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Examining Project Success Factors and Success Criteria in a Company from the Perspective of Project Leaders

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Abstract: Within the project management literature, there is a decades-long history of interpreting and investigating the success of projects, and of uncovering the details behind the success of projects. The present project success research study covered the project leaders of a pharmaceutical development and manufacturing company in the corporate sector in Hungary. The aim of the study was to identify and evaluate the success factors and success criteria of projects with the help of using the results of the relevant project management literature and the relevant project success research. A questionnaire survey was used as a quantitative research method to assess project leaders' perceptions of success factors and success criteria. The questionnaire survey investigated what success factors project leaders consider important in achieving project success and what success criteria they use to judge the success of projects. The study shows that the understanding of project success often goes beyond the classic project triangle (time, cost, quality) and the human factors, including stakeholder satisfaction, play an important role. The results of this research can contribute to a deeper understanding of project management practices and can also support the development of a project culture at organizational level.

Keywords: Pharmaceutical industry, Project success, Success factors, Success criteria, Project leader

Introduction

The research included the identification of project success factors and project success criteria defined in the domestic and international literature, and their importance within a given company. According to prominent representatives of the project management discipline, project success should no longer be examined and defined within the framework of the classic project triangle (time, cost, quality/specification). The assumption made within the research was that, in addition to the basic elements of the classic project triangle, other success factors and success criteria also play a somewhat important role in the evaluation of the project leaders.

Project and Project Management

Dancsecz stated that the definitions found in the literature are not uniformed in terms of the concept of a project but listed some common features that are found in project definitions. These characteristics are the followings:

- a single, complex task
- a specific objective, goal (product/service/outcome)
- a specific start and end time
- a unique, complex and significant problem
- specialized knowledge and multiple resource needs
- short to mid-term, strategically important process
- change, create something new or special
- multifunctionality (Dancsecz, 2008).

Blaskovics states that the diversity of project definitions points to the fact that its interpretation goes beyond the earlier, otherwise essential project triangle [according to Olsen (1971), time, cost and quality] (Olsen, 1971, as cited in Blaskovics, 2014). The professional standards for project management are:

- the process by which a project is scoped, planned, monitored, controlled and executed to achieve pre-defined outcomes (APM, 2008),
- the application of knowledge, skills, tools and methods for activities to meet project requirements (PMI, 2012); (AIPM, 2008).

According to definition of Görög, project management is "... a management function that focuses information, resources - especially the project team staff as the temporary project organization implementing the project - and project management tools to achieve a specific project outcome within a given schedule and budget" (Görög, 2013).

According to the authors Varga and Csiszárik-Kocsir (2024) the importance of project management can be demonstrated in many areas and is more than just a set of methodologies. Project management is a dynamic discipline in which complex tasks can be carried out along well-designed processes, thus reducing potential risks and directing and focusing the available resources and activities towards a specific goal (Varga, Csiszárik-Kocsir, 2024).

The review of the stages of development of project management also provided an interesting insight. In her doctoral thesis, Horváth provides a visual summary of the overview of the different project management trends, schools and their development over time, as previously formulated by Turner (2013) and his colleagues Horváth (2018).

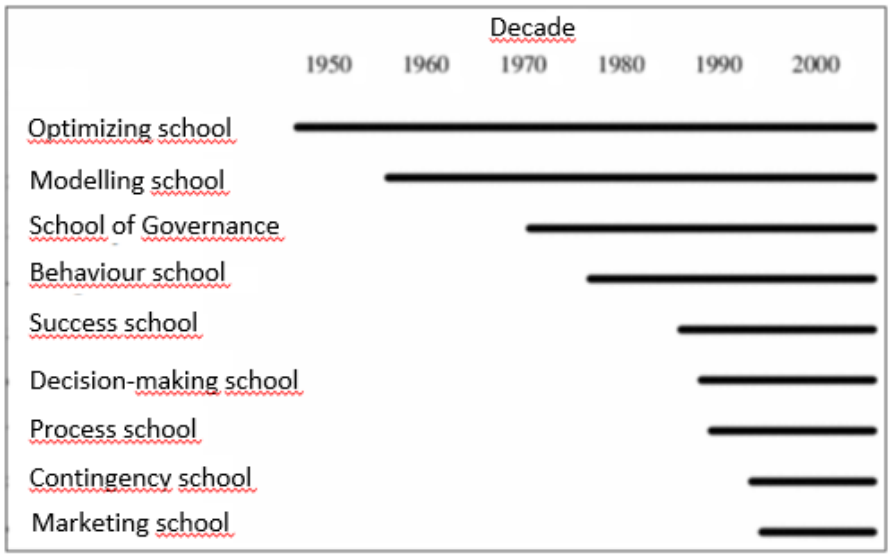

Figure 1. The nine schools of project management (Horváth, 2018)

