The Development of a Task Management Software (TMS): A bridge between Project Management's sub-activities (especially in multi-project context) and "ordinary" assignments to follow [1]

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ABSTRACT

For some people, organization is a way of life, from private life planning meals and shopping lists several days in advance, to the purely working environment: they keep track of all work projects, they always know what the present and future commitments and those to pay particular attention to are, and above all there is never missing a deadline. But what happens when, usually at work, time management becomes a difficult business due to a multi-project context with different tasks and sub-activities when there are also "ordinary" activities to complete and follow at the same time? The question comes immediately: "And now? What should I do first?"

Without having a specific software used to manage different tasks and schedules, it becomes difficult to remember all the sub-activities of a given project, to give the right importance to them, and then to balance it with office daily routine: consequently, the time spent cannot be recreated and once it has elapsed it cannot be reused. If it is used unproductively, it is necessary to add resources to complete the work required and this inevitably leads to higher costs. Therefore, this paper aims at investigating how the benefits of using a Task Management Software (TMS) in an office context within the company can lead an organization to seen improved the ability of managers and professionals (but also for the other Stakeholder engaged) to use and make the most of their time, by definition a limited resource and therefore precious for the achievement of business objectives. [1]

A literature review in the field of task management software was performed, with particular attention in setting the priorities, in terms of efficiency and productivity, between activities and tasks coming from projects but also "ordinary" duties. In more details, organizational and managerial aspects, subjects involved, advantages, enabling and hindering factors, and context of application were analysed, in order to prove that an implementation and subsequently adoption of

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a TMS can offer the necessary help for anyone who simply wants a solution to keep things to do under control, by excellently balancing and managing the tasks and schedules of a project and, at the same time, focusing on the office routine.

Keywords: Project Management, Task Management Software, Stakeholder Engagement, Eisenhower Matrix, multi-project Management, efficiency

INTRODUCTION

A project is by definition a set of cross-functional and multidisciplinary activities that are undertaken at all levels of the organizational structure and can involve from a single subject to thousands of people (stakeholders) with heterogeneous skills, disciplines, and different professional roles. The word itself derives from the Latin verb *"pròicere"* (or in a non-contracted form *"pro iacere"*), that is to launch or project: the focus is precisely the future, understood as planning, monitoring and advancing certain activities. [2]. In fact, they must be exploited, managed, and oriented to achieve the project objectives, with the ultimate aim of creating value for the company itself (Figure 1.1).

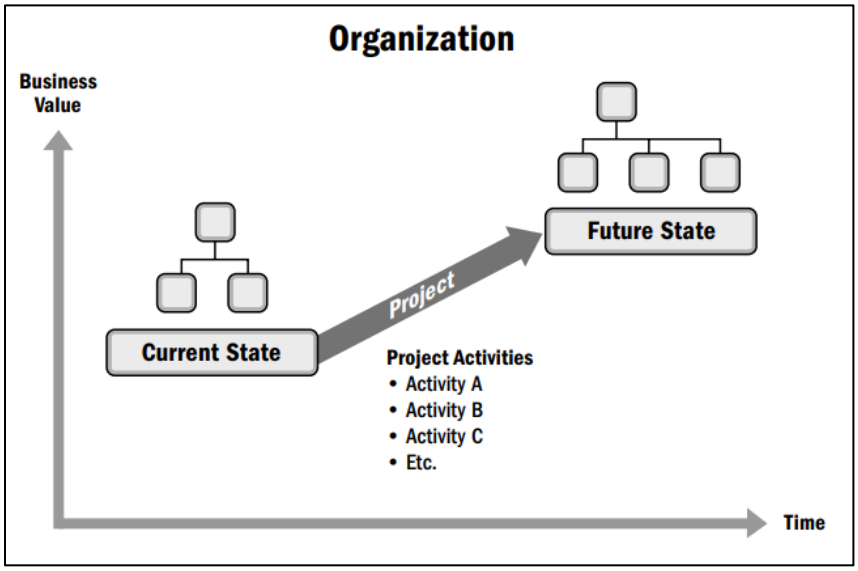


Figure 1.1 Transition of the state of an organization through a project Source: PMBOK, p.6 [4]

Organizational structures carry out the activities to achieve a series of objectives: generally, these activities can be classified as belonging to a project or operational functions, although the two categories sometimes have common areas. Projects and operations share many characteristics: they are both executed by people (teams), they are constrained by limited resources, they are subject to planning, execution and control. However, they are to be distinguished mainly by the fact that the operational functions are performed continuously and are repetitive in nature, while the nature of the projects is temporary and unique [3].

In fact, the expression *"Project Management"* refers to the management of all the corporate project activities concerning both the front and the back office: the Project Management Institute (PMI) defines it as "the application of knowledge, attitudes, tools and techniques to the activities of a project in order to achieve and satisfy the identified objectives and requirements "[4].

Project Management is, therefore, one of the most important activities in the company: it is dedicated to the analysis, planning, organization and control of the work done and to be carried out; defines the type and size of the resources to be involved (time, people, money, etc.) and the macro and micro objectives to be achieved; it operates through three main lines: people, processes and information/ technologies; it is transversal to both functions and organizational processes as it involves a team of specialists from various company areas and focuses them on achieving a specific result, for a common goal.

In particular, the Project Manager is the figure who summarizes, through his organizational and directive capacity, the skills and information of the individual members of the project team, managing the various activities to produce a result that changes the status quo of the organization and accompanies it up to the established goal. [5]

In such a context, organization represents an important issue for the working environment, but when the time management becomes a difficult business, for example, due to the presence and coexistence of many collaborators in large projects, in a multi-project context with different tasks and sub-activities, or simply when there are also "ordinary" activities to complete and follow at the same time, both assets and project activities management are penalized.

In fact, without the presence of a specific software used to manage different tasks and schedules, it becomes difficult to remember all the sub-activities of a given project, to give the right importance to them, and then to balance it with office daily routine: if time is used unproductively, it is necessary to add resources to complete the work required and this inevitably will lead to higher costs and the entire company will be penalized in terms of effort and achievement of performance objectives. Hence the need for the individual (but not only) to have a personal TMS.

