

Emotional-intellectual and Cognitive Factors of Success in Project Management

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Abstract

The article discusses the criteria for evaluating the success of the project. The issues of project success assessment are probably the least elaborated and at the same time the most important in the field of project management. Previous theoretical research found a lack of systematic understanding of how companies implement projects that can be considered successful upon completion. In particular, this problem is acute when considering projects related to the development of a new product. This fact is confirmed by statistics: quite often projects to develop a new product are considered failures, and succeed in an average of 60% of cases. A formalized model of project success in the format of set theory, which provides an integrated understanding of project processes. This model identifies those elements that can and should be under the control of the project manager. The practical approbation of the results on the example of the company "Dahservis" was carried out and the competencies that the project manager lacks were established. The elements of the model include such factors as the competencies of the leader, team values, transformational leadership, emotional intelligence.

Keywords 1

cognitive factors, team values, emotional intelligence, transformational leadership, project management.

1. Introduction

As for the development of this topic in the literature, it is appropriate to mention the scientific works of Belassi and Tukel [2], Cooper [7], Westhuizen and Fitzgerald [10], Gemuenden and Lechler [11] and many others, which reflect different ideas about the success of the project and the principles that the authors recommend to follow when managing projects to achieve success.

This literature covers a wide range of issues in the field of project management - from planning activities and team management to taking into account the interests of sponsors and stakeholders.

Based on the analysis of sources, we can conclude that there is no single set of factors and criteria, universal for all projects, as the topic of assessing the success of such projects is moderately studied in both domestic and foreign literature. Among the authors who came closest to resolving this issue, we can highlight the following: Souder, Tzokas and Weidman.

According to Smith and Reinertsen, the degree of success of the project is the degree of achievement of goals. The key objectives of the project - technical performance (functionality and quality of the product), unit cost of the product, time to market. These goals are set at the beginning of the project and their achievement as a result is a success [20]. Translating the complex concept of project success, it should be noted the conclusions of Cooper and Kleinschmidt. The authors identify two key components of project success: profitability and impact. Profitability covers all aspects that reflect the benefits and profits of the effort. This concept includes: profitability compared to competitors; overall performance rating; achievement of planned goals; cost-effectiveness; the impact of all efforts on the profit of the business unit [9].

Proceedings of the 2nd International Workshop IT Project Management (ITPM 2021), February 16-18, 2021, Slavsko, Lviv region, Ukraine

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CEUR Workshop Proceedings (CEUR-WS.org)

2. Problem statement and the aim of the article

At the level of project theory, given the lack of elaboration of the topic of success in science, there is no single established paradigm that defines a formalized set of criteria and factors of success. As a result, there are differences of opinion as to which project should be called successful, as each company has its own "recipe" for success.

Statement of the research problem. The article considers a formalized model of project success and its practical application at «Dahservis». The aim of the article is to build a formalized model of project success to achieve the goals of the organization.

3. Criteria and indicators of project success

The issues of project success assessment are probably the least developed and at the same time the most important in the field of project management. Previous theoretical studies have revealed a lack of systematic understanding in terms of how companies implement projects that can be considered successful upon completion. In particular, this problem is acute when considering projects related to the development of a new product.

The practical significance of measuring success is also that this activity is aimed not so much at assessing the quality of the already implemented project by analyzing its results and the degree of achievement of goals, but at predicting the future success of the project at different stages of implementation.

Factors that guarantee commercial success are called critical success factors: you need to think about how to benefit from using these factors and how they can be translated into the management process.

It is also important to understand that the presence of critical success factors does not guarantee the successful completion of a project, but their absence seriously reduces the likelihood of achieving project results [22].

Many articles are based on a statistical analysis of completed projects and all end with a list of factors that unite successful projects. Factors contributing to the successful implementation of the project include:

- Clear goals. Starting with the philosophy of the project (or its mission). Commitment of the project team to the stated goals.
- Competent project manager. A competent, sociable leader who has the necessary technical and administrative experience.
- Support from senior executives. All stakeholders should be aware of and feel this support.
- Competent members of the project team. The success of the project is ensured by a competent and trained group of performers.
- Sufficient resources. Sufficient financial, human, material and other resources.
- Adequate information support. Availability of information necessary for the project implementation about its goals, status, changes, organizational conditions and customer needs.
- Management mechanisms. Mechanisms for managing all events and detecting deviations from the plan.
- Feedback. All stakeholders in the project should be able to study the situation and make appropriate suggestions and adjustments.
- Sensitivity to customers. All potential users of the project receive information about the status of the project.
- Mechanisms for finding and correcting deviations. A system of measures to find problems and eliminate their causes.
- Invariance of the composition of project participants. The personnel component of the project for the entire period of its implementation should remain constant as much as possible. Frequent personnel changes can disperse the group's experience.

