

ROLE OF LEADERSHIP COMPETENCIES AND TEAM SOCIAL CAPITAL IN IT SERVICES

HYEJUNG LEE
Yonsel University
Seoul, Korea

JUNGI PARK
Yonsel University
Seoul, Korea

JUNGWOO LEE
Yonsel University
Seoul, Korea

ABSTRACT

As the nature of work changes into team-based knowledge work, the social capital among team members becomes more and more critical. This study applies social capital theory to IT service team environment. The research model of this study includes emotional, cognitive, and social intelligence competencies of project managers (PM) as they lead to the project performance, while team social capital is posited as a mediator between these leadership competencies and team project performance. A PLS analysis of 285 data points collected via a validated questionnaire revealed the followings: (1) *emotional intelligence competencies of PM* directly influence the project performance, (2) *social intelligence competencies of PM* indirectly influence project performance only via team social capital, and (3) *cognitive intelligence competencies of PM* maintains direct influence on project performance in shorter term projects, but indirect influence only via the accumulated team social capital in longer term projects. The analysis also reveals that it takes time to grow team social capital. Implications of the findings are discussed, and further studies are suggested.

KEYWORDS: project manager, leadership competencies, team social capital, project performance, project duration, IT services, emotional competencies, social competencies, cognitive competencies

1. INTRODUCTION

Today, firms push ahead with IT projects in order to gain a competitive edge, improve their competitiveness, launch new businesses and introduce management innovations. Firms' investments have increased as corporate-level IT projects become more advanced and grow larger in scale in today's complicated and globalized business environment. However, it is true that some of these projects fail to achieve adequate outcomes or end in failure when they exhaust their budgets and human resources. IT projects in which considerable financial and human resources are invested have a great impact on business operations. As for firms, one underlying issue is related to what they should do to make their IT projects successful. In particular, Jursion [23] points out that selecting a competent project manager is very important for the successful completion of projects. In a project that should accomplish its intended goals given limited time and resources compared to repetitive routine tasks, the project manager's position is very important because he/she has to control potential risks, manage a wide variety of activities properly in consultation with many different interested parties, and make decisions on the general matters of the project.

Previous studies of IT projects' outcomes indicate that project performance is significantly influenced by project managers' competencies, roles and leadership [24]. In studies of project

managers' leadership, one of the key success factors for projects, it has been traditionally described as their personal disposition (i.e., personality or style), but recently it is noted by a situational theory that leadership can vary depending on certain external variables or situations in which leadership should be demonstrated. Noting that sufficiently competent project managers have a positive impact on project performance [1, 11, 21], there are ongoing studies of what leadership competencies the project managers should have. Meanwhile, some studies are being conducted on the interactions between project team members for project success [23, 36]. If members of a project organization perform their roles effectively and bring favorable changes to one another, their project will produce successful outcomes [35]. In that the project's success or failure depends on the interactions between project members, emphasis is placed on the importance of elements such as the relationships, trust and consensus between team members.

In this context, there are ongoing discussions about social capital as formed in the reciprocal relationships among project members [36]. Commonly, studies explain the effective decision-making and continuous knowledge exchange and cooperation between members of a project as the effects of accumulated social capital, but the role of social capital as accumulated in project teams has not been thoroughly studied [30]. In this study, we explore not only the relationship between project managers' leadership competencies and project performance, but we also conduct an empirical analysis of what roles the project teams' social capital plays as regards its relationship in a IT service team environment.

2. LITERATURE REVIEW

2.1 Project Manager's Leadership Competencies

A project is a temporary endeavor undertaken to produce a unique product, service or result, and project management is defined as applying knowledge, skills, tools and techniques to project activities in order to meet the project's requirements [32]. Above all, to make a project successful, the project manager should have sufficient capability. This means that the manager's leadership is very important when seeking to manage the problems and risk factors that occur effectively during the project and to ensure external customer satisfaction and internal inter-member cooperation. In particular, the performance of an IT project is greatly influenced by the project manager's capability and leadership [34].

