say “I can’t even take half a day” then action needs to be taken. Planning the use of resources with time buffers is a fundamental practice of good management.

Myth: Micro-management

The term “micro-management” is used to describe the attitude of a manager to control in the smallest detail the activities of his team and of the single collaborators. Although in some circles this attitude is praised “because if you don’t check every comma they don’t do anything!”, in reality it is an extremely problematic attitude and does not allow teams to be managed effectively. The micro-manager does not delegate any decision and wants to be consulted even for an expense of a few euros (such as stationery), he or she deals with activities such as calling a supplier to ask for a discount of a few hundred euros when managing a portfolio of projects of many tens or hundreds of millions, and so on. This attitude, in addition to not allowing the micromanager to focus on his specific tasks, destroys the motivation of the teams that feel challenged, thus ceasing to make decisions and waiting for a decision from the boss even for the most trivial things, causing paradoxical bottlenecks and eliminating any capacity for resilience and adaptability of the organization. The (project) managers must focus not on the details, but on the overall vision, identifying and claiming to be able to monitor some characteristic aspects of the project and of their own work, delegating the more specific decisions to the various members of the team, possibly defining quantitative thresholds for decision-making (for example, up to 1,000 euros of expenditure it is not necessary to consult the boss but one can decide autonomously, etc.). The micromanager is often appreciated by small entrepreneurs because they have learned that the attention in avoiding even the smallest waste has allowed their company to save and prosper, but this attitude must be abandoned, once

the company grows, and delegated to the various levels of the structure, otherwise resulting in the chronic dwarfism of the organization.

3.2 Define the Team's Ground Rules

Among the aspects often taken for granted by project managers and teams is that of ground rules. This term refers to the sharing of simple rules—or ground rules—among all members of the team—which, however, if not respected by all, significantly worsen the performance and mood of the team and undermine trust, and which—and I cannot stress this enough—is the key to the smooth management of a project team. In order to be well received and internalized, the rules must not be handed down from above, but shared among all members of the team. The project manager needs to find the right way to explain the importance of having ground rules and that they should be respected by everyone, and to guide the resolution of any conflict that may arise. Once defined, the rules must be communicated with a certain formality (even a meeting minute is fine, up to more advanced tools such as those called **Team Charter**). The project manager will also be the guarantor of these rules for the duration of the project, so he or she will have to find a way to deal with and manage any violations by any member of the team.

I'm referring to rules like:

- You arrive at the meetings a few minutes early so you can get off to a perfect start time.
- If an unforeseen circumstance prevents us from being on time, the meeting organizer should be notified as soon as possible.
- We must always relate to the other members of the team with respect, even when they have different positions from ours. It is forbidden to insult or mock others for their positions.
- When you have a different position than other members of the team, it is necessary to deal with differences in an open and constructive dialogue, and it is forbidden to harbor resentment and talk behind one's back, always preferring a win-win solution to conflicts.
- We avoid any behavior that might undermine the relationship of trust between the members of the team.

- When we disagree and have to give each other negative feedback, we do so in a respectful manner, clarifying the substance of what part of the other position we disagree with and what other parts we agree with, demonstrating our understanding of each other's positions.
- At the meetings we come prepared, having read the documents and information that have been shared with us in preparation, and having gathered the information that is required of us.
- We always avoid bringing problems of a project to a personal level.
- The meetings have an established duration which must be maintained in both the beginning and the conclusion. Each person, when presenting, should do his/her best to stay within a time that allows everyone to express themselves and respect these times.
- The person organizing the meetings is also responsible for writing the meeting minutes—that identify what actions are required of each participant by what date, and monitors that when agreed upon is kept.
- When receiving an invitation to a meeting without understanding what the reason is, the summoned person clarifies with the organizer and, if it is found that participation is indeed not necessary, agrees not to attend.
- The organizer of a meeting may cancel a meeting not later than 24 h before it is scheduled to begin, clarifying the reasons in the cancellation notice.
- We speak one at a time, no side discussions allowed.
- No working on a computer or using a cell phone during meetings.
- The organizer of the meeting is responsible for introducing any new members to the team.
- The various members of the team are referred to by their first names, avoiding the use of the pronouns "she" or "he".
- If you have a problem with someone, talk to them, respectfully, as soon as possible.
- It is forbidden to send emails and talk about business matters outside of the normal course of business hours and weekends, except in cases of extreme urgency.
- Depending on the specific project and the cultural context in which you will be working, specific cultural themes could be introduced, such as:
  - never touch your nose and mouth or blow your nose during meetings or burp,
  - always let the oldest person in the team speak first,

– always refuse food that is offered at least twice, and accept only at the third etc.,
– always ask permission before asking a question,
– always thank after an answer and always respond with “you’re welcome” to every thanks,
– do not force guests to eat or drink local food.

The level of formality with which to express these concepts may differ from case to case, but the mistake is always in taking these rules for granted and, therefore, not addressing the topic. If you feel that some members of the team may react badly to this topic by remarking “but you’re treating us like kindergarten children?!” you can create an alibi of business rules or requirements of some kind, but I recommend addressing this topic. **As the workteam is spread out and includes different (national and/or corporate) cultures, this issue becomes increasingly important**.

3.2.1 Team Charter

It is a document that collects project team values, agreements, general guidelines, and sets clear expectations about acceptable or unacceptable behavior by project team members. It is recommended to be used for very heterogeneous teams, coming from different realities and cultures, and also on projects with mainly virtual teams.

3.3 Build Shared Understanding (Vision) About the Project

It is pretty common during a project execution to find out that the project idea that some in the team have formed is significantly distant and different from the project idea of others, although the project may have worked well in terms of project planning and documentation. This misalignment, which is often dismissed by each party by saying that it is the others who did not understand or did not read the documentation, can create a considerable drop in efficiency in project management due to the different project visions that coexist between team members and, more generally, stakeholders. The approach to deal with this problem can vary from case to case: while in projects of a more traditional nature plenary meetings are used to discuss the various phases of the project and create documents such as the **project**

charter or a shared high-level WBS discussed during a **Kick-off meeting**, in contexts more oriented towards agile methodologies creative methods such as the **Product Vision Box** can be used. In carrying out these activities, the project manager must be careful not to be overly directive, but to let all participants express their point of view, so as to identify all the facets of the project and, not least, to identify in advance all the possible risks to which the project will meet. At the end all project participants should be clear about the direct and indirect objectives of the project.

Myth: The Project Taken Badly
A classic case that can be cited here is that of a project taken "wrongly", i.e. with lower-than-average margins, in order to enter a new market considered strategic and to work with a new and important customer: in this case it must be clear to all those involved in the project that, among the objectives of our organization, in addition to executing the project on time and on budget by delivering the agreed product or service to the customer, there is also the objective of developing relations with the customer and/or creating references for that new market. In these cases, which in my experience are very common in all organizations, often the lack of alignment between the visions of those who started the project and the rest of the team means that projects 'taken wrong' always end up worse than expected, and in the end there is not even the indirect benefit of having acquired a new customer or created a good reference for a new market. Aligning stakeholders on the overall vision and direct and indirect objectives of the project helps organizations to create maximum value from projects.

3.4 Negotiate Project Agreements

> In business as in life you don't get what you want, you get what you negotiate. (Chester L. Karras)

Negotiation of agreements (which may take the form of contracts, orders or otherwise) is a fundamental aspect to manage for the project manager, and that will have an impact—positive or negative—on the whole project. The aim of negotiating is for one party to come closer to the other

one. When agreements are negotiated with clarity for both parties, and without one side trying to prevail over the other imposing situations like “if you want to work with me you have to make this discount and guarantee me these conditions”, the project benefits in a very significant way. Alternatively, when the agreement is based the maximum discount and/or on the imposition of transfer of very high not even quantified risks, the projects start off on the wrong foot, and there will be problems throughout its execution.

A project manager, in the interest of his/her own organization, of the project that he/she is called upon to manage, and of himself, when negotiating—both in the first phases of the project and, possibly, when they have to discuss variations during the development of the project itself—must negotiate with the objective of the maximum mutual understanding between the organization, customers and suppliers, clients and the project team. Lack of clarity has detrimental repercussions on the whole project, and is never a good idea. I know that those who negotiate deals are often pressured by other parts of the business to get the maximum discount or the maximum margin—not that this is a mistake per se—but the project manager must always seek a balance with respect to non-financial objectives and the sustainability of the business in general, which may include aspects of customer satisfaction and retention, the reputation of the organization if certain aspects of the contract are disclosed, the collaboration (partnership) with suppliers, the satisfaction and commitment of the project team.

In order to obtain a climate of trust also towards customers and suppliers or other involved parties, the agreements must be well analyzed in terms of scope, and the maximum effort must be made to leave “grey areas”. It is clear that this issue is easier to deal with in the case of traditional projects and requires a greater effort in the case of projects with agile features, because the uncertainty in the requirements of the final product must be represented in the agreements through a careful management of the risk aspects—while it is very common that, faced with uncertainty of the final solution, generic formulas are used in the contract such as “everything is included and compensated” “the supplier takes charge of whatever activity is necessary to…” which represent the assumption of an unlimited risk by one of the parties, and which can only

lead to discussions, disputes with consequent delays and a drop in the performance of the project in general.

In order to have agreements that are easy to respect and manage, it is very useful to define the level of quality required for the deliverables, and how this will be measured. In some cases of high uncertainty it may be useful to identify subject matter experts within the client and supplier project team who are charged with resolving any technical disputes.

A check that the project manager must absolutely do, if he or she does not negotiate in person but the commercial department or the purchasing office does it for him or her, is whether the agreements—be they contracts, purchase orders or other—include the high-level goals. It seems obvious, but in the various steps, especially in complex projects that require many phases in the negotiation, the various trimmings make people lose sight of some project goals, or open the door to significant risks. Sometimes the focus is on the central phases of the project, neglecting the phases that are considered marginal and of little value, while in the end it is these that cause significant losses of marginality and efficiency of the project.

When getting prepared for a negotiation, one aspect to consider is the negotiation power, that is the capability of one party to force the other party to change behavior in a desired direction. Power is a relative concept, as only if one party perceives itself more dependent to the other, then the other party is likely to perceive more power.

The source of this power can be:

- Information about the other side's preferences, desired price, and/or cultural negotiation practices
- In complex and long negotiations presenting new alternatives/options can revitalize the process and prevents deadlock
- Relationships
- Time availability

Bad Idea: Milestones with Unknown Deliverables

I often have to manage projects where a very large payment is linked to, for example, the completion of the executive design, or the completion of mechanical assembly activities, without specifying which documents or other methods are required to certify the achievement of these results, resulting in discussions between client and supplier during the project

phases. For example, if a payment milestone is related to the completion of certain design activities, it is critical that at a minimum it is mentioned which categories of documents will be subject to approval, and possibly the documents that will be subject to approval should be listed in the agreement or in an annex. If the milestone is to certify the completion of certain mechanical work, for example, it is critical to specify what attestations will be required (including photographs), and what performance levels will be required and how they will be measured and ascertained. It is very healthy for the project that the deliverables linked to each milestone are mentioned in the initial tender or contract between the parties, to limit discussions close to completion and avoid delays in payment.

3.5 Empower Team Members and Stakeholders

Giving the right autonomy to each member of the project team is a practice often missing from many organizations, especially those run by one “Nun” (v.), And this causes a frustrating stop-and-go in the activities of projects because no one is sure that the taking of certain decisions is their responsibility. This attitude dramatically worsens the performance of the project and frustrates both the project team and the rest of the stakeholders. The crux of the matter lies in clarifying what is the perimeter of autonomy of each member, which decisions require a collegial decision, and which rules must be followed when making decisions as a team. This is also the basis for defining the thresholds at which the escalation process is necessary. Anyone who has worked on a project, even the simplest one, knows the discomfort when it is necessary to ask the “boss” for any decision, and the boss is often not easily accessible and has other priorities. The project manager has to work from the beginning to give the right decision-making autonomy to the individual members and the team, and to demand it in turn from the rest of the organization. Autonomy must take into account the skills and experience of the individual, because too high a level of autonomy given to young or inexperienced members of the team may lead to anxiety and stress, while too low a level of autonomy given to a senior resource will normally lead to frustration and, again, stress.

Autonomy should be linked to specific tasks or activities, and include clear thresholds to avoid uncertainty. It should also be made clear in the WBS which team member is responsible for which deliverable or result of the project: this attitude is normally sufficient to motivate the various members and to generate unexpected energy in the team, moreover, it avoids blame-shifting behavior where it seems that the final responsibility always lies with the project manager—or at least when things go wrong.

If well organized, this empowerment of the team facilitates the self-organization of individuals and the team, and relieves the project manager from managing the day-to-day micro-tasks, concentrating on the longer-term perspective of the whole project.

3.6 Train Team Members and Stakeholders as They Need

Phrases such as “It’s the HR dept. who should take care of the training” or “The people working on my project must already be trained”—very common in my experience—represent short-sightedness of the project managers who utter them. In most cases, in fact, the project manager does not have the possibility to choose the members of the project team, but they are assigned according to the resources available in the company at that time and the phrase “you work with what you have” is often pronounced with a sigh of disconsolation. This approach is as wrong as possible: if it is true that the project is a “unique” initiative, all members of the team, including the project manager, will have some gaps to fill, and will therefore need training. As a consequence, it will be the responsibility of the project manager, at the beginning of the project and whenever a new member joins the team, to determine if and which training initiatives are necessary for each member, even if it will not be possible to train every member perfectly because there will always remain a “learning by doing” quota, that can be better covered by mentorship initiatives. In order to do so, it is essential that funds are allocated for training in the project budget, that the training office in your organization is aligned and engaged, and that the timing of the training activities is reasonable. The training needs can be on technical, cultural and behavioral aspects, and can be concentrated at the beginning of the project and/or foreseen in specific phases of the project,

especially for projects of long duration. For example, if a European company is working for the first time with a Japanese client, the whole team should attend a seminar on Japanese culture and doing business in Japan. If it is an internal process improvement project, all participants should have at least a basic knowledge of e.g. lean thinking practices. If we have won a contract with an innovative component, perhaps the project manager him/herself will need to learn more about agile project management techniques if he or she has always managed projects in a traditional context in the past, and the technical manager will need to have an in-depth discussion with an expert in the field where the necessary innovation belongs. The training budget must include funds to pay trainers, to pay for travel, and the hours that team members will spend on training and not working on the project. If one of these aspects is missing, the training aspects of your project will not be effective and specific problems will occur (you should open at least one line in the risk register in this case). Normally it is motivating for a course participant to know that at the end there will be a check of understanding and a personal certificate will be given. In any case, it is necessary to determine a way to measure the effectiveness of the training initiatives undertaken.

3.7 Virtual Teams

Today almost all projects include at least a portion of meetings that take place virtually, so any project manager has to deal with this topic that until not many years ago was marginal or at least specific to a few projects.

The topic is of particular complexity because it involves both technical and cultural aspects. It is always important to evaluate all the alternatives and be sure that the virtual interaction achieves the required effectiveness. When managing a team in virtual mode, the project manager’s effort to avoid losing team members is much greater than in face-to-face interaction: above all, since the tendency for technical reasons is to keep the microphone in “mute” mode unless asked, exchanges are reduced to the bone compared to face-to-face meetings, and therefore it is fundamental that whoever coordinates the meetings is sure that each participant expresses himself/herself adequately and acts with a facilitator’s approach much more than he/she would normally do. The lack of trust, transparency

of information and the presence of conflict between members has an even more disruptive effect in virtual teams than in ordinary ones.

The technical aspects to be considered in this context are:

- the availability of a stable and suitable internet connection for all those participating in the project in virtual mode,
- a workstation and hardware suitable for the purpose, and
- the ability to have or install the necessary software.

Cultural aspects may include:

- geographical location and time zone of the various members;
- cultural approach to the use of the camera;
- ability to use virtual collaboration tools for team activities, such as:
  - brainstorming boards,
  - mind maps,
  - kanban boards,
  - etc.;
- differences in approach to professional ethics:
  - working hours,
  - use of email,
  - differences in the approach to work outside the context of a regular office,
  - punctuality at meetings.

The project manager who manages a virtual team must continually keep his or her antennae straight to assess the effectiveness of the approach, because the risk of losing some team members is always lurking. Coordination in the virtual environment always requires, in my experience, a greater effort – about 50% more than usual—on the part of the project manager, and this must be taken into account in the bidding and training phase of the team.

3.8 Collaborate with Stakeholders

The first step of this project management task includes implementing a stakeholder register, which should be started from the earliest stages of a project, because knowing who to invite to the table is one of the first

thoughts of any sensible project manager, and forgetting someone and then having to contact them after the project is underway always has damaging consequences for the project. Projects that deserve it can also implement a formal Stakeholder Engagement Plan, but even projects that don't implement a formal Stakeholder Engagement Plan do not exempt their project managers from thinking carefully about the issues related to these activities.

Each stakeholder must be identified by name—it is bad practice to write "customer" or "suppliers" in the register—because the project manager must be able to contact them individually if necessary. If the client or suppliers are structured organizations, there will be more than one stakeholder involved in the project, each with different tasks and different communication needs.

Each name should be accompanied by a reflection on the need to be involved (engaged), and at what stage of the project it is best to achieve it, always preferring involvement at an earlier stage of the project to later. Other reflections that are added to the individual stakeholders in the register may include:

- organization he/she belongs to,
- expectations from the project,
- level of influence on project results,
- preferred type of communication,
- current and desired involvement.

Once the stakeholder register is complete the project manager must begin the engagement process, discussing with each stakeholder their expectations of the project and, where and whenever possible, including stakeholder expectations in the project deliverables: having the maximum number of stakeholders supporting the project and trusting the team is more than ever an insurance for project success, and an elixir of life for the project manager.

A mistake that is sometimes made by project managers is to consider stakeholder involvement as a one-off activity, which is done only once at the beginning of the project, like "ah I told them…". Obviously the activity has to be repeated, according to how it makes sense for the project, throughout its duration: think about when you are the stakeholder of a project, which maybe you are not very interested in: you would tend to

forget about the project after a few months, and instead you would see the project manager who periodically informs you about what is happening and collects your comments.

3.9 Lead the Team

Leading the project team is actually the job of the project manager, and would deserve a separate book. In this section I try to provide the basic elements that, according to my experience, a project manager needs to govern a project, and some ideas to deepen according to their needs.

The first step that the project manager must always take when he or she is entrusted with a project and a team to execute it, is to create a shared vision and make it clear to everyone what the purpose—the mission—of the high level project is. This step, which is overlooked by many because it is considered obvious and naïve, in reality I can assure you that it is of great value—both in waterfall and agile context—and helps avoiding the false starts that are very common in projects, especially those with a significant innovative component and uncertainty of requirements. Often it's enough to discuss for a few hours, in the weeks before the start of the project, how the project itself will be approached. Personally, I generally use a few slides in which I discuss the detailed responsibilities of individuals, how we will collaborate and communicate, the tools we will use to communicate and manage the deliverables, and the risks and opportunities.

The ground rules of the project team are often seen as a frivolity which is not worth discussing because "just use common sense". Often the rules of behavior are implicit within one's own organization, but differ from those of the other organizations involved (if the project is purely internal to an organization and involves a few colleagues from the same department it may be that everyone is already implicitly aligned on how to behave, but the project manager is right to think about this anyway). The issue becomes more and more important as other organizations are involved (customers, suppliers, consultants) and as the level of internationality increases.

Aspects that we consider obvious might not be so for others belonging to other cultures, or some ordinary behaviors might be considered offensive and make others feel uncomfortable. Some cultures consider it unnecessary to show up on time to meetings, while for many cultures not arriving a few minutes early is a serious discourtesy and lack of respect towards others.

Small gestures such as touching oneself or blowing one's nose are seen as extremely rude in some parts of the world. Actually each organization has its own corporate culture, which can cause people to behave differently compared to even an organization across the street.

In order to facilitate collaboration in teams with different organizations and cultures involved, it is a good idea for the project manager to address the issue, either directly or indirectly. This is referred to as ground rules, and the artifact that can be implemented here is usually called a team charter (see Chapter 2).

In general, the project manager must ensure that communication is appropriate and effective, and that there is no wasted effort due to misunderstandings, bottlenecks, lack of communication between some members and stakeholders. Personally, this is an issue that I always address in the very early stages of the project, i.e. creating a project environment with quantity and quality of meetings to ensure that information is never lost without being overly redundant. It is also useful for the project manager to have a method of measuring the effectiveness of communication within their team, and question themselves often and throughout the project on this aspect. Here, too, the principles of emotional intelligence can be of great help.

An increasingly topical consideration is to look at the diversity of the team, because having members all with very similar education and culture limits the team's ability to innovate which, as written in many other parts of this book, is a fundamental competence that must be sought in any high performing team. The kind of diversity to be looked at is related, at least, to:

- culture
- experience
- education
- sex
- age

Diversity of views requires all members to be tolerant and respectful of those who have different opinions, and the project manager must be a guarantor of this aspect which, if not managed, can become critical, while, if well managed, can release a lot of value.