Table 1 provides an overview of the key success factors of the projects identified by different researchers.

Table 1

Key success factors of the project	
Researchers	Key success factors
Lynn and Bender	<ul style="list-style-type: none"> ▪ some understanding of the product; ▪ understanding of the market and its dynamics; ▪ team support and vision from top management; ▪ adequate funding and a tight time frame; ▪ team factors (skills, experience, stability); ▪ availability of experienced team members; ▪ storage and processing of information; ▪ structured process of new product development; ▪ clear and definite vision in the team; ▪ the process of developing a new product; ▪ development and launch of a new product within the planned time frame; ▪ redefining the product after launch to create a long-term perspective; ▪ accounting for errors upon completion of projects.
Cooper, Edgett	<ul style="list-style-type: none"> ▪ emphasis on previous research; ▪ development of products that surpass competitors; ▪ high quality of work; ▪ hard, strict decision points; ▪ availability of performance indicators (NPV, timely launch); ▪ project manager who drives the process.
Cooper and Kleinschmidt	<ul style="list-style-type: none"> ▪ high-quality new product development process; ▪ availability of a new product strategy with appropriate goals; ▪ availability of material and human resources; ▪ professional project teams; ▪ involvement of top management; ▪ innovative climate and culture; ▪ use of cross-functional project commands; ▪ responsibility of top management for results; ▪ customer orientation.

The success factors of the project also include timely assessment of project indicators (Table 2).

Table 2

Relationship between success factors and timely project indicators	
Indicator	The goal it affects
Costs exceed budget	Cost
Cash shortage	Cost
Change in the price of suppliers	Cost
Large overtime	Cost
Changes in project objectives	Quality, time, cost
Low technical indicators	Quality, time, cost
Insufficient control	Quality, time, cost
Incorrect information	Quality, time, cost
Delays in the supply of resources	Time, cost
Supplier delays	Time, cost
Change by the buyer of delivery date	Time, cost
Delay in starting work	Time
Untimely completion of works	Time

The above are general fundamental factors and indicators related to the circumstances and technical side of the project, but researchers and researchers do not take into account a number of important factors, which will be discussed in detail in the next paragraph.

3.1. Influence of key factors on the success of the project within the life cycle stages

Based on the main factors that determine the success of the project, we can assume that at different stages of the project life cycle, some factors have a greater impact than others. For example, in the initial stages, important environmental factors, analytical processes, the role of management in decision-making, as well as the technological and research level of decision-making. At later stages, the professionalism of the project team and the administrative qualities of the project manager are of great importance, due to which compliance with deadlines and competent management of internal processes are achieved.

Consider in more detail the key success factors, metrics and tools for measuring project progress for each stage of the project life cycle (Fig. 1).

The key factor of success at the "zero" stage is the formation of a clear and unambiguous product strategy, formed within the company's strategy. The company's strategy should provide a clear understanding of the goals and objectives for the introduction of a new product, as well as reflect the expected return on investment (ROI). Thus, companies that have clearly defined strategies for their new products have a 32% higher success rate of projects, 42% more often meet the sales plans and achieve the planned profit 39% more often [8].

At the stage of generating ideas, the key factor of success is customer focus, many studies show that a deep understanding of customer needs is vital to the success of a new product [3]. Active participation of the client is necessary already at a stage of generation of ideas. According to Souder's review of the causes of project success and failure, ideas generated within the company had lower success rates than ideas generated by external sources [21].