In general, the studies of project management leadership are represented by six theories [21]. In the 1940s through the 1960s, two major theories are the leadership trait theory, which assumes that leaders are born, and not made, on the premise that there are common attributes among leaders, and the leadership behavior/style theory, which assumes that leaders have a specific

pattern and style of behavior. Situational leadership theories, which emerged in the 1960s and 1970s, assume that leadership will depend on the situation [12, 22]. Major situational theories of leadership include Hershey & Blanchard's maturity theory [20] and House's path-goal theory [22]. The situational theories — which are based on the concept that the effectiveness of leadership depends on the situation — note that leadership demonstration is greatly influenced by situational factors such as the members' characteristics, the leader-member relationships, the characteristics of the task and the nature and dimensions of the organizational structure.

In the 1980s and 1990s, there were many studies of visionary or charismatic leadership. Bass described leadership by classifying it into two types: transformational leadership which includes charisma, individual consideration and intellectual stimulation, and transactional leadership, which emphasizes members' exchanges of rewards to achieve goals [21].

In the late 1990s, the emotional intelligence theory began to draw increased attention. Goleman, Boyatzis & McKee [15] argue that a leader's emotional intelligence has a greater influence on team performance than the leader's intellectual capability. Their study divides emotional intelligence into four types — self-awareness, self-management, social awareness and relationship management — and shows that there are clear correlations between emotional intelligence, leadership styles and organizational performance.

Recent studies of project manager leadership tend to put more focus on leaders' competencies [1, 11, 21, 40]. Boyatzis [5] and Crawford [9] define competencies as the “knowledge, skills and personal characteristics that produce outstanding results.” Turner [38] explains in a study of leadership that knowledge and skills as competencies represent the intelligence, problem-solving and management skills, whereas personal characteristics refer to leaders' inborn qualities and emotions. Higgs and Dulewicz [21] classify the leadership competencies defined in the existing literature into four types — cognitive, behavioral, emotional and motivational competencies — and reconstitute a total of 15 sub-competencies into the three main categories of intellectual intelligence, managerial intelligence and emotional intelligence. Boyatzis & Ratti [6] compare and contrast the competencies of firms' effective and non-effective leaders through an empirical analysis and categorize the leadership competencies of project managers into three types: emotional, cognitive and social intelligence competencies. In their study, the emotional intelligence competencies include efficiency orientation, planning, initiative, attention to detail, flexibility, and self-confidence; cognitive intelligence competencies include the use of concepts, systems thinking, and pattern recognition; and social intelligence competencies include empathy, persuasiveness, developing others, group management, networking, negotiating, oral communications, and social objectivity.

2.2 Team Social Capital

The term “social capital” began to be widely used after it was defined as “the aggregate of actual or potential resources” by the French sociologist Bourdieu [3]. Heo and Cheon [19] describe social capital as ties that involve a smaller number of routinized relationships and a larger number of solid networks in interpersonal friendships or acquaintances. The notion of ‘social capital’, referring first to community participation [17], describes “features of social life-networks, norms, and trust, which enable

participants to act together more effectively to pursue shared objectives [33].”

Social capital is studied in a number of disciplines and has different definitions or concepts according to the studies' objectives. In education, social capital is viewed as allowing the members of community to generate opportunities and gain a competitive advantage in achieving goals [4]. Social network among students are known to help reducing drop-out rates [10] and to improve student achievement [14]. Team social capital can foster knowledge flows within a team, becoming an important indirect source of innovation [31].

Studies of social capital in organizations [2] explain how an organization maintains a competitive advantage based on social capital theory, classifying social capital into structural, relational and cognitive dimensions according to the forms and contents of the social relationships. The structural dimension refers to the overall pattern of connections between members. There are three major facets: network ties, the network configuration, and an appropriable organization. In addition, the relational dimension embraces the resources created through inter-member relationships, including trust, norms and identities. The third dimension of social capital, cognitive dimension, relates to shared language and stories, including cultures, among organization members who form a relationship.