A personal Task Management Software (TMS) is a tool that should describe the planning, prioritising and list-making of tasks employed by an individual user [6]. The TMS must not, however, remain an individual software but needs to be shared among the resources that deal not

only with the same project but also that they are found within the same functional scheme. Therefore, there must be various levels of profiling of the software itself in order to allow sharing and views on the various tasks according to the belonging of the resources to the various working groups. Users can choose over one hundred of them, which are currently available on the market and offer a wide range of functions and features [7]. However, according to Haraty et al. [7], the approval of these tools has been low and in most cases the activities are managed with modalities and instrumentation which are totally inadequate [5]: this phenomenon is caused by the fact that many people instead prefer using paper-based tools, an excel sheet or a wall blackboard to manage their tasks [7]; [9]; [10].

Nevertheless, the limitations of existing tools have been highlighted by previous literature. On this point, it has been identified that there have been some ambiguities or inconsistencies between the concepts perceived by users and those represented by existing time management tools (e.g. event priority) [9]: for example, Bank et al. [11] have pointed out that existing tools, in particular calendars, fail to act as an active repository, while Haraty et al. [7] have discovered that people prefer to use tools which they can easily personalise to suit their individual needs, which tend to evolve over time. They have further noticed that the existing tools have not been adequately equipped with such capability.

In the book "Kanban: Successful evolutionary change for your technology business" [31], the principles of the Kanban method are described by Anderson as "visualise the workflow", "limit work in progress", "measure and manage flow", "make process policies explicit", and "improve collaboratively" [32]. The core tool to execute the Kanban method's principles in practice is the Kanban board, which uses visual cards representing work items and columns as the stages of the process; the Kanban board can be implemented physically using post-its on a wall or virtually using collaborative Kanban board-based software solutions for managing and visualising projects and their corresponding tasks. An example of a Kanban board can be found in Figure 1.2.: the first column of the board usually contains the backlog of open tasks; once requiring new work, team members pull new tasks out of the backlog, which leads to a continuous flow and minimises idle times. In order to limit the work in progress (WIP), a maximum number of tasks is defined for certain columns. The visualisation of the workflow allows identifying bottlenecks and measuring the team's performance, furthermore, by adding new tasks to the backlog and prioritising it accordingly, new requirements by stakeholders can be fulfilled quickly [8]. Many companies offer virtual Kanban board implementations for different use cases and extend them with various features. The following Figure 1.3 below shows four of these tools in more detail. All presented applications are web-based: Atlassian Jira, Trello and Asana also provide mobile applications. However, existing implementations lack quantified information regarding the project's progress which support project scheduling and planning; therefore emerges the need for a board-based task management software that allows arranging tasks in arbitrarily nested lists with the aim of improving the visualization [30].

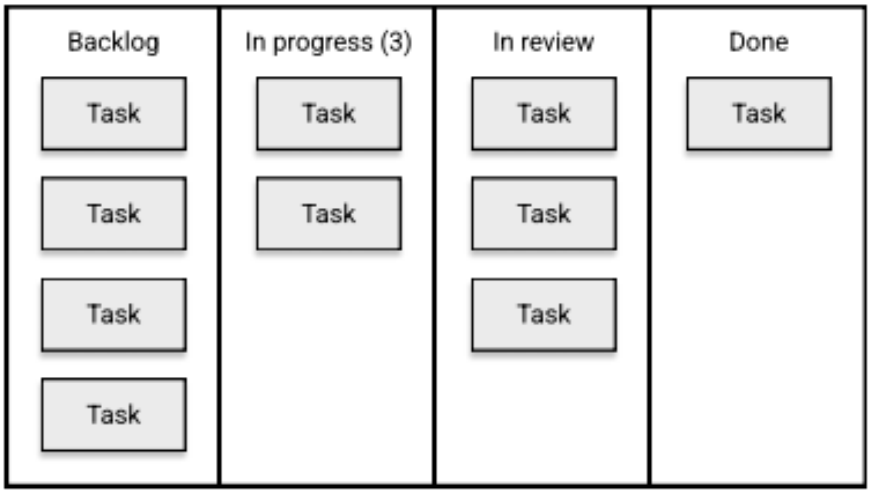
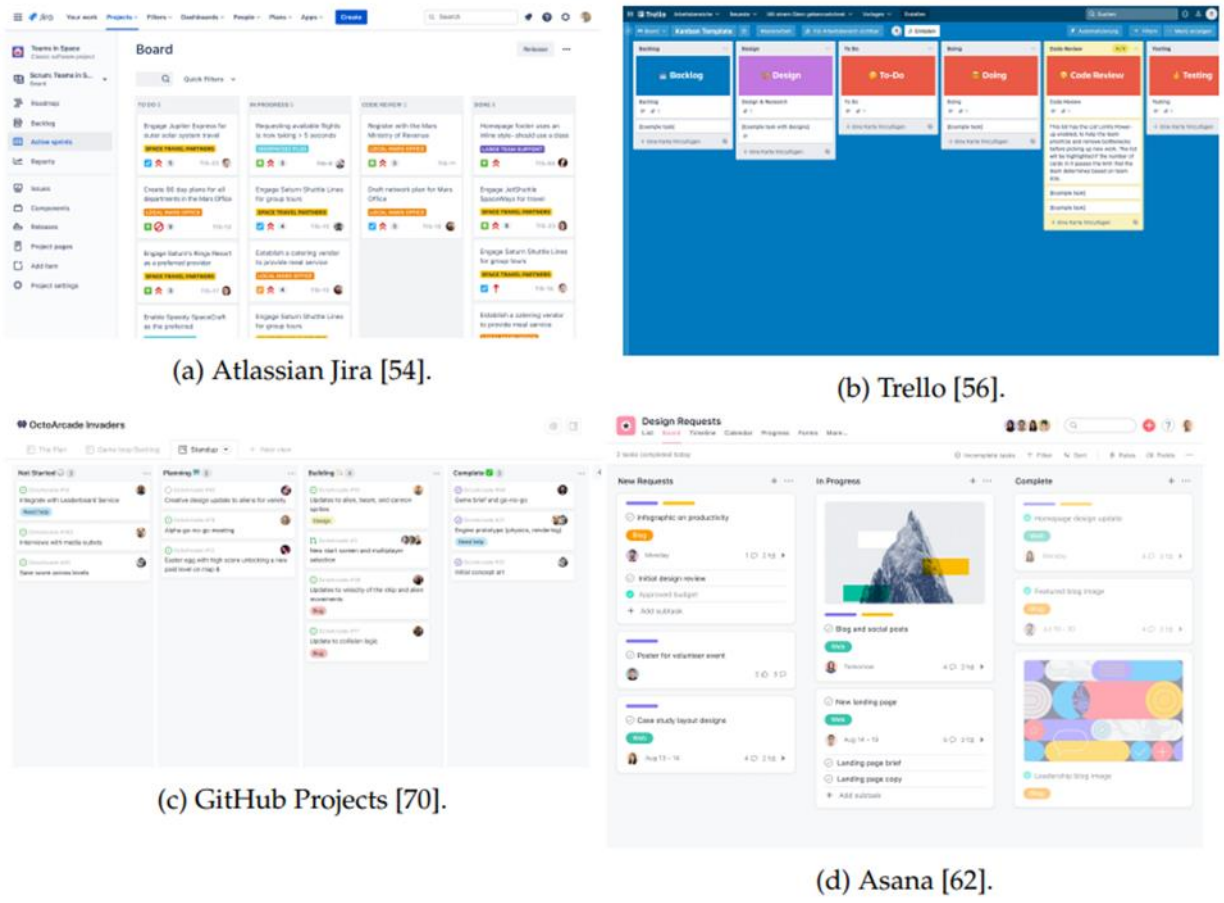


