Maarit Bendeçon

FUTURE COMPETENCE EXPECTATIONS OF AN INFORMATION SYSTEMS PROJECT MANAGER

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Maailma muuttuu asiakkaiden liiketoiminnan ja informaatiojärjestelmien-, sekä teknologioiden ympärillä jatkuvasti ja viime aikoina Covid-19 pandemia on vaikuttanut dramaattisesti liiketoimintaympäristöömme. Tietojärjestelmien monimutkaisuus on lisääntynyt, asiakkaiden odotukset ovat korkeat ja kilpailu IS toimittajien välillä kovaa. Asiakkaat informaatioteknologian sektorilla odottavat projektin perustavoitteiden toteutumista projektissaan: projektin toimitus sovitun aikataulun mukaan, sovitussa laajuudessa ja kustannuksissa. Lisäksi asiakkaat odottavat todellista arvoa liiketoiminnalleen. Projektien ja ratkaisujen tulee olla innovatiivisia ja luovia, tuoda selvää arvoa ja hyötyä asiakkaan liiketoiminnalle sekä tarjota erinomainen asiakaspalvelukokemus asiakkaalle. Informaatioteknologia- ja järjestelmäprojektipäälliköiden tulee pysyä kilpailun huipulla ja pitää osaaminen sekä taidot ajan tasalla tässä jatkuvasti muuttuvassa maailmassa. Tässä tutkielmassa oli tavoitteena löytää tulevaisuuden IS projektipäälliköiltä vaadittavat taidot ja osaamiset perustuen tämän hetken tilanteisiin ja tarpeisiin. Kirjallisuuskatsaus loi teoreettisen pohjan empiiriselle tutkimukselle. Uusi viitekehys luotiin käyttämällä pohjana olemassa olevaa kattavaa osaamiskategorisointia. Empiirinen tutkimus toteutettiin teemahaastatteluilla, haastattelemalla IS toimittajan projektipäälliköitä, IS toimittajan asiakasyksikön johtajia sekä asiakkaita. Empiirisen tutkimuksen tulokset osoittavat, että johtaminen, asiakkaan liiketoimintaympäristön tuntemus ja kommunikointi ovat kaikkein tärkeimpiä taitokategorioita projektipäälliköille tällä hetkellä. Haastattelujen tulokset osoittavat myös, että etäjohtaminen, virtuaalitiimitaidot ja kyky yhdistää erilaisia tiimejä monikulttuurisen tiimin johtamisen ohella, ovat erittäin tärkeitä taitoja projektipäällikölle tulevaisuudessa. Tulokset viittaavat myös siihen, että projektipäälliköillä tulee olla erinomaiset esiintymis-, ja englanninkielentaidot suullisen sekä kirjallisen kommunikointitaidon lisäksi. Nämä tulokset viittaavat myös siihen, että asiakkaan liiketoiminnan ymmärrys ja toimialatuntemus ovat vaadittavia taitoja, jotta projektipäällikkö voi onnistua projektissaan ja tuottaa asiakkaan liiketoiminnalle arvoa.

Avainsanat: projektipäällikkö, pätevyys, taito, tietojärjestelmäprojekti, asiakasodotus, onnistunut projekti

ABSTRACT

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The world around customers in business and information technology is changing rapidly and lately the Covid-19 pandemic has been affecting to the business environment dramatically as well. Information systems are more and more complex, customers' expectations are high and competition between IS service providers is fierce. Customers in the information technology sectors are expecting basic project goals and objectives to realize in their projects: project delivery on agreed schedules, scopes and costs. In addition, customers are expecting real value for their business. Projects and solutions need to be innovative and creative, bring clear business and IS benefits and provide excellent customers experiences. IS project managers need to stay on top of the competition by keeping their competences and skills up to date in this continuously changing world. The goal of this thesis was to find out, what are the future competences requirements of an IS project manager based on current situations. The literatures reviews created the theory that was used as basis for the empirical research. A new framework was created by choosing an existing comprehensive skill categorization. The empirical research was conducted with theme-based interviews, by interviewing IS supplier´s project managers, IS supplier customer managers and customers. One possible future research topic would be to conduct this study in another country to see possible differences between results. Based on the empirical research results, leadership, business domain knowledge and communication were the most important skills categories for project managers. The results indicate that remote leadership, virtual team skill and ability to bridge diverse teams with multicultural team leading are very important skills in the future. The results also indicate that project managers need to have good presentation skills and English skills on top of verbal communication and written communication skills. These results indicate also that customer business understanding, and industry knowledge is required so that project manager can succeed to create real value for the customer business.

Keywords: project manager, competence, skill, information system project, customer expectations, successful project

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1 INTRODUCTION

Information technology (IT) is changing rapidly, and it requires information system (IS) to change continuously as well. These changes in IT and IS environments are causing need for change also to project managers and project team members competencies. Information systems are more and more complex, customers' expectations related to their IT platforms and information systems are high and competition between IS service providers is fierce. Customers in the information systems sector are expecting basic project factors to be realized in their projects: project delivery on agreed schedule, scope and costs. In addition, customers are expecting real value for their business. Projects and solutions need to be innovative and creative, bring clear business and IS benefits and provide excellent customer experience. In this study, information technology and information systems in project environment are considered to mean the same in this context.

Information systems project manager's competencies are studied in many previous studies, which have concentrated currently required skills and competencies. Project managers future competence requirements seem to be fairly unexplored area. According to Keil, Koo Lee and Deng (2013), certain IT project manager skills seem to be highly correlated with project success and outcomes, so it is critical to understand required skills and competencies. Liikamaa (2015) did competence modelling in her research and found out 30 individual and important competencies for project managers: e.g., leadership skills, achievement driven, pursuing goals despite of obstacles and setbacks and conflict management. According to Lampel (2001) the competencies in engineering- construction firms can be divided to four different categories: entrepreneurial competencies, technical competencies, evaluative competencies and relational competencies. Results of Ko and Kirsch (2017) research shows that firms should consider employing senior IS project managers who understands existing tools, techniques and technologies of the company to be able to manage projects within the same business domain.

Companies working in information technology and information systems sector, providing project managers to different kind of customer projects, need to be prepared to the rapid changes in this area. In spring 2020, Covid-19 changed

the world around us totally and forced also IS companies to find new ways of working and new skills also highlighted compared to past situations.

The purpose of this study is to find out what are the future competence expectations of an information systems project manager, as it has not been studied comprehensively lately and how expected, competence requirements have been changing from current competencies that can be found from the literature and from the results of the interviews as well. It is important to recognize expected future competencies, so that project managers can develop themselves and different organizations can plan and provide education and trainings which support addition of identified competencies. Success in projects is relying highly to project managers skills and competencies and having right competencies is a real competitive advantage for IS suppliers and project managers, who recognizes and acquires needed future competencies. The main research problem of the thesis is the following:

- What are the future competence expectations of an information systems project manager?

Research is also trying to answer to these following questions:

- What are the differences between current and future competence expectations of the information systems project manager based on empirical research?
- How information systems project manager competence expectations have changed compared to the literature review and empirical research results?

The empirical data of this study was collected by interviewing experienced IS project managers, IS supplier´s customer managers and customers project owners. The interview type was a theme-based interview and interviews were conducted as a semi-structured interview with open-ended questions. Results from this study indicates that IS project managers benefit of capabilities to stay on top of the changes happening around them. Valuable skills for project managers in the future are continuous learning desire, capabilities to do so and even more important than earlier, leadership skills both face to face but also remote leadership and multi-cultural team leadership. Importance of soft skills and personal characteristics including e.g., emotional intelligence, were identified as very important competencies in this study. The results of this study can be used by IS project managers, different kind of information systems organizations, both suppliers and customers, to learn what kind of skills and competencies are expected from the project managers in order to plan development paths for project managers. However, the results shall be taken with caution, because this empirical study was conducted in Finland only with local IS supplier and customers with relatively small number of interviews.

This study is based on a literature review and an empirical research. The literature view is focusing to find currently required skills and competencies of IS project managers. Author completed wide review of existing literature to achieve required understanding about the research done in project management competence area. Literature review was done by using following databases: JYKDOK, Science Direct, Google Scholar and computing Machinery (ACM). The keywords included but were not limited to: "project manager",
"competence", "skill", "information system project", "customer expectations" and "successful project".

The author started the literature review process by checking articles and publications from different sources and if an article seemed relevant to the topic, the author read through the abstract of the article. If the article still felt relevant for the research, the author read through the whole article or publication. Most of the articles are from project management in information technology but also project manager generic competencies were collected from general project manager competence articles. Journals and publications were the main literature source, but also books have been used to collect details of the current project manager competencies. The author has left out those studies, which did not contain relevant information for this study and majority of literature sources or articles over 10 years old were left out.

Empirical research was conducted by interviewing people who have worked in the area of information systems project management. Based on previous literature review, interview questions were created as an open-ended and the purpose was to find answers to research problems and to the research questions. The empirical research method, interviews and all results will be reported in later chapters of this thesis.

In the next chapters, theoretical background, framework and current literature findings will be presented. First, project and project management are described. Project lifecycle is shortly presented, and definitions and requirement of successful project are described. The rest of the thesis focuses on empirical research and results. In the end of the thesis, the results are discussed, and possible future research topics are presented.

2 PROJECT AND PROJECT MANAGEMENT

In this chapter the definitions and characteristics of a project and project managements are explained. This chapter explains also typical project lifecycles and definitions of successful projects.

2.1 What is a project

Projects have been existing since the early times of organized work. Historical buildings like Greek Parthenon and Egyptian pyramids are good examples of huge projects in the history of the projects (Artto, Martinsuo & Kujala, 2006). When discussing about project management, it is important to understand and describe a project. Literature defines a project in many ways. A project is independent, phased and unique effort, which has an agreed content, schedule and costs. Project has always a clear purpose related to content and quality, which are connected to the strategic purposes of the organization (Liikamaa, 2015). Project can mean one-time effort with one common goal for many parties or it can be time-limited and goal-oriented organization to solve certain problems in agreed schedule. A project is a typical working way in information systems field and is often defined as a team of people who work together for certain period of time to achieve specific agreed goals in defined schedule and budget (Horowitz & Liu, 1989). Project management institute (2011) defines project to be temporary endeavor to create unique product, service or outcome. Project has objectives related to quality and resource consumption. In addition to this, project has always a project owner who ordered planned a project and the project is subject to evaluations. Nevertheless, recurrences can be seen in the results of the projects even if there are always individualistic characters in every project. For example, certain software can be implemented to two customers in completely different way depending on number of customizations and customer business requirements (Project Management Institute, 2011).

Kerzner (2009) and PMBOK® Guide have identified the following characteristics which apply to the projects:

- specific objective to be completed within defined scope
- start and end dates defined
- agreed budget (if applicable)
- human and nonhuman resource consumption (i.e., money, people, equipment)
- multifunctional (i.e., cut across several functional lines)

Schwalbe (2010) underlines that projects are often customized and always unique, which causes challenges and uncertainty into the planning and implementation.

She also defines project attributes to describe a project precisely. A project has a unique purpose, and it is temporary effort. Scope of the project changes in the beginning and becomes clearer as time passes in the project, so project is developed by using progressive elaboration. A project requires resources like people, hardware and software. A project should also have always a primary customer or sponsor to provide direction and funding for the project.

Project is general way of working in information systems (IS) and information technology (IT) area. IS projects can be divided based on changing factors, which include technology, project requirements, personnel and external environment. They differ from other projects also due to their versatility (Pirhonen, 2013). Typical characteristics for IS projects are also high complexity and chances of failures, conformity, changeability and invisibility (Jurison 1999, Schwalbe 2010).

All elements of the project affect to one another and existing infrastructure or applications in IS projects. Typically, projects are results of development and installations, but not every project in this field is a pure development project. In most cases, projects are "hybrids" meaning that they include multiple independent sub-projects which are managed separately (Dekkers & Forselius, 2007).

To illustrate the concept of a project, the following table by Artto, Martinsuo and Kujala (2006) describes the differences between projects and recurring activities:

TABLE 1 Differences between projects and recurring activities (Artto & al., 2006)

Differentiating factors	**Projects**	**Recurring activity**
Requirement of operating environment	flexibility, renewal, change	Stability, continuity, predictability
Relationship to change	Aims to measurable change by creating imbalance between the current state and the goal	Strives to gradual change by maintaining and finding balance between different requirements
Object, scope	Unique solution for customer requirements	Individual projects and items according to the volume or efficiency requirements
Time limitations	Schedule limited	Continuous
Resources	Resources based on the demand and purpose (scope)	Relatively stable resources
Budget	Budget based on the demand and purpose (scope)	Yearly budgets or e.g. batch budget
Efficiency point of view	Making the right things	Cost – effective achievement
Targeting people for different tasks	Project goals and personal skills regulate – tasks can vary during the project	Job description and role regulate, tasks are permanent and predefined
Predictability of the results	Unpredictable and risky. Previous experiences increase risk-taking capacity and risk management helps on result predictability	Predictable and experiences increases predictability even more, risks are minimized

Artto & al. (2006) are describing that a project has always predefined goal or objective which binds the project supplier to customer's business and strategic goals. It means changes to an existing situation. They also mention three parallel perspectives of the project in their book:

- Project is temporary organization, meaning that the project organization is set up to perform certain works and it will be dissolved when work has been completed.
- Project can be seen as a product or working structure, meaning that the project can be seen through the product or work carried out as a result of the project.
- Project can also be tasks or phased process where project can be managed with tasks and their phase dependencies.