This study attempts to explore the relationships between social capital, leadership competencies and organizational performance in teams. Numerous studies of social capital have been conducted, but few have studied the relationships between in-team social capital and leadership. One study investigated social capital's mediating role through an empirical analysis of the effects of the person-environment fit and information systems acceptance factors on work performance and work satisfaction [19], but it provided an analysis of work satisfaction and performance on a personal level and thus did not focus on the influence of organizational-level social capital on work performance. From a literature review of leadership and social capital, another study indicates that an increasing number of leadership studies place emphasis on social capital [29]. This study demonstrates that while the preferential focus is on human resources, the ability to manage social capital attracts an increasing amount of attention as a type of leadership competency. Moreover, few studies empirically analyze the causal relationship between social capital and leadership or the influence of these factors. In terms of leadership, there is a study of project team trust [36] and an analytic study of social capital's mediating roles [26]. Tansley & Newell [36] indicate that trust is needed to achieve performance success and that social capital is an essential prerequisite for this. In other words, leadership competencies should work to strengthen social capital inside a project team by building and enhancing trust to improve its performance and achieve project success. Lee et al. [26] present the direct and indirect effects of social capital on project performance according to leadership styles and report the results of an empirical analysis of social capital's mediating roles on leadership competency and their intensity levels.

3. RESEARCH MODEL AND HYPOTHESES

3.1 Research Model

The purpose of this study is to verify the influence a project manager's leadership competencies in an IT project have on his/her team's social capital and project performance. For this purpose,

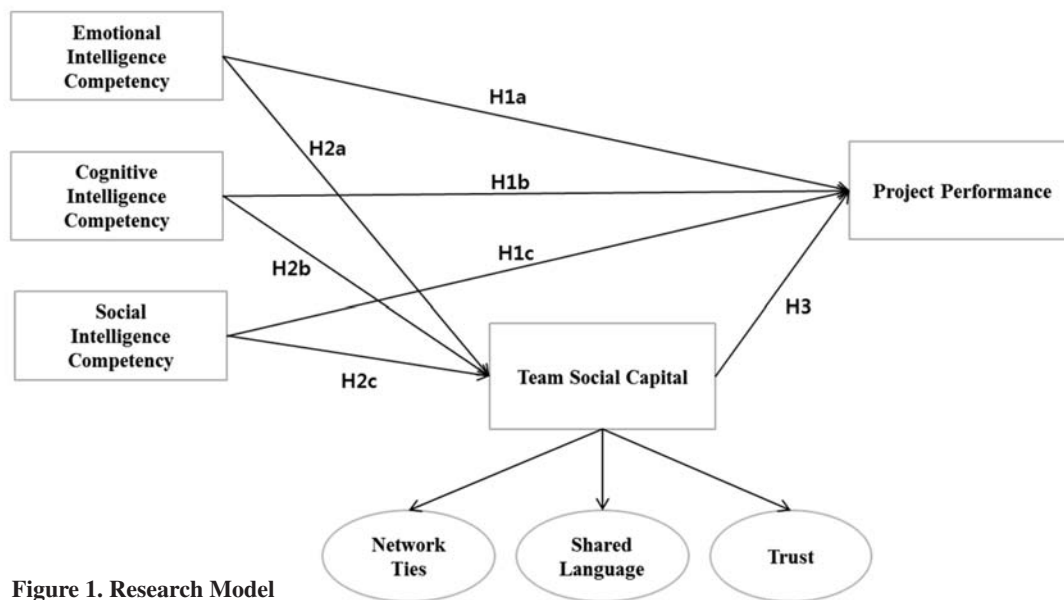


Figure 1. Research Model

reviewed are previous studies of project managers' leadership or competencies. Based on findings of the review, project manager leadership competencies are posited as three types for this study: emotional, cognitive and social intelligence. These three types of leadership competencies were set as independent variables. Network ties, shared language, and trust were selected as the primary constructs for determining team-level social capital. Project performance was set as a dependent variable, and several hypotheses were formulated based on the relationships between these variables. Figure 1 shows a schematic diagram of the research model for this study.

3.2 Hypotheses

To verify the variables included in the research model, the study set up hypotheses with regard to the major factors working between the independent variables (project manager's emotional, cognitive, and social intelligence), a mediating variable (team social capital) and a dependent variable (project performance), based on their theoretical relevance.