Figure 1.2 Kanban board with WIP limit for "*In Progress"* Source: Erdelt [30]



(a) Atlassian Jira [54].

(b) Trello [56].

(c) GitHub Projects [70].

(d) Asana [62].

Figure 1.3 Virtual Kanban implementations, Source: Erdelt [30]

The analysis of these cases provides a high added value to the topic as far as it clearly highlights some of the limitations of the existing TMS tools, which make it difficult for the users to manage them. It is obvious that, perhaps due to limitations of the tools used, none of these methods are oriented towards sharing information and collecting data: consequently, it is understood that, without an order management tool, it is difficult to organize work effectively and efficiently.

Haraty et al. [7] have also pointed out two reasons for such low adoption of existing electronic tools: the first can be traced back to the mismatch between users' needs and existing tools, while the second reason refers to task management tools' steep learning curve. In addition, Blandford and Green [9] have highlighted that some of the features represented by existing tools seem of ambiguous interpretation and use: some typical examples of TMS tools are *Achieve Planner* [12] and *Gtdagenda* [13]. Both these organization tools represent a 'priority' concept but in a slightly

different implementation: while in fact Achieve Planner provides four different levels of priority to show the degree of importance of tasks (A, B, C or D) and, alongside these, users can assign any number to further vary them, Gtdagenda on the other hand allows users to assign a number (between 1-5) to represent the priority.

Therefore, also due to their different implementation and configuration, it is now difficult to ascertain which of them is designed in accordance with users' needs, making it challenging to assess how well they can support users in their situated context of use [7]. To solve these problems, it is essential to first develop a detailed understanding of the primary organizational and managerial needs of the target users (both ordinary workers and project team members), embedded in a particular context of use, and consequently to plan operational and managerial steps to follow in order to complete the set performance objectives [7].

The paper is organised as follows: Section 1 is composed by an introduction, Section 2 illustrates the objectives and the adopted methodology, Section 3 reports the results of the analysis and, finally, Sections 5 and 6 set out the discussion of results and conclusion, respectively.

OBJECTIVES AND METHODOLOGY

As mentioned in the previous section, this paper aims at promoting the adoption of a TMS approach in order to increase the productivity of the individual (and overall) in the company, by structuring and organizing one's time better and establishing the right priorities, also favouring the control of the work carried out (both planning at team level and ordinary routine) both in terms of quality and compliance with the agreed time and economic constraints.

Some topics that remain crucial within a production process, regardless of whether it is the work of an individual or a team, are the following crucial aspects (CA) [14]:

CA1: *Identification and management of priorities*
CA2: *Organization of work*
CA3: *Time and Resource Management*

To explore and analyse the previously CAs, a literature review has been carried out: all the articles' main information collected (such as database/search engines, journal, or date of publication) have been schematized and summarized (Figure.1.4). Because of conducting a systematic literature review, research outcomes have been assessed and aggregated, in order to provide a balanced and objective summary of research evidence regarding the advantages, the opportunities and the limits supporting the possibility of adopting a TMS approach in all organizations, to identify the improvement (in terms of performance and efficiency) that could be obtained to ensure the achievement of the objectives.

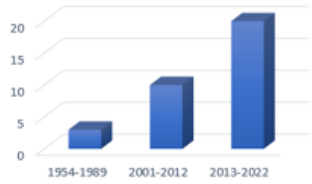
Date of publication	Author's country	Searching field	Main journals	Database/search Engines
	USA, Germany, UK, Canada, India, Italy	Topic, article, title, abstract, keywords, all text	Management Rewiew Journal, Journal of Library Administration, Il Sole 24 Ore, Project Management Institute	Google Scholar, Semantic Scholar, Research Gate, IEEE Computer Society, Google Chrome

Figure 1.4 Searching strategy and criteria adopted in the literature review

RESULTS

The so-called Task Management Software includes a set of tools and methods used to organize and manage the tasks assigned to an individual (seen not only as a single person but also as part of the resources of an organization): this includes a good part of the methodologies of Project Management tools, which is responsible for coordinating and organizing the performance of tasks in structured workflows [1].

CA1: Identification and management of priorities

The most delicate part of a project, production process or simply a series of activities to be carried out is in fact the phase in which the order of priorities for the various things to be done is defined. In fact, every project, or ordinary job duty, involves series of tasks, activities, people, budget and deadlines. No matter how big or small the project/task is, its success or failure depends on the execution plan and the order in which the tasks are fulfilled. In Project Management methodology there are numerous roles that are attaining the success of a project by balancing the competing constraints on a project with the resources available: when one knows how to organize, schedule and delegate tasks it is an easy step for them to obtain the success. Currently, there is no system or tool to organize the project related tasks and segregate it on priority [29].

In such a context, the Eisenhower matrix is a frequently used model for project and time management that increases productivity: it is indeed a framework that helps people prioritizing a list of activities or assignments by classifying them according to their urgency and significance. Basically, it categorizes tasks into four boxes, indicating which should be prioritized, delegated, or deleted. The priority on decision-making for different categories of assignments can make the difference between project success and failure, and also maintain a balance that can help to determine the overall quality of a project.