2.2 Key dimensions of project management

The project management approach is quite modern, and it has stabilized in the 21st century in the IS field in general. Despite youth of it, project management has developed tremendously and is currently affecting all parts of the companies. Project management is considered more business process than a project management process (Kerzner, 2010). In this thesis, project management is reviewed as a project management process from project managers point of view.

The Project Management Institute (Project management institute, 2011) describes project management as following:

> The application of knowledge, skills, tools, and techniques to project activities to meet project requirements" and characterized "high quality projects [as those that] deliver the required product, service, or result, within scope, on time, and within budget.

Project management term can be understood as management projects, but it covers a broader range of areas and features where actual management is only one part of the whole (Murch, 2001; Kerzner, 2009). Artto & al (2006) describes project management as a use of management styles to achieve set targets and goals. Concept of management style includes all information, skills, methods and tools which are needed to achieve project targets and goals. Achieving the targets and goals requires project to meet the needs and expectations of the different stakeholders. Project stakeholders are all involved parties who are affected by the project or have ways to affect to the project and success of it.

Project management includes several activities related to implementing the agreed scope as efficiently as possible (Jurison, 1999). Schwalbe (2010) describes project management as combination of knowledge, competencies, tools and techniques to meet project requirements and expectations. Project managers should facilitate the entire project process to satisfy needs and expectations of project stakeholders. The project manager plans, defines scope, estimates, schedules, resources and controls projects typically as a single set of tasks in information and communications technology (ICT) projects (Dekkers & Forselius, 2007).

During last years, project management has become a new form of management. Organizations have constantly changing business environments and they need to deal with complexities of knowledge-based teamwork. Project management includes and provides managers with different methods and tools for planning, organizing, managing and following up team-based activities to achieve defined goals (Jurison, 1999).

Project management is the approach on how to achieve project objectives and goals by leading and managing the project. According to Artto & al (2006) and e.g. Project management institute (PMI, 2013), the most common perspective to view project management is to list all the information areas it should include:

- Whole project management which integrates leadership of the project and sub-projects, so that overall targets of the project will be achieved.

It also includes management of dependencies, project plan, goal setting and fine tuning during the project and change management.

- Project scope management is needed to make sure that the result of the project is what has been ordered and project will be completed effectively without unnecessary work.
- Project time management ensures that project will be delivered according agreed schedule. It also includes task creation, definitions of tasks related dependencies, determination of task durations and change management.
- Cost management includes budgeting, cost estimates and follow up of costs during the project.
- Resource and employee management is related to having right resources at right time of the project and using resources effectively. Resource planning, finding right resources and developing co-operation of the project team is part of this process.
- Communication management means information sharing and interaction between project parties and stakeholders.
- Risk management starts with risk identification and evaluation and continues with planning and implementing preventive tasks.
- Procurement management includes finding and using external resources, making agreements and managing and following up them.
- Quality management includes quality planning and all tasks related to achieving agreed quality levels in the project.

The increased use of different technology, virtual and multicultural teams, internet communication and outsourcing are the trends of the project management nowadays and even more in the future. Project team members may never meet face-to-face during the project and it sets different requirements for project management (Kets De Vries, 2001). All the projects have stakeholders, otherwise projects would not exist. Project sponsor is a stakeholder who expects the project´s deliverables. Project manager must identify stakeholders and actively manage their expectations during the project. Project stakeholder management includes four main processes: identify stakeholders, plan stakeholder management, manage stakeholder engagement and monitor stakeholder engagement (PMBOK, 2017). Stakeholder management is related to construction of trust relations. Relational stakeholder management is based on intuitive trust followed by integrity trust and competence trust (Oliviera & Rabechini, 2018).

Project management can be problematic as objectives of the project are often changing during the project. It is also challenging to communicate about the vision of the project as the project managers vision might differ from the vision of the project owner or the one who ordered the project. Bigger programs include several sub projects and stakeholders, which all can have different understanding and view of the project result. Despite of these mentioned challenges in project management – project manager should be able to satisfy all the project stakeholders (Morris & Pinto, 2007).

2.3 Project lifecycle

All projects are following serious of different phases from the beginning to the completion of the project. Project lifecycle means a chain of phases in which idea and project expectations and opportunities are identified, the project is implemented, and its results and usage are supported. Project is often part of wider whole and understanding of it is important for the successful implementation (Artto et al, 2006). According Jurison (1999) and project management institute (2011), project life cycle varies depending on the nature of the project, but all projects can be divided into four to five following generic phases:

TABLE 2 PMI project phase categorization (Project management institute, 2011)

Project phase	Description
Project initiation	Best given resources are selected, benefits of the project are recognized, project sanctions are planned and documented, and project manager is assigned.
Project planning	Work requirements are defined, quality and quantity of the work is recognized, resourced needed are defined, activities are scheduled, and risks are identified and evaluated.
Project execution	Project team members are negotiated, work is directed and managed and work to support team members to improve happens.
Project monitoring and control	Project progress is tracked, actual outcome is compared to predicted outcome, variances and impacts are analyzed and adjustments are done when needed. (Not part of Jurison´s life cycles).
Project closure	Resources based on the demand and purpose (scope)
Budget	Verification that all work has been completed happens, contract closure is done with financial closure and administrative work to close the project is completed.

Artto & al (2006) added one phase more into this typical and widely used phase model. They include usage and support of the project result as a last step of the project lifecycle after the project closure. The simplest way to define project management includes only two components, leadership and communications (PMI, 2013).

Project managements key elements include the project stakeholders, project management knowledge areas, tools and techniques utilized in the projects and successful project benefits to the enterprise (Schwalbe, 2010).

2.4 Successful project

Most of the projects we hear of in media, are either over budget, delivered late or the quality of the project is not good enough. In year 2009, The Standish Group International reported that 44% of all IS projects are failing either related to project schedule, budget or deliverables (Keil, Lee & Deng, 2013; Wateridge, 1995). Project success seems to be rather elusive concept and not easily definable what constitutes project success. The success of the project is one of the most important project management issues, it is one of the most frequently discussed topics and no single generally accepted definition of a project's success exists. Success of the project is meaningful and reoccurring topic in project management area (Pirhonen, 2013).

Success in project needs to be defined already in the beginning of the project so that all stakeholders share the same view of the success. Success from project management side can be measured with the project achievements related to quality, schedule and costs. From the customer business point of view, success can be measured by using different key performance indicators (KPI) like cutting costs, getting more customers or added value earned (Thomas & Fernández, 2008).

Successful project management can be defined in as many ways as a project and project management previously. Project success is critical in information systems (IS) and it influences critically to organizations' business and performance. The foundation for project success is strong upfront planning which includes realistic deadlines and budgets, well defined goals and objectives and detailed project plan with proper follow up (Jurison, 1999). According to several research, it is widely admitted that the result of the project is vitally depending on the project manager (Ahsan, Jo & Khan, 2013; Wateridge, 1995). Project manager competencies seem to have remarkable importance for successful projects.

Kerzner (2009) described project management success as having achieved the project key objectives:

- within time and cost
- at the planned performance/technology level to achieve the scope goal
- effective and efficient utilization of the assigned resources
- accepted by the customer

These dimensions are still considered the most important when measuring project success. Although following triple constraints of the project illustrates how project basic elements interrelate, there are other elements also in important roles. Quality and customer or sponsor satisfaction are often a key factor in project success. Successful project management means achieving all three project goals and succeeding to satisfy project sponsor (Schwalbe, 2010).

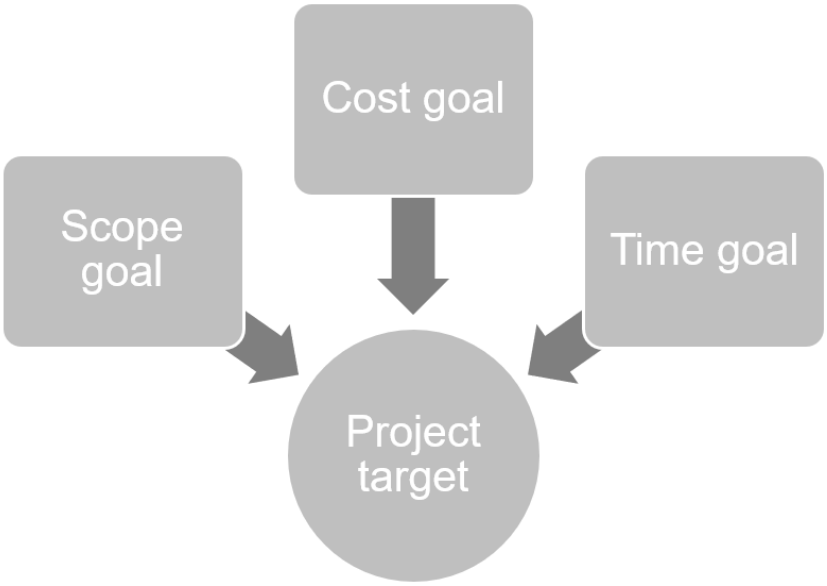

FIGURE 1 Project management triple constraints (Schwalbe, 2010, p.9)

In addition to the project holy trinity, project success requires an effective project manager and project managers' close co-operation with the project sponsor and customer, project stakeholders and the project team (Schwalbe, 2010).
Important dimension in project success is also overall satisfaction of the customer. Pirhonen (2013) summarizes the project success dimensions with three distinct but interconnected components: project management success, product success and learning success.

TABLE 3 Dimensions of project success (Pirhonen, 2013)

Success dimension	**Assessment criteria**	**Time perspective**
Management	Time, cost, quality	Short term
Product	Meeting the strategic stakeholder objectives Satisfaction of users and stakeholders Business and direct success Financial rewards	Long term
Learning	Knowledge management during a project Continuous stream of successfully managed projects Extent of culture of effective knowledge transfer	Short / Long term

Project success is multi-dimensional, dependent on context and interpreted differently by different stakeholders. Success of project management is highly

dependent on the competence of the project manager (Pirhonen, 2013, Whittaker 1999). Dekkers and Forselius (2007) mention project scope management as a critical success factor of successful ICT project completion. Number of human factors are also influencing IS project success, e.g. competencies, project managers and team member's skills and experience, support from top management, quality of project management and leadership and stakeholders´ involvement (Gottschalk and Karlsen, 2005). Turner and Muller (2005) conducted a research into whether the project manager's leadership style is a success factor on projects and existing literature does not typically mention it as a success factor on projects. Prabhakar (2008) made a conclusion in his study, that project manager is in important role in achieving successful project and project manager's leadership style has profound impact on project success. Projects fail more often due to lack of project management than due to technical issues, so the role of project manager is remarkable for project success (Pirhonen, 2013).

Project success factors should be defined and implemented with the clear method in the beginning of the project. Project success factor concept defined by Elbaz and Spang (2020) includes following enablers: project organization, project team, project management workflow, contract management, communication, knowledge transfer and project documentation. With these enablers other success factors can be easily implemented in projects.

2.5 Summary

This chapter focused on describing and defining a project which is currently mostly used way to organize work in IS area. Project management is a new form or management. Key dimensions of project management were presented and in summary, project management include use of different management and leadership styles to achieve set targets and goals. Virtual project management is used more nowadays as project team members are located in different cities and countries and especially now during Covid-19 time when majority of people are working remotely.

3 CURRENT CORE COMPETENCE REQUIREMENTS OF AN INFORMATION SYSTEMS PROJECT MANAGER

In this chapter the characteristics of an information technology project manager competence expectations from the literature will be presented.

3.1 Definitions of the competence

Concepts of competency and competence are used widely from individual and enterprise perspective. Numerous additional concepts are used to explain similar aspects like capabilities from an enterprise or individual perspective and KSA (knowledge, skills, abilities/attitudes) from an individual perspective (Holtkamp, 2015). Competence, definitions of it and how it can be measured, has been researched a lot during last decades (Aitken & Crawford, 2008; Stewenson & Starkweather, 2010). Woodruffe (1993) proposed that the term competence could be used in a job-related (area of competence) and/or in a person-related sense (competency). He refers to overall ability to perform a job in competent way and each competency is a behavior dimension which is relevant to performance in the job. Boyatzis (1982) defines job competence as a latent character of the person which leads to good performance at work. Personal competencies reflect capabilities and talent of the person. Characteristics and job competencies of the person are considered as competencies in different levels. Boyatzis also describes skills as a repeated human behavior which is related to achieving objectives and goals and it is also visible for other people. Project management field is not static but continuously changing environment, where also the role of project manager as well as requirements are in constant change (Muller & Turner, 2012).

Project management Institute (2011) defines project manager's competence as a skills and capacity, which is required to achieve project objectives and goals. Mirabile (1997) defines competency as a knowledge, skills, ability, or characteristics related with high performance on a job, such as leadership, problem solving or analytical thinking. Knowledge refers to body of information related to performance of job and it is what people need to know to be able to complete a job. According Mirabile (1997) skills are referring to the demonstration of a talent like a verbal skill such as making a presentation.

Common sense defines that competence of project manager is a key factor influencing the successful outcome of the project (Stewenson & al, 2010) In this research, competence is referring to person related competence and skills.