3.2.1 Project managers' leadership competencies and project performance

In a project that has to accomplish its desired performance with limited time and resources, the project manager's role is important for the project to be successful [24]. In particular, the performance of IT projects is greatly influenced by the competencies and leadership skills of project managers [23, 34]. Thus, several studies have been conducted on the leadership competencies that should be retained by project managers [5, 6, 11, 21, 23, 38]. In this context, the present study divided leadership competencies into three categories — emotional, cognitive and social intelligence — based on the results of Boyatzis and Sala's and Boyatzis and Ratti's studies [5, 6]. The following hypotheses were formulated to verify the influence of the leadership competencies in each category on project performance:

H1a. A project manager's emotional intelligence has a positive (+) influence on project performance.

H1b. A project manager's cognitive intelligence has a positive (+) influence on project performance.

H1c. A project manager's social intelligence has a positive (+) influence on project performance.

3.2.2 Project managers' leadership competencies and team-level social capital

When a project manager has exhibited a proper type of leadership, it allows the project team to build up social capital. The ensuing network relationships, shared language and trust have a critical influence on project performance [36]. What role a project manager plays influences the interactions inside his/her team and determines the project performance [30]. This suggests that the project manager's leadership competencies influence the team social capital. One study emphasizes that, in provisional organizations such as project teams, leadership competencies are effective for performance creation and maintenance when they consist of elements related to building, maintaining and managing social capital performance [29].

Therefore, the following hypotheses are proposed to verify the correlations between managers' leadership competencies and social capital:

H2a. A project manager's emotional intelligence has a positive (+) influence on the team social capital.

H2b. A project manager's cognitive intelligence has a positive (+) influence on the team social capital.

H2c. A project manager's social intelligence has a positive (+) influence on the team social capital.

3.2.3 Team social capital and project performance

An empirical study of the relationship between social capital and project performance argues that proactive members tend to take advantage of the support and social relations of other fellow members as they are suitable for their desired goals [37]. Social capital among members was found to have a significant effect on the enhancement of job performance [2]. As such, organizational performance can be formed by knowledge creation resulting

from members' personal qualities and interactions and can be maximized in positive reciprocal relationships between members. Therefore, this study conducted an empirical analysis of the relationships between project teams' social capital and project performance, based on the findings of previous studies, by framing the following hypothesis:

H3. A project team social capital has a positive (+) influence on project performance.

4. RESEARCH METHOD

4.1 Data Collection and Sample Characteristics

Data collection was carried out twice. First data set was collected from 183 participants in 25 IT projects performed in 2010 in a global electronic parts manufacturer with about 10,000 employees. A questionnaire was administered online in November 2010. A total of 133 questionnaires were returned (response rate 72.7%), but 120 were used for analysis after excluding those that had any missing responses. Second dataset was collected from 192 participants in 15 IT projects conducted in 2011 from the same company. Likewise, an online questionnaire was administered in January 2011. A total of 172 questionnaires were returned, yielding a response rate of 89.6 percent, but only 165 were usable. As a result, the final analysis used data collected from 285 people who had participated in 40 IT projects. Table 1 shows the characteristics of the projects for which the questionnaire respondents participated.

4.2 Operationalization

In this study, the operational definitions of the measures and

TABLE 1. Sample Characteristics

Category		Frequency	Percentage (%)
Project Size	KRW 50 million or less	82	28.8%
	KRW 50-100 million	47	16.5%
	KRW 0.1-0.5 billion	108	37.9%
	KRW 0.5-1.0 billion	14	4.9%
	KRW 1.0 billion or more	34	11.9%
Project Term	3 months or shorter	68	23.9%
	4-5 months	91	31.9%
	6-9 months	71	24.9%
	10-12 months	44	15.4%
	More than 12 months	11	3.9%
Project Type	Introduction or development of new things	170	59.6%
	System improvement	62	21.8%
	Process improvement	42	14.7%
	Consulting	12	4.2%
Project Role	Project PMO	50	17.5%
	Project Leader	89	31.2%
	Project team members	146	51.2%
Total		285	100%

