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THE IMPACT OF PERSONAL ATTRIBUTES OF PROJECT MANAGERS WORKING IN ICT SECTOR ON ACHIEVING PROJECT SUCCESS

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The impact of personal attributes of project managers working in ICT sector on achieving project success

Ph.D. dissertation

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1 Introduction

Organizations always endeavored to define success. On a company level, it is easy to accomplish. Since many index number was expanded in the question of direct financial (quantitative) or deployed special "soft" elements. An example for the previous is ROI or ROA, whilst the latter group contains the Kaplan - Norton Balance Score Card or the Sveiby Intangible Asset Monitor (see e.g. Antal-Mokos et. al., 2003).

Nevertheless, the success of the project was hard to define. Namely, there was lack of mature methods (examination of the success of a project began in the 50's). At the same time, projects can create a considerable amount of added value.

However, project success became crucial for all organizations. Owing to the fact, that, for the new situations, for the varied environmental conditions as well as for the strategies defined by new policy the implementation's tool is the project (Görög, 2003.). Thus if a company does not launch a suitable amount of project, it inevitably becomes static. In turn, a static company in today's extraordinary speeded-up life can only survive with fortune. Of course it is not interpreted just on micro-levels as companies, but on the level of countries, moreover polities (e.g. EU) too[1].

Considering this, as long as the economic crisis exploded, the amount of money that was spent on projects was significant and constantly grew (Bredillet, 2007; Standish Group, 2009, World Bank, 2005), at the middle of the last decade it was close to 20% of the World's GDP[2]. However the foundation of the project is not enough for a company's country's or region's successful adaptation of changed circumstances, it is sufficient that the project could productively (effectively and preferably efficiently) be implemented. Unfortunately, despite of the rich specialized literature the difference is notable between the projects initiated and those that are implemented successfully. The proportion is around 35% (Standish Group, 2009.) but in the case of the ones that are connected with informational systems, thus IT/IS projects, this number is lower, around 30%. (Deák, 2001.) Moreover, the 15-20% of these projects are stemmed before the ending, that is in the phase of execution or planning, when such a vital error spawns that

[1] In such a case, the making of the project is in different environment and criteria system since the non-profit sector puts other values in the highlight.
[2] The amount of money, spent on the projects can be notable even after the crisis.

it is worth to decide for cancellation (Kappelman et. al. 2006, Lee-Kelley – Loong, 2003)[3].

Others pointed out that between the causes, technical reasons and the lack of resources play less rugged role than we would thought. Namely, the essential technical and human resources are broadly obtainable, to wit: if absence starts up, it is easy to provide those in return of the suitable offset. In addition organizations recognized and they had to recognize the importance of projects, hence they occupy suitable amount of inner resources (money, project members, infrastructure), as long as it is an accordingly high priority one of course. Consequently the main reason is not about the lack of resources[4], but the inappropriate project scope definition, which neglects the interests of the project owner's and the key stakeholders, the absence of the eligible extent and time of reaction for the internal and external changes or the lack of project management competencies (e.g. Judgev – Müller, 2005; Jing et al., 1996; Yeo, 2002).

Based on the previous, the success of a project and the factor's examinations that conduce those can be very important not just in the academic sphere but also for the practicing specialists. Thus, my dissertation's intention is to improve the understanding of project success. As the concept is too complex and broad for making a comprehensive examination that unfolds every factor, the focus of my dissertation is on the project management attitude of the project manager, specifically on the outlook of the project success and two additional project manager's features (personal characteristics, leadership style). I give answer throughout my dissertation whether there is an impact of project management attitude on project success, or do the project manager's personal characteristics can have an impact on the project management attitude and the leadership style.

In the course of research, semi-structured interviews were used. The population was project managers of the Hungarian subsidiaries of multinational companies operating in the ICT sector. I interviewed 31 project managers from 5 companies, and based on their answers, the research questions could be answered.

[3] This is not the mistake of the project management. It can happen due to inner changes since the IT environment changes in a more dynamic and fast way (Mészáros, 2010). In addition, the reaction to these is not easy even with the change management toolbar.

[4] However, of course if these are not available the project will fail.

Throughout the dissertation I touch upon what manner, can companies use this in practice. I would like to highlight in which direction it is advisable to position the academic courses and the trainings. Furthermore, I would like to give guidance to the sector this research was based on and so to the other similar sectors, which project management attitude the project managers should be using to increase the potential for project success. In addition, this dissertation could be the fundament for the creation of certain trainings and academic courses, which aim is to enhance the project manager's project management knowledge.

It is notable though that this research will not try to create a management framework, with which different organizations could evaluate the knowledge of their project managers. It also cannot be a goal to define the exact content of courses mentioned. In addition, there is no aim to identify the scale of certain impacts, identify every factor that has an impact on project management attitude and leadership style, and to identify the factor which has the most remarkable impact on them. However, the current dissertation could be used to establish all the previous in the future.

According to this, the dissertation builds up of four chapters with the exception of the introduction, which are the followings:

- In the second part of my dissertation, I introduce the development of the understanding of project, its fundamental characteristics and phases. The importance of it is justified by the fact that project management requires diverse acquaintance and knowledge than the traditional sense of management namely a company or organization (e.g. SME, non-profit or bigger organizations). Then I introduce the different management dimensions, and highlight the differences between general (strategic) management and project management. The fundamental tasks of the project manager are also introduces, and (due to the better understanding of the research) I briefly introduce the agile project management methodology. Moreover, I introduce the dominant paradigms of project management in this chapter as well.
- In the focus of the following chapter stands the understanding and development of project success and its components. I introduce success criteria that are base values for evaluating project sucess. As well as, critical success factors are going to be delineated (CSF) that increase the potential to achieve project success. In the last part of

the chapter, I will introduce the criticism of the critical success factors and the attempts to align critical success factors and success criteria and their shortcomings too.

- The dissertation's forth chapter covers the project manager's knowledge, personal characteristics and the leadership style. The development of project managerial knowledge, its complexity also comes to presentation together with the expected capabilities of the project manager. I briefly introduce the qualitative and quantitative tools and techniques and the tacit and explicit knowledge as well. The expected personal characteristics of the project manager is also highlighted (optimism, team-building ability, motivational ability, ability to build trust, empathy and improvisation). I introduce the leadership styles as well considering a special role in this part that there is a lack in the literature regarding the impact of the six personal characteristics highlighted before on the leadership style.
- The dissertation's fifth chapter contains the presentation of my research. I will demonstrate which literature serve as the guidelines of the research. Based on that I formulate the research questions and hypotheses. I present the model of the research as well. Moreover, I describe the applied research methodology and the interview questions as well, just like the research environment, sampling method and the sampling size. Then the analysis of the answers for the interview questions is done in a detailed manner. Then (based on these) I accept or reject the hypotheses, formulating my theses, general conclusions and defining the relevancy for the academic sector and for practitioners as well.

The primary results of my dissertation:

- The quantitative project managerial tools do not contribute in a greater extent to the three levels of the project success than the qualitative ones. Thus, when achieving the project success, the qualitative tools are just as important as the quantitative tools.
- When considering the project manager's project management attitude, the explicit knowledge is not present in a higher degree than the tacit. Thus, it is important to put great emphasis on transferring the tacit knowledge as well.
- The project manager's project management attitude has an impact on each three levels of project success. This means, that improvement or the development of the project management approach could be important when the organizations try to increase the potential of achieving project success.

- The project manager's personal characteristics have an impact the project manager's project management attitude and his/her leadership style. Based on this statement, there should be a great emphasis placed on the improvement of the personal characteristics, since they have an indirect effect on the project success (by the project management attitude and the style of leadership).

This could constitute a pivotal initiative in order to refine the academic courses, seminars and the trainings, in such a manner that both the tacit knowledge transfer and the proper introduction of the qualitative components would materialize. Furthermore, it is important to improve the personal characteristics that affects the project management attitude (thus the project success). These could be achieved by the creation of situational games, case study classes and a mentoring system (cf. Horváth, 2013).

2 The understandings of the project

The understanding of projects changed throughout the years, adapting to those expectations that are provided by recent time's turbulent economic environment. The very first endeavors of projects go back to the Taylor era, which existed until the 70's (e.g. Gaddis, 1959; Olsen, 1971). According to these definitions, the project is an activity or series of activities, which is defined by the expended time, cost and the expected prime quality[5].

As times were passing by[6] these approaches lapsed since many project have been created in which time, cost and quality (namely the project triangle) played an important role, at the same time however, the project - just like modern times - has exceeded it. Project Management Institute defines projects in the following way (Project Management Institute, 2006, page 21.):

- 'Project is an effort which is restricted by time in order to create a unique product, service or result.'

It is clearly seen in the definition that the project interpretation passes the project triangle and brings in achievement orientation. Specifically timing, cost and quality is important but it is not the main point of the project (cf. Judgev-Müller, 2005). Thanks to the fact that it's environment ceased being static (Mészáros, 2010). Tough these three elements do not guarantee the success of an investment[7]. That is why achievement orientated definitions became necessary. Of course it does not mean that project triangle's (time, cost, quality) parameters would be negligible but it means that these per se do not match today's project analysis.

According to the previous Görög defines the project as:

- '… an activity which is a single and complex task to an organization in which the duration and cost are limited and having a definite aim to create a certain result (Görög, 2003, pp. 20.)

Clements and Gido gives a similar definition:

[5] The quality parameters can be connected with activities as well but in this case, it is understood as project result related quality..

[6] Moreover, owing to the fact that besides the classic, mainly infrastructure projects the less well or badly quantified projects as R&D or space research projects also emerged.

[7] The investment is not equal with the project. Namely, investments can be done without projects.

- "A project is an endeavor to accomplish a specific objective through a unique set of interrelated tasks and the effective utilization of resources." (Clements-Gido, 2006, 4. page)

After these two definitions, it is clear that project triangle and achievement orientation appear in the same time. Similarly to the previous definition by the Project Management Institute this definition excludes repetition. To be more precise, a project is always unique, necessary to build up something new. This fact derives from the function of a project, more accurately it gives the answer to the changes of the environment. So to establish a project, which already exists in a company, is excluded.

Eric Verzuh (2008) approximates the project in a more organization-centric way because he emphasizes not just the project triangle and achievement orientation but the project organization too. On the bases of these for him project is not just an activity; it is a series of activities or processes but such an organization, which comes into being to achieve a given result besides the given constraints.

Overall, we can determine that the understanding of project has changed in the course of time and today's interpretations have the following features:

- organization
- result oriented
- unique, temporary
- limited by time and cost

Particularly, thanks to the uncertainty, which became an immanent attribute of projects (cf. Judgev-Müller, 2005.), the focus of project's definition also changed. From the initial project triangle, the accent changed to achievement orientation and lately the organization focused approaches come into being. Of course, it has an effect on the abilities necessary for managing a project (e.g. the competencies tied to a certain project will be valorized).

Based on the previous description Fekete and Dobreff (2003, pp. 9.) gives the best possible definition, which sound as follows:

'…we consider those tasks as projects that are:

- well defined and help to achieve significant (strategic) goals,
- require the integration of many organizations due to the demand for the complex professional knowledge,
- not to be organized into the activities of those departments that operate based on the classic responsibility limitations,
- finished in a well-defined time-frame,
- operating in-between properly set budget boundaries,
- unique and novel, because projects are always risky
- requiring dynamic fulfillment (conditions can change throughout the processes).'

Looking at this definition we can see that many approaches are present: the approach based on the project triangle, organizational approach, the uniqueness and result orientation. We can declare this definition to be full-fledged.

2.1 The evolution of the project's interpretation

The understanding of the project (as it has been described in chapter 2.) has been through a great evolution. The main approach that was focusing on the project triangle has been replaced by more complex approaches. One type of project understandings considered projects as unique tasks. This means a project has a starting-, and an ending-point, set budget, and even the project result is defined. At this point the emphasis is certainly on the quantitative component: meaning that the process-, and the result control and all other linking factors become prominent (cost and time planning) (cf. e.g. Goldratt, 1997). The viability of this point of view is given by the classic project managerial approaches (see e.g. Project Management Institute, 2006), since according to these, the most important parts of the project management are the implementation, the project plan and the compliance with it (and also their examination).

However Lundin and Söderlund (1995) pointed out that the projects are not only unique tasks but temporary organizations as well. Thus, it is advisable to examine the projects in an organization-centric way, meaning that the projects are established in such circumstances where the people (mostly the project team) are in the middle of the attention. The viability of this approach could be derived from such condition where the project-organization is built on the hierarchic organizational structure and the project is

to be fulfilled in such framework[8]. Since the project is treated as a temporary organization, whenever the project reaches its end the organization will shut down. So the project inevitably exists for a shorter period of time than the organization that is the basis of the project (Rozman, 2006), unless the only task of the organization is the fulfillment of the project.

Parallel to this, Cleland (1994) found that the project can be handled as a strategic building block too, since project could mean the realization of the strategy. In this case though, it is often required to step out from the boundaries of the unique projects and to treat the projects as interrelated programs (Cleland, 1994; Cleland – Ireland, 2002; Görög, 2008). The fundament of this approach is today's always changing and shifting environment, to which is difficult to adapt[9]. That is the reason why it is necessary to create different interrelating projects that are combined into programs.

There is only a pseudo contradiction amongst the three approaches, since projects can simultaneously be seen as unique tasks, temporary organizations and strategic building blocks. This three-staged approach validates Fekete and Dubroff (2003) definition of project, because we can find a realization of the triple-interpretation in it.

2.2 The project's role in the organization

The role of the project as the time passed has also changed. However, the essential aim is the adaptation to the changes of the external or internal environment (Görög, 2003.). While the external environment was static (thus internal environment was also static or rarely changing) project was established to create project result[10] (cf. Fortune-White, 2006; Olsen, 1971.). This per se guarantees the adaptation for changes. After all, later, with the changing environment and the disappearance of the static nature, the role of the projects has changed[11]. Project remained as the tool of adaptation to the internal and external environment but with a strategic approach (see e.g. Judgev-Müller, 2005). These days the main tool of strategy is project; this means that project has to get the strategic focus (cf. Cleland, 1994.). Otherwise it is not capable to secure all that reason why it has been brought into being. More precisely, the organization is required to adapt

[8] The scale of the project overlay is depending on the project organization's form chosen.
[9] It can happen however, that even one project is adequate in solving a problem caused by any transition or change.
[10] The project result contains the setting up of output(s).
[11] This was caused by the oil crisis in 1973 and 1979.

to all the conditions altered. Of course it involves that strategic management and project management should be in a closed relationship and managers[12] should work harmonized together. The definition of project shows this evolution, since the classic project-triangle-focused approaches were enhanced by result/service orientation.

We have to differentiate those companies, which function partly or fully on the bases of projects. In such a case companies, sell service. Typical examples are event planning offices or designer offices. In this case, the essential role of project is the generation of the company's income. However, the contradictions between strategy orientation and the operative activities are pseudo contradictions. In this occasion, we just have to contemplate the project accomplishment with the client's eyes. It is easy to expect that the project owner's main viewpoint is the adaptation for the environment and that the requirements are given on the bases of this for the companies.

According to the grouping it matches with the previously mentioned elemental aim, with the adaptation to the environment, projects are classified in three categories. The main point of the grouping is given by the question what changes and claims generate it. The groups are the followings (Cicmil, 1999; Görög, 2007):

- strategic project
- problem solving project
- event project

According to the first approach, it is an investment, through which the company could reach its strategic goal (Grungy-Brown, 2002.). Such an example is the commission of a new production line or the opening of a new office. Most of the classic projects are placed into this group.

The second group was created by notable changes. Specifically if such a problem or change in a parameter emerges in the company, which await for solution, problem-solving project is the most adequate. An example is the changes of law, which limits the pollution in the case of factories. The solution in this case, might be to build in new air filters in order to encumber emission (Görög, 2008.).

[12] This person is the project manager but there are enterprises where the designer and leader is different.

The third type is when the project is not derived from the strategy or environmental changes, but created for the organization's basic objectives; for example when a non-profit organization organizes the usual annual party or a shareholders company organizes the assembly each year, or the organization of the university fresher's ball (Görög, 2007.).

In every case, it is clear that the bases of the project are the cogent reaction for the changes or strategic, organizational needs. Thus, contradiction between the first and last part of the chapter is apparent because this grouping organizes the project in categories in the adaptation to the environment, but here the environmental changes arise from internal (e.g. strategy or organizational features[13]) or external sources (e.g. legal restrictions).

It is possible however to group the projects different from the previous solutions (see e.g. Bower – Walker, 2007; Crawford – Pollack; Turner, 2006). However, these are not handled based on the nature of the project result but on their complexity and persistency. Thus, they are less in concert with the fundamental goal of the project (reaction to the environmental changes by generating the project result).

Overall, we can state - based on the definition of project - that it is necessary to consider the achievement orientation specifically this ensures the thought, that the organization realizes the aim, which was the cause for creating the project. Moreover, for creating these a suitable project manager is indispensable who have the tools and techniques for the successful implementation.

2.3 Phases of projects

Projects are made up of different phases as a result of their immanent characteristics; they are temporary and were initiated to reach a certain aim. Thus, the project consists of the following stages (Görög, 2003; Fekete-Dobraff, 2003; Project Management Institute, 2010; Verzuh, 2008):

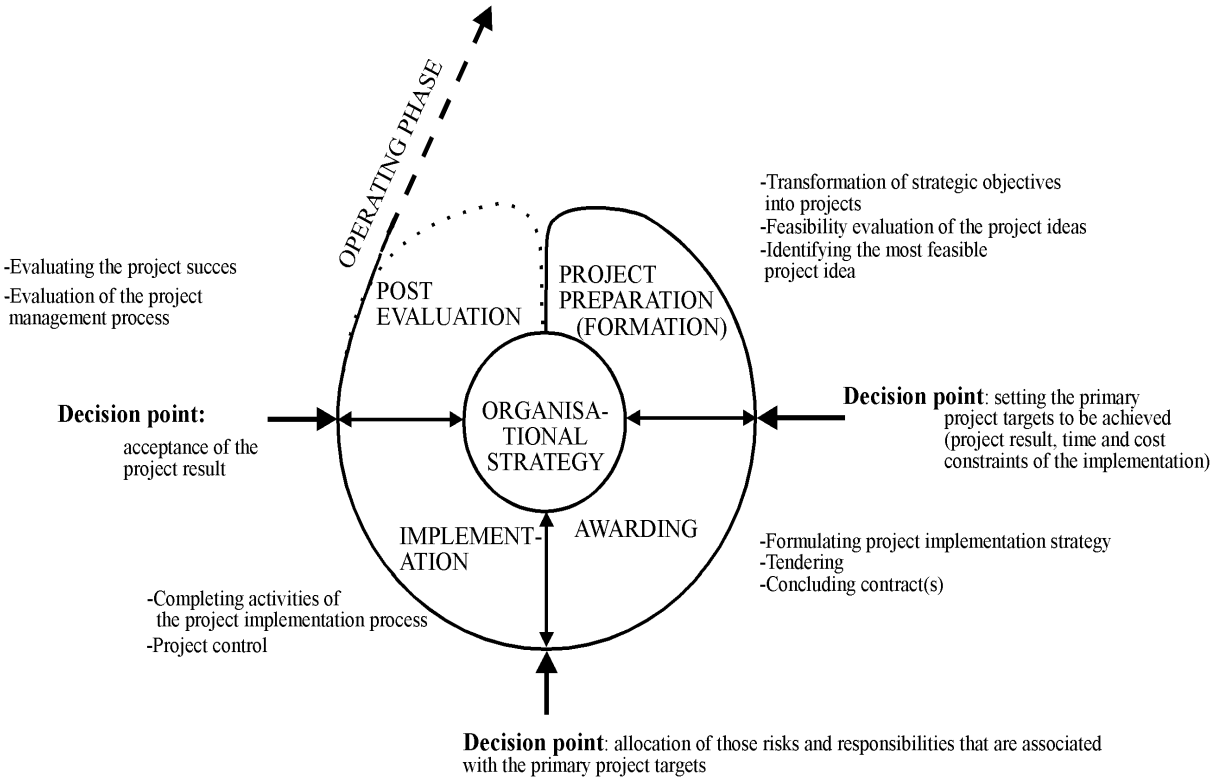
- Defining project concept,
- Planning the project,

[13] Of course, the source can derive from external change but the convergence is an inner demand.

- Building the frameworks[14] of the project,
- Implementing the project,
- Closing of the project.

According to Görög (2003), there are four departments, which are introduced in the 1st figure.

Figure 1. The general model of project cycle



Source: Görög (2003), pp. 65.

In the first phase of the project; e.g. in the planning phase the frames are configured. The most important product of this period is the project plan besides many other e.g. project charter. The project plan contains the followings (Fekete-Dobreff, 2003; Görög, 2003: Project Management Institute, 2000; 2006, Verzuh, 2008):

- project scope definition

[14] Frameworks are used from the point of view of boundaries, like setting up the project organization.

- analysis of the important stakeholders
- work breakdown structure and the logical relationship between activities
- cost, resource and time plan
- risk management policy
- communicational strategy of project
- structure of the project organization
- method of project control
- method of the escalation
- different documental obligations (e.g. credentials) and their patterns

It is clear that the project plan is formalized and requires serious preparation from the manager and from those who participate in the creation of the plan. The most intensive work from the managers can be experienced in this phase. At this point each entity who has interest in the project can efficiently and effectively enhance it, thus it is advisable to properly map the internal and external environment before planning (Project Management Institute, 2000). Furthermore, it is necessary to note that Görög's (2003) model merges the conceptualization and the project planning and moderately the establishment of the project framework (e.g. the framework for the acquirement of certain resources).

The last step of this phase is the making of decisions through which the already done plan is accepted, rejected or adjudged to modification. If there is a need for modifying a plan, a new decision will be made to change the project plan (Görög, 2003).

Some approaches identify two separate parts of the planning period (see e.g. Verzuh, 2008): for the determination of the project and the making of the plan (Figure 1.) This approach also have raison d'étre mainly in that case when the project demands more serious integration from the organization than in the case of an easier project (e.g. in the case of an ERP introduction project). Here the strategic aim and the derived parameters (from strategy), which contain the business plan, receives greater emphasis[15]. Nevertheless, it significantly does not change the constructional period

[15] In case of some project management methodologies e.g. PRINCE2 the business plan is worked out in each case (Molnár, 1997.)

since it contains the decisions of the launch, modification and rejection of the project. It simply happens in two steps[16].

Figure 2. The standard project cycle

Source: Verzuh (2008) pp. 22.

The second phase is the awarding. This phase is used only at external or at mingled projects, since throughout this process, the type of contract and the form of payment, the external contributor are defined together with the tender documents. Thus, the result of the phase is the closed contract with the external contributors. Of course, here we also can find a decision point through which the contract and tender conditions are decided[17] (Görög, 2003.). It is important to note that the authors rarely mention this particular phase (see e.g. Rawlings, 1987), since the selection and acquirement of the external resources do not differ from the internal ones. This is the reason why it can be handled together with the planning, since it does not differ in its nature from planning, even though if other tools have to be utilized.

The third period, which requires the most time and energy investment of the project organization's members, is the implementation of the project. In this period, the project result is being made. The project manager's job - contrary to planning - concentrates only to several things tough this period requires much time input. The main tasks are the followings (see e.g. Fekete, 2000; Görög, 2003, Project Management Institute, 2006):

- the implementation of the activities through the project plan
- risk management and monitor
- project control

[16] Of course it not exclude that there was decision of the project thus the decision of the business plan was already made and it is presented as a fact to the designer group. In an extreme case, there can be more decision point since another expense, time project organisation plan could be accepted.

[17] If this item is needed, namely the enterprise is not able to make inner prime powers and it is not worth to internalize at the market the powers, external contributor is needed. Of course, the tender is not obligatory and specific jurisdiction decides the need of this.

- continuous communication with the members of the project and main stakeholders
- reporting
- arranging and carrying out meetings
- escalation of problems
- optimization (if needed)
- account of accomplishment in the case of the employment of external contributors (based on the contract signed)

Of course, it easily happens in this phase of the project that iterative activities appear, e.g. the review of stakeholders' analysis or the risk analysis.

The decision point in this case is whether the project is accepted or not. In the latter case, the project is commenced or modified - but it could happen through the whole implementation phase (Görög, 2003.).

The last period is post evaluation. Some sources call it termination. This phase contains the assessment of the project in the aspect of efficiency and effectiveness. Of course, in this period there is no decision point, only the acceptance or rejection of the project's analysis happens. Important features of the period are the closing, analyzing and evaluation documents, since those have important role in gathering and preserving the accumulated experience (e.g. Görög, 2003, Project Management Institute, 2000).

It is clear that the project managerial knowledge is an excessively diversified and complex factor, which is impossible to narrow into a sole dimension. The project manager has to acquire certain knowledge and capabilities through his/her pragmatic work; otherwise, the project is condemned to fail.[18]

It is necessary to note that by the classic project-stage-typologies there are other approaches that have been defined. Ende and van Marrewijk (2014) has created such approach that separates four distinct stages, like:

- initiation and feasibility
- implementation,
- operation,

[18] Even if the members of the project group can help to the project manager.

- termination

The first stage incorporates the classic planning tools (including the tenders). Throughout the second stage the project gets implemented. The third stage contains the testing/trial phase of the project result. When speaking of a classic investment this trial phase incorporates two tests: cold and warm testing. Cold testing is used when the project outcome is utilized without materials (or any other resources used for manufacturing); warm testing is when they utilize certain resources when using the project outcome. Last stage happens when the project owner receives the project. Certainly, if there is any problem occurs to the project outcome in the third stage they have to be immediately fixed because, without it, the project cannot proceed to the next stage (stage 4.).

This approach does not differ in its character from the previously introduced approaches, since the "only" difference is the testing phase (the trial of operation) in terms of the previously described project-stage-typologies.

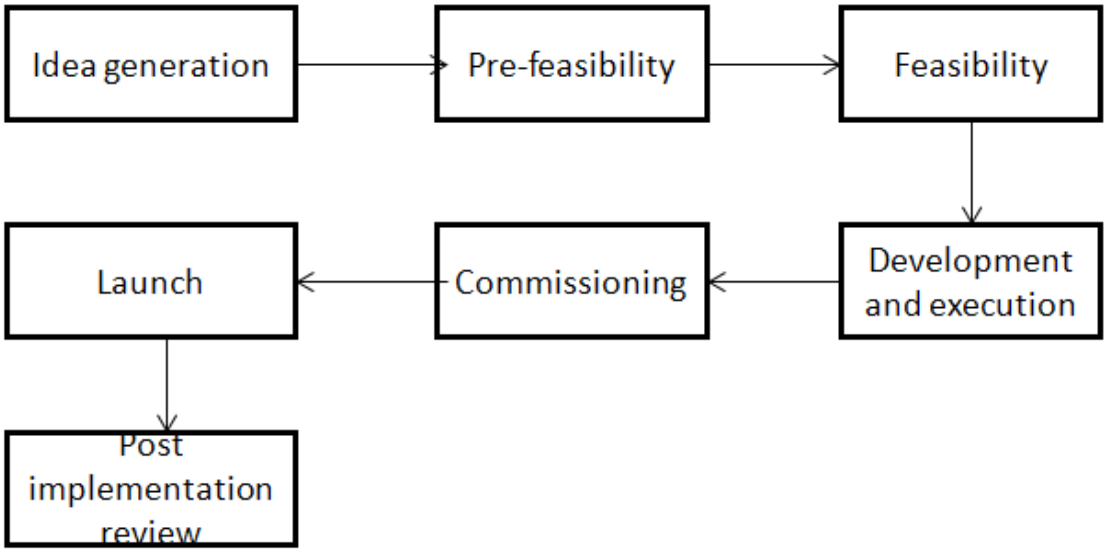
There is another similar approach to this from Buttrick (2000), who defines the following stages:

- idea generation,
- pre-feasibility,
- feasibility
- development and execution,
- commissioning,
- launch
- post implementation review.

The idea generation stage corresponds to Verzuh's (2008) definition, stating that the project-ideas – in concert with the business demands – are collected at this stage. The second stage is the pre-feasibility examination of the project ideas. In the third stage, based on the previous, those ideas will be selected (meeting the business demands), which were the most viable. The fourth stage is the execution of the project, which has the same characteristics as the previous conception introduced. The fifth stage encompasses – similarly to the concept of van den Ende and Marrewijk (2014) – the test in the environment in that the operation takes place. Though, this stage could

only be interpreted when dealing with strategic projects, still primary testing can be run in the case of event based projects. This time however, test is quite limited. After all the previous stages comes utilization of the outcome. And finally the evaluation. The author highlights that the last stage could only happen 9 to 15 months after the project was brought into use. The previous process is shown on the 3rd Figure:

Figure 3. A different approach of the project-lifecycle



Source: based on Buttrick (2000)

Similarly to the previous section the last approach introduced did not develop anything new (newer process), simply breaks down the previous approaches into more detailed stages. This can receive a higher importance when dealing with significant investments or strategic projects, because it can direct the attention to the critical processes (selecting proper project idea and the testing phase).

A newer approach that differs in its characteristics has been laid down by Laubschange and Brendt (2005). They went beyond the early project-cycle interpretations and started focusing on those phases that happen after the project was handed over. Thus, they focused on the project outcome itself instead of just the project. According to this description they defined the following phases of projects:

- detailed design,
- construction,
- operations/maintenance,

- decommissioning.

The first two phases correspond to the stages of the early project-cycle approaches (planning and execution). The innovation of this approach is the last two phases. However, if we were to accept the classic project approaches, then we can see that the last two phases are not parts of the project. Based on the last statement the approach by Laubschange and Brendt (2005) is incorrect in regards of the project management. However, this draws the attention to post-project management phases of the project. The utilization of this approach is only necessary when the project result bears a great significance. An example to this could be (by the interpretation of the authors too) when there is a certain need in the projects for sustainability measures (cf. Gareis, 2008; Gareis, 2010a; Kerekes, 2007). Thus, this way of seeing project goes beyond the project-cycle approaches and inadequately considers the lifecycle of the projects. The reason for this is that it simultaneously handles (in an integrated manner) the operative management (see chapter 2.4) and the project outcome.

Similarly to the previous approach Grillitsch et. al. (2007) have another research studying the project-cycle. They integrated the components of the knowledge management into the project-cycle. They separate five distinct stages of projects:

- the creation of project idea,
- the application of previous experiences when creating the project idea,
- the setup of the project tasks,
- implementation,
- the gathering of lessons, experiences.

They gather the previously acquired project-experiences throughout the second stage. Based on these experiences they define the third stage (this stage corresponds to Verzuh's [2008] planning stage). Finally, they draw the conclusions that helps the accomplishment (efficiently and effectively) of upcoming projects later on. At this point the aggregation of certain project tasks is the duty of the project manager (in cooperation with the project engineers [Fehér, 2004]).