3.2 Project management

Project manager is defined as a person, who is responsible of the project and tasks around it for the whole duration of the project. Project manager is operative manager, whose goal is to achieve project´s targets and objectives with given resources (Artto et al., 2011, Pirhonen, 2013). Project manager is not normally direct manager of the project team members, so communication and negotiation with organizational managers of the members is needed in addition to communication with team members. Role of the project manager is crucial in project success and has lot of changing priorities and responsibilities (Project management institute, 2011). Project manager can be considered as a CIO of the project (Müller & Turner, 2010). Project management institute (2011) defines project manager also as a person, whose objective is to achieve project goals.

Project manager is operative manager and leader, who is responsible of daily activities, leadership and management of the project. Project manager delegates the implementation responsibilities to the project team members to achieve project targets and goals (Ruuska, 1999)

Project manager is responsible of all the parts of the project. PMI (2011) describes the responsibilities of the project manager as following:

- Project plan and additional plans during the project
- Project budget and schedule creation and follow up
- Risk identification and management
- Reporting according the agreed reporting schedule
- Communication to and between project stake holders, especially to project owner and project team.

The competence of the project manager is a factor in successful project management. Both managerial and leadership skills are needed. Managerial skills include processes, tools and techniques used in a project and can be considered as "hard skills". Several studies have addressed the relationship of the project managers competencies and leadership skills to projects performance and success (Gottchschalk & al, 2005, Turner & al, 2005, Jurison, 1999). The combination of project manager's role, characteristics, competencies and leadership skills with knowledge and experiences of the project team, are crucial factors affecting to the success of the project (Pirhonen, 2013). Skills and competencies required from project manager are changing as the projects are always different in many ways (Wateridge, 1997). From this could be deduced, that different kind of project managers are needed to different projects and competency of the project manager is related to project type.

Tolerance of uncertainty is part of the projects always as well as readiness to accept continuous changes. Project manager needs to not only tolerate uncertainty and accept the change, but also to be able to sell changes to project members and stakeholders during the project (Artto et al.,2011, Pirhonen, 2013).

Uncertainty is permanent part of projects and causes lot of stress to project managers. Taipalus, Seppänen and Pirhonen (2020) did comprehensive research about uncertainty in information systems development and found out that uncertainty is caused by stemming from within the development organization, from the client organization and from outside the organization.

Project managers are searching for challenges. Due to this fact, project manager should not be given projects which require lower project management and leadership skills what person currently have. It often leads to negative results in projects (Muller et al.,2007). Nominating most experienced substance expert as a project manager is often a mistake, as the skills of the person can better be utilized as a member of the project team (Artto et al., 2011).

3.3 Project manager

Interest towards project manager's competencies has grown significantly among project management researchers (Kerzner, 2008; Pirhonen, 2013). Work of project manager is demanding, complex, full of continuous changes and requires balancing between many issues and topics at the same time. Due to the versatility of projects, project management requires a mix of different competencies. As projects are more and more considered as the new form of general management, different skills sets are required (Pant & Paroudi, 2008). Project manager role requires good interpersonal skills and broad understanding of several areas to be managed (Ahsan et al., 2013).

Project management knowledge areas are defined by many different standards by different researchers. They are usually separated into multiple project management knowledge areas. Project management institute (2011) separates competencies of project managers to three dimensions: project management knowledge, performance related competencies and personal competencies. PMI (2011) also stresses awareness of application area e.g., understanding of project environment, general management and leadership skills and softs skills like interpersonal skills. The International Project Management Association (IPMA) competence baseline includes three competence areas: Technical competences, behavioral competences and contextual competences (IPMA, 2006).

Muller & Turner (2010) have done research of the main competencies of successful project managers and based on the results of the research, they divided competencies to three different categories: Intellectual competence, managerial competence and emotional competence. With intellectual competence, they refer to critical thinking and analysis, visioning capabilities, imagination and strategic vision. Managerial competence includes resource management, communication and management of the project. With emotional competence, they mean e.g. self-assertion, motivation, flexibility, conscientiousness and effectiveness.

Certain level of technical competence is needed, and it helps to succeed in the project, but managerial and interpersonal skills are the key competencies of project managers. An extensive background is more important than certain

expertise in any technical area as successful project managers are generalists (Jurison, 1999).

Murch (2001) divides project manager competencies to four different categories: personal skills, technical skills, management skills and survival skills. Murch also emphasizes that good project managers are not born, they are trained to be good. They develop their skills continuously through experiences and training. Following table describes what Murch has included to each categories of project manager competencies:

TABLE 4 Competencies of project manager (Murch, 2011)

Personal skills	**Technical skills**	**Management skills**	**Survival skills**
Motivation skills	Knowledge of technology	Organization skills	Flexibility
Leading by example	Project specific technical understanding	Planning skills	Conflict resolution skills
Problem solving skills		Communication skills	Information processing skills
Positive attitude		Knowledge of project management tools	Stress management
		Risk management	Creativity
		Change management	

Project management institute (2011) recommends, that project manager understands and implements expertise in the following project manager competence areas:

- The project management Body of Knowledge
- Application area knowledge, standards and regulations
- Project environment knowledge
- General management knowledge and skills
- Soft skills or human relation skills

In the recent study, project manager competencies were divided to seven groups of competencies: leadership, self-management, interpersonal competencies, communication, technical competencies, productivity competencies and managerial competencies (Alvarenga, Branco, Guedes, Soares & Silva, 2019). The results of this study show that communication, commitment and leadership were the top 3 competencies required from project managers.

Project managers´ competencies need to develop continually and they need to assess their own skills and competencies to identify their own strengths and weaknesses to discover those characteristics they currently have and those that require development (Liikamaa, Koskinen & Vanharanta, 2003).

It cannot be clearly seen from the current research results, that there are special technical requirements of competencies of an IS project manager except in Ashan et al., (2013) research, where the results indicate that IS project manager

in Australia and New-Zealand is required to have also technical skills like good understanding of software development.

3.4 The key competence areas of project manager

In this chapter, project manager competency categorization used in this study, will be presented. The author decided to use this categorization created by Keil & al., (2013) as it was comprehensive, detailed, clear and it has been created based on interviews of IT project managers so that only valid competencies were chosen to the categories. This categorization was used in the analysis of the results of the study interviews.

Competence categorization of Keil & al., (2013) has been created by using Delphi-method. In their research, IT project manager's competencies were inquired in three different phases. In the first phase (brainstorming), 115 competencies were identified all together. By grouping, combining and removing duplicates, research group narrowed the total number of competencies to 48. These competencies were then divided to 10 different competence categories.

In the second phase, (narrowing down), group of IT project managers were asked to select 20 most important competencies. Initial list was reduced in this phase from 48 to 19 competencies.

TABLE 5 Summary of skills categories (Keil et al., 2013)

Skill category	Description	Skill
Team management	Team leadership include those skills that are required as an IT PM for effectively leading and managing project members within and across different teams. Competent IT PMs need to not only provide leadership, but also motivate and empower their team members to successfully execute the project.	Ability to bridge diverse teams Ability to empower future leaders Celebrating accomplishments Leadership Collaboration Ability to motivate team members Virtual team skills
Business domain knowledge	Business domain knowledge encompasses the skills that IT PMs need to work effectively with their business partners. An effective IT PM needs to understand the overall context of the project, in addition to how the project will affect the business and the stakeholders.	Ability to understand the business domain Ability to identify stakeholders Business skills Knowledge of the end product Ability to document process Strategic thinking
Communication	Communication involves the skills required to communicate effectively with those involved in the project. This skill category also includes listening, which is critical for understanding expectations and identifying the issues that arise during the course of the project.	Verbal communication Written communication Listening Ability to construct persuasive arguments
People skills	People skills are required to maintain good relationship with those who are associated with the project. This skill category includes understanding the perspectives of the different stakeholders involved in addition to managing conflicts and exerting influence over people.	Relationship building Understanding of the psychology of the people Conflict management Good people skills Negotiation
Technical skills	Technical skills refer to skills that are normally associated with being an IT developer. This skills category includes technical knowledge as well as knowledge of the development methodologies, processes, and techniques used to develop information systems.	Understanding of the technologies project involves Architectural understand

Skill category	Description	Skill
Project management	Project management includes skills that are relevant to managing the various aspects of IT projects. Competent IT PMs need the ability to effectively plan, monitor and control the project while managing the scope, resources and risks to ensure that the project is completed on time and within budget. This skill category also includes knowledge and experiences of the tools and techniques used in project management.	Scope management Project planning Time management Resource utilization Closing the project PM tool skills Project chartering Cost management Risk management
Personal characteristics	A competent IT PM has particular personal characteristics that may be beneficial to the execution of a project. In this category, we grouped those personal characteristics that may be inherent in nature but can still be nurtured.	Sense of humor Patience Ability to handle stress Seeking consensus Persistence Cooperation Attention to detail
Organizational	Organizational skills include the ability to organize and coordinate project activities and resources. These kills are required by project managers to manage task dependencies and deadlines.	Organization Multi-tasking
Problem solving	Problem solving includes those skills that are necessary for identifying, analyzing and solving the problems that arise during the course of the project.	Analytical skills Research skills
Professionalism	Professionalism refers to the values and qualities of an IT PM that communicate integrity and commitment to quality.	Credibility Commitment Focus on quality Professional skills

One of the most interesting insights of this study is the relative importance of skills categories. Three of the ten skills categories did not contain any skills that panelists ranked as sufficiently important and following seven categories contained ranked skills (table 6).

TABLE 6 Relative importance of skills categories based on mean rank (Keil et al., 2013)

Skill category (in order of importance)	Ranked skills subsumed (mean rank based on 3rd round results)	Mean rank of skills subsumed in category
1. Communication	Verbal communication (3.27) Listening (4.27) Written communication (7.47)	5.00
2. Team management	Leadership (1.67) Ability to motivate team members (9.60)	5.64
3. Project management	Scope management (4.20) Project planning (5.33) Time management (11.87) Resource management (12.67) Risk management (13.07) Cost management (14.87)	10.44
4. People skills	Good people skills (7.93) Negotiation (9.80) Relationship building (12.60) Conflict management (12.80)	10.78
5. Personal characteristics	Attention to detail (13.20)	13.20
6. Organizational	Organization skills (11.80) Multi-tasking (16.4)	14.10
7. Problem solving	Analytical skills (17.20)	17.20

Mean rank of the skills associated with each category showed that communication was defined as the most ranked category. Team management, project management and people skills followed the most ranked category (Keil et al., 2013).

3.4.1 Communication

Keil et al., (2013) describe communication to include all competencies and skills which are needed for communication with the team involved to the project. Listening is also mentioned here as an important competence so that one can understand project expectations and identify problems arising during the project. Verbal and written communication, listening and ability to construct persuasive arguments, are part of this competence category as well.

Communication skills are mentioned in many research as one of the most important skills of project manager and it includes not only communication but also capabilities to listen others and interpretation of other people's behavior

(PMI, 2011; Liikamaa, 2006; El-Sabaa, 2001). Communication competencies are soft skills which are related to capability to communicate in several context e.g. negotiations, customer relationship, conflict management. Communication is essential tool for project manager to connect different stakeholders of the project together (Alvarenga et al., 2019). According to Ziek and Anderson (2015), communication skills enable project managers to be effective in their project and it has clear impact to project success. Also, PMI (2002) defines communication as the key and crucial competence in project management. Communication involves different dimensions, such as oral and written, project internal and external communication, formal and informal, and horizontal and vertical (PMI, 2011). IPMA (2006) highlights that communication should be clear, timely and useful so that right information is transferred to relevant parties on time and regularly enough. In the recent study, results clearly indicated that communication was the most important skill for IS project manager (Varajão, Silva & Pejic-Bach, 2019).

3.4.2 Team management

Team management consist of those competencies and skills that are required for effective leading and managing project members. Leadership, capability to motivate and empower team members is essential part of competent IT project managers work and successful execution of the project. This competence category also includes collaboration, accomplishment celebration, ability to bridge diverse teams and virtual team skills (Keil & al., 2013).

Project manager's leadership competencies are including all those competencies which are needed for successful leadership of project personnel towards project objectives and goals (Liikamaa, 2006). In general, leadership seems to be underestimated in projects, even though it is required in any form of organized work like in projects (Ruuska et al, 2003). Leadership competencies are required from project managers and include e.g., decision making, commitment, initiative, decision making capability and achievement orientation in addition to general leadership (Alvarenga et al., 2019).

PMI (2011) defines differences between leadership and management so, that leadership or leader focuses on big picture objectives and on long term goals, while they inspire team members to reach their goals. Management or manager works with day-to-day details to meet specific objectives. Differences of these two competencies can be seen from these phrases of PMI (2011, p. 24):

> Managers do things right; leaders do the right thing.
>
> Leaders determine the vision, and managers achieve the vision.
>
> You lead people and manage things.

Kets de Vries (2001) claims that leaders are assumed to have charisma, but managers trust on their position in the organization for authority and power. Leadership is a set cluster of competencies that make certain people effectively achieve

their goals. Kets de Vries argues also that most effective leaders have set of competencies in three areas:

- Personal competencies (e.g., achievement motivation, personal effectiveness, energy and self-confidence)
- Social competencies (e.g., empathy, influence and political awareness)
- Cognitive competencies (e.g., conceptual thinking)

Project manager should be able to motivate and support the project team members (Murch, 2001). Motivation also means people´s praise and talk to them to increase commitment to the project. Creation of the team spirit is also seen as an important competence for the outcome of the project. Team spirit can be raised with open gratitude and rewarding of the project team. Purpose of the good team spirit is to get project team working together towards common goals (Fisher, 2011).