the measurement items are as follows: first, a project manager's competencies were defined as the competencies of emotional intelligence, cognitive intelligence and social intelligence based on the results of Boyatzis's study [5, 6]. Emotional intelligence was defined as "the ability to recognize, understand, and use emotional information about oneself that leads to or causes effective or superior performance" and was measured by five items. Cognitive intelligence was defined as "the ability to think or analyze information and situations leading to or causing effective or superior performance" via six items. Social intelligence was defined "as the ability to recognize, understand and use emotional information about others that leads to or causes effective or superior performance" and was measured via five items. Second, a team social capital was defined as a set of network ties, trust and shared language, based on the studies by Bolino et al. [2] and Heo and Cheon [19]. Network ties represent close relationships between members in a project team or the degree of cooperation for frequent communication and interaction with other members, while trust refers to the trust that project team members place in their coworkers or supervisors. Shared language is the use of common and meaningful terms in interactions between project team members, meaningful communication patterns, and message understandability. Each item measuring team social capital was adapted from existing literature. Finally, project performance was measured in terms of the perceived efficiency and effectiveness of the project phase from Henderson and Lee [18]. The dimensions of efficiency include the productivity of the team's operation and the adherence to the budget and schedule. Measures of effectiveness include the quality of deliverables. See Appendix 1 for details about the measurement items and literature sources.

5. RESULTS

5.1 Analysis

A partial least squares (PLS) analysis was performed to test the research model. The PLS analysis is a component-based approach and thus does not have strict requirements for the sample size and residual distribution [27]. Another advantage of the PLS analysis is that it can evaluate a theoretical structural model and a measurement model simultaneously [8]. Due to the large-scale survey and the complex data collection process for eliciting participation in an IS project, the sample size for the final analysis was acceptable at a modest level, making the PLS appropriate for testing our model. We used Smart PLS for analyzing the models. Furthermore, to measure project performance, particularly IT project performance such as information system development, the project duration is used as a key indicator [25, 28, 34, 39]. Accordingly, this study conducted an additional analysis to determine whether project durations cause differences as regards the influence of project managers' leadership competencies on social capital and project performance. First, all samples were analyzed regardless of their durations. Second, samples were grouped by the project duration and analyzed separately: 159 data points in shorter-term projects less than six months (55.8%) and 126 longer-term projects lasting more than six months (44.2%).

5.2 Measurement Model

It is indispensable in a PLS analysis to assess convergent validity and discriminant validity [16]. A confirmatory factor

analysis was conducted to determine whether the measurement variables were properly loaded onto their constructs.

5.2.1 Convergent Validity

Convergent validity refers to the degree to which a measure is correlated with other measures to which it is theoretically predicted to correlate. This implies that the measurement variables of each potential construct should be loaded with significant t-values. For the PLS-based analysis of convergent validity, this study conducted a confirmatory factor analysis and examined the sizes of factor loadings for the relevant variable of each measurement item. If the factor loading between the measurement item and variable is 0.7 or more, the item is considered valid [7]. In our final results, all relevant loadings

were more than 0.7, as shown in the table. The internal consistency of the measurement items was assessed by measuring the average variance extracted (AVE), the composite reliability and Cronbach's α [13]. From the measurements, both the composite reliability and Cronbach's α were found to have values of more than 0.7, 0.893-0.957 and 0.840-0.940, respectively, while the values for AVE ranged from 0.659 to 0.847, greater than the threshold of 0.5. These findings indicate that the measurement items have convergent validity.

5.2.2 Discriminant Validity

Discriminant validity refers to the low correlations that should exist between different measurements designed to measure different constructs. The correlation coefficients of potential