This matrix can emphasize change in a project that could occur because of the environment that projects themselves operate within. Therefore, projects need a good approach to allocate time to

activities that are important in addition to those that are urgent. This distinction must be understood to avoid the stress of having too many tight deadlines [15].

The theory helps project managers to better understand the trade-off dynamics among the four quadrants in the Eisenhower matrix, which simplifies the decision-making process of project management (even though the Eisenhower matrix is a discrete indicator regarding project management success, it is not necessarily the only marker of overall project success).

The Eisenhower Matrix model was designed by Dwight D. Eisenhower, the 34th President of the United States. Eisenhower also served as Supreme Commander of the Allied forces during World War II and subsequently led NATO. He was well-known for his strategic and productive mind.

Eisenhower effectively de-escalated Cold War situations, ending the Korean War and keeping the United States at peace: he was a skilled organizer who managed to stay on top of things by differentiating them between the important and the urgent. When asked what principle he adhered to when dealing with his multiple obligations, he stated, "What is important is seldom urgent, and what is urgent is seldom important." This principle was built on this premise, later known as the Eisenhower Matrix.

In fact, a To-Do List (a list of things to do), is very simple to draw up but when it comes to respecting it, it only really works if a person is relentless in prioritizing different tasks, and if once he prioritizes, he is committed not to even consider the next To-Do (task) until he has completed the one he's working on.

A list of prioritization methods can be the following one [16]:

Analyse your To-Do List

Choosing priorities

Prepare a list of priorities for the day

Establish absolute priorities (MIT)

- **Analyse the To-Do List:** the individual identifies each task that can be completed definitively, done and finished. If he is waiting for something to be done by someone else, simply he has to remove the task from the list (in a separate list, or has to insert it into a shared project on Google Drive, Dropbox, Asana etc.), deleting it from the To -Do;
- **Choosing priorities:** all the tasks that belong only and exclusively to themselves are collected, and sorted according to the Eisenhower or Covey Matrix, after identifying the deadlines and the available resources as accurately as possible. Priorities are linked to the values, principles and objectives of the individual, therefore getting used to managing them with awareness of one's own scale of values is essential for an effective time management, especially when working in a team [17], [29].

The Eisenhower matrix, also known as the Covey matrix after the name of Stephen Covey, who studied the model in his book "*The 7 habits of highly effective people*" [18], is a valid tool as it helps to visualize and define what is really important and what can instead wait, it therefore serves to order priorities by separating and classifying daily activities according to their degree of urgency and/or importance [16], [17], [29]. It should be noted that "important" is a subjective concept: what is relevant for one resource may not be so for another, and furthermore what is important today may not be so in another moment of life. However, one must try to be as objective as possible. Generally speaking, everything that involves the achievement or maintenance of a long-term advantage and which, if not done, could have serious repercussions (e.g., preventive control and maintenance activities) is to be considered *"important"*. Everything that must be done as soon as possible must be considered *"urgent"*: the concept of "urgent" is objective and it depends solely on the time variable; it should therefore be applied to those activities that require immediate or very short-term attention [17]; by combining the two parameters mentioned above, the four quadrants that make up the Eisenhower matrix are obtained (Figure 1.5). The method at the basis of this matrix allows the management of priorities through the evaluation of the activities according to four criteria, corresponding to the quadrants, to maximize company and personal productivity [17], [18]:

- Q1 - *Crisis* (urgent and important): in Q1 are those actions that must be carried out as soon as possible and which cannot be delegated to others (expiring projects, telephone calls to customers, pressing problems that need to be solved urgently, programs expiring or already expired). The activities that fall into this quadrant must be reduced to the maximum, as they are those that increase the risk of losing control of the situation and forcing one to work in a state of emergency, increasing the probability of making mistakes;
- Q2 - *Quality* (important and not urgent): this is the quadrant relating to medium/long-term projects, activities aimed at personal improvement, or the definition of new operational strategies to be put into practice (e.g., training courses, research d new business opportunities) that help manage the individual and his time, improving his quality of life. Having a strategic and long-term nature, these work commitments can be tackled without the pressure of urgency (however, if you continue to postpone their execution, they will fall back into Q1);
- Q3 - *Deception* (urgent and not important): these are actions deemed urgent and deceptively important, almost always depending on external people or situations, often delegable (superfluous meetings, tasks that have been "downloaded" by someone else...);

- Q4 - *Waste* (not important and not urgent): it includes everything that is pure and a simple waste of time: trivial or superfluous activities, distractions, more or less conscious excuses to postpone what is really important and/or urgent. Very often it is an escape route for those who are overwhelmed by problems that they are afraid to face, and who will inevitably end up regretting having wasted their time unnecessarily.

Once the To-Dos have been distributed in the various quadrants of the matrix, priority is given to those in quadrant Q1 (to be done immediately). Subsequently, the focus will move to the more productive quadrant (Q2), with tasks that are often simple to complete - above all thanks to the fact of not having to act under pressure - and which, once completed, will bring a significant increase in added value. The To-Dos in Q3, if possible, are to be delegated, while it is a good rule to keep as far away as possible from unimportant and non-urgent ones (box Q4). From the picture outlined above, it is therefore evident that the more one's time is occupied with the activities of quadrant Q2, the less there will be the need to deal with emergencies (Q1 and Q3): in fact, if a project has been planned well in advance (Q2), when the day of delivery of the same arrives, it will not run into the state of urgency (Q1). It is therefore important to always keep in mind that something urgent does not automatically become important and that, if it is not, it should be completely ignored.

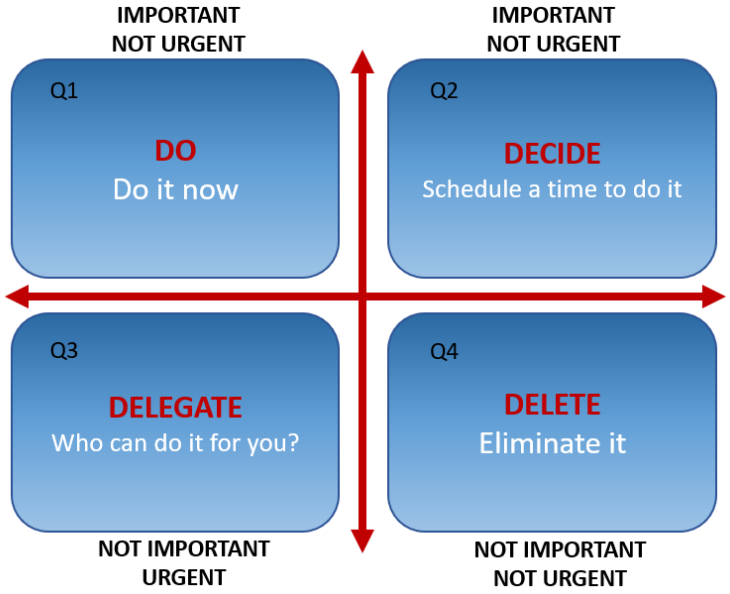


Figure 1.5 Eisenhower Matrix Source: A. Elle [19]