In terms of research direction, the success school is highlighted, which examines the relationship between project objectives and business, strategic goals. Two main areas of research are project success factors (which may contribute to some extent to the achievement of success) and project success criteria (which allow the measurement of project success) (Turner et al., 2013).

Project Success

The topic of the research was success research in the field of project success research, so of course, the literature review also covered the concept of project success in the following. The most cited researchers in defining project success are Baker, Murphy and Fischer, who argue that project success cannot be defined in its entirety/exhaustively as achieving quality/specification within a timeframe and budget. Perceived project success was defined as the achievement of the defined quality/specification with a high level of satisfaction of the parent organization, client/customer, user and project team. It can be observed that the authors were the first in the literature to mention the importance of customer satisfaction (Baker et al., 1983).

Görög formulated the following definition of project success: "a project is considered successful if the project outcome contributes to the achievement of the underlying strategic goal in the initiating organization and both the project delivery process and the resulting project outcome are acceptable to the stakeholders involved" (Görög, 2013). According to Horváth, like the project, clearly defining project success is a challenging task. "Defining the success of a project is difficult in itself and understanding it is greatly aided by defining two related concepts, the success factor and the success criterion, and distinguishing between the two" (Horváth, 2018).

In Blaskovics' formulation, success factors focus on the parameters that contribute to success, thus they deal with the input factors of success, while success criteria allow the measurement of the project success achieved, i.e. they concern the output of success (Blaskovics, 2014). In the following, the possible success factors and success criteria for projects are shown, based on the literature.

Success Factors

The Pinto-Slevin team has identified 10 success factors that depend on the internal organization as a result of their collection-aggregation work:

- project objective, goal
- support of senior management
- project schedule
- consultation with stakeholders, identification of requirements
- team members
- technical performance
- acceptance of the project result by the client
- information flow (monitoring, feedback, control)
- communications
- troubleshooting, problem solving (Pinto-Slevin, 1988).

According to Verzuh, regardless of the industry, all successful projects can have certain characteristics that are constant, so five success factors were summarized for projects:

- clearly defined objectives, agreed by all participants,
- an appropriate project plan (task plan, schedule, budget),
- constant and effective communication between stakeholders,
- a well-defined and regulated scope,
- support of senior management (Verzuh, 2006).

Carden and Egan reviewed the literature from the 1970s, 1980s and 1990s and found that the following success factors were highlighted: project management competencies of management, communication and negotiation skills, project organization structure, and collaboration between business units and senior management (Carden and Egan, 2008).

In their research, El Khatib et al. (2023) highlights the importance of emotional intelligence. They state that the key to project success is project managers with high emotional intelligence, i.e. with appropriate social skills, motivation, empathy, self-awareness and relationship orientation. If the project manager is able to perceive, understand and effectively manage the feelings and emotions of the project team, it can have a positive influence on the project team's performance and thus on the outcome of the project also. An important moment in the history of the discipline is that literature has identified success factors within the set of success factors that are of particular importance and weight. These are the critical success factors (CSF).

According to Earl, the method of critical success factors is to identify a small number of factors (preferably 3-7) during the project planning process, the achievement of these factors alone can ensure the success of the project (Earl, 1989). Rockart also states that while success factors may contribute to some extent to success, critical success factors contribute to a large extent (or the greatest extent for the project, in extreme cases up to 100%) to project success (Rockart, 2002). Similar findings are made by Fortune and White, who describe critical success factors (key success factors) as those that contribute to a large or outstanding extent to the evolvement of project success as defined by one of the criteria (Fortune and White, 2006).