Two fundamental artifacts in the initiating phase of an agile project are the "Envision Box" and the "Project/Elevator Statement," which are

intended to create and communicate the team's vision for the product. The development of those artifacts is also an excellent vehicle to amalgamate the team and get the members to start collaborating.

3.9.1 Envision Box

In agile projects, in the initiating (envision) phase, it is recommended to ask the team to develop the "envision box". This is to physically create a box which represents the packaging of the project, with the main face where the project name, logo, and at least three of its main features must be represented. On the rear side complementary information and warnings can be inserted, on the remaining sides there is space for a representation of some particular aspects/functionality of the product.

It is an extremely naïve activity that is often, at first glance, rejected by more orthodox techies and traditional project managers—I admit I've been there too—but if you try to create it you will see that it is actually a very powerful tool that stimulates team self-organization, aligns the overall vision on the project and shapes the team, all in an hour. I'd say it's a pretty good deal!

3.9.2 Project Statement

A description of the project called "Project Statement" is generally provided together with the "Envision Box".

This description is defined through a discussion among the team members in order to communicate a winning and comprehensive idea about the project in the shortest and most concise form possible. The underlying idea is the "elevator statement" which is also used in business: Imagine that you are in an elevator together with a customer/manager and you want to "sell" your idea to him/her in a few seconds during the ride together in the elevator shaft and you have no other chance.

The structure of an "Elevator statement" normally follows a form like:

- For (reference customer)
- Who (description of the need or opportunity)
- The (product name)
- Is a (product category)
- That (key benefits and valid reason for purchase)
- Unlike (primary competitive alternative)
- Our product (description of primary differentiation)

The same structure can be used for the project statement.

3.9.3 Servant Leadership

Acting like a servant leader (the term represents an oxymoron, because it combines the term “leader”—often confused with “boss, “head”—with that of “servant”, which means “service person” or even “slave”) is no longer a choice for a project manager, it is a must. There is a lot of rhetoric around this concept, but if a project manager works to clean up this aura of sanctity that the concept brings with it, I am absolutely sure that he or she will manage his/her projects at their best and will be recognized by the team and the stakeholders as a concrete leader.

Servant leadership refers to the practice of leading a team by putting oneself at its service, to implement agile’s suggestion on team management: “Build projects around motivated individuals, give them the environment and support they need, and trust that they will get the job done.” Servant leadership focuses on understanding and addressing the needs and development of team members to facilitate getting the job done with the best possible performance.

Servant Leader Characteristics are:

- Listen before making decisions or coming to conclusions.
- Help each person in the team grow through work in the project.
- Serving the team members to understand the issues and pave the way for the team.
- Use coaching versus tight control.
- Fostering a working environment where everyone feels safe, respected and trusts each other, and
- Promote everyone’s energy and intelligence.

Servant leaders, unlike more traditional leaders, **facilitate collaboration between team members instead of trying to coordinate and control everything**, trying to bring out the best in everyone by encouraging participation in project decisions, understanding and shared team responsibility for the results achieved.

During the meetings, **a servant leader acts more as a facilitator**, encouraging the exposure of problems and bottlenecks that slow down the work, then leaving the resolution of the issues to the project team. In

general, the servant leader encourages collaboration with interactive meetings, but also informal dialogue and knowledge sharing.

One aspect that I think is very important is that servant leaders should be expected to constantly work to **remove organizational obstacles**, with **a mindset of continuous improvement**, in order to facilitate the work of the team and pave the way. It is very common to find project managers who, suffering from the halo effect, focus on technical issues and consider organizational issues as frivolous: a mindset change that can help project managers and organizations a lot is to understand how much impact organizational issues actually have on poor project performance. As discussed elsewhere in this book, **in the vast majority of cases, project problems do not have a technical root, but an organizational one**. Servant leaders need to identify unnecessary or low-value processes in the organization that cause bottlenecks and prevent agile team management, and work to eliminate them with the team, or project sponsor, or other responsible stakeholders.

In summary, **the servant leader works to generate a context in which it is easier for the team to carry out the project with the least possible effort**, while letting the technical management of the processes and the product be done by the self-managing and self-organizing team.

A paradox to which one may tend is that if a servant leader succeeds at his or her job, succeeds in removing all obstacles, and succeeds in getting teams to be self-organizing and take responsibility, he or she may become useless. You could go towards project management without project managers. However, I believe that project managers can rest assured, at least for the time being: the creation of a project environment in which it is possible to create such an ideal situation is, in my opinion, still a long way off. However, this should not stop us from trying to create it.

Myth: He Thought He Was Agile, but He Was Just Naive

It is very common to find disorganized and confused managers who justify the chaos to which they condemn their employees with their supposed agile approach. They are used to publicly pronounce hyperbole about the importance of flexibility at work and the self-organization that is required of all employees, but then in reality they live only on perennial urgencies and always wait until the last moment to do things, in a total lack of planning. This is not agile, it is just an intermediate

approach between the presumption of the organizational mind (see in this chapter) in that this style, ‘is enough to solve everything ‘ combined with the ‘nun’ (see in this chapter). It is pure naivety. Agile is something else.

3.9.4 Context-Based Leadership

In speeches it’s not uncommon to hear phrases such as “if you want to be a boss and you don’t whip your subordinates, they will sleep in the office and they won’t do anything!” Whoever pronounces sentences of this type does nothing but denounce his or her total managerial unpreparedness: it is enough to pause for a moment and reflect that there cannot be a leadership style that is better than others in all cases, but the (project) manager must know how to calibrate his or her own style according to the context in which he finds him/herself operating.

The totally **prescriptive (directive) style** (what our interlocutor above identifies as “whipping”) is not wrong a priori, because there are contexts in which it is appropriate for the leader to clearly indicate what the members of the team must do without having to give too many explanations—but always respecting the co-workers, without “whipping” them. It is a style that is also appreciated by co-workers when they feel unprepared and insecure, for example at the beginning of a project with a significant innovation component. This is the case when members are at best task-oriented (see Chapter 1). The leader, in this case, has to behave by giving clear directions and few explanations.

If the team members are unprepared but willing to grow, the leader can use a **coaching style**, which consists of giving prescriptions, as in the management style, but which are explained with constant interaction, in order to make the team members grow and possibly become autonomous in the future.

As employees feel more confident, it is possible for the leader to use a leadership style that is usually called “**involvement**” or “**coaching**”, in which he or she does not impose directives but tries to stimulate the ideas and participation of the members in the decision-making process, which remains guided by the leader.

When members are competent and confident, it is possible to completely delegate the responsibility for deciding and executing the work,

providing only broad goals. The **delegation** leadership **style** is the one that, when applicable, guarantees maximum results because team members are normally highly motivated and can express themselves to the fullest.

Try to think: when you work in a team, what leadership style do you expect to be applied to you? If you answer “delegation” you haven’t gotten the message (it was a trap!). Even if it applies to all of us who feel more comfortable in a context where we get delegation from our boss, in reality, when we enter a new project in a field we know little about, we absolutely prefer the leader to be directive with us, because we are unprepared and unsure and are very afraid of making mistakes and causing problems for the team. As we clarify our ideas, gain confidence, and feel more secure, we are happy to gain more autonomy to a delegation context. Delegating in a context in which the co-workers are not ready can create big problems for the project and the team members, who may be under great stress and lose motivation due to mistakes they made because of the little experience they could rely on.

The concepts I have expressed above are borrowed from **situational leadership theory** first published by Paul Hersey and Ken Blanchard in 1969. It is generally represented in a qualitative graph like the one below (Table 3.2).

Table 3.2 The 4 leadership behavior according to situational leadership theory

Leadrship mode	Directing	Coaching	Supporting	Delegating
Decision-making	Project Manager	Project Manager	Project Manager after consulting the team	Collective
Maturity of the team	Not competent or prepared	Not competent but available	Competent but not confident	Capable, available and self confident

Myth: The Nun’s Leadership

I remember with great fondness my kindergarten and elementary school years when I attended a school run by Catholic nuns. I was always quite lively, and the nuns were worried that I would get into trouble, so they made me (not just me, actually) ask permission for whatever I wanted to do. If I wanted to pick up a game, I had to ask permission, likewise for drinking, playing with a friend, even going to the bathroom. I have to say

that, as I grew up, I had great empathy for the nuns who looked after me when I was a child, and I partly understood them.

Many companies and top positions in companies are governed by managers who apply the same leadership style that my nuns used for me and other companions. These are managers who do not grant even the smallest measure of autonomy to their staff, and who demand that they be asked for permission for even the smallest anomaly or expense. I have personally worked with managers who demanded to be consulted for stationery orders of a handful of euros. In the case of the project manager, the heads of the Project/Program Management Offices or, at any rate, the heads of the project managers, apply the nun's leadership when, for example, they do not admit any deviation from the project budget without being consulted or—which is the same—they do not give the project managers the authority to dispose of the project contingencies, even if only under certain conditions.

The leadership style of the nun undermines the trust between the boss and the collaborators, who become demotivated and unaccustomed to thinking, because in the end the decisions are always taken by the nun! The nuns do not make the people who work with them grow in any way. In addition, corporate nuns are incredible organizational bottlenecks, slowing down in a frustrating way any company process and causing activities to proceed in fits and starts waiting for their approval.

These phenomena are more evident than ever in companies because when the nun is absent, or resigns, or retires, these companies immediately collapse, and nobody decides anything.

If you're wondering if there are nuns in your organization, it's easy to answer: they're immediately identified because they have a queue of people outside the door waiting to get approved for a few tens of euros in expenses, and project managers in meetings never get to give direct feedback to the client but always take time to ask.

Bad Idea: Everyone Knows What to Do: Go and Do It!

I have been involved in several projects in which the project sponsor said to the team a kind of: "everyone knows what to do: go and do it!" without any preliminary planning activity. In his/her mind this was a well-intended gesture demonstrating trust in the capabilities of team

members. For the team members to be told that they, ‘know what to do’, the situation creates dense fog, stress and misalignment with other team members. Probably your project sponsor is acting in good faith but doesn’t have adequate preparation on project management.

If you face such a situation as project manager, just thank your project sponsor, and organize a separate planning meeting with team members to plan the project execution properly.

3.9.5 John Maxwell’s 5 Levels of Leadership

John Maxwell presented his paradigm about the five levels of leadership is his book “Developing the Leader Within You” and then expanded it in “The 5 Levels of Leadership”. Figure 3.8 explains briefly the model.

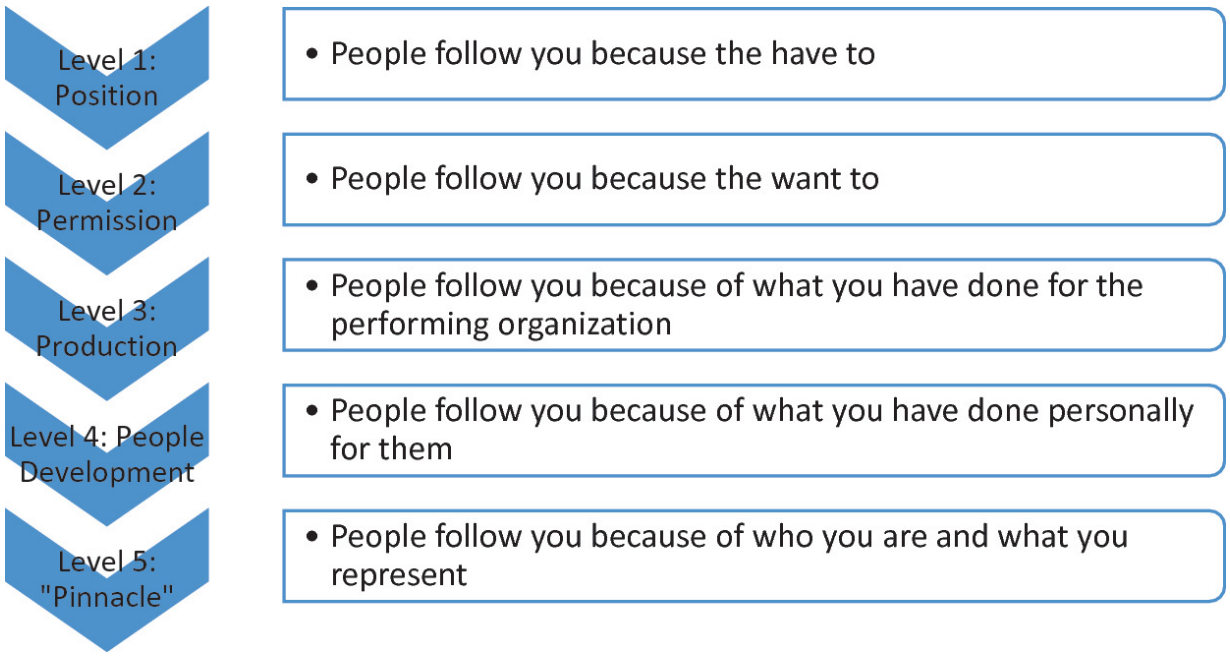

Fig. 3.8 Maxwell’s 5 levels of leadership

3.9.6 Silo Thinking

Silo thinking is the reluctance to share information with colleagues in different departments and divisions of the same organization. This attitude is generally recognized as the cause of serious inefficiency in the organization and, in the most serious cases, of potential collapse.

Attitudes of siloed thinking that hinder organizations:

- Continuous search for a culprit to justify the problems, without ever doing auto analysis.
- Ignoring problems even when they are recurring and blatant, giving them as the cause of someone from another department.
- Continued search for excuses to justify inefficiencies.
- Confusing management in general.
- Reckless decisions not the result of collective analysis.
- Presence of conflicting objectives between the various corporate structures.
- Harmful internal competition.
- In general, watching others fail, doing nothing.
- Absence of helpful, negative or positive feedback.

This kind of attitude is very widespread, and I admit that in the past I have also been its interpreter. In general, project managers are very often victims of it because, in the majority of technocratic companies, the added value that the role of project manager brings is not understood, because his or her job is actually to cut the silos. In this context, the project managers are often used as scapegoats for all the problems of the project, with phrases such as “but where was he/she?”, “but I told him/her”, “but we’ve been talking about it for months, is it possible that he/she didn’t understand it by himself/herself?”. The cure for this attitude is to have great patience and show great personal commitment and understanding of other people’s problems, supporting all team members and other stakeholders, picking up the issues that plague them and solve their problems by “paving the way”. It takes a while but it usually works.

3.9.7 Challenging the Status Quo

It is very common that the corporate culture of the organization where the project manager is working is a very strong constraint on project management. The tendency to repeat established patterns in project delivery —even though these patterns have obvious flaws and continually cause the same problems and frustration for clients, suppliers and the team—are characteristic of many of the organizations in which I have worked. It is very healthy for the project manager to **get into the habit of asking the “why” of practices and behaviors**, especially when they clearly generate risks. I refer, for example, to the following,

- the execution of activities in such a way that no type of progress monitoring is allowed except at the end, such as, for example, design activities that do not subdivide the deliverables or procurement activities with very long lead times that are not divided into intermediate phases,
- the lack of interfaces between the various offices and departments involved in the project activities, a situation of watertight compartments (silos),
- Ineffective or unplanned communication between some of the parties involved,
- the lack of document templates to ascertain the status of project activities (achievement of milestones for example),
- to any recurring problem in the organization which can be easily identified simply by talking to team members, perhaps individually.

The project manager challenges the status quo by asking the various stakeholders why their practices are the way they are and facilitates the generation of innovative methods for the team to develop the project more efficiently and effectively. Among other things, it facilitates the transition from a task-oriented to a result-oriented culture. Also part of this attitude is the application of the practice and mentality of continuous improvement.

3.10 Support the Team Performance

In order to facilitate the members of the project team to do their best in the project it is essential to make sure that they are clear about the attitudes of the organization and the project towards them. The project manager must ensure that this condition is met, even if the organization does not allow the project manager to set objectives for the resources employed in the project —often matrix organizations have the very obvious flaw of allowing only the hierarchical head of a resource to set objectives, while the project manager is commonly not even consulted.

For this purpose, it is important to make an effort to identify KPIs (Key Performance Indicators), which must be numerically and quantitatively expressed in an easily and unambiguously detectable way, in order to be able to monitor the overall progress of the project and the performance of individuals. The beauty of using KPIs is that it gives the possibility to implement dashboards and other visual tools for performance reporting, and this helps team members to compare themselves and their best. Ideally, it

would be possible to implement an MBO (Management by Objectives) system based on these KPIs, i.e. to agree with each team member on a KPI what rewards may be awarded when he or she achieves his or her performance expectations.

It is important that the project manager finds the time to periodically give feedback on progress. When someone in the team does a good job and achieves the expected results, they should always be praised—telling someone “well done” is never a mistake—both in private and on public occasions, taking care to mention the objective achieved in a quantitative and objective manner, so as to limit any jealousy as much as possible. When in doubt, I think it’s always better to say “bravo!” once more than once less. When I’ve had the opportunity to work with great executive managers, I’ve always observed how they were very demanding, but also very complimentary, in private and in public, when their expectations were met. But while giving positive feedback is quite easy, giving negative feedback is much less so. Negative feedback has a fundamental importance for the good performance of a team, because only by addressing problems and disagreements the team members will be able to build the harmony and trust that are the basis for high performance. In many organizations there is a great difficulty in giving negative feedback, and this leads them slowly to decline, because the problems are always the same and amplified, people remain frustrated and flatten on mediocre performance.

In general, it is recommended that the project manager works to maintain a positive attitude, because this can have a huge impact on the project team’s commitment and availability, and positivity is contagious. Maintaining a positive thinking requires effort, above all in difficult project phases. Expressing gratitude is another generator of positive mood in the project. Using irony, when possible, contributes to spread positivity in the project team.

3.10.1 SMART Objectives

Of all the acronyms that come to us from the management manuals—and which are often devoid of concrete value—SMART is one of those that I would certainly save, because it actually represents a very useful track, when defining a goal, to make it effective. The acronym refers to the following words (other terms of reference can also be found in the literature, these are the ones I prefer):

- **Specific**, that is, it’s clear when achieved.
- **Measurable**: there has to be some kind of metric, even if it’s just based on intermediate milestones.
- **Attainable**, achievable—even if challenging.
- **Relevant**—and not trivial.
- **Time bound**—having a certain deadline.

An example of a famous SMART goal was J.F. Kennedy’s speech in 1961 when he said that a man would be sent to the moon and would return alive by the end of the decade.

Also in the description of the project objectives, starting with the project charter, is It is essential to think in a SMART way (Table 3.3).

Table 3.3 Examples of non-SMART VS SMART goals

Non-SMART goal	SMART goal
Being in a good physical shape for the summer	Weight 75 kilos by the end of June
Get a salary increase	Get a 200€ salary increase by next 6 months
Learn English	Passing a C1 English exam by the end of the year
Becoming an author	Publish a book by the end of next year

3.10.2 Team Dynamics with Tuckman’s Model

Bruce Tuckman published his model of team dynamics in 1977. The model originally consisted of four stages to which two more final stages were added:

1. **forming** (constitution period)

2. **storming** (conflict period)

3. **norming** (regulatory period)

4. **performing** (period of performance)

5. **adjourning/mourning** (period of suspension/”death” of the team)

Like all models, they serve as an ideal reference point that can be used to interpret and correct certain behaviors that occur. I can guarantee from

my experience that, while at first glance it seems excessively rational to represent everything that actually happens to the team during the project, in reality it helps a lot in the interpretation of certain dynamics as they occur, and gives excellent hints for their resolution. Project managers need to be aware of the possibility of the team slipping back from one phase to the previous, for example from the performing to the storming phase if the work is subject to major changes. Changes from one phase to the next are the most critical moments when special attention is required by the project manager to guide the team's transition (Fig. 3.9).