- **Prepare a list of priorities for the day,** referring exclusively to the tasks that the individual will have to complete on that particular day. Daily actions or non-work commitments (such as practicing physical activity, having lunch, shopping) can be included, in order to have an overview of the whole day, which will give a high added value to the organization of the individual: already knowing that he was going to have a particularly busy day, he will therefore be able to avoid overloads with commitments that may not be managed or managed poorly;
- **Establish absolute priorities (MIT),** that is, knowing that the MITs (Most Important Tasks) are the things the individual resource absolutely want/must do during the day, and tackle them one at a time, not giving up a task until he has it concluded. This can help formulate more realistic To-Do Lists: once the daily MITs have been archived, all the other things to do will appear as simple additions.

A summary scheme of this first phase for the adoption of a TMS approach can be found in Figure 1.6 below.

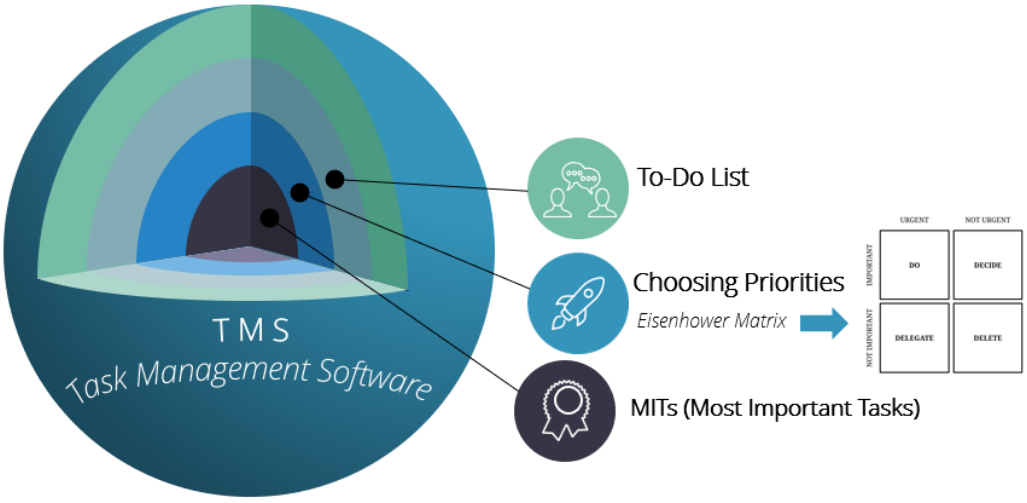


Figure 1.6 The structure of CA1: *Identification and management of priorities*

CA2: Organization of work

The management of the various company activities, whether they are specific tasks forming part of a specific project or routine activities to be completed, should include a complete system for identifying, tracking and completing the work to be carried out, including monitoring the progress of the activities themselves from inception to completion, setting deadlines and delegating tasks to team members.

Because of what has just been stated, some key steps relating to the basic organization of work for proper management of activities can be identified in the following points (Figure 1.7) [20]:

Milestone monitoring

Establish coherent and appropriate objectives

Planning management

Collaboration

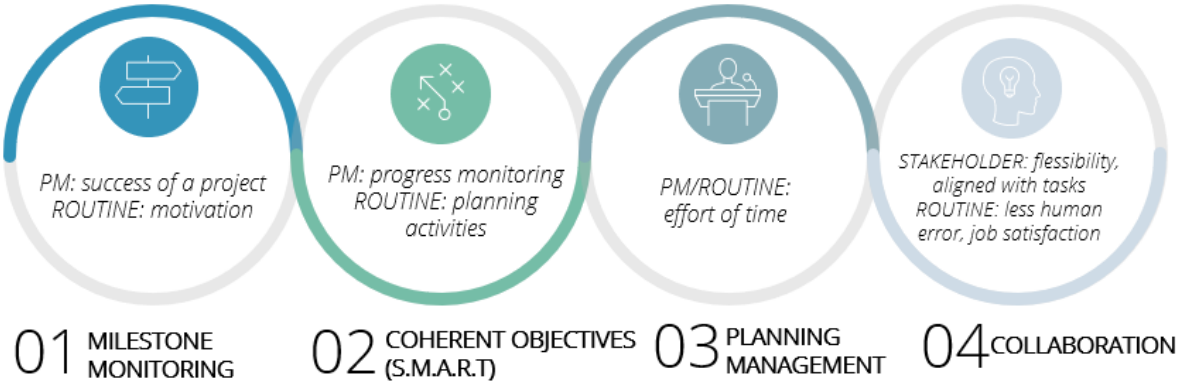


Figure 1.7 Procedural steps as logical flow for the *Organization of Work*

- **Milestone monitoring**

  Establishing clear objectives is an essential part for the success of a project: although a final goal is not necessary for the management of the activities but only to establish and organize a sort of "priority list", defining the milestones helps to motivate the teams to ensure that the activities are carried out successfully;

- **Establish coherent and appropriate objectives**: as the definition of clear and achievable objectives is in fact a crucial step for the success of any business or professional activity, outlining them carefully is in fact fundamental in order to effectively direct the design efforts and in the same way to facilitate the planning of activities, but having a well-defined

goal also helps to monitor the progress of the work and the quality of the performance.

Moreover, it is relevant and with a high added value to divide goals into short-term and long-term categories to discern if they are SMART, making sure they meet the definition criteria of each word represented in the acronym. The Isipm-Italian Institute of Project Management [21], considers two different levels of objectives in Project Management: the first level is represented by final project objectives/long-term strategic objectives *(goals)*, i.e., the objectives of the organization in which the need arises project (opportunity). They are usually expressed in the mission and in the strategic plan and, starting from the project deliverables, they aim to achieve concrete measurable benefits over time; the second level includes the so-called project/interim/end-of-project objectives *(objectives)*, that reflect the goals of the organization and end customers. They contribute to the achievement of the final objectives through the production of the required deliverables.