Some authors highlight the control activity (see e.g. Wysocki, 2013), however it is by definition that the control stage is part of the implementation. Even though, the

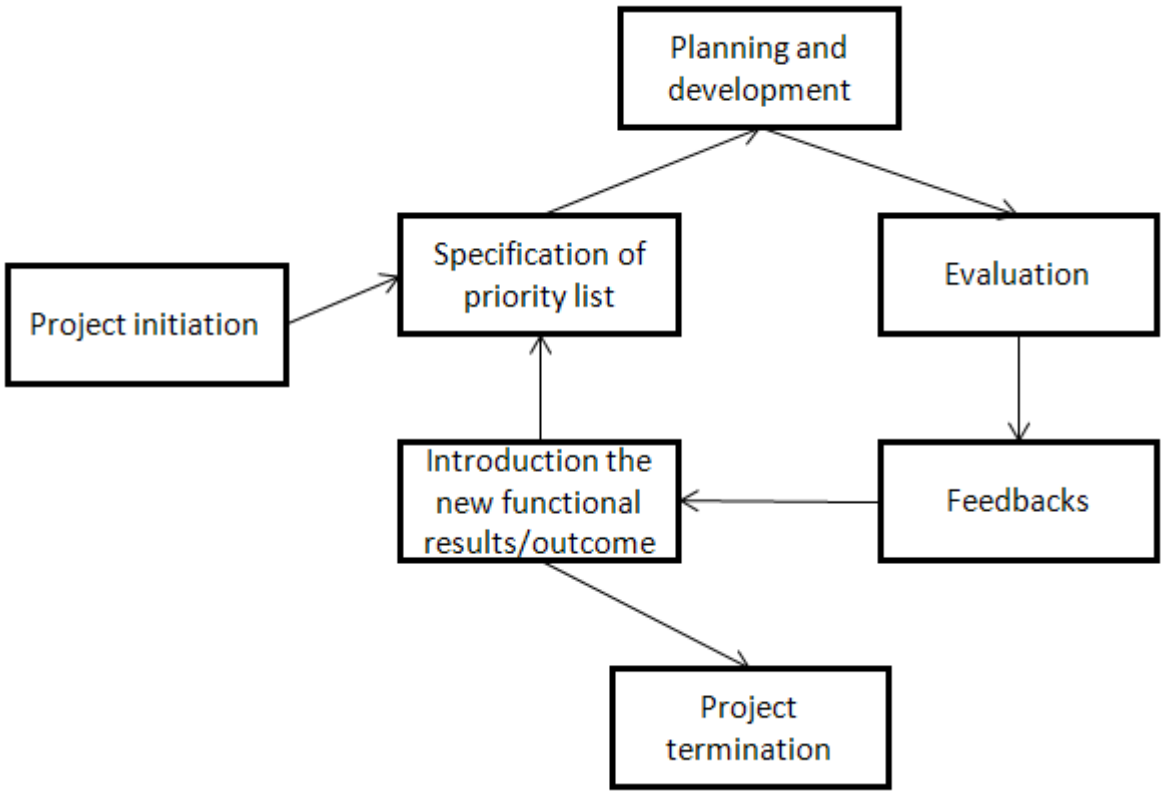
project limitation and the implementation are handled as iterative activities due to the agile project management (cf. Aljaz, 2013).

Other than those approaches (so called ‘waterfall’ approaches) that have been introduced up to this point, there is a different project managerial method called agile project management. This aspect of the project management has the following stages (see for example Wysocki, 2013):

- project initiation,
- specification of the priority list,
- planning and development,
- evaluation,
- feedbacks,
- introduction the new functional results/outcomes,
- the project termination.

The only new component in this approach is stage 2. At this stage the task is to organize, with the help of the customer, the components of the project result into a sequence based on their importance. The most important component will be planned, developed, evaluated, reviewed and delivered. And so the second stage gets repeated until every single component of the project outcome gets delivered. Thus, the project termination can be carried out. This type of project approach is quite widespread in the IT sector. There is potential in the IT sector to decompose the project result into components without significant functional decrease, that components might have different importance (cf. Aljas, 2013). This process is presented in the following figure:

Figure 4. The project phases of the agile project managerial methodology



Source: based on Wysoczki, 2013

The same conclusion applies to this kind of approach as well. It does not differ in its characteristics from the classic project-process approaches. The only thing it does is the creation of a project in the project, breaking down the project outcome into more detailed components. These components then get handled as separate projects.

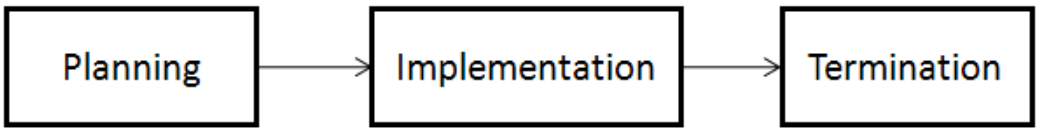
As a conclusion we can determine that the exact stages of the projects are the following:

- planning,
- implementation,
- project termination.

Every stage however can be broken down into more detailed sections. The planning stage can be separated into the creation of conceptions, the detailed planning and the

awarding. So as the implementation can have multiple sections, like: execution, control and testing. Looking at the project termination the following sections can be defined: the use of the project outcome, the aggregation of the experiences and the feedback stage. Overall, the classic projects (and somewhat the new agile projects as well) can be broken down into three stages:

Figure 5. Phases of project cycle



Source: the proprietary

To draw a conclusion, these three stages can definitely be found in any professional literature. But each stage can be diversified. It depends on the actual industry (cf. Judgev-Müller, 2005), or on the project management methodology (cf. Wysocki, 2013), or on the project objectives (cf. Labuschagne – Brendt, 2005) or on the project characteristics (cf. Görög, 2008; Verzuh, 2008).

2.4 Differences in management dimensions

Though the management of the project is similar to the disciplines applied through the organizational management, however there are many differences because of the specialties of the projects. Thus, it is necessary to compare the discovered leading dimensions.

Throughout the organization of the companies, the new interpretations differentiate three leading dimensions (Görög – Smith, 1999):

- strategic management
- project management
- operational management

Görög (2008) summarizes the main differences:

Table 1. Comparison of the management dimensions

Aspect of the Comparison	**Strategic Management**	**Project Management**	**Operational Management**
Time horizon of decision-making	Long term	Medium term	Short term
Influence on the organization	Decisive in long term	Decisive in medium term	Decisive in short term
Motivating forces	The likely future operational environment	Beneficial change within predefined cost and time	The actual market and/or the available resource
Nature of the task	Complex and innovative	Complex and innovative	Routine-like and standardized
Continuity of the task	Quasi-continuous	One time but recurring	Continuous

Scope of the task	The entire organization	The entire organization or more than one functional unit	Functional units

Source: Görög (2008), pp. 20.

It is clear from the table that the three types significantly differ from each other - but of course, there are common features. All of the management types are important to create an effective organization, however in some cases (especially in case of smaller companies) two or three out of the three is done by the same manager. After all, speaking of greater organizations, because of the differences caused by the diverse competence, different people do the different managerial tasks.

Looking at Table 1, we can determine that the main focus of the strategic management is the definition and realization of the long term objective; accordingly the benefit can also be realized in long term period.[19] Additional feature is that it creates changes concerning the whole organization, e.g. improving the product selection or rationalizing the expenses (see e.g. Antal-Mokos et. al., 2003; Mészáros, 2005). One of the main features by the people creating strategy is excellent analytic skill and willingness of running a risk.

Similar difference is identified by Labuschagne and Brandt (2005), see the table below:

Table 2. The characteristics of project and the operational activity

Project	Operational activity
Produces a new specific deliverable	Delivers same product
A defined start and end	Continuous
Multidisciplinary team	Specialized skills

[19] We have to mention that the time horizon can be different by industrial branches since in the different sectors of IT (for example in case of online marketing) the strategy is one-year-cycle but in the case of classic sectors the cycle can be 3-5 years, and a long term one can last for 10 years. (cf. Antal-Mokos et. al., 2003; Chickán – Czakó, 2009; Mészáros, 2005).

Temporary team.	Stable organization
Uniqueness of the project	Repetitive and well understood
Work to a plan within defined costs	Work within an annual budget
Canceled if objectives cannot be met	Continual existence is almost assured
Finish date and cost more challenging to predict and manage	Annual expenditures calculated based on past experience

Source: Labuschagne – Brandt (2005), pp. 165.

Contrary to this, the main function of the operative management is the arranging of the daily, operative (financial, production etc.) tasks and their efficient and effective operation – as it is seen on Table 1 and 2. It is important that the time horizon in which the operative management exists is short term, thus the leaders should possess avail of short-term maximized competences. Further feature – speaking of functional organization - that it stays in a particular organizational unit not exceeding its boundaries (cf. Dobák, 2006). It not just gives the chance for the managers to possess the knowledge of methods on how to manage people but also for the deftness in the technical matters. (cf. Bakacsi, 2004) Thus, they can easily allocate the tasks to the suitable people. The precondition is the transformation of the higher-level, hardly interpretable directives according to the relevant cultural specialties of the unit that everybody could provide the tasks. To do so, there is a need to possess certain amount of technical, analytical and managerial capabilities.

Overall, we can state that strategic management abilities are connected to the complexity and innovative tasks, the operative management deals with routine-like, well-regulated tasks.

The project management is situated in between the two time horizon containing the features of both, since strategic changes are needed to be realized on the level of functional unit(s). The project task keeps the complexity of strategic management and innovation centricity; however, it has the operative management's task-oriented aspect

(the amount varies project by project), and also get in connection with the functional unit's members (or at least the managers[20]).

The project management makes connection within the operative and strategic management not just technological but also content point of view (Görög, 2003). As soon as the strategic goals become definite, the project is created, which has impact on the operative management.[21] For example, a cost reduction strategic objective could be manifested in a business reorganization project by which the functions of one or more functional departments are rationalized. There is a need to draw the attention to the following fact; projects could not be initiated by senior management only. In companies that have the suitable organizational culture the middle managers or the operational managers or even workers could initiate beneficial changes and thus projects (Earl, 1989; 1996), though only the professional, specialized people can turn these ideas into real projects.[22]

2.5 Understanding of project management

Every organizational activity is needed to be managed on a certain level. Earlier the three main types were introduced on the bases of which we can make a difference between the company management aspects and dimensions.

The project management makes concordance between the two, since it builds in the goals made by the strategy into the operative environment. However, the meaning of project management is wider, throughout the years many concept came into being:

- 'The project management, throughout the fulfilment of the project activity is the knowledge, abilities, tools and the use of technics as the aim of the fulfilment of the project's requirements.' (Project Management Institute, 2006, 24. page)
- 'Such a management activity, which is emerged from other management areas, and different from operation management routine-like being, is aimed to implement the unique, complex set of activities defined by strategic management'. (Görög, 2003, pp. 363.)

[20] It is influenced by the basic project organisation.
[21] See: e.g. Antal-Mokos et al, 2003; Mészáros, 2005; Kiss – Molnár – Klimkó, 1993)
[22] Of course, in the case if the idea is worth making by the board of directors / committee.

On the fundaments of the previous written, we can state that the primary task of project management is to bring the project into success within the given setting made by the board of directors. Of course, it could eventuate that the conditions change hence those should adapt to the environment. Besides, it is important not just to realize success in the end, but to coordinate and control, thus manage the project efficiently and effectively. Thus, the tasks of project managers are the following (confer Fekete – Dobreff, 2003; Kiss – Molnár – Klimkó, 1993b; Project Management Institute, 2000; 2006):

- coordination of the project,
- project scope definition of the project,
- the definition of the project's duration and budget,
- the control of the project's duration and budget,
- the quality assurance of the project,
- the communication with the stakeholders,
- the risk management,
- the management of the external resources.

This is in accordance with the evolution of the understanding of project and the understanding project management. If the project is defined as a unique task, then the primary task of the project manager is the management of the project implementation process (cf. Project Management Institute, 2010). If the project is defined as temporary organizations then the primary objective of the project manager is to manage these organizations and the project team (cf. Lundin – Söderlund, 1995). On the occasion that the project is understood as a strategic building block, then the main duty of the project management is to actually manage the delivery of the beneficial change. These roles are complementary to each other (so as the project's interpretation) with overlapping components. To showcase the different interpretations, the roles and the harmonization of the project-cycles, the following table has been established:

Table 3. The alignment of the understanding and the phases of the project and the project management tasks

The interpretation of the project	Project managerial tasks	The phase of the project, in which the task is

		present
Project is defined as a unique task	Project scope definition of the project The definition of the project's duration and budget The control of the project's duration and budget Coordination of the project The quality assurance of the project Managing the external resources	Planning Planning Implementation Implementation Implementation Implementation
Project is defined as a temporary organization	Coordination of the project The communication with the stakeholders	Implementation Implementation
Project is defined as a strategic building-block	Project scope definition of the project	Planning of the project

Source: proprietary

This table shows which project managerial task is required by each approaches. It also tells where the exact task is present. Though the table is not deterministic, meaning that the tasks could and have to be utilized in different approaches. For example if the project is considered to be as a unique organization the utilization of certain tasks (planning and implementation) are still required; though the communication "task" receives the higher emphasis. Furthermore, it is necessary to note that only the project stage has been identified that was the most dominant out of all (it was the same when identifying the managerial tasks). For instance when looking at the control task, the definition of norms - that are used as a fundament - is done in the planning phase.

Thus, we can determine that the management of the projects is quite complex and requires an extended knowledge, which is going to be unfolded in chapter four.

2.6 Brief introduction to the methodology of the agile project management[23]

The agile project managerial methods (see e.g. Aljas, 2013; Wysocki, 2013) follow a different path than the classic, waterfall approaches (see e.g. PMBOK [Project Management Institute, 2010]). The essence of the waterfall approaches that the stages of the project are implemented after each other and well separated (see in chapter 2.4). Firstly the planning then the implementation and finally the termination of the project (see in Table 5.). The agile project management however breaks down the project result into result segments and creates projects in the primary project (Figure 4). With this, it can better respond to the changed environmental conditions thus the altered customer (project owner) demands. The only requirement is the close cooperation with the actual customer (project owner).

There are certain other cases when the agile project management differs from the classic, waterfall approaches (cf. Wysocki, 2013). Three additional factors can be revealed. The first is that the role of the project team alters. There is a greater responsibility on each member of the project team. The project team has to plan the project-result components, has to define and allocate the tasks and implement the project based on the priority lists. These make the role of project team very important. The second factor is the altered role of the project manager. Since the planning and the control is driven by the project team, his/her task remains the coordination and the assistance. His/her task is the prevention of all those difficulties, problems that could obstruct the implementation of the project. Nevertheless, it is viable to note that the project team itself has a manager, the so called scrum-master who is responsible for doing the classic project managerial functions (control and the delegation of the tasks), and at the same time he/she does other work-tasks (e.g. software coding). The third factor is that the project team is not to be dissolved after the project was terminated, instead it is to be delegated to a different project. This can significantly contribute to the preservation of the experiences and to a more efficient and effective workplace procedures (cf. Dobák, 2006).

[23] The detailed analysis of the agile project managerial methodology is not part of the current draft, though, for the sake of the research it has to be noted to some extent.

It can easily happen that an organization just partially adapts the agile project managerial methods. For instance the organization splits the projects into result segments but keeps the classic project managerial role (or at least some parts of it).

Coming to a conclusion we can determine that in case of the agile project management the value of the project team increases (Wysocki, 2013), even if the tasks that are run by the project manager do not alter (or to a minor extent only). This is due to the fact that their knowledge, skill opinions are significantly taken into consideration in the scope definition of the project result segments, thus can increase the efficiency and effectiveness of the project work in terms of the integration.

2.7 The general paradigms of project management

It is clear that project management is a complex discipline thus in the last years many ordinary and broadly accepted point of view emerged. Since project management is not accepted as a mature science according to the definition of Kuhn (1984), thus in the case of this discipline, the paradigm is not visualized as framework but one or more point of view generally accepted by researchers (Shenhar – Dvir, 2007).

The most important within paradigms is the approach of project, specifically how project is considered. At this point, we can differentiate three distinct approaches (as it has been introduced in chapter 2.1); we can consider the project as (cf. Shenhar – Dvir, 2007):

- unique task,
- temporary organizations,
- strategic building-blocks.

Overall, we can see projects as a unique task, temporary organization and strategic building block since they contain those features. They help reaching the strategic goal, operate as an organization within an organization and have the features of a process. However, the emphasis in every case is different: in the case of process-centric approach, the emphasis is on the quantitative features, the case of organization-centric on the management approaches and the case of strategic approach on the business strategy and the relations of the projects. This does not mean that there are no overlaps

between the approaches, moreover in the case of organization centric approach the adaptation of quantitative tools (for example time planning) are needed (cf. chapter 2.5).

The second common paradigm became known in the XX. Century, namely the strategic approach (Görög, 1996.). Today it became indispensable that the managing of the project conciliates with business strategy. It is important to mention that it not coincides with the previously approached strategic component namely; the project in this case could easily be concerned as the part of the program. The main essence of this perception is to overrun the project triangle's time, expense and quality limits and business strategy should be concerned as the primary criterion (even in concert with different projects too).

We can conclude that project management has two basic paradigms:

- the main category of the project,
- the following of the strategic aspect throughout the management of the project.

Of course the previously introduced enumeration is not complete since throughout the years many other point of view appeared (e.g. the project's duration cannot be longer than two years [Gareis, 2010b.]), nevertheless these were not accepted broadly in order to became the bases of an examination or project management.

3 Project success

Project management as discipline has many paradigm, definition and framework in order to be able to determine that. However, its most important role is to bring project into success furthermore these factors were created to help this process.

Nevertheless, organizations have to face many times with project failure instead of success nowadays. In the golden age of project management, in the Taylor era, the ratio of successful projects was high since everything was well defined. One of the main roles of the management was to integrate the mainly unqualified workforce into the organizational structure (Apello, 2011.). This, with the given circumstances more or less came to fulfillment. Projects were the manifestation of this, in a way, since project organizations, which were created from this workforce, aimed to achieve a certain goal under special constraints.

However, those tasks, which required knowledge that is more complex, could not be quantified that much and failure appeared in project management. Examples for this are space exploration, military technology, R&D or organizational development projects (Görög, 2007.). It is simple to acknowledge that developing a space shuttle is harder than the implementation of a new production line (assuming that the environmental factors are more or less the same for both projects). Regarding the IT/IS projects, the ratio of the project failure is quite conspicuous where the chance for success in the beginning of the XX. Century was less than 30% (Deák, 2001) and cost overrun was quite common among them (Berce, 1998; Radujkovic – Izetbegovic, 2000). Furthermore, one third of these projects were commenced before the handling/takeover (Lee-Kelley – Long, 2003), namely we can state that it became inevitable, the board of directors faced with such a high time or cost overrun that was impossible to optimize and other factors were not able to compensate those.

The ratio of unsuccessful projects within the military is more obtrusive, where only the 2% of the projects were used as it were planned (and only 3% were used with modifications) (Fehér, 2008). It means that the vast majority of the projects were unsuccessful, and considerable amount of resources were also wasted. This fact is noticeable, even if it is known that the army was never too efficient in expenses and the technology can be easily outdated. Moreover, a development takes very long time (think

about the development of the brand new machines, which sometimes require 10 years because of the complexity and technological difficulties).

Nevertheless, in these days, low success ratio concerns not just those projects that are not standard ones. It is noticeable also in the real estate development industry or in the non-profit sector where the success ratio of the state investment is low (FOVOSZ 2012).

On the bases of these, we can determine that project success bears of primary importance since without project success organizations cannot reach their strategic goals or realize their income. Additionally - as I mentioned in the introduction- huge amount of money is spent; so the redundantly spent money's proportion is also solicitous.

Many researches took place regarding the project's success throughout which several approaches evolved. It is worth to emphasize that failure cannot be explained with the lack of resources since these are available in the market[24]. Quantitative factors play more important role in project failure, like the scale of the inadequate project scope definition or the lack of project management competencies (see e.g. Standish Group, 2009).

3.1 Understanding of project success

As I mentioned before, the examination of project success is vital. What we regard as project success? Why we consider a project successful? How can we measure or help the achievement of project success? The answers for these questions can be done based on the success criteria and critical success factors. Success criteria helps to evaluate the project in the aspect of success, namely it means an output-oriented approach. The definition is the following:

"Success criteria are those base values based on which project success can be evaluated." (Görög, 2008, pp. 228.)

On the other hand, critical success factors mean an input-oriented approach, meaning when the success factors are realized the potential for project success is

[24] Exception is the very rare and specific resources. That is why there is competition between the organisations and within organization as well for them (Evans. 2000).

increased to a great extent, in an extreme case even to 100% (Fortune-White, 2006; Rockart, 2002).

To understand project success, it is necessary to examine it both from input and output side otherwise, we get a distorted picture.

3.2 Development of the understanding of project success

To understand project success completely, it is indispensable to know the development of understanding. This evolution is in accordance with the development of the project and to some extent the understanding of strategy. Judgev and Müller (2005) determined four eras in their paper.[25]

In the first era, which was classified from the 50's till the beginning of 70's[26], when the success criteria, success factors were characterized by the classic project triangle: time, cost and quality parameters. (cf. Olsen, 1917). Of course, it does not mean that the three criteria are not that important today and those methodologies were inadequate for success. It just meant that because of the predictability of the market the long-term strategic planning was enough to manage the organization in an appropriate way (Antal-Mokos et. al., 2003). It contains, that the main aim of the projects did not change throughout the implementation, those parameters remained important which were defined throughout the scope definition (cf. Judgev-Müller, 2005). Thus, the time, cost and quality completion meant project success.

The second era is typical for the 70-80's and the project triangle as the only success criterion, was not enough anymore. The two oil crises (which eventuated in 1973 and 1979) gave unpredictability and dynamism features to the market (cf. Antal-Mokos et.al, 2003), and projects had to react to this. Time, cost and quality were not enough; a more client centric approach was needed. Thus, such success factors and success criteria came increasingly into prominence, which emphasized the importance of client's and project owner's satisfaction (cf. Atkinson, 1999).

[25] The couple saw conclusion in the base of US projects. In Europe (or in the rest of the world) this four eras can be found also, though the time horizon is different due to cultural differences.
[26] It not means that before the 50's, projects were not vital but there was no notable professional literature.

The 90's include the third era where it was necessary to examine projects in a strategic orientation so that, it needed to have a closed integration with the business strategy. These all was due to the World's momentary status (e.g. opening, uniformity). They realized that, critical success factors should not be considered as separate beings, they should be treated in as a part of a system, integrated with other processes. Besides they recognized that for the project success the external and internal stakeholders greatly contribute, moreover the environment creating the project got a considerable role in the achievement of success (cf. Belassi – Tukel, 1996; Görög, 2003)

In the fourth period - which started at the dawn of the new millennium and still lasts - the strategic approach got a deeper interpretation due to the faster and more complex World (which was caused by the for example due to the globalization or the quick spread of the internet) (cf. Mészáros, 2010). Therefore, integration and the examination of the interrelationships among each other became more necessary[27] (Westerveld, 2002).

It is clear that the examination of success criteria and success factors has to transpire in an integrated system following a holistic approach (Turner, 2009). Otherwise, we get a distorted picture of the project. Due to these, successful projects could be evaluated failure or on the contrary, unsuccessful projects could be characterized as sounding success.

[27] We have to mention that despite the realization of this, only a few literature treated success criteria and success factors in an integrated manner, rather authors were aiming to identify new criteria or factors.

3.3 Success criteria

With the help of success criteria (as the fundaments of the comparison) project success can be evaluated (Cooke-Davis, 2002; Görög, 2007). The definition of criteria in a specific project most of the time is complicated since a seemingly well-defined project could fail in the long run. However, we can assess that success criteria has been developed together with the understanding of the project (Judgev-Müller, 2005).

On the bases of these (and as it was mentioned before), we can declare that the project success has to follow a holistic aspect, namely it has to represent the complex environment.

It was unambiguous from the beginning of the 1980's that per se the project triangle was not enough for the measurement of the project success. New approaches were needed; new factors had to be built in the model in order to get a relevant picture.

Many approaches revealed with two bigger groups (Görög, 2003):

- non-hierarchical approaches
- hierarchical approaches

The essence of the non-hierarchical approaches is that the equal weight is assigned to the criteria contained by the model, while the hierarchical models assign different weights to the criteria.

Both approaches are common in literature though as Judgev and Müller (2005) say two requirements have to be met:

- Holism: it is necessary to collect all of the relevant factors
- Reality: it is necessary that the model based evaluations match in reality, to classify successful projects as really successful and unsuccessful projects as unsuccessful

3.3.1 The non-hierarchical approaches

Many literature approaches have been made in this topic, as a development of the evaluation based on the project triangle.

Wateridge's paper was a milestone in the first requirement, in the definition of relevant criteria (holism). He defined their criteria based on 132 IT/IS projects. He stated that beyond the three elements of project triangle three other criteria play important role in the evaluation of the project. These are the followings:

- meets user requirements;
- achieves purpose;
- happy users.

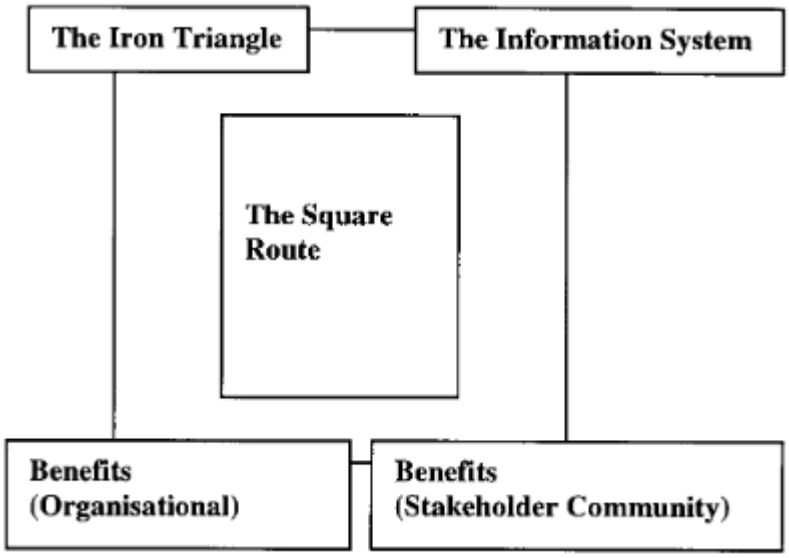
We can see that it is a user-based model since the three criteria mentioned above are the same on the bases of these aspect. Therefore, we can reveal that the satisfaction of the users or project owner is an indispensable factor in a relevant model.[28]

The criteria of Atkinson (1999) softens the over representation of the users adequacy of the IT/IS project's features, albeit his criteria was determined on the same kind of projects. The author begun the examination from another point of view, he examined the causes of failure. He distinguished two kinds of mistakes, type one and type two. In type one there are those which were made wrongly (e.g. wrong time and cost plan or the badly assessed risk or the badly planned project control.). The type two contains those, which remained unaccomplished (e.g. inappropriate project scope definition, risk identification or stakeholder management). Atkinson (1999) deduced from these how to measure project success. He conceived four criteria:

- iron triangle: time, quality, expense;
- the information system (technical adequacy of project result);
- benefits (organization);
- benefits (stakeholder community).

[28] We have to mention again that he draw the conclusion based on IT/IS projects, where the end-user satisfaction bears of great importance (Turner, 2004). However, in the case of every project it is important to meet the user requirements, even if the nature of the project does not assign such an importance for this criterion.

Figure 6. The Square Root



Source: Atkinson (1999), pp. 341.

The criteria are similar to Wateridge's, though Atkinson brings in another one, the stakeholders' satisfaction (benefits for stakeholder community). In the earlier mentioned study by Judgev and Müller (2005), the satisfaction of the stakeholders in a broader sense as a factor became essential when evaluating project success. Thus, Wateridge's criteria do not accomplish the first requirement (the holism) mentioned earlier. Contrary to Atkinson's model, which contains ever-important criteria, moreover it is easy to tailor-make to a project.

The second requirement is also worth examining, namely if we regard every criteria as equal (assign equal weight to every criterion), whether we get a realistic picture of the project or not. It can be easily seen that we do not get a realistic picture. It could easily happen that one of the criteria damages, though the project succeeds. For an example, we can have the Opera in Sydney where there were 10 years of delay in the opening of the building; moreover, the construction price of the building grew to 100 million dollars, which was 13 times more than the originally planned (Kun, 2005). However since the Opera is the symbol of Sidney, the project ended with an undoubted success. Regarding the criteria identified, in this case only three were achieved, so normally this could have led to failure. Of course we can add dynamism to the model. We can assume that the three criteria could compensate (by means of the success of a

project) the fourth one, though this would mean that we do not regard the four essential criteria equally important, so we would apply a hierarchical approach.

Based on the previous statements we can see that there are criteria, which can compensate lack of each other's, so that inducing the necessity of hierarchical models.

The case of the Sydney Opera House (so as the conclusions) assumes the issue of bounded rationality (cf. Simon, 1957; 1982), since it is simple to acknowledge that even if the outcome was not the best it could have been, still the project was considered to be successful. So all of the decision-makers accepted the satisfactory outcome instead of the optimal one. This could have been the result of two matters. On one hand, the environmental conditions were excessively complex when trying to optimally evaluate them, so the managers simplified the processes (cf. bounded rationality). Thus, the preliminary expectations did not consist the possible demands of change (cf. Kun, 2005.). On the other hand, the proper weighting of certain evaluation criteria were not happened, though it would have been required (cf. Tofallis, 2012). To this last matter the KIPA method could (Kindler – Papp, 1984) give solution, which can be utilized when dealing with complex decisions. One of the elements of this method is the weighting of the evaluation criteria.

It is then reasonable to assume that the weighing of the evaluation criteria is always required (cf. Tofallis, 2012), even if (based on the bounded rationality) there is no potential to establish a completely accurate weighting system. This motivates the use of hierarchical models (see detailed in chapter 3.3.2.).

3.3.1.1 Financial based evaluation models

It is important to note that some papers regard suitable diverse financial based evaluation models (e.g. Freeman – Beale, 1992; Gardiner – Stewart, 2000; Yu et al, 2005). Specifically the evaluation is based on indices like ROI or NPV and not for example on the satisfaction of users/project owners or on the bases of time limits.

However, these also have their own boundaries. In the case of a project, which is related to profit orientation or cost optimization, expenses could seem viable (for example building an estate or merging departments together which was motivated by reducing the costs). However, the evaluation does not go beyond the ex post and ex ante comparison of the financial feasibility study. Moreover, it does not permit the evaluation of the softer factors. However, the serious boundaries are the projects, which could not or less likely to be measured in a financial aspect. An example for this is the initiation of the knowledge management system. We can admit that this kind of project's benefit could be measured with reductions if we apply a financial based evaluation model.

There were attempts to recover this incompleteness with the known system the Balance Scorecards (see e.g. Eilat et al, 2008), but the previously mentioned shortcomings can be experienced here also, thus the quantitative aspects got excessive emphasis. This evaluation is also quite sensitive to those outcomes that can hardly be quantified. Without proper weighting – which depends on the actual project – some evaluation-factors receive higher or lower importance than required. This, however could be compensated with the integration of the proper weights, so that establishing the hierarchical approach (cf. Tofallis, 2012). Nevertheless, it has to be assessed that the evaluation based on Balanced Scorecards is more than just a sheer financial evaluation, since it integrates many other aspects. The shortcoming of this type of evaluation is not in the lack of evaluation criteria[29], but the lack of weights (cf. Eilat et al., 2008).