According Muller & Turner (2007), project manager´s emotional competence and leadership competence promotes success of the project. Multicultural project teams seem to require more leadership than local projects. One of the biggest challenges for project managers is to lead multicultural teams especially if all the member's cultures are not known by project manager (Mäkilouko, 2004).

3.4.3 Project management

Keil & al., (2013) include skills that are required to manage various aspects of IT projects. Competent IT project manager can do effective project plans, follow up and control the project from the beginning to the end. Scope management, resource utilization and risk management ensure that project is completed on time and within agreed budget. This category also includes time management, resource utilization, PM tools skills, project chartering and closing the project.

Project management knowledge in general refers to the book "Project Management Body of Knowledge" (PMBOK, 2011). PMBOK is a project management standard which describes project management processes, tools and technics which can be used to achieve successful project result (PMI, 2011). Management competencies of project managers are referring to traditional project management competencies e.g., project planning, organization skills, budgeting, resource management, risk management, conflict management and other basic project manager competencies (PMI, 2011; Ruuska & al, 2003, Schwalbe,2011). Management competencies mean those competencies required to be able to manage and take the project forward (Murch, 2001). In this research, project management competence means the knowledge of project management methods, tools and practices.

Project planning and organization skills are the key competencies in project management. Successful project planning requires general understanding of the project scope, discipline and knowledge and experience of the methods how

project planning can be done (Murch, 2001). Project planning also requires understanding of the dependencies and big picture of the project (El-Sabaa, 2001). Conflicts are serious threat to project success and possible conflicts should be recognized and solved early enough before they endanger project outcomes (Fisher, 2011). Several studies are referring to conflict management as an important competence of the project manager (Clarke, 2010; Fisher, 2011; Stevenson & al, 2010).

3.4.4 People skills

Project managers people skills are required to create and maintain good relationship with project team members and other project stakeholders. It includes also understanding the psychology of people, conflict management, negotiation skills and exerting influence over people in the project (Keil & al., 2013). Teamwork relates to interpersonal skills and confirms that it is important for project managers to create, keep and enlarge good interpersonal relationship in their projects (Clarke, 2010). Project managers should show strong commitment to their projects and maintain flexibility when dealing with people (Alvarenga et al., 2019). El-Sabaa (2001) uses term human skills and it is primarily how project manager is working with people. Competent human skills project manager is sensitive to the team members needs and motivation and is skillful in communication with team members and project stakeholders as well.

3.4.5 Personal characteristics

Keil & al., (2013) include certain personal characteristics to this category. IT project manager's persistence, consensus seeking, and patience are required successful execution of a project. Ability to handle stress, cooperation skills, sense of humor and attention to details are also mentioned in their study as a part of this category.

Personal competencies are often described as natural skills and capabilities and can be considered as characteristics of a person (Liikamaa, 2006). Project manager should be flexible, patient and perseverant (El-Sabaa,2001; Murch, 2001). These characteristics relate to coping with continuously changing situations, often associated with the survival of uncertainty (Stevenson & Starkweather, 2010).

Emotional intelligence is one of the most important characteristic of project manager, which supports project success. Emotional intelligence explains variance in the project manager competence of teamwork, attentiveness and managing conflicts (Clarke, 2010). Clarke (2010) also found out in his research, that project managers' empathy was clearly associated with the attentiveness competence. Emotional intelligence capability and emotions usage to facilitate thinking, was also found to be clearly related with the transformational leadership dimensions. Emotionally intelligent project manager co-operates better as they understand their own and emotions of others and can manage emotions better. It helps to create trust and friendliness to the project organization and helps to get team to complete their tasks on time (Maqbool, Sudong, Manzoor & Rashid, 2017).

Achievement orientation, commitment and having initiative were the three most mentioned competencies in this group in the study of De Rezende & Blackwell (2019). Project manager should also create trust and have the courage to challenge project members and ideas in order to achieve targets of the project.

3.4.6 Organizational skills

Organizational skills are required from competent IT project manager. Competent IT project manager needs to have ability to organize and coordinate the project resources and activities. Managing deadlines and task dependencies is important part of the project and project manager needs to be able to multi-task as well (Keil & al., 2013). El-Sabaa (2001) combines conceptual and organizational skills together and emphasizes project managers ability to envision the project as whole. Project manager needs to be able to recognize dependencies of the project and how changes in any part are affecting to other parts. Organization and coordination skills are focusing on a hands-on attitude to ensure the achievement of defined goals. Organization skill is also about the ability to systematically arrange and order things and project team members with the purpose of enabling them to effectively work together in the project. This competence is also including coordinating, determining the workflows and tasks, structuring information flows and organizing project team members (de Rezende & al. 2019).

3.4.7 Problem solving skills

Keil & al., (2013) include skills which are mandatory for identifying, analyzing and solving problems to this category. Analytical skills and research skills are also part of this category. De Rezende & al. (2019) describe problem solving as capability to find and create a solution to question or unexpected issue in the project.

Problems are part of the projects always and one cannot manage project so well that no problems will occur. When project manager has an effective way to recognize and solve problems, project can succeed (Jurison, 1999). Problem solving has been mentioned in numerous studies as important competency of a project manager (Keil, Lee & Deng, 2013; Fisher, 2010; Tian, 2020).

3.4.8 Business domain competence

Business domain competencies are referring to specific industry or domain related competencies related to area where project is implemented. It includes knowledge and understanding of the customer´s business. It is also knowledge of used technologies, technical understanding of application area and knowledge about specific standards related to the area (Keil et al., 2013). Technical understanding can also include special knowledge of tools and technologies used and understanding of methods, processes and procedures related to the environment

(El-Sabaa, 2001). One important part of application area competencies is also project environment knowledge, which includes social, political and physical project environment. Common understanding and agreement of project environment is important for the project communication and understanding customer requirements in requirement analysis, not only for project manager but for the whole team (Schwalbe, 2010). Study of (Ko and Kirsch, 2017) suggests that IS project manager role should be shifting towards business knowledge. Hybrid IS PM has one foot in the information technology domain and the other foot in business domain. Shifting towards business knowledge, increases possibility to deliver successful project (Ko et al., 2017).

3.4.9 Technical skills

Technical competencies of an information project manager have been studied in many studies and according Keil et al., (2013), technical competencies are not valued in IT project manager's competencies. In their study, interviewed IT project managers emphasized the role of the project manager in projects is to concentrate leading the project. IT project manager anyhow needs understanding of project related technologies, methods and processes needed in the project. Project manager needs to communicate with technical specialists of the project, so basic understanding of the technologies is needed. Also, Stevenson and Starkweather (2010) mention that IS directors' value technical competencies of an IS project manager little and in their research for IS managers, technical competence of an IS project manager was only in the eleventh place of important competencies. El-Sabaa (2001) describes technical skills as valid specialized knowledge and analytical capability to use techniques and tools of information systems area.

3.4.10 Professionalism

Keil et al., (2013) define professionalism as values and qualities of an IT project manager that are showing integrity and quality commitment. Credibility, commitment, focus on quality and separately mentioned professional skills are the key competencies in this categorization. De Rezende & Blackwell (2019) include ethics and accountability to project manager professionalism. In overall, professionalism is about how people behave at work. Ethics in project management mean moral principles related to behavior while managing the project. Integrity, honesty, reliability, punctuality, politeness and respectfulness can be considered as part of professionalism. Developing accountability and responsibility skills was mentioned in addition to ethics of a project manager.

3.5 SUMMARY

Project manager competencies has been studied a lot during last decades. There are many ways to categorize competencies and many kinds of views to combine characteristics under bigger entities. In this chapter, competencies were characterized under seven categories: team management, business domain knowledge, communication, people skills, technical skills, project management, organizational skills, problem solving and professionalism. Based on reviewed studies, project manager's competencies affect clearly to possibilities of the project to succeed. It is important to understand what kind of competencies are expected from effective and successful project manager.

4 METHODOLOGY

Research methodology, objective and research model are first presented in this chapter. The research methodology of this study is a qualitative research method conducted with interviews. Research objective is to find answers to the research problem and to the research questions. Empirical research design is presented along with data analysis method used.

4.1 Research methodology

A qualitative research method is used in this study. Objective of qualitative research is to understand the object of the research (Hirsjärvi, Remes and Sajavaara (2009). Qualitive research is about information gathering and people are used as the information gathering source. The researcher relies on her or his own observations, findings and discussions with interviewed people. Research material is studied in detailed level by utilizing inductive analysis. The research object is chosen on purpose, not randomly (Hirsjärvi et al., 2009). According Järvinen and Järvinen (1995), interview is considered as a main method to collect data in qualitive research. This method was chosen to collect more data and understanding of required skills of an IS project manager, as in the interviews more detailed answers can be asked from the interviewees.

According to Hirsjärvi et al. (2009) research should start by getting the knowledge and understanding about the area of the research, therefore this study started with the literature review. If researcher is researching a phenomenon, she or he can choose group of people and interview people from that group to validate or to find new information. (Hirsjärvi et al., 2009). Based on this model, interviews were conducted in this study as the source of qualitative empirical research material gathering. All the interviews of this study were conducted in information systems sector. Interviewed project managers and customer unit representatives are all working for big international information systems supplier and customers interviewed are from different industry sectors.

4.2 Research objective and research model

As mentioned earlier, the purpose of this study is to find out what are the future competence expectations of an information technology project manager and how expected competencies have been changing from current competencies that can be found from the reviewed literature. The main research problem of the thesis is the following:

- What are the future competence expectations of an information systems project manager?

Research is also trying to answer to these following questions:

- What are the differences between current and future competence expectations of the information systems project manager based on empirical research?
- How information systems project manager competence expectations have changed compared to the literature review and empirical research results?

This framework is based on the categorization used as a basis of this study (Keil & al., 2013).

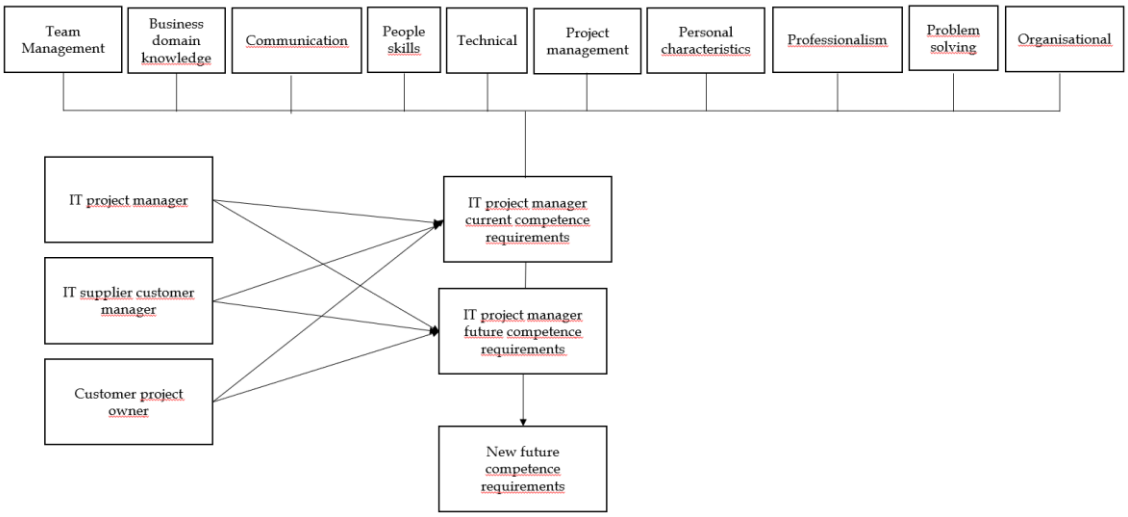

FIGURE 2 The research framework

This research model describes how this study is done to identify current and future IS project manager competencies and update original categories based on findings of the interviews.

4.3 Data collection and analysis

The interviews of this research were conducted as semi-structured interviews with open-ended questions. Chosen interview type was theme-based interview. Theme based interview is a mix of survey and open-ended questions. The theme areas are usually defined, and interview can be conducted as individual interviews, pair interviews or group interviews. Individual interview is the most

usual way of interviewing (Hirsjärvi et al., 2009). Interviews in this research were conducted as individual interviews. As interviewers, one should be prepared for both talkative and taciturn interviewees, it is recommended to do a couple test interviews before that actual research interviews (Hirsjärvi et al. 2009). Prior to actual interviews, two test interviews were conducted for this study. As a result of these two test interviews, themes and questions of the interview were proven to give answers to the research problem and research questions.

The author asked face-to-face or called each person individually to participate to the interviews. Willingness and interest towards participating to this study was asked from each participant and the author explained the background and the purpose of this study for each of participants. Participants were chosen from different industry sectors and were all working closely with projects in information systems area. After getting their approval to participate to this study, author invited people to interview either face-to-face or utilizing skype meeting. All the interviews were eventually conducted as skype meetings and recorded with skype meeting recording for later use. Interview recording permission was obtained before each individual interview. Author confirmed in the beginning of each interview, that interviews were confidential and only the author and/or university professor could have access to the interview materials. Every participant received themes of the interview in advance so that they were able to be prepared for the interview. Interviews were conducted in semi-structured way and based on answers, the author was able to ask participant to give more details about their answers. Interviews lasted from approximately 45 minutes to 110 minutes.