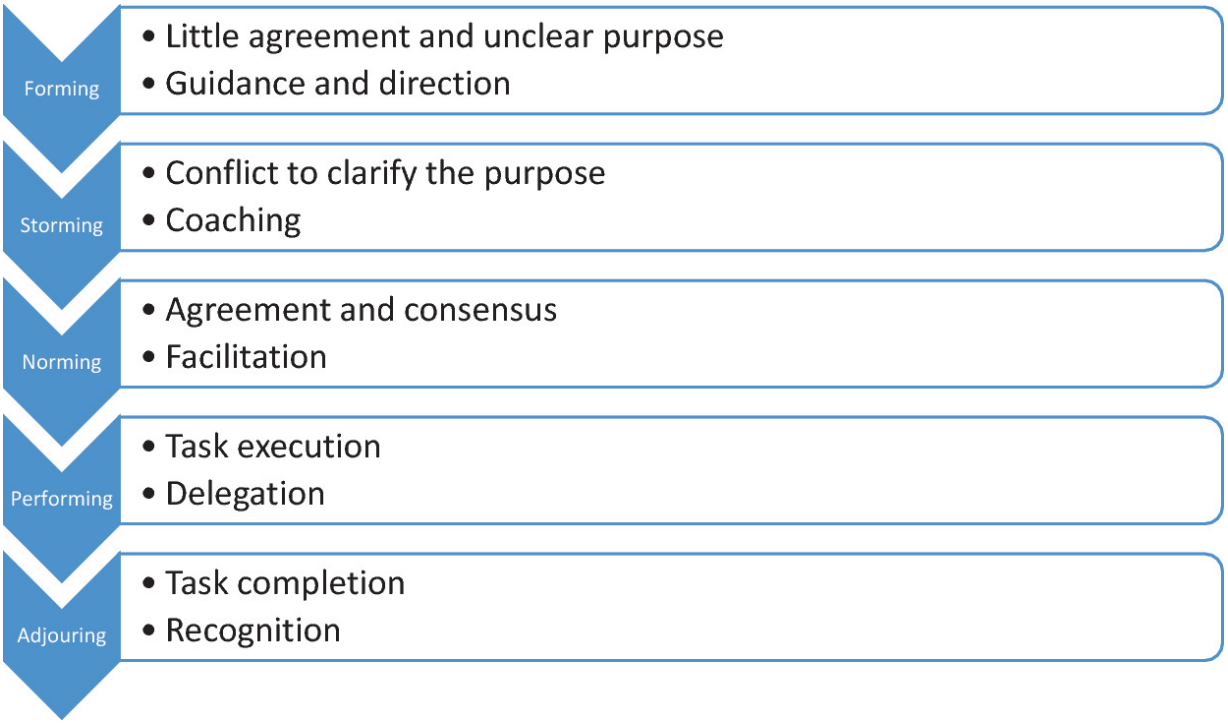

Fig. 3.9 The Tuckman model of team development

3.10.3 DESC Method

The "DESC" method was devised by Sharon Anthony Bower and published in 1976 in Asserting Yourself, and is a process for building an argument with an interlocutor who is difficult because they may be offended or because they may not recognize our authority as a project manager appropriately.

DESC stands for:

- **Describe**,
- **Express**,

- **Specify**, and
- **Consequences**.

The method consists of construct arguments following the outline below:

1. Describe the situation as precisely and objectively as possible.

2. Diplomatically express your feeling about the situation.

3. Specify a possible solution in order to reach an agreement with the other person.

4. Represent the Consequences, both positive and negative, if no agreement is reached.

Example:

D. When I was presenting my work in the meeting, you interrupted me often.

E. This made it difficult to give a clear and full explanation to the rest of the participants.

S. If it's ok with you could you give me your comments at the end next time.

C. This will make the meeting shorter and be more effective.

3.11 Manage Conflict

Conflict management is a skill that every project manager must cultivate and use often during project execution. Conflicts—or differences of opinion—can arise within the team, among stakeholders, and with clients or suppliers. In any case, when the project manager realizes that there is a conflict, and therefore a reason for tension, between some members of the project, he or she must act immediately to find a solution, because conflicts spread like wildfire and, sooner or later, become critical for the whole project. **Differences of opinion, on the other hand, are necessary moments within projects, because they are the basis for innovation**.

When a project manager is called upon to be the arbiter of a discussion, he or she must focus on the specific issue and not be influenced by the

people who are involved—"**don't make it personal!**". He or she should try to identify the core issue at the root of the disagreement, understand the context in which the issue is occurring, and assess the situation from both the rational and emotional perspectives of the people involved. In a preliminary phase it is advisable to listen to the positions, even individually if it is necessary, making use of active listening (see Chapter 2). Once sufficient data has been collected, it is necessary to guide the discussion, usually based on the conflict resolution model (see Chapter 2).

3.11.1 Active Listening

When you are listening to someone and you want to enable them to say whatever they want to say, you should follow a few rules that facilitate this process We refer to these rules as "active listening".

- **Remain silent**: Some people constantly interrupt people when they are talking, but this does not help others to express themselves.
- **Smile** and generally maintain a positive facial expression.
- Maintain **eye contact**, make eye contact with the person talking to us.
- **Nod** to imply that we are interested and understand what is being communicated.
- Make **opening body movements** (avoid crossed arms or crossed legs).
- **Take notes** in a notebook.

In this way those who talk to us are spurred to share as much of their feelings as possible, and allows us to have as complete an understanding as possible. Trying is believing!

3.11.2 Conflict Resolution Model

The tree below represents the options you have when dealing with a conflict.

- **Avoidance**: this is the first option, and it's also the easiest, which is to ignore what's happening. "I won't do anything, it will solve itself anyway". Anyone who has even a little experience knows that it is almost impossible for an ignored problem to resolve itself, so my advice is always avoid to avoid (Fig. 3.10).

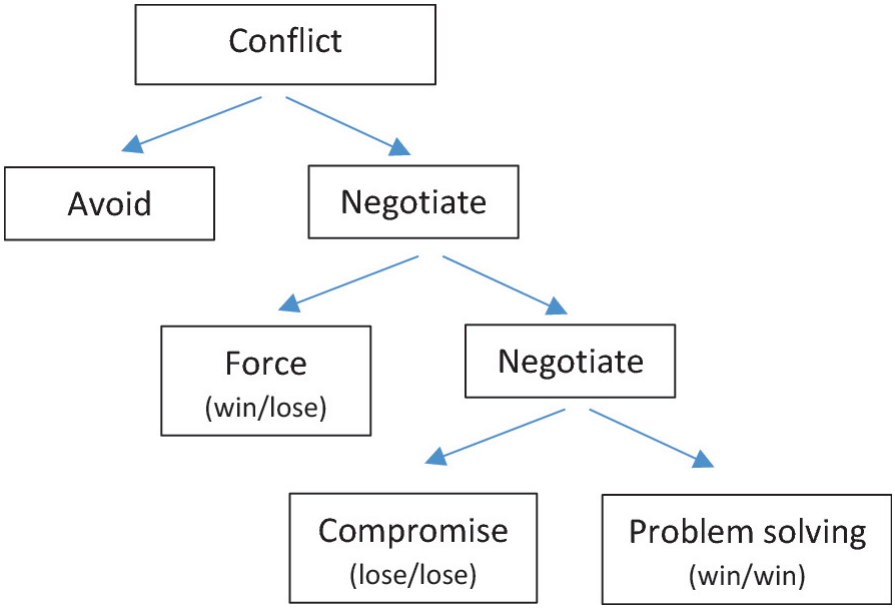

Fig. 3.10 Conflict management

- **Forcing** the solution: If one of the two has a higher authority than the other party (he/she is the boss or has a higher grade within the organization) he/she may consider using this option, which is of the type "it is done this way because I say so!". The advantage is that the conflict can be resolved quickly. On the other hand, the person who is prevailed will probably be very unmotivated in the next phases of the project. This option, which is characterized as. "**win-lose**" because one party wins while the other loses, should therefore only be considered when the time for the solution of the conflict is very tight and there is really no room for discussion.
- **Compromise**: this is probably the worst option, denoted by "**lose-lose**", because it represents a scenario in which both parties give up something of their vision, so that in the end nobody is really satisfied. It's as if one party wants to make the object white and the other party wants to make it black, and in the end you make it gray so that no one is displeased, even though no one actually thinks gray is the right color for the object. This option is usually practiced when there is no one in a position to force (none of the disputants has the necessary authority) and there is not much time to discuss and investigate.
- Finding an **agreement**: this is the best option, denoted as "**win-win**", in which the two contenders find a solution that satisfies both. The new solution can be the original solution of one or the other, or an entirely

new and different solution from the original one from the start. This type of scenario requires in-depth discussion between the parties, who need to understand the reasons behind each other's positions. Once the reasons are understood, it is easier to find solutions that are reasonably acceptable to both. This option, which achieves maximum involvement, however, requires some time and commitment to be pursued. In my opinion, there is almost always time (actually, not that much time is needed), but one of the other options is preferred out of laziness. An effective project manager always seeks agreement first, and is recognized as an effective "judge" by all team members and stakeholders in general.

3.12 Mentor Relevant Stakeholders

The project manager is often in a position to mentor team members and other stakeholders. Mentoring generally consists of assigning an experienced colleague alongside a less experienced, perhaps young or newly hired colleague. In the case of project management what happens is that the project manager is expected to mentor the less experienced colleagues and to support the most relevant stakeholders for the success of the project. This can be done with younger team members who are considered to have high potential, but also with older team members who may have solid technical experience with respect to the scope of the project, but are not experts in managing their technical skills within a project environment.

Mentoring is something that all recognized and effective project managers do carefully, because it significantly benefits the project, and improves and reinforces the team's trust in the project manager. To do this properly, it is necessary to recognize that **it takes time and effort**, so the project manager must allocate time and energy to it. This activity can be carried out both formally—in some cases a "training and mentoring plan" can even be drafted—but also informally (and in my experience this is the most frequent and effective way). A tip when acting as a mentor is not to seem like a "schoolteacher" who wants to teach a lesson that he or she has read in a book and of which he or she has not understood much: I think we have all come across a supposedly clumsy mentor who has had the sole result of convincing us of the opposite of what he was preaching.

Even for training, coaching and mentoring activities, it is advisable to establish a set of guidelines, goals and give yourself ways to check if you are getting the expected results.

Myth: The Learning Paramecium
The paramecium is a genus of microscopic and single-celled protozoan. It feeds by osmosis, that is letting its food near it pass through its membrane, just for contact. In my metaphor, you can identify a paramecium in your organization when you deal with colleagues that likes putting on their desk, in plain sight, a brand new and untouched book (for example the PMBOK or a Harvard Business Review Handbook), trying to make you believe that they read it and that book exactly supports their vision of the business. They are like the paramecium because they assume that the knowledge contained in those books can pass into their mind by osmosis, just because of their proximity, without neither opening nor reading those books.

I have worked many times with colleagues totally uneducated on project management, but unwilling to participate in any project management class, content to show me their untouched copy of the PMBOK on their desk.

When you face a paramecium you have to demonstrate **to** him or her that you know the topic very well (because you actually read those books or others on the same topic) and you must be ready to rebut in specific. In this way, maybe he or she will agree to participate **in** some class on the topic in the **near** future, or they will accept to be, formally or informally, mentored by you. A very bad idea is to give a book as a present to the paramecium, because he or she won't read it but they will claim that that **the** book supports his or her vision.

The corollary to this is that, as good project manager, you must always be updated on new trends in the profession, reading books and papers.

3.13 Promote Team Performance Through the Application of Emotional Intelligence

Emotional intelligence is referred to as **an individual's ability to recognize, categorize, and manage his or her own and others' emotions to better direct his or her actions and behavior**. It is based on a model presented in 1990 by Peter Salovey and John Mayer.

Emotional intelligence is a very broad topic, very in-style, and having a lot of books, both scientific and popular, presenting it. The concepts it expresses are of fundamental importance. **The rational paradigm, which excludes emotional aspects from the management of organizations, is clearly not effective**.

I won't deny, however, that I'm often uncomfortable when I come across consultants who advocate emotional intelligence as the panacea for any business problem, a sort of naïve one-sided love in which the centrality is in feelings, and the technical and hard aspects are a marginal concern of foolish and emotionally sterile managers. This is not my vision of the world, but then, again, I am an engineer. Hard and technical skills are the foundation of any profession. Soft skills are, as mentioned in other parts of the book, equally important as hard skills, but we must not make the mistake of thinking that the managers of the new millennium should be focused only on relational skills, because we risk creating monsters who do not really know how to fulfill their roles, with harmful consequences on the performance of organizations and the quality of life of those who work in them. Having made this premise in which I clarified (quite harshly, I realize) my position, let's try to understand together why emotional intelligence is actually a critical factor for the success of any project manager's action.

Knowing how to recognize the profiles of one's collaborators and the way they use emotional aspects to interact, allows, referring to the model of emotional intelligence, to observe expected behaviors and, therefore, to be able to act consciously to manage them.

In general, **emotional intelligence is based on 5 dimensions of personality**, called the "Big Five personality traits", namely:

1. outgoing, i.e. a predilection for curiosity, creativity and novelty,

2. conscientiousness, related to self-discipline and achievement of the objectives,

3. extraversion, linked to sociability and talkativeness,

4. agreeableness, which is typical of affable and friendly people,

5. neuroticism, linked to low self-confidence, the manifestation of negative emotions, anxiety and poor stress management.

There are several empirical methods for measuring personality traits in each. Identifying personality traits helps to interpret what happens and can happen in the behaviors and interactions between stakeholders, and thus the project manager can decide the best way of working and communicating based on the personality traits of the team members.

Many publications can be found on this subject, linking the Big Five to certain behaviors, from decision making to propensity to crime. Everyone can apply them according to their own interests and types of teams they manage. The Big Five, once detected among team members, allow the project manager to identify the most appropriate motivational levers to allow each person to express him/herself.

3.13.1 Maslow's Pyramid of Needs

A classic theory is the one proposed by the psychologist Abraham Maslow in 1954: it is a motivational model based on a "hierarchy of needs", represented by five levels arranged hierarchically, from the base to the top of a pyramid, assuming that the satisfaction of the most basic needs is the condition for the emergence of subsequent needs.

At the base of the pyramid there are the needs essential for survival, while going upwards there are the more immaterial needs.

1. **Physiological needs** are at the base of Maslow's pyramid. These include: food, water, shelter, etc. They are needs connected to physical survival. These needs are connected to the physical survival of each of us, and are, according to Maslow, the first to be satisfied because they are based on the instinct of self-preservation innate in each of us (Fig. 3.11);

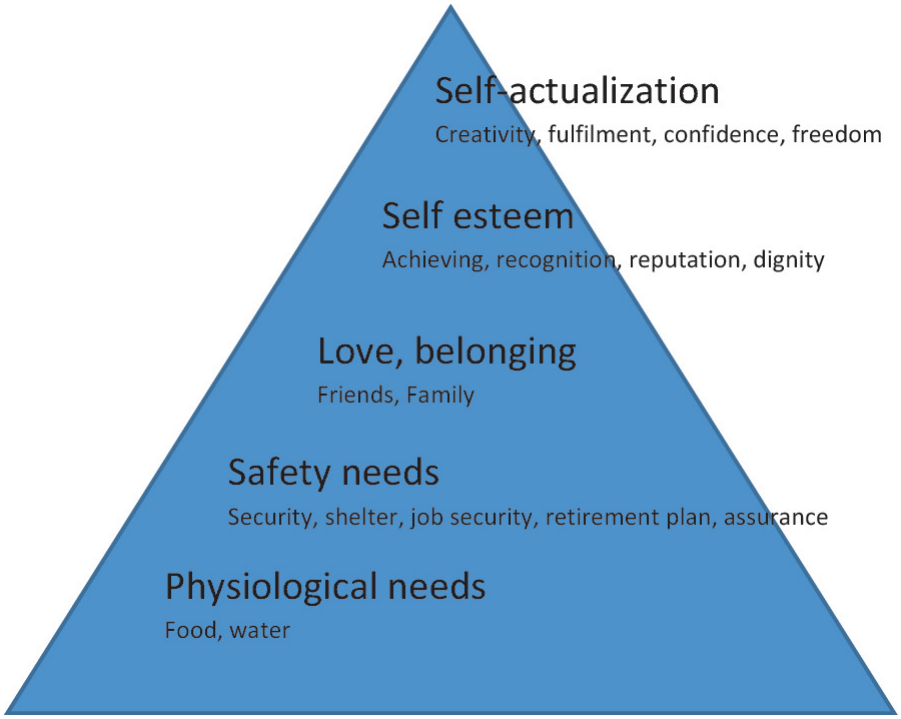

Fig. 3.11 Maslow's Pyramid of needs

2. **Security** needs are at the second level of the pyramid, and include the needs for protection, tranquility, security for the future, minimization of anxiety and worry, etc. They aim to give each person protection and tranquility; they aim to give each person peace of mind.

3. the need to **belong**, i.e. to be loved and cherished, to be part of a team, to cooperate and participate in the life of a social team, etc. This category represents the need that everyone has to be an element of a community. This category represents the need everyone has to be a part of a community;

4. the need for **esteem**, i.e. to be a valued, respected, approved and known individual in one's own community, linked to the need to be competent and productive;

5. The needs of **self-realization** are based on the ambition to create one's own identity according to what we identify with our expectations and potentials, to occupy a social role we consider adequate, etc. It is the aspiration of each person to achieve what ambitions we have by exploiting all our mental and physical potentials.

Like other models, it is not a truth of nature, but it is a reference point that everyone can use when motivating an employee. For example, when I offer an intern a job with a bombastic name I am acting on the last two levels, when perhaps, given the low salary I am awarding, he or she has problems on the lower levels. In the same way, when I continue to offer salary increases to a collaborator, I will realize that at a certain point they will no longer be as effective as they were at the beginning, precisely because I may have saturated the needs of the lower levels, and I will do well to think about strategies that develop the higher levels of the pyramid.

3.13.2 Theory X, Theory Y and Theory Z

Theory X and Theory Y are two famous models developed by Douglas McGregor of MIT Sloan published in 1960. They represent a spectrum of employee motivation and corresponding management styles. Other authors later extended the model with theory Z. The application of one theory does not preclude the possibility of the coexistence of the others.

- **Theory X**. The X-side of the model assumes that **individuals work for the sole purpose of earning the resulting income**. They are not ambitious or goal-oriented, and they tend to have difficulty completing complex tasks. To motivate individuals behaving according to theory X it is necessary to have a very practical and top-down approach (top-down decisions). It is a style of management that characterizes production environments or, in any case, environments with high labor intensity, with very structured and stratified hierarchies.
- **Theory Y**. The Y-side of the model assumes that **individuals spontaneously tend to assume responsibility, an attitude of loyalty and commitment, and naturally tend to do a good job**. The management style recommended here is closer to coaching, in which the manager encourages creativity and debate. This style is mostly used in creative environments and with highly skilled workers.
- **Z Theory**. It was later developed with the contribution of A.Maslow and W.Ouchi. According to this model **individuals are motivated to work for self-realization, by values and a higher calling**. The optimal management style in this case focuses on motivating employees by creating a workplace where they feel comfortable and where they would like to work all their lives, and where the focus is on the welfare of

employees and their families. This management style seeks to promote high productivity, morale and satisfaction.

3.13.3 Herzberg's Hygiene Theory

In the late 1950s, Frederick Herzberg performed a study on motivation factors at work. According to him, motivating factors (also referred as job satisfiers) are primarily intrinsic job elements that lead workers to satisfaction, and hygiene factors (also referred as job dissatisfiers) are extrinsic elements of the work environment. Table 3.4 list both categories.

Table 3.4 Herzberg's motivating and hygiene factors

Motivating Factors	Hygiene Factors
Achievement	Company policies
Recognition	Supervision
The Work itself	Work conditions
Responsibility	Relationship with colleagues
Advancement	Salary and benefits
Growth	Salary
	Status
	Security

The very important finding of Herzberg's studies it the fact that **the opposite of satisfaction is not dissatisfaction**. According to him, proper management of hygiene factors can prevent employee dissatisfaction, but they could not serve as a source of satisfaction or motivation. For example, good working conditions can keep employees at a job, but won't make them work harder. On the other hand, bad working conditions (dissatisfier) can cause employees resignation.

3.13.4 McClelland Needs Theory

David McClelland was an American Psychologist who developed his theory of needs in the 1960s. This theory assume that all of us possess three basic needs regardless of one's age, sex, race, or culture. These needs are:

- need for achievement,
- need for affiliation, and
- need for power

For all of us, one of these needs is our dominant motivating driver. Another important assumption in this theory is that these motivators are learned, and consequently largely dependent on our culture and life experiences.

In Table 3.5 the characteristics of people according to their dominant motivators are listed. This can help you to identify the dominant motivators of people on your team in order to set their goals accordingly, and in general to motivate them in the best way.

Table 3.5 Characteristics of people according to McClelland's Needs Theory dominant motivator factor (from: McClelland's Human Motivation Theory—Savage, 2016)

Dominant Motivator	Characteristics
Need for achievement	• Has a strong need to set and accomplish challenging goals • Takes calculated risks to accomplish their goals • Likes to receive regular feedback on their progress and achievements • Often likes to work alone
Need for affiliation	• Wants to belong to the group • Wants to be liked, and will often go along with whatever the rest of the group wants to do • Favors collaboration over competition • Doesn't like high risk or uncertainty
Need for power	• Wants to control and influence others • Likes to win arguments • Enjoys competition and winning

3.13.5 The Concept of Time: Kronos and Kairos

The ancient Greeks had two different words for what we simply call time. The one that most closely resembles our idea of time is K*ronos*, the time that passes inexorably and consumes us (in the myth, the god *Kronos* devours his own children), it is an undifferentiated continuum that flows despite ourselves. In this perspective, time is that of the Gantt chart, and project management is reduced to planning and control. Then there was *Kairòs*, which represents the dimension of time lived subjectively, of experience, and is linked to the concept of opportune time, coincidence, auspicious moment. While in the *Kronos* all the instants are identical, in *Kairos* each instant is unique and is perceived as such. The *Kairos* is always

associated with the archer who waits for the most opportune moment to shoot his arrow, and I think it gives the idea: if a good project manager has to plan over the entire project duration based on *Kronos*, he or she must also know that there is always a more opportune—or less inopportune—moment for any project activity, and he must always be alert, during the project execution phases, in being able to see when the most opportune moment is, for example, for a certain critical meeting, or for the execution of a certain particularly delicate task, like the archer who, with his bow outstretched, waits for the right moment to shoot his arrow.