On the bases of these, we can state that the financial based models are not appropriate for complete and accurate evaluation in each case, moreover do not fulfill the requirement of holism in most of the cases.

[29] Although there are other criteria which could part of the model.

3.3.1.2 Key performance indicators (KPI)

The non-hierarchical approaches contain the key performance indicator based evaluation models (see e.g. Toor – Ogunlana, 2010), which evaluate projects by certain indices[30] and decide on the success of the project. Throughout the KPI measurements, they determine the expected values, which have to be completed, or else the achievement is not suitable, the project will not be successful. Such an example is in the case of an IT system regarding the respond time or the number of the transactions can be made at once. Of course, there are more qualitative approaches.

We can admit that these indices are similar to the previous ones and its disadvantage reveals in the case of hardly quantified projects. In the case when indices could not be assigned to the projects.

Besides there are other softer factors of the quantifiable projects, which are essential too, but these cannot be expressed with KPIs.

Moreover, the indices are treated equal, meaning this method does not assign weights to each criterion, which contains the risk that the picture of project success will not be realistic.

Keeping the previous fundaments in mind, we can declare that the KPI based assessment could be useful in many cases and draw the attention to the project's quantitative parameters for which the chance of realizing these grows. Nevertheless, there could be deficiencies in the evaluation (lack of holism and realism) thus it is advisable to use more complex models than the KPI-based ones.

3.3.1.3 Summary

Of course, the previously mentioned methods are not inadequate in each case in the evaluation of project success, many organizations use them. In certain cases, the Atkinsonian iron triangle is enough for it. However, these methods possess serious limits, since there are many projects where they cannot be utilized because they not meet the requirements of holism and/or realism. That is why hierarchical approaches are vital.

[30] This system is used for mainly evaluate the performance of a company, but it was converted to project level as well. .

3.3.2 Hierarchical approaches

Hierarchical approaches correct the lack priority of Atkinson's model since those 'rank' the success criteria. Thus, the question is the number of steps, which are necessary for the adequacy for reality[31].

However, de Wit (1988) distinguishes two levels in his work the success of the project managements' by means of the project triangle and the project success, which means the stakeholders' satisfaction. These are handled separately and in a hierarchic manner. Other advantage of the model is that it assumes correlation between the two steps, project management success can help to realize project success. However he notices that conversely is not true, which is not appropriate in each case (enough to think of the case of Sydney Opera House). The question is if the two steps are enough for the realization of the truth.

Baccarini (1999) determined a similar system of criteria. He also defined two levels, which are as follows:

- product success;
- project management success

The latter estimates the management efficiency whether the project met with the predefined time, cost and quality requirements or not (besides the quality of project management process and the satisfaction of the stakeholders taking part in the project completion). Thus this model also contains the project triangle.

The product based success estimate three more aspects:

- meeting the project owner's strategic organizational objectives (project goal);
- satisfaction of the user's needs (project purpose);
- satisfaction of the stakeholder's needs where they relate to the product.

It is visible the Baccarini's model match the interests, contains every relevant aspects. Worth to emphasize that it contains the correspondence to the strategic aims, which further increases the relevance of the model, since Judgev and Müller (2005) stated that in this turbulent environment this aspect is needed. Another advantage is

[31] Authors do not nominate their models hierarchical in each case. Though I considered those models hierarchical, where it was clear that a model assigns different weights to the criteria.

Baccarini catches the attention to the interrelationships between the two levels namely; project management success influences greatly the project success. For example the meeting of organizational objectives is influenced by the project's duration and cost. Of course, the affect is true contrariwise since the product success can justify the time and cost overrun. Moreover emphasizes that the evaluation's time horizon have to be different. For example, the project success cannot be always defined the moment the project is ended, while the completion of the project triangle can be done already after the ending (in case of an appropriate project control, also during the implementation). This time distinction deviates project by project. Thus, the evaluation of the project not ends after the handling/take-over, it must be evaluated later also.

The model is holistic at first sight and emphasizes the coherences between the dimensions though there is a deficiency. Particularly some criteria of the product is handled equal whereas it does not work in every case. For example in the case of an ERP system, the triangle met with the predefined requirements, the client is satisfied but the end-users cannot use the system, the project is unsuccessful[32]. An extreme example in a project, which has a dramatic influence on environment e.g. the building of a nuclear power plant where the neighboring stakeholders or certain organizations (E.g. Green Peace) could stop the successful completion of the project even if it was suitable in every aspect.

Due to the latter reasons, the two-level hierarchical level is not adequate for evaluation and such approaches are needed that do not handle equally the satisfaction of the stakeholders and the project owner's satisfaction.

As a solution, we can find the hierarchical model (Görög, 2008), which examine the success of the project on three levels:

- The time, cost and quality of the project
- The satisfaction of the client or project owner (based on the realization of the underlying strategic objectives)
- The stakeholders satisfaction (meeting with the expectation of other relevant stakeholders' interest)

[32] The question comes up whether the meeting with the organization objectives is realized if the end-users cannot use the system, and this yields for example cost reduction cannot be realized. But that is the consequence of the fact that end-users cannot use the system.

It is encapsulated in Figure 7.

Figure 7. Hierarchical model

Source: based on Görög (2008)

As it has been mentioned previously, it is necessary to evaluate every project based on the model's three criteria. With that said, projects should also be evaluated based on the evaluation efficiency (project-triangle) and the effectiveness (satisfaction of the client and the stakeholders). This way the hierarchical model would meet the requirements of the holistic requirement. Other advantage of the model is that it satisfies other criteria, the reality due to consideration of the interrelationships and levels (and due this latter ones, the weights). Besides the projects contain the strategic approach, which was emphasized by Belassi and Turkel (1996), Grundy (1998), Judgev and Müller (2005) (based on the second and to an extent, on the third criteria. Therefore, we can state that this model contains all of the previously mentioned advantages of the models, nevertheless in the aspect of relevance it goes beyond it.

The author emphasizes that there is interrelationships between some criteria. Namely, as Baccarini stated that the project triangle has an impact on the client's satisfaction and the realization of these can compensate the exceeding of the project triangle. Nevertheless, the satisfaction of the project owner can have an impact on the stakeholders' satisfaction, or vice versa, stakeholder satisfaction can have an impact on client satisfaction (for example in case of an ERP project)

3.3.3 Summary

Reaching out for a conclusion, we can state that the hierarchic modal accomplishes both requirements, holism and reality, namely contains every important success criteria and considers different weights due to the levels. Other advantage is that it contains the strategic aspects too (due to the second and to some extent, the third success criterion) which further increases the model's relevancy. Without these there would be difficulties with the evaluation of the project in the modern, turbulent environment. Namely, it provides the suitable dynamism. We can declare that if we would like to evaluate a project properly, it is advisable to use the hierarchical model.

It is important to note that there could be cases where it is not necessary to evaluate based on the model, there are some other models, which could give a relevant picture of the project success. Alternatively, financial approached models or the nonhierarchical or the two-levelled ones, moreover the project triangle could be enough. Furthermore the realization of the strategic goal and the satisfaction of the stakeholders could be evaluated just after the completion of the project, namely the evaluation should go beyond the project's time horizon. This is of course a task that requires resources, however it is vital in the aspect of the experience and 'the correctional.

Moreover it is important to mention that there are other authors who are published papers in this topic (e.g. Agarwal – Rathod, 2006; Ahadzie et al, 2008; Bryde – Robinson, 2005; Doloi, Iyer – Sawhney, 2011; Gemünden et al, 1990, Hassen et al, 2011; Laubschagne – Brent, 2005; Lim – Mohamed, 1999; Patanakul – Milosevic, 2009; Savolainen et al, 2012; Thomas – Fernandez, 2008; Worthen 2008). However, these evaluate, based on similar aspects, or consider less criteria or the conclusions of these papers were summarized in the earlier works.

Based on all of these, it can be stated that the hierarchical model meets the two requirements (holism, reality) written in chapter 3.3. Furthermore, it integrates the strategic approach as well that has already been highlighted by many authors (e.g. Grundy, 1998). Thus, this model could be the fundament in evaluating project success.

3.4 Critical success factors

In order to gain a complete overview of the success of the project, it is advisable to observe from an input viewpoint as well. Useful tools for this purpose are the success

factors or more importantly the critical success factors. The differences between the two are the extent. While the success factors can help to achieve success, the critical success factor (CSF-s) can fundamentally increase to potential (or considering the whole project contribute majorly or in extreme cases the dependency on them may even reach 100%) to achieve the success of the project (Rockart, 2002)

This feature composed the basis of the method of success factors. The fundament of this method is that during the scoping of the project several (3-7 if possible) such factors should be determined whose realization should ensure the success of the project altogether (see e.g. Earl, 1989). The golden age of the critical success factors method was in the early 90's, which does not mean the definition the CSF are no longer present. The recent issue is that the practitioners consider critical success factors as hints, rather than building the project management process on them (cf. Görög, 2008). Since they do not guarantee success in themselves, although defining the CSF-s may provide additional aid to achieving success. So finding the key factors are still beneficial to project success.

3.4.1 The evolution of critical success factors

Just like the 'development' of the success criteria, the 'development' of critical success factors equals to the development in the understanding of projects. At the dawn of the CSFs the focus was on project triangles their main task was to ensuring it in order to achieve success. However, with the fall of long-term strategic planning more "soft", more refined management-related related factors were required (cf. Antal-Mokos et. al., 2003). Such are the competency of project managers and project team or the support of senior management (cf. Fortune – White, 2006; Judgev – Müller, 2005).

Fortune and White (2006) observed 63 pieces of related literature and based on them identified dozens of critical factors. However, filtering the redundancy like content correspondence and differences only in composition 63 was reduced down to 27. It is important to stress that in some instances the scale of the simplification was too big since support and the involvement of senior management are not the same in each case. Considering the above mentioned the following five factors were the most popular:

- Support from senior executives (39 out of 63 publications)
- Clear realistic objectives (31 out of 63 occurrences)

- Strong/detailed plan kept up to date (29 out of 63 occurrences)
- Good communication/feedback (27 out of 63 occurrences)
- User/client involvement (24 out of 63 occurrences)

As a conclusion, it can be said that nowadays the more "soft" issues bear greater importance as they are less related to the project triangle than it was with the concepts of the project management decades earlier. Moreover, further results are the relation between the project and the organization became more important (support from senior management, clear realistic objectives, user involvement).

Turner's (2004) four conditions are an interesting approach as they sum up two author's (Wateridge's and Müller's) discussion regarding success factors and success criteria. The four conditions are the following (Turner, 2004, p. 350):

- The success criteria should be agreed with the stakeholders before the start of the project, and repeatedly at the configuration review points throughout the project
- A collaborative working relationship should be maintained between the project owner and project manager, with both looking at the project as a partnership.
- The project manager should be empowered with the owner giving guidance, as how do they think the project should be best achieved, but allowing the project managerial flexibility to deal with unforeseen circumstances as they see best.
- The owner should take an interest in the performance of the project.

It is perceivable (and Turner also called the attention to this factor), that the points above are not actual success factors, as their completion alone does not grant the success of the project. They are rather failure factors so lacking these will influence the outcome of the project in a negative way[33]. It is important to note that these factors emphasize rather the importance of the project manager and project structure. Since the first point is in essence, equals to the involvement (into the higher level planning) of stakeholder with which the refusal of the final project result by the essential stakeholders (e.g. the end-user in case of an ERP-system) can be avoided. The second point emphasize the cooperative work between the two most prominent parties namely the project manager and the project owner. Lacking this, debate over authority might

[33] However, the realization of these four in same time can increase the potential for project success to a great extent.

rise that would inevitably harden the job and may even result the failure of the project. The third point might be related to the second one although it observes from a different angle. According to this, the directives are required unless they overly restrict the project manager since in such case he becomes unable to react properly to arising changing demands (without actualizing the guidelines). In addition – unless the project is a very short-term one – certain changes are to be calculated with. The last point calls the attention to the importance of permanent control without which the emerging deviations, faults or mistakes are treated with a delay or difficulty or even improperly.

As a conclusion, it can be stated that the above-mentioned four conditions approach the success of the project from a different angle since they define failure factors (see more e.g. Al-Ahmad et.al. 2009; Kappelman et. Al., 2006). However this only seemingly contradicts to the previously introduced ways (the critical success factors) since devote resources to avoid the failure factors increase the chances of project success.

Of course, far greater articles, papers and writings are about the critical success factors but their vast numbers (both the numbers of writings and critical success factors) restrict the more extensive analysis. Due to this, their grouping is advised. Based on the literature, nine major groups can be created. The basis of the grouping was Görög's (2003) grouping, but this was extended by the critical success factors of Fortune-White's (2006) and many publications (Black, Akintoye - Fitzgerald, 2000; Bryde, 2008; Chen - Chen, 2007; Cheung, Yiu - Chiu, 2009; Clark (1998); de Bakker, Boonstra - Wortmann, 2010; Fiedler, 2010; Fortuna - White, 2005; Gelbard - Carmelli, 2009; Ho, Chang - Wang, 2008; Hartman - Ashrafi (2002); Hormozi - Dube (1999), Jang - Lee, 1998; Lindner - Wald, 2011; Müller - Turner, 2010; Ng - Tang, 2010; Papke-Shield, Beise - Quan, 2010; Pinto - Kharb-a (1996); Pinto - Slevin, 1987; Turner, 2004; Umble, Haft - Umble. 2003; Yang, Huang - Wu, 2011; Yeo (2002); Yu - Kwon, 2011; Westerveld, 2003).

The nine factor groups are the following:

- Clarity of the underlying strategic objectives of the project
- Scope definition of the project

- Continuous communication amongst the project team members (including the user's involvement and the support of the senior management)
- Reliability of the project triangle and the availability of the resources needed
- Competency of the project manager and his/her leadership style
- Competency of the project team and the team's motivation
- Risk management
- Change management
- Organizational and environmental characteristics

It is perceivable that these categories are very complex ones also, they can include numerous factors. However, for purposes of further analyses these are sufficient for they illuminate the most important groups. Moreover, a categorization was required for such analyses and such groups represent in a decent way all the so far known success factors.

As a conclusion it can be determined that the numbers and spectrum of success factors are vast. Based on that, there was a need to create groups among them, which help the further analyses. Of course, this does not mean that all the critical success factor groups must be analyzed but rather that it is advised to pay keen attention to their various natures during the analyses.

3.4.2 Criticism of the critical success factor approaches

The CSFs and mainly the method of CSFs received severe critics over the years due to the fact that it is hard to summarize the ways of achieving project success in several factors. However, this was not the biggest problem for experts, but those which were summarized by Fortune and White (2006)

• The importance of critical success factors may vary throughout the completion of the project and most of the analyses do not consider this.

• The interrelationships among critical success factors could be more important than the factors itself, however the literature does not analyze these.

The second point is supported by the following example by the authors: The support of senior management is a factor that is related to the organization and is influenced by the current state of the economy. The uniqueness of project activities can

have an impact on the required level of the competency of the project manager. The simultaneous lack of senior management support and the lack of competency by the project manager can lead to project failure.

The above-mentioned two criticisms might be supplemented with two additional ones. The first viewpoint treats project success as a homogenous term, thus not taking the different success criteria into account. This point slightly correlates with the first points of criticism in a sense that if the project success is treated as a homogeneous term then the importance of its various factors changes greatly during the completion of the project. However, if the project success is divided into several criteria the priority differences caused by project progress can be dampened. By the second viewpoint, identifying a general critical success factor could run into obstacles (Görög, 2008).

The second criticism gathered by Fortune and White (2006) emphasizes the importance of correlations, however – according to my point of view – the analysis of individual factors alongside with their impact on success criteria in itself can result useful consequences. Since the initial step is the determination of CSF-s impact on a particular success criterion, the determination of the impact's extent provides the necessity of additional analyses.

To sum up, the criticism regarding the CSF is relevant and it is essential not to perceive the project success as a homogeneous factor. Moreover taking the correlation into account the CSF method can be improved since the relation between them can have a substantial impact on the degree of completion of individual factors.

3.4.2.1 Responses to the criticism of critical success factor approaches

The criticisms regarding the critical success factors – as I have demonstrated above – may significantly reduce the usability of the factors themselves. Just a few researches exist that consider any of the four critics or even all of them – compared to those literature that deal with the critical success factors (cf. Fortune – White, 2006). Thus, the number of papers, which analyze the impact of the critical success factors' (e.g. coordinating methods of project leader) on success criteria (see e.g. Jha – Iyer, 2007) is relatively small. Even fewer pieces devote attention to correlations between the factors (with the exception of e.g. Yang, L. Juang, - C. Wu, K, 2011). Cserháti and Szabó (2014)'s paper is notable to mention amongst these. They analyze the impact of several critical success factors (project definition, contract strategy, project leadership,

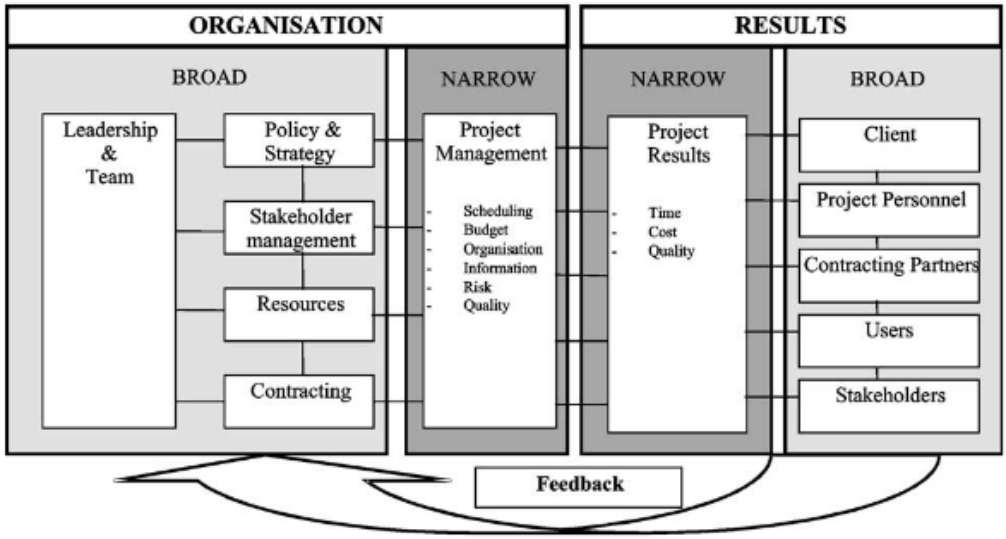
organizational culture of project team, communication & co-operation with contractors & sponsors, partnership with local & national stakeholders) on project success (fulfillment of project objectives and satisfaction of project stakeholders). The advantage of this paper is that the authors analyze these interrelationships in very-detailed manner and on a sounding basis, considering not a single critical success factor or success criteria.

Moreover two such approaches appeared that attempt to frame critical success factors and success criteria.

3.4.2.2 Alignment based on The Project Excellence Model©

One of the two mentioned above was introduced by Westerveld (2002) based on the Project Excellence Model©. The model's advantage is that it utilizes the EFQM's (European Foundation of Quality Management) model and extends it with the hence published academic literature pieces. The essence of the model is that the organizational factors are synchronized with the project goals. (See Figure 5.)

Figure 5. The Project Excellence Model©



Source: Westerveld (2003), pp. 415

The model evaluates on the basis of six aspects:

- The narrow interpretation of the project result (time, expenses, quality)
- Based on the viewpoint of the client
- Based on the project personnel (team)
- Based on the contracting partners of the project
- Based on the users of the project
- Based on the stakeholders of the project

It can be seen that the listed criteria are in accordance with the requirements of holism (cf. Judgev-Müller, 2005, Turner, 2009) so it evaluates based on the project triangle and satisfaction of the client and stakeholders the project. Its only disadvantage is that it does not evaluate based on a hierarchical basis. The severity of this disadvantage is somewhat lessened by the fact that due to the immanent characteristic of

the model broader and narrower evaluating criteria can be identified which placed into suitable environment may mean hierarchy as well.

Above the evaluating criteria, the model also identifies factors that advance their completion and observe them primarily from the prospect of the organization and states the following:

- Leadership style of the project manager (with careful attention to the management of the project team)
- The appropriateness of the strategic goal of the project (and its disambiguate)
- Stakeholder management
- Resources used
- Contracting strategy and the appropriateness of it
- The quality of project control

The author states that not every type of project requires all evaluating aspects (e.g., the contracted concerned parties' satisfaction is irrelevant in an inner project) moreover, not every project demands the "aid" of every organizational branch.

Due to this Westerveld (2002) considered the proper categorization of the project the "zeroth critical factor". According to this, he identifies five different project types as the following:

- Product orientation: in this case, the project is an organization which purpose is the creation of a product defined by the client. The author stated an example about the removal of sunscreen in a hospital.

- Tool orientation: In this scenario, the project must be considered a process that also intends to produce a final product but in this case specific methodology and tools are needed. The author stated an example about a specific maintenance in a factory.

- System orientation: The project is a system which purpose is the creation of a product that considers the interests of multiple stakeholders. The author stated an example about a school that takes into account the interests of locals, children and teachers alike.

- Strategy orientation: The project is an organism that intends to create a project result that satisfies the demands of the clients and users while affected by the

boundaries made by external stakeholders. The implementation of an ERP system is a typical example for this category.

• Total Project management: In this case, the project is a complex network of stakeholders closely related to each other trying to create a certain project, which satisfies the demands of the client and users. The author stated an example about the renovation of a city center.

Naturally, varying project types demand varying success factors. The table below contain Westveld's (2002) summary:

Table 4. The characteristics of certain project types by the Project Excellence Model®

	Key project organization	Key result areas	Key organizational area	Key to success	Critical control aspects
Product orientation	control Clear work descriptions Progress reports Effectiveness Executing tasks	Project result	Project management	Opportunism	Time or money
Tool orientation	Strong division of tasks Supporting tools Phases execution Efficiency Reacting to conflicts	Project result Appreciation pProject Personnel	Resources	Efficient use of resources	Time and money
System orientation	Control stakeholders Inform stakeholders Co-operate with contractors Quality of the work processes Estimate and control risks	Project result Appreciation Project Personnel Appreciation Contracting Partners	Contracting	Read the environment	Time, money, quality, risks
Strategy orientation	interaction Consult users and clients Serve needs of client and users Flexibility Pro-actively managing risks	Project result Appreciation Project Personnel Appreciation Contracting Partners Appreciation Client Appreciation Users	Policy and Strategy	Flexibility	Time, money, quality, risks, organization
Total project management	Sharing responsibility Co-operative decision and execution Long term solutions Innovative methods Manage risks together	Project result Appreciation Project Personnel Appreciation Contracting Partners Appreciation Client Appreciation Users Appreciation Stakeholders	Stakeholder management	Establish consensus	Time, money, quality, risks, organization, information

Source: Westerfeld (2002), pp. 416.

From the table it is clear that the system is complex and is suitable for the holistic requirement (cf. Judgev-Müller, 2005, Turner, 2009). Otherwise, it cannot give

answer[34] what kind of success factors having an impact on which success criteria. We can conclude indirectly namely where there is just one criteria everything have an impact on that one. Of course, where there is more, the impact cannot be decided.

On the bases of these we can determine that the model is an outstanding step since it puts in an integrated system the success factors and success criteria, moreover we cannot doubt it's practical relevancy. However, the lack of hierarchical aspect and the specific nature of the model prevent it from being the base for general analyses. Of course, this does not mean that it is not a valuable knowledge for the experts

Furthermore, it is important to note that the newer version of the Project Excellence Model® has been already created (see International Project Management Association, 2014), with updated content, though it kept its original style and structure. However Westerveld (2003) draws his conclusions by the previous version, and due to this the previous model was described.

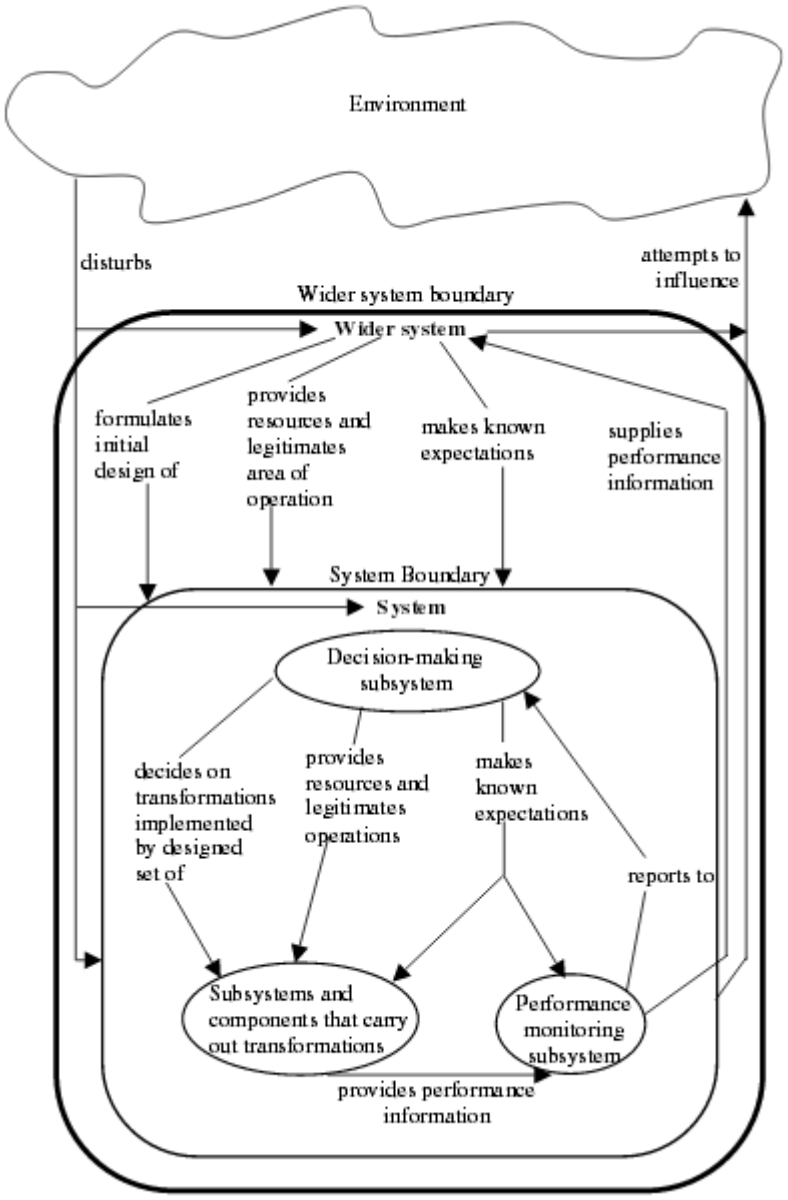
[34] It was not the aim of the author.

3.4.2.3 The Formal System Model

Another known approach, which tries to take into a system the success factors and criteria, were created by the Fortune and White (2006). The base of the model is the Formal System Model, which was created by Bignell and Fortune (1984).

The biggest advantage of the model is, that align success criteria and critical success factors with each other (see Figure 9.)

Figure 9: The Formal System Model



Source: Fortune- White (2006) pp. 57.

The model divides the environment of the project into three parts, which is suitable for the evaluation criteria such as:

- system;
- wider system;
- environment

The system is to represent the project management. On the bases of these, we can find those success criteria and success factors, which are connected to this dimension. An example for this is the classic project triangle or the resources and the continuous communication[35]. Besides, the performance monitoring, subsystem plays an important role, which role is more or less equivalent to the classic project control; namely the evaluation of time, quality and cost completion and reporting the deviations from the plans. However, it goes beyond it, since the management of risks and changes are solved by the subsystem. Of course it is required to specify projects that are to create the project team, which role is to implement the project, a monitoring system (or person) who performs the control and gives continuous feedback. Besides these, there is a need for a project manager who creates the microenvironment in which the projects could be made (time and cost plan, definition of methodologies and implementation of changes – if needed).

The second step is the wider system, which represents the project owner organization's demands and opportunities. This part's (or rather the representative of the project owner's organization, like the sponsor or the Steering Group) main role is to define the expectations and provide resources. Of course, besides these, there is a need for continuous communication to succeed. Furthermore, there is a need to evaluate and monitor control reports and change management and if there is a need, define corrective actions.

The third and last part is the environment, which contains passive and less passive elements too. For example state agencies, consultants or vendors. These parties have influence on the project, while the project could have an impact on them. Namely the external environment makes certain requirements regarding the project's achievement

[35] The first is a success criteria the last two are two success factors.

directly (for example by law) and indirectly (for example by capacity), whilst their demand, attitude can change to a moderate extent.

Overall, we can state that the Formal System Model is a complex system, which is to align critical success factors and success criteria. The authors introduce how the system can treat more difficult and complex projects based on two examples (in both cases there were more than 120 stakeholders). Finally, they declare they could harmonize the accomplishment with the evaluation of achievement.

3.4.2.4 Critics regarding the alignment of success factors and success criteria

The alignments build on the professional literature's most remarkable disadvantage that tries to make harmony in a very specific way between success criteria and critical success factors. An example is how the leadership style has an impact on the stakeholders' satisfaction. It is positive that the success is not concerned as homogenous concept, but the try to divide those based on the requirement of the modern era (e.g. Yang et. al., 2011). Of course, we can find a counter-example where success is undivided, homogenous (e.g. Bryde, D.J., 2008). Thus, we can state that these are the pioneers, on which we can build in the future, however their spectrum is too narrow to be the base of the research. Though it is positive that it eliminates the problems of other researches, thus demonstrating the fact that there is raison d'étre of the examinations, which are less general and more specific and thus providing a more specific result (cf. Cserháti – Szabó, 2014).

The other solution is when they try to make a framework to manage the projects. The two examples were the Project Excellence Model® and the Formal System Model.

The previous, the Project Excellence Model®'s biggest disadvantage is that it is not clear which success factors have an impact, on which success criteria (cf. Cserháti – Szabó, 2014; Jha – Iyer, 2007). However, we can regard it as an advantage that it analyses the project environment integrated. Overall, I think that it is a fine approach though the relevancy could be increased, if the impact of (at least some of the) factors could be examined in a more detailed manner. The main weakness of the model: It is not clear, which factors can compensate the weakness of each other, or which factors are needed in each case.

The other approach is the Formal System Model. The greatest problem in this model is the lack of the evaluation criteria's direct appearance. The fact is similar to the case of the other model (just there were success factors instead of success criteria). We can conclude only indirectly what are important for the given stakeholders. Moreover, the interrelationships are considered indirectly since for example the satisfaction of stakeholders can have an impact on the project success in case of an ERP-system. Though this is not self-evident in the Formal System model it can be concluded indirectly.

Thus, the models complement each other. They compensate each other weaknesses without keeping the other's strengths. Thus, the direct alignment of critical success factors and success criteria is not realized.