Twelve people were interviewed for this study and all of them had more than five years experiences of working in information systems projects. All the interviews were transcribed after interviews by author. The interview themes and questions were the same for all interviews. Interview questions were designed to provide answer to study problem and related study questions.

After the interviews were completed and transcribed, the author started analysis of the interviews. The author analyzed each interview one by one and theme by theme. The author created an excel sheet based on Keil & al., (2013) categorization of IT project manager competences. Every category with specified competences was part of the excel and all competencies which were not found from the excel, were added to the list either under valid category or to the end of the list as a new competence.

When all the interview data was analyzed from the transcriptions, the author collected the separate lists of current competence requirements and future competence requirements. As a result, several new skills compared to original skills in the categories, were added to the valid categories and similar expressions were grouped. As author conducted the interviews by herself, she was able to interpret the interview answers also based on the expressions and how they were said.

5 RESULTS

This chapter describes the results of this study. People with relevant background from information systems project management and projects were interviewed to this study. Interviewees were different ages, genres and from different organizations but all of them had extensive experiences of information systems projects. Results are divided into ten different groups based on the ten project manager competence areas presented in the chapter three. First results related to current project manager competencies are presented and after results from future competence requirements.

5.1 Background information about research subjects

Prior to the actual interviews, all interviewees answered to few background questions, to review the variety between different interviewees. Background questions included questions about their age, gender, educational background, current role and experience in the projects, experience from working as a business owner or customer project manager and steering group work experience in years. Twelve people were interviewed all in all for this study. Analysis of the background information confirmed that interviewees had extensive experiences from the study area. All interviewees had more than 5 years of experience in information systems projects area (table 7).

TABLE 7 Background information about interviewees

Question	Answer option	Frequency
Age	30 – 39 years	2
	40 – 49 years	6
	50 – 59 years	4
Gender	Female	5
	Male	7
	Vocational school	1
	Undergraduate degree	4
	Graduate degree	7
Role	IS supplier customer manager or executive	2
	IS supplier project manager	1
	IS supplier program manager	4
	Customer business stakeholder	3
	Customer PMO head	1
	Customer manager	1
Work experience in IS projects	5 – 10 years	1
	11 – 15 years	2
	Over 15 years	9
Work experience as a business owner or customer project manager	6 – 10 years	2
	11-15 years	5
	Over 15 years	5
Work experience from project steering groups in IS-projects	6-10 years	1
	11-15 years	4
	Over 15 years	7

Age distribution of the interviewed persons was between 30 – 59 years and five of them were female and seven males. An author interviewed four project or program managers from IS supplier, four IS supplier customer unit representatives who are working as an IS supplier project owner and four project owners from customer side.

5.2 Empirical research results

5.2.1 Current competence requirements of an IS project manager

Interviewees were interviewed about current and future competence expectations of an IS project manager to get answers to research questions. Interviewees told very openly their opinions and experiences of competencies of good IS project managers. Interviewer did not show any prepared list of competencies to interviewees.

Analysis of the result was based on project manager competency categorization done by Keil et al., (2013). New competencies found in interviews were

added to most appropriate category with bolded cursive text. The author has tried to group answers meaning the same thing under the same description.

Team management category was changed to team leadership by an author of this study as it describes better this category and skills listed under it.

Team leadership

Team leadership is the first category and all interviewees mentioned leadership as mandatory competence of project manager (table 8). One interviewee told:

> Leadership is the most important competence of good project manager. PM should not be substance specialist, but overall understanding of used terminology and context is needed. PM is a leader who leads the project to the desired goal. Leadership is "service occupation" - you as s leader must enable good performance for your team.

Another interviewee explained his view of project leadership this way:

> Authoritarian management is old fashion and there is no space for it anymore in modern project management. Project manager needs to be able to lead the project, lead people, steer with questions and to be able to challenge specialists also. By managing people, you cannot succeed in project management, but good leadership is mandatory for project success.

TABLE 8 Answers related to team leadership

Skill category	Description	Skill	Frequency
Team leadership	Team management includes those skills that are required as an IS PM for effectively leading and managing project members within and across different teams. Competent IS project managers need to not only provide leadership, but also motivate and empower their team members to successfully execute the project.	Leadership	12
		Ability to motivate team members	9
		Multi-cultural team leading	**7**
		Emotional intelligence	**7**
		Collaboration	6
		Ability to bridge diverse teams	6
		Virtual team skills	5
		Self-leadership	***4***
		Coaching	**2**
		Ability to empower future leaders	1

Several interviewees emphasized the importance of leading from the front with your own example. Motivation of the team was also mentioned by several interviewees:

> Project manager must know how to motivate his/her team to do their best in the project and work together toward common goal.

Multi-cultural team leading, emotional intelligence, project managers self-leadership and coaching were added as a new skill compared to original categorization as they were mentioned in several interviews.

> You as a project leader, need to be capable to lead people coming from different countries and cultures. It requires genuine interest towards your team members, respect of different cultures and personalities.

As all interviewed people are working in either multicultural company or working with IS suppliers from other countries, it is evident that capability to lead multi-cultural teams was brought up in seven interviews.

Emotional intelligence was mentioned in seven interviews and self- leadership in four interviews. One interviewee told:

> You can only lead others if you can lead yourself and your ways of working. You learn it by doing yoga, mindfulness and different kind of sports to keep yourself in good physical and mental health.

Business domain knowledge

Second category is business domain knowledge, which emphasizes project manager skills related to customer business knowledge and business skills and as a new skill in this category – stakeholder management (table 9). The most important skills in this category are clearly ability to understand business domain and business skills.

> Project manager should get to know the customer and their business e.g. reading their annual report and getting to know the industry even if it is not clearly involved to the project. To succeed in your project, you need to understand the business of the customer and in what kind of markets they are operating.

Several interviewees also told that customers appreciate and more and more also expects project manager to understand their business and challenges the project will solve:

> PM needs to understand customer business environment in the level that you know what and how it will change their business environment, what benefits and value to the customer it will bring.

In original skill category, ability to identify stakeholders was listed as mandatory skill for project manager but in 4 interviews, interviewees told that overall

stakeholder management is important for good project manager (table 9). One extract from interviews:

> Project manager needs to be able to not only identify project stakeholders but also lead them throughout the whole project.

TABLE 9 Answers related to business domain knowledge

Skill category	Description	Skill	Frequency
Business domain knowledge	Business domain knowledge encompasses the skills that IS PMs need to work effectively with their business partners. An effective IS PM needs to understand the overall context of the project, in addition to how the project will affect to business and the stakeholders.	Ability to understand the business domain	11
		Business skills	10
		Stakeholder management	**4**
		Ability to identify stakeholders	1
		Knowledge of the end product	1
		Strategic thinking	1

Ability to document process, strategic thinking, knowledge of endo product and ability to identify stakeholders are not seen as important skills of project manager or they are foregone conclusion.

Communication

Third category is communication and in overall, that has been identified as a very important competence area for project manager (table 10). Verbal and written communication were mentioned in every interview and listening in ten out of twelve interviews. One of the interviewees told:

> Project managers must be able to listen customer to hear what they really need. Listening project team members is mandatory as well for the best outcome.

English skill was mentioned also by majority of the interviewees as majority of the IS projects involve participants from other countries as well, so project documentation and meetings are often held in English.

TABLE 10 Answers related to communication

Skill category	Description	Skill	Frequency
Communication	Communication involves the skills required to communicate effectively with those involved in the project. This skill category also includes listening, which is critical for understanding expectations and identifying the issues that arise during the course of the project.	Verbal communication	12
		Written communication	12
		Listening	10
		English skills	***10***
		Presentation skills	***9***
		Ability to construct persuasive arguments	2

Presentation skill was mentioned by nine out of twelve interviewees separately related to communications. Both English and presentation skills were added to this category. One extract from interviews related to presentation skill:

> Project manager needs to be able to create visual and nice-looking presentations as well as be good in presenting them.

People skills

People skills are required from project manager to build and maintain good relationships with project team and stakeholders. Based on interviews, first three skills from table below were mentioned the most important skills from this category (table 11).

TABLE 11 Answers related to people skills

Skill category	Description	Skill	Frequency
People skills	People skills are required to maintain good relationship with those who are associated with the project. This skill category includes understanding the perspectives of the different stakeholders involved in addition to managing conflicts and exerting influence over people.	Good people skills	9
		Relationship building	8
		Understanding the psychology of people	6
		Conflict management	3
		Negotiation	2

One customer manager had this to say about relationship building:

> Project manager needs to build up good relationship to all parties involved to the project, both internal and external. When you have good relationship, you can bring up easier also more difficult topics to the awareness of others and be honest.

Technical skills

There was lot of comments about technical skills in the interviews. Understanding of the technologies project involves and high-level architectural understanding was brought up in many interviews and author added those to this competence category (table 12). One project manager commented as following:

> Technical skills are not needed for project managers because architects and technical specialists have needed technical competencies, but project manager should understand technical domain in high level.

Several interviewees commented that project manager should more be like generalist, instead of concentrating to certain technology or business area:

> Project manager should not concentrate to certain technology, because it will be limiting the competences and PM will start to focus wrong things in the project. PM will start to go to deep to the technologies with substance knowledge and it easily leads to micromanagement.

> Nowadays too often big programs are led by amateurs whose competencies are 80% substance and 20% project management. That does not work, and project manager should have 20% of substance knowledge and 80% of project manager competences.

TABLE 12 Answers related to technical skills

Skill category	Description	Skill	Frequency
Technical skills	Technical skills refer to skills that are normally associated with being an IS developer. This skills category includes technical knowledge as well as knowledge of the development methodologies, processes, and techniques used to develop IS systems.	***Understanding of the technologies project involves***	***10***
		Architectural understanding	***6***
		Technical skills	5

Development methodology skill was not seen as important from original categorization by any interviewee, so it was removed from the above table (table 12).

Project management

Project management skill category got clearly biggest amount of hits from the interviewees. Basic project manager skills related to project planning, scope management and all the other parts of project lice cycle were mentioned in most of the interviews (table 13). Here is an extract from one of the interviews related to risk management:

> On top of basic risk management, project manager needs to be able to take risks in the project as decisions needs to be done often with limited amount of facts.

Majority of the interviewees mentioned that it is important to know different project management methods and to be able to choose right method for the project. One of the experienced program managers said:

> PM needs to understand which project method suites best to certain kind of projects and to be able to utilize the chosen method effectively. PM needs to have not only knowledge of agile methods but capability to use them in projects.

TABLE 13 Answers related to project management

Skill category	Description	Skill	Frequency
Project management	Project management includes skills that are relevant to managing the various aspects of IS projects. Competent IS PMs need the ability to effectively plan, monitor and control the project while managing the scope, resources and risks to ensure that the project is completed on time and within budget. This skill category also includes knowledge and experiences of the tools and techniques used in the project management.	PM tool skills	12
		Scope management	11
		Project planning	10
		Time management	10
		Resource utilization	10
		Closing the project	10
		Cost management	10
		Risk management	10
		Project chartering	8
		Project method competence (waterfall, agile, safe, hybrid projects	***8***
		Devops knowledge and understanding	***3***
		Project financials including customer invoicing	***2***
		Itil process knowledge and understanding	***1***

Project financials as whole were mentioned by two interviewee and an author added it as a new skill to this category because project finances are much more than just cost management. One customer manager explained why this is so important for him as a project owner:

> Project manager needs to know the customer contract well to understand what belongs to the agreement and what can be invoiced separately based on the work completed or changes approved to the original scope. Finance follow up, cost and revenue forecasting and reporting in overall about finances of the project are mandatory skill for PM.

Itil process knowledge and understanding was mentioned separately in one interview. Itil change management process is important in projects as all changes to the scope of the projects, should be done via proper changes.

Personal characteristics

The biggest number of new skills was added by an author to this skill category based on interview answers. Proactivity and spontaneous was mentioned in seven interview and this requirement came from either customer manager or from IS supplier customer manager. They see that project manager must be proactive, actively seek and propose improvements to the customer (table 14). One customer manager emphasized the importance of solution-oriented attitude:

> Bring me solutions, not problems – solution-based attitude is mandatory for good project manager.

TABLE 14 Answers related to personal characteristics

Skill category	Description	Skill	Frequency
Personal characteristics	A competent IS PM has particular personal characteristics that may be beneficial to the execution of a project. In this category, we grouped those personal characteristics that may be inherent in nature but can still be nurtured.	***Proactivity and spontaneous***	***7***
		Ability to motivate team members	***6***
		High moral and working ethic	***6***
		Learning ability	***5***
		Execution capability	***5***
		Situational awareness	***5***
		Decision making capability	***5***
		Visionary skills	***4***
		Punctuality	***3***
		Empathy	***3***
		Delegation skill	***2***
		Networking capability	***2***
		Mental and physical health	***2***
		Sales mindset and capability to sell	***1***

Interesting thing is that none of the original skills was mentioned in any interviews. Instead of existing skills, interviewees emphasized ability to learn, capability to execute, situational awareness and decision-making capability. Sense of humor, patience, ability to handle stress, seeking consensus, persistence,

cooperation and attention to detail were removed from the table above (table 14). One program manager explained this way the importance of situational awareness:

> Project manager needs to be able to understand the current situation and proceed what is the best for that situation. PM is not just someone who implements certain methodology in the project but needs to see the whole forest from the trees.

