The Impact of ICB 3.0 Competences on Project Management Success

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Abstract

There is a great deal of literature written on how different project management standards and models bring success to projects. IPMA has introduced a competence model (ICB 3.0), which encompasses 46 competences, and which, according to IPMA, increases the success of projects and the way they are managed. However, there is a scarcity of studies which support and validate this notion. Therefore, in this study we sought to find a connection between ICB 3.0 and project management success by measuring the level of each ICB competence across different projects. We mainly targeted the construction industry where we analyzed 472 project management professionals, among which 88 were certified under the IPMA-4-L-C system. We found that the level of achievement of project management success greatly depends on the perception of competences. Behavioral competences were identified by the respondents as the most important ones, followed by the technical and the contextual ones. Furthermore, we found that project managers working on projects with significant time overruns did not perceive the importance of: Ethics, Information and Documentation, Health and Security, Safety and Environment. In addition, project managers working on projects with significant cost overruns did not perceive the importance of: Assertiveness, Start-up and Close-out. This research, although founded mainly on data from the construction industry, clearly demonstrates the importance of the ICB 3.0 system. Then, we call on further research which will be expanded to other industries and countries and which will validate the use of the ICB 3.0 competence system in project management.

Keywords: Project management; success; competences; construction industry; ICB

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1. Introduction

The world recognizes a clear need for increasing the success of projects, i.e., the need for improvement of the achievement of project objectives. Here, management decisions play a key role in managing projects and project deliverables, which is the domain of project managers. Their effects are the result of knowledge of the required processes as well as their competences. Simultaneously, an increase in the level of interest in studying what competences are required in a project manager for achieving project success is observed, but the research has not yet found a direct connection between project managers’ competences and project success. Researching the impact of competences on project success on construction projects will contribute to and raise the awareness of influential competences that directly contribute to project success.

2. Literature review

Since the 1990s the research into finding best practices in project management has intensified (Cooke-Davies, 2002). Consequently, the number of research papers on the subject has increased. In fact, projects can be executed within the planned time and cost, while still not fully meeting the demands and expectations of the client (Atkinson, 1999), or they are commercialized with great difficulty. This indicates that project management consists of a wide range of parameters that need to be explored, and not only of execution within the planned time and expense framework. Various project stakeholders have different objectives that contribute to the project. Their interests require changes which also need to be managed such that the fulfilment of pre-set goals is always sought. Lechler (1998) claims that when dealing with project management, one is always dealing with people, because it is people who contribute to project management. Cooke-Davies (2002) sought to link cost and time overrun with the adequacy of the application of aspects of management. They investigated the factors of project success, success in project management and factors for continual success of project realisation, citing the omission of the human factor as the only possible omission in their research. As a collateral phenomenon they link the success of a project with the application of management, but do not develop this any further. Dvir has a similar view: that in order for a project to succeed, commitment is required on the part of those whose personality suits the respective project (Dvir et al., 2006). Dvir and his colleagues investigated the relationship between the personality of a project manager and its impact on the success of the project.

Other researchers have investigated the relationship between the style of management and the type of project, not recognizing the important influence of the personality of the project manager on the execution and success of the project (Crawford et al., 2004; Shenhar & Dvir, 1996; Shenhar, 2001). Although researchers have previously dealt with the significance of technical knowledge and styles of management, newer research focuses on defining the relationship between competences, personality and project success (Fazel et al., 2011). One of the first studies to link project success and the personality of the project manager was carried out by Crawford (Crawford, 2007).