3.4.3 Summary

Based on this chapter, both the critical success factors and the success criteria underwent major development during the last decades and it can be said that the new millennia brought changes that the academic literature must react. The success criteria conform to the norms of the new age the hierarchical approaches (especially the hierarchical model, the one evaluates according the three levels) are able to react the dynamic and complex environmental terms. However, righteous critics can still be made against critical success factors for the reason that the majority of authors still focus on identifying the factors contributing the most to success. This however must be overstepped; otherwise, overly specific less usable criteria will be the result (cf. Görög 2008). To amend these researches already made attempting to manage the three major points of criticism (lack of considering the change of importance by the progress of the project, lack of considering the interrelationships among them and project success is not a homogenous term). However, only a few of these endeavors have taken them into consideration completely. Unfortunately, such approaches (that inevitably mean to observe more than one success factors) failed to give an answer to all the critiques. The two models presented above the Formal System Model and the Project Excellence Model®. In these approaches, it is still not possible to determine unambiguously which success factors have an impact, on which success criteria. Due to this, the understanding of interrelationships among success factors can become questionable as well as considering the priority-differences of factors throughout the project completion.

Based on the previous statements, it can be declared that nowadays, if someone wants to analyze the impact of the critical success factors on project success (and make relevant conclusions), is unable to avoid not to observe the success of the project using one of the hierarchical approaches (it is advised to use the three level hierarchical model). The application of this model helps to take into account the priority differences derived from the project phases (further attention is advised however). Moreover it is advisable to consider the interactions in case more than one factors are analyzed. Thus, such research model should be developed that observes the project success based on the hierarchical model and subordinates the CSF or CSFs to it (or align with it).

4 Competency of project managers

When it comes to the actual project, the most important assets are the people behind it. They are the main drive and wheels of success. We could have twice as much resource than we require but still can fail if we do not have the appropriate human resources who could create the success for us. This all comes down to finding the right person, the project manager who can guide others fulfilling the actual project. Finding the appropriate project team so as the manager can always compensate the lack of certain resources (cf. Fortune – White, 2006; Standish Group, 2009). It is simple to acknowledge that the project manager is one of the most remarkable party, if not the greatest in creating valuable projects on the path to success (cf. Fortune – White, 2006). With all this in mind, a project manager has to bear different capabilities, competencies and strong academic knowledge. Numerous authors have already focused on the importance of project manager competencies (e.g. Ahadzie 2014; El-Sabaa 2001; Lampel 2001; Loo 2002). In their study, Fortune and White (2006) found that 30% of the academic researchers who had dealt with skilled critical success factors found the competent project manager important in project success[36].

The theoretic fundaments, when interpreting the project managerial competences, originate from the general competency-interpretations. Many believe that the competency is a specification attributed to a person consisting for instance the personal characteristics, nature, knowledge or motivation (see e.g. Boyatzis, 1982; Winterton et. al., 2006). The same approach applies to the project managerial literature, researchers consider the personal characteristics of the project manager, attributes, motivation, knowledge and capabilities as a part of the competency (cf. Ahadzie et. al., 2009; Briére et. al., 2014; Chen et. al., 2009, Spencer – Spencer, 1993; Stevenson – Starkweather, 2009).

The dissertation examines the following competences: the capabilities of the project manager, the leadership style and his/her personal characteristics. Without narrowing down to these competences, the definition would be too broad to discuss within the dissertation's boundaries.

[36] The highest percentage received was the support of senior management, 62% identified this factors. Writers ranked the project manager competency (competent project manager) as the 6th most important factor (based on Fortune – White (2006).

4.1 Project manager's capabilities

Project managerial capabilities by definition those knowledge areas, which the project manager has to possess in order to successfully manage the projects (Görög, 2013a). The capabilities that are the project manager's knowledge or project management attitude are complex critical success factors because they have various sub-fields.

However, it is essential to clarify that the topic of capabilities is quite broad, consists many components. The expression 'project manager' who bears adequate capabilities inevitably was understood differently in the 50's than nowadays[37]. This way the dissertation is reviewing and summarizing them as well.

4.1.1 The evolution of the project manager's capabilities

The basic evolutional concept of the project manager's capabilities is in accordance with the evolution of the understanding project success (cf. Görög, 2003).

The initial studies highlighted the importance of the capabilities related to the project triangle (acquiring the resource and scoping it) The reason was that the initial findings considered the project itself as a unique task, this way the project manager's task was to manage the implementation. They treated the mainstream project management knowledge (e.g. time planning) and the supporting technical expertise (such as the basic technologic knowledge of every functions and activities in a building construction project) as the most important factors to possess (cf. Olsen, 1971). This means that the authors considered the quantitative techniques, when they were assessing different fields of project management knowledge areas.

However as of today more and more projects are being unsuccessful, and the always changing, thus highly dynamic project environment (so as the evolution of the project's and project management's understanding) required broadening this bipolar explanation of the definition. In addition, many have brought the attention to the importance of the project manager's company related and other limitations (e.g. Pinto, 2000, Zimmerer – Yasin, 1998). Limitations like the followings:

[37] Especially, when speaking of those project management methodologies like the agile methodology, by which the managerial duty of the manager is less emphasized than by the classic approaches (see chapter 2.6).

- One of the huge negative impacts on the project success is the specific problem of a project team (personal issues, coherence issues, and cooperation problems with others). Thus, it was necessary to create techniques to manage anyone in the group concerned.
- There is a great emphasis on the personal characteristics of the project manager. A factor that also playing role in achieving project success (e.g. the ability of solving certain issues, or the results-oriented as well as proactive behavior).
- Project managers are usually not appointed from the higher level of hierarchy. This way the authority and power provided by the hierarchy is often not enough to efficiently manage a project team.

In addition to the last of the possible limits listed, there are times when project managers don't even own the formally delegated powers e.g. the permission for rewarding project members (or using coercive powers), which could be a serious tool to motivate people. If we were to consider that the members of each project team increasingly play a definite role in reaching the project success (cf. Fortune – White, 2006; Görög, 2003), then it is easy to understand, that the project manager has to adopt and implement other management tools to have the team members generate the highest performance possible to achieve the project success.

This all can be driven back to the evolution of the understanding of projects. Lundin and Söderlund (1995) pointed out, that a specific project cannot just be treated as a unique task, but also as a temporary organization. This ultimately means that the role of a project manager needs to be expanded for him/her to be able to manage this temporary organization. Eventually a project manager will have to possess such knowledge and capabilities that aid to managing the temporary organization, that are the human capabilities.

Continuing this theoretic approach, all the skills and abilities in managing a project team, as parts of the manager's knowledge, have received higher importance. However, that does not mean disregarding all the other important capabilities but with that in mind, that besides all the mainstream qualities - like technical and quantitative project management competencies – the human capabilities are also playing a vital role.

At the beginning of the last decade, many subsequent authors tried to come up with different explanations on what capabilities a project manager has to bear (e.g. Edum-

Fotwe – McCaffer, 2000; El-Sabaa, 2001; Loo, 2002). They have defined two distinct directions:

- Technical capabilities: they incorporate all the knowledge related to technical content of the project (in a broader sense also, for example the knowledge of different financial parameters that are tied to certain project-results).
- Human capabilities: they incorporate all the knowledge required for managing the stakeholders and all the persons affected by the project. Certain researchers have broken this down into more distinguished segments e.g. managerial and organizational knowledge (e.g. Loo, 2002), motivational and communicational capabilities (El-Sabaa, 2001; Henderson, 2004; Pinto, 2000; Sotiriou – Wittmer, 2001). However, as for their nature, these segments do not vary from the fundamental goal of this field of capabilities: managing stakeholders.

Overall reaching the end of the second millennium, it turned out to be obvious that the technical capabilities are not enough to manage a project effectively and efficiently. Though it does not mean that these capabilities can be neglected (enough to think about the deliverables/project documents presented in chapter 2.1). Then human capabilities in project management are building blocks of the managerial arsenal, moreover some researchers argue that these capabilities are many times more essential than the technical capabilities.

At the same time, Cleland (1994) has raised awareness of the strategic side of the projects (strategic building blocks), saying that one of tasks of the project manager when managing a project is to deliver the beneficial change. This made it inevitable for the project manager to possess such a managerial arsenal – besides the technical and human capabilities - that helps to facilitate managing the so-called beneficial change.

Thus, project managers are expected to set-up their knowledge based on the following three primary dimensions (Cleland, 1994; Dogbegah et. al., 2011; Hwang – Ng, 2012):

- technical capabilities,
- human capabilities,
- project related capabilities.

The first group still contains all those technical capabilities that embody all the technical knowledge that are required for managing a project: like knowing the

technical contents, and basic economic concepts. Every each of them are inevitable when planning and carrying out different projects.

The second group of capabilities, the human capabilities still incorporates those capabilities that are required for managing stakeholders. These capabilities are also complex in themselves, containing many factors (Clements – Gido, 2006; Görög, 2003; Mantel et. al., 2001) like:

The third category, speaking of the project related capabilities contains the knowledge of project management tools and techniques, the skill to use them together with the project manager's project management attitude (Cleland, 1994; Görög, 2008). This set of capabilities, on one hand, were also considered as important factors in the earlier researches (see e.g. Zimmerer – Yasin, 1998), though they were not differentiated, they were considered to be the part of other capabilities. On the other hand, however this set of capabilities goes beyond the classic capability-interpretations (especially the project management attitude). Because it incorporates more than just academic disciplines, the relation to the project as well. Some interprets this as a separate competency (see e.g. Ahadzie et. al., 2009; Görög, 2013a; Spencer – Spencer, 1993).

4.1.1.1 The aspects of project related capabilities

Just like introduced in the previous chapter, every single capability is a highly complex, so as standalone system. However, in this dissertation in meeting the initial objectives only the project related capabilities will be covered in their very details. Project related capabilities encompasses the professional content of project management, that is possessing the knowledge and the ability to use project management tools and techniques (Görög, 2013a).

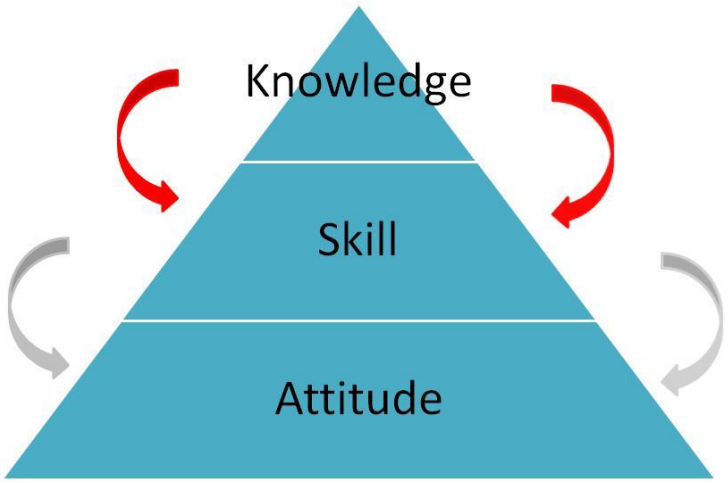
It is in the nature of these capabilities that they tend to incorporate highly complex expertise and knowledge fundaments.

More approaches have already been published on this topic (Görög, 2013a), however this dissertation introduces Cleland's point of view, due to his close connection to the evolution of understanding of project and project management. The project capabilities incorporate all the project management knowledge and the ability to use this knowledge, so as other knowledge that are closely tied to the project manager itself (e.g.

project management attitude). Cleland (1994) distinguished three different levels (Figure 10.):

- knowledge,
- skill,
- attitude.

Figure 10. The aspects of project related capabilities



Source: based on Cleland (1994)

The first level is the is the familiarity with project management toolkit (e.g. the knowledge of how to create a time plan). This level is obviously placed below of the other two since it cannot guarantee the proper use of the knowledge.

The second level is the ability to use the knowledge. At this stage, it is not enough to know certain management tools but to utilize them as well. It is simple to recognize that this dimension contains the previous dimension as well, meaning without any knowledge it is impossible to apply certain tools even when there is a great professional literature at hand.

The third and topmost level is the project management approach incorporating the other two below it. This dimension defines how a project manager uses the managerial tools and how he/she adjust them to the actual project context. Thus this describes the attitude towards project management. There have been two distinct approaches formed to assess this dimension (Cleland, 1994; Görög, 2013a):

- project context centric attitude,
- attitude based on the understanding of project and project management.

The project context centric approach embodies every steps the project manager considers: whether he/she considers the characteristics of the inner and outer environment; when he/she applies the qualitative and quantitative project managerial tools during the project process or utilizes some type of best practice instead.

The second approach listed covers every aspects of the project manager's attitude towards certain projects. If the manager considers the project as a unique task, then the primary task of project management is managing the implementation process. If so, the emphasis is on planning, controlling and on the optimization. In the event the project manager considers project as temporary organization then the primary objective is to manage the organization and the project team. In this particular case, the most essential management tools and techniques are the proper communication and motivation. On the occasion that the project is understood as a strategic building block, then the main duty of the project management is to deliver the beneficial change. This means that the project manager has to follow the strategy-oriented approach, so that it is necessary for him/her to consider the corporate strategy from which certain project goal derives (Judgev – Müller, 2005). The emphasis then is clearly positioned on the project scope definitions, communication, and optimization or on the change management. Certainly, it can happen however, that the manager endorses not only one viewpoint but also a different combination of the three attitudes introduced. This is in concert with that managerial approach, where - throughout the project completion - the emphasis is on different components, with that this outlook can reflect in the project management approach as well.

The approach overlaps with the two previously introduced capabilities: human and technical capabilities (this particularly applies to the project comprehension approach). However, the approach definitely goes beyond only referring to a single knowledge component, academic discipline or even a capability. The approach is the way in which the manager applies certain academic disciplines or capabilities.

Overall, all the knowledge that is required from a project manager is quite comprehensive and covers many fields of study. It is inevitably important to possess all the professional knowledge that certain projects require based on their contents. Without this knowledge is impossible to attribute definite parameters to the project triangle. However, as of today it is not yet adequate. It is necessary for the project manager to possess all the capabilities and knowledge that are required for the efficient and

effective management of the stakeholders (especially the project team) (cf. Fortune – White 2006; Kappelman et al. 2006). With that in mind, the project managers are also supposed to possess the professional content of project management. This can be divided into three sub-groups[38]; knowledge, skill, attitude, . The most complex level or sub-group is the attitude, which incorporates the various ways of applying the quantitative and qualitative managerial tools or their adaptation to the project-environment.

4.1.2 Grouping the project managerial tools

Every project managerial tool and technique varies from other tools in its characteristics. At the very beginning there was a great focus on the time, quality and cost trio. Later on different soft tools and techniques emerged, which were hard to quantify. Nowadays, because of the previous statements, we can differentiate two kinds of project managerial tools and techniques (Görög, 2013a):

- Quantitative project managerial tools and techniques: they handle each emerging demand in a numeric way. For instance, cost- and time planning or the assessment tools used in risk management.
- Qualitative project managerial tools and techniques: because of their characteristics (not manages the problem in a numeric way) and because they are more like descriptive tools, these are to give an overall answer to each demand emerges throughout the projects. The tool 'communication' would be the best instance for this.

It could happen however, that a task has quantitative and qualitative parts as well. For example, when creating the schedule, the definition of the critical path is quantitative, the identification of the activities is rather qualitative (cf. Fekete, 2000). However, it is necessary to state that most of them sharply differ (e.g. there are no quantitative components when managing the stakeholders) or speaking of a certain tool, either the qualitative or the quantitative components dominate (e.g. when setting up the timeframe [schedule] the quantitative elements dominate).

At the same, time it is essential to emphasize that each tool has a different effect on each success criterion. Görög (2013b) has gathered various methods and their effects on the success criteria (Table 5.).

[38] The two other academic capabilities are quite complex as well, however they will not be introduced in depth in the current dissertation.

Table 5. Relationship between PM toolkit and success criteria

Success criteria	Project managerial tools
Project triangle	Time planning, resource allocation and cost estimation Risk assessment Process control (earned value analysis)
Client satisfaction	Scope definition Feasibility studies Project-organizations Project implementation strategy Scope control
Stakeholder satisfaction	Stakeholder analysis Project marketing

Source: Görög (2013b), pp. 20.

The author draws the attention that the first four tools are quantitative, whereas the other seven tools are qualitative ones. This way the quantitative tools and techniques help to achieve the project triangle aspect of project success, whereas the qualitative tools and techniques client satisfaction and stakeholder satisfaction.

The main issue of the previous table is that it does not consider the indirect effects (Görög [2013b]). Since, the project team gets better motivated when using proper project marketing, which can help to achieve the project triangle aspect of project. The same applies to the communication (as a tool of project marketing). This can have a great impact on the satisfaction of the project owners. Because all of the previous, Table 5 cannot be treated as accurate, though it can embody a fundament for the further researches.

Furthermore, it is necessary to note that either, inside every task a project manager has, the quantitative or the qualitative tools might dominate (e.g. when making the

completion plans: the quantitative ones dominate). However, table 5 does not provide a reliable base for defining this dominations.

As a conclusion, there are two groups of project managerial tools and techniques. On one hand the tools and techniques that have numeric outcomes: quantitative, on the other hand, those tools, which assess the problems in a descriptive way, thus offering answers: qualitative tools and techniques. Nowadays however, each of them is required to efficiently manage the projects. There would be no possibility to handle various problems that emerge throughout the implementation without jointly utilizing them (cf. Chapter 2.5).

4.1.3 The project manager's explicit and tacit knowledge

A different approach when assessing the project managerial knowledge could be the explicit and tacit knowledge assessment. The explicit knowledge is easily quantifiable, means the learnt and easily transferable knowledge. Many different professional textbooks are aiming to transfer the explicit knowledge, whereas the tacit knowledge is the one that means the embedded knowledge. Acquiring this knowledge could take up years (cf. Fehér, 2004; Davenport – Prusak, 1998). The explicit knowledge is rather learnable, whereas the tacit could only be obtained. If we were to compare certain tools when specifying the knowledge, we could discover that both inside the qualitative and the quantitative are the tacit and the explicit knowledge as well. For instance when setting up the schedule the calculation is mainly explicit, whereas when gathering the activities is many times a tacit task. The same applies when analyzing the stakeholders: the calculation and the categorization (up to an extent) require explicit knowledge, whereas the definition of the relevant stakeholders requires primarily tacit knowledge (cf. Davenport – Prusak, 1998; Görög, 2007).

The same statements apply to the technical, human and project related capabilities. They tend to bear tacit and explicit characteristics as well. For instance, parts of technical knowledge can be studied at the university (think of various financial modelling methods). The other parts can only be acquired in practice (think of the precise evaluation of certain factors that have distortional effects). Just the same applies to the human capabilities. For example, negotiation techniques and conflict resolution techniques are taught in different economic schools, however to place it to the right context it is necessary to spend years in practice earning experience.

The project related capabilities are different however. The knowledge and skill dimensions can be well acquired. For instance from certain professional textbooks, however the attitude is different; a manager has to spend long time before he/she could acquire it (conf. Davenport – Prusak, 1998). To continue with the examples if a project manager interprets the project as a strategic building block, meaning he/she scope the project in accordance with the organizational strategy, he/she will not be able to achieve success without proper qualifications or predispositions. Thus, the third dimension, the so-called attitude incorporates a greater knowledge as opposed to the previous fields. Important to note though that in the other two dimensions the explicit knowledge is also present as well as the tacit components in the approach, but their scale is different.

Most of the project managerial literature concentrate on the transfer of the knowledge (see e.g. Lindner – Wald, 2011; Pollack, 2012), not giving enough attention to the types and the scale of certain knowledge components present in the tools and techniques. This could account for further investigations in this topic.

4.2 Project managers' personal characteristics

For a project manager to efficiently and effectively manage a project has to possess certain capabilities besides the various aspects of the project management knowledge. These are the leadership styles (see in chapter 4.3) and the personal characteristics. Personal characteristics (personality) are those attributes that a person was born with and are hard to improve (Görög, 2013a). Although, many believe that these characteristics are the aspects of the competency, thus mixing them up with the manager's other features (see e.g. Dulawicz – Higgs, 2003; Müller – Turner, 2010), but this approach is inadequate. It is because, similarly to the leadership style, the personal characteristics can intensify or weaken the effectiveness of certain areas of knowledge. A project manager for instance who is a very emphatic can solve different issues easily and quickly related to persons or conflicts when they emerge. Moreover, the personal characteristics are those which (as opposed to the capabilities or the leadership style) people born with it and it is also difficult to improve. The capabilities, on the other side, are easy to be learnt or improved in a short period. The basic personality is something that is quite complicated to alter (see e.g. Cloninger 1994). As a result, the personal character, thus the personality cannot be handled collectively with the capabilities and interpreted as one of its aspects. Nevertheless, the relationship between the two is quite

strong, since the project management capability can only prevail through the presence of the personal characteristics (Görög, 2013a).

In addition, the project manager is required to possess certain personal characteristics; however, they differ in some aspects from the classic fields of management. The project manager has to manage (in accordance with the evolution of project interpretations) the project process together with managing the temporary organization and delivering the beneficial change. Thus, the main duty of the manager is complex, requires various and broad field of competences as well as many personal characteristics. Most of the writers point out the necessity of the stakeholder-related competences, for example the motivational ability or the empathy (see e.g. Clarke, 2010; Goleman, 2004; Nauman et. al., 2010). This can derive from many factors. On one hand, it can arise from the difficulties when keeping in touch with people, because it is highly diversified. The communication with people could be difficult and ineffective without possessing certain sense (cf. Görög, 2013a; Yang et. al., 2011). On the other hand, it can arise from the fact that this process (managing people) is not well-structured. When establishing a plan, it is possible to follow the same steps as before (cf. Project Management Institute 2008), whereas this can rarely occur when communicating with the participants (e.g. stakeholders). However, it does not infer that it has no such component (see e.g. communication strategy) but in this field we can find a higher rate of problems that cannot be well-structured (cf. Cleland, 1994). At the same time, however unexpected events can emerge in the planning phase as well. In this case the project manager has to respond quickly and well, so he/she has to improvise (cf. Görög, 2003), which is an attribute a person was born with. Thus, as a conclusion, most of the personal characteristics a project manager finds important are tied to the stakeholders; though other aspects have to be considered as well.

Corresponding to the previous, established Dulawicz and Higgs (2003) that list of competences a project manager has to possess (assuming the presence of different leadership styles). These competences are the following:

- critical analysis & judgement,
- vision and imagination,
- strategic perspective,
- engaging communication,
- managing resources,

- empowerement,
- developing,
- achieving,
- self-awereness,
- emotional resilience,
- motivation,
- sensitivity,
- influence,
- intuitiveness,
- conscientiousness.

The first three have been grouped as the intellectual competencies, the second five as the managerial competences and the last seven as the emotional competences. However, amongst these competences, we can find academic disciplines that can be studied and there are personal characteristics, which are natural and can be improved. The developing, the achieving and the managing resources are such properties that can be studied, even if the writers had attributed a deeper and broader connotation to them. Beyond all this, there are such competencies that can prevail only through a personal characteristic. Such competences are critical analysis & judgment and engaging communication capabilities and some projections of vision and imagination. The strategic perspectivity is more of an attitude than a real personal characteristic, whereas the empowerment is a tool, through which a project manager can achieve his/her goals. However, the other competences can be considered as classic characteristics. If we were to consider the manager's tasks (in accordance with the understanding of the project) as a fundament, then the basic or more like standard personal characteristics are: critical analysis, imagination, self-awereness, motivation, sensitivity (from the point of view the empathy primarily), influence and intuitiveness[39].

There has been a similar approach established by Goleman (2004) based on the ideal manager. The author names the following competences: self-awareness, emotional resilience, motivation, empathy and social abilities. At the same time, Ivancevich et. al. (1977) found that the psychological attributes, the intelligence, the social background,

[39] Many personal characteristics are not corresponding to the managerial tasks. These are such characteristics that could be applied to any managers or persons in leader positions. This dissertation makes an attempt to examine this question related to the project managers.

the attitude towards work and the social abilities are the ones, which are significant competences. Consequently, the competences listed by Goleman (2004) are considered personal characteristics, whereas Ivancevich (1977) groups the ability, the approach and the background of the project manager, thus having no personal characteristics.

Stevenson and Starkweather (2007) found that the most important competences of a project manager are the leadership style, oral and written communication abilities, attitude, coping the uncertainty and those competences that allow him/her to be able to communicate on different levels. Out of the previous competences however, only the creativity (coping the uncertainty) can be considered as a real personal characteristic. Crawford and Nahmias (2010) concluded the same: coping with the change (thus, creativity) is highly important is.

Görög (2013a) gathered the primary personal characteristics, in correspondence with the previous writers, which the project manager has to possess:

- Optimism (attitude toward the project): since projects are usually non-recurring activities/processes/organizations, this attitude is inevitably required for the project success.

- Emotional intelligence: empathy is a key for the manager to properly identify and if needed, to manage the emotions of the stakeholders present in the project.

- Team-building ability: the project manager usually has to group people from different divisions into a project team in a quite short term. Moreover, at this point, there is no sign of the classic peer pressure (like in a department), since the project-team has to be built from people who do not know each other.

- Trust building ability: trust is inevitably a key toward the project and the manager, so this characteristic secures the acquirement of trust (from the stakeholders).

- Motivational ability: such an ability with the project manager can persuade somebody to do such tasks he/she normally would not do.

- Improvisation: this is a certain personal attribute, with that the manager can respond to unexpected situations and is able to select the best solution out of the possible resources. Görög (2013a) classifies creativity to this category, since a project manager has to be creative to adapt to new situations. Moreover, creativity can affect the managerial equipment a manager uses (see e.g. Magyari-Beck, 2006). This however,

is in close relationship with the improvisation. This characteristic is quite complex, since it incorporates different components.

The previous six personal characteristics seemingly correspond to the earlier introduced project management roles[40]. The improvisation aids to the implementation of the project process if there is a need to respond to an unexpected event and the same applies when introducing the favorable change. The emotional intelligence, the team building capability, the trust building capability and the motivational capability are aiding to the management of the temporary organization. The optimism should be such an immanent specialty a manager possesses that can stimulate every phase of the project, thus aiding each managerial role. Though, a project managerial position requires additional knowledge and capabilities. These are not characteristics but learnt abilities or such knowledge that the manager utilizes when managing a project. For instance, creating the time plan (applying technical and project related capabilities), control (applying technical and project related capabilities) or selecting the proper form of contract.

4.3 Project manager's leadership styles

The primary task of the management and this could apply to any managerial activity, is the security of coordination. Dobák (2005) specifies three distinct coordination mechanism:

- structural,
- technocratic,
- person oriented.

The first is interpreted as the hierarchical or organizational solution, so the establishment of organizations (even projects). Dobák (2005) defines the technocratic coordination as the regulations by that a task is fulfilled. The third coordination mechanism is interpreted as the tools with the individual can identify his/herself with the goals and the tasks. To this group belong the direct and indirect tools (e.g. incentive, coercive or ideological), through which the tasks can be fulfilled efficiently and effectively. The author notes that the right tools depend on the organizational circumstances.

[40] By implementing the project process, by managing the temporary organization and delivering the beneficial change.

Since Lundin and Söderlund (1995) found that, the project can be considered as a temporary organization (by the unique task and strategic building block). This way we can acknowledge that the coordination mechanisms can also be found in the projects as well, though not in a classic manner (cf. Görög, 2013a). If we were to analyze the coordination mechanisms from a project managerial point of view, we would find that the greatest impact on the project team exerted by the person oriented coordination mechanism. Because Pinto (2000) found that, the project manager does not possess the powers granted by the hierarchy. The technocratic tools are also aiding to the efficient and effective fulfillment of projects, though the project manager is rather has a passive role rather than an active. The form of appearance of the previously mentioned tools are the project management methodologies, the frameworks and guidelines. These help the manager but can decrease the flexibility and the project managerial freedom as well (cf. Kiss et al., 1993a; Project Management Institute, 2008). This all comes down to those coordination tools that are tied to the person, with which the manager can manage a project efficiently and effectively. These are, among others, embodied by the leadership style.

A manager's leadership style can be decisive in terms of project success (see e.g. Cleland, 1995; Fortune – White, 2006; Hall et. al., 2003; Kendra – Taplin, 2004; Wang etl.al., 2005). Many have already studied this issue (see e.g. Müller – Turner, 2007; Robbins, 1997). The leadership style is "such a management behavioral form (relationship with the people led), through which a manager can exert influence on the people managed in order to achieve the goal set" (Görög, 2013a, pp. 67.).

Most of the studies that examine the leadership styles were focusing on two basic phenomena. The first phenomenon's objective was to identify the extreme forms of managerial behavior. This could be the authoritative or the democratic managerial directions (see e.g. Fiedler, 1967; Nauman et. al., 2010, Yang et. al., 2011), the lassisez faire or the plan oriented approach (see e.g. Schmid – Adams, 2008), the guiding or the commanding styles (see e.g. Goleman et. al., 2002; Goleman, 2004), or others (see e.g. Turner – Müller, 2007). These studies however, highlight that the combination of each two directions is adequate but to only follow one of them. The second phenomenon examines the effects of project differences on the leadership style. Writers found that, a distinct type of projects or project environment requires the application of distinct managerial forms (see e.g. Anantatmula, 2008; Prabhakar, 2005). They tried to specify

such leadership styles, or highlight some components at least, which can be true to certain types of projects or project environments. Some drawn the attention to the application of different leadership styles in different phases of the projects (see e.g. Frame, 1987; Prabhakar, 2005; Turner, 1999b). However, there have been various approaches established (see e.g. Thomas – Bendoly, 2009), which considered the stability as a key in the leadership style, and the change inside the project to be adverse in terms of project success.

Turner and Müller (2007; 2010) analyzed both phenomena. As for the second phenomenon they tried to identify certain managerial forms that are worth to follow in terms of the IT and organizational development projects. They deducted that having various components in a project is quite important. With that, they also identified the leadership styles present in the professional literature[41]:

- The leadership style based on personal traits: this approach assumes that a project manager possesses such ultimate merits, which are inevitable for the project success (such as confidence or being born to manage). If the manager bears these, the project will be successful.
- The style based on behavior or stlye: this suggests that every project requires different leadership styles, thus the manager has to mobilize those attributes of his/her (developed or owned) and in a scale that a project demands. Such attribute could be flexibility or the empowerment. The writers noted though, that the managerial capability can be improved.
- The style based on contingency: this approach recommends identifying the project parameters and delegate the project manager who possesses the most correspondent attributes.
- The style based on charisma or vision: this one is a complex approach, since it can be divided in to two sub-types. The first sub-type suggests that the manager aims to implement the project by giving guide and by mobilizing the appropriate personal characteristics. The second sub-type believes that the emphasis is on the completion of each task via bonuses and reaction to deviations.

[41] They also mentioned the leadership style that is based on the works of Confucius, Aristoteles and Brandt; however, the studies positioned this style to the pre project managerial times, when the managing of projects was not conscious. The introduction of these styles is not covered in the current dissertation.