Cooper's complex, comprehensive, multi-industrial study during the Covid-19 pandemic suggests that the key to success lies in accelerating development and innovation processes, which can also ensure companies' survival. The author highlighted the importance of the project's success factors identified in the literature that could have contributed significantly to maintaining or improving the performance of companies during the pandemic:

- an appropriate and realistic schedule plan
- adequate resource plan
- known and appropriate processes
- partner's satisfaction
- customer's satisfaction
- the satisfaction of colleagues
- stakeholders' satisfaction
- management's satisfaction
- owner's satisfaction
- satisfaction of the project leader
- the size of the project team
- composition of the project team
- the commitment and satisfaction of the project team
- communication within the project team
- change management competences of the project leader and project team
- problem-solving skills of the project leader and project team
- the commitment of management, the project leader and the project team
- continuous monitoring, evaluation and feedback on the status and scope of the project (Cooper, 2021).

The complex national Project Management Panorama survey, conducted in 2022, covering both the public and private sectors, highlights that the human factor is the most prominent and primary factor influencing project success. Personal, competence-related factors were clearly identified as the most important determinants (facilitators or inhibitors) of project success. The research concludes that project success is almost guaranteed if project managers - who are motivated, customer and user-oriented, have the right competences, the ability and willingness to work in partnership with stakeholders - work together with committed and motivated project teams with the right competences (Hungarian Project Management Association, 2022).

Success Criteria

In her doctoral thesis, Dancsecz summarized the results of research on the criteria for judging project success and concluded that, in addition to the elements of the magic triangle, the contribution to the strategy and the satisfaction of the different stakeholders/interested parties are the main elements that appear more often in the different works studied (Dancsecz, 2008). The 6th edition of the Project Management Body of Knowledge (PMBOK) published by the Project Management Institute has formulated the following success criteria:

- the compliance of the revenue/benefit plans,
- compliance with the financial indicators (net present value (NPV), return on investment (ROI), internal rate of return (IRR), payback period (PBP), and cost-benefit ratio (BCR)) of the pre-decision study that determines the business case,
- to meet the non-financial objectives of a pre-decision study to determine the business case,
- meeting the quality requirements of the outcome,
- integrating the project results into the organization's operational environment,
- fulfilment of the contractual conditions,
- meeting organizational strategy and objectives,
- meeting the objectives of organizational governance,
- achieve the desired positive changes in the organization,
- the satisfaction of the stakeholders concerned,
- customer's/end-user's satisfaction
- other criteria (PMI, 2017).

Horváth classified these criteria - in terms of their content - into the following four basic competence categories:

- business value-based criteria
- criteria for meeting the primary project objectives (time, resource and cost plans and quality requirements)

- satisfaction of the project owner organization and compliance with organizational objectives
- criteria addressing the satisfaction of the stakeholders concerned (Horváth, 2018).

Project Success in the Pharmaceutical Industry

As the project success research was conducted in a pharmaceutical development and manufacturing company, it was important to include the relatively small amount of published success literature that reported on previous pharmaceutical success research results. According to Sara, the key to success is to involve management/leadership in the project from the start, providing moral, financial and business support (Sara, 2012). According to Pattanaik, the critical success factors for a pharmaceutical project are the role of the project manager and stakeholders, team communication, and business processes (Pattanaik, 2014). According to Koka and his co-authors, project management itself, as a success factor, is one of the most effective management tools to influence the full process (from clinical research through production to market logistics) of the entire spectrum of drug development and manufacturing (Koka et al., 2015).

Overall, the quality and quantity of the success factors and success criteria identified and highlighted in the literature clearly indicate that the elements considered in defining and evaluating project success are no longer limited to the elements of the project triangle. More than 4 decades of success research have led to the recognition and acknowledgement that, while the importance of the project triangle is undeniable, the number of elements contributing to project success has increased in proportion to the increase in complexity of projects.

Method

Following the literature review, questionnaire-based primary research was conducted to investigate which success factors and success criteria were considered important by the project leaders of the given company (study population) according to their experience. The research methodology (questionnaire) is based on the books by Malhotra (2017) and Gyulavári et al (2017).