3.13.6 The Eisenhower Urgent/Important Matrix

In 1954, the former U.S. President Dwight D. Eisenhower, during a conference, expressed the way he organized his everyday work: “I have two kinds of problems: the urgent and the important. The urgent are not important, and the important are never urgent”. This is called the **Eisenhower principle**. According to this principle, in order to minimize the stress of having too many tight deadlines, and to improve our effectiveness and efficiency, we need distinguish between:

- **Important** activities, the ones leadings us to achieve our long term goals
- **Urgent** activities, the ones requiring immediate attention and usually associated with achieving someone else’s goals.

As urgent activities have immediate consequences, it is very common that people concentrate on them and keep important activities in a lower position in their personal backlog. This is a capital mistake causing one never to achieve important goals, and being very alike to the hamster (see Chapter 1). The solution recommended, based on the Heisenhower principle, it to focus on Urgent/Important activities, then to Important-Non Urgent ones, etc. The picture below should help.

This principle is considered as the basis for effective **self-management**. It is very important that the project manager follows this principle and helps the other members of the project team to do the same, in order to focus the effort and avoid high levels of stress (Table 3.6).

Table 3.6 The Eisenhower Urgent/Important Matrix

	Urgent	**Non Urgent**
Important	Do it	Schedule it

	Urgent	Non Urgent
	Activities with clear deadline and relevant consequence if not immediately addressed Examples: • Delivery a customer project • Submitting a paper • Providing directions to you colleagues or suppliers	Activities without a set deadline but very relevant for your goals Examples: • Strategy development • Training • Networking
Non Important	Delegate it Things that need to be done and have a clear deadline, but don't require specifically your skills Examples: • Scheduling • Reporting • Responding to emails	Delete it Distraction that don't let you feel ok afterwards Examples: • Social media • Watching TV • Not value added meetings

3.13.7 Assessment of Resources

A manager's duty is as much to acquire new resources when they are needed as it is to release them when they are no longer needed. This phrase, which is often found shocking when heard for the first time, is actually a great truth that distinguishes mature managers from those who manage the team with a clumsy goodness that often hides cowardice and laziness in dealing with problems, and puts the whole team at risk. I am not advocating a pure utilitarianism whereby every resource should be used as long as they are is needed and dismissed a minute after they have finished their task: this would be a wrong organizational approach that would find its origin in the poor planning of resources and, ultimately, of the (project) manager. I am referring instead to those people who are negative for the project and the organization (see "assholes" in this chapter), people who get in the way for their own reasons, who criticize indiscriminately without giving clear reasons, and who make the whole team uncomfortable. Those people must be expelled from the team as soon as possible, using all the (legal) methods that are available.

A heuristic approach is to classify people in your team into 4 categories A, B, C, D, where:

- A are talents you expect to grow significantly in the near future and to become pillars of your organization in the future
- B is the troop, the most of your team members you rely on to carry out the work
- C are difficult people under observation, needing coaching to go on B, or at risk to go on D
- D are people you are sure they have a negative effect on your team, and you must be looking for release

In general, the majority of team members are in category B, and it is always recommended to populate all 4 categories. All your effort must be dedicated to let talent stay and grow, and B to stay. When you have some Ds, it is your duty to look for opportunities to get rid of him or her.

3.13.8 The Assholes

In the vast majority of texts on human resource management there is a fundamental part missing that those who have experience in working in companies know well: the management of "assholes", i.e. those **colleagues and collaborators who do not show a rational and collaborative behavior, and use the organization to prevaricate and bully others**. This issue was addressed in a masterly way by Professor Robert Sutton of Stanford University in his book "The No Asshole Rule" [Sutton, 2020], which I recommend reading. Sutton uses the term "asshole", because in his opinion using sweetened terms and periphrases would not help to address the issue:

> Researchers (...) define what we call assholery as "**the prolonged display of hostile behaviors of a verbal or non-verbal nature, to the exclusion of physical contact**". It's a useful definition, but it doesn't explain in enough detail what assholes do.

According to Sutton, we can realize that we are dealing with an asshole if, when dealing with this person, feel constantly uncomfortable because we feel that we are not irreparably adequate to the context, and we see no way to improve. This feeling, when experienced, is never true—there is no context to which a human being cannot make himself/herself adequate if he or she makes an effort—but is generated by an asshole. I have been fortunate enough to work with people of superior intelligence, brilliant

minds for whom I have a very strong admiration, and I don't think my work will ever be as good as theirs, but I can assure you that they have always been the first to encourage me to continue my activities by suggesting how I could improve my current research: when I talk to one of these people, in the end, I always feel a great pride and not, as I might expect, a sense of frustration. The sense of discomfort and inadequacy is not caused by the fact that the person we are interacting with is smarter or in some sense superior to us, but by the fact that this person is, in all likelihood, an asshole. It's probably happened to all of us to act like assholes in some circumstance, but, according to Sutton, we can only consider as genuine assholes those who act like assholes constantly, and enjoy mistreating and making their colleagues feel uncomfortable. To dispel a myth that is often heard in companies, that "the guy is an asshole but gets results", Sutton analyzes the costs that an asshole causes to the company he works for, ranging from employee resignations, to company litigation and civil lawsuits that the company is subjected to, to behavior management training and coaching, and determines that it is never a business case for an organization to employ an asshole. Sutton's final assumption—which I fully endorse and recommend everyone to adhere to—which in the original text is the "no-asshole rule", is to never hire assholes and, if you do find them, to encapsulate them in roles where they can't do more damage and, as soon as possible, to get rid of them.

Myth: The Leviathan

Leviathan is a mythological sea monster of invincible strength that, when it decides to come out of the waters where it normally lives placidly, reduces everything it comes into contact with to a state of primordial chaos, and there is no way to oppose it.

Companies that have a certain history (at least 20 years of history behind them) often have a leviathan inside them. In my experience, the leviathan is difficult to identify for those entering an organization for the first time, because it is usually one of the founders of the company or a long-time senior manager who likes to say how the company is open to innovation and works by objectives. When a recently joined project manager begins to manage a project according to modern standards, stimulating trust among stakeholders through ethics and transparency, and facilitating innovation in the team, the Leviathan usually suffers in

silence for a few weeks (in my experience the record was 6 weeks), after which, taking a project problem as a pretext, he calls a plenary meeting and imposes old-school management methods, which usually include nebulous reporting to the client, a few traps set for the client to milk, gratuitous abuse based on strictly contractual management. Usually the Leviathan justifies the total lack of ethics of the company in what he does with the necessity of the company to prosper or, in difficult times, not to close down. He often quotes the fact that in the past, when the company developed, it was done so (and stories follow).

I won't hide the fact that the leviathan is a big problem for the companies, because it prevents any organizational innovation. My interpretation is that, having been successful in the past, thinking with certainty that he had great merit in that, but knowing, more or less consciously, that he had been largely lucky, the Leviathan fears change because it represents for him, in fact, a turn of the wheel, putting himself for a second time in the hands of fate, and this terrifies him because he fears that the second time might not go as well as the first. The Leviathans I have met in my life had the characteristic of having a long operating experience, of rising through the ranks, but of having absolutely no management or organizational culture. In the past, I have tried to convince Leviathans by presenting overall plans, to make them understand the overall vision, and presenting data analysis to guide the choices, but I must say that I have never been successful: the Leviathan decides purely from the gut, and is absolutely convinced that he is right (he often falls into the category of assholes (see in this chapter)). The only way to channel the energies of the Leviathan in a direction more congenial to us is to make him/her afraid. The leviathan's fears are usually related to his reputation and that of the company, so making sure to show him that not making a certain decision or behaving in an old-fashioned way will lose a customer or put the organization in a negative light can sometimes be the key.

Otherwise, as in the Old Testament, when the Leviathan comes out of the water, you better not be found.

Myth: The Crown Prince

Many companies have a Crown prince (or princess). One becomes a Crown Prince when one is appointed to his or her position regardless of ability or achievements, but maybe for birthright or for *being at the right place at the right time*/ having been the only one in the company at a specific moment. The Crown prince or princess has the characteristic of being immovable and often capricious because his or her operational objectives are different from those of the company. They are children, relatives or grandchildren of the owners or founders of the company, or even employees who have made a career because, at a given time, they were the only person in the company who had a certain skill (who spoke a foreign language, for example, or who was a chartered engineer), who hold top positions (CEO, vice president, director or so on), who have no experience other than working in the specific company, having never done anything other than what they do. They are often convinced that they are endowed with intelligence and critical capacity far above the average of their colleagues whom they see as inferior beings (they therefore fall into the category of assholes), and believe that their position is due to them by divine right because of their genetic superiority and/or bloodline. They are characterized by predictable statements that, despite declaring genius ideas as though they were the first person to come up with them, such as, 'we need to be as good as them with our data' and we 'we must be like them' when talking about the best competitors in the market but without any follow up or action plan.

The Crown Prince is a tax that many companies have, and which they cannot shake off. Project managers who find themselves managing projects that have a crown prince as a stakeholder must be careful not to be diverted from project and strategic objectives by the crown prince's misaligned demands. Since it is also not possible to always answer "no", it is one of those stakeholders whose expectations must be managed, even if they are sometimes bizarre.

Myth: Einstein

Albert Einstein (1879–1955) was a German-born physicist, best known for developing the theory of relativity, and became paradigmatic of the most intelligent person who ever existed and synonymous of genius.

When managing projects, I call those team members ‘Einstein’ who are actually very well prepared (maybe global leaders) in their field, but who subtly point it out to the rest of the team. It is not unusual that university professors or top-level consultants behave like this. The difference between the Einsteins and the *étoiles* (see Chapter 2) is that the first are actually very smart, and whose behaviour can be likened to Pantagruel (see Chapter 1). You need the contribution of an Einstein in your team if you need strategic advice and you look for disruptive innovation. Einsteins are generally not very good team members: they are rarely on time at meetings, often cannot focus during debates, delay the release of their deliverables, and sometimes disappear for days without giving any information. And typically take for granted that they are allowed to behave in a bad way – for sure breaking most of the ground rules of any team – because they are in high demand. Nevertheless, their attitude is not anyway justified and can have a negative impact on the team’s life.

As their contribution is generally high level and not specific, you need to pay a lot of attention when the terms of their contribution to your project are defined, and ensure that they respect those terms. Most of the time you have a contract based on an hourly/daily rate: in this case, you have to make certain that they stay focused on your project for the time agreed, and that their effort is 100% on your project when paid. If you have a lump sum project agreement, be very clear in defining the quality and quantity expected for their deliverables. Einsteins are actually very intelligent and their contribution to your project can be critical, but they are very hard to handle. From the beginning of the project work to keep him or her onboard – show them respect but demand yourself respect as well – insist on their attendance to project meetings when requested, and guarantee timely and quality results. The risk of working with Einstein is not to receive the expected support, and be left almost empty-handed.

Myth: The Chimera, Aka the Technical Project Manager

In many companies, this mythological figure is conjured up at difficult times: what is needed is a technical project manager who understands technical problems and can explain them to the customer. When someone in the company, usually from the technical office area, invokes the chimera, it is a clear indication of organizational and managerial

incompetence on their part. It is very common that the technical departments of companies—not all of them of course—but especially the operational part, suffer chronically from the halo effect (see in Chapter 1) and tend to have a silo attitude (see silo thinking in Chapter 3), insinuating that the fault of the disorganization and continuous stress to which their resources are subjected is linked to the fact that the project managers are not technical enough—an adjective that in a technical department is synonymous with “good”—because they do not understand the “real” problems—which are the technical ones—and instead they just try to pander to the customer who makes absurd demands because he or she, too, is not technical enough.

The technical project manager is a complete nonsense. Depending on how a company is organized, it is very positive that each area has a coordinator,—who acts as the quality, time and cost manager of the area —and who interfaces with the project manager of the order: this is the technical project manager! This is a coordinator of the project activities for a specific company area (technical department, purchasing, production etc.) and “lives” not in the project management department, but in the individual departments.

The project manager must have a minimum of technical culture, which can also be acquired “on the road”, it is not necessary to be an engineer with ten years of experience in the specific sector. The added value of the project manager is in organizing the project in its management aspects.

When departments start talking about the need for technical project managers, it simply demonstrates their organizational incompetence. If it’s an area manager or office manager requesting, in my opinion this person is not fit for their role.

I recommend that you never give in to requests for a technical project manager, because it is simply a misplaced problem that cannot be solved: if you start to listen to these requests, you will soon see that the technical project manager will never be technical enough. If I were the managing director of a company and I heard one of my managers talking about a technical project manager, I would be very worried about the choice of my front lines (in practice, whoever talks about a technical project manager is not suitable to be a resource coordinator, because, just

by expressing such a wrong concept, shows to have neither culture nor managerial predisposition, and probably veers towards silo thinking).

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4. Business Environment and Perspective: No Project is an Island

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Abstract
This short chapter is about managing the impact that any project gets from the external environment. This aspect is dramatically undervalued by most project managers, but has a huge impact on the project success and must be kept into consideration in daily project activities.

4.1 Plan and Manage Project Compliance

Alignment between the goals of the project and the goals of the organization for which the project is being executed is something that is generally not given much consideration, or overlooked altogether. What often happens is that projects start out as a discussion of some corporate body (individual department, or business need) but lack a well-rounded discussion with other departments or corporate bodies, which may have different views of the project objectives. **The project manager, when he or she starts with a project, must always do a compliance check between the project objectives and the general objectives of the organization**, otherwise there is a risk that projects become like so many horses pulling the same wagon (the organization) in different directions. However, from the point of view of the management of the company, this aspect is fundamental because it represents the only lever to obtain the cascade effect

between the strategy decided and approved at high level (Board of Directors, General Assembly) and the implementation from the bottom in every element of the organization: **every project** that starts in the company, both internal to the company and external to the company, **must contribute to the implementation of the strategy** that the organization has decided for itself in the medium-long term.

The project manager cannot do the compliance check of his/her project alone and without tools: in a structured organization you would expect the Project Management Office to provide its project managers with tools, such as a checklist. If the organization you work for is not structured enough to provide you with this kind of support, don't feel apologetic if you don't address this issue: you can certainly check if your project has obvious gaps with respect to health, safety and environmental issues, ethics, standards (internal to your organization or external from regulatory bodies or applicable laws) that you need to adhere to, and in general strategic objectives that your company publicly states. If some issues are not clear from the beginning, or cannot be neutralized immediately, it is good to implement a register to monitor these situations (the easiest thing is to make them part of the risk register in order to be able to keep an eye on them in an agile way and not to have to implement new tools and processes, as potential non-compliance is a risk).

As with other aspects of project management, it is good to be able to determine with certainty and measure compliance, so it is appropriate to create a specific section in the Quality Management Plan identifying appropriate tools and metrics, measurement tolerances, and ways to manage non-conformance situations.

4.2 Evaluate and Deliver Project Benefits and Value According to the organization's Strategy

As described in several parts of this book, the benefits an organization has from implementing a project often transcend the "deliverable" to the end customer. Benefits may include, for example:

- enter a new market,
- acquire and retain a new customer,
- acquire new skills within the company,

- develop a new product partly financed by an external contract,
- better integrate with other sites of the same company or with strategic partners,
- develop new project management methodologies,
- etc.

and often the project sponsor and/or key stakeholders expect the project to generate these benefits in parallel with the implementation of the main product, service or outcome, and perhaps at no cost. This aspect, which is present, in my experience, in almost all projects, must be addressed in great detail by the project manager together with all the main stakeholders, because otherwise it creates bumps throughout the project, and makes reporting—and the project manager's life in general—very difficult.

Determining what benefits the organization expects from the project from the very first stages (these should be included in the project charter or similar preliminary documents) is fundamental, and at the same time it must be made clear to stakeholders that it is difficult without a specific budget to generate value in the shadow of the activities related to the main project deliverable. It is therefore necessary to allocate adequate resources and hours to realize these complementary benefits as well. Otherwise, if you leave stakeholders under the naive illusion that the project will deliver many complementary benefits for free, in the medium term you will only disappoint them and lose their support, worsening the performance of the project even in terms of its main value.

Once this has been established, the project manager must identify the value and benefits that the various stakeholders expect from the project, ensure that these benefits are made explicit and that there is a clear mandate to achieve them, then make them part of the project requirements and treat them as such, measuring and monitoring them throughout the project, and ensuring that the value of all the benefits achieved is clearly perceived by the stakeholders.

4.3 Evaluate and Address External Business Environment Changes for Impact on Scope

Changes in the environmental context in which the project operates can also significantly impact project performance, especially if the project has a

significant duration (I would say longer than six months). What can happen is that there is a significant reorganization that impacts the project management department or other stakeholder departments, or that there are changes in the environment outside the organization that affect the project, such as changes in the availability and pricing of needed raw materials, changes in applicable laws or regulations, catastrophic events, etc.

Although the project manager may not have the power to influence these events, he or she must be prepared to manage the consequences. Keeping the antennas up throughout the project, he or she must identify the external factors that may impact the project and manage them as risks to the achievement of project requirements and objectives in general, and possibly implement actions to adapt priorities to the new changed context, trying to defend the value that the project generates for the stakeholders. This process, like most project management actions, requires consensus, so it should be implemented by consulting with the team to identify the best options and keeping stakeholders aligned on the choices made.

4.4 Support Organizational Change

Organizational culture has a decisive impact on the success of a project: the same project, developed by two different organizations which have, by their nature, two different organizational cultures, will be developed and generate value in very different ways—any project manager who has managed similar projects in different organizations knows this well. **Organizational culture** is an invisible but very powerful force that manifests itself in the behavior of people working together. It **is made up of a system of values, beliefs and attitudes which have a decisive influence on the behavior**—and especially on how decisions are made—of people working in the same organization. It can be observed above all by studying the “unwritten” rules that people adhere to and automatically assume as valid, and for which they cannot give a clear rational justification.

A project manager has to ask him/herself, from the very beginning of the project, what the corporate culture is and how the project will impact and be impacted by the behavior related to it. This analysis normally leads to identifying project risks. For example, it may be that a project will place an organization in the position of having to work with a new client who bases their contracts on common law rather than the continental law that is

normally used by our organization, and this may create problems in managing the contract, any discussions, or managing back-to-back relationships with suppliers. Another case could be a project that requires significant agile management, while our organization always uses the waterfall methodology. Etc.

In order to do this in a structured way, it is possible to do a specific review of everything in the project environment.

Once the exercise of determining the gaps between the corporate culture and what is required by the project has been done, the project manager must ask him/herself whether a change action in the organization is sustainable, to accommodate the needs of the new project. Change management, as noted in other sections of this book, is one of the most difficult aspects to manage and requires strong and continuous support—and therefore not taken for granted—of the key stakeholders of the project. The more the project requires actions that are distant from the current organizational culture, the more effort will be required by the project manager to govern issues related to these aspects during the project.

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5. Beyond the Boundaries of Project Management

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Abstract
In this chapter I describe in broad terms the business functions that are contiguous to project management and their operating principles: it is very common to discover that the goals within the same organization are misaligned, and this, although it should not shock us, represents a serious problem that the project manager has the duty to communicate to his or her sponsor to work together for an organizational improvement. For example, a classic case of misaligned objective in which I often come across is that of the purchasing department that has as its sole objective to obtain discounts from suppliers, without taking into account other aspects that impact the company as the level of quality and sustainability of the supplier's business and the on-time delivery. The supplier who is “plucked” and induced to accept an excessively low selling price will try to make efficiency at the expense of lead time and/or quality of deliverables, thus causing problems for the project. In such cases, the project manager must work with his or her sponsor to ensure that the purchasing department's action is also sensitive to the supplier's performance issues in terms of time and quality. And so on.

What is presented in this chapter does not pretend to be exhaustive with respect to the topics covered, but I believe it provides those who are project managers with the basic notions to orient themselves when they have to interface with these functions.

5.1 Before and After Project Management: Business Analysis and Operational Management

From the point of view of project management, a project lies somewhere between business analysis (upstream) and operations management (downstream). In this case it is possible to represent time with a straight line and to represent the three phases as in the picture below (Fig. 5.1).