- The style based on emotional intelligence: the emotional intelligence approach is based on that condition that this intelligence has a greater contribution to the project management (to project success), than the tools used bye any other leadership styles. This school puts emphasis on four components of the emotional intelligence: self-confidence, self-control, social-awareness and relationship management. Görög (2013a) defined six distinct leadership styles based on the professional literature (and on the combination of those four components): visionary leader, trainer, networker, democrat, autocrat and commander. At the same time, he draws the attention to the harmful effects of the last two styles and suggests using them in the worst case.
- The style based on competency: this style emphasizes the importance of the managerial competences. A project manager has to possess adequate emotional, managerial and intellectual capabilities and required to utilize them in proper combinations (situation dependent) to successfully manage each project. Müller and Turner (2007) identified three different styles of leadership based on the three groups of capability: objective oriented, innovative and conscientious.

They (Müller – Turner, 2007) also found that the first four approaches were valid for the past, whereas the last two style (the emotional intelligence and competency based) are the products of the first decade of the third millennium[42].

Consequently, each leadership style has two significant differences. The first is that the efficiency of the leadership styles can vary by the type of project and by the project environment. The second difference is what kind of competences or the personal characteristics[43] contribute to a certain leadership style. However, they tend to show similarities in their contents, since they try to define the approaches between the objective oriented, authoritative way management and the supportive, mentoring way of management.

Based on the previous findings we determine that each leadership style are constantly aiming to define those managerial approaches that are in between the democratic approach and the autocrat approach (as two poles) (cf. Blaskovics, 2014; Fiedler, 1967). We can also deduct that each pole or leadership styles apply distinct tools and techniques. The dictatorial styles primarily build on the hierarchical power (in

[42] Since the two studies were published in 2007 and 2010; but they can be extended to 2010 and later too.

[43] The professional literature calls the components as attributes or competency but they are more like personal characteristics in most of the cases.

case if the project manager possesses such powers due to the organizational structure), on the efficient resource allocation, on the planning and the compliance with the plans. The democratic approaches however emphasize the communication, teamwork and the empowerment (cf. Müller – Turner, 2007). For validating the previous statements, Fiedler (1967) defined two leadership style: task oriented and stakeholder oriented leadership styles, of which components can be noticed in every approach. As it has been determined before, the two different poles can barely be applied efficiently and effectively. This way, they are suggested to be used in some combination when managing projects.

4.3.1 The shortcomings of the professional literature on the leadership styles

As it has been introduced previously, the project manager's leadership style is a critical success factor, which bears those shortcomings that have been mentioned down earlier. Thus, many focused on, when trying to identify the leadership style, how could these have an impact on the project success (see e.g. Hall et. al., 2003; Kendra – Taplin, 2004). However, in many cases the project success itself has been considered as a homogenous terms, thus not expressed in terms success criteria (which is the first shortcoming). This primarily applied to the papers of the past, but later from the mid-2000s writers have been initiating new approaches to subdivide the project success (see e.g. Müller – Turner, 2007; Yang et. al., 2011).

The second shortcoming is that the leadership style is usually considered as dower without examining whether the personal characteristics or the competences contribute to development of certain leadership styles (see e.g. Nauman et. al., 2010). These deficiencies are treated by those studies that belong to the latter two schools. Müller and Turner (2010) analyzed those emotional, managerial and intellectual competences, on which each leadership style can be classified (after Dulawicz – Higgs, 2003).

Table 6. The impact of the competencies on the leadership style

Group	Competency	Goal oriented	Involving	Engaging
Intellectual (IQ)	1. Critical analysis & judgment	High	Medium	Medium
	2. Vision and imagination	High	High	Medium
	3. Strategic perspective	High	Medium	Medium
Managerial (MQ)	4. Engaging communication	Medium	Medium	High
	5. Managing resources	High	Medium	Low
	6. Empowering	Low	Medium	High
	7. Developing	Medium	Medium	High
	8. Achieving	High	Medium	Medium
Emotional (EQ)	9. Self-awareness	Medium	High	High
	10. Emotional resilience	High	High	High
	11. Motivation	High	High	High
	12. Sensitivity	Medium	Medium	High
	13. Influence	Medium	High	High
	14. Intuitiveness	Medium	Medium	High
	15. Conscientiousness	High	High	High

Source: Müller – Turner, 2010, pp. 438.

However, in case a comparison is made between the basic project manager's personal characteristics that have been defined, then simple to realize that there are significant differences present. For instance, either the team-building ability or the trust building ability is missing. Other professional literature shows the same deficiencies (see e.g. Fiedler, 1967; Goleman, 2004; Ivanchevich et. al., 1997). Furthermore, there are additional shortcomings, when the authors not paying enough attention to the development (or the change) of the leadership styles. They miss to identify whether the academic disciplines, attributes or the personal characteristics or even other factors having an impact them.

Overall, the leadership styles have a great professional literature build on them, and usually it aims to identify the ideal leadership style between two extremities while some authors considering the type of project and the project environment when they identify it. Some studies highlight the different kinds of personal characteristics or competences that are required or contribute to certain leadership styles. However, these studies miss to pay enough attention to the key personal characteristics (see chapter 4.3), instead they

mention generic managerial competences. Moreover, these either not or not adequately consider the possibility of change. Consequently, the impact of the six previously identified project managerial characteristics on the leadership style it has not yet been defined, especially in light, whether the improvement in the characteristics could initiate the change in the leadership style.

4.4 Summary

Overall, to give a deduction to the previous findings, the project management competency is quit a broad and complex concept. One of its component are the project manager's capabilities that incorporate all those knowledge, which are expected from a project manager (Görög, 2013a). Their evolution corresponds to the evolution of the project understanding. Since, nowadays besides the technical capabilities the human capabilities and the project related capabilities are just as important. The latter goes beyond the simple capabilities as a component of competency, because (besides the knowledge and skill) it incorporates the project management attitude as well. Namely, the way, a project manager approaches to a certain project. Although, the professional literature examines the capabilities expected in their very details but pays less attention to which quantitative or qualitative tools or techniques (as the derivatives of the capabilities) contribute to achieving project success (which is expressed in terms of certain success criteria). Furthermore, these studies miss to precisely analyze whether inside the capabilities (especially inside the project management attitude) the tacit or the explicit knowledge is present in a greater extent.

The other field of the competency are the so-called personal characteristics. However, based on the professional literature, the researches that have been made are lacking some details. These tend to identify the competences primarily expected, but to define specific personal characteristics. However, it is possible to gather all the project manager's main characteristics based on these researches (considering the basic attributes of the personal character), these are the following: optimism, emotional intelligence, team-building ability, ability to built trust, motivational ability and improvisation. However, the impact of these six characteristics neither on the project management attitude (though they aid to the fulfillment of the capabilities and the awareness) nor on the leadership style have not yet been mapped. Even though, the literature on the leadership styles is quite rich. Nevertheless, the primary focus of these

writings is the identification of the adequate leadership style and its impact on the project success. Those researches that consider the type of competences contributing to the development of certain leadership style do not differentiate e.g. capabilities, attributes and personal characteristics.

5 The research: The impact of the project manager's features on the project manager's project management attitude, leadership style and success criteria

The basic aim of the research is contributing to the better understanding of achieving project success. In order to do so, there is a need to show the relationship between one of the critical success factors, the aspects of project manager's features (project manager's capabilities, leadership style and personal characteristics) and the project success. Namely, to highlight impact of the project manager's managerial attitude on the three levels of project success; project triangle, client satisfaction and stakeholder satisfaction and the impact of the personal characteristics on the leadership style and the project management attitude.

The importance of the research is given by the fact that most of the trainings concentrate on the presentation of the ideas, knowledge transfer and minimally concentrate on the shaping the project management attitude and/or the importance of the training in context. If it is successfully highlight the relationship between the two factors, it can give a base in the improvement, in the structure and in the content of the project managerial training. For giving a base in improvement, it is necessary to examine, besides the previously mentioned relationships, the ratio of tacit and explicit knowledge. If the project managers think that the explicit knowledge is as vital as the tacit, the improvement is not necessary, since the emphasis should be placed on the widespread way of teaching, on the knowledge transfer.

Furthermore, it could be important for certain organizations to map the knowledge and the project managerial attitude of their project managers, in order to increase the chance for achieving project success.

Thus, the aim of the research is to highlight the relationship between the project managerial attitude, project success, the personal characteristics and leadership style. However, the research does not encompass the making of a knowledge map or improvement, of a course or the creation of a professional literate or the definition on the scale of the relationships. Of course, it does not mean that a later step could not be one of these, though for the occurrence of the previous, the existence of the relationship must be confirmed.

5.1 The fundaments of research

The bases of the research are the followings:

- The criticisms of the critical success factor approaches
- The examination of the project managerial attitude effect and its absence (in accordance with the evolutional interpretation of the project and project management)
- The lack of similar researches

5.1.1 The criticisms of the critical success factor approaches

The critical success criteria have been hit by four serious criticisms:

C1: The importance of the critical success factors may vary throughout the delivery of the project, and this is not taken into consideration

C2: The interrelationships among the critical success factors are not taken into consideration, although the interrelationships could be more important than the factors themselves.

C3: The critical success factors are project-, or project-type specific. It is difficult to define generalized critical success factors.

C4: The analyses about critical success factors consider project success as a homogenous term.

These were considered in the following way:

Consideration of C1: In my research, I examine the group of critical success criteria that connects to project managers namely the project managers' project management attitude, leadership style and personal characteristics (Fortune – White, 2006). The project manager's role has an considerable impact on each phase of project, thus its importance does not change in every phase.

Consideration of C2: Because in my research, I consider only one group of critical success criteria (the competency and [leadership] style of the project manager), there is no need to consider the interrelationships between the groups (on macro levels), since the thesis' goal is not to map impact (scale and existestence) of the project managerial

characteristics on other groups of critical success criteria. On micro economical levels, the current research considers the impact of the project manager's personal characteristics on the project managerial attitude and on the leadership style as well.

Consideration of C3: Though the critical success factors are project-specific and the phrasing of general critical success factors could run into obstacles. However, the thesis' aim is not the identification of one these.

Consideration of C4: The research does not consider project success as a homogenous term. Due to the hierarchical model, the project success is expressed in terms of the already mentioned three success criteria.

Following the previous mindset, we can determine that the research considers the critics of the critical success factor approaches.

5.1.2 The examination of the project management attitude's impact and the lack of it (in accordance with the development of the understanding of project management)

The second base of the research is the project management attitude of the project managers. Throughout the research, that interpretation of the attitude is to be considered, which was derived from the development of understanding of the project and the project management. Thus, project has to be interpreted as a unique task, temporary organization and strategic component. Deriving from these, the project manager can treat the project as a unique task, temporary organization and strategic building block, or the combination of these. If the manager interprets the project as a unique task, then the primary task of project management is the management of project process. In the event the project manager interprets project as temporary organization then the primary objective is to manage this organization (especially the project teams). On the occasion that the project is understood as a strategic building block, then the main task of the project management is to deliver the beneficial change. Overall, we can state that one of the fundaments of my research is given by the Cleland (1994) competency-segmentation and especially its third element: the project management attitude of the project managers.

5.1.3 The lack of similar researches

My research has also been triggered by a special component: it is the lack of the similar researches. There are dissertation about project success, success criteria, critical success factors, project manager, expected capabilities, personal characteristics and leadership style though the intention summarized in the dissertation (namely the impact on each other) is not examined as of yet. The project manager's project management attitude's impact was not examined on project success, which is interpreted accordingly to the triple segmentation of the hierarchic model. However, the personal characteristics' (or competencies') impact on leadership styles were examined many times (cf. Müller – Turner, 2010), but the six personal characteristics' [that have been gathered by Görög Mihály (2013a)] impact has not yet been analyzed on the project management attitude of the project manager.

Overall, I accept the hierarchical model when analyzing the output oriented approach of the project success. The components of this model are the project triangle (time, cost, and quality), the satisfaction of the client and stakeholders. Regarding the personal characteristics, I concern the Görög (2013a) six-item segmentation as the base, namely I regard personal characteristics: optimism, motivational ability, and team-building ability, trust building ability, emotional intelligence and improvisation.

5.2 Research questions and hypotheses

The aim of the research is two-fold. The first aim is to highlight the relationship between the project success expressed in terms of three success criteria of the hierarchical model and the project management attitude of the project manager. The second aim is to highlight the personal characteristics' impact (the impact in itself, not the scale) on the leadership style and the project management attitude of project manager's. However, for the research to reach its basic aim, namely to contribute to the better understanding of the project success and the project manager's personal features, there is a need to formulate other aims as well. As a third aim it is needed to show the kind of the knowledge (tacit or explicit) and the kinds of tools (qualitative or quantitative) that contribute to project success to a greater extent.

After these, the summarization of the following questions is necessary:

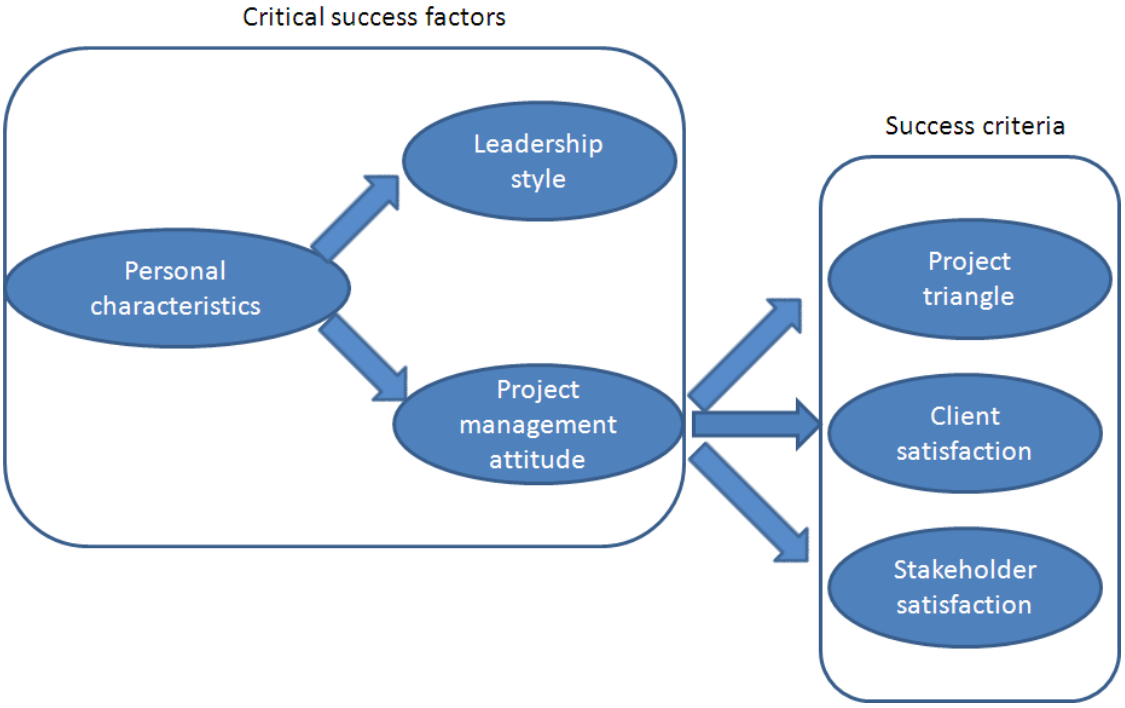
- RQ1: In what extent do the qualitative and quantitative tools of the project management contribute to the three levels of the project success?
- RQ2: What type of (tacit, explicit) knowledge plays a greater role when talking about the project manager's project management attitude?
- RQ3: Does the project management attitude have an impact on the three levels of the project success?
- RQ4: Do the personal characteristics have a high impact on the project management attitude and the leadership style?

Considering the research questions and the coherences expanded in the academic part, the following hypotheses have been identified:

- 1: The quantitative project managerial tools have a higher level of contribution to all the three levels of the project success than the qualitative project managerial tools.
- 2: In the project managerial attitude the explicit knowledge exists in a higher degree than the tacit knowledge.
- H3: The project managerial attitude has an impact all the three levels of the project success.
- H4: The personal characteristics have an influence on the project managerial attitude and on the leadership style.

Following the previous, the research is encapsulated in the following model:

Figure 11. The logical model of the research



Source: proprietary

5.2.1 The research method

Throughout the research, the quantitative and qualitative methods could have also been used: like creating a questionnaire, content analysis, observation or making interviews.

However, the best method when answering the research questions and hypotheses, is the qualitative interview one (Babbie 1994; Creswell 2003). Another useful method could be the formulation of questionnaires and their analysis; however, considering the advantages and disadvantages, this method has been rejected. However, the advantages are serious (speed, bigger model, good codification) but the disadvantages are more significant. Because the questionnaire sensitively reacts to the deviation between the planned and actual response rate, and there was a chance that the project managers are not willing to fill out the questionnaires even if there was proper assistance at hand. Of course for solving this issue there are many methods, e.g. sending another questionnaire or the methodology of sparse matrix. However, the previous does not guarantee that the new interviewee would fill that either, or in the second case, the rates could be distorted. Another disadvantage derives from the characteristic of the research namely (in case of

the questionnaires): the questions could not be summarized briefly and it could be necessary to give an explanation to each of them. Without these, the questions would be unanswered by those who do not understand the highbrow literature. With the explanations, the questionnaire would not be clear-cut; moreover, excessive rate of simplification would result that the latent relationships, coherences couldn't be revealed.

The latest excludes the observations and content analysis (analysis of project documents), since these cannot give enough information, particularly the latent relationships, coherences would not be revealed.

On the other hand, however, throughout the interviews the interviewee could get more information than throughout the statistical analysis or the questionnaires. Moreover, depending on the answers the interviewer can clarify the questions, which could be very important in such a research. Other advantage is, similarly to my research questions, that the interviewees do not give relevant answers (opinions or facts), and this could be filtered or clarified during the sessions. The disadvantages of the interview (difficulties when coding, time-consumption) were prevented by the detailed planning of the schedules and the proper formulation of the questions.

That is the reason why the interview, more precisely semi-structured interview is the most suitable and efficient method.

The interview, in the favor of giving answers for the research questions (and accepting/rejecting the hypotheses), has to cover four issues. The first block contains the acknowledgement of the project manager tools and which one to use in order to reach the hit. The second block contains the acknowledgement and the mapping of the rate of tacit and explicit knowledge within the project managerial attitude. The third block contains the acknowledgement of the attitude of project manager's management and the effect they have on the project success. The fourth block contains the acknowledgement of personal traits effect on the outlook of the project manager and leadership styles. On the bases of these, we can summarize the following questions:

a. Impact of quantitative/qualitative knowledge on the project success:
a. What kind of project management techniques/tools do you know?
b. What kind of project management techniques/tools do you use?
c. Who are the most important stakeholders in your projects?

d. How could you achieve stakeholder satisfaction?

e. How could you achieve client satisfaction?

f. How could you achieve success, measured against project triangle (time, cost, quality)?

b. Tacit/explicit knowledge in the attitude

a. What kind of degree or project managerial qualification do you have?

b. Based on what kind of attitude do you manage your projects?

c. Based on what kind of attitude do you use your qualitative and quantitative project managerial techniques?

c. Impact of attitude on project success

a. Based on what kind of attitude do you manage your projects?

b. Based on what kind of attitude do you use your qualitative and quantitative project managerial techniques?

c. What do you think, what is the impact of this attitude on the project triangle and why?

d. What do you think, what is the impact of this attitude on client satisfaction and why?

e. What do you think, what is the impact of this attitude on stakeholder satisfaction and why?

d. Impact of personal characteristics on attitude and leadership style

a. What do you think, what factors have an impact on the attitude?

b. What do you think, what factors have an impact on the leadership style?

c. Have your personal characteristics changed during your career?

e. Could you characterize yourself, mentioning these points:

i. optimism;
ii. emotional intelligence;
iii. team building ability;
iv. ability to build trust;
v. ability to motivate;
vi. improvisation.

f. In case I get negative answer to 4/c question, then the following question applies: How would you describe your leadership style?

g. In case if I get positive answer to question 4/c, then the following question applies: How would you describe yourself before and after the changes, mentioning these points?

i. optimism;
ii. emotional intelligence;
iii. team building ability;
iv. ability to build trust;
v. ability to motivate;
vi. improvisation

h. In case I get positive answer to 4/c question, then the following question applies: How could you describe your leadership style before and after the changes?

i. Do you think that with the change of your personal characteristics, your management attitude and leadership style would change too?

For reaching the aim of the research, we have to apply the two-stage approach: literature review and field research.

In the course of the literature review, the following literature were gathered and examined: project success, success criteria, critical success criteria, type of knowledge, knowledge of the project manager, leadership style and literature connected to the personal characteristics. Therefore, the followings were identified: relevant assessment model (hierarchical model), the project manager's project managerial attitude, the leadership style and personal characteristics. Thus based on these, the interview questions could be created.

The interview, as I have mentioned before, is built up of four vital question-groups. Throughout the first part, the identification of the project manager's knowledge was examined, which contains five steps. The first step served mapping the tools and techniques known by the project manager. Namely, that manager who does not have the suitable knowledge could not have manager proper project managerial attitude. (cf. Cleland, 1994). Throughout the next step, we get to know the project management tools and techniques used by the manager. The aim was to identify the kinds of qualitative and quantitative tools a project manager uses. In that case, if the quantitative elements dominate or the manager considers them more important, the first hypothesis is likely to be accepted. To reinforce (or to deny) this, 1/d, 1/e, 1/f questions were also asked,

however with detailed distinction. The aim of this question-group is to reinforce the previously mentioned point of view (question 1/b), namely the acceptance or rejection of the first hypothesis. Based on the result of question-group (1/d, 1/e and 1/f), and certainly on the answers given, those qualitative and quantitative tools have been identified, which are required for achieving project success expressed in terms of the success criteria of the hierarchical model. Of course, could also happen that the manager does not give the classic project management tools and techniques as answers; however, these were categorized based on the professional literature (Görög, 2013a, Project Management Institute, 2013). The stakeholders, who work on the projects, have been questioned too. This has helped in creating the conclusion, since if the manager faces limited number of stakeholders (especially if the client is not among them), there is no potential to formulate general conclusions. The dependent variable in this question-group was one (or more) aspects of project success, and the independent variables were the qualitative tools and techniques.

The second question-group's aim was to find out if the use of the tacit or explicit knowledge dominates in the project management approach of the project manager. The first question is about the identification of the manager's education and qualifications. It could happen that the qualification and education has an impact on the tools and techniques he/she uses. However, my research does not aim to map the impact of it but it can be an important base. On one hand the manager's qualifications[44] ensure the possession of the appropriate project management tools and techniques (cf. question 1/a), on the other hand it can be a ground for questions 4/a, and4/b. At the second question the project management attitude of the manager was identified (see chapter 4.1.1). The next step was identifying how they utilize the so-called qualitative and quantitative tools. The question was clarified many times if it was obtainable or learnable (cf. explicit versus tacit knowledge). In the light of these, we can identify that throughout the application of the tools (depending on the use of certain project management approach), the use of the tacit or explicit knowledge dominates. Based on all of above, we can decide if the second hypothesis can be accepted or rejected.

The third part's aim was to identify the impact of project manager's project management attitude. The research's aim is the demonstration of the impact but the

[44] For example PMP, Six Sigma certification.

scale. For questions 3/a, b we could get the information earlier, though in some cases (after asking question 3/c, 3/d and 3/e) further clarifications were required. In case a complete answer is received in the course of the second part (question 2/b and 2/c), there was no need to ask. Furthermore, the upcoming questions have been skipped. The next three questions (3/c, d, and e) ask directly the project management attitude's impact on the project success. However, because of the complexity of certain questions, the project manager had to tell, not only in which way (positively, negatively), but how the project management attitude has an impact on the given aspect of project success. This way, the inappropriate answers could be filtered. Thus, based on the on the three questions (3/c, 3/d, and 3/e), we can decide if the third hypothesis can be accepted or rejected. Thus, in this question-group the dependent variable was one (or more) aspects of project success, and the independent was the project manager's project management attitude.

The aim of the fourth part was to identify the impacts of the manager's personal characteristics on the manager's leadership style and the project management approach of the project manager. This identification process had two stages. The interview interviewees were asked (in the course of question 4/a, b) what factors have contributed to the development of their leadership style and project management attitude. Here the interviewee did not get any help at the beginning. However, if the manager could not give answer then the personal characteristics, family, education was enumerated or if the organizational culture had an impact on the development of the two factors. If the project manager did not mention the personal characteristics, it was asked, whether they have an impact on the development. However due to minimize the influence, they were integrated to the previously mentioned other factors (education, family, organizational culture – of course if these were not mentioned). For the leadership style, there was a need for further reinforcement, which was done with the help of mutual change. The changes of the personal characteristics[45] were also asked, which could be written with words or evaluated on a scale. If it changed, the change in leadership style was also asked; if the answer was no project managers had to characterize their leadership style (with a special attention to if it was changed or not). If mutual change occurs, answer for 4/b is confirmed. Of course we have to consider, whether it is easy to trap into the fake correlation. However, question 4/b (and to some extent 4/h) eliminates it. The other

[45] These were shown to the project manager.

factor that we have to consider is not just the personal characteristics that have impact on the leadership style. However, the aim of the research was not to identify every factor that has an impact on the leadership style and project management attitude, just like not to identify the factor which has the biggest impact on them. Finally, the 4/h question was considered as a checking of the answers. Thus, we can determine that the acceptance of the fourth hypothesis is compounded with more steps. At the project management approach question 4/a meant the initial point, so if the manager mentioned the personal characteristics (and question 4/h reinforces this) the hypothesis was accepted. At leadership style, question 4/b was the initial point; however, in this case, dual examination was enrolled. On one hand, the mutual change or non-mutual change was examined and 4/h question helped to filter the wrong answers or the contradictions. In case contradiction happens, the answers are examined again or refined. One example to this was when the managers answered that their leadership style is affected by their personal characteristics, though despite of the change their style stays the same. In the light of the above mentioned the fourth hypothesis - by the fourth part of the interview - could be accepted or rejected. Thus, in this question-group the dependent variable was the project management attitude and leadership style of the project managers, and the independent was the project managers' personal characteristics.

5.3 The sample

The base of the research was given by the Hungarian subsidiaries of the multinational enterprises in the info communication sector (ICT) sector. There was need for the multinational characteristics for dampening the effect of the Hungarian characteristics (e.g. in this way the competences weigh more when setting up a new project-team). Throughout the research, five subsidiaries were selected (based on professional estimation) those, which are the leaders of the market. However, their names due to confidential reasons cannot be mentioned.

As it was previously presented, semi-structured interviews were used in the course of the field research. The length of each interview was 45-70 minutes, it is enough time to answer the questions and decide about the hypotheses.

Throughout the research the population, namely the base of the model was the project managers of the 5 organization. If the organization happened to have more

subunits with different functions (like implementing a new system or penetrating into a new market segment), then those project managers have been chosen who worked in such department that was the closest to the IT. Of course it could happen that the IT department cooperates with other functional units (like the technical support by means of a new system in case of a market penetration), then those project managers were asked, that were the closest to the IT. The 31 project managers, which were the sample for the research, were chosen among them with the help of the Project Management Office (PMO) or with the help of a prominent project manager in the given company. Throughout the sampling, random sampling has been applied using the moderator help of the PMO or the project manager. The method was that either the PMO or the project manager had sent out mail notifications (or asked in person) asking if he/she could participate in the research. Those project managers who applied made up the current sample. Certainly the time and the mood meant a significant barrier when establishing the sample, however it did not affect the randomness (it was not a controlled survey) only the sample size. If the sample size seemed inadequate, the managers received another request. The following table shows the exact sample size in terms of different organizations:

Table 7. The exact numbers of interviewees in the research sample

Organization	Number of interviewees	Subpopulation
Organization 1	11	50+
Organization 2	5	20+
Organization 3	7	8
Organization 4	2	4
Organization 5	6	around 50

Source: proprietary

The sampling element seems little in the case of the second and fifth organization. However, because of the homogeneous knowledge of the managers and the homogeneous feature of the projects initiated it seems adequate. Namely within the concrete firm the managers have homogeneous knowledge regarding the project

management tools techniques and general philosophy. Moreover, the project management culture is the same within a company. This is due to the trainings and applied frameworks, tools and techniques suggested by the company. Therefore, we can state that the sample size is enough for taking relevant conclusions to the organizations and organizations having similar features with these.

5.3.1 The characteristics of the industry

The ICT sector is turbulent, rapidly changing, innovative, knowledge intensive and the technological lifecycle is short (cf. Blaskovics, 2014). Thus, the emphasis is on the employees and the utilization of their knowledge (especially when there is a new ICT application introduced). These industrial characteristics could have an impact on the leadership style and project management attitude, though the impact of the industrial characteristics on them is not part of the research. It is important to mention because the consequences formulated in this thesis are relevant only to those organizations' project managers who are working in a similar industries.

5.3.2 The characteristics of companies

Based on the preliminary examinations there are two factors, which can have an impact on the project manager's features. On one hand, the utilized project managerial methodology, on the other hand the organizational culture. The first is the same in every case namely each firm tries to apply agile project management methodology. The organizations certainly are on different levels in terms of the application; organization number five and four utilize these methods on a higher level, whereas the first three takes over certain components from the classic waterfall project managerial methodology, but less from the agile methodology. The other important element is the organizational culture. The third, fourth and fifth organization adapted Scandinavian culture thus the satisfaction of workers and the utilization of their knowledge were vital for them. In the case of the rest two organizations (however they are under foreign ownership), the international culture is less sensible but it appears in the applied methodology since throughout the managing of the project the parent company'a customized project management methodology means the base (which is usually based on the PMBOK).

Overall we can determine that the organizational culture have a considerable impact on the third, fourth and fifth organizations, whereas the impact is mediocre on the other

organizations. In regards to the applied project managerial method, the fourth and fifth organization use agile project management methodology, while the first three use classic with agile elements. These (similarly to the industry's characteristics) also have an effect on the project manager even though if the project manager is an active player, who can limit the industrial and organizational impacts.

5.3.3 The limitations of research

Since the sample of the research was given by the subsidiary companies of the multinational companies in the ITC sector, the research has serious limitations. The results of the research are valid only to those enterprises (to its project managers), which have the same characteristics as one of the five enterprises and are present at a similar industry as the ITC sector. It is clearly seen that in the case of the classic construction industry, that the workers have less role than in the case of system development. Moreover, the suitable knowledge is relatively easy to learn (of course there are exceptions, like the engineers possess high level and difficult to acquire knowledge). Therefore, the aim of my research is not to generalize, to define a conclusion that is valid to every industry. However, I feel that it is more useful to analyze a particular industry in detail with a bigger sample size than to have a general, less extensive examination expanding to other segments or industries.

5.4 The research outcomes

The basic aim of the dissertation was to answer for the four research questions as well as the acceptance or rejection of the hypotheses. To achieve all this we have used semi-structured interview presented previously. The research can be decomposed into four, moderately overlapping groups of questions, which components are:

1. The mapping of the project manager's knowledge. In the course of this, the mapping of project manager's tools and techniques, the identification of stakeholders of the projects managed by the project managers and whether the qualitative or quantitative tools and techniques dominated in the course of realization of project success expressed in terms of the three success criteria For this, it was vital to find out what tools and techniques the manager use (for achieving project success).

2. The identification of the project management attitude adapted by the project manager, and within the attitude the identification whether the use of the tacit or the explicit knowledge dominate

3. The impact-identification of the project management attitude on the project success, expressed in terms of the hierarchical model (Görög, 2013a).