2.1. Competences for successful management

The Project Management Institute developed the Book of Knowledge of project management and defined project management processes (PMI, 2008). The International Project Management Association (“IPMA”) went one step further and produced national guidelines for competences of project managers (IPMA, 2006). It is well known that for management, processes alone are not enough, the competences of those leading the project are also important. In the field of intelligence research, emotional competence (EQ) is more important for leadership than intellectual competence (IQ) (Goleman, 1995).
Competence was defined as a particular combination of knowledge, skill and personal characteristics (Boyatzis, 1982; Crawford & Turner, 2003). The project leader's personality manifests through various behaviours, beliefs, values and abilities. Without the appropriate implementation of these features, a project can not be successfully brought to completion (Bass, 1985). Competences for successful management were first studied through styles of leadership. These styles yield only short-term results and present a threat to the long-term cooperation between the leader and the followers. Various streams of education in competence and leadership have therefore been developed. For education in competence, 15 dimensions of leadership have been identified, divided into three groups: intellectual (IQ), emotional (EQ) i managerial (MQ) (Boyatzis, 1982; Crawford & Turner, 2003).

Carrying on from Crawford's research, it can be said that personality and competence of the project leader somehow influence the success of the project and that for the selection of an appropriate project leader, it is important to look at the type of project that needs to be led. (Fazel et al., 2011). There is a connection between the characteristics of the project leader and the success of the project, but nothing is yet known about the effectiveness of the competences of the project leader on the success of a specific type of project (Fazel et al., 2011).

A standard of competence for project management is mentioned for the first time within standards of the International Council on Systems Engineering (INCOSE). The first integrated standard appears in the mid 1990s (e.g. Australian Institute of Project Management - AIPM). The IPMA published the first standard for project management competence in 1997 (International Competence Baseline), after which an improved version was issued in 1999 and in 2006, with more and more emphasis on contextual and behavioral competences. The research indicates that all management competences will be even more important in the future (Silvius et al., 2012). However, key behavioral competences are difficult to identify (Cheng et al., 2005). In the literature, it remains unclear whether it is possible to develop specific competences to suit specific industries (Cheng et al., 2005; Tett et al., 2000; Brophy & Kiely, 2002). Table 1 summarizes the other important research in the field of personal characteristics of project managers.

2.2. The success of project management and project success

De Wit (1988) went on to make a distinction between the success of a project (measurement of the overall achievement of project objectives) and the success of the management of the project (measurement of the cost, time and quality in the realization of project objectives). Achievement of success in project management is a narrower concept than the achievement of project success, which scientists explain with the “easier grasp of management success” than of “project success” (Cooke-Davies, 2002). The assessment of the accuracy of forecasting potential success on the basis of performance is one of the main guidelines for determining project success.

The well-known Project Management Triangle: time, cost, quality (Oisen, 1971; De Wit, 1988; Yu et al., 2005; Atkinson, 1999) presents traditional criteria for project success, but is not sufficient for a complete picture of the success of a project (Fazel et al., 2011). It is realized that specific personality traits may contribute to certain roles (Berens et al., 2005.) in project management. There is a link between the characteristics of a project manager and the success of a project, but nothing is yet known about the effectiveness of the competences of a project manager on the success of a particular type of project. (Fazel et al., 2011).

Chan and Chan (2004) have proposed two groups of measures of success: objective measures, such as time, cost, safety and environment. The second group contains subjective measures which consist of quality, functionality and the satisfaction of different project participants. Ideal research of project success would test both groups of measures, which is not a scientifically straightforward task because each of these groups requires different research methods and approaches. Construction project success requires
broader research as different people have different perspectives on a similar issue (Al-Tmeemy et al., 2011).

Table 1. Studies of personal characteristics of project managers (Fazel et al., 2011)