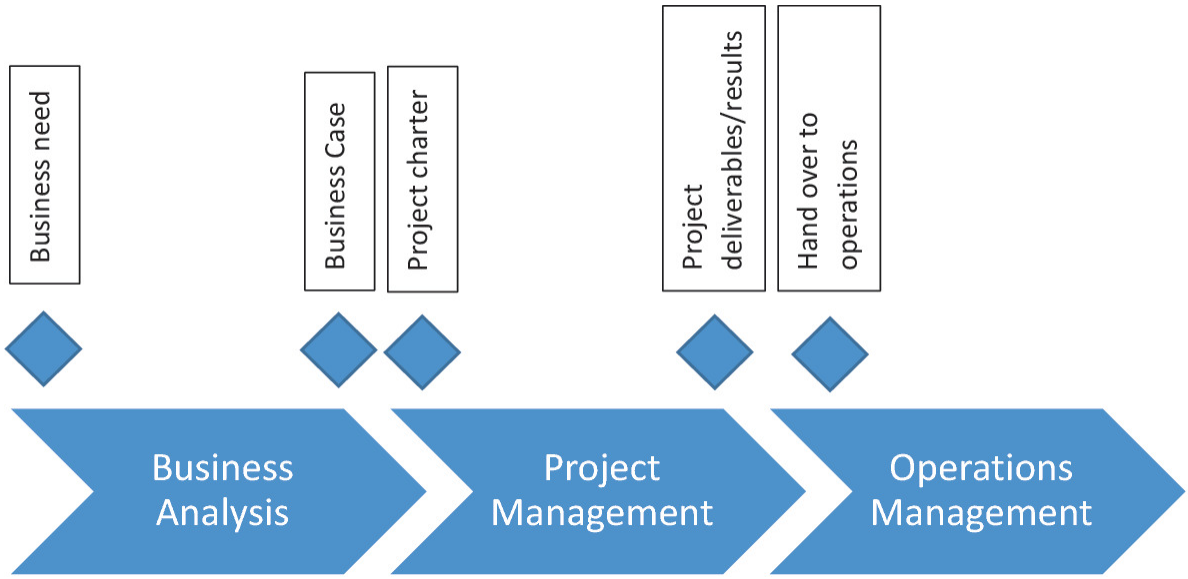

Fig. 5.1 Project management continuum

In the pre-project phase, the business analysis, the needs of the organization are analyzed starting from problems or opportunities, feasibility (business cases) are developed in which alternatives are evaluated, then it is decided which, among the many projects, is worthy to be initiated, keeping in mind the limited amount of resources available to any organization. Therefore, projects start and complete. When a project comes to completion, the products or services developed move into an operations management phase. In the table below I have tried to collect some examples (Table 5.1).

Table 5.1 Examples of various project at different stages of their life-cycle

	Business Analysis	Project Management	Operations management
New road	Feasibility, preliminary design with alternatives	Detailed design, procurement, construction, tests	Car passing on the new road
New website	Feasibility study, mock ups with alternative solutions	Development of the new site	New site online
New automatic production line	Feasibility study, User requirement specifications, alternative analysis	Detailed design, procurement, construction, tests	New line working
New product development	Need analysis, benchmarking, competitor analysis		Product on the market shelves
New custom product for a customer	Commercial/bid/tender stage		New product at customer premises ready for working

From a business point of view, the three phases run continuously together. For example, if we look at it from the point of view of product management, the initial business analysis which decided to finance the development of a new product, the development project of the new product (project management) and the putting into production and marketing of the new product (operations management), is flanked by new business analysis phases for parallel projects of technical improvement, or marketing, or for the development of new functions. The representation would be more correct if done in a circular fashion as in the image above (Fig. 5.2).

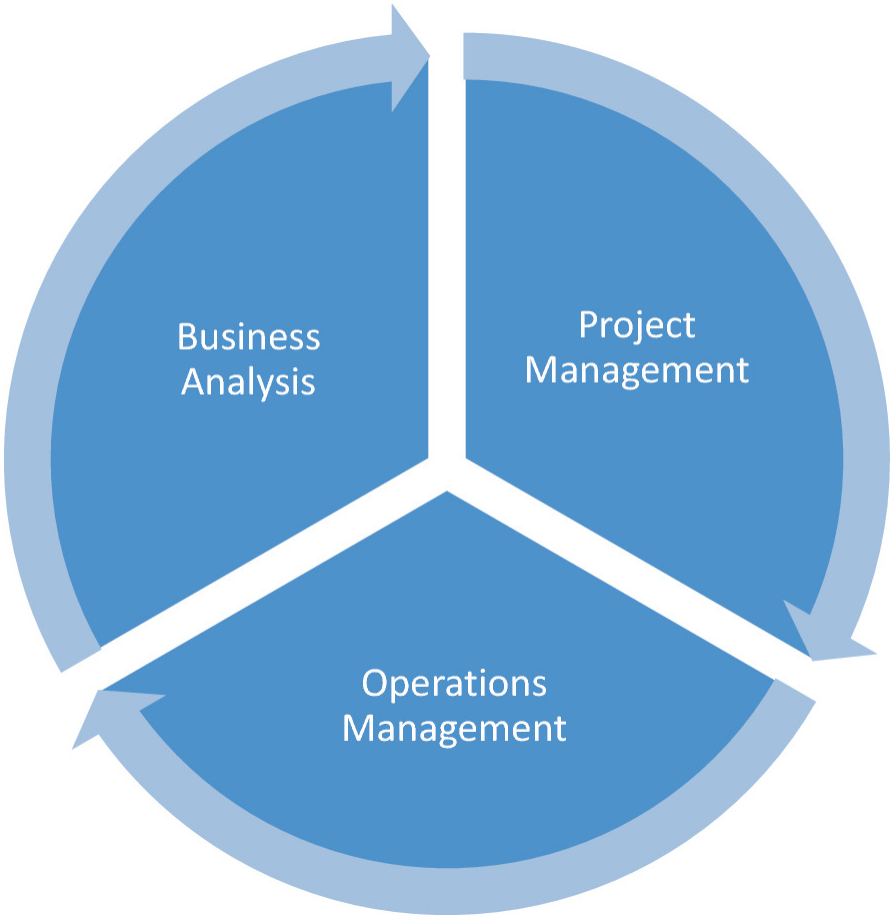

Fig. 5.2 The never-ending project management continuum from a company perspective

5.1.1 Business Analysis

Business Analysis **is the discipline that serves organizations to facilitate change by identifying needs and recommending possible solutions** that provide maximum value for stakeholders. It is from the Business Analysis activity that projects are generated. Many organizations, however, do not apply it in a formal and structured way, or apply it partially, and this causes serious risks and problems for the following activities, because really critical needs—problems or opportunities—are not identified, and sub-optimal projects are launched according to the (scarce) resources available. In structured companies the function charged with the task of selecting the projects to be implemented is generally called strategic planning.

The skills required are very close to those of project management, although the approach of the business analyst is often significantly different from that of the project manager. In fact, the project manager knows where the project should go, while the business analyst has to decide

what should go where. If we were to use the metaphor of navigation, the project manager would be the captain of the ship, the business analyst the ship-owner (or his/her trusted advisor). The techniques in use can also be found in project management books, with the difference that the Business Analysis activity is never linear, and agile and iterative approaches prevail in the absolute majority.

The document that typically guides the business analysis process and collects all the data resulting from the activity is called the **business case**.

5.1.1.1 Business Case

The business case **is the document that provides a justification for the launch of a project** or a series of actions by **balancing the direct and indirect benefits** expected from the solution developed **against the costs** and resources needed to implement it.

A business case logically and rationally outlines the rationale for undertaking a project or otherwise a change initiative. It is a document whose level of formality and detail may vary from one organization to another: some make a presentation, others a text document, others use a spreadsheet. Whatever the form, the important thing is that a management document exists before the start of any initiative in the company, and that this document covers all the areas described below. The amount of time and resources spent on making the business case should be proportional to the size and importance of the potential of the initiatives being evaluated. A business case must be developed at a level of detail (just enough) to be able to seek and receive stakeholder approval for the activities it contains.

It's generally broken down as follows:

- identifying organizational needs
- determining the desired results,
- assessing constraints, assumptions and risks
- identifying different solutions (at least three is my recommendation), which then are compared and the best one is recommended
- analyzing how the project contributes to the achievement of the organization's strategic objectives.

5.1.1.2 Project Canvas

Antonio Nieto-Rodriguez proposes Project Canvas—borrowed from the Business Model Canvas by Alexander Osterwalder—as **a universal tool**

keeping the project execution aligned with the expectations of project sponsor, top management and executives in general, considering that most of them are not familiar with project management terms and methodology.

Project canvas are included on a normal A3 sheet or similar, generally divided into three domains:

- Foundation or Why, including
  - Purpose of the project
  - Investment needed
  - Expected direct and indirect benefits
- People or Who
  - Project Sponsor
  - Resource working on the project execution
  - Stakeholders
- Creation or What and How
  - Deliverables and results
  - Project Plan
  - Risk and change allowed

All the Project Canvas spaces are filled with very high-level information that can be understood by any stakeholder involved in the

project, independently from his or her education or experience in project management.

5.1.1.3 Four Step Method

This method is in my opinion extremely effective in moving from a problem to its final solution. I personally apply it every time I perform business analysis, and I can testify it works very well. What often happens in organizations is that they confuse problems with causes, and solutions with projects to be launched to implement them.

It starts by brainstorming with a team of stakeholders who are united by a part of their activities. It can be a department of the company, or the functions involved in a certain supply chain, or the first lines of the CEO.

1. During the **brainstorming**, participants are asked to write down all the problems or opportunities they see for the company in the specific sector under examination (this step is often done using sticky notes or analogous software). Once collected, all reports are examined and aggregated in the so called "**affinity diagram**" —often several participants identify the same topic of attention.

2. After that, we decide together on which issues to proceed with the **root cause analysis**; keep in mind that there can be more than one cause for the same problem or opportunity. The root cause analysis can be carried out with the Ishikawa fishbone diagram (see in this chapter), or with the 5-whys method, or with other creative methods.

3. Now the team is ready to **imagine solutions that solve the root cause** of the problem. Also in this case there can be more than one possible solution to solve the same problem. Often there is a minimum intervention solution that costs little but only partially tackles the problem, a complete solution that solves the problem completely but requires significant investment and time, and finally intermediate solutions. It is essential that the team, facilitated by the business analyst, identifies all possible solutions. Some solutions may be mapped but then discarded almost immediately due to obvious problems, perhaps using a SWOT analysis. For each solution, the expected direct and indirect benefits should be defined and quantified.

4. For each solution that seems sensible to the team, it is necessary to outline at a high level (main milestones) the project that could implement it, identifying some key indicators such as time and cost of implementation, level of risk, or also others considered relevant by the organization or the team, such as the level of sustainability.

At this point the team can move on to choosing the best solution for each identified problem or opportunity (Fig. 5.3).

Fig. 5.3 The Four-Step process to pass from a problem or opportunity identification to the implementation of the viable and definitive solution

5.1.1.4 Theory of Change

What is internationally known as the Theory of Change (ToC) is actually a method to identify, measure and control projects that have a prevailing social impact as a result. It is applied using a well-defined and widely participatory method whereby members of the organization and stakeholders express their long-term goals and define the conditions under which these goals can be considered to have been achieved. These conditions are then represented in the project outcomes and illustrated in a causal model (results chain). An effective ToC provides a roadmap that contributes to:

1. guide the work of the organization, determining in a shared, clear and testable way the logic and methods with which the initiative will be carried out

2. position the initiative in an immediate way to internal (e.g. staff) and external stakeholders (e.g. beneficiaries, partners, donors) favoring accountability, the birth of new collaborations, and reducing the risk of self-referral

3. lay the groundwork for impact assessment by defining an indispensable point of reference (i.e. the concept of ‘success’ and how to achieve it) and arranging from the outset for the collection of robust and adequate data—avoiding complex ex-post research that generally results in increased costs and a decrease in the degree of reliability of the study.

The method involves a participatory workshop coordinated by a facilitator who guides organizational members and stakeholders to define impact objectives and then, backwards, to clarify the conditions necessary to produce them, and to identify metrics to assess their success. At the end of the workshop, it should be possible to create a project charter—which can also have a schematic and tabular form—that allows a project sponsor to decide whether to approve the implementation of the project, and a project manager to implement its content.

5.1.1.5 Root Cause Analysis

A mortal sin of any manager is to confuse the problems with the causes. In medicine, you might say it’s confusing the symptoms with the illness. For example, if I have a fever of 38°C degrees (symptom/problem), I need to figure out if it’s the flu or a wound infection (illness/cause), and treat myself accordingly. If I only worry about lowering the fever but don’t treat the problem, e.g., the wound, the fever will continually return and may worsen over time. In organizations, exactly the same thing happens: when any problem occurs, it is essential that the manager works with the employees to identify the cause(s) that generated it, so that specific actions (immediate and/or medium-term) can be defined to correct them in a definitive way so that the problem does not occur again. This technique is used in different fields. In project management, it is mainly applied in quality management and risk management.

The most used methods are the Ishikawa diagram or fishbone diagram, and the 5-whys method. In some particularly structured contexts checklists exist to analyze problems in very specific operational areas.

Ishikawa or Fishbone Diagram

It is a diagram like the one below in which, given a problem, the causes are searched according to some areas where they could originate. In the case below we have used the areas defined with the so called 6 M, but we can

also use other areas that we think are better suited to the specific case. The team, aided by a facilitator who may be the project manager, given the problem written on the right, analyses each of the 6Ms to identify in which areas the causes of the problem under examination reside (Fig. 5.4).

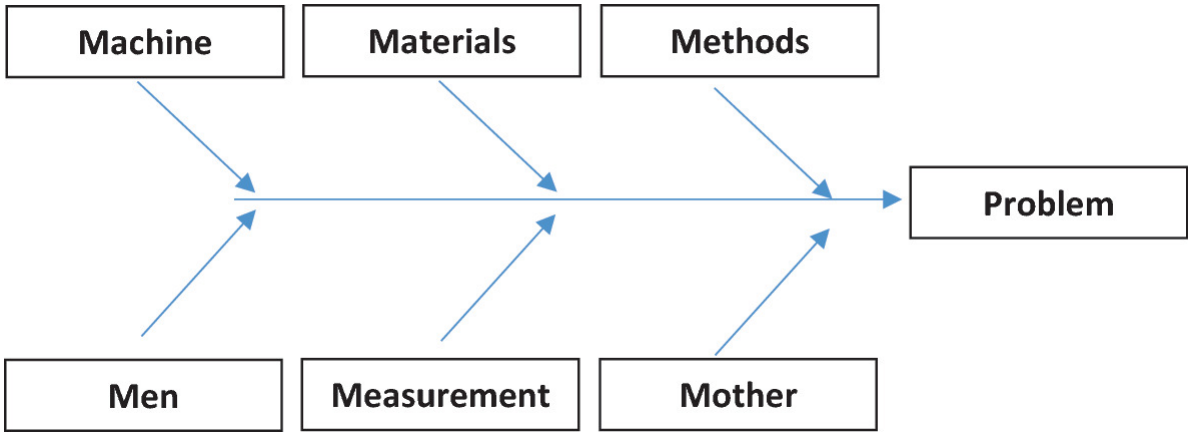

Fig. 5.4 The fishbone diagram with the "6 M"

5-whys

This method is based on the assumption that when I have a problem, I won't have found its root cause until I will have asked myself "why (it happens)" at least 5 times. At first glance this may seem plethoric, but if you try to apply it you'll see that this is actually the case (sometimes you can stop at 4 whys, but you can hardly stay below 4) (Table 5.2).

Table 5.2 Diagram for root cause analysis using the 5-whys method

0.Problem	**1. Why (it happens)?**	
	2. Why (it happens)?	
	3. Why (it happens)?	
	4. Why (it happens)?	
	5. Why (it happens)?	Possible solutions?

Myth: Vampires

Vampires are our colleagues involving us in long and hard discussion, analyzing why a recurrent problem occurs, and agreeing on a solution. Up to now, everything would be fine. But Vampires never implement the solution identified, and come back to you with the same problem in few weeks or months, complaining that the problem is still there. Like

Vampires, they suck our time and energy. Vampires also like to propose solutions which are impossible to implement, because they are too complex, or unrealistic considering the organization environment, or too sophisticated.

The hard part is often the implementation of the identified solution though unstructured action plans, or a structured project plan. If you like talking about problems and complaining that they are always there in the same way without taking any concrete action, you are a vampire!

(Joke: can Vampires be good project managers? Obviously no, because they are not willing to meet stake-holders!).

Bad Idea. It's Obvious! Let's Make a Start

A mistake to be avoided is also to be too rash: sometimes, given a problem, the root cause and solution seem obvious to us and we dodge the issue in a hurry. It is always worthwhile to reflect a few minutes more (if I had to give a rule: it should be mandatory to discuss at least 5 min for each problem). An emblematic case that happened to me is that of a process company in which I was developing an improvement initiative with a team of fifteen production workers. From the preliminary brainstorming everyone had manifested a problem of the type: "when I need a forklift it's never there". During the discussion, it emerged that they all had a driving license for the forklift. The root cause seemed to be the insufficient number of forklift trucks in the company, and the solution seemed to be the purchase of more trucks (the budget for improvement would have been sufficient). Proceeding with the analysis using the fishbone, however, it emerged that the production space and activities were fragmented, so that at each production phase it was necessary to transfer the forklift as little as a few meters. In addition, the raw materials warehouse and the finished products warehouse were significantly distant from the production sites. Having made these considerations, it became clear to everyone that the problem was not actually generated by the lack of vehicles (if everyone had their own forklift, there would probably have been traffic jams and even dangerous situations) but by the organization of the production space. We therefore started a project to review both the layout of the machinery and to

automate certain activities at the beginning and end of the line, with a very considerable increase in productivity.

5.1.1.6 Choosing the Best Solution

SWOT Analysis

This is a qualitative method by which the team is asked to characterize a solution according to the four areas:

- Strong points
- Weaknesses
- Opportunities
- Threats

(Table 5.3).

Table 5.3 Framework for the SWOT analysis

	Useful	**Dangerous**
Internal to the organization	Strengths	Weaknesses
External to the organization	Opportunities	Threats

You can use sticky notes and each participant **starts** individually, or do a structured brainstorming session using a flip chart.

It is most useful when used to analyze two or more competitive solutions, to decide which one to choose.

Benchmarking

Benchmarking consists of comparing one's own organization (office, department, division or the whole company) with comparable organizations (other offices, divisions, etc.).

The aim is to identify how others do it and which are the best practices in their own market/environment, to understand how we are positioned in

the current state and in which direction we could improve.

Pareto Principle or 80/20 Method

The Pareto principle—based on empirical observations—assumes that about 20% of the causes cause 80% of the effects. The method that derives from it is therefore based on the identification, among all the causes of a phenomenon, of that 20% that has the greatest influence (80% of the effects) in order to concentrate efforts on those.

Quantitative Financial Methods

A fundamental method for deciding which solutions to implement and which projects to launch, even if considered by many as not exhaustive, is the one based on expected financial performance.

There are several types, all of which compare the expected costs and revenues over the life of the project, discounted to the present time. The most used indicators because they are more consistent and reliable are Net Present Value (NPV) and the Internal Rate of Return (IRR).

NPV

$$NPV = \sum_{t=1}^{n} \frac{R_t}{(1+i)^t}$$

where:

- t = cash flow period (year or month of the project in which it occurs)
- i = the discount rate in force
- R_t = net cash flow (Revenues-Costs) in period t
- n = total number of periods considered

$$0 = NPV = \sum_{t=1}^{T} \frac{C_t}{(1+IRR)^t} - C_0$$

where:

- C_t = net cash flow (Revenues-Costs) in period t
- i = the discount rate in force
- t = total number of periods
- C_0 = initial investment

Both indicators can be calculated automatically with a spreadsheet. The best projects are those which have both indicators the highest. Usually both are evaluated because a project with a high IRR might actually yield little in absolute value, or vice versa a project with a high NPV might have a low return on investment so it is not really worthwhile.

One can also use the ratio between discounted benefits and discounted costs to evaluate the goodness of an investment (Benefit-Cost Analysis). The theoretical criterion is that an investment is worthwhile when it exceeds the threshold of 1, although it is obvious that organizations normally target a value above at least 1.5 to account for risk.

The benefit-cost ratio consists of the ratio between the sum of the net present value of all expected project benefits and the sum of the net present value of all expected project costs.

Opportunity Cost

When analyzing alternatives, the opportunity cost represents the potential loss of other alternatives when one alternative is chosen. For example, if the organization has two different investments in capital projects to choose between, both costing about 100k€, but the available financial resources allow the organization to allow only one of them start, the opportunity cost it is represented to the project not started, and the loss of its benefits. When choosing one option, it always makes sense to evaluate which alternatives are you are losing.

Multi-Criteria Analysis (MCA)

Multi-criteria analysis is an alternative or complementary approach to cost-benefit analysis, and is preferred in fields where the decision is not merely made in terms of the financial profitability of the investment, but indirect benefits of the investment (e.g. social or environmental) that cannot be included (at least not easily) in a financial calculation are to be taken into account.

The process has two phases. In the first phase, a set of goals or objectives (criteria) are identified that are to be pursued with the projects being evaluated, and metrics are defined to measure them.

In the second phase, weights are defined for the different criteria defined in the first phase and values are assigned to the various elements, thus determining the best solution.

The simplest application is that contained in the formula below, although there are some far more elaborate models.

$$MCA_i = A_i P_A + B_i P_B + C_i P_C ...$$

where:

- i indicates the i-th solution
- A, B, C indicate the criteria
- Px indicates the weight given to criterion X, and
- MCAi denotes the score of the i-th solution

Decision trees

The decision tree is a method of support to the assumption of decisions that evaluates the implications of a chain of multiple options in presence of uncertainty, and it is based on a tree diagram in which it calculates, for each branch, the expected monetary value for the solution that it represents.