4. The impact-identification of the project manager's characteristics on the project management attitude and leadership style. As it has been introduced previously, as for the impact on project management attitude we used a two-staged method, whereas for the impact on the leadership style a three-staged examination method.

5.4.1 The mapping of the project manager's knowledge

The first phase of the research was mapping the knowledge of the project manager so as the identification of the tools and techniques the manager uses in order to achieve the project success in terms of the hierarchical model (Görög, 2013a). The hierarchical model contains following criteria: project triangle, the satisfaction of the client and the stakeholders. The focus was, in case of question 1/d, 1/e, 1/f, on the nature of applied tools and techniques, that is the qualitative or quantitative ones contributed project success to a greater extent.

This phase's first step was to know the manager's knowledge. If the manager had the suitable knowledge than can have the base to latter examinations since as it was stated in chapter 4.1.1, the project manager can have the project management attitude only if he/she has the appropriate knowledge (cf. Cleland). We have to consider that under the management of the project the project manager uses less tools and techniques than he/she knows about (e.g. due to the applied methodology) that is why the mapping of both the known and applied is needed.

The knowledge expected could be highly widespread due to the evolution of the project's-, and project management's understanding (cf. Görög, 2013a, Project Management Institute 2010); thus focus were on the followings:

- proper planning of completion;
- suitable control;
- suitable management of stakeholders;

- optimization (if the interviewee mentioned the change management it was accepted even though the two cannot be treated as complete synonyms).

Planning is a complex procedure, which contains more project management tools, since it contains the creation of work breakdown structure, time plan, resource plan, cash-flow plan, risk management, stakeholder analysis, and project scope definition[46]. If the project manager mentioned planning, this also was accepted, there was no need to mention all seven factors, and however, some managers characterized their knowledge more detailed. It has to be admitted that these are more like activities than project managerial tools and techniques, though each tool or technique derives from the activity itself (e.g. the GANTT-diagram in case of time planning), thus there is no need for detailed decomposition by the project managers (cf. Görög, 2013a). If the project manager knew one of the project management methodologies, frameworks or guidelines, it was also accepted. For example, the use of PMBOK, or its organizational adaptation, or the project management aspect of Six Sigma, IPMA qualification or PRINCE2. The agile project managerial method was accepted if other tools were mentioned too. On the bases of these, the project managers know and apply the following tools and techniques (or activities) presented in Table 8:

Table 8. The known and applied tools and techniques/activities by the project managers

		Known tools and techniques (activities)	**Applied tools and techniques (activities)**
Organization 1	**Interviewee 1**	planning, control, stakeholder management, change management	planning, control, stakeholder management, change management
	Interviewee 2	planning, control, change management	planning, control, change

[46] In the planning other factors can be involved (e.g. the definition of certain norms of the control, or the creation of the communication plan), though these are the main components (cf. Görög, 2013a).

			management
	Interviewee 3	none of them	ad hock tools (stakeholder management, optimization)
	Interviewee 4	planning, control, stakeholder management, change management	planning, control, stakeholder management, change management
	Interviewee 5	planning, control, stakeholder management, change management	planning, control, stakeholder management, change management
	Interviewee 6	PRINCE, PMBOK	planning, control, change management
	Interviewee 7	PMBOK	planning, control, change management
	Interviewee 8	PMBOK	planning, control, stakeholder management, change management
	Interviewee 9	IPMA training	planning, control, change management

	Interviewee 10	Agile, waterfall approaches	planning, control, stakeholder management, change management
	Interviewee 11	PMBOK	planning, control, stakeholder management, change management
Organization 2	**Interviewee 12**	Six Sigma	planning, control, stakeholder management, change management
	Interviewee 13	PMBOK	planning, control, stakeholder management, change management
	Interviewee 14	PMBOK	planning, control, stakeholder management, change management
	Interviewee 15	PMBOK	planning, control, stakeholder management, change management
	Interviewee 16	PMBOK, IPMA, PRINCE2	planning, control,

			stakeholder management, change management
Organization 3	**Interviewee 17**	none of them	none of them
	Interviewee 18	PMBOK,PRINCE2, agile	planning, control, stakeholder management, change management
	Interviewee 19	PMBOK	planning, control, stakeholder management, change management
	Interviewee 20	PMBOK	planning, control, stakeholder management, change management
	Interviewee 21	PMBOK, Six Sigma	planning, control, stakeholder management, change management
	Interviewee 22	planning, control, stakeholder management, change management	planning, control, stakeholder management, change management

Organization 4	**Interviewee 23**	PMBOK	planning, control, stakeholder management, change management
	Interviewee 24	resource planning, control	resource planning, control
Organization 5	**Interviewee 25**	PMBOK	planning, control, change management
	Interviewee 26	PMBOK, agile approach	planning, control, stakeholder management, change management
	Interviewee 27	PMBOK, agile approach	planning, control, stakeholder management, change management
	Interviewee 28	PMBOK, agile approach	planning, control, stakeholder management, change management
	Interviewee 29	PMBOK, agile approach	planning, control, stakeholder management, change

			management
	Interviewee 30	PMBOK, agile approach	planning, control, stakeholder management, change management
	Interviewee 31	PMBOK, agile approach	planning, control, stakeholder management, change management

Source: the proprietary

Based on the previous, we can state that the interviewee 3 and 17 cannot be the model while in the case of the interviewee 24 we have to consider that the known tools are restricted (due to the lack of experience and trainings). However, the result of the interviewee 24 must be taken into consideration, since he possesses a basic knowledge. The interviewee 3 did not study tools and techniques thus he/she uses his/her experiences only so the project management attitude could not evolved in him. The interviewee 17 does not manage projects so his answers could not be relevant throughout the research. However, we have to emphasize that his/her answers can be very valuable and can be used in another research, since it analyzes project from a higher level.

We can determine that base of the research – considering the project manager's knowledge as a constraint – is the following sample encapsulated in Table 9:

Table 9. The final sample decomposed by organizations

Organization	All interviewees	Interviewees without suitable knowledge	Interviewees with acceptable knowledge	Interviewees with suitable knowledge

Organization 1	11	1	0	10
Organization 2	5	0	0	5
Organization 3	7	1	0	6
Organization 4	2	0	1	1
Organization 5	6	0	0	6

Source: proprietaryion

Then those stakeholders were examined, with whom the project managers had in touch. The importance is justified by question 1/d but mainly 1/e and 1/f. If e.g., if the project manager is not in touch with the client or end-users, then the use of the tools and techniques will be limited (e.g. the contents of the tools could alter when communicating). Through the answers, the following stakeholders' identification was needed:

- project team;
- functional managers (they give some resources for the projects, make requirements regarding the project in some case – for example the legal department by means of adapting to a certain law);
- project sponsor (his/her role is to strengthen the support of the project and/or the help to acquire certain resources);
- project owner[47] (representing the client's demand in the project);
- vendors;
- client;
- end-users.

[47] This is not equal to the project owner mentioned in chapter 3. The one which was mentioned there initiates the project (so he/she/it is the client). This project owner here represents the client within the organization and he/she is an internal stakeholder (from the point of view of the company) in each case.

Of course, it can occur that some stakeholders are not involved in projects; though this is influenced by the nature of the project, since it can happen that two or three roles are merged together (for example the project owner and a manager of the functional unit could be the same). It can happen too that the project manager does not have direct relationship with some stakeholders, although indirectly, he/she can have. An example for this is if certain department communicates with the client, e.g. in case of organization 3, 4 and 5. However, in this case they are categorized as stakeholders since their demands are involved directly in the project but by a mediator party. Moreover, we have to mention that more stakeholders could be identified just they are not notable, since their interests is present in the project in another way (like in case of authorities). The project team's as stakeholders, advantaged role (from the point of view of project success) is reasonable because of the agile project management process and organizational culture. Since throughout the agile project managerial process (Aljaz, 2013), the satisfaction of project team bears of greater importance just like in the case of the organizations with Scandinavian culture (organization 3, 4 and 5).

On the base of the answers, the following stakeholders were identified (in brackets the numbers represents how many project managers mentioned it):

Table 10. Stakeholders identified

	Stakeholders to keep in touch with	**Vital stakeholders, rare keep in touch with**	**Vital stakeholders with no contact**
Organization 1	project team (10), project sponsor (10), project owner (10), vendors (10), client (10), end-users (6)	functional managers (1)	

Organization 2	project team (5), functional managers (5), project sponsor (5), project owner (5), vendors (5), client (5), end-users (4)		
Organization 3	project team (6), functional managers (5), project sponsor (6), project owner (6), vendors (6), client (6), end-users (4)		
Organization 4	project team (2), functional managers (2), project owner (2), client (2)	vendors (1)	project sponsor (2), end-users (2)

Organization 5	project team (6), functional managers (6), project sponsor (6), project owner (6), vendors (6), client (6), end-users (3)		

Source: proprietary

On the bases of these, we can state that each organization's managers compose relevant base in the 1/d, f, e questions namely how they achieve project success expressed in terms of the three success criteria. By the answers, we have to consider four circumstances. At the fourth organization, the end-user satisfaction is not present (due to the lack of connection with them); the project team, functional managers and project owner and the vendors to some extent can be considered in the course of analyzing stakeholder satisfaction. Moreover, the sponsor and the project owner satisfaction is strongly interrelated with the satisfaction of client since the latest's main aspect is the creation of the client satisfaction while the previous is going to be satisfied if the sale is completed. The third is that the interview did not encompass which roles (stakeholders) are merged into one (for example the project owner and the functional manager). However, the separation would not influence the research, since in this case the examination of the suitable level of satisfaction is needed and if the role is dual than there are more interest. Namely, the emphasis is on the role of the stakeholders not on the stakeholder as entity itself. The fourth is that the setup of a project team is not in the role of project managers (except for making demands for resources in the planning phase), thanks to the fact that all of the organizations work in the matrix structure (usually in a weak matrix), moreover inner rules and regulations limits the project managers throughout this process, thus their role is passive, rather than active, which means there is a lower need for knowledge related to the project organizational structure. Moreover, the contracting and the project implementation strategy (type of

contract, form of payment, pre-qualification, tendering) is also out of their role; that is the job of a separate department.

The next step was the use of tools and techniques (activities) used by project managers to achieve project success. Throughout the research, the base for grouping was the amount of qualitative and quantitative tools contained by a certain activity (in accordance with the research question). As introduced in chapter 4.2 the quantitative tools and techniques are those where the base of the then is about the numbers. An example is time planning. While the qualitative tools and techniques are the ones, which give an answer for a problem by means of numbers, e.g., communication. Of course it happens that the manager use mostly quantitative tools, it does not certainly mean that it infers dominancy to the contribution of project success. Those activities that contain quantitative tools are planning and control, since in these cases the emphasis is on the qualitative elements. Of course, some elements can be divided into qualitative and quantitative parts (for example in case of the planning the identification of activities is rather qualitative, but the definition of the duration, critical path and resource demand is quantitative), though the quantitative elements are more dominant throughout the process (cf. Görög, 2013a). Such a tool, within both the qualitative and quantitative elements have an important role is the scope definition, optimization[48], output excellence, assurance of project result (cf. Görög, 2008). In case of these, the emphasis is not just on calculations, since there is a need for example, to think over the consequences of the applied activities or tools and techniques or there might be a need to represent certain interest. Exceptional tool is the assurance of the project result, which by definition means that the client receives that project outcome he/she/it expects. Of course, it is related to the project scope definition but it is rather boarder, since it also has its effect in the process of implementation. It cannot be regarded as control either, since the control 'just' controls, whether the implementation is in accordance with the plans. The product excellence is also a tool like the success assurance, since the quality plays a great role in the implementation process and project managers try to realize the required (or better) quality. The qualitative tools are the communication and the stakeholder- management. Of course, communication is wide

[48] In this case, the change management was also accepted. This tool is complex, contains more techniques e.g. the change of project triangle (or scope) or the assigning more resources to certain activities. If the project manager mentioned at least one of these techniques, it was accepted as a complete answer.

since it encompasses for example, throughout the planning and optimization the communications of the plans and modiciations is needed, there is a need to communicate with the project team and the client escalation, so every iteration that is used with communication. Stakeholder management contains those tools and techniques, that are used for gaining the support of the stakeholders (cf. Görög, 2003), except for communication (like involvement or holding trainings).

The project managers gave the following answers (Table 11, 12, 13) on how they could ensure the certain level of success (the numbers in brackets indicate the number of project managers who gave that answer):

Table 11. The impact of the project management tools and techniques on project triangle

Success in terms of project triangle	**Quantitative tools**	**Qualitative and quantitative tools**	**Qualitative tools**
Organization 1	planning (10), control (7)	project scope definition (2), optimization (7)	stakeholder management (3), communication (8)
Organization 2	planning (4), control (4)	project scope definition (1), optimization (3)	stakeholder management (0), communication (3)
Organization 3	planning (6), control (6)	project scope definition (3), optimization (6)	stakeholder management (4), communication (4)
Organization 4	planning (2), control (2)	project scope definition (0), optimization (2)	stakeholder management (0), communication (1)
Organization 5	planning (6), control (4)	project scope definition (3), optimization (3)	stakeholder management (0), communication (4)

Total	planning (28), control (23)	project scope definition (9), optimization (21)	stakeholder management (7), communication (20)

Source: proprietary

Table 12. The impact of the project managerial tools and techniques on client satisfaction

Success in terms of client satisfaction	**Quantitative tools**	**Qualitative and quantitative tools**	**Qualitative tools**
Organization 1		assurance of project result (1), project scope definition (6)	communication (9), stakeholder management (4)
Organization 2		assurance of project result (4), project scope definition (2)	communication (4), stakeholder management (4)
Organization 3		assurance of project result (3) project scope definition (2)	communication (5), stakeholder management (1)
Organization 4		assurance of project result (2) project scope definition (1)	communication (1), stakeholder management (0)
Organization 5		assurance of project result (4)	communication (5), stakeholder

		project scope definition (0)	management (1)
Total		assurance of project result (14) project scope definition (11)	communication (24), stakeholder management (10)

Source: proprietary

Table 13. The impact of the project managerial tools and techniques on the stakeholders' satisfaction

Success in terms of stakeholder satisfaction	**Qualitative tools**	**Qualitative and quantitative tools**	**Qualitative tools**
Organization 1	control (2)	project scope definition (2), optimization (2), output excellence (2)	communication (7), stakeholder management (7)
Organization 2	control (0)	project scope definition (0), optimization (1), output excellence (0)	communication (5), stakeholder management (4)
Organization 3	control (0)	project scope definition (4), optimization (0), output excellence (1)	communication (4), stakeholder management (4)
Organization 4	control (0)	project scope definition (0), optimization (1), output	communication (1), stakeholder management (2)

		excellence (1)	
Organization 5	control(0)	project scope definition (0), optimization (0), output excellence (0)	communication (3), stakeholder management (4)
Total	control (2)	project scope definition (7), optimization (2), output excellence (3)	communication (20), stakeholder management (21)

Source: proprietary

The results of the research are divided into three parts just as the research question and hypotheses.

Throughout the achievement of the project success measured in terms of the project triangle, we can state that those activities that contain quantitative tools have dominance in numbers over the qualitative tools. The planning phase is quite significant as well, because every manager with the exception of one mentioned it. However, control is as important which was mentioned quite frequently, with the exception of six managers. Optimization (21) and communication (20) were also mentioned frequently. The project scope definition (9) and stakeholder management (7) is less important based on the responses. The explanation to the low results of the project scope definition is that a project manager at a multinational organization has less influence on the project result, since the business demands are given. Of course, it can be compensated e.g. gaining a high reputation over the office or acquiring a so-called inner project. The explanation to the low responses on the stakeholder management is that it tries to achieve with

hierarchical tools (employer-employee relationship) or communication in order the project team do their tasks properly suitably.

Overall, we can determine that more managers apply those activities that consist of quantitative tools, though it is cannot be stated whether their contribution is better to this aspect of project success. Even if there were 51 mentions like this. Which is owing to the fact that those project managers who mentioned communication, declared that, without communication, none of the plans can be achieved (no matter whether it is time plan or related to control). Thus, the number of managers who do not rely on the qualitative tools is quite low (8). There are 20 managers who mentioned the need of communication besides planning and one, who did the same with the stakeholder management. Based on the findings – it might appear that the quantitative tools contribute to the project success (in terms of the project triangle) in a greater extent than the qualitative ones – we can determine that the qualitative tools are just as significant as the quantitative ones. It is then required to utilize them commonly.

As a conclusion, the first element of the first hypothesis can be rejected.

Throughout the use of the tools, which are needed for realizing the client satisfaction, we can state that those activities that utilize quantitative tools and techniques are not mentioned, at best where the both qualitative and quantitative tools and techniques are also present, namely the assurance of project result and the project scope definition. 24 out of 29 managers regarded the use of the communication highly significant. Moreover, out of the 24 managers 10 consider vital, as one of the communication tools, the continuous reporting of products namely a status report of the project completion. The second most important is the assurance of project result (almost half of the project managers mentioned); the third place is the project scope definition which was mentioned by 11 managers. Of course, the latter one has a tight coherence with the assurance of project result; however six managers did not consider it as important. At the last place, there is the stakeholder management, which is thanked to the fact the client is a very important stakeholder so the communication with him/her/it is considered to be a separate tool. The other management tools (besides communication) were found to be important by nearly one third of the project managers (like for examples satisfying the workers of the client which increases the potential for the satisfaction of the client).

Considering this fact, we can state that the quantitative elements are not more important in the aspect of the client satisfaction than the qualitative ones. There is a higher potential in the other way, namely the qualitative elements contribute to client satisfaction in a bigger manner than the quantitative ones, but without further analyses, this cannot be stated either (although there is a high potential for it).

On the bases of these, the second part of the first hypothesis is rejected.

The third aspect was about those tools that having an impact on the satisfaction of the stakeholders. On the bases of the manager's answers the most important and frequent element is communication and stakeholder analysis. There have been only nine managers, who did not consider communication as a vital factor. One of the managers declared that this aspect of project success is not relevant for him/her since he/she does not deal with stakeholders. Thus the sample in this case is not 29, but 28. Another interesting thing is that in the case of the fourth organization both managers considered communication vital though they do not have relationship with the end-users. It is interesting too that only two project managers did not mention the qualitative elements (stakeholder management and communication). 16 project managers uses only qualitative tools, and two managers uses quantitative elements in case of achieving the satisfaction of the stakeholders. The latter one is interesting, since this aspect of project success is considered to be the most qualitative one (cf. Görög, 2003). We have to mention too, that there was just one manager, who applied more than one quantitative (planning, control), and qualitative and quantitative tool (for ex. project scope definition, optimization, control). He/she considered project scope definition and output excellence as important activities in case of achieving this aspect of project success.

Overall, we can determine that in the case of the stakeholder satisfaction aspect of project success, the number of qualitative tools and techniques dominate the number of quantitative tools and techniques. There was no project manager, who said the quantitative techniques contribute to this aspect of project success in a greater manner than the qualitative ones. Nevertheless, 16 managers used just qualitative tools for achieving stakeholder satisfaction.

In light of these we can reveal that the third element of the first hypothesis can be rejected thus the first hypothesis is rejected too.

5.4.2 The identification of the project manager approach applied by the manager

The second part of the research focused on the project manager's qualifications, the project management attitude of the project managers, just like the tacit or the explicit knowledge is present in a greater manner in the tools and techniques applied in this frame of the identified project management attitude.. For the latter, we had to ask the question: if the tools and techniques are applied in the frame of this management attitude, have their content developed throughout the usage and whether they are obtainable or learnable. Can they be studied from professional literature, from traditional knowledge-transferring courses or the knowledge should be transferred a way that the tacit elements could also be acquired (cf. Horváth, 2013).

The qualification of the manager could be important because of two factors. On one hand, the qualification can validate the answer given for the two of the previous questions (known and utilized project managerial tools). On the other hand, throughout the first two questions of the fourth part of the research it can give a base namely, what factors had an impact on the leadership style and project management attitude.

The project managers' education and qualification are summarized in the following table[49]:

Table 14. The education and qualification of the project managers

		University qualification	**Project manager qualification**
Organization 1	**Interviewee 1**	economist, system analyst	PMP
	Interviewee 2	doctor	-
	Interviewee 4	electrical engineer, teacher, MBA	-
	Interviewee 5	engineer (2),	IPMA record

[49] Candidate number 3 and 17 have been earlier disqualified from the sample.

		economist (2)	
	Interviewee 6	programmer	SSADM, PMP
	Interviewee 7	transportation engineer	-
	Interviewee 8	engineer	PMP
	Interviewee 9	engineer, teacher, computer engineer	-
	Interviewee 10	MBA, technician	-
	Interviewee 11	economist, technician- computer engineer	-
Organization 2	**Interviewee 12**	economist, journalist	PMP, Six Sigma Black Belt
	Interviewee 13	computer engineer, accountant	PMP
	Interviewee 14	economist, MBA	-
	Interviewee 15	economist, engineer	PMP
	Interviewee 16	engineer	PMP
Organization 3	**Interviewee 18**	engineer	PMP
	Interviewee 19	economist engineer, accountant	PMP
	Interviewee 20	engineer-computer engineer, economist engineer	PMP
	Interviewee 21	engineer	Six Sigma Black Belt
	Interviewee 22	organizer, IT, economist MBA	-
	Interviewee 23	engineer	PMP
Organization 4	**Interviewee 24**	IT	-
	Interviewee 25	technical engineer	-

Organization 5	**Interviewee 26**	economist, electrical engineer	PMP
	Interviewee 27	engineer	-
	Interviewee 28	economist, mathematician	PMP
	Interviewee 29	IT, electrical engineer	PMP
	Interviewee 30	electrical engineer	PMP
	Interviewee 31	engineer- IT	-

Source: proprietary

Based on table 13, we can determine that everybody have IT or engineering qualifications except for the interviewee 14. In addition, 17 interviewees have some type of project management qualification; there are two candidates, who have these kinds of ongoing project management studies. This way we can verify the sample to be valid because it is likely possible that every manager in the sample bears the management tools and techniques mentioned for question 1/a and 1/b. We can also determine that there is a high potential (based on their academic qualifications) for the project managers having the relevant and suitable project management attitude (cf. Cleland, 1994).

The next step within this part is the mapping of the project manager's project management attitude. Three management attitudes are possible. The first one, the managers considers project as unique task, then project management means managing the implementation process of this task, thus the project management attitude is project process centric. The second one, the project is considered to be as temporary organizations, and then the project management means managing the temporary organization, thus the project management attitude is stakeholder-centric. The third one, the project is considered to be strategic building blocks, then the project management means delivering the beneficial change; this way the project management is strategy-oriented. Of course, the combinations of these could be valid too. The direct questioning was impossible, thus, in this case the question was, by what kind of guideline the project is led, namely what kind of approach is followed. Throughout the assessment,

this constituted the base. If the project managers considered the completion of the plans important, then they followed a project process-centric project management attitude. If the managers highlighted the management of the stakeholders (especially the project team), they followed a stakeholder-centric project management attitude. If the managers regarded important the interests and strategy of the organization, they followed a strategy-oriented approach.

The project management attitudes have been summarized in Table 15. The second column consists of detailed explanations, given by the project managers.

Table 15. The list of the project management attitudes

		Manager's answers of the approach	**Project management attitude**
Organization 1	**Interviewee 1**	people centric, management of stakeholders	stakeholder centric
	Interviewee 2	importance of keeping contact with stakeholders, delivering what the client wants	stakeholder centric
	Interviewee 4	importance of colleagues	stakeholder centric
	Interviewee 5	suitable management of conflicts, suitable management of projects (’selling the project’)	stakeholder centric
	Interviewee 6	methodical, planned	project process centric
	Interviewee 7	well based planning, process centric	project process centric

	Interviewee 8	deliver what the client wants, but help to find the best solution	strategy orientated
	Interviewee 9	clear aims to reach	project process centric
	Interviewee 10	keep the deadlines, high morale, team play	project process centric, stakeholder centric
	Interviewee 11	stakeholder centricity	stakeholder centric
Organization 2	**Interviewee 12**	service, consideration of environment	stakeholder centric
	Interviewee 13	stakeholder centricity	stakeholder centric
	Interviewee 14	consider the interest of client	strategy orientated
	Interviewee 15	project team-centric management, help the project team to understand the aims of the project , suitable style and direction for the project	stakeholder centric
	Interviewee 16	the task what has to be done	project process centric
Organization 3	**Interviewee 18**	everybody should find their aims in the project, team centricity	stakeholder centric
	Interviewee 19	motivational atmosphere, grace, penalties if required	stakeholder centric
	Interviewee	a task to solve	project process

	20		centric
	Interviewee 21	business benefit in the center, people should feel the sense of the project	strategy orientated
	Interviewee 22	aligned with strategy	strategy orientated
	Interviewee 23	plan based, structured task	project process centric
Organization 4	**Interviewee 24**	the interviewee mentioned strategy orientation, however based on the other answers he/she is rather process centric since the emphasis was on the plans and the realizations of those	project process centric
	Interviewee 25	quality centric (and due to this process centricity)	project process centric
Organization 5	**Interviewee 26**	first the clarification of the project rules, making of positive attitude	stakeholder centric
	Interviewee 27	the interest of the organization (client) is in the center	strategy orientated
	Interviewee 28	the interest of the organization (client) is in the center	strategy orientated
	Interviewee 29	understanding of technics, importance of	stakeholder centric, project process

		team play	centric
	Interviewee 30	organized work and cheerful, motivated project team	stakeholder centric
	Interviewee 31	human centric, suitable atmosphere	stakeholder centric

Source: proprietary

The project management attitude's suitable categorization as a post-examination was conferred with the managerial tools. This can be a firm base whether the manager categorized himself/herself right. For instance, that manager who believed himself/herself to be stakeholder-centric without utilizing the stakeholder-analysis (neither when achieving certain stages of project success nor generally), could not be stakeholder-centric. Based on the previous findings the approach of interviewee number 24 has been changed.

The project management attitudes were shaped in case of the organizations as the following table (Table 16) shows:

Table 16. The distribution of project management attitude by organizations

	Project process centric	**Stakeholder centric**	**Project process centric, stakeholder centric**	**Strategy oriented**
Organization 1	3	5	1	1
Organization 2	1	3	0	1
Organization 3	2	2	0	2
Organization 4	2	0	0	0
Organization 5	0	3	1	2
Total	8	13	2	6

Source: proprietary

Based on table 15, we can see that in case of four organizations, the project-process centric is the dominant project management attitude. This could be due partly the agile project management method's high level (this however, would mean following the stakeholder-centric project management attitude as well, but the project managers do not admit following it [cf. Aljaz, 2013]).

We can state that most of them follow the stakeholder-centric approach. The reason for this is the use agile project management method, the industrial organizational characteristics. The second most common is the project's process centric approach; the explanation is the classic project managerial process's project-process-centric approach. (cf. International Project Management Association, 2006; Project Management Institute, 2010). The strategy-oriented approach is however not that common amongst the managers, owing to the fact that it claims more serious experience (and due to that important position) and organizational culture. In light of these, organizations 3 and 5 have the suitable culture and/or highly qualified managers (cf. Table 16).

For the acceptance of the second hypothesis, there was a need to ask whether the project management tools and techniques are applied in accordance with the project management attitude followed be the project managers and the utilization of the tools identified have developed throughout the project managers' career. In addition, these tools are rather obtainable or learnable. The results are summarized in the Table 17:

Table 17. The relationship between the project management attitude and the knowledge

		Project management attitude	**Are the tools applied on the bases of this attitude?**	**Have the utilization-methods of these tools developed through the past years?**	**These are rather obtainable or learnable?**
Organization 1	**Interviewee 1**	stakeholder centric	yes	yes	obtainable
	Interviewee 2	stakeholder centric	yes	yes	obtainable
	Interviewee 4	stakeholder centric	yes	yes	obtainable
	Interviewee 5	stakeholder centric	yes	yes	obtainable

	Interviewee 6	project process centric	yes	yes	obtainable
	Interviewee 7	project process centric	yes	yes	obtainable
	Interviewee 8	strategy orientated	yes	yes	obtainable
	Interviewee 9	project process centric	yes	yes	obtainable
	Interviewee 10	project process centric, stakeholder centric	yes	yes	obtainable
	Interviewee 11	stakeholder centric	yes	yes	obtainable
Organization 2	**Interviewee 12**	stakeholder centric	yes	yes	obtainable

	Interviewee 13	stakeholder centric	yes	no	obtainable
	Interviewee 14	strategy oriented	yes	yes	obtainable
	Interviewee 15	stakeholder centric	yes	yes	obtainable
	Interviewee 16	project process centric	yes	yes	obtainable
Organization 3	**Interviewee 18**	stakeholder centric	yes	yes	obtainable
	Interviewee 19	stakeholder centric	yes	yes	obtainable
	Interviewee 20	project process centric	-	-	-
	Interviewee 21	strategy orientated	yes	yes	obtainable
	Interviewee 22	strategy orientated	yes	yes	obtainable

	Interviewee 23	project process centric	yes	yes	obtainable
Organization 4	**Interviewee 24**	project process centric	yes	yes	obtainable
	Interviewee 25	project process centric	yes	yes	obtainable
Organization 5	**Interviewee 26**	stakeholder centric	yes	yes	obtainable
	Interviewee 27	strategy orientated	yes	yes	obtainable
	Interviewee 28	strategy orientated	yes	yes	obtainable
	Interviewee 29	project process centric, stakeholder centric	yes	yes	obtainable

	Interviewee 30	stakeholder centric	yes	yes	obtainable
	Interviewee 31	stakeholder centric	yes	yes	obtainable

Source: proprietary

The project managerial tools are applied by the previously identified project management attitude in each case (except for one who did not answer). Moreover, only one manager thinks that the way of using the tools and techniques that he uses did not develop throughout the past years. The others think it was developed. The explanation to this could be that project managers utilize the managerial tools with higher efficiency, with improved content or with customization (personally tailored). Finally, all of the project managers agree that the tools are rather obtainable; though nine managers emphasized the importance of education and/or training. To be more accurate they feel necessary the literature bases. Probably it is true amongst the others too, that they could hardly manage the projects without a reliable basis knowledge, however, they concern the acquired experience more important, insomuch that they regard minimal the role of education.

In light of these we can reveal that if we accept that the transfer of the tacit knowledge is hard and the people can have it through practical experiences (it is obtainable, not learnable) or in an environment which is used for modeling practice (cf. Horváth, 2013), we can determine that every manager think that the tacit elements are more important throughout the management of projects.

On the bases of these the second hypothesis - the explicit knowledge exists in a higher degree than tacit in the project management attitude -, can be rejected.

This result foreshadows that the university seminars, which are related to the project management, should set the target that besides providing an academic base for the students, it must create an environment where the tacit knowledge can be transferred.

5.4.3 Highlighting the impacts by the previously referred project management attitudees on the project success

The third part of my research maps the impact of certain project management attitudes identified previously. As it has been written before, the research is not intended to identify the scale of the impact but to describe whether each project management attitude has any impact on the project success itself or not. The project success has been

defined on the fundaments of the hierarchical model. Thus the hypothesis is divided into three parts: whether the project management attitude has an impact on the project success expressed in terms of the project triangle, the satisfaction of the client and the satisfaction of the stakeholders. To increase the relevance of each answer given, an extra question has been defined to gather information on the ways of the impacts; how the impacts of the management attitude could affect each of aspect of project success.