The most used methodology to designate these objectives, which allows people to define realistic goals to better invest the time and resources available, is known as the S.M.A.R.T. method, in which each letter of the acronym defines a specific criterion [22], [23]:

-*Specific*: the objectives must represent something defined and tangible, therefore they must be as clear and specific as possible (objectives that are too generic could leave room for ambiguity about the purposes and methods);

-*Measurable*: the established objectives must be quantifiable, just as the progress towards their achievement must be clear and defined (that is, they must be able to be expressed in numerical form);

-*Assignable/Achievable*: an objective must be coherent and compatible with the context and company resources starting from the margins of realization of a project, considering for example internal factors, sector, economic situation or external factors (overly ambitious objectives must be avoided at any cost because they can negatively affect motivation and end up being seen as unattainable);

-*Realistic/Relevant*: each of the objectives pursued must be able to be assessed as realistically achievable and must be able to contribute significantly to the growth or improvement of a company's activities, aligning itself with the business model and the market in which it operates;

-*Time-related (depending on time):* the objectives must be linked to precise deadlines, i.e. it is necessary to define a period within which a certain goal must be achieved. Assigning a deadline to each goal helps keeping motivation high and contributes to make the goal important in the eyes of those involved in achieving it (a goal with no deadline is perceived as unimportant and, in most cases, ends up passing secondary to all projects deemed urgent). In fact, there is no project which was not planned, that is, that didn't have a chronological determination with relationships between the activities linked to start and end events. [24]; [25];

- **Planning management**, as ensuring that the task to be performed is completed on time, is an aspect that affects the overall status of the project. In this case, it is essential to allocate the right amount of time by estimating the necessary effort;
- **Collaboration**: for all the phases mentioned above, collaboration is essential for the success of the objectives that had been set. In this case, an activity management software can help the team to always stay connected and aligned with the various tasks, as well as being flexible and adaptable to ordinary deadlines, in order to improve both the job satisfaction of the individual resource and profits company totals. The correct implementation of such a system will therefore be able to redirect the workforce of employees to their most productive use, resulting in a higher quality of work and a decrease in human error, ensuring the smoothest possible execution of projects, dividing them into detailed activities and sub-tasks, thus helping the practitioner to devote an ideal amount of time to each activity and making him responsible for their completion [20].

In the 2017 survey by PMI (Global Project Management), 37% of executives said that "the main cause of failure [of projects in their organization] was the lack of clearly defined goals and milestones to measure progress" and "the lack of discipline in the implementation of the strategy". Failure to implement a task management software can in fact lead to missed deadlines, unnecessary and unsolicited stress and can be the main cause of project failure [21]. The main reason why business projects and initiatives fail is due to the lack of clear objectives to refer to.

Further consequences of poor planning include the following points [20]:

- **Insufficient time management,** as the lack of deadlines generates unproductiveness among staff members and poor-quality work, thus reducing the profits of the entire business;
- **Unclear goal definitions**: as stated above, without clearly outlined goals and without instructions for carrying out different tasks, staff members are unaware of what is expected of them in terms of performance. Productivity and production will suffer as a result, potentially causing project failure;
- **Undefined budget:** failures to set a budget can lead to misuse or wasted funds (such as costing much more than necessary). Due to lack of sufficient budget, goals can also fail;
- **Unsatisfied customers and increased exposures to high risks and problems:** poor or no planning damages the company's ability to establish good relationships with current and potential customers, just as an improper and wrong planning increases the company's

likelihood to incur unforeseen risks and problems.

Conversely, the main benefits of using task management and proper task planning can in the long run translate into:

- *Optimized productivity*, as idealizing productivity by implementing a task management software and allocating the right amount of time to each will result in more task completion in the long run;
- *Increased Efficiency:* improving productivity will symbiotically increase business efficiency;
- *Trend Analysis and Stress Reduction*: task management tools will provide easily accessible statistics to help corporate employees determine which areas need attention or improvement; moreover, thanks to the hard planning, they will help to reduce unnecessary stress, burnout and unproductive multitasking among resources.

CA3: Time and Resource Management

After having analyzed and developed a structured and sequential system for identifying and managing priorities in which the order of priorities for the various things to be done is defined, and subsequently having eviscerated the key steps relating to the basic organization of work for proper management of company activities, in the last step, the time and resource planning tools necessary to schedule the amount of work and skills take on a particularly important role: having support to determine these factors is in fact a basis for every Project Manager which will subsequently use these plans under implementation to check the progress of the works in accordance with what was planned [1].

In fact, optimal resource management represents the next step to ensure efficient task management: it is essentially a matter of assigning, according to the budget and the schedule, the right talent, and the appropriate number of resources to do a given job [20]. No less secondary and fundamental activity concerns time monitoring: tracking time can help not only to measure the approximate time of a single scheduled activity, but it can also be useful to increase corporate efficiency, analyzing its improvement and growth in terms of effort and goals achieved. What has just been stated can be found summarized in Figure 1.8 below.

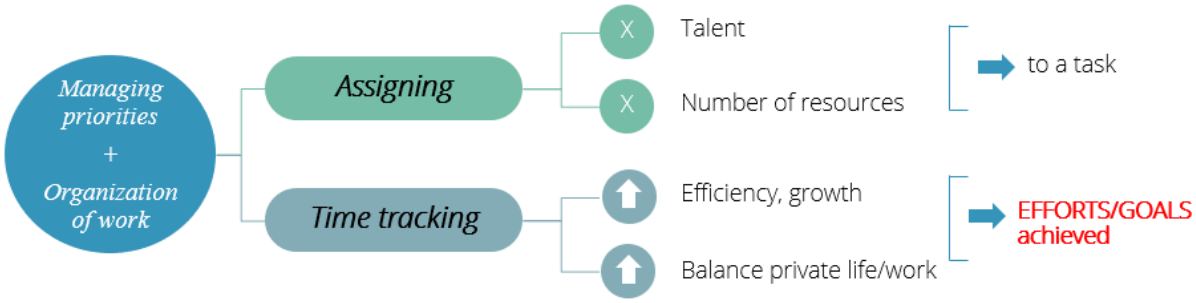


Figure 1.8 *Time and Resource Management* flowchart

Nevertheless, it is only with project scheduling that we obtain the information necessary to exactly determine the project times in terms of objectives, activities and time availability of human resources, describing the activities in their sequence (an activity cannot be started before the other ends) and in their possible parallelism: at each control date, data concerning the progress of the works are entered, activity by activity (Figure 1.9). [26]

Specifically, the techniques that adopt representations of the reticular type (CPM) and the Gantt Diagram are particularly helpful in the work of defining the times.