5.1.2 Operations Management and Supply Chain Management

Operations management (OM)—sometimes referred as "Running the company"—is the management of activities in order to create the highest possible level of efficiency within an organization. It is concerned with transforming materials and labor into goods and services for internal and external customers in the most efficient way possible, in order to eliminate any waste and maximize profit for the organization. Operations management teams work constantly to balance the costs incurred in producing goods and services with sales revenues in order to achieve the highest possible profit.

Operations management is therefore the use of personnel, material, and equipment resources to create value for the company and its customers. Operations managers are always called upon to balance customer demands with production needs for the company, because often the optimum for one does not coincide with the optimum for the other. In general, while the project manager has a project view based on the need for change, the operations manager has a view of the company's efficiency. A classic case is when several projects need to be implemented in a short time frame, causing a peak of work for some departments, and maybe leaving a gap later on: the project manager is generally more oriented to the punctuality of his or her project and tends not to pay too much attention to these

situations, while for the operations manager these cases are absolutely to be avoided. Solutions must be found in a constructive dialectic between the different parties, balancing customer satisfaction with the costs and efficiency that our organization must face in order to achieve it.

Operations management deals with a multitude of issues, from more strategic ones such as the needs of production sites and therefore new production facilities or the need to implement new IT tools, to more operational issues such as inventory management (a subject that is neglected by many and considered boring, but which has a huge impact on company budgets) to quality control and maintenance.

The disciplines that are used for this purpose are lean and six-sigma. In general, the former deals with the elimination of waste and is more qualitative, while the latter focuses on improving existing processes and is more quantitative.

While operations management deals mainly with the internal activities of the company's production sites, supply chain management deals with the management of the chain of materials and suppliers/partners that the company needs to generate its products or services, always with a view to maximizing efficiency and reducing of waste.

5.1.2.1 Lean

The term "lean thinking" was coined in 1992 by two researchers from the MIT in Boston (MA), James Womack and Daniel Jones, who have actually stylized the approach to operations management that was born in the late fifties of the twentieth century at Toyota thanks to Taiichi Ohno (even now we talk about Toyota Production System—TPS—as a specific method different from both the lean and the six-sigma). Lean production is a set of principles, methods and techniques for the management of operational processes of organizations that focuses on eliminating waste in order to maximize value for the customer, implementing an approach of continuous improvement that must involve everyone in the company, from top management to the most operational people. It is said that the goal of lean manufacturing is "to do more with less":

- less time
- less space
- less effort
- fewer machines

- less material

It is interesting to observe how the concept of waste in Japanese culture (*muda*)—where this approach was born—has a meaning that is close to what in English we would call sin as well as waste. This explains how Lean practically declares a “holy war” against waste.

Lean is based on 5 principles:

1. **Identify value**: **Value is only what the customer is willing to pay; everything else is waste and must be eliminated**.

2. **Identify the value stream**. In order to eliminate waste, it is necessary to “map” the value stream, that is, to identify and visualize all the activities in which the operational process is articulated, distinguishing between those that add value for the customer, which must be maintained, and those that do not add value, that are called “waste” and must be eliminated.

3. **Facilitate the flow of value**. The process of value creation is seen as a flow, which must run in a continuous and homogeneous way, minimizing lead times.

4. **Pull production**. In order to satisfy the customer in the best possible way, it is necessary to produce only what he or she requires, when and as much as he requires, making him or her wait as little as possible; a production organized in this way is “pulled” by the customer’s sales/requirements and not “pushed” by production.

5. **Pursue perfection**. This principle, which comes full circle and takes a lot from Japanese culture, requires that lean companies continue to improve, chasing waste and improving lead times so that improvement processes never come to an end. Perfection is the benchmark to which one must strive without end through continuous improvement, and corresponds to an ideal total elimination of waste called “Objective Zero” (Fig. 5.5).

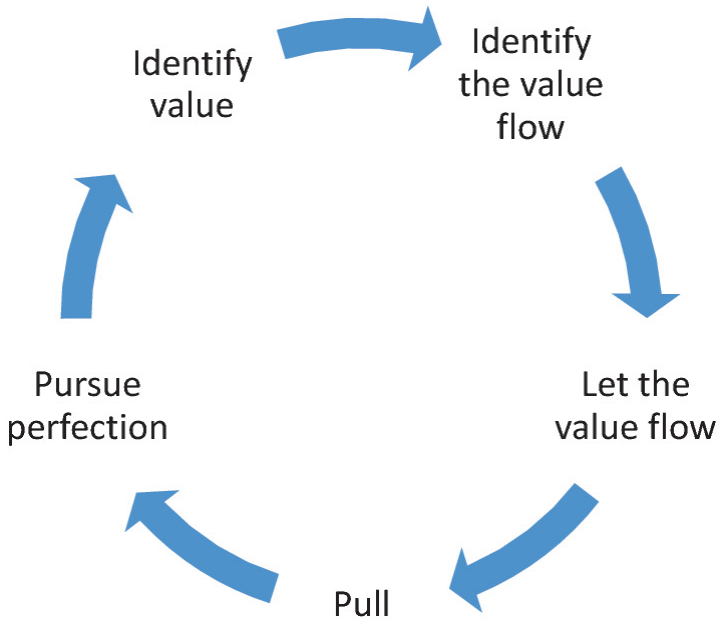

Fig. 5.5 The five step of lean implementation and management

To facilitate the hunt for waste, models have been developed over the years that classify it. We talk about the 7 wastes (*muda*) of lean, to which an eighth has recently been added—the unused talent of employees—for which we talk about 7 + 1.

1. **Transportation**: the Customer is never willing to pay more because of your transports, so a very basic target of lean is to reduce any transportation to minimum.

2. **Inventory**: it represents an amount of the company money allocated without producting any profit, with the risk of the material becoming obsolete and to lose its capital value. A high inventory represents both a cost and a risk for the company, and it is also the indicator of other organizational problems in the company.

3. **Movement** of materials along the productiontion process: moving semifinished products from one production line to another or from a warehouse to a production plant is not value added to the Customer and it is always a waste. It also includes movement of employees inside offices, for example to go from their desk to the copier, or to the archive, or to the toilet or smoking area.

4. **Waiting** for missing or wrong pieces, or for a process to be completed, is always a waste.

5. **Overproduction** causes a waste of effort and material that increase inventory, and consequently it is a waste

6. **Over-Processing:** processes and documentation are ok in lean if they are kept at minimum for creating value for the Customer. Any additional process requesting useless paperwork that nobody will ever read or complex authorization processes are a pure waste.

7. **Defects**: products that need reworks are a waste of production time that nobody will pay for, even worse if they cause scraps. The worst situation is the return of a good shipped to the customer, because it also results in a loss of trust by the Customer.

To strive for Goal Zero, one must work on four pillars:

- **Just In Time** (JIT) Zero Stock Production: implement a Pull system with the objective of purchasing materials and producing only what is already sold, minimizing stocks. It is done by mapping the value chain (Value Stream Mapping) and reflecting on waste.
- **Autonomation** (*Jidoka*) Zero Defects without Controls: everyone is responsible for his or her part of the process, post-process control activities are not of value to the customer and should be eliminated as much as possible
- **Total Productive Maintenance** (TPM) with Zero Downtime.
- **Workplace Organization** (WO) Zero Inefficiencies

Underlying these four pillars are two fundamental concepts:

- **Standardization** (Standard Work), which makes extensive use of Visual Management
- **Continuous Improvement** (*Kaizen*), which relies on specific techniques of Problem Solving.

These concepts are often represented in the “House of Lean”, somewhat naïve but very effective in my opinion.

5.1.2.2 Workplace Organization

An optimal organization of the workplace allows waste reduction in a very consistent way and to obtain very significant savings. The two main techniques that are used in this field are spaghetti mapping and 5S. Like most lean techniques they can be applied to both production and office spaces.

Spaghetti Map

The spaghetti mapping consists in following a certain period of time (from half a day to a week generally) the employees of a department noting their movements on a map of the area with lines (the “spaghetti” in fact). Observing the most frequent displacements, and remembering that displacements are one of the 7 wastes, you can reason on how to modify the disposition of the spaces in order to reduce the displacements.

5s

The 5S technique involves successive steps to make sure that the work stations are as efficient as possible. It makes extensive use of visual techniques. Below is a list of the 5S’s. You can’t implement one without completing and internalizing the previous one. When it is applied it is subject to periodic checks in which each workstation is given the number of “S”s it has achieved.

1. **Sort**—Keep only what you need in your location and get rid of the rest

2. **System, Set in Order**—Find a place for everything, and put everything in its place! Tools and materials should be arranged according to frequency of use and ergonomics

3. **Sweep, Shine**—Cleaning as a form of visual inspection and control

4. **Standardize**—Make it a daily discipline.

5. **Support, Sustain**—Make it a habit and tend towards improvement.

5.1.2.3 Maintenance

Issues related to the efficient maintenance of production lines is a topic that plagues many companies. If this issue is not addressed machines can break

down at any time and consequently stop production. In these cases, it is necessary to have maintenance teams on hand, but they have nothing to do until the breakdown occurs, so they represent a considerable fixed cost against a very low added value. Moreover, a downtime has an image cost and generates delays for customers, so it cannot be something ordinary in the life of a company.

Plant maintenance can be approached rationally by making a few simple considerations.

There are three possible strategies by which maintenance can be approached:

- **Reactive (run-to-failure)**. When a component fails, i.e. you wait for it to fail, at which point you stop production to replace it, and only after the repair has been carried out can production start again. This approach requires you to have a very high stock of spare parts, because you can't wait for the failure to order the part to be replaced, and it always causes an interruption in production.
- **Preventive**, i.e. components are replaced before they break down. The replacement plan is developed by making a historical statistical analysis of the failure times of the components under consideration (life cycle of the components). On the basis of this analysis, a replacement time is normally set that covers a very high percentage of cases (80–90%). In this case, the cost of replacement materials is higher (the components that I replace preventively could continue to work if I let them break down), but on the other hand I eliminate or drastically reduce production stoppages due to faults, because I can carry out preventive maintenance when the plant is not working—at night or on weekends or during summer holidays, for example. Even in this case, however, there remains the possibility, albeit limited, of component failures, due to the residual percentage of end-of-life cases prior to the life cycle time I have assumed in the maintenance plan for replacing the part.
- **Predictive**, i.e. maintenance is done when certain indicators, that are continuously monitored, alert me that the fault is about to occur. In this case I have the lowest possible cost for the components to be replaced, because I wait until they reach the end of their life and replace them just before that. In addition, predictively-maintained components are not subject to sudden failures, so production is never stopped for maintenance. On the other hand, not all parameters and components can

be monitored in a predictive manner, and even when this is possible, it is sometimes necessary to install sensors and complex equipment to implement it, which in turn requires maintenance.

In literature you can find a more granular analysis of these approaches.

A rational maintenance plan uses all three strategies balancing the regularity and continuity of production with the costs of maintenance. It is not necessarily the case, for example, that a component can always be subject to predictive maintenance, and therefore it could be that the cost of implementing a monitoring system is high and, moreover, the impact of a failed maintenance of the component so limited, that it is better to go for the reactive strategy.

5.1.3 Strategy Deployment—continuity Between Strategy and Operational Reality

The strategy and plans of an organization are realized through projects, and the alignment of all projects and project managers in the organization is a key aspect of the success and prosperity of the organization.

Making plans come true, both project plans and strategic plans of the organization, shows the coherence of the management with respect to what has been declared, and is a fundamental value that an organization must pursue with great determination because it is a principal criterion of sustainability with which the organization positions itself in its market. On the other hand, an organization in which plans are regularly disregarded loses credibility both internally (with the members of the organization) and externally towards customers, shareholders and other stakeholders, and is therefore destined to an inexorable decline.

I think we all have met incoherent people (entrepreneurs or managers) who make big statements about how they run their business when they are having a coffee or attending official events, sometimes even supported by the projection of beautiful presentations, but then, in practice, the next day all those statements are not applied in any of the actions that the company pursues, and everything goes back to business as usual. Sometimes, in confidence, these people admit that they feel obliged to make bombastic statements “because it is the kind of things you are supposed to say, but in reality they are impossible to achieve”. This attitude, which is tolerated in many circles, is, in my opinion, extremely serious. As we all know, these people can fool you once or twice, but at some point, already in the short to

medium term, they lose all credibility and are subject to scorn. Similarly, the problem manifests itself in organizations: if the President/CEO declares grandiose goals of change and transformation every year, and then everyone realizes that nothing follows in reality, and everything continues to run as in previous years, who will want to invest time and money in that organization? A very common example is on 3P sustainability issues (see Sustainability in Chapter 1): many presidents and CEOs at year-end events declare grandiose plans to implement environmental and social sustainability actions for the benefit of employees, customers and the community, and then do not follow up with any serious strategic plan with resources clearly allocated to specific projects, and thus in the medium term discredit themselves and the organization. **Consistency between words, plans and deeds is a fundamental characteristic that must be pursued by any (project) manager**.

Strategy does indeed represent the dreams of an organization, but to make these dreams come true in the best way requires a coherent and integrated system of strategy deployment based on the implementation of projects.

According to Stephen Convey—a famous American author on leadership:

> most business leaders would prefer a mediocre strategy with an excellent implementation over an excellent strategy with a mediocre implementation

This sentence clearly expresses the difficulty with which the absolute majority of companies in the world are measured. The problem is not coming up with good ideas for strategy, but putting them into practice. **To put strategy into practice you need an excellent and relentless project management team.**

Strategy deployment, also referred to by the Japanese term *hoshin kanri*, is the process of aligning, both vertically and horizontally, the functions and activities of the organization with its strategic objectives. This activity is based on a plan—the strategic plan—that is usually developed annually, which determines precise goals, actions, timeframes, responsibilities and methods. The first time an organization structures this process it starts with a top-down approach, but when sufficient maturity is reached and the main

objectives have been defined, the process moves both top-down and bottom-up, because it requires a continuous dialogue between the management and the project teams about the resources needed and the time available to reach the objectives, in continuous feedback. The objective of the process is to weigh the available resources against the projects to be implemented, so that the objectives are realistically achievable and have the necessary support. In companies that implement strategy deployment in a more mature way, the process is mainly driven from the bottom up, with each part of the organization being encouraged to propose ideas to management to improve performance and achieve shared strategic goals (Fig. 5.6).

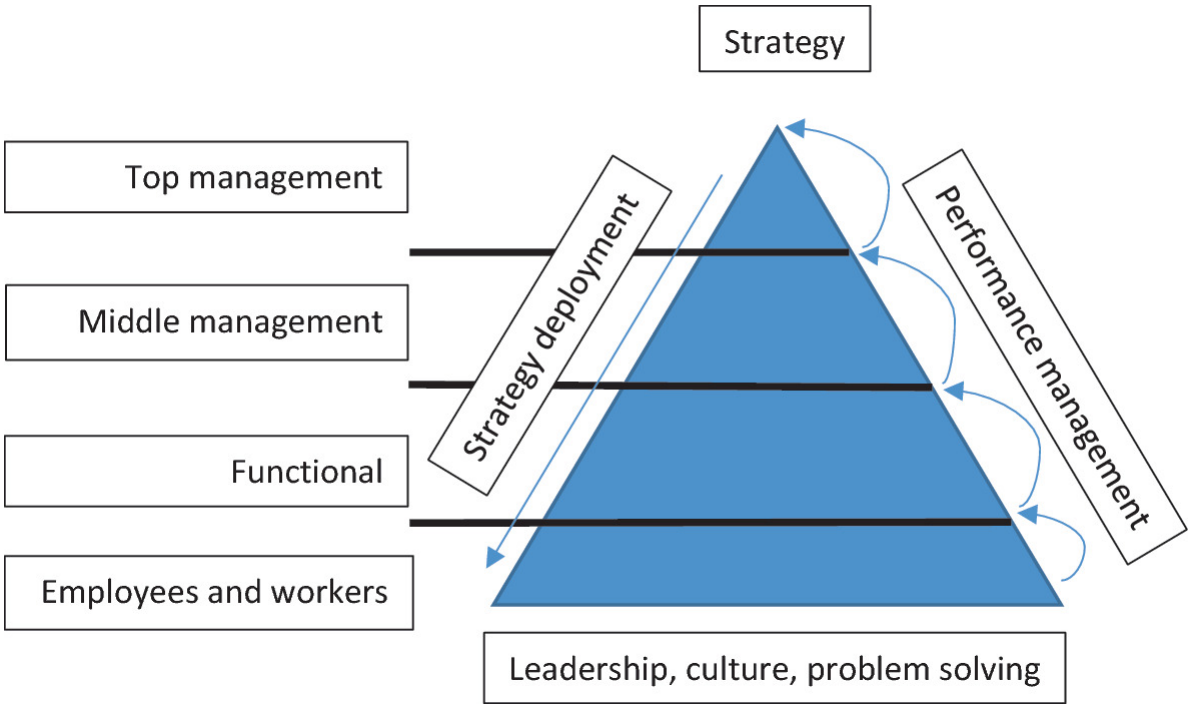

Fig. 5.6 Diagram for strategy deployment

The first step to be effective in the implementation of an organization's strategy is to have a document—the strategic plan—where the medium-to long-term objectives of the organization are clearly expressed and argued in a SMART way. This aspect seems obvious but, at least in my experience, there are a lot of SMEs that do not have a strategic plan, and therefore live day-to-day and navigate by sight. A strategic plan generally includes:

1. The Vision of the organization with respect to markets and the place it wants to infiltrate in the medium term

2. Based on the vision, you define a handful of strategic long-term objectives

3. A detailed analysis of the coming year, defining, with respect to the strategic objectives, which priority actions (projects) will be implemented, the metrics to measure their achievement or progress, and the number of projects that will be implemented.

4. For each priority action, the sponsor and project manager must be identified.

5. Management is generally implemented through the X-matrix

It often happens that the actions linked to the strategic plan and contained in the X matrix, because they come from the tradition of the lean approach, are managed at arm's length and in any case without the attention to project management that they deserve. Some of the actions are very specific, so they don't really need to have structured project management, but the absolute majority of the priority actions that are identified in the strategic plans are complex and are composed of many projects, some of them very articulated, that need very effective project management and great leadership from the project manager to be successful. When involved in strategy implementation, even if our organization does not automatically apply project management principles, the diligent project manager must use the strategic plan and the X-matrix to derive a project charter, get it approved, and then apply whatever is needed to implement the projects he or she is charged with.

X Matrix

It is a tool to implement the strategy, linking long-term strategic objectives to annual objectives and identified priorities (which are projects in their own right), with target values referring to established metrics. Furthermore, sponsors and project managers of the initiatives are identified and linked to the single actions.

The X-matrix is a very easy tool to create and very intuitive, so once implemented, you need someone to follow the application of individual projects (project manager) as well as someone responsible for the overall

strategic actions (program manager), which is typically a person reporting to the top management.

5.2 Not to Reinvent the Wheel for Every Project: The Project Management Office

In many organizations there is a belief that the projects being carried out are completely different from each other and, as a result, there is no possibility of creating templates and procedures that are applicable to all projects, present and future, that the organization will undertake. Comments such as “every client wants different things” and “every project here is completely different” are used to discourage any attempt at standardization. This is a fatal mistake, because all projects, even the most creative ones, if done by the same organization, show a lot of similar characteristics and, consequently, a lot of opportunities for standardization, so it is a very serious waste of resources, every time and for every project, to start from scratch and “reinvent the wheel”. Not standardizing project management processes has extremely heavy consequences. Among these we can mention:

- Increased costs
- Worsening of customer satisfaction
- Stress and distrust in the project team and stakeholders
- Loss of confidence in project management within the organization.

Many organizations suffer from amnesia, i.e. they forget what problems they had and how they overcame them previously, and waste energy and resources each time reinventing solutions to the same problem (reinventing the wheel). For these reasons, it is important that each organization activates a Project Management Office (PMO), of a size and level of control commensurate with its needs.

PMO is sometimes referred to as Project Management Office, but also as Program or Portfolio Management Office, but it is always a corporate body that standardizes and governs project management activities and facilitates the role of the project manager. The main benefit of having a PMO for an organization is to have better project management in terms of time, cost, quality, risk and other aspects. In addition, the PMO plays a critical role in aligning projects with the company’s strategic objectives,

improving stakeholder relationships, developing talented project managers, and maximizing the direct and indirect value that projects generate.

The PMO can take many different forms and many different tasks. In general you can find:

- PMO that is the reference point to ask, at the beginning of each project, for document templates, databases for estimates, experience from previous projects, and anything else that can be useful as experience from past projects, to work as little as possible, and not reinvent the wheel every time.
- PMO support in planning, risk management and control activities and reporting in general.
- PMO who is part of a specific department to manage a particular portfolio of projects, e.g. marketing or organizational change projects.
- Companies that are more mature in terms of project management may have an Enterprise-level PMO that acts as a link between the overall business strategy versus the investments made with projects.
- In some companies with very horizontal organizational approaches that approach projects in an agile way the PMO may be called an Agile Center of Excellence (ACoE) or even a Value Delivery Office (VDO). These bodies are characterized by being less focused on prescription and control than on project management practices, while they focus on coaching teams, mentoring key stakeholders and especially sponsors, developing skills and an agile mindset throughout the organization.