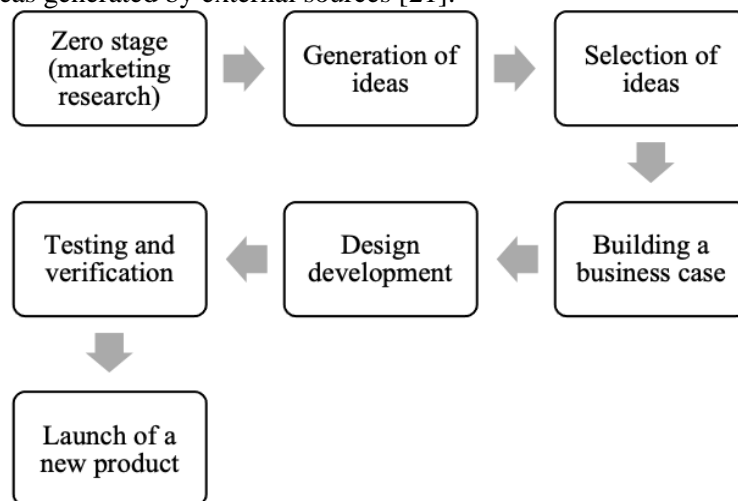


Figure 1: Project life cycle

At the stages of concept development and business case building, the key success factor is preliminary work, which includes such activities as financial analysis, market analysis, competitive analysis, identification of customer needs, concept testing, preparation of feasibility study. Carrying out careful preliminary work makes a significant contribution to the success of the product and strongly correlates with financial performance. Companies spend on average about 7% of the project budget and 16% of man-hours on these activities, which is not enough to create a successful product [4]. These facts allow us to conclude that more time and resources should be devoted to activities that precede the design and development of the product.

The development phase of new products often takes years, and the most unexpected events can occur during this time. The market may change and initial estimates of market size and volume may

be out of date. Customer requirements may change as the initial characteristics of the product become obsolete. Also during this time, competitors can develop similar products. These and other possible changes mean that the original definition and concept of the product are no longer valid.

Based on this, the key to success at this stage is the reduction of development time. Companies that develop products quickly gain a number of competitive advantages: premium prices, valuable market information, positive reputation, leadership, reduced development costs and accelerated learning [7]. In addition, the rapid development process minimizes the impact on the project of a changing environment. No less important factor in the product development stage is the availability of customer feedback, which guarantees the correct purpose and design of the product, as well as to accelerate the movement to the intended goal. In order to develop a product that fully meets the customer's request, it is not enough to follow the information gathered about the customer's needs before the start of development, it is important to consider the feedback that is formed during the development process.

At the testing stage, the functionality of the product is crucial. Therefore, customer acceptance of the product is a key factor in assessing whether the product is acceptable to the customer, measuring the level of interest in the product, sympathy and intention to purchase, identify the presence or absence of benefits and features of the product important to the customer [16].

At the final stage - launch and entry into the market, the most important factors for the success of projects should include a developed strategy for promoting a new product and its business model, availability of material and human resources, the ability to redefine (change) the product after its launch to create long-term prospects. marketing and customer interaction.

However, it is not enough to define the success of the project and identify the key factors influencing its success within the chosen model, it is also necessary to evaluate and track the success of the project in some way.

Once you have clarified the main aspects of the impact of key factors on the success of the project, you should understand the algorithm for forming criteria to assess the success of the project [1].

As mentioned earlier, project success criteria are standards that help make decisions about the status and progress of a project, and factors are facts or situations that affect results.

The set of criteria that a company adheres to depends on its specifics and values. According to Kerzner, the main role in assessing the success of the project is played by three criteria, namely: approval of the results of end users, mutually agreed changes in the scale of activities, the absence of radical changes in the corporate culture of the company [14]. The company can implement models and methods of development and adaptation of the organizational structure taking into account proactive and bi-adaptive approaches [19, 22-24]. Thus, the criteria "the absence of radical changes in the corporate culture of the company" can be improved.

3.2. Building a formalized model of project success

Approaches to determining project success have varied from the traditional triple constraint to multi-criteria and multi-factor models. This can be explained by the fact that the stories of many successful projects show the insufficiency and ambiguity of time, cost and quality constraints (external success), and hence the need to assess success as a set of features closest to the specifics of the project [17].

Within the framework of the conducted scientific research a number of concepts were used, about which there are still discussions in wide scientific circles. Therefore, in order to further correctly understand the conducted in the framework of this scientific work, it is advisable to present the basic concepts and their definitions. The main concepts in the work are defined as "emotional intelligence", "transformational leadership", "leadership competencies" and "team values". Each concept is considered separately below.

Emotional intelligence - the ability of the project manager to interpret their own emotions and the emotions of others, based on them to organize effective interaction in the business community with all stakeholders for the successful implementation of the project and program.

Transformational leadership is a process in which a leader overcomes selfish preferences, increases the level of consciousness and creativity of his subordinates ("followers") through an individual approach, intellectual stimulation, inspiring motivation and idealized influence.

Competence - a given area (field) of activity in which the project manager must show the ability to effectively (successfully, rationally) to act purposefully in complex situations.

Team values are a reflection of the choice of behavior of team members, taking into account: openness, focus, commitment, courage, respect in making decisions to achieve goals.