The answers that have been given on the impact on the success deriving from project triangle can be seen in Table 18:

Table 18: Impact of project management attitude on project triangle

Project triangle aspect of project success		Project management attitude	Do you think such project management attitude has an impact on this aspect of project success?	If so, how do you think such project management attitude has an impact on this aspect of project success?
Organization 1	**Interviewee 1**	stakeholder-centric	yes	through highly motivated project-team
	Interviewee 2	stakeholder-centric	yes	through resource-allocation and communication
	Interviewee 4	stakeholder-centric	yes	through the establishment of partnership (completes the job on the

				basis of mutual conceptions)
	Interviewee 5	stakeholder-centric	yes	through optimization
	Interviewee 6	project-process centric	yes	through careful planning the elimination of the risks
	Interviewee 7	project-process centric	yes	through proper structure, planning in accordance with client's demands (though the planning phase gets longer but worth to do)
	Interviewee 8	strategy oriented	yes (either can be supportive or interfering)	if the product is important, then it helps, otherwise not (speaking of the case of the

				importance of personal relationships)
	Interviewee 9	project-process centric	yes	through the planning and setting of the objectives
	Interviewee 10	project-process centric, stakeholder-centric	yes	through highly motivated project-team
	Interviewee 11	stakeholder-centric	yes	through highly motivated project-team
Organization 2	**Interviewee 12**	stakeholder-centric	yes	through planning and the consideration of the environment
	Interviewee 13	stakeholder-centric	yes	through continuous cooperation
	Interviewee 14	strategy oriented	yes	it has an impact basically on the quality,

				but through highly motivated project-team
	Interviewee 15	stakeholder-centric	yes	through clearly defined tasks (proper planning)
	Interviewee 16	project-process centric	yes	through value creation and its communication
Organization 3	**Interviewee 18**	stakeholder-centric	yes	through adequate cooperation
	Interviewee 19	stakeholder-centric	yes	through motivation and involvement
	Interviewee 20	project-process centric	yes	through planning and optimization
	Interviewee 21	strategy oriented	yes	through proactivity and motivation
	Interviewee	strategy	occasionally	-

	22	oriented		
	Interviewee 23	project-process centric	yes	through planning
Organization 4	**Interviewee 24**	project-process centric	yes	through optimization and prioritization
	Interviewee 25	project-process centric	no direct relationship	-
Organization 5	**Interviewee 26**	stakeholder-centric	yes	through optimization and prioritization
	Interviewee 27	strategy oriented	yes	through prioritization, motivation
	Interviewee 28	strategy oriented	yes	-
	Interviewee 29	project-process centric, stakeholder-centric	no	-
	Interviewee 30	stakeholder-centric	yes	through motivation
	Interviewee 31	stakeholder-centric	yes	through managing the whole as a system (planning,

				stakeholders)

Source: proprietary

Table 18 shows, that most of the project managers believe that the project management attitude has a definite impact on the project triangle. Only two project managers believed that there is no impact on this aspect of project success; one said the project management attitude has an impact though only occasionally. Two other project managers have not given any reasons why certain management attitude that he/she represents has or has not have an impact on project success. It can also be stated that those, who represent the project-process centric approach believe that the proper planning is the base for success. Those interviewees, who represent stakeholder-centric approach, emphasize the need for the highly motivated project team; the strategy-oriented managers believe that the prioritization and proactivity that leads to project success. This coincides with the theoretic approach, since if the project management is understood as managing the implementation process, then the emphasis is on planning, on the control and on the optimization. In that case, the project management is treated as managing temporary organization (especially the project-team) then the primary task is the management of the stakeholders. When the last possible case occurs, speaking of the strategic building-block approach of project, then the focus of project management is on the delivery of the beneficial change, thus the proper planning and the consideration of the client's demands become inevitably important. Certainly, it is not necessarily about the abandonment of using other project management tools. Managers that follow the strategy-oriented project management attitude (and have given answers), all excluding one, believe that motivation of the project-team is highly important too. The results also show that interviewee no. 5, 15, 20, and partially 31, – even though they stated to be stakeholder-centric – emphasize the planning part of the process, which is in a slight contradiction with their previously identified project management attitude, suggesting that in their attitude, they inevitably have project-process centric components as well. The same thing happens when looking at interviewee number eight, however in this particular case the contradiction is unreal. The strategy oriented approach does not require frequent communication, thus more emphasis can be levied on proper planning (in accordance with the client's demands); this is the reason why his/her answer is adequate. However, all the other managers use those management tools and techniques that correspond to their management attitude. This way the results confirm and prove their project management that has been previously identified.

When looking into the project management attitude's impact on the project triangle, then – excluding the answers that were not correspondent– we can determine that 21 project manager assumed (with giving adequate reasons) that the project management attitude has impact on the project triangle. Two thought that project management attitude did not have an impact and one thought the impact is occasional. Out of those project managers who believed that the project management attitude has impact on the success also were confident about its positive direction; only one manager said the impact to be bi-directional. None of the project managers thought the impact to be negative, however many have highlighted (interviewee 2, 20, 26) that the impact on each component of the project triangle depends on certain situation (e.g. the timely completion can be achieved by means of increasing the costs).

Overall, we can determine that 21 project managers believe that the project management attitude has an impact on the project triangle, whereas two managers assume no impact, this way making the first part of the third hypothesis to be accepted.

The second step in this part of the research was highlighting the impact of the project management attitude on the client satisfaction. Corresponding to the project triangle aspect of project success, the same two questions have been asked from the managers. Namely they were not just asked about the existence of the relationship, but how the project management attitude has an impact on this aspect of project success. The results are shown in the Table 19:

Table 19. The impact of the project management attitude on client satisfaction

Client satisfaction		Project management attitude	Do you think such project management attitude has an impact on this aspect of project success?	If so, how do you think such project management attitude has an impact on this aspect of project success?
Organization 1	**Interviewee 1**	stakeholder-centric	yes	communication (with the client)
	Interviewee 2	stakeholder-centric	yes	communication (with the client), compromises, top service (e.g. complementary trainings)
	Interviewee 4	stakeholder-centric	yes	by having things working in order (on the personal side as well)
	Interviewee 5	stakeholder-centric	yes	through partnership and through gestures

	Interviewee 6	project-process centric	yes	through validity of the project
	Interviewee 7	project-process centric	yes	through the balance between stakeholder management and the content
	Interviewee 8	strategy oriented	yes (either can be supportive or interfering)	if the product is important, then it helps, otherwise not (speaking about the case on the importance of personal relationships)
	Interviewee 9	project-process centric	yes	through communication
	Interviewee 10	project-process centric, stakeholder-centric	yes	through fast delivery and honesty
	Interviewee 11	stakeholder-centric	yes	through soft skills (e.g. fine-looks, proper management of the stakeholders)
Organization 2	**Interviewee 12**	stakeholder-centric	yes	through the adaptation and its fulfillment
	Interviewee 13	stakeholder-centric	partially	through the project result

	Interviewee 14	strategy oriented	yes	through emphasis of the alternatives
	Interviewee 15	stakeholder -centric	yes	through continuous reporting and communication
	Interviewee 16	project-process centric	yes	through value creation
Organization 3	**Interviewee 18**	stakeholder -centric	yes	through control and communication
	Interviewee 19	stakeholder -centric	yes	through the representation of interest and business orientation
	Interviewee 20	project-process centric	yes	through the fulfillment of the requirements
	Interviewee 21	strategy oriented	yes	through highly motivated project-team, the achievement of the project result, proactivity – the prevention of business obstacles
	Interviewee 22	strategy oriented	yes	through project feedbacks and critics
	Interviewee 23	project-process centric	yes	through plans (receives what expects)

Organization 4	**Interviewee 24**	project-process centric	yes	through the achievement of project result expected
	Interviewee 25	project-process centric	yes	through high quality products
Organization 5	**Interviewee 26**	stakeholder-centric	yes	through the consideration of interests
	Interviewee 27	strategy oriented	yes	through products (provides services as well and places adequate emphasis on the communication and gestures)
	Interviewee 28	strategy oriented	yes	through consideration of the stakeholder-interests
	Interviewee 29	project-process centric, stakeholder-centric	no	-
	Interviewee 30	stakeholder-centric	yes	through product and communication
	Interviewee 31	stakeholder-centric	yes	through the consideration of business environment

Source: proprietary

Wrapping up the responses, we can verify that the answers given by each project manager suit the specific project management attitude they apply. The only exceptions are interviewee 9, 13 and 31. One would expect that the project-process centric approach – based on the professional literature – aims to ensure the implementation and the satisfaction of the clients by providing the proper project result, whereas the stakeholder-centric approach aims to ensure the same by managing the stakeholder properly, so as the strategy-oriented attitude by considering business approaches (proactivity, analyzing the alternatives). As a contrast, two project managers failed to gives such answer that corresponds to his/her management attitude. Two of the interviewees did not answer in accordance with these. Interviewee number nine emphasizes communication as an important factor, whereas interviewee number thirteen emphasized the importance of the project result. This however not necessarily means that certain approaches could not utilize atypical managerial tools. At this point tough, if those tools that are tied to a certain approach not even used, then there is a possibility that the project manager follows a different project management attitude. It could also happen that he/she miscategorized his/herself before. Evaluating the tools and techniques used by interviewee 31, we have to acknowledge that it is quite general, since it considers the environment, that incorporates the project team and the client as well, making his/her answer to be relevant (even if it is not specific). There could also be a pseudo contradiction when looking at interviewee number eight, though referring to the previous argument (where there is client's interest is manifested in the product) the answer is relevant.

Consequently, the responses of 27 interviewees can be accepted as relevant. Out of 27 project managers 25 think that his/her project management attitude have an impact on this aspect of the project success (client satisfaction). Twenty-four out of twenty-five interprets this impact to be positive and only one to be situation dependent. One project manager believes that his approach has partial impact on the success and another one assumes that the project management attitude does not have any impact on project success.

This way the second part of the third hypothesis can also be accepted.

The third step in this part of my research is the examination of the impact of the project management attitude on the stakeholder satisfaction. Similarly to the previous

two steps, the questions and their order stayed the same; this way making the inappropriate responses easy to filter. The following table shows the responses given to this set of questions:

Table 20. The impact of the project management attitude on the satisfaction of the stakeholders

Stakeholder satisfaction aspect of project success		Project management attitude	Do you think that such project management attitude has an impact on this aspect of project success?	If so, how do you think such project management attitude has an impact on this aspect of project success?
Organization 1	**Interviewee 1**	stakeholder-centric	yes	through communication
	Interviewee 2	stakeholder-centric	yes (negative impact)	the quick delivery would be important for the end-users, though it is not aided this way
	Interviewee 4	stakeholder-centric	yes	through mutuality
	Interviewee 5	stakeholder-centric	yes	through relationship management and agility

	Interviewee 6	project-process centric	yes	through involvement in the planning
	Interviewee 7	project-process centric	no	-
	Interviewee 8	strategy oriented	yes	it acts as a shield to the stakeholders (primarily to the project team)
	Interviewee 9	project-process centric	yes	through communication
	Interviewee 10	project-process centric, stakeholder-centric	yes	through invitation to product tests, gestures (e.g. saving time for the stakeholders)
	Interviewee 11	stakeholder-centric	yes	through soft skills (e.g. fine-looks, proper management of the stakeholders)
Organization 2	**Interviewee 12**	stakeholder-centric	yes	through constant communication and transparency

	Interviewee 13	stakeholder-centric	yes	through constant communication and consensus
	Interviewee 14	strategy oriented	yes	through motivation
	Interviewee 15	stakeholder-centric	yes	through good atmosphere and good relationships
	Interviewee 16	project-process centric	yes	through providing the input to everyone on time
Organization 3	**Interviewee 18**	stakeholder-centric	-	-
	Interviewee 19	stakeholder-centric	yes	through motivating environment and project-characteristics (motivational)
	Interviewee 20	project-process centric	yes	through guiding, mentoring and commitment
	Interviewee 21	strategy oriented	yes	through proactivity and using proper tools
	Interviewee	strategy	no	-

	22	oriented		
	Interviewee 23	project-process centric	no	-
Organization 4	**Interviewee 24**	project-process centric	yes	through resource-optimization
	Interviewee 25	project-process centric	yes	through good decisions
Organization 5	**Interviewee 26**	stakeholder-centric	yes	through interest-consideration
	Interviewee 27	strategy oriented	yes	through the excellence of project result (speaking of end-users) and through gaining the support of serious sponsors (speaking of other stakeholders)
	Interviewee 28	strategy oriented	yes	through indication of certain problems
	Interviewee 29	project-process	no	-

		centric, stakeholder-centric		
	Interviewee 30	stakeholder-centric	yes	through stakeholder management
	Interviewee 31	stakeholder-centric	yes	through change management

Source: proprietary

The responses show that those interviewees, who believe that the project management attitude has an impact on the project satisfaction of the stakeholders, have given such answers that in most cases correspond to their project management attitude. According to the previous chapters in case of the project-process centric behavior, the emphasis would be laid on planning-, on the proper management and testing of the process. In case of the stakeholder-centric behavior, the emphasis would be laid on the stakeholder management, whereas the strategy-oriented approach would consider the stakeholder management applied in terms of business interests. Considering the previous statements, the only exceptions might be interviewee 8, 9, 14 and 31. The eighth project manager puts emphasis on his project team. However if we were to take it into account, when using an agile project management method, the project team turns to be one of the most important stakeholder, then his/her answer is understandable and acceptable (especially considering the fact that in case of a multinational company a project manager is not in touch with the end-users in each case). So the contradiction is again pseudo one. The ninth project manager highlights the importance of communication that is proper when it communicates the project process and the project result. His/her answer would also be relevant even if there were a slight contradiction between his/her project management attitude and the answer given. Interviewee number fourteen gives significance to proper motivation even though he follows the strategy-oriented project management attitude, which shows close association with interviewee nine. However if we analyze the differences between the two organizations (speaking of the second company, more stakeholders gets in relationship with the project manager, see table 10.), then we can say that the motivation has limited impact and not relevant. The same applies to project manager number thirty-one; his/her answer can be disregarded since the so-called change management (more from the technical point of view) has to be the part of the project-centric approach. As a result, the responses of project manager number 14 and 31 should be excluded from the evaluation.

In case of discussing the impacts of the project management attitude on this aspect of project success (stakeholder satisfaction), it is inevitable to consider only the relevant answers. With this in mind, the answers of twenty-seven project managers have been reliable. Based on the responses given there are 24 project managers who believe that their project management attitude has impact on this aspect of project success, whereas 3 managers say there is no impact.

Ultimately we can declare that the third part of the third hypothesis can be accepted, meaning that we the third hypothesis as whole can be accepted. Therefore, the project management attitude has an impact on each level of project success expressed in terms of success criteria found in the hierarchical model.

The answers given in the third part however are to be tested as a whole instead of splitting them apart based on the success criteria.

It is however, also practical to compare the answers to each other. See the table 21 of comparison below:

Table 21. The impact of the management attitude on project success

Project success		Project management attitude	Do you think such project management attitude has an impact on the project triangle aspect of project success?	Do you think such project management attitude has an impact on the client satisfaction aspect of project success?	Do you think such project management attitude has an impact on the stakeholder satisfaction aspect of project success?
Organization 1	**Interviewee 1**	stakeholder-centric	yes	yes	yes
	Interviewee 2	stakeholder-centric	yes	yes	yes (negative impact)
	Interviewee 4	stakeholder-centric	yes	yes	yes

	Interviewee 5	stakeholder-centric	yes	yes	yes
	Interviewee 6	project-process centric	yes	yes	yes
	Interviewee 7	project-process centric	yes	yes	no
	Interviewee 8	strategy oriented	yes (either can be supportive or interfering)	yes (either can be supportive or interfering)	yes
	Interviewee 9	project-process centric	yes	yes	yes
	Interviewee 10	project-process centric, stakeholder-centric	yes	yes	yes
	Interviewee 11	stakeholder-centric	yes	yes	yes
Organization 2	**Interviewee 12**	stakeholder-centric	yes	yes	yes
	Interviewee 13	stakeholder-centric	yes	partially	yes
	Interviewee 14	strategy oriented	yes	yes	yes
	Interviewee 15	stakeholder-centric	yes	yes	yes
	Interviewee 16	project-process centric	yes	yes	yes

Organization 3	**Interviewee 18**	stakeholder-centric	yes	yes	-
	Interviewee 19	stakeholder-centric	yes	yes	yes
	Interviewee 20	project-process centric	yes	yes	yes
	Interviewee 21	strategy oriented	yes	yes	yes
	Interviewee 22	strategy oriented	occasionally	yes	no
	Interviewee 23	project-process centric	yes	yes	no
Organization 4	**Interviewee 24**	project-process centric	yes	yes	yes
	Interviewee 25	project-process centric	no direct relationship	yes	yes
Organization 5	**Interviewee 26**	stakeholder-centric	yes	yes	yes
	Interviewee 27	strategy oriented	yes	yes	yes
	Interviewee 28	strategy oriented	yes	yes	yes
	Interviewee 29	project-process centric,	no	no	no

		stakeholder-centric			
	Interviewee 30	stakeholder-centric	yes	yes	yes
	Interviewee 31	stakeholder-centric	yes	yes	yes

Source: proprietary

According to the previous explanations that project manager who did not give a corresponding answer to his/her project management attitude, has to be excluded from the research in the case of this question. When looking at the project triangle aspect, interviewees 5, 15, 20 and 31 will be excluded, whereas at client satisfaction aspect, interviewees 9, 13 and 31 have to be excluded. Finally, when analyzing stakeholder satisfaction aspect of project success, interviewees 14 and 31 are excluded. At this point of the research, it could be practical utilizing strict criteria, excluding those project managers from the sample, who gave at least one inconsistent answer. Again, this is the reason why the following project managers have been excluded from the research sample (in this case): 5, 9, 13, 14, 15, 20, and 31.

After having the sample reduced, it is apparent that - regarding to seventeen project managers – the project management attitude has certain impacts on each three aspects of project success. There have only been one project manager, who believed that only two aspects of success are affected and the third one just partially hit (interviewee 13). Two other managers said that the project management attitude has impact on two aspects of the success but not on the third (interviewees 23 and 25). According to one manager, the project management attitude only sometimes has an impact on two aspects of the project success, but the third is not affected (interviewee 22). Finally, one manager believed that there is no impact of the project management attitude on the three aspects of the project success at all (interviewee 29). Therefore, according to 17 project managers, the impact of the project management attitude is there on every level, whereas 5 managers believed the opposite. This further reinforces the acceptance of the third hypothesis[50].

In a wider sense only one project manager (29th) responded that the project management attitude has no single impact on any levels of the project success, whereas twenty-one said it at least affects one aspect of the project success.

Ultimately, **the acceptance of the third hypothesis is proven.**

It is worthwhile to note that the project management attitude is developed in the project manager him-/herself, so that according to the second hypothesis the tacit knowledge just as important for him/her as the explicit one. However, the project manager can have an impact on the project management attitude he/she has adopted, so

[50] Especially when we were to consider the fact that, every project manager excluded believes that the project management attitudemanagement attitude could have an impact on all three levels of project success.

we can assume that he/she adopted the best attitude, which has the greatest impact on the success. One of the project managers' quotes fits the previous description the best: „If I were not to assume that my project management attitude has impact on success, I would not have adopted it!"

5.4.4 Identifying the impact of the personal characteristics on the project management attitude and leadership style

In the final chapter of this research, the impact of personal characteristics on the project management attitude and the leadership style was mapped. As it has been introduced before, this part of the research consists of multiple stages: considering the management attitude, we can talk about two stages, whereas the leadership style gets a three-staged analysis. When examining the personal characteristics I have used the previously introduced six different characteristics as a fundament (optimism, emotional intelligence, team building ability, ability to build trust, ability to motivate and improvisation). Though it is necessary to emphasize that only nine answers have been received regarding the team building ability, making its relevancy to be uncertain but for the research to stay comprehensive this also gets presented.

However, the impacts of the project managers' personal characteristics were mapped simultaneously on the project management attitude and leadership style – for the better understanding – have been introduces in separate chapters.

5.4.4.1 The impact of the personal characteristics on the project management attitude

At the first step of the fourth part of this research, every project manager had to mention those factors that had affected his/her project management attitude. This had to be done by them, though in case they were clueless they received some advice. It was mentioned, whether the childhood's parental discipline styles[51], the education, the personal characteristics, the organizational culture or in some cases the previous bosses/project managers had any impacts on them or not. If there were no personal characteristic mentioned, then the previously mentioned five factors were directly asked

[51] By means of discipline we meant the upringing.

from the interviewee (taking his/her previous answers into consideration). Table 22 shows the results:

Table 22. The factors that have an impact on the project management attitude

		Factors that have an impact on the management attitude
Organization 1	**Interviewee 1**	experience, education, discipline, previous project managers (bosses), organizational culture, personal characteristics
	Interviewee 2	experience, personal characteristics
	Interviewee 4	client, personal characteristics
	Interviewee 5	experience, education, discipline, previous project managers (bosses), client, personal characteristics
	Interviewee 6	experience, organizational culture, personal characteristics
	Interviewee 7	experience, education, organizational culture, personal characteristics
	Interviewee 8	education, organizational culture, personal characteristics

	Interviewee 9	education, discipline, organizational culture, personal characteristics
	Interviewee 10	education, discipline, organizational culture, personal characteristics
	Interviewee 11	education, discipline, organizational culture, personal characteristics
	Total	experience (5), education (7), discipline (5), previous project managers (bosses) (2), organizational culture (7), personal characteristics (10), customer (2)
Organization 3	**Interviewee 12**	education, organizational culture, personal characteristics
	Interviewee 13	experience, discipline, organizational culture, personal characteristics
	Interviewee 14	previous project managers (bosses), colleagues, personal characteristics
	Interviewee 16	experience, education, organizational culture, personal characteristics

	Interviewee 17	experience, education, organizational culture, personal characteristics
	Total	experience (3), education (3), discipline (1), previous project managers (bosses) (1), organizational culture (4), personal characteristics (5), colleagues (1)
Organization 3	**Interviewee 18**	education, discipline, previous project managers (bosses), organizational culture, personal characteristics
	Interviewee 19	experience, education, discipline, previous project managers (bosses), organizational culture, personal characteristics
	Interviewee 20	experience, education, organizational culture, personal characteristics
	Interviewee 21	experience, previous project managers (bosses), organizational culture, personal characteristics

	Interviewee 22	previous project managers (bosses), organizational culture, personal characteristics
	Interviewee 23	education, discipline, personal characteristics
	Total	experience (3), education (4), discipline (3), previous project managers (bosses) (4), organizational culture (5), personal characteristics (6)
Organization 4	**Interviewee 24**	discipline, organizational culture, personal characteristics
	Interviewee 25	discipline, organizational culture, personal characteristics
	Total	discipline (2), organizational culture (2), personal characteristics (2)
Organization 5	**Interviewee 26**	discipline, organizational culture, personal characteristics
	Interviewee 27	organizational culture, personal characteristics
	Interviewee 28	experience, previous project managers (bosses), organizational

		culture, personal characteristics
	Interviewee 29	previous project managers (bosses), organizational culture, personal characteristics
	Interviewee 30	previous project managers (bosses), organizational culture, personal characteristics
	Interviewee 31	experience, education, organizational culture, personal characteristics
	Total	experience (2), education (1), discipline (1), previous project managers (bosses) (3), organizational culture (6), personal characteristics (6)
Total		experience (12), education (15), discipline (12), previous project managers (bosses) (10), organizational culture (24), personal characteristics (29), colleagues (1), customer (2)

Source: proprietary

The tables clarify the effects of the personal characteristics on the project management attitude because every project manager mentioned them. This, of course, does not mean that the personal characteristics have the greatest impact on the project management attitude. For example interviewee 16 and 25 stated that the organizational culture had the greates impact on them. However, the aim of the current research was not to identify either the scale of the impact or the exact factor that has the most remarkable impact. Besides talking about the personal characteristics and the organizational culture, it is necessary to consider the education as a factor, since half of the responding managers have indicated this factor to be important. It would also be an interesting approach if the analysis was done on micro levels as well, examining the organizations in their segments. At this point, the differences are significant, since for example, concerning the first organization, the education factor is considerably important, whereas speaking of the second and the third, the importance of the same factor is lower (but still important). Speaking of the fourth and the fifth organizations, the education is not an important factor. When looking at the factor previous project managers (bosses), the situation is the same: in organization three and five, it gets an important role, whereas in the other organizations it is not that important. Considering the experience factor, in nearly every organization its importance is mediocre (except the organization number four). It is quite interesting however, that in organization four both project managers specified exactly the same factors – without knowing each other's answers of course. Furthermore, we have to note that the 'previous project managers (bosses)' factor has been nomited quite frequently without mentioning it as an aid; it almost got the same results as the personal characteristic or the organizational culture. Based on that two conclusions can be done. The first is that the personal characteristics and the organizational culture have impact on most of the project manager's project management attitude (the first one has an impact on all the project managers, the second only on 80% of them). As for the second conclusion, deeper analysis are justified, since the project managers from the different organizations gave different answers, even if the organizational characteristics are similar and operating in the same industry. This then lets us predict that there are significant differences can be discovered in the project management culture and in the selection process of the managers at each organization.

Based on these, we can determine that there is a possibility of accepting the first part of the fourth hypothesis.

However, it is necessary to examine the changes of the personal characteristics' impact. This means that the project managers also had to give answers whether their personal characteristics changed would alter their project management attitude or would not. The following answers have been given:

Table 23: The impact of change of personal characteristics on project management attitude

		Do you think if your personal characteristics changed would change your project management attitude?
Organization 1	**Interviewee 1**	likely
	Interviewee 2	yes
	Interviewee 4	yes
	Interviewee 5	-
	Interviewee 6	yes
	Interviewee 7	yes
	Interviewee 8	no
	Interviewee 9	yes
	Interviewee 10	yes
	Interviewee 11	yes
	Total	yes (7), no (1)

Organization 3	**Interviewee 12**	yes
	Interviewee 13	yes
	Interviewee 14	yes
	Interviewee 16	yes
	Interviewee 17	yes
	Total	yes (5), no (0)
Organization 3	**Interviewee 18**	no
	Interviewee 19	yes
	Interviewee 20	yes
	Interviewee 21	yes
	Interviewee 22	yes
	Interviewee 23	no
	Total	yes (4), no (2)
Organization 4	**Interviewee 24**	-
	Interviewee 25	yes

	Total	yes (1), no (0)
Organization 5	**Interviewee 26**	yes
	Interviewee 27	yes
	Interviewee 28	yes
	Interviewee 29	no
	Interviewee 30	yes
	Interviewee 31	yes
	Total	yes (5), no (1)
Total		

Source: proprietary

Looking at the results, 22 project managers believe that if their personal characteristics changed, it would definitely change their project management attitude. Two project managers did not give any answers; another one said it would likely alter his approach (though he was uncertain about it, that way his answer had to be disregarded). Four of them believed it would not change their approach at all. These last four interviewees explained that their personal characteristics have already been carved in stone and cannot be changed, thus the question was irrelevant to them[52]. The third organization is however outstanding because one-third of the project managers said the change in the personal characteristics did not result a change in the project management

[52] This could be due to the fact that, there are personal characteristics which can be hardly changed or cannot be changed at all. We can meet with this attitude in psychology quite frequently (cf. Cloninger, 1994). Project managers are very likely to give their answers based on this. However, two of them mentioned that, their personal characteristics could be refined but could not be changed. Deciding about the relevancy of this approach is, however, out of scope of the thesis.

attitude. However this slightly contradicts to the results received earlier, since every project manager thought that the personal characteristics had an impact on the project management attitude, while at this stage, four of them thought, even if a change in the personal characteristics, the project management attitude would remain the same. However, this turns out to be a pseudo contradiction since it excludes only the change of the personal characteristics but not the impact of the personal character itself. Overall, we can say that the personal characteristics have an impact on the project management attitude. 22 managers believe that the change in the characteristics would lead to the transformation of a project management attitude. Four interviewees presume that at this age, their habits would not change, but when speaking of the evolution of the project management attitude the personal characteristics play an important role. Three of them however were not able to answer this question.

Considering the two outcomes introduced, the first part of the fourth hypothesis can be accepted**, so that the personal characteristics of the project manager have an impact on the project management attitude.** Again, there are two factors, which have to be considered. The current research does not imply – concerning the results -, that only and exceptionally the personal characteristics have an impact on the project management attitude. Moreover, the aim of this research was not identifying the scale of the impact and the identification of the factor that has the greatest impact of the management attitude.