In large organizations, PMOs may be stratified: for example, an EPMO may have subordinate PMOs and VDOs, and they may have different skills**. It is not mandatory that project managers in an organization with a PMO report hierarchically to the PMO**: sometimes, for example, they belong to the operations area and therefore report to the head of the division, but then they have a functional (dotted-line) relationship with the PMO, who is not part of any operations division or area.

The best formula for implementing a PMO in an organization has to be found according to the conditions under which it operates: resources, environment, customer mindset etc. As each organization is unique, the way of implementing the PMO has to be well assessed against the context. If an organization does not have one, it can start to apply these practices maybe associating them to an existing department, for example, with the support of

the quality management processes (ISO 9001 and similar) and, after observing the advantages, move towards more complete forms of PMO. It is obviously desirable that all initiatives that have the characteristic of a “project” within the company fall under the PMO, for at least three reasons:

- all initiatives will be managed more efficiently
- project managers will grow in awareness of their role by managing a wide variety of projects.
- there is a cross-fertilization between different areas of the company, which would otherwise work in silos.

In general, PMOs must help ensure that the organizations in which they exist realize value:

- Promoting project management practices that are result-oriented and deliverable-oriented rather than task-oriented.
- Maintaining a holistic, overview and perspective view of projects (big picture) without getting lost in the details
- by establishing a mentality dedicated to continuous improvement, to the spread knowledge and organizational change
- focusing on the most critical projects for the organization
- promoting the dissemination of skills and facilitating people’s growth talented.

5.3 International Projects

In principle, international projects do not differ in substance from any other project. Throughout the book, I have included considerations and suggestions to help you deal with any type of project, including international projects. Those who have experience in project management, however, know well that managing a project among one’s own compatriots compared to one in which the project team has members from many different nationalities is quite different, and many things we take for granted are no longer valid. Imagine, for example, managing a project where everyone is from your country—colleagues, customers, suppliers, other stakeholders—and another where your company includes three other production sites on as many continents, the customer is Japanese, a North American supplier, another Indian, and the reference legislation is partly international and partly national to the customer. There will always be a

WBS, a Gantt, a budget, and there will be meetings and gate reviews, but the coordination effort will be different.

In fact, managing international projects requires the project manager and the project team to deal with cultural, organizational, geographical and time zone differences. This is why managing an international project goes beyond the mere application of standard project management techniques. In an international project, the project manager has to deal with very heterogeneous stakeholders, in an extremely empathetic and creative way, also in order to achieve objectives that become challenging due to the nature of the project, and that would be considered much less challenging if carried out in a local and not international context. **The importance of relational skills (soft skills) has an exorbitant impact when compared to a non-international project,** and it is precisely in the field of people management that the difficulty is measured.

In particular, special considerations must be made about how leadership and motivation should be managed. In fact, several studies have shown that each culture has its own preferred leadership styles, so the project manager of an international project must pay particular attention to using the leadership style that is most appropriate not only to the context of the project, but also to the cultures with which he or she is interfacing. It is therefore necessary for a project manager who is commissioned to manage an international project to inform him/herself about the cultural aspects of the people who will be working in the team so that he/she can best exercise leadership.

A key aspect of leadership is related to motivation. Also this aspect is strongly influenced by national culture. **Individual cultures** value autonomy and resources work well if they are left free to organize themselves with clear tasks and objectives. **Collectivist cultures**, on the other hand, value interactions with the team and time spent together, such as during lunch breaks or after working hours. In the case of international teams working virtually, the effort of the project manager to accommodate and motivate members of collectivist cultures can be very considerable. Other issues to be taken into account in motivating team members are the preference for a financial reward, or instead for free time: here too culture —as well as the inclinations of individuals—may have a relevant weight.

For this reason K.Köster indicates the following as the necessary characteristics for an international project manager:

- Adaptability
- Genuineness—being as you appear
- Empathy
- Be sensitive to context and cultural issues
- Audacity in experimenting new solutions
- Enthusiasm for the project and the international context
- Openness to innovation
- Personal stability: must be aware of being the right person in the right place
- Openness
- Patience and perseverance
- Respect for others

A project manager should pay particular attention in the early stages of an international project to the formation of the team to ensure effective leadership from the outset. K. Köster again indicates the activities listed below as crucial and always necessary.

a. Interview key stakeholders about their direct and indirect expectations related to the project

b. Carefully plan the first meetings of the project

c. Decide on the contents and objectives of the first meetings of the project together with the team members and key stakeholders

d. Place great emphasis on building trusting personal relationships with team members and key stakeholders

e. Exploring the similarities and differences between the cultures involved in the project

f. Agreeing on ground rules for cooperation

It is evident that these are activities that would be good to carry out always, even on ordinary projects, but on international projects they become vital. In fact, if you miss even one of these activities, I guarantee you that the project will have difficulty getting off the ground because of

problems of collaboration and mutual understanding among the members of the team.

For those who work mainly in international contexts, I recommend reading K.Köster's book indicated in the bibliography.

5.4 Major Works, Large Projects and Megaprojects

In the international literature, "megaprojects" are defined as the way in which complex, large-scale investments are made in a variety of public and private sectors, with an investment value exceeding one billion dollars/euro. These projects have a very high riskiness, are typically very difficult to manage, and often, in the end, fall far short of the expectations of when they were started [Denicol et al., 2020]. Still in literature, similar projects but with amounts from 100 M€ upwards, are called Major Projects or Large Engineering Projects (LEPs), showing the same phenomena related to the complexity of the interventions, although to a lesser extent, and are normally called "Major Works" [Miller and Lessard, 2001].

The idea that the threshold for defining a "mega" or "major work" project is not simply a matter of budget is fairly well established: in addition to the value of the investment, an indicator of complexity can also be identified in the number of stakeholders that the project has to deal with, and this is how an IT project, for example the creation of an electronic health record (HER) for the citizens of a region of our country, worth several million Euros, can be defined as a "mega" or "major" project not from the perspective of the budget but because the number of stakeholders equal to the citizens of the region itself, and can be expected that phenomena emerging in it can be similar to the one of megaprojects, despite a very low investment value compared to the norm. Megaprojects always require a multidisciplinary approach [Favari and Cantoni, 2020].

One crucial feature to be evaluated when deciding if to start a megaproject is the value creation: direct economic benefits—the one typically included into classical Benefit Cost Analysis—are less and less of the benefits generated and mentioned by stakeholders involved in the decision making process of a megaproject. It is generally requested to include indirect economic benefits into the Benefit Cost Analysis, that are

somehow quantifiable. But there is also a “third” category of benefits that cannot be directly monetized, but that anyway exists and are on the table of (political) decision makers when determining if the megaproject has to be done. In this scenario, it is pretty common that megaprojects with negative Benefit Cost Analysis are anyway executed and, afterwards, become successful examples: the reason is that actually that benefit to cost ratio was not really negative, but rather CBA is narrowly defined, not including all the benefits that stakeholders would receive from the project.

A common problem of megaprojects are poor performances in terms of schedule, cost and quality of the final result, independently from the region of the world where they are carried out. The situation seems not to have improved over the last 70 years. Flyvbjerg coined the “Iron law of megaprojects: over budget, over time, over and over”. Many scholars, in particular Edward Merrow, Bent Flyvbjerg, Peter Love and Giorgio Locatelli, investigated on this subject. Actually, the Flyvbjerg’s iron law is a social construct, based on the rationalistic assumption that a megaproject’s performance can be assessed just in terms of “on time”, “on budget” but this does not make any sense in megaprojects.

In fact, one basic issue with megaprojects is that it is very difficult to establish a baseline against which to measure: in fact, it takes years for megaprojects from the time they are proposed to the time they reach the laying of the first stone, and it takes yet more years—sometimes decades—to get to the inauguration. In addition, since these projects have a large component of complexity and innovation, they cannot be expected to be planned in a perfectly predictive manner, also because one characteristic of mega-projects, compared to ordinary projects, is that they modify the environment in which they are implemented: if I insert an ordinary project in a defined environment, it will be quite easy to study how the surrounding environment will react to the new project (for example, if I insert a shopping center + in a district of a city, I can foresee with a reasonable precision how the traffic will be modified as a consequence); quite different is the case of the construction of a completely new system such as a new subway line in a city that does not have one, because such an operation will modify the environment: a case that is often quoted is the red line of the Milan metro, which is forked in the peripheral sections and therefore admits the frequency of circulation of half of the trains compared to the main section: when it was built it was absolutely sufficient to satisfy the transport

demand, but now, if you look at a map of Milan, you can see how the city has developed around the metro line within a radius of a mile, and today, in the peak periods, the demand for transport in the peripheral sections is much higher than in the previous years.

This phenomenon associated with major projects poses one of the biggest problems for decision-makers: it is in fact useless to develop feasibility studies in the traditional sense, in which we study how the work works in the existing context, simply because the environment in which the work will operate once completed will be different, and it will be thanks to the work itself. What is done to resolve this paradox is normally to make very strong assumptions about the final situation of the environment in which the work will be located. Like all hypotheses and assumptions, these generate risks, and in particular, in the case of large works, the risk that occurs almost constantly is a propensity to optimism (optimism bias in the literature) of the promoters, i.e. the phenomenon whereby the costs are underestimated and the benefits are overestimated, making the feasibility analyses substantially positive.

The optimistic bias and the strategic misrepresentation are two central players in this game.

- Optimistic bias means that the stakeholder promoting and involved in a megaproject tend to under evaluate negative event and risk, and concentrate on positive aspects and opportunities. This affects any estimate in the project and causes any baseline to be unrealistic.
- Strategic misrepresentation is the tendency to knowingly underestimate costs and overestimate benefits when presenting a megaproject for approval.

Another specific feature of meg-projects compared to ordinary ones is the great difficulty in collecting the lessons learned, because these are projects with such an extended time horizon and with such a great variety of actors involved that no organization manages to collect in an effective time frame the experiences on what worked and what did not, and this generates the fact that in many megaprojects the same mistakes are made as in previous megaprojects. It is now a consolidated practice at the international level that, in order to carry out a megaproject, the promoting organizations set up a Special Purpose Vehicle (SPV) to limit the risk of the initiative and not allow it to spread to the original organizations in the event of problems,

and this obviously diminishes the presence of structured returns on experience. On this aspect academic research can contribute a lot.

Some studies also identify the lack of project management culture in the decision makers and stakeholders involved in a megaproject decision and development. [Denicol et al., 2020].

Also lack of proper stakeholder engagement and 3P sustainability approach are claimed to be the causes contributing to the iron law, causing high level of conflict during the execution stage of megaprojects resulting in major changes with cost and schedule delays.

The literature identified several cures for addressing these issues. Among these:

– Improving estimates with an extensive use of case studies and benchmarking. A way for implementing this is the reference class forecasting, that [Flyvbjerg, 2006] “is a method for systematically taking an outside view on planned actions. More specifically, reference class forecasting for a particular project requires the following three steps:
– Identification of a relevant reference class of past, similar projects.
– Establishing a probability distribution for the selected reference class.
– Comparing the specific project with the reference class distribution.”

Reference Class Forecasting is essentially a way to try to create a more reliable budget, basically estimating a budget uplift. The problem in the implementation is that a megaproject behavior is sensitive in time and place. And thus what happened in the past in other places is a bad indicator of future project performance.

Peter Love is highly critical of Reference Class Forecasting and argues we need heuristics, but the problem is we still do not have them, and project sponsors and executives want predictability.

– Modularization and standardization
– Clarifying since the beginning “What is the purpose” of a megaproject [Nuno Gil, 2022], including the generation and distribution of value between the broad stakeholders audience, including non-market stakeholders.
– Identify your stakeholders: often the law defines who the stakeholders are and says who you need to consult, even if you can go beyond the mere law dictate. The tricky question is when is it necessary to engage in consensus-oriented negotiations? If you do it too early, you can shoot

yourself in the foot because your traditional cost benefit analysis will look horrible, and perhaps you cannot build consensus, but if you delay too much consensus-oriented talks, it can also backfire — you can get a really disruptive late change. Again, the trade-off is never easy.

The studies on megaprojects also lead us to reflect about the difference between project management success and project success (see in this chapter).

5.5 Multi-Project Environments (Program Management)

In my experience, very often organizations fail to implement even the most elementary project management practices because the projects they develop are of limited size and the same resources (from the project manager to the project team) are normally allocated to many projects, without any real coordination between the different projects and a clear definition of priorities for the resources, which, due to this situation, are usually extremely stressed generating a high rate of turnover. In addition, single projects should also be considered as multi-project environments, born from a single contract, which, however, activate many sub-projects in parallel, carried out by several business units or different suppliers/partners, such as a railway line complete with all civil and technological subsystems, a pharmaceutical or food automation line that includes isolation and sterilization systems, a website that includes e-commerce and direct interfaces with social networks, management and CRM etc. Managing these types of initiatives as individual projects and not as programmes causes the same problems as the mismanagement of many individual projects.

In many cases the coordination between projects is done at the level of functional managers of the different departments involved (chief project manager, chief technical officer, chief production officer etc.) maybe with a periodic (weekly) meeting plus extemporary phone calls and emails to manage urgencies outside the periodic meeting. This system always fails because it is not humanly possible to effectively manage such a magma, neither as managers nor as members of the project team. It is in these cases that managers can be tested on their organizational competences, because it is they, and not the project workers, who must design an organizational

system in which priorities are sufficiently clear and no escalation is necessary for any, even minimal deviation, with a subsequent queue outside the managers' office waiting for instructions from above.

A mortal sin that is made in the planning of multi-project environments is not to take into account the loss of efficiency that each resource faces in moving from one project to another: in my opinion a single person can reasonably work on no more than 5 projects, beyond this limit the risk is that the "background noise" caused by continuous interruptions (while I work on a project I get a call from the client of another project or I am called to a meeting for another project or an emergency arises on yet another) that generates an unsustainable stress in the medium term (by project managers and the rest of the project team) who inevitably perform poorly, become depressed and sooner or later resign. The choice of the project portfolio of an organization, in the commercial phase, has to take into account these aspects, and to foresee an appropriate management effort.

The first step for functional managers, in my opinion, is to equip themselves with a shared system for planning and managing priorities: today this system can only be software, which must be sufficiently customized to the specific needs of the organization, and which must make it possible to manage the priorities of resources by avoiding queues outside managers' offices.

The issues that need to be carefully managed in multi-project environments are:

- An appropriate level of resource autonomy, based on quantitative thresholds, to make decisions on deviations without having to wait for feedback from your manager. This must include tools to decide whether to focus forces on one project or another at a given time, according to the needs of the organization.
- Planning of activities taking into account that resources will never (or very rarely) dedicate 100% of their time to a given project, so planning with lower percentages of resource availability allows to have a clearer and more realistic vision of a project duration. Furthermore, the planning cannot disregard the trend of the other projects on which the resources will be allocated at the same time. It is possible that, by assessing the other projects in detail, some similar activities can be carried out in synergy, reducing the total effort needed to carry them out if they were managed independently (for example, if two projects both produce parts

that require the same job, you could organize those activities together, reducing the overall duration and probably achieving economic efficiency).

- Resource Effort Planning and Project-based allocation of resources. This helps to avoid constant overloading of some, often the most valuable, resources in the company. Another exercise that is easy to implement, but of fundamental importance, is separating milestones and deliverables between projects managed by the same resources. All these management methods are easily implemented with the project management software available today.

A real Project Management Office (PMO) that harmonizes tools, methods and processes is of great value in multi-project environments, because it facilitates communication and interfaces between team members, when they move from one project to another, because they all speak the "same language". For example, within the same organization, standardizing the WBS (at least for each division) and, as a cascade, standardizing the high level structure of plans and budgets, requires very little effort to implement but has crucial impact on the efficiency of the company's processes. A problem that sometimes prevents the implementation of good project management practices in multi-project environments is the presence of very different sized projects (even of one or two orders of magnitude in budget value) and this raises doubts about the effectiveness of project management techniques ("it doesn't work here because we are too different"). This problem can be easily and reasonably remedied by defining one or two thresholds that determine which projects are large, medium or small (or even just large and small) and implementing comprehensive methodologies for large projects, and reduced management methodologies for smaller projects. I often come across organizations that qualify as projects the supply of "on the shelf" products or, in any case, products with very little customization and very low value: this type of supply can be easily removed from the management of the project management office and managed directly by operations, or a project manager or two can be appointed to manage these micro-projects more effectively.

At the end of this short paragraph, a recommendation: in multi-project environments, which are, in my experience, the absolute majority of cases in which organizations working for projects operate, the co-ordination of

initiatives (program management) is as important as an appropriate project management. Adequate performance in project management cannot be expected without appropriate program management, the effectiveness of which is delegated not to individual project managers but to another organizational level (normally the n + 1 of project managers in the hierarchy).

5.6 Product Management

Product management consists of the strategic management of the entire life cycle of a product, from the initial development, to its eventual launch, to the support and continuous improvement until its withdrawal from the market. It is immediately evident that product management consists in the management of a portfolio of projects which are connected by the fact that they all address the same product. At any time during the life of a product, based on feedback from the market and customers, product management can initiate projects or programs in order to create or improve components and functionalities.

Although product management is a separate discipline from project management, there are many considerations that unite them. In the most modern sense, product management is recommended to:

- create stable project teams that can operate throughout the life of the product
- use incremental funding systems that activate funds based on the projects that are initiated, always evaluating the benefits that each project brings to the overall value to the organization
- apply program management techniques.

5.7 Project and Project Management Success

In 2018, the Project Management Institute, in its annual Pulse of Profession report, conducted surveys of a very large sample of project managers. They found questions such as, “How many projects in your organization come to fruition on the time, cost, quality originally planned,” while further down the line a question was along the lines of, “How satisfied are you with the projects that are taking place in your organization.” Surprisingly, the

percentage expressed in the answers to the first question was about twenty points higher than the answers to the second. In other words, there is a substantial proportion of projects that are completed within the time, cost and quality established in the initial plan, but still do not satisfy the stakeholders.

This aspect, which in reality was already the object of debate since the end of the 1990s (a milestone for the debate is Roger Atkinson's 1999 article Project management: cost, time and quality, two best guesses and a phenomenon, it's time to accept other success criteria) is increasingly evident for those who manage projects, even in the most strictly finance-oriented organization. The reality is that it almost never happens that projects (including those born out of contracts signed with third-party customers) are started solely for economic-financial reasons - to generate margin. On the other hand, this does not mean that the project manager has to disregard the efficiency in terms of Time–Cost-Quality of his project, but he has to be aware that there is also something else. And this "other" is always different, and is specific to each stakeholder, so a further burden of the project manager is to understand what the expectations of the project are for the individual stakeholders and make sure to accommodate them as much as possible. If a stakeholder has an exorbitant request that the project cannot meet as designed (no budget or no time), it should not simply be ignored, but the issue should be addressed with the stakeholder and sponsor to avoid raising false expectations.

According to some the success of a project should be measured not only against the dimensions of the magic triangle quality-time–cost, but against the three pillars of sustainability. This is more true than ever for projects using public resources, but increasingly also in the private sector it is evident that a sustainability strategy of organizations requires further attention not only to financial sustainability, which is normally unbiased by the magic triangle, but also to the environmental and social dimensions. In fact, already in the medium term, the additional costs of the amount that the project has to face in order to internalize the externalities in these two areas are amply repaid by the benefits that the organization can enjoy in the medium term (see the section on sustainability in Chapter 1).

In projects involving a large number of stakeholders it is essential to identify to whom the costs and benefits are allocated and how the value generated by the project is distributed. There are direct and indirect benefits

that are identifiable and quantifiable, so it is possible to ask those who receive them for their contribution to the project. There are indirect benefits which are not well quantifiable and which will be distributed over a class of stakeholders which is not well circumscribed: this is the case with many public projects, e.g. infrastructure projects. In the latter case, it is reasonable that the community bears the costs: this is, for example, the reason why it makes sense for those who will never use a certain road to contribute to pay for its construction, because they will indirectly enjoy the benefits that the new infrastructure will generate in the territory where it is built.

Every project hides a number of benefits, most of which are not outlined in the project documents (business case and project charter above all), but which some stakeholders intuitively expect. These hidden expectations, if not identified at an early stage and managed during the project, generate dissatisfaction among the stakeholders and cause lack of support. And in the end these stakeholders will not be satisfied with the project even if it has been completed on time, and on budget?.

Project management success it typically measured against the iron triangle, instead a project' success against the effective benefits that the project result can actually deliver throughout its life. So a project manager, today, must have excellent control and ability to reporting with respect to the three dimensions of the magic triangle—which are never secondary aspects—but must also know that this is not enough: the benefits and value that the project brings to an organization transcend only these dimensions, and a project manager must be concerned to identify the value that the project spreads among all stakeholders, do everything possible to represent it and keep its evolution monitored.