Relying only on the external or only internal criterion of success is useless. What looks like the pinnacle of success from the outside, may be a complete disappointment from the inside. In this paper, it is proposed to mean success by internal success:

$$\text{Project success} = \text{External success} + \text{Internal success}, \quad (1)$$

$$\text{External success} = \text{Time} + \text{Cost} + \text{Quality}, \quad (2)$$

$$\text{Internal Success} = \text{Emotional Intelligence} + \text{Transformational Leadership} + \text{Leadership} \\ \text{Competences} + \text{Team Values}, \quad (3)$$

Formally, the success of a project or program can be represented as follows:

$$\{EI_n, TL_m, CP_t, TV_i\} \subset PS, \quad (4)$$

where PS is the success of the project or program;

EI_n - a set of elements of emotional intelligence;

TL_m - a set of elements that form transformational leadership;

CP_t - a set of elements of professional competencies of the project manager;

TV_i is a set of elements of command values [18].

A lot of emotional intelligence (EI_n):

- elements of self-awareness. An emotionally mature project manager understands both his strengths and areas for development and how to act accordingly. We denote such a subset by $\overline{SA_s}$.
- self-control (self control). The leader can control and control his feelings and emotions properly in the appropriate situation. We denote such a subset by $\overline{SC_r}$.
- social responsiveness. A reasonable share of empathy can significantly improve the quality of life and communication with people on an emotional level. We denote such a subset by $\overline{SR_r}$.
- relationship management. A manager with well-developed social skills likes to be among colleagues and subordinates. We denote such a subset by $\overline{RM_m}$.

$$\{\overline{SA_s}, \overline{SC_r}, \overline{SR_r}, \overline{RM_m}\} \subset EI_n, \quad (5)$$

Many elements of transformational leadership:

- elements of intellectual stimulation. The leader encourages employees to use their imagination, think independently, look for new creative ways to solve common problems. We denote such a subset by $\overline{IS_c}$.
- elements of individual consideration. The leader gives subordinates such tasks that would develop their skills and strengthen self-confidence. We denote such a subset by $\overline{IC_r}$.
- elements of inspiring motivation. The leader creates a clear picture of the future, which is both optimistic and achievable, encourages others to raise expectations. We denote such a subset by $\overline{IM_p}$.
- elements of idealized influence. The leader strives to become a role model for his employees, is in a constant process of change and development of himself. We denote such a subset by $\overline{IF_k}$.

Formally, the set TL_m can be represented as follows:

$$\{\overline{IS_c}, \overline{IC_r}, \overline{IM_p}, \overline{IF_k}\} \subset TL_m, \quad (6)$$

The set of competencies of the project manager:

- Promising competencies (strategy; leadership, structures and processes; compliance, standards and rules; power and interest; culture and values). We denote such a subset by $\overline{PC_p}$.

- Human competencies (self-reflection and self-regulation; personal integrity and reliability; personal communication; relationships and interaction; leadership; teamwork; conflicts and crises; ingenuity; coordination; result orientation). We denote such a subset by \overline{HC}_m .
- Practical competencies (project design; requirements and tasks; content; time; organization and information; quality; finance; resources; procurement; planning and control; risks and opportunities; stakeholders; change and transformation; selection and balancing). We denote such a subset by \overline{RC}_k .

Formally, the set of CP_i can be represented as follows:

$$\{\overline{PC}_p, \overline{HC}_m, \overline{RC}_k\} \subset CP_i \quad (7)$$

Many teams value. The TV_i set will consist of five subsets:

- focusing elements - \overline{F}_p ;
- elements of obligation - \overline{O}_l ;
- elements of courage - \overline{C}_r ;
- elements of openness - \overline{P}_k ;
- elements of respect - \overline{R}_m .

Formally, the set TV_i can be represented as follows:

$$\{\overline{F}_p, \overline{O}_l, \overline{C}_r, \overline{P}_k, \overline{R}_m\} \subset TV_i \quad (8)$$

«Dahservis» is a ukrainian enterprise (founded in 2002), that performs roofing and facade works, as well as provides comprehensive supplies of materials for roofs and facades. Analyzing the company «Dahservis» it can be noted that the advantage is the application of the standard IPMA ICB 4 "Individual competencies of specialists in the management of projects, programs and portfolios." The results of modeling the behavior of the project manager are shown in Fig. 2.



Figure 2: Modeling results for the group "Behavioral competencies"

According to the results of the analysis, we will highlight the competencies for which the manager lacks competence. These are "Self-reflection and self-regulation", "Coordination", "Relationships and interaction" and "Teamwork". In the process of developing the competencies of the project manager, these competencies should be considered for their development [12,13]. The intersection of the competence of project managers is based on behavioral competencies. This forms the structure of the chromosome, which reflects the creation of the product and the result of the project and the project management process [6]. In the study of management methods at this company and the implementation of projects, it was found that there are not all components of success:

- management uses a transactional management style;
- there are no prescribed clear team values.