Interesting comment about sales mindset and capability to sell was mentioned by one IS supplier customer manager:

> Project manager needs to be capable to sell solutions to the customer, not only in the sales phase but throughout the whole duration of the project. Add-on sales can make big impact on project success and financials.

Also, visionary skills, personality, punctuality and empathy were identified as important skill by several interviewee and were added to this skill category.

Organizational skills

Organization skill was mentioned by nine out of twelve interviewees as a mandatory skill for project manager (table 15).

TABLE 15 Answers related to organizational skills

Skill category	Description	Skill	Frequency
Organizational	Organizational skills include the ability to organize and coordinate project activities and resources. These skills are required by project managers to manage task dependencies and deadlines and include the ability to multi-task.	Organization	9

Multitasking is not seen any more as a good and needed skill as it was not mentioned in any interviews, so it was removed from the table.

Problem solving skills

This category of problem-solving skill did not get many answers in the interviews (table 16):

TABLE 16 Answers related to problem solving

Skill category	Description	Skill	Frequency
Problem solving	Problem solving includes those skills that are necessary for identifying, analyzing and solving the problems that arise during the course of a project.	Analytical skills	2
		Research skills	1

Only two interviewees mentioned analytical skills as important skill of project manager and research skill was mentioned only by one interviewee.

Professionalism

Skill category of professionalism was identified as quite important skills in interviews. Ten out of twelve interviewees mentioned commitment and professional skills as mandatory skills for project manager. One customer manager emphasized the importance of this commitment:

> PM needs to take the ownership of the project in total, not just work for the project. PM is the CEO of the project and needs to stand behind it in every situation.

Credibility and focus on quality were not seen as important as previous skills in this category (table 17):

TABLE 17 Answers related to professionalism

Skill category	Description	Skill	Frequency
Professionalism	Professionalism refers to the values and qualities of an IS PM that communicate integrity and commitment to quality.	Commitment	10
		Professional skills	10
		Credibility	4
		Focus on quality	3

Only four out of twelve interviewees mentioned credibility separately in the interviews and even one less focus on quality. These skills might be thought obvious requirements for an IS project manager.

5.2.2 Future competence requirements of an IS project manager

Team leadership

Team leadership is clearly even more important skill area in the future than it was in current skill answers. Ability to bridge diverse teams, leadership in overall and remote leadership was mentioned in most of the interviews as mandatory skills of project manager in the future (table 18). One extract from interviews:

> Pm need to understand when team can be located all over and when it is better to work in same location to achieve best results. Teams who are located physically close to each other's, achieve results quicker and better results. As projects with global teams are becoming new normal more and more, project manager must know how to lead global teams remotely and virtually.

TABLE 18 Answers related to future team leadership skills

Skill category	Description	Skill	Frequency
Team leadership	Team management includes those skills that are required as an IS PM for effectively leading and managing project members within and across different teams. Competent IS project managers need to not only provide leadership, but also motivate and empower their team members to successfully execute the project.	Ability to bridge diverse teams	12
		Leadership	12
		Remote leadership	***11***
		Collaboration	10
		Virtual team skills	10
		Multi-cultural team leading	***10***
		Self-leadership	10
		Emotional intelligence	***9***
		Ability to motivate team members	8
		Mentoring	***6***
		Coaching	***5***
		Ability to empower future leaders	3

Collaboration, virtual team skills, multicultural team leading and self-leadership with emotional intelligence were mentioned also by most of the interviewees. Mentoring was brought up by six interviewees and one of the program managers told based on his experience:

> Leadership especially is more and more important in the future and PM work should be 80% of people leadership and 20% of project management and managing things around the project. Soft skills are also more important in the future. You as a project manager, need to know how motivate your team, how to coach and mentor as well.

Business domain knowledge

Business domain knowledge is going to be mandatory skill for project manager also in the future. Ability to understand the business domain was brought up in all interviews and most of the interviewees told also that project manager must have understanding of the business environment in the level that he/she knows how it will change the customer business environment (table 19). One customer manager shared her view related to this area:

> Project needs to provide value to the customer and project manager needs to lead project to that point where customer gets business value out of the project.

Other customer manager saw role of project manager changing towards advisory role:

> PM needs to work more as an advisor to the customer in the future. PM should also question customer requirements and expectations so that best possible solution can be found to bring value to the customer.

TABLE 19 Answers related to future business domain knowledge

Skill category	Description	Skill	Frequency
Business domain knowledge	Business domain knowledge encompasses the skills that IS PMs need to work effectively with their business partners. An effective IS PM needs to understand the overall context of the project, in addition to how the project will affect to business and the stakeholders.	Ability to understand the business domain	12
		Business skills	8
		Stakeholder management	**6**
		Ability to identify stakeholders	2
		Knowledge of the end product	2

Stakeholder management was brought up by same interviewees than in current competence expectations. Ability to identify stakeholders, knowledge of end products, process documentation and strategic thinking was not seen as important skills for project manager in the future by interviewees.

Communication

The results from the interviews remained quite the same than when talking about the current competence requirements of IS project manager. In overall, communications are experienced as an important skill for future project manager. English skills were mentioned the most from this category. Written and verbal communication, listening and presentation skills were mentioned in ten interviews our of twelve. Ability to construct persuasive arguments was said important only by one interviewee (table 20).

TABLE 20 Answers related to future communication skills

Skill category	Description	Skill	Frequency
Communication	Communication involves the skills required to communicate effectively with those involved in the project. This skill category also includes listening, which is critical for understanding expectations and identifying the issues that arise during the course of the project.	***English skills***	***11***
		Written communication	10
		Verbal communication	10
		Listening	10
		Presentation skills	***10***
		Ability to construct persuasive arguments	1

One customer manager shared her view of importance of communications in project management:

> Project manager must create systematic way for communications in the project and outside of the project. Project needs to show up frequently and effectively to all parties involved. Proper communication plan is always needed.

People skills

People skills results remained quite the same than in current competence requirement analysis. Most important skill in this category is overall people skills and relationship building (table 21):

TABLE 21 Answers related to future people skills

Skill category	Description	Skill	Frequency
People skills	People skills are required to maintain good relationship with those who are associated with the project. This skill category includes understanding the perspectives of the different stakeholders involved in addition to managing conflicts and exerting influence over people.	Good people skills	8
		Relationship building	7
		Understanding the psychology of people	4
		Conflict management	1
		Negotiation	1

Understanding of psychology of people, conflict management and negotiation skills were not seen as that important as only few of the interviewees mentioned those during the interviews.

Technical skills

Understanding of the technologies project involves and architectural understanding are the most important skills in this category still like in current competencies. Technical skills and development method skills were not mentioned by any interviewee, so they were removed from the table (table 22).

TABLE 22 Answers related to future technical skills

Skill category	Description	Skill	Frequency
Technical skills	Technical skills refer to skills that are normally associated with being an IS developer. This skills category includes technical knowledge as well as knowledge of the development methodologies, processes, and techniques used to develop information systems.	***Understanding of the technologies project involves***	***10***
		Architectural understanding	***6***

One of the customer managers commented:

> Understanding of enterprise architecture on high level is needed to be able to see the big picture. Good project manager is generalist and not locked to certain technologies.

The other customer manager told:

> Now and more in the future, project manager must understand the wider framework related to the project, purpose of the project, what value and benefit it will bring to the customer and how business benefit will be achieved. It is mandatory that project manager understands the business expectations and how to provide expected value.

Project management

Project management got clearly much less answers than in current competencies. PM tool skills were still the most important skill and rest of the current skills in this category were not seen as important anymore (table 23). One of the interviewed program managers said:

> Project manager needs to know modern technologies related to sharing information (sharepoint/teams/google etc.), how to lead and activate people in virtual meetings and how to document effectively in one shared location.

Multi-vendor project management was mentioned by seven interviewees and it is added as a new skill to this category. Extract from one interview:

> SIAM projects where many suppliers and other parties are involved, are the new normal in the future and project manager must be able to lead multi-vendor projects.

One customer manager explained his view about future projects:

> Clock speed is faster than ever before and changing IS suppliers frequently is a new normal. Project managers must be able to lead third parties in the projects also so, that

e.g., in exit project, new IS supplier project managers is able to lead the exit suppliers' tasks and schedules as well.

TABLE 23 Answers related to future project management skills

Skill category	Description	Skill	Frequency
Project management	Project management includes skills that are relevant to managing the various aspects of IS projects. Competent IS PMs need the ability to effectively plan, monitor and control the project while managing the scope, resources and risks to ensure that the project is completed on time and within budget. This skill category also includes knowledge and experiences of the tools and techniques used in the project management.	PM tool skills	10
		Scope management	9
		Project method competence (waterfall, agile, safe, hybrid projects	***8***
		Project planning	7
		Time management	7
		Resource utilization	7
		Project chartering	7
		Multi-vendor management	***7***
		Risk management	7
		Closing the project	6
		Customer expectation management	***6***
		Project financials including customer invoicing	***4***
		Devops knowledge and understanding	***3***
		Understanding of what to bring to steering groups and what to operative meetings	***2***

Customer expectation management is also new skill in this category. It was mentioned by six interviewees. Here is an extract from one of the interviews:

> Project manager needs to be able to lead and manage customers' expectations during the whole project. If expectations are too high and unrealistic, customer will feel project failed even if all agreed end results were delivered.

One customer manager told his view of customer expectation management:

> Customer expectation management is important already now but even more in the future. Project manager needs to know how project can bring business value and create good customer experience to the customer.

Personal characteristics

The biggest number of new skills was added by an author to this skill category based on answers also in future requirements of an IS project manager. Continuous learning / self-development was mentioned by eleven of twelve interviewees. Proactivity and spontaneous remained as very important skill as they were mentioned in ten interviews. One customer manager emphasized the importance of attitude to learn new continuously:

> Good PM needs to be able to learn new things continuously and learn also from other projects. Benchmarking from previous projects, using lessons learned or retrospective, sparring with other project managers etc.

Continuous learning attitude was mentioned by one program manager also:

> Every project is teaching new things to project managers. Go out of your comfort zone, challenge yourself and learn new things. Change in thinking is needed. What worked yesterday, might not work tomorrow anymore so more out of the box thinking attitude for future.

Only one of the original skills was mentioned in any interviews and it was cooperation, which was mentioned in four interviews.

Instead of existing skills, interviewees emphasized execution capability, high moral and working ethic, decision making capability and situational awareness (table 24).

TABLE 24 Answers related to future personal characteristics

Skill category	Description	Skill	Frequency
Personal characteristics	A competent IS PM has particular personal characteristics that may be beneficial to the execution of a project. In this category, we grouped those personal characteristics that may be inherent in nature but can still be nurtured.	***Continuous learning /self-development***	***11***
		Proactivity and spontaneous	***10***
		Execution capability	***8***
		Ability to handle changes	***8***
		High moral and working ethic	***7***
		Decision making capability	***7***
		Situational awareness	***6***
		Visionary skills	***5***
		Punctuality	***5***
		Empathy	***5***
		Networking capability	***4***
		Sales mindset and capability to sell	***4***
		Cooperation	*4*
		Delegation	***3***

Also, visionary skills, personality, punctuality, empathy, networking capability and sales capability were identified as important skill by several interviewees and were added to this skill category.

Organizational skills

Organization skills are considered obvious skills for project managers. Organization skill was mentioned by eight out of twelve interviewees as a mandatory skill for project manager (table 25).

TABLE 25 Answers related to future organizational skills

Skill category	Description	Skill	Frequency
Organizational	Organizational skills include the ability to organize and coordinate project activities and resources. These skills are required by project managers to manage task dependencies and deadlines and include the ability to multi-task.	Organization	8

Multitasking wad not seen as a good and needed skill in the future, as it was not mentioned in any interviews, so it was removed from the table

Problem solving skills

This category of problem-solving skills not got only few answers in the interviews. Three interviewees mentioned analytical skills as important skill of project manager and research skill was mentioned only by one interviewee (table 26):

TABLE 26 Answers related to future problem-solving skills

Skill category	Description	Skill	Frequency
Problem solving	Problem solving includes those skills that are necessary for identifying, analyzing and solving the problems that arise during the course of a project.	Analytical skills Research skills	3 1

One customer manager expressed his view of analytical skills:

> Leading with data is strongly here now but, in the future, even more. You need to know how to gather, analyze and use the data in your project. Also, how you visualize it, create presentations and modify the data is very important.

One IS supplier program manager told:

> Analytical data collection, understanding and use of it is mandatory in the future project management work. Good project manager collects data e.g. from sales cases versus actual project hours, analyzes it and uses in new sales cases.

Professionalism

Skill category of professionalism seems to be quite important also for future project manager. Ten out of twelve interviewees mentioned professional skills as mandatory skills for project manager and commitment remains as an important skill also in the future. One project manager emphasized the importance of commitment:

> When project manager is committed and shows it to project team and stakeholders, commitment from others can be expected as well. If you are not committed, why should others be?