5.7.1 Project Management Stress

Being a project manager exposes to stress. Even if in theory everything is clear, those who work as project managers and, in general, those who work on projects, know very well how there are an infinite number of more or less predictable issues, which can be triggered on the project with critical outcomes. The project manager is always responsible for the result in the eyes of the project team, the client, the sponsor and the stakeholders. In addition, projects by their nature have periods of greater calm and periods of greater intensity, which can hardly be covered with an adequate increase of resources, generating great stress. Since the project manager is always a

single person, even though he or she may have good collaborators, when entering critical phases there are several aspects that are very difficult, if not impossible, to delegate. But this does not demotivate project managers, because for many it is also the most satisfying job they can aspire to.

Having said that, you absolutely must not accept stress, you must limit it, circulate it and do everything you can to defuse it. And the only antidote I can suggest is to fully apply project management, which is what I have tried to expound in this book. It is not uncommon for some people to let themselves be overwhelmed by stress, and get used to working 12 hours a day, including weekends, saying that in their company or in their industry it is so and there is nothing that can be done. In this way one easily becomes a corporate zombie (see "we must bite the bullet!" in Chapter 3) and is not effective in project management work. One has to defend oneself against such situations, into which I see many people getting inexorably dragged. **An effective antidote is to learn to say, to colleagues or bosses or customers or suppliers, polite and motivated but firm "no!"**. Very often there is the misconception that the project manager, since he or she is responsible for the final result, must be the "complement to 100" and therefore must do everything that the rest of the team does not do for some reason. I've seen colleagues put themselves in charge of the technical department, or some area of production (literally wiring up machines) or testing and quality control: it can't work, or at least it can't be the inexorable norm on any project a project manager manages. If there is a lack of resources for critical activities, the project manager must have anticipated this beforehand, must have secured them, and if they are lacking he or she must start with an appropriate escalation—up to the president of the organization if needed—and if the president is not interested in the project, it is obviously not of interest to the organization, so it is ok to delay the project according to the resource available. And so on.

In my career (I started as a project manager on large projects long before I studied the discipline and got certified) I have found great relief since I understood in general what it means to manage projects and started applying the discipline of project management. Stress reduction in limiting and identify areas of uncertainty, know what is due and what is not according to the contract, work from the earliest stages in favor of clarity to defuse subsequent discussions, should be done primarily for their own sake.

In summary, **the best—and I believe the only—antidote to project management stress is project management itself**.

However, there are toxic organizations in which it is completely impossible to express oneself as a project manager, even with the utmost commitment and competence. There may be many reasons for this: it may be that the head of project management has been appointed for the halo effect but has no specific expertise and preaches something between common sense and "we need to grit our teeth", or that the rest of the company believes that project management is a secretarial function and is there to do the things that others don't like/do not want to do, or that the company is completely unstructured and governed by the leadership of a nun, or something similar. Unfortunately, in my experience, organizations of this type are not few. If you find yourself working in such organizations, you must patiently and diligently point out the problems you face, explaining the risks that bad project management can cause to the company. If, after a few months, you see that the organization is not interested in improving in any way, and the constructive attitude of organizational learning is not only not appreciated but unwelcome, I recommend looking for another position, even if you earn a little less, where there is evidence that project management has a minimum of maturity, or there is a real opening for it to mature.

Myth: Stachanov

Aleksej Stachanov (1905–1978) was a Russian miner and Soviet hero because he was able to improve the organization of the work in mines increasing productivity by many times—so actually a good example for all of us. Today the word "Stakhanovite" is used to refer to a person working very hard, and no longer very efficiently compared to the original historical figure of Stachanov who did.

I refer to "Stachanov" to those colleagues that are proud to show everybody that they work 15 h per day, including weekends, and send emails during the night or during the weekend. My assumption is that these kinds of people are not actually good employees, because they are very far from being efficient in their daily activities, and because it is humanly impossible to be efficient working 24/7. Most likely, even if very committed on the project or to the company, these people are dramatically disorganized (see "the hamster" in Chapter 1) and risk

becoming zombies (see “we must bite the bullet!” in Chapter 3). In addition, they make all the rest of the team feel ill at ease because they typically implicitly assume that, to be an adequate and committed project team member, you have to behave like he or she does.

If you have a Stachanov in your team you have to address the situation immediately**: the normal situation must be working the normal 8 or 9 h per day, and enjoying free time for relaxing and recharging with family and friends. Emails and other communications must normally arrive during working hours.** There can be exceptions to these rules only in very specific situations, such as very critical phases of the project, but for sure this can’t be a project normality. You can, for example, work on the ground rules or on the team charter to establish with the whole team what is considered as normal behavior, and ask all of the team members—including Stachanov—to follow the common rules. If not, Stachanov will become a source of stress for most of your team members and reduce the overall harmony and ability to cooperate in your team. **“Working smarter, not harder” must be a continuous effort for any project manager.**

5.8 Certifications

In the jungle of project managers who rely on common sense, and companies who think that project management is the secretariat of contracts, I recommend that anyone who wants to be a project manager seriously consider a certification that can easily allow anyone to distinguish themselves from amateur project managers. Obviously a person can acquire the same project management skills as someone who is certified without having a piece of paper to attest to it, but if you are certified it is certainly easier to be considered for the most interesting positions. There is a wide variety of certifications on project management: below I try to represent those that, from my point of view, are the main ones and that you should take into consideration.

5.8.1 Project Management Institute (PMI)

It is one of the world’s leading project management organizations, founded in 1969 in Philadelphia (PA, USA) where it still has its headquarters. It

offers several project management certifications, all at individual level (it does not certify organizations for project management processes). For details, please visit: www.pmi.org/certifications.

The most widespread and, from my point of view, most recognized certification in the world is the Project Management Professional (PMP). The requirements for access are a degree or diploma, respectively 3 or 5 years of experience working on projects, and 35 hours of project management course. The exam is done on-line and consists of 180 multiple choice questions with a maximum time of 230 minutes. The result is immediate at the end of the test.

If you don't qualify for the PMP, you can opt for the Certified Associate in Project Management (CAPM), which requires a bachelor's degree or diploma, respectively no experience or one year of experience working on projects, and 23 hours of project management training.

5.8.2 International Project Management Association (IPMA)

The oldest project management association is IPMA, founded in 1965 (some years before PMI) and still one of the reference points for project management. It offers several certifications, both individual and organization-wide. On the website you can see the details: www.ipma.world

Individual certifications range from IPMA level E (dedicated to people who have no experience) to IPMA level A which is for "Project Director". Simplifying, we can say that IPMA level C is the analogue of PMI PMP, and IPMA level D is the analogue of PMI CAPM.

5.8.3 ILX Team

PRojects IN Controlled Environments (PRINCE2) is a very popular certification in the UK and Commonwealth countries especially in governmental bodies. PRINCE2 certifications are issued by the ILX Team and differ from those of PMI and IPMA because PRINCE2 is a specific and defined methodology, whereas PMI and IPMA certifications are a body of knowledge and the specific methodology is left to the individual practitioner. There are a number of PRINCE2 certifications, the most common being spread are PRINCE2 Foundation and PRINCE2 Practitioner. You can visit the website for details: www.ilxteam.com

5.8.4 Scrum Alliance

Of the specifically agile certifications, the most popular are those of the Scrum Alliance. The most well-known is Certified ScrumMaster (CSM). Details at: www.scrumalliance.org

5.8.5 ITIL

The Information Technology Infrastructure Library (ITIL) is a set of detailed practices for IT activities that focus on aligning IT services with the business needs. Certification in ITIL is only available to individuals, and go from ITIL Fundation to ITIL Master. It is more related to service management than to project management, even if in several IT projects, project managers are also required to be ITIL certified. Details on: https://www.axelos.com/certifications/itil-service-management

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5.9 Conclusion: The Mere Mortal's Way to Project Management

> *We know why projects fail, we know how to prevent their failure—so why do they still fail?*
>
> *The "Cobb's Paradox" by Martin Cobb*

If you are a mere mortal project manager, that is a normal project manager managing normal projects, after reading this book, maybe you are willing to implement some improvement in your organization about how projects are managed. I am glad, this was my intent when writing this book. On the other hand, I want to warn you: it is one of the toughest projects! Most likely, it will turn out to be a programme, because probably several projects need to be implemented together to achieve such an endeavor.

1. First of all: find your sponsor! It is very unlike that you succeed in implementing such a change without having a **strong sponsorship of a top executive internal to your organization**. The best would be the CEO or an Executive Director. If you cannot find such a sponsor, maybe you can address some change just in the way you and your team work.

2. **Find an external consultant** you feel is able to understand you, your organization and your market. The perspective of someone external to your organization and with a strong reputation is fundamental. Unfortunately, project management is a field full of self-styled experts and consultants, which in many cases are only able to provide basic classes with slides that probably are not made by them. A project management consultant is something else. As minimum requirement, look for someone **that has experience both as professional project manager of major international projects and as a lecturer in top institutions**. A consultant without such a curriculum probably will turn out to be a kind of "yes man" for you, not able to identity the sore points in your organization, discuss with you and look for solutions considering the most up to date theory, practice and trends globally. Such consultants typically are not cheap and not easy to find, but maybe they will accept to be involved part time in your project together with junior consultants working with them, and this solution generally represent the best compromise.

3. **Identify your stakeholders**, at least the most important. Decide which to involve from the beginning (not only the supportive ones, on the contrary meeting the gatekeepers in your organization you expect to be contrary to your initiative can help a lot to better target your intervention). In my experience, the needs are different between **project managers, executives, non-project managers** participating in project teams such as technicians, and non-project managers not participating directly in project teams but somehow involved in project development (often departments like procurement, quality, marketing, HR). **Don't forget your customers, and your suppliers neither**: your project management strategy could not be considered completed and effective if you avoid these crucial stakeholders. With the ones selected, spend a lot of time talking, understand their needs and their concerns—most of them won't be explicit, and you will need all your empathy skills to understand them. **Work to co-create and shape with them the project scope**. Get onboard those stakeholders that will have an active role in the project team.

4. **Clearly identify what the need of your organization is, customer and industry: maybe it is enough to implement, at least at the beginning, only basic features**—I would focus on having most of your stakeholders at a reasonable level at the end of the project than having bombastic tool and templates that nobody will use. Benchmark your competitors both in the market and outside it. Look for the basics at the beginning, and only after the new way of managing projects has become a normal attitude in your organization, go ahead with another step. A common mistake when starting this journey is to be eager to implement the most advanced tools and techniques that few in the organization can understand, and causing a rejection of the project results, defeating all the efforts. When deciding the scope of such an initiative, you must be realistic in setting the goals and pace yourself: it will surely take time (first results won't start occurring before 6 months, and the complete implementation will be a matter of years), so **perseverance is the key**.

5. Clearly **identify the benefits** you want to achieve and share the vision with the sponsor and the stakeholders. **The economic benefit of improving management practice into an existing organization is always hard to quantify and to agree upon with executives**. So, in parallel with economic benefits of decreasing non-effective meetings, fighting waste, reducing reworks of white and blue collars, I recommend to compile a list of indirect and non-quantifiable benefits such as the improvement of customer satisfaction and opportunity of becoming partners of major customers, reduce stress and improve employees retention rate, becoming a success story in the industry (for additional suggestions please see the section on sustainability in the Chapter 1). The benefits must be shared in the approved project charter and reviewed time by time with the steering committee of the project, to keep all the stakeholders aligned on the purpose.

6. Define the extent of your intervention, identify the projects that compose your programme—a common mistake is to consider such an endevour a single project and not a programme with single projects with a single manager—and draft a roadmap—it must be managed

with an agile approach, or, if you prefer, with a hybrid approach with a lot of agile features.

7. **Only when you feel that the extent of intervention is reasonably clear and you feel safe with a strong sponsorship and significant stakeholder support, jump into the execution phase**. The leadership of such a project is generally slippery, so you had better be very careful in having a management approach that is agreed with all stakeholders. In particular, it is better to agree on the frequency and the purpose of meetings, and on the—kind but steady—level of control that you must maintain on the progress of activities. It is very common that activities related to such a programme goes at the bottom of everybody's personal backlog, and are constantly overlooked due to other priorities coming from the operations: this is obviously not acceptable for you, so you must be confident to a control system in place able to identify when some activity is not progressing and, if you can't find any solution with the person responsible, immediately escalate. The **frequent and timely delivery of results is critical** to maintain a high level of sponsorship and, in general, of executive support, throughout the execution of the initiative. **Rewarding and celebration** of project achievement with all the people involved in its development is of particular importance for maintaining everybody's commitment and focus on it.

8. When addressing formal **training**, be sure that financial resources are allocated, and the time for people to attend is also allocated. Be sure that everyone involved understand the reason for that. A typical case is the i**nvolvement of technical personnel into managerial and behavioral classes for their first time**: you must work to get them prepared, if not the rejection of what is taught during the course is almost sure. Executives of the company often tend to send their subordinates to classes, because "they have no time and already know everything". This is a capital mistake: **executives should be the first group to attend classes** of project management in order to prepare the ground for their collaborators. It is impossible that your organization improves its project management skills if executive have neither a rough idea of what project management is or what its basic principles

are. **The learning program dedicated to executives must be specific for preparing them to be effective as project sponsor.**

The learning program for project managers must be complete: under no circumstances can you have competent project managers with 3 day course in 3 weeks on the whole. In order to have all the project managers population aligned, you have to plan an extensive training program including project management basics and advanced concepts, people management and digital tools. The risk of an incomplete learning path is that the final feeling of participants is that "in the organization's reality" project management practices are actually not applicable. Three/four learning modules of 3/4 days each lasting for 6 months is what, according to my experience, is generally needed. The final target of an individual diploma or certification is generally the spur to make most of participant commit to the course. For training, go to the best: they cost a little more but they provide so much more than the mediocre. Opt for in presence classes rather than virtual, or a blend. **All virtual training will not be effective**.

Certifications in general—and specifically for project managers—**are**, in my opinion, something **very good** for guaranteeing the success of project management. Try to figure out: If your customer sees that all of your project managers are certified, they understand that project management is a serious thing for you. The same for your suppliers. The aura of professionalism in general helps in entrusting credibility from the beginning of any project, and the discussion in the project generally stays at a very professional and rational level. Moreover, after getting a certification that required hard work, your project managers will be committed on good project management practice and are more oriented to keep their career in project management at least in the middle term.

9. For the tools needed to implement project management, you must guarantee some investment in terms of new software and in integration of existing software. Some organizations refer to "frugality" as a principle to ask project managers to use freeware software or just a spreadsheet for managing project: this can't work. **To be a professional project manager you need professional tools**, that cost something but that can help in managing and integrating projects, and to show to your customers and suppliers that project

management is central in your organization. What is your impression if a supplier of yours provides you with a Gantt chart, even well done, but made on a spreadsheet? Do you feel confident of its project management practice?

You can address several digital tools: Gantt, ticketing, financial control, risk management. In my opinion, a tool such as Microsoft Project or Oracle Primavera is needed for a project manager. For managing the team, considering that today it is very common to work with virtual teams scattered on several time zones, a ticketing system can be useful for keeping the progress of single tasks on the project under control. For this purpose, Microsoft To-do up to Atlassian JIRA can be considered. With a similar purpose, e.g implementing a scrum-ban board, Microsoft Planner or Atlassian Trello can be considered. If you work very strictly with your team you can consider using an issue log based on a spreadsheet instead of the ticketing system, and a real board with sticky notes for the Scrum-ban. For the financial control of projects, I have seen that each company has a different approach, that is rarely under the control of the project management department and is typically given by the CFO department. The risk for project management is that, if not proactive with working with the CFO in tuning that tool, the project manager turns out to be more a project controller that a project manager. A wise CFO can surely understand if the reporting needed to him or her is too heavy and is therefore open to evaluate alternatives. If the reporting is very heavy and not value-added from the perspective of project management, but is maybe required for the management control policies, some dedicated staff of the CFO can be allocated to fulfill it. Regarding risk management, my advice is: there must be something to manage project's risks during planning and execution. In many companies there is some department managing product risk or running quantitative risk analysis or performing a risk checklist during the feasibility stage of the project before the go/no go decision, and nothing actually happens during project planning and execution. There are tools for project risk management that are very good, but, due to my experience, there can be even just a risk register made in a spreadsheet: the important thing is that it is used by project managers. Training on the software selected is also needed: online tutorials can be good for the basic

features, but to get the most out of your software you need some full training.

Obviously, not only digital tools are needed: you have to work on those tools required to implement the basics of a Project Management Office or, if it already exists, to make it effective. So make a list of policies and templates that are needed to make project management effective in your organization, without forgetting the integration with existing policies and other tools already in place and belonging to other departments.

10. Last thing, but you probably already guessed: **the mere mortals way to project management never comes to an end**. Since the beginning of your initiative and even after the completion of it, one of the results must be a permanent committee—meeting, for example, every semester—discussing the effectiveness of the project management practices and looking for improvements, since the beginning of the initiative. In any organization, there is always room for improvement! Happy Project Managing!

5.10 Further Readings

Below are some texts that I have found interesting for developing the skills and awareness needed to be the best project manager. I have teamed them into areas according to one's interests.

5.10.1 In depth readings

- Andrew Davies (2017), Projects: A Very Short Introduction, Oxford Univeristy Press
- John Elkington (1999), Cannibals with Forks: The Triple Bottom Line of 21st Century, John Wiley & Sons.
- Edoardo Favari (2021), Project Management per Comuni Mortali, Esculapio
- Bent Flyvbjerg (2003), Megaprojects and risk, Cambridge University Press
- Nuno Gil et al., (2017),Megaproject Organization and Performance, Project Management Institute

- Harold Kerzner (2009), Project Management: A Systems Approach to Planning, Scheduling, and Controlling, Wiley
- Kathrin Köster (2009), International Project Management, SAGE Publications Ltd
- Edward Merrow (2018), Leading Complex Projects, Wiley
- Antonio Nieto-Rodriguez (2021), Project Management Handbook, HBR
- Kenneth S. Rubin (2012), Essential Scrum: A Practical Guide to the Most Popular Agile Process, Addison-Wesley
- Kathy Schwalbe (2013), Information Technology Project Management, 7th Edition, Cengage Learning
- Gilbert Silvius (2012), Sustainability in Project Management, Routledge
- Robert Sutton (2010), The No-asshole rule, Business Plus
- Rodney J. Turner, Martina Huemann (2010), Perspectives on Projects, Routledge
- Vv.Aa. (2021), A Guide to the Project Management Body of Knowledge (PMBOK) 7th Ed. , PMI
- Vv.Aa. (2015), ICB4 - Individual Competence Baseline, IPMA

5.10.2 Research

- J. Denicol, A.Davies, I. Krystallis (2020)—What Are the Causes and Cures of Poor Megaproject Performance? A Systematic Literature Review and Research Agenda, SAGE
- Edoardo Favari, Franca Cantoni (2020), Megaproject Management A Multidisciplinary Approach to Embrace Complexity and Sustainability, Springer
- R.E. Freeman, J.S. Harrison, A.C. Wicks (2007)—Managing Stakeholders: Survival, Reputation, and Success, Yale University Press
- Nuno Gil, Yongcheng Fu (2021)—Megaproject Performance, Value Creation and Value Distribution: An Organizational Governance Perspective, Academy of Management
- M.Huemann, P.Eskerod, C.Ringhofer (2016), Rethink! Project Stakeholder Management, PMI
- Edward Merrow (2011), Industrial Megaprojects: Concepts, strategies and practices for success, John Wiley & Sons Inc.
- Roger Miller, Donald Lessard (2001)—The strategic management of large engineering projects, MIT Press

- P.Morris, J.Pinto, J.Söderlund (2009), The Oxford Handbook of Project Management, Oxford Univeristy Press

5.10.2.1 Exercises and case studies

- Harold Kerzner (2013), Project Management: Case Studies, John Wiley & Sons Inc.
- Mauro Mancini, Costanza Mariani (2021), Quantitative tools for a Smart Project Management, Esculapio
- Rita Mulcahy's PMP Exam Prep—use the latest version available, it is often subject to revision, as I write this the tenth edition is out.
- Andrew Ramdayal, PMP Exam Prep

5.10.2.2 Various inspirations

- On eudemonistic ethics: Aristotle (4th century BC), The Nicomachean Ethics
- On the complexity of the world we live in: Zygmunt Bauman (2000), Liquid Modernity, Polity Pr
- On the concept of good and bad: Marvin Harris (1986), Good to Eat: Riddles of Food and Culture, HarperCollins Publishers Ltd
- On decision-making processes: Julian Jaynes (1984), The Origin of Consciousness in the Breakdown of the Bicameral Mind, Mariner Books
- For the understanding of communication technologies and their impact: Walter Ong (1982), Orality and Literacy, Routledge
- On the approach to chaos: James Gleick (1987), Chaos, Penguin
- Benoit Mandelbrot (1977), Fractals: Form, Chance and Dimension, W.H.Freeman & Co Ltd
- For the approach towards the (project) environment: Michael Pollan (1991), Second Nature, Grove Pr