| Researcher          | Personal characteristics of project managers                                                                                                                                 |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Archibald (1976)    | Flexibility and adaptability; Propensity for self-initiative and leadership; Aggressiveness; Self confidence; Persuasiveness; Verbal expression; Ambitiousness; Activeness; Rashness; Effectiveness in communication and integration; Wide range of personal interests; Balance; Enthusiasm; Spontaneity; Imagination; Ability to balance technical solutions within the given cost, time and human factors; Organization and self discipline; Generalist rather than specialist; Ability and willingness to plan and control; Ability to grasp problems; Readiness to make decisions; Balancing the use of time |
| Stuckenbruck (1976) | Multidisciplinary orientation; Focus on global issues; Efficiency in decision making and problem solving Has knowledge of management; Analytical judgement; Creativity; Charismatic communicator; Motivator; Flexible; Appropriate temperament that quick, quiet, real, quick thinking, etc. as needed |
| Kirkpatrick & Locke (1991) | Instigator and ambitious; Desire to lead and influence others; Sincerity and integrity; Self confident; Intelligent; Has technical knowledge |
| Turner (1999)       | Problem solving ability; Focussed on results;; Energy and initiative; Presumption; Perspective; Communicative; Ability to negotiate |
| Houze (2000)        | Having vision and a clear picture of the future; Goal oriented; Clear intention to achieve goals; Self control/ Self discipline; Ability to communicate; Energetic; Persistence; Positive attitude |
| Kerzner (2001)      | Realistically faces problems; Assessment of risk; Sincerity and integrity; Understanding problems in a team; Knowledge of the technology in a project; Business management competences; Management with principles; Communicativeness; Alertness and speed; Versatility; Energy and resilience; Ability to make decisions |
| Goleman et al., (2002) | Self awareness; Self management; Social awareness; Relationship management |
| Peters (2007)       | Sincerity; Competence; Forward thinking; Inspiration; Intelligence; Honesty; Openness; Courage; Directness; Imagination |
| Charan (2008)       | Ambitiousness; Instigation and persistence; Self confidence; Psychological openness; Sense of reality and insatiable hunger for knowledge |
| Rainer (2009)       | Loyalty; Joy; Ethical; Self awareness; Invention; Love; Rigor |

From the above-mentioned examples of research to date, it can be concluded that the competences of the project manager have not been sufficiently investigated in real projects, which was the main motivation for carrying out such research in construction. Unfortunately, the compatibility between the personality of the project manager and the type of project managed by him or her has not been given sufficient importance. There is some research on the characteristics and competences requirements for a project manager, but very little on their relationship with project success (Fazel et al., 2011).

Table 2 provides a brief overview of the most significant research on the success of project management and project success.
Table 2. Summarised view of the research on project success

| Researcher | Research on aspects of success |
|------------|--------------------------------|
| De Wit (1988) | Success in project management and project success |
| Morris & Hough (1986) | Measurement of project success |
| Lim & Mohamed (1999) | Use of micro and macro criteria for project success |
| Shenhar (2001) | Criteria of project efficiency |
| Atkinskon (1999), Willard (2005), Al-Tmeemy et al., (2011), Baccarini (1999), Belassi and Tukel (1996), Tsang (1998), Chen & Partington (2005) | Golden triangle: cost, time and quality and key project stakeholders’ satisfaction with the project |
| Rodrigues & Bowers (1996) | Strategic project management as a critical issue for project success |
| Pockock, 1996 | New success measures, such as participants’ satisfaction |
| Chan and Chan (2004), Freeman & Beale (1992), Liu & Walker (1998) | The contractor’s and the client’s perspective lead to different measures, as project success means different things to different people |
| Baker et al., (1988) | There is no absolute success in a project, there is only perceived success. |

3. Research

The purpose of the research is to link the competences of the project manager with project success. The main components of competence include ability, attitude, behavior, knowledge, personality and skills. They affect a major part of one’s work (i.e. one or more key roles or responsibilities). Competencies are related to job performance, and can be measured using generally accepted standards and improved through training and development. Research which would verify the knowledge, attitudes and skills of project managers would be too complex and would still not point directly to the link between competences and project success. Due to the complexity of the object of the research, it is the perception of the importance of competences that is measured. In order to link objective and subjective measures of success, research through the perception of the importance of competences has been selected. These will not provide absolute quantitative values of competences for project managers, but will provide comparable measurable values which need to be associated with corresponding project success. Perception is not a direct image of objective reality, but an interpretation of that reality; however, it speaks of the importance that respondents give to the competences. A link can be made between perceptions of competences and project success that follow such perceptions of importance of competences.