TABLE 27 Answers related to future professionalism

Skill category	Description	Skill	Frequency
Professionalism	Professionalism refers to the values and qualities of an IS PM that communicate integrity and commitment to quality.	Professional skills	10
		Commitment	8
		Credibility	4
		Focus on quality	3

Credibility and focus on quality were not seen that important as previous skills in this category (table 27).

5.2.3 Leadership in successful projects

All twelve interviewees answered that project cannot succeed without leadership (table 28).

TABLE 28 Answers related to leadership in successful projects

Question	Yes	No
Can project succeed without leadership?	0	12

Interviewees commented that there must be always leadership in the successful project. If there is no official project manager, someone from the project team will take the lead in the project. All interviewees had experienced of non-successful projects and lack of leadership was clearly the big reason behind the failure of the project. Comments from the interviews:

> You need clear leadership and ownership for successful project. Project leader has to stand behind the project. Better you understand and can explain to the project team what this project is about, the better you can succeed and get the trust of the team.

Role of the leadership is very important in the projects. Project organization can be described as a circle, which includes every role of the project. If one part is missing, it is hard to succeed in the project. Without project manager, project cannot succeed. If project manager is missing, someone in the project will take that role. Networked leadership is more important than leading with top-down approach.

How well you can lead your customer, project team and all involved participants and stakeholders, will tell how well you succeed in your project.

If people are doing the work in project instead of robots and there is human factor involved, there is need for leadership always.

When you are leading diverse teams, you need to do more leadership than when you are all in one location. You need to get to know your virtual team and get it working together virtually.

Project is always a change to current situation and change does not happen without leadership.

Project manager works in the front line of the project and enables and supports team to achieve set goals of the project.

Leader is needed to every project to succeed. With good leader, project team is committed to the project and they have common goal.

Based on these comments from the interviewees, it is hard to have a successful project without real leadership provided either by nominated project manager or by team member who takes the lead.

6 FINDINGS

In this chapter the results of this study are analyzed, and conclusions are drawn from the results and analysis. Practical implications, limitations of the study and future research possibilities are presented in this chapter as well.

6.1 Interpretation and reflection of results

In this thesis, current competencies were compared to future competence requirements of an IS project manager. The thesis sought answers for the following research problem and rest of the interview areas which did not clearly relate to the research problems, are not part of the results analysis and interpretation of the results:

- What are the future competence expectations of an information systems project manager?

Research tried to also answer to these following questions:

- What are the differences between current and future competence expectations of the information systems project manager based on empirical research?
- How information systems project manager competence expectations have changed compared to the literature review and empirical research results?

The goal of this thesis was to study what are the current required competencies of an IS project manager and what competencies are expected in the future from an IS project manager. Literature review did not find valid studies about future IS project manager competence requirements. Based on the interview results it is possible to assume that current and future competencies differ in some areas. All skills related to team leadership e.g., ability to bridge diverse teams, remote leadership, virtual team leading and multi-cultural team leading were seen very important skills for the future project manager. Ability to understand business domain and understanding of business environment in the level that you know how it will change customer business environment were clearly emphasized for future business domain knowledge category. All communication skills including English skills, listening and presentation skills were identified more important in the future than currently. Technical skills and multitasking were not seen important at all for future project manager. Project management skills were not seen as important for future as for current project managers. Completely new competence, customer expectation management, was identified by

half of the interviewees as an important skill for future project manager. Continuous learning / self-development, proactivity, overall learning capability and execution capability were seen more important skill for future project manager.

Based on the study results, new skills are needed in the future to ensure successful project management from the beginning of the project, until the end of the project and being able to answer to customer expectations and needs as well. The results also indicate that all the competencies in the used framework are not seen as important as previous research proves. During this study, new skills were added to the original categorization of an IS project manager by an author (table 29).

TABLE 29 New categorization of an IS project manager future skills

Skill category	Description	Skill
Team leadership	Team leadership include those skills that are required as an IT PM for effectively leading and managing project members within and across different teams. Competent IT PMs need to not only provide leadership, but also motivate and empower their team members to successfully execute the project.	Ability to bridge diverse teams Leadership Remote leadership Collaboration Virtual team skills Multicultural team leading Self-leadership Emotional intelligence Ability to motivate team members Mentoring Coaching Ability to empower future leaders
Business domain knowledge	Business domain knowledge encompasses the skills that IT PMs need to work effectively with their business partners. An effective IT PM needs to understand the overall context of the project, in addition to how the project will affect the business and the stakeholders.	Ability to understand the business domain Understanding of the business environment in the level that you know how it will change customer business environment. Business skills Stakeholder management Knowledge of the end product
Communication	Communication involves the skills required to communicate effectively with those involved in the project. This skill category also includes listening, which is critical for understanding expectations and identifying the issues that arise during the course of the project.	English skills Verbal communication Written communication Listening Presentation skills
People skills		Good people skills

Skill category	Description	Skill
	People skills are required to maintain good relationship with those who are associated with the project. This skill category includes understanding the perspectives of the different stakeholders involved in addition to managing conflicts and exerting influence over people.	Relationship building Understanding of the psychology of the people Conflict management Negotiation skills
Technical skills	Technical skills refer to skills that are normally associated with being an IS developer. This skills category includes technical knowledge as well as knowledge of the development methodologies, processes, and techniques used to develop information systems.	Understanding of the technologies project involves Architectural understanding
Project management	Project management includes skills that are relevant to managing the various aspects of IT projects. Competent IT PMs need the ability to effectively plan, monitor and control the project while managing the scope, resources and risks to ensure that the project is completed on time and within budget. This skill category also includes knowledge and experiences of the tools and techniques used in project management.	PM tool skills Scope management Project method competence (waterfall, agile, safe, hybrid projects etc.) Project planning Time management Resource utilization Project chartering Multi-vendor project management Risk management Closing the project Cost management Customer expectation management Project financials DEVOPS knowledge
Personal characteristics	A competent IT PM has particular personal characteristics that may be beneficial to the execution of a project. In this category, we grouped those personal characteristics that may be inherent in nature but can still be nurtured.	Continuous learning and self-development Proactivity and spontaneous Learning ability Capability to execute Ability to change High moral and working ethic Decision making capability Situational awareness Visionary skills Punctuality Empathy Networking capability Sales mindset and sales skills Cooperation

Skill category	Description	Skill
		Delegation
Organizational	Organizational skills include the ability to organize and coordinate project activities and resources. These kills are required by project managers to manage task dependencies and deadlines.	Organization
Problem solving	Problem solving includes those skills that are necessary for identifying, analyzing and solving the problems that arise during the course of the project.	Analytical skills Professional skills
Professionalism	Professionalism refers to the values and qualities of an IT PM that communicate integrity and commitment to quality.	Credibility Commitment Focus on quality

All together 31 new skills were added to this categorization of future project manager competence expectation and eleven of original skills were removed as they were not seen important skills by anyone of the interviewees. Interesting results was to see that e.g., multitasking, technical skills and seeking consensus were not mentioned in the interviews. Also, ability to handle stress was not mentioned and most likely it is so obvious skill for an IS project manager, that it was not mentioned for that reason. Most mentioned new skills were remote leadership, multicultural team leading, self-leadership, emotional intelligence, mentoring, coaching, stakeholder management, architectural understanding, multi-vendor project management, customer expectation management and continuous learning / self-development.

6.2 Reflection of results from different competence areas

6.2.1 Team leadership

This category is called team management in original categorization of project management competencies by Keil et al. (2013). Team leadership and team management are not synonyms and even if they overlap, they are not the same. Organization can only achieve optimal effectiveness with strong leadership and strong management. Leadership is needed to support with new challenges and management is needed e.g., for effective utilization of resources. Leadership sets the direction, motivates and inspires, communicates vision, mission and direction while management plans and budgets, controls processes and implements vision (Kotterman, 2016). One of the leading models of leadership styles divides leadership to transactional and transformational leadership. Transactional leaders lead by exact goals and tasks while transformational leaders motivate the

team see current problems in new light and to work harder for the benefit of the project group. Transformational leadership is focusing more on active participation of the project, includes individual coaching and empowering the team members to solve their problems (Robbins and Judge, 2015). Servant leadership is often compared to transformational leadership as both are considered being an employee-oriented leadership style. Servant leadership can have a positive impact on project success and that's why leadership skills are clearly very important skills for project managers (Harwardt, 2020).

As majority of the skills belonging to this category are clearly leadership skills, an author decided to change this category to team leadership. Originally this category has 7 skills and based on interview results, new skills were added both current and future competence needs. One of the original skills of this category, celebrating accomplishments was removed as it was not mentioned in any interviews even if many successful companies celebrate success to motivate people and to raise team spirit.

Leadership was clearly the most important competence in this category both in current and in future competencies. Based on the interview results, several skills related to leading people who are working in different locations, was experienced as very important skills. This skill is pronouncing especially now, when we are living corona-epidemic time all over the world and majority of project works is done remotely.

Remote leadership and multicultural team leading came up in most of the interviews. Emotional intelligence was mentioned by 9 interviewees as an important skill for project manager in the future. Mentoring (6 answers) and coaching (5 answers) were added to this category as well. Based on the comments of interviews, leadership is the heart of the project and gives the positive pulse to the project team members to give their best to the project.

6.2.2 Business domain knowledge

Keil et al., (2013) include application area competence of specific industry or domain, understanding of customer business and technical understanding of application area to this category. As Ko et al, (2017) suggests, IS project manager role should be shifting towards business knowledge instead of deep technical knowledge. Same direction can be found as a result of this study as well. Understanding of customer business domain was brought up in every interview as mandatory competence for IS project manager in the future. Knowing what project will change in customer business, is requirement for project managers success currently but especially in the future. Business skills remain as important skill in this category. Instead of stakeholder identification ability, stakeholder management was experienced as an important skill in both current and future competencies and six of twelve interviewees expected project manager to manage stakeholders in the projects. Based on this study, end product or service

knowledge, ability to document process and strategic thinking was not seen as important skills by interviewees.

6.2.3 Communication

Communication has been defined as crucial competence for project managers in many studies. Ruuska et al., (2003) involve several dimensions to communication such as oral and written, horizontal and vertical, formal and informal and internal and external communication. Effective communication can build confidence, motivates project team members, reduces non-productive work, helps to avoid mistakes and build good teamwork (Clarke 1999).

Based on this study, communication skills were experienced as important skills for both current and future project managers. As this study was done in Finland, where Finnish is mother language, English skill was mentioned in almost every interview as it is commonly used language in IS world. Projects in Finland are rarely fully locally implemented. Big IS suppliers are international companies and project participants are more and more often coming from all over the world. Project documentation, communications and meetings are held in English, so that is the reason why English is mandatory skill. It was added to this category as a new skill with presentation skills which was also seen as mandatory skill for both current and future project managers. Project managers are visible in the project from the beginning to the end and presenting solutions, project status reports and other presentations to the project teams and customers. When presentations are looking professional and presentation itself is done in professional way, project manager makes much better impression of the project and how it is managed.

6.2.4 People skills

People skills are mandatory skill for project manager to create and maintain good relationship with project team members and other project stakeholders (Keil & al., 2013). Clarke (2010) takes the aspect of teamwork, which relates to interpersonal skills and confirms that it is important for project managers to create, keep and enlarge good interpersonal relationship in their projects. Alvarenga et al., (2019) refer to strong commitment and flexibility of a project manager when dealing with people. Term human skills is used by El-Sabaa (2001) and it is primarily how project manager is working with people and how sensitive project manager is to needs of project team members.

Good people skills and relationship building were clearly the most important skill in this category for both current and future skills based on the interview answers. Psychology of people, conflict management and negotiation skills were not seen that important currently or in the future.

6.2.5 Technical skills

In the original categorization of Keil et al. (2013), this category refers to skills that are normally related to be an IS developer and includes knowledge of development methodologies, processes and techniques used in developing information systems. As a result of this study interviews, majority of the interviewees brought up that it is important to understand technologies projects are involving and overall architectural understanding. None of the interviewees saw technical skills and development methodology skills as important skill for future project managers. Overall technical understanding is needed but technical subject matter experts are in the project team so that project manager itself should concentrate leading the project and stay in overall technical level.

6.2.6 Project management

Results in this category were following well the original categorization in both current and future skills of an IS project manager. Typical project manager skills e.g. PM tools skills, project scope management, planning and chartering with resource utilization, risk management, cost management and closing the project were seen quite important as current and future skills. Several new skills were added to this category based on the interviews. Nowadays projects are very often in IT world including several parties, so multi-vendor project management was clearly an important skill for future project manager. Often customer does not have enough resources or will to manage whole project and they outsource multi-vendor project management to IS supplier, who will be managing other service providers in the project as well. Project success requires customer expectation management from the beginning of the project until the end of the project, and that was brought up by six of twelve interviewees as an important future skill of an IS project manager. Project financials not just cost management and devops knowledge and understanding was also seen as important skill for future project manager by several interviewees.

Project method competence was experienced as important current skill by eight of twelve interviewees, and they brought up the importance to understand different methods like waterfall, agile, safe and hybrid projects and which one suite best for which projects. However, this competence did not come up as a future skill required from an IS project manager.

6.2.7 Personal characteristics

Personal characteristics category got most new skills in this study both in current and future skills. Continuous learning / self-development was seen the most important future skill of an IS project manager. Customers are expecting project managers to be proactive and spontaneous, learning fast and executing in the project as well. Ability to change, high moral and working ethic, decision making capability, and situational awareness were brought up in most of the interviews.