5.4.4.2 Impact of the personal characteristics on the leadership style

The second section of the fourth hypothesis is about revealing the impact of the personal characteristics on the leadership style. This part of the research has been broken down into three phases. In the first phase – just like when examining the project management approach's and the personal characteristics' relationship – each project manager had to describe which factor could have an impact on their leadership style. If he/she was unable to name a single one (or personal characteristics were not mentioned), then the previously introduced five factors were presented to them (personal characteristics, organizational culture, childhood discipline, education and in certain cases: the previous project managers (bosses)). Based on the previous explanation, the following responses have been given:

Table 24: Factors having an impact on the leadership style

		Factors that have effect on the management attitude
Organization 1	**Interviewee 1**	experience (life experience too), education, discipline, previous project managers (bosses), organizational culture, personal characteristics,
	Interviewee 2	experience, personal characteristics, previous project managers (bosses)
	Interviewee 4	client, personal characteristics,
	Interviewee 5	experience, education, discipline, previous project managers (bosses), client, personal characteristics
	Interviewee 6	experience, education, organizational culture, personal characteristics

	Interviewee 7	experience, education, organizational culture, personal characteristics
	Interviewee 8	education, organizational culture, personal characteristics
	Interviewee 9	education, discipline, organizational culture, personal characteristics, previous project managers (bosses)
	Interviewee 10	discipline, organizational culture, previous project managers (bosses) personal characteristics
	Interviewee 11	education, discipline, previous project managers (bosses) organizational culture, personal characteristics
	Total	experience (5), education (7), discipline (5), previous project managers (bosses) (6), organizational culture

		(7), personal characteristics (10), client (2)
Organization 3	**Interviewee 12**	education, organizational culture, personal characteristics
	Interviewee 13	experience, discipline, organizational culture, personal characteristics
	Interviewee 14	previous project managers (bosses), colleagues, personal characteristics
	Interviewee 16	experience, education, organizational culture, previous project managers (bosses), personal characteristics
	Interviewee 17	experience, education, organizational culture, personal characteristics
	Total	experience (3), education (3), discipline (2), previous project

		managers (bosses) (1), organizational culture (4), personal characteristics (5), colleagues (1)
Organization 3	**Interviewee 18**	Organizational environment (culture)
	Interviewee 19	experience, education, discipline, previous project managers (bosses), organizational culture, personal characteristics
	Interviewee 20	experience, education, organizational culture, personal characteristics
	Interviewee 21	experience, previous project managers (bosses), organizational culture, personal characteristics
	Interviewee 22	previous project managers (bosses), organizational culture, personal characteristics
	Interviewee 23	education, discipline,

		personal characteristics
	Total	experience (3), education (3), discipline (2), previous project managers (bosses) (3), organizational culture (5), personal characteristics (5)
Organization 4	**Interviewee 24**	previous project managers (bosses), organizational culture, personal characteristics
	Interviewee 25	experience, organizational culture, personal characteristics
	Total	discipline (1), experience (1), previous project managers (bosses) (1), organizational culture (2), personal characteristics (2)
Organization 5	**Interviewee 26**	organizational culture, experience
	Interviewee	organizational culture,

	27	
	Interviewee 28	previous project managers (bosses),
	Interviewee 29	experience, personal characteristics
	Interviewee 30	previous project managers (bosses), organizational culture, personal characteristics
	Interviewee 31	experience, education, organizational culture, personal characteristics
	Total	experience (3), education (1), discipline (0), previous project managers (bosses) (2), organizational culture (4), personal characteristics (3)
Total		

Source: proprietary

According to the table above, great number of project managers has given the same answers except interviewee number 2, 6, 9, 10, 15, 24, 25, 26, 27, 28 and 29. Thus eleven project managers felt that the different personal characteristics having an impact on their leadership style than on their project management attitude. This means 40% of the interviewees, which is quite significant. The most remarkable difference is the raising responses of the 'experience' and the 'previous project managers (bosses)' factors (3). It is essential to highlight that four project managers said that the previous project managers (bosses) factor had an impact their leadership style but not had an impact their project management attitude, whereas another one project manager said the opposite. The most significant decrease in the responses can be discovered in the personal characteristics (4), but education (1), discipline (2) and organizational culture (2) decreased as well. Furthermore, organization number four is not that unified in terms of the factors affecting, than unified it was concerning the management attitude. Nevertheless, new factors have not been added. Overall, when speaking of the development of the leadership style, the environment (experience, previous project managers (bosses), organizational culture) has a greater impact than it had when analyzing the project management attitude, even if the organizational culture as factor was mentioned less frequently. Fewer project manager think that values brought (education, discipline, personal characteristics) have an important role in the development of leadership style. This predicts that the tacit knowledge-transfer could be more important in terms of the leadership style than in terms of the project management attitude. However, this cannot be stated without further researches. Still most of the managers (higher than 85%) consider the impact of the personal characteristics on the management attitude to be important. Many have argued that they could not manage projects differently but as it naturally comes from their habits. However, a couple of them from organization no. 5 indicated (interviewee number 16 as well) that the project manager has to possess more than one leadership styles because it is not sufficient to utilize only a single one. The use of certain leadership styles is always up to the project team, though its examination is not part of this draft.

With the results introduced the second part of the first hypothesis supposed to be accepted, however it yet cannot be stated considering this single question.

The second part of this step is analyzing the collective change of the personal characteristics and the leadership style. The interviewees had to answer whether their

leadership style changed due to the change of their personal characteristics (the six previously identified ones[53]); if the answer was yes, they had to explain how. This was an ex-post check for question 4/b and the detailed description of the change reduced the potential for inappropriate answers. The managers were allowed to describe the change in the personal characteristics with their own words (grew/reduced/have not changed), or they could evaluate them on a five point scale. In case of the leadership style, the change should be described by his/her words. Of course we have to take care for the fake correlation, namely the change of the leadership style was caused by other factors than the change of the personal characteristics. In this case, there is a need to find another, underlying reason behind the mutual change (cf. Babbie, 1994). To eliminate the potential for this, 4/b and 4/h questions were asked. If the personal characteristics were not changed, the project manager had to describe his/her leadership style.

Next table (table 25) is the summary of the answers provided by the project managers:

[53] However, many have missed to give proper answer to the issue of team building capability, because of lack of time or other issues

Table 25. The change or stability of personal characteristics and leadership style

		Have you had your personal characteristics changed throughout your business career?	If yes, then how would you describe it?	Has your management attitude changed?	Describing management style or in case of change, the description of change
Organization 1	**Interviewee 1**	yes	optimism (reduced), emotional intelligence (stayed), team-building ability (-), trust building ability (improved) , motivational ability (improved), improvisation (improved)	yes	Tries to stay objective rather than too emphatic
	Interviewee 2	yes	optimism (no change), emotional intelligence (no change), team-building ability (-), trust building ability (no change), motivational ability (improved), improvisation (improved)	yes	Better consideration of the human factor, more emphatic

	Interviewee 4	yes	optimism (0), emotional intelligence (0), team-building ability (-), trust building ability (1), motivational ability (2), improvisation (2)	yes	more emphatic
	Interviewee 5	yes	optimism (reduced), emotional intelligence (improved), team-building ability (-), trust building ability (improved), motivational ability (no change), improvisation (improved)	yes	People-centric from plan-centric, more freedom for the member of the project team, but applies strict control
	Interviewee 6	yes	optimism (reduced), emotional intelligence (improved), team-building ability (-), trust building ability (-), motivational ability (improved), improvisation (-)	yes	Can accept better now, if things differ from the plans.
	Interviewee 7	yes	optimism (no change), emotional intelligence (no change), team-building ability (-), trust building ability (no change), motivational ability (improved),	yes	Better consideration of the human factor, more emphatic

			improvisation (no change)		
	Interviewee 8	yes	optimism (no change), emotional intelligence (improved), team-building ability (-), trust building ability (improved), motivational ability (improved), improvisation (improved)	no	Seeks consensus, integrates every argument into the decisions
	Interviewee 9	yes	optimism (improved), emotional intelligence (improved), team-building ability (improved), trust building ability (improved), motivational ability (improved), improvisation (improved)	yes	More determined, more emphatic

	Interviewee 10	yes	optimism (stayed), emotional intelligence (improved), team-building ability (-), trust building ability (improved), motivational ability (no change), improvisation (improved)	yes	Tolerant, anthropocentric, quicker feedbacks
	Interviewee 11	yes	optimism (no change), emotional intelligence (improved), team-building ability (-), trust building ability (improved), motivational ability (improved), improvisation (no change)	yes	Diplomatic, but now able to make strict decisions if necessary
Organization 2	**Interviewee 12**	yes	optimism (no change), emotional intelligence (improved), team-building ability (-), trust building ability (improved), motivational ability (improved), improvisation (no change)	yes	More stakeholder centric, less likely to insist on the plans

	Interviewee 13	yes	optimism (reduced), emotional intelligence (improved), team-building ability (improved), trust building ability (improved), motivational ability (improved), improvisation (improved)	yes	Greater emphasis on stakeholders (primarily through communication)
	Interviewee 14	yes	optimism (no change), emotional intelligence (improved), team-building ability (-), trust building ability (-), motivational ability (improved), improvisation (improved)	yes	Changed attitude towards people
	Interviewee 15	yes	optimism (no change), emotional intelligence (improved), team-building ability (-), trust building ability (improved), motivational ability (improved), improvisation (improved)	yes	Became more stakeholder centric

	Interviewee 16	yes	optimism (no change), emotional intelligence (improved), team-building ability (-), trust building ability (improved), motivational ability (improved), improvisation (improved)	yes	Became more stakeholder centric
Organization 3	**Interviewee 18**	yes	optimism (0), emotional intelligence (3), team-building ability (1), trust building ability (0), motivational ability (3), improvisation (0)	yes	Became more anthropocentric
	Interviewee 19	refined	optimism (no change), emotional intelligence (improved), team-building ability (-), trust building ability (improved), motivational ability (improved), improvisation (improved)	no, only refined	primarily rewarding, though if needed then penalize

	Interviewee 20	yes	optimism (no change), emotional intelligence (improved), team-building ability (-), trust building ability (improved), motivational ability (improved), improvisation (improved)	yes	less authoritative
	Interviewee 21	yes	optimism (no change), emotional intelligence (improved), team-building ability (-), trust building ability (improved), motivational ability (improved), improvisation (no change)	yes	turns from planner into communicator
	Interviewee 22	yes	optimism (no change), emotional intelligence (no change), team-building ability (-), trust building ability (improved), motivational ability (improved), improvisation (no change)	yes	started to be more determined (before was more liberal, tried to understand everyone)

	Interviewee 23	yes	optimism (no change), emotional intelligence (improved), team-building ability (-), trust building ability (improved), motivational ability (improved), improvisation (no change)	yes	-
Organization 4	**Interviewee 24**	no	optimism (0), emotional intelligence (0), team-building ability (-), trust building ability (0), motivational ability (0), improvisation (0)	no	indicates expectations
	Interviewee 25	yes	optimism (1), emotional intelligence (3), team-building ability (-), trust building ability (1), motivational ability (1), improvisation (no change)	yes	turned to more output oriented
Organization 5	**Interviewee 26**	yes	optimism (no change), emotional intelligence (improved), team-building ability (improved), trust building ability (improved), motivational ability (improved), improvisation (no change)	yes	knows various leadership styles, the transition in-between is quicker (autocratic, democratic and somewhere in-between)

	Interviewee 27	yes	optimism (no change), emotional intelligence (improved), team-building ability (improved), trust building ability (improved), motivational ability (improved), improvisation (no change)	yes	considers organizational culture more
	Interviewee 28	yes	optimism (reduced), emotional intelligence (improved), team-building ability (improved), trust building ability (improved), motivational ability (improved), improvisation (improved)	yes	got more democratic
	Interviewee 29	yes	optimism (improved), emotional intelligence (improved), team-building ability (improved), trust building ability (improved), motivational ability (improved), improvisation (improved)	yes	got more determined and more adaptive

	Interviewee 30	yes	optimism (no change) emotional intelligence (improved), team-building ability (improved), trust building ability (improved), motivational ability (improved), improvisation (reduced)	yes	started to be more determined (before was more liberal, tried to understand everyone)
	Interviewee 31	yes	optimism (0), emotional intelligence (2), team-building ability (1), trust building ability (1), motivational ability (2), improvisation (0)	yes	set higher priority to the organizational interests, got more patient

Source: proprietary

Based on the previous table, according to 27 project managers their personal characteristics definitely have changed throughout their career. However it slightly contradicts the earlier findings (four managers said that the personal characteristics did not change – see table 23), since they conceived that the fundaments of their character do not change but refines over time and the latest 'version' of their personal characteristics shaped during their career. This way their answers are adequate since refinement also is a type of change. However, this research is not dealing with the exact time they reached their final state. One manager though explicitly stated that his personal character had not changed just refined throughout his career. Those managers whose personal character had not changed did not alter their leadership style, this way leaving it plan-centric (indicating the expectations). That project manager who believed that their personal characteristics have refined over time, highlighted that their leadership style refined as well. However, their ultimate leadership style stayed either reward-centric or penalty-centric, so stayed the same.

Considering the other interviewees the change was noticeable. In many cases, optimism has not changed (20 cases); it has decreased in 5 cases and it increased in 3 cases. Nearly the same has happened to the improvisation, since it has not changed in 15 cases, increased in 13 cases, and decreased in 1 case. It is however important to acknowledge that speaking of improvisation the static nature not that distinct. Talking about those personal characteristics that relate to people (emotional intelligence, team building ability, motivational ability, trust building ability), every project manager who believed that his personal characteristics changed, experienced positive changes. These changes affect their leadership style too, since they turned out to be either more democratic (in case of plan-centric and authoritarian persons), or more authoritarian (in case of too lenient persons). With this in mind, those personal characteristics that relate to people can have a significant impact on the leadership style. That manager who was able to understand the project members better got more determined, whereas who had less understanding of people got more anthropocentric. However, it does not infer that each project manager would pursue exactly the same leadership style; they definitely do differ in the very details of their leadership style.

Additionally, three distinct exceptions could be identified: the first exception was interviewee number eight, who said that his/her personal characteristics have changed over time but his leadership style has not (this way he stayed a person, who makes decisions based on broader perspectives). However, he responded with "no" to that question, whether his

personal characteristics changed would lead to the change in his leadership style and/or his project management attitude. Simply because he assumes that, the personal character cannot change. This contradicts that statement that he had experienced change in his personal characteristics before. Due to this anomaly, interviewee number eight has been removed from the sample regarding this question. The second exception was the sixth manager, who did not become more anthropocentric, but less of a planner (even if the other answers might suggest he/she should have changed into a more anthropocentric project manager). The third exception was interview interviewee sixteen, who became more output oriented (even if the other answers might suggest he/she should have changed into a more anthropocentric project manager).

Overall, the previous examination shows that the change in personal characteristics can cause the change in leadership style by the exact style the manager pursues. In case of the project manager was more authoritarian earlier, became even more democratic later, whereas when he/she was highly democratic before became more consolidated later on (though the managers stayed stakeholder-centric and democratic all times). If we wanted to compare this against the leadership style-categories (cf. Fiedler, 1964; Müller – Turner, 2007), then we can experience that the task oriented management became refined and more relationship oriented or the relationship oriented management became task oriented (except managers 6 and 16). To make this broad category even more sophisticated we can say that those schools that build on the emotional intelligence conceive the project manager role as a person who is a trainer, networker and a democratic leader.

The findings show (due to the fact that the personal characteristics amongst the 26 project managers either changed or refined, whereas the same happened regarding the leadership style, and only in 1 case, where the change of personal characteristics did not initiate a change in leadership style), that the second section of the fourth hypothesis likely be accepted further on.

The last question at this point was the same as with the project management attitude: if the personal character altered would that imply the change in the leadership style also. The responses coincide with those when analyzing the management attitude, meaning we can declare that in 22 cases, it would change the style, and in 4 cases it would not.

Consequently, the approach three-stage approach has verified that personal characteristics have impact on the leadership style when analyzing the answers given to each question. On one hand, 25 project managers believed that their personal characteristics have the impact on their leadership style, and on the other hand, 26 managers conceived that their personal characteristics changed throughout their career, and the leadership style also changed. In addition, one of the project managers considers both features as static. But then again 22 project managers thought that the change in their personal characteristics would initiate a change in their leadership style.

Based on these statements the personal characteristics of a project manager can have an impact on the leadership style **leading to the acceptance of the fourth hypothesis's second section and the complete fourth hypothesis as well.**

As for the sake of a different perspective, an extra question has been created to evaluate whether the leadership style, the personal character and the management attitude can be built around a theoretical triangle, namely the change of any of the project management attitude, personal characteristics and leadership style would yield the change of the other two. 17 project managers assumed that these factors could be perceived as a theoretical triangle, whereas 10 of them articulated that it could not. One manager responded with an uncertain maybe and one did not give any answers. Based on the responses given we can imply that there is an interrelationship between each component, though we cannot exclude the opposite circumstance. Further investigations are still required for the revelation of this topic.

5.5 Conclusions

The insight that has been obtained throughout this study indicates, that the project manager's features certainly had great impact on the project success (Fortune – White, 2006). However, the impacts of the project manager's features on project success are important for both the practitioners and the academics.

The structure and the primary aim of the current research looked like as follows: With the utilization of which tools (qualitative or quantitative) could the project manager better achieve success? The explicit or the tacit knowledge can act as dominant entity in terms of the project management attitude. Does the project management attitude have an impact on the project

success? Could the project manager's personal characteristics affect the management attitude or the leadership style?

The findings show, speaking about the impact of the qualitative and quantitative tools on the project success in terms of the hierarchical model, (Görög, 2013a) we cannot state that the quantitative tools would have greater impact than the qualitative ones. Furthermore, it found that in the project management attitude the explicit knowledge is not present in a greater extent than the tacit. Additionally, results show that the project management attitude has an impact on each three levels of project success defined by the hierarchical model (Görög, 2013a). Moreover, continuing the deductions, the project manager's personal characteristics affect the project management attitude and the leadership style.

To sum it all up, the hypotheses that we have laid down at the beginning have been accepted or rejected as follows:

- H1: The quantitative project management tools have a higher level of contribution to all the three levels of the project success than the qualitative project management tools. **REJECTED**

- H2: In the project management attitude the explicit knowledge exists in a higher degree than the tacit knowledge. **REJECTED**

- H3: The project management attitude has an impact all the three level of project success. **ACCEPTED**

- H4: The personal characteristics have an influence on the project management attitude and leadership style. **ACCEPTED**

Looking at the results the qualitative tools and techniques are at least as significant as the quantitative ones. When analyzing the impacts of the project management attitude, we can determine that they have an impact on the project success in terms of the success criteria defined by the hierarchical model, thus on the project triangle, the satisfaction of the client and the stakeholders. Moreover, the tacit knowledge exists in at least that amount in the managerial project management attitude as the explicit one. In light of these statements, the development of the project management attitude is necessary. With that, it is also essential to develop the project manager's personal characteristics, since it was concluded that these have an impact on the project management attitude. Furthermore, these have the impact on the

leadership style, which is a critical factor in achieving success (cf. Fortune – White, 2006). Thus, the following theses have been identified:

T1: The quantitative project management tools do not have a higher level of contribution to all the three levels of the project success than the qualitative tools.

T2: In the project management attitude the explicit knowledge does not exist in a higher degree than the tacit knowledge.

T3: The project management attitude has an impact all the three level of project success.

T4: The personal characteristics have an influence on the project management attitude and leadership style.

Rejecting the first two hypotheses and accepting the last two and forming the theses, we can form four distinct implications (I1-I2-I3-I4):

- I1: With the better understanding of project success in regards to its achievement, the organizations can increase the success rate of their projects.
- I2: When improving the project management expertise it is essential to put an emphasis on qualitative elements.
- I3: When increasing project management expertise it is important to put an emphasis on the improvement of the project management attitude in a way that the tacit knowledge could also be transferred.
- I4: When improving the project management expertise it is necessary to put an emphasis on developing the personal characteristics, though it could be difficult to achieve.

The first implication suggests that with the better understanding of project success in regards to its achievement, the organizations can increase the chance of successfully fulfilling their projects. Based on the previous research, a great emphasis has to be levied on the qualitative managerial tools when managing project. Furthermore, the project management attitude and the tools utilized by it can have a huge impact on the project success. Thus, the qualitative project managerial tools, the project management attitude (affected by the personal characteristics and the leadership style) and the personal characteristics have a highly emphasized role when securing project success.

The second implication proposes that the university classes and trainings should also embrace the qualitative techniques, (e.g. the communication, and project scope definition)

than only the classic quantitative ones (e.g. risk management, cost planning). However, the importance of the quantitative management tools and techniques in achieving project success cannot be neglected. With all this, the structure of each class and training could be refined.

The third implication suggests that the project management attitude should also be improved throughout the classes and trainings by the transfer of the tacit knowledge elements. For this task, a person required who is capable of transferring this knowledge. He/she has to bear adequate project management attitude. On that debate of which management attitude is the best, is hard to reach consensus. Based on the current research, many adopt the stakeholder-centric approach. The organizations in this research articulate indirectly (through the high amount of successful projects) that this is the most successful approach they follow. It is then worth to assist the creation of such approach. However, the organizational and industrial characteristics also have to be considered (see the theory of contingency). Furthermore, in respects to the second implication, it is not enough to introduce the qualitative and quantitative management tools and techniques but it is required to deliver those knowledge elements that are difficult to learn. For this reason is important setting up such environment and utilizing such instructional/tuition tools (e.g. situation games, case studies, out of class tasks), which goals are to improve the project management attitude and the tacit-knowledge transfer (cf. Horváth, 2013).

According to the fourth implication, there should be a great emphasis levied on the development of the project manager's personal characteristics, more like on those that are tied to the human factor (emotional intelligence, team-building ability, trust building ability, motivational ability). It can be very difficult to develop and improve the characteristics specified and can be achieved by utilizing the same elements just like at the tacit- knowledge transfer (cf. Horváth, 2013).

As a combination of the second and third implication (and considering the research result), it could be practical to develop the personal characteristics and the project approach in a way, with the result of the project manager pursues the stakeholder-centric (or its sub-categories: trainer, networker, democratic) behavior. However, all the research limits have to be considered, since the organizations that are present in this study, are operating in the ICT sector. For this reason, it is hard to imagine that a company that operates in the construction industry could benefit from such a project management attitude. Nevertheless, where the environment is quite turbulent, the knowledge and the satisfaction of the project team is

important, there this attitude is appropriate. For instance, the same project management attitude could be utilized in the IT-, bank sector, or in an R&D project.

Consequently, throughout the education (either university studies or corporate trainings) those elements that are hard to develop are just as important as the transfer of the classic quantitative knowledge is. Putting more emphasis on the development of the previously introduced elements is the responsibility of the instructors and the professors.

5.6 Future researches

This research however bears serious limitations, thus its sample requires expansion. It might be practical to analyze other organizations with different characteristics too (in different industries as well). This way the relevancy of the implications can be increased. Another way of proceeding with the researches is the examination of the project management attitude impacts on the project success in terms of the scale. Further investigations should be established to define the scale of impacts of the personal characteristics on the project management attitude and leadership style. As a matter-of-fact, it would be essential to define which factors are playing the most significant role in the advancement of the management attitude and the leadership style. The improvement of these factors could also be reasonable.

Notwithstanding, the most important advancement would be the realization of these outcomes throughout the courses. When setting up the courses, it would be essential to create such educational materials that place the emphasis on the transfer of the qualitative and tacit knowledge-transfer and on the development of the project management attitude so as on the characteristics. The project management classes currently held, are notably a perfect base for the previous; however, I think they still could be improved.

6 Final conclusions

The primary objective of my research was to enable the better understanding of the project success. To be more precise with the previous statement, the sub-objective was establishing a comparison to demonstrate the impacts of the qualitative tools and techniques, tacit knowledge (indirectly), project management attitude and indirectly the personal characteristics on project success have at the same scale of impact on project success as the classic quantitative tools and techniques/components/knowledge. The practical advantage of this research is the possible improvement of certain project management classes and trainings. To aiding this improvement, I have examined four different questions (research questions):

RQ1: In what level do the qualitative and quantitative tools of the project management contribute to the three levels of the project success?

RQ2: What type of (tacit, explicit) knowledge plays a greater role when talking about the project manager's project management attitude?

RQ3: Does the project management attitude have an impact on the three levels of the project success?

RQ4: Do the personal characteristics have a high impact on the project management attitude and the leadership style?

As for the first question, the answer I have found (in the course of hipothesis) was that the qualitative tools and techniques have at least the same scale of contribution to the project success as the quantitative ones. As for the second question, the answers that have been identified (in the course of hipothesis) indicate that in terms of the projet manager's project management attitude the tacit knowledge is present in at least the same extent as the explicit. The answers given to the third question (in the course of hipothesis) prove that the project management attitude can and does have an impact on each level of the project success. The results of the fourth question (which was received in the course of hipothesis too) demonstrate the impacts of the project manager's personal characteristics on the project management attitude and the leadership style. Chapter 5.4 summarizes the findings.

In order to compose the research questions (and the hypotheses deriving) there was a certain need for literature review. The related literature that was selected for the research included the understanding of the project and the project management role (in terms of their

evolution), the project success, success criteria, and the project management capabilities (especially the knowledge tied to the the nature of this knowledge [tacit, explicit] and project management attitude). Furthermore, certain studies that discuss the project manager's personal characteristics and the leadership style have also been selected as the fundaments for this research.

In the introductory part of the dissertation, the low success rate on projects was described and the need for related researches. In addition, this chapter defined the objectives and the content of the dissertation.

The second chapter reviewed the evolution of the understanding of project and the project manager's role. The primary assessments were the following:

- The understanding of project has been changed, thus as of today it is not adequate to understand it as a unique task but to see it as a temporary organization and strategic building block tool.
- This way, the role of the project manager altered too. He/she is not only responsible for the management of the implementation process but also for the management of the temporary organization (primarily the project team) as well as for the delivery of the benficial change.
- This chapter also summarized the literature related to the phases of the project and the tasks of the project manager (in accordance with the previous bullet point).

As proceeding with the dissertation, the third chapter revealed all the professional literature that are assessing the project success. The primary findings of this chapter are:

- The understanding of the project success developed in accordance with the understanding of the project itself.
- When evaluating project success, the most adequate fundament is the hierarchical model (Görög, 2013a). The additional models – by the author's point of view – are bearing serious shortcomings.
- The literature of the critical success factors is quite widespread; however, it is possible to create nine distinct groups out of it. One of the groups is the competencies and the leadership style of the project manager.
- The literature reviewing the critical success factors have four significant critiques:

- The importance of the critical success factors can change as the project progresses and researches do not take this into consideration.
- The interrelationship among critical success factors is not to be considered.
- The viability of the critical success factors is debatable, since it is difficult to identify general factors.
- When examining the impacts of the critical success factors on the project success, project success is considered to be homogenous, not expressing it in terms of the success criteria.

- The number of papers that studies the alignment of the critical success factors with the success criteria is very low. and the majority handle this topic quite generally, inadequately and without enough depth.

The fourth chapter reviews the project manager's competency and his/her leadership style. The followings are the primary findings:

- The project manager's expected capabilities; personal characteristics and his/her leadership style are very important features when examining project success, since he/she can have a huge impact on the project success at every stage of the project.
- Cleland's (1994) model of capabilities is a decent fundament when reviewing the project manager's expected capabilities.
- The project management attitude that is defined as a part of the manager's capability is barely handled well by the professional literature. For this reason, as a fundament of this research the evolution (the evolution of the understanding) of the project and project management was selected to investigate the project management attitude.
- The literature that builds on the project manager's personal characteristics is very few; moreover, the authors tend to mix the characteristics with the competencies. But they do definitely differ: one of them is about the knowledge the manager acquired through his/her studies, the other is about the required characteristics a manager supposed to have in order to use his/her knowledge. Thus, the theoretic fundament that was used for this research is Görög's (2013a) theory about the six different personal characteristics, which consists of true personal characteristics.
- The literature that deal with the impacts of the project management tools and techniques on the project success is very few. They do however identify those tools that have an impact on project success but miss their in-depth analysis.

- The professional literature on the project manager's leadership style has significantly improved over the past decades. From the initial trait-based interpretations to the stakeholder-centric and other interpretations, many have emerged. However, on the factors that have an impact the leadership style just few literatures present; these are rather competency-based, and thus, they do not differentiate the competencies from the personal characteristics.

Based on these findings we can give the following conclusions:

- It is necessary to examine the impacts of the project manager's features on the project success.
- When analyzing the project manager's features (as a critical success factor) it is important to consider the critiques of the professional literature on the critical success factors.
- There is no example in the professional literature that would map the impact of the project manager's management attitude on the project success.
- The literature identifying the certain factors that have impact on the project management attitude and on the leadership style is competency-based.
- The mapping of the impacts by the qualitative and quantitative project management tools and techniques on the project success is limited.
- The literature that analyses the presence of the tacit and explicit knowledge inside the project management attitude is also limited.

The fifth chapter summarizes the research. The following four hypotheses have been established (based on the professional literature review and the research questions):

H1: The quantitative project management tools have a higher level of contribution to all the three levels of the project success than the qualitative project management tools.

H2: In the project management attitude the explicit knowledge exists in a higher degree than the tacit knowledge.

H3: The project management attitude has an impact all the three level of project success.

H4: The personal characteristics have an influence on the project management attitude and leadership style.

To decide on each hypothesis, whether to accept them or reject, a sample was taken out of those international companies that have subsidiaries in Hungary and operating in the ICT sector. Based on the estimation of the professionals, five companies have been selected,

taking special care to select those that are have leading position. Out of the project managers of these five companies, 31 project manager have been selected with the use of random sampling.

However, when progressing with the research it appeared that two of the managers did not have adequate knowledge to draw a relevant conclusion. Thus, 29 project managers remained in the sample to work with.

The deductions after winding up the research are the following:

- The quantitative managerial tools do not contribute to the project success (which was interpreted by the hierarchical model) in a greater extent than the qualitative ones. Despite to the fact, in the course of project triangle aspect examination, more manager mentioned those activities, which contain quantitative techniques and tools, thus planning (28 cases) and control (23 cases) than the qualitative ones, like the communication (20) and the stakeholder management (7). Because of the fact that those managers who apply communication consider communication just as important as the planning, thus we cannot declare the quantitative elements to be more significant. When assessing the satisfaction of the project owners it is clear that the quantitative components do not contribute to the project success in a greater extent than the qualitative ones (they did not mention true activities that consist of qualitative tools and techniques though). Very similar applies to the satisfaction of the stakeholders (in terms of project success); however two project managers mentioned ’control‘ as important element to achieve this project aspect. This way it cannot be stated that the quantitative managerial tools would contribute to every level of project success in a greater extent than the qualitative ones.
- The managers who gave answers (28 managers) said that they use those quantitative and qualitative tools that correspond to their project management attitude. In addition, 27 believed that the practical experience affected the improvement of their tools, only one believed it did not (he/she thought there was no improvement). Furthermore, responders believed that the tools are more like obtainable than learnable. However, many project managers highlighted that the theoretic fundaments are essential. This way the explicit knowledge is not present in greater extent than the tacit knowledge in the project management attitude.
- The majority of project managers believed that their project management attitude have an impact on the project success expressed in terms of the project triangle (21 project

managers), the satisfaction of the client (25 project managers), and the satisfaction of the stakeholders (24 project managers). Moreover, 17 of them said that their project management attitude has impacts on every three levels of the project triangle, whereas 5 said not every or all of the levels. Thus it can be concluded that project management attitude has an impact on project success (every level of it).

- Finally, based on the responses given, the personal characteristics have an impact on the project management attitude and the leadership style. Every project manager (29) named his/her personal characteristics as factor that have an impact on his/her project management attitude. To verify the previous, they had to answer whether they think if their personal characteristics changed would their project management attitude change as well. 22 said yes, 4 said no. When assessing the leadership style, 25 managers believed that their personal characteristics had an impact on the development of their leadership style. Later on, they were asked to give answers if their personal characteristics changed throughout their career or not. If the answer was yes they were required to explain how their leadership style changed. One manager believed that his personal characteristics had not changed, stayed constant, so as his leadership style. 28 managers believed that their personal characteristics changed throughout their career. 26 thought that their leadership style had changed also, one thought it had not, another one said it only had refined. The primary direction of the change, on one hand, is tied to the stakeholders, since the personal characteristics related to these had changed the most (emotional intelligence, team building capability, motivational capability, trust-building capability). On the other hand, the change in their leadership style was mostly present when looking at their relationship to the stakeholders. In case of the project manager was more authoritarian earlier, became even more democratic later, whereas when he/she was highly democratic before, became more consolidated later on. Finally, there was a verification on the previous questions, whether the change in the personal characteristics would result the change in the leadership as well. The response ratio looked just like the same as in the previous stage; 22 said yes, whereas 4 said no. In light of the findings, we can declare that the project manager's personal characteristics have an impact on the management attitude and the leadership style.
- Eventually, the first two hypotheses have been rejected, whereas the second two have been accepted.

Although, this research bears considerable limitations (five companies of only one industrial industry have been analyzed), but its results could aid to the development and improvement of certain academic courses and trainings. Based on the results, there should be an adequate emphasis placed on the teaching of qualitative tools and techniques and on the transfer of the tacit knowledge, just like the same on the improvement of the project management attitude and the personal characteristics. I believe that this way the quality of the academic courses could increase. A considerable further step of this research could be the integration of these finding into an academic project management course.

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