The TMS, therefore, should include the ability to manage projects and tasks in teams, to plan better with the timeline view (Gantt chart) and the possibility of working simultaneously.

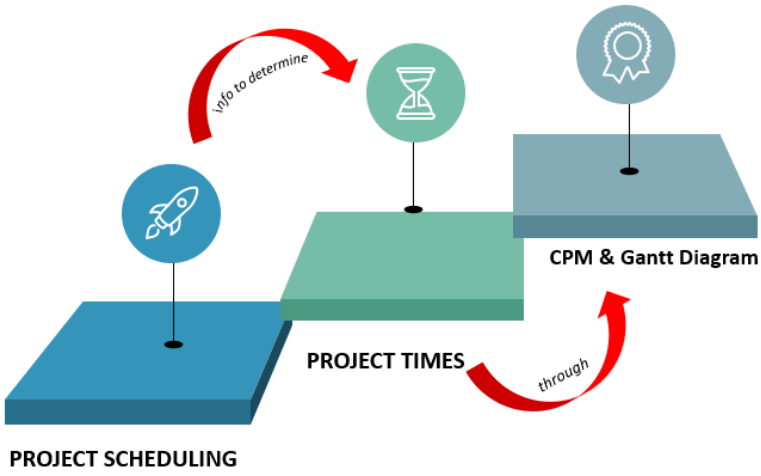


Figure 1.9 The process of defining time and resources in a TMS

From the foregoing, emerges thus the importance for a specific project in the context of Project Management, but also for the correct management and scheduling of purely ordinary activities, the use of software for the management of activities/times/resources, as well as the purpose of creating a Gantt Diagram of the project to identify the individual critical path: the TMS, as well as allowing an increase in the efficiency of the work performed and in assigning priorities to projects/activities, can also help individuals to set a better balance between work and private life, because you will no longer have to constantly stress about what you have forgotten to do at work.

Going down into the technical specifics, some important qualities to look for in a Task Manager Software with the purpose of improving work can be the following ones (Figure 1.10) [27]:

- **Presence of a hub of projects/activities**: with all the tasks in a single space, it will be possible and not too expensive to keep track of the various activities/projects in progress; in the hub there will have to be the possibility of clearly see the progress of each resource involved (each of them will always be aligned with incoming and future deadlines and the expected completion date);
- **Task Acceptance:** for Project Managers or team leaders, task management solutions will need to give all resources the ability to accept tasks and thus they will allow other people involved to see who has been busy with the work, being able to identify who is responsible for what and to avoid unnecessary duplication of work;
- **Triggering of dependent activities**: ideally, within the hub, the completion of an activity will have to be communicated to the person responsible for the next activity, in order to obtain a workflow that is as uninterrupted as possible;
- **Task Manager App**: today's workforce is highly mobile, therefore it acquires a great importance to choose a task manager that will work with both laptop or desktop PC and the mobile phone or tablet through an app that will give people access to the same available information in the office, in order to be able to keep track of projects/ordinary activities everywhere;
- **File archiving**: with task management software that can archive and organize resource files, such as documents, spreadsheets, and images, as well as attach specific files to specific tasks to match the information to the appropriate tasks, a person can always be sure that he is working with the correct information;
- **Permission to prioritize tasks**: a TMS software should allow for task prioritization, as it is the most delicate part of a project, production process or series of activities to be carried out. In the context previously seen, the Eisenhower matrix can be an effective model for project and time management to increases productivity by prioritizing a list of activities or assignments and classifying them according to their urgency and

importance. The point is the following: managing priority on decision-making for different categories of assignments can make the difference between project success and failure and maintaining a balance that will help determine the overall quality of a project.

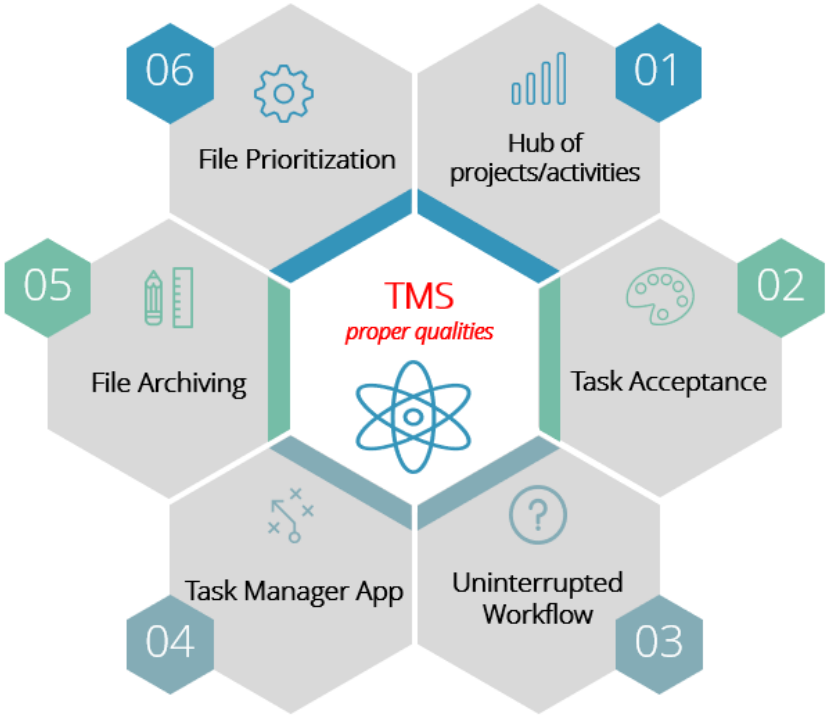


Figure 1.10 Main features of a TMS global approach

To summarize, a right Task Management Software application should provide to users most of the features required to manage the tasks developed in a firm: in fact, thanks to tools that allow to assign specific activities to the individual, it will be easy to maintain control, as everyone will be able to know exactly what needs to be done and when. And, if we are talking about tasks belonging to a certain project involving a team, with the possibility of attaching files to activities, project stakeholders will never be forced to search for the right files, data or information before starting to work. For corporate resources who travel frequently or work remotely, access to a task management app, whether routine or project, will allow them to keep up to date with their execution status wherever they go, with the aim of combining in the smartest and most flexible way possible a greater productivity during office hours and the possibility of enjoying one's free time as well. An evidence at a global overview level of the integrated methodology of the TMS approach is represented in Figure 1.11.