The success factors and success criteria listed in the questionnaire are external data from secondary research, publications, articles, studies, validated questionnaires, no pilot surveys were needed. The number of pharmaceutical industry-specific studies and literature was relatively small compared to the total literature processed, so the success factors and success criteria identified in the general multi-industrial literature, and the small number of pharmaceutical industry-specific literature were used together as a basis for the definition of the success factors and success criteria to be included in the questionnaire. The success factors of the project under review were grouped into logically and substantively coherent clusters based on the study by Tsiga et al (2017). The success criteria of the project under review were sorted into logically and content-wise coherent groups based on the research of Horváth (2018).

The questionnaire was designed to allow the project leaders to rate anonymously, based on their own opinion, the success factors and success criteria listed in the questionnaire on a scale of 1 to 4, with 1 being the least important and 4 being very important. The scale categories were determined based on research by Bostock Marketing Group (2014) so that there were no neutral response options. Respondents were given a choice of two positive and two negative response options (forced choice). The questionnaire subjects were asked to choose which success factor/success criterion was most important to them in their work.

The questionnaire was a one-answer closed-ended questionnaire. The questionnaire also included free spaces to allow the respondents to specify some additional factors/criteria if they did not find them listed but were important to them. The research sought to answer the following questions:

- What are the success factors that can determine the success of projects in the given company from the perspective of project leaders?

- What are the success criteria for assessing the success of projects in the given company from the perspective of project leaders?

- Do the chosen success factors and success criteria differ from the elements of the classic project triangle?

Results and Discussion

More than 90% of the project leaders were willing to fill in the questionnaire, allowing for a representative survey. The evaluation was carried out according to the recommendation of Malhotra (2017) and using Microsoft Excel software, examining success factors and success criteria for each group separately.

Success Factors

In the success factors section of the questionnaire, project leaders who completed the questionnaires were asked to rate which factors they felt and experienced contributed to the success of their projects. The first set of success factors are external and internal challenges. In this group, respondents could rate the environmental factors surrounding the company and its employees. Of the success factors included in this group, the working environment and the technological environment were considered the most important in terms of their scores. The availability and provision of adequate working equipment and a suitable working environment have paramount importance to the company. The evaluation scores reflect the company's strong HSE (health, safety, environment and health and safety) policies and principles. For project leaders, the technological environment is an important factor, i.e. the facilities, equipment, technical staff, R&D, infrastructure, technical and technological standards, IT infrastructure.

The next group of factors is the knowledge and experience group. Factors in this group scored highly. Both knowledge management and realistic and achievable plans are important factors. Incorporating previous experience and lessons learned from similar projects into the new upcoming project can lead to efficiency and lower risk for project leaders. Within the senior management support group, the most important factors in the group, according to the project leaders, are the support of the project by Management and the commitment of Management to the project. If Management commits and shows commitment to the project and supports the project as one person, then the designated project leader and the project team he/she manages can execute the project with greater efficiency and therefore greater success.

The next group of factors is the group of institutionalized factors. The factors in this group were found to be equally important for project leaders. In the pharmaceutical industry, quality and quality specifications have high importance, as their existence and assurance are essential throughout the life cycle of pharmaceutical products. Projects can be implemented faster and more efficiently by following known processes.

The project manager competence group is the next group of factors assessed. The project manager's competence in team organization and team leadership, his/her competence in planning and organization, his/her ability to manage conflict, and his/her ability to inspire and motivate were all given maximum scores by all respondents, making them critically important success factors to the project leaders who completed the questionnaire. These competences and skills are essential for project leaders to possess throughout the project life cycle, from planning to closure, in order to ensure successful project implementation. Failure to take these assessed success factors into account may result the failure of the project. Problem solving and communication skills scored highly. The importance of these factors indicates that the 'soft' elements of the human aspect may also contribute more to project success.

According to the scores given to the factors in the project-based organization group, the existence and subsequent continued presence of a project team and a defined resource plan were rated as critical success factors for the project leaders who completed the questionnaire. The provision of the necessary resources for project planning and implementation, including human resources and a project team for the entire duration of the project, were considered by the evaluating project leaders to be critical for a successful project. High scores were given to the defined time and schedule plan, the defined scope and the defined budget plans.