The perception of project success varies depending on the industry, the complexity of projects, the project managers’ age and cultural traits of the project manager (Muller & Turner, 2007). The research was carried out in the construction industry in a transition country (Croatia), where the project approach has been applied in business activities in the last 20-odd years. Small, medium and large projects have been analysed in equal proportions. The average age of respondents was 45 years old.

The research is by nature a mixture of confirmative - explanatory research. Scientific methods are used: classical and contemporary search of literary material, direct and systematic observation, survey and statistical methods. Survey respondents first focused on projects success, and then perception of the importance of competences is assessed. Using structured questionnaires, distributed among 2622 project managers, information was collected in respect of perceptions of the importance of competences for project success. At the same time, enquiries were made regarding the success of projects in which the respondents were participating. The managers were approached by a professional online research service provider. The response rate was about 18% - 472 questionnaires were completed. Respondents were
certified and uncertified IPMA 4-L-C project managers from upper, middle and lower management in Croatia. Project manager respondents were not selected randomly. A database from the Croatian Association for Project Management as well as database of certified construction engineers was used (a filtered selection of project managers in the construction industry). The questionnaire consisted of eight questions. The first two questions categorized the respondents into groups (according to the activity profile and the level of management in which they work), the next two questions focused on the success of projects in which the respondents were participating, questions 5-7 asked for an assessment of the importance of competences for achieving project success, and last question investigated the status of the project manager certification. For each type of competences according to ICB 3.0 one question was asked. A scale of “1” - “6” was used (not important to extremely important). An even number of options was selected in order to avoid neutral responses. All ICB 3.0 competences were covered.

After an initial analysis of the structure of respondents and the general perception of importance of competences, the results of the perception of the importance of competences were analysed by groups of respondents, depending on the level of management (senior, middle or operational) in which they operate and the profile of main activity (investors, consultants, contractors). 78 senior managers participated in the research, 146 managers from middle management and 248 managers at the operational level. They were investors (76), consultants (300) and contractors (96) (see Figure 1).
Fig. 1. Structure of respondents

For performance indicators, timely execution and execution within planned costs were selected. In this regard, project success is divided into 4 categories with respect to time and 4 categories with respect to the cost of the project: the achievement of 5% within the set limit (time or cost), exceeding the limits by 5-15%, 15-30% or more than 30%.

4. Results

After collection of the data, statistical analysis was carried out. According to the research, technical competences - control and reports, information and documentation - are critical to the realisation of project objectives. At the same time, ethics, values appreciation and reliability seem to be critical behavioural competences, while systems, products and technology and law are crucial contextual competences for project success. For 27.4% of respondents, projects do not exceed planned costs, and for 20% of respondents, projects do not exceed the planned timeframe. For the purposes of the analysis the term “successful project” was used, to refer to projects with no cost or time overruns.

IPMA 4-L-C system certification of the project manager does not influence cost overruns in projects – in the entire sample and in successful projects, certification was equal. For respondents whose projects had no cost overruns, for the most part there were no time overruns (in 78% of cases, time overruns were less than 15%, and in 51% of cases, up to 5%). For respondents whose projects had no time overruns, for the most part there were no cost overruns (in 90.4% of cases, cost overruns were less than 10%).

5. Conclusion

This paper provides concrete evidence that the influence of ICB effect 3.0 competences can be linked to project success. After collecting data from 472 respondent questionnaires, the correlation was reached which is presented graphically in Figure 2. The perception of the importance of competences in projects that are successful is different from the perception of the importance of competence in projects that have time or cost overruns. This correlation should be further explored in order to reach a clear rule for the impact of competences on project success, and it is obvious that it exists. Such finding participates in the determination of competences that will be focused on in the selection of project managers. On the other hand, the picture of the perception of the importance of competences will diagnose the expected success of a project and increase the possibility of timely impact on a project in order to ensure the realization of its objectives.
Fig. 2. Correlation between perception of importance of competences and project management success

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