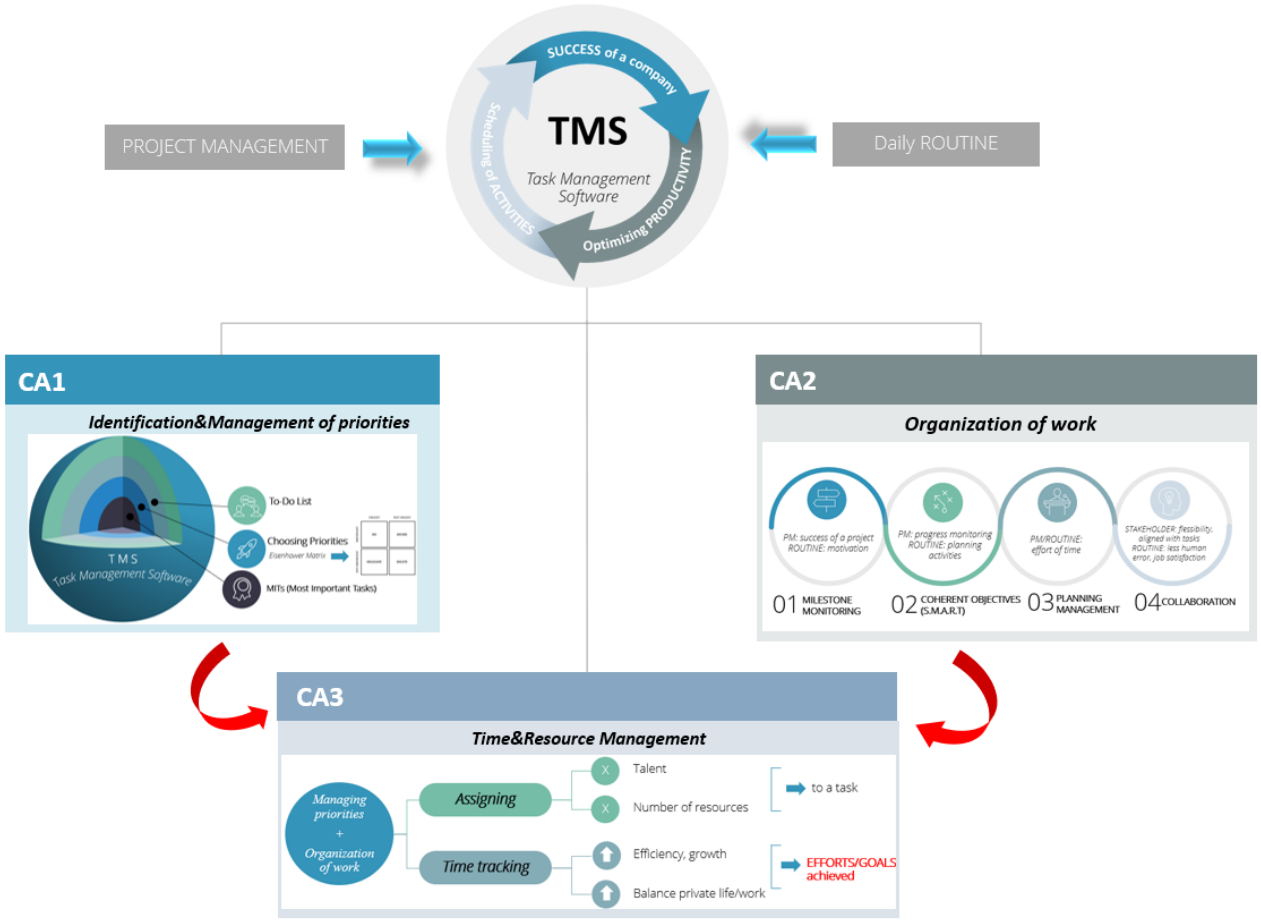


Figure 1.11 The background logic of adopting a TMS approach in organizations

DISCUSSION AND CONCLUSION

Nowadays, still too often in companies there is a tendency to perform following a pre-established daily routine, perhaps dictated by custom. Whole departments operate far from awareness of the corporate objective, one lives and works in the company as if the "objectives" question were a mere necessity of the sales department or a problem of the entrepreneur, and the others just have to carry out or proceed to tow others. Furthermore, frequently the line of objectives to be pursued lies in the head of a single person who does his best trying to keep things together, thus wasting an enormous amount of energy that is not reflected in the increase of the value produced: not to mention the obvious managerial stress experienced by all the staff and by the entrepreneur in primis. [28]

In recent decades, however, various methods have been developed for optimizing productivity, and consequently, the correct scheduling of the activities to be performed. Some techniques are based on the senses such as sight or touch, and can be combined with each other: blackboards, post-it, lists to check off, but also timing systems, scheduling and above all, specific software with certain intrinsic and preparatory functions for work organization, are the most used tools to manage a large amount of tasks in a virtual space and which lend themselves optimally to organization into ordered parts. [14]

In conclusion of what has been discussed in this article, however, unlike the software already on the market and in use in companies and in the Project Management field, it is nowadays more than ever necessary to have a real database that allows the historicization of what happens and more generally of the activities performed (for example, even the priority of a task can be changed and it is important to know the moment in time in which it changed, when it has passed to a different priority and why), as well as how the TMS itself periodically updated, as it is itself "a task"! In fact, even the last task to be executed must allow "priority 1" to be timed.

To sum up, having a Task Manager Software that allows people to organize their own work, that of collaborators and of the whole company means establishing which symphony to play and, even more, which interpretation to give to the only score to refer to. Everyone with their own instrument must feel part of the whole and contribute to the construction of the overall work and not of a single sound: a company is successful when everyone follows a single work program and a single objective (perhaps divided into sub-objectives). Learning how to master each of these points (CA1, CA2, CA3) will allow the individual resource involved to define precise and measurable objectives, to organize his personal agenda by proceeding with order and in full awareness of his work priorities, in an attempt to achieve a work effort that will respect the established times, and at the same time will significantly improve the productivity of work and the organizational capacity of the individual.

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