Project manager should also be visionary, precise and empathic. Networking and sales mindset with capability to sell was also mentioned in quarter of the interviews. Original skills of this category were not seen as important skills for project manager at all except cooperation which was mentioned by four of twelve interviewees as a future competence requirement.

Project managers are living in uncertain working environment as uncertainty is naturally part of the projects always and causes stress to all project members. Project manager needs to tolerate continuous changes and keep the project team members and stakeholders in the change accepting mode (Artto et al.,2011, Pirhonen, 2013).

6.2.8 Organizational skills

Organizational skills are required from a competent IT project manager. Competent IT project manager needs to have ability to organize and coordinate the project resources and activities. Managing deadlines and task dependencies is important part of the project and project manager needs to be able to multi-task as well (Keil & al., 2013). This competence is also including coordinating, determining the workflows and tasks, structuring information flows and organizing project team members (de Rezende & al. 2019).

Organizational skills remain as important skill for project manager based on this study for both current and future competence requirement. Nature of project managers work is heavily related to organizing and coordinating everything around the project. Multi-tasking has been one of the skills in this category, but it was not mentioned in any interviews. Multi-tasking is an apparent human ability to perform more than one task, or activity, at the same time. Multi-tasking can result in time wasted due to human context switching and apparently causing more errors due to insufficient attention. Clearly based on interview results, multi-tasking is not experienced as beneficial way of working in projects. Concentration to one task at the time brings better results in shorter time.

6.2.9 Problem solving

Keil & al., (2013) include skills which are mandatory for identifying, analyzing and solving problems into this category. Analytical skills and research skills are also part of this category. De Rezende & al. (2019) describe problem solving as capability to find and create a solution to question or unexpected issue in the project. Problem solving has been mentioned in numerous studies as an important competency of a project manager (Keil, Lee & Deng, 2013; Fisher, 2010; Tian, 2020). When project manager has an effective way to recognize and solve problems, project can succeed (Jurison, 1999).

Problem solving skills include skills which are required for identifying, analyzing and solving the continuous problems arising during the project. For some reason, these skills were not seen very important skills in this study. Only few interviewees mentioned these skills in the interviews. Problem solving is big part

of project managers work as project manager must find solution with the team to every occurring challenge in the project. This might have been so obvious skill, so interviewees did not even think about mentioning it separately.

6.2.10 Professionalism

Keil et al., (2013) describe professionalism as values and qualities of an IT project manager that are showing integrity and quality commitment. Credibility, commitment, focus on quality and separately mentioned professional skills are the key competencies in this categorization. De Rezende & Blackwell (2019) include ethics and accountability to project manager professionalism. In overall, professionalism is about how people behave at work. Ethics in project management mean moral principles related to behavior while managing the project. Integrity, honesty, reliability, punctuality, politeness and respectfulness can be considered as part of professionalism.

Professionalism includes commitment, professional skills, credibility and focus on quality. These skills talk about the values and qualities of an IS PM that represent integrity and commitment to quality. Commitment and professional skill were experienced as important current and future skills by majority of the interviewees. Credibility and focus on quality were mentioned by one third of the interviewees. This might be also one example of obvious skills of project managers and these were not mentioned due to that.

6.3 Implication for research and practical

The results from this study suggest that competencies of an IS project manager shall be reviewed and rethought regularly based on the previous and traditional competence requirements so that competencies are supporting project success also in the future. World around information technology is changing so rapidly that new competence requirements can arise at any time. Covid-19 pandemic in the end of year 2019 and during current year 2020 unexpectable changed working conditions very quickly and majority of information technology companies and employees had to adjust the working habits from traditional office work to full remote working. This emphasized certain skills of IS project managers, like remote leadership, ability to bridge diverse teams and virtual team skills. Future competence requirements of an information systems project managers are not widely studied so far, so this study gives basis for the future research at the scientific level.

To stay on top of the hard competition, project managers shall be interested to develop his/her competencies continuously based on changes in IS business, technologies, working environment or in the society. These changes require flexibility and genuine interest towards continuous change in the working environment and requirements around it.

The results of this study can be utilized by IS project managers who are interested to develop their skills and competencies to stay on top of the IS project management requirements for project managers. Results can be also used by organizations and managers who are developing their IS project managers competence requirement and personal development paths.

6.4 Research reliability and validity

The reliability in this study was secured by completing comprehensive literature review related to the research problem and the research questions. Different databases were used to collect wide range of valid literature. Interview reliability was ensured by interviewing adequate amount of people to collect enough data for analysis.

Research validity means research method´s or indicator´s capability to measure exactly what is planned to be measured. Measures and indicators do not always correlate to the reality that the researcher is thinking to measure. A researcher might get answers to question forms, but respondents have understood the questions in a completely different way that the researcher meant them to be understood (Hirsjärvi et al., 2009). To avoid misunderstandings and to make sure that questions are giving answers to the research questions, author did test interviews prior to actual interviews. The first test interviews confirmed that interviewees understood the themes and questions and were able to answer to the questions properly. Preliminary test interviews were analyzed to get confirmation that questions provided answers to study problem and study questions. All interviews were recorded and transcribed afterward to verify that the author did not miss anything important that interviewees said about project managers competencies.

6.5 Future research

There are numerous different future research possibilities in the project manager competence requirement area. The first future research topic is how IS project managers competence requirements vary depending of the country or continent where research is done. As results of this study vary a lot from original results and categorization made by Keil & all (2013), it would be interesting to see how much different results are depending on country or continent where study was performed. Also, this study could be done in different IS sector companies to see if results will vary when IS company´s headquarter is in Finland or in other country. It would be interesting to see if differences in answers between different countries.

Another future research topic is that how project managers current competencies can be developed best way towards future competence requirements and

build development path towards skills and competencies required in the future. Yet another future research topic is to involve project team members to research and get their opinion of the competence requirements for an IS project manager. This study involved IS project managers, IS supplier's customer managers and customer to get their view of the competencies. Technical specialists, architects and other technical people who are part of the project team, can have different kind of view about the competencies they expect from their IS project manager. Interesting topic would be also to study what competencies are needed to customer project organization and how they differ from IS project manager competencies.

7 SUMMARY

The world around customers in business and information technology is changing rapidly and lately we have seen Covid-19 pandemic changing world around us dramatically as well. Information systems are more and more complex, customers' expectations are high and competition between information service providers is fierce. Customers in the information technology sector are expecting basic project goals and objectives to realize in their projects: project delivery on agreed schedule, scope and costs. In addition, customers are expecting real value for their business. Projects and solutions need to be innovative and creative, bring clear business and IS benefits and provide excellent customer experience. IS project managers need to stay on top of the competition by keeping their competencies and skills up to date in this continuously changing world.

The goal of this thesis was to find out, what are the future competence requirement of an IS project manager based on current views. The thesis searched answers for the following research problem:

- What are the future competence expectations of an information systems project manager?

Two research questions tried to find answers to the problem:

- What are the differences between current and future competence expectations of the information systems project manager based on empirical research?
- How information systems project manager competence expectations have changed compared to the literature review and empirical research results?

Empirical study was conducted as semi-structured interviews with mostly open-ended question as the interview type was a theme-based interview. Twelve project management professionals were interviewed to this study and were selected so that four people were interviewed from these groups: IS project manager, IS supplier customer manager and customer project owner. All interviews were transcribed and analyzed afterwards. All together 31 new skills were added to the original categorization and from the below table can be seen all those skills which were mentioned in 4 or more interviews either in current or future competencies.

TABLE 30 New skills into current and future competence expectations of an IS project manager

Current competences			Future competences	
Skill category	**Skill**	**Frequency**	**Skill**	**Frequency**
Team leadership	Multicultural team leading	7	Remote leadership	11
	Emotional intelligence	7	Multicultural team leading	10
	Self- leadership	4	Self- leadership	10
	Coaching	2	Emotional intelligence	9
			Mentoring	6
			Coaching	5
Business domain knowledge	Stakeholder management	4	Understanding of business environment in the level that you know how it will change customer business environment	9
			Stakeholder management	6
Communication	English skills	10	English skills	11
	Presentation skills	9	Presentation skills	10
Technical	Understanding of the technologies project involves	10	Understanding of the technologies project involves	10
	Architectural understanding	6	Architectural understanding	6
Project Management	Project method knowledge	8	Multivendor project management	7
	Devops knowledge	3	Customer expectation management	6
	Project financials	2	Project financials	4
Personal characteristics	Proactivity and spontaneous	7	Continuous learning/self-development	11
	High moral and working ethic	6	Proactivity and spontaneous	10
	Learning ability	5	Learning ability	9
	Capability to execute	5	Capability to execute	8
	Decision making capability	5	Ability to change	8
	Visionary skills	4	High moral and working ethic	7
	Personality	4	Decision making capability	7
			Situational awareness	6
			Visionary skills	5
			Punctuality	5
			Empathy	5
			Networking capability	4
			Sales mindset and capability to sell	4

Results indicate that team leadership, business domain knowledge and communication are the most important categories in this study when reviewing the future competence expectations. Several new skills were added to original

categorization including continuous learning / self-development. Capability to change is mandatory skill now and in the future as technologies and customer business are changing rapidly and keeping in mind that the change is natural and evident part of the projects. In the team leadership category, skills related to remote leadership, ability to bridge diverse teams and leadership in overall were the most important skills. Multicultural team leading, virtual team skills and self-leadership were also mentioned by ten of twelve interviewees. Emotional intelligence was mentioned by nine of twelve interviewees as well.

Business domain knowledge seem to be very important competence for an IS project manager already now but even more in the future. Customers are expecting project managers to know how the project will change their business and bring new business value for them. It is beneficial for the project, if project manager can understand customer business to be able to discuss how it relates to the project and advice customer to choose the right solutions.

Communication skills were the third most important category and as majority of IS projects are involving team members or stakeholders from other countries, the most important skill in this category was new English skills. Verbal and written communication and listening remain as important skills for project managers. On top of these, presentation skills seem to be very important skill for future project manager. With professional looking presentations and professional presentation, you create trust and convince meeting participants.

Results also indicate that from technical skills it is enough that project manager has overall understanding of the technologies project involves and deep technical knowledge is not needed. Project manager is not subject matter expert in technologies but more general project manager who can lead different kind of projects involving different technologies.

There can be seen certain differences between current and future competence expectations from the empirical study results. Importance of team leadership skills clearly raised up from the current expectations. Remote leadership, multicultural team leading, self-leadership and emotional intelligence were seen much more important for future project manager. Understanding customer business environment and stakeholder management were ranked higher in future competence expectations from business domain knowledge category. There were no big differences in communication category where the results indicated similar expectations for both current and future competencies. Interesting result can be experiences in project management category, where the importance of traditional project manager skills was not seen as high in future skills than in current skills except for new skill customer expectation management which came up in six of twelve interviews. Ability to change and develop yourself, continuous learning and capability to execute were ranked much higher in future competencies of personal characteristics category. Rest of the categories did not have remarkable changes between them.

There are limitations, when it comes to the empirical research part of this study as this study was conducted on in Finland with Finnish project managers, local IS supplier and local customers. All the interviewed project managers and

IS supplier customer managers worked for the same IS company and subjects from different companies could have been interviewed to get views and experiences from other companies as well.

There are numerous possible future research topics, for example, study what kind of competencies and skills project team members would see as important skills for the future IS project managers. This study could be also done in different countries and in different companies to see possible differences compared to the results found in this study. Another future research topic is that how project managers current competencies can be developed best way towards future competence requirements and build development path towards skills and competencies required in the future.

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APPENDIX 1 INTERVIEW QUESTIONS

Background questions

1. Age
   - < 30 years ___
   - 30 – 39 years ___
   - 40 – 49 years ___
   - 50 – 59 years ___
   - 60 < years ___

2. Gender
   - Female __
   - Male __

3. Your highest educational background
   - Primary school ___
   - Vocational school ___
   - High school ___
   - Undergraduate degree ___
   - Graduate degree ___
   - Other, what? _____

4. Which one of these roles best describes or described your current role in projects?
   - IT supplier customer manager or executive ___
   - IT supplier project manager
   - IT supplier program manager
   - Customer Business stakeholder ___
   - Customer CEO
   - Customer PMO head ___
   - Customer Manager ___
   - Other, what? _____

5. Work experience from IT projects
   - < 5 years ___
   - 6-10 years ___
   - 11-15 years___
   - 15 < years ___

6. Work experience from working as a business owner or customer project manager in IT projects
   - No experience ___
   - < 5 years ___

- 6-10 years ___
- 11-15 years___
- 15 < years ___

7. Work experience from project steering groups in IT projects
   - No experience ___
   - < 5 years ___
   - 6-10 years ___
   - 11-15 years___
   - 15 < years ___

Interview themes

1. What is your view of the core competencies of an IT project manager currently?

2. What is your view of the future core competencies of an IT project manager? Which competencies will be required and more important in the future?

3. What is your view of leadership in the project management of successful projects? Can project succeed without leadership?

4. How do you define successful project?

5. International competence – what this means for you? How important is that in an IT project manager work nowadays and in the future?

6. Continuous, life lasting learning – how important you see that in an IT project manager work?

7. How project managers can/should gain new required competencies?