The above factors lead to reduced performance at the company «Dahservis». This is due to the following provisions of transactional leadership:

- execution of instructions and orders of the leader - the main task of subordinates;
- people best carry out orders when they are formulated very clearly and distinctly;
- employees are motivated by a system of incentives and penalties;
- subordinates are closely monitored to ensure that they meet management's expectations.

If employees perform their duties well, they are rewarded; if subordinates fail, they receive a reprimand or a more severe punishment. The occurrence of anomalies in management decisions is facilitated not only by incorrect decisions of governing bodies, but also by the formed anomalies in the construction of the organization. These anomalies also lead to disruption of the work process, cause declines in the organization. An example is pendulum solutions at «Dahservis». This pathology occurs due to the lack of a clear decision-making system and plan, and as a result the result of some actions is neutralized by others. Sometimes it manifests itself in its pure form: a countermeasure is introduced to the extent taken, and the decision is revoked. For example, the creation of a center of competence for the management of development programs and its subsequent abolition, justifying the importance of introducing new technology and returning to the old method of production, etc. Situational approach, lack of action program can be very dangerous because is reduced to zero. The company does not develop and loses competitiveness [5]. Rules, procedures and standards play a critical role in transactional leadership. The creative approach of employees to work is not particularly encouraged, as is the search for new solutions to problems. Research has shown that transactional leadership is usually most effective when the issues to be addressed are simple and clearly defined. Although transactional leadership can be quite effective in some situations, it is considered insufficient: it can prevent both the leader and subordinates from fully unleashing their creative potential. Therefore, the company «Dahservis» proposed to use subsets of transformational leadership to increase the successful implementation of projects. Qualities necessary for the process of transformation of a leader to successfully fulfill its functional role:

- focus on the future, strategic and proactive thinking;
- charisma - integrity, the presence of an inner core;
- $IQ + E$ - and emotional intelligence is more important, but no one has canceled a sufficient level of IQ [15];
- LQ - the level of vital energy of the leader - an innate indicator that significantly determines the leadership potential;
- confidence in yourself, your business and subordinates.

After the implementation of transformational leadership, the following quantitative and qualitative indicators were obtained:

- increased productivity;
- reducing staff turnover;
- employees showed greater job satisfaction and commitment to the organization, readiness for organizational change;
- stimulates innovative behavior of subordinates;
- increased internal motivation of employees to work, increased involvement in work (work engagement);
- increased efficiency of teamwork (growing trust in the leader and other team members, creating an atmosphere of cooperation);
- positively influenced the team's faith in its own strength, that it has difficult tasks;
- contributed to the formation of an innovative environment in the organization;
- the organization's ability to learn has increased;
- the company's intellectual capital is used more efficiently.

4. Conclusion

The following results were obtained in the process of research and development:

- The concepts and components of the project success model are studied.

- Approaches to determining project success have varied from the traditional triple constraint to multi-criteria and multi-factor models. This can be explained by the fact that in the history of many successful projects there is a lack and ambiguity of limitations in time, time and quality, and hence the need to assess success as a set of features closest to the specifics of the project. The main components of all approaches to assessing the success of projects are the definition of their criteria and factors. If the criteria play the role of project success indicators and serve as a basis for further decisions, then the factors are the drivers that directly affect the success of the project.
- As for the factors, in theory there is currently no ideal approach to determining the critical success factors of projects. As a result, a set of success factors was formed by selecting from different models those that are recognized by all authors of scientific papers and those that reflect the specifics of projects in terms of management, project team, the project itself and its external environment.
- For the first time, a model of project success is formalized, which demonstrates the relationship between emotional intelligence, transformational leadership, competencies and team values during the implementation of a project or program. The main sets related to the success of the project are considered and highlighted.
- A practical approbation of the project success model was carried out. The enterprise «Dahservis» is analyzed and it is defined which components are not enough for successful realization of projects. According to the results of behavior modeling, competencies are identified for which the manager lacks competence. These are "Self-reflection and self-regulation", "Coordination", "Relationships and interaction" and "Teamwork". In the process of developing the competencies of the project manager, these competencies should be considered for their development. It was found that at the «Dahservis» management uses a transactional management style. Situational approach, lack of action program can be very dangerous, because the result of the organization in this case is reduced to zero. The company is losing competitiveness. Therefore, the company is proposed to use subsets of transformational leadership in order to increase the successful implementation of projects. It is established that the company does not have clearly defined team values and mission. Values should not only be articulated in the organization, but a policy should also be pursued to prioritize values. Until those actions that contribute to the achievement of the main corporate goals are listed, these actions will not be considered a priority.

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