Among the factors classified into a separate group based on contractual and partner aspects, the commitment of partners was rated as a critical success factor by the project leaders. The support, presence, cooperation and planning ability of partners (suppliers, service providers, partner companies entrusted with specific phases of development and production, other partner companies) were rated as a key success factor, and their potential contribution to the success of the project was rated the highest by the project leaders. Among the elements of the project team competency factor group, the project team's commitment to the project and communication within the project team scored highly with project leaders. This group also contains factors that were identified as critical factors based on the scores. A committed project leader and a collaborative project team can be a solid indicator of project success.

The next and last group of factors assessed is the requirements management group. The project leaders who completed the questionnaire gave also the highest possible score to one factor in this group, namely the defined project objective. This factor was rated as a critical success factor, so for this factor it can also be concluded that planning and implementing projects without a goal can lead to failure of the project. It is evident for the project leaders conducting the evaluation that knowledge of the project's goal has a great importance, as it is this goal that they communicate to the project team and stakeholders, and it is this goal that they and their project teams are working towards.

Success Criteria

In case of success criteria, the project leaders who completed the questionnaires were asked to rate the criteria listed in the questionnaire according to which criteria they preferred when evaluating the projects executed. The first set of success criteria is the set of business criteria. Within this group, profit growth and value creation both scored highly as success criteria, so project leaders place great emphasis on these criteria when evaluating projects. Business and economic profit was rated as a critical criterion by the project leaders, it became a critical criterion, so failure to meet this criterion could make the project unworthy to evaluate by the project leaders. The profit generated by the successful execution and implementation of a project is an important driving force for projects, which can make an integral contribution to the survival and development of the company. Profit can be a direct result of the projects and a direct performance indicator for the project team and the project leader.

When evaluating the criteria in the group of project ownership and organizational criteria, project leaders highlighted the project manager's skills, abilities, competences and goal performance criteria as important. These criteria became critical criteria based on the project leaders' ratings. For project leaders to evaluate a project as a successful project, the project manager's ability, skill, and competency performance throughout the project, as well as the project's goal performance, are also important evaluation criteria. It was observed that among the success factors discussed in the previous chapter, the project manager's ability, skills and competencies, as well as the defined project goal, were critical success factors. They are therefore critical elements of high importance, both from the input and output side.

Of the criteria in the group of stakeholder criteria, both the product/process sustainability and reliability criteria scored highly in the assessment of the project leaders who completed the questionnaire. For them, the satisfaction of stakeholders, the partner and the client/customer is also an important project evaluation criterion. The high scores for these criteria show that the pharmaceutical product and process development projects should not only last until the product and process are developed and improved. To secure survival, development and future of a company can be based on reliable and sustainable processes and products, and on the trust and cooperation of satisfied internal and external stakeholders.

Conclusion

In the assessment of success factors by project leaders, 10 factors were also rated as critical success factors. Because of their relatively high number, these priority factors deserve more attention. If they are applied throughout the project life cycle, they can make a very significant contribution to the successful execution and implementation of the project and to the achievement of project success. The more identified critical success factors are implemented into the projects, the greater the likelihood of a successful project life cycle. It is observed that several success factors that are not elements of the classic project triangle received high and maximum scores. It is noteworthy that several of these factors have a 'soft' human aspect.

During the evaluation of the success criteria by the project leaders, several success criteria received high scores, and 3 criteria were also evaluated as critical success criteria, CSC (like the name of the critical success factor), the achievement of these criteria can itself entail a significant positive assessment, evaluation and project success. The critical success criteria include a 'soft' criterion with a human aspect, not belonging to the classical project triangle (the project manager's skills, abilities and competences).

In case of several of the elements to be evaluated, it was observed that they were rated as critical elements with a maximum score both on the input side (i.e. as success factors) and on the output side (i.e. as success criteria). In other words, the inclusion of these elements, their fulfilment and compliance with them can in themselves ensure the success of projects, greatly increase the likelihood of successful project implementation in the given

company, and their fulfilment can make a significant contribution to the sustainable development of both the company and its colleagues.

Scientific Ethics Declaration

* The authors declare that the scientific ethical and legal responsibility of this article published in EPESS journal belongs to the authors.

Conflict of Interest

* The authors declare that they have no conflicts of interest

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