TABLE 2. PLS Factor Analysis

		All			Long term			Short term		
		Mean	S.D	Loading	Mean	S.D	Loading	Mean	S.D	Loading
Emotional Intelligence Competency	EQ1	4.112	0.788	0.900	4.190	0.836	0.926	4.050	0.745	0.863
	EQ2	4.119	0.764	0.841	4.190	0.827	0.881	4.063	0.709	0.784
	EQ3	4.116	0.807	0.837	4.246	0.787	0.858	4.013	0.811	0.826
	EQ4	3.874	0.730	0.826	3.897	0.788	0.846	3.855	0.683	0.813
	EQ5	3.884	0.820	0.855	3.992	0.853	0.850	3.799	0.786	0.860
Cognitive Intelligence Competency	IQ1	4.147	0.813	0.820	4.262	0.821	0.794	4.057	0.798	0.851
	IQ2	3.965	0.911	0.858	3.968	1.011	0.907	3.962	0.826	0.804
	IQ3	4.014	0.787	0.879	4.032	0.819	0.915	4.000	0.763	0.845
	IQ4	3.944	0.762	0.839	3.976	0.834	0.855	3.918	0.702	0.822
	IQ5	3.867	0.816	0.819	3.905	0.871	0.858	3.836	0.770	0.776
Social Intelligence Competency	SQ1	3.996	0.807	0.860	4.063	0.910	0.875	3.943	0.714	0.845
	SQ2	3.902	0.854	0.889	3.976	0.925	0.889	3.843	0.792	0.886
	SQ3	3.895	0.886	0.844	4.016	0.903	0.850	3.799	0.863	0.839
	SQ4	3.926	0.834	0.825	4.000	0.903	0.834	3.868	0.772	0.812
	SQ5	3.768	0.824	0.840	3.778	0.866	0.824	3.761	0.791	0.861
	SQ6	3.968	0.857	0.795	3.968	0.938	0.795	3.969	0.791	0.798
Network Ties	NC1	3.996	0.858	0.896	4.008	0.916	0.925	3.987	0.811	0.867
	NC2	3.958	0.867	0.908	4.032	0.912	0.909	3.899	0.828	0.911
	NC3	4.042	0.895	0.873	4.000	0.980	0.916	4.075	0.823	0.829
	NC4	3.982	0.874	0.915	3.992	0.872	0.916	3.975	0.878	0.919
Shared Language	SL1	3.958	0.879	0.877	4.048	0.884	0.899	3.887	0.871	0.863
	SL2	4.039	0.823	0.913	4.056	0.803	0.905	4.025	0.842	0.919
	SL3	4.018	0.866	0.925	4.000	0.839	0.934	4.031	0.889	0.921
	SL4	4.063	0.898	0.876	4.095	0.898	0.874	4.038	0.899	0.877
Trust	TS1	4.018	0.780	0.904	4.032	0.809	0.887	4.006	0.759	0.918
	TS2	3.996	0.748	0.945	4.024	0.764	0.949	3.975	0.737	0.942
	TS3	3.916	0.852	0.844	3.889	0.869	0.842	3.937	0.840	0.848
	TS4	3.961	0.793	0.911	4.000	0.790	0.927	3.931	0.797	0.898
Project Performance	Perf1	4.109	0.782	0.872	4.222	0.799	0.882	4.019	0.759	0.869
	Perf2	4.133	0.803	0.829	4.159	0.889	0.863	4.113	0.729	0.807
	Perf3	4.116	0.902	0.836	4.198	0.921	0.807	4.050	0.884	0.854
	Perf4	3.933	0.945	0.802	3.937	1.010	0.746	3.931	0.894	0.847

variables should show an appropriate pattern of factor loadings, and the measurement items should be highly loaded onto the allocated factors. In PLS, discriminant validity can be deemed adequate when the square roots of the AVE values are greater than correlation coefficients between the variables [13].

Table 3 shows the correlation coefficients between the variables. The values in the diagonal direction are the square roots of the AVEs. As indicated in the table, square-rooted AVE values are greater than other correlation coefficients; thus, the requirements for discriminant validity are satisfied.

5.3 Structural Models

The hypotheses proposed in our study were tested using PLS. The significance of all paths in each model was tested using a bootstrap procedure with re-sampling of 500. A structural model is used to represent a set of dependent relationships between potential variables or correlations between variables. The structural model calculates the measurement coefficients as well as the standard error and t-value for each coefficient. This study performed a two-tailed test at a 5% significance level when the t-value was greater than or equal to 1.96 [16].

Three PLS analyses were conducted. First, all of 285 samples were used. Second, data points collected in longer term projects were put into PLS separately from short term projects.

5.3.1. All Sample Analysis

The results of the PLS analysis using all of 285 data points are presented in Figure 2. The path coefficients are the standardized beta coefficients. As expected, emotional intelligence competency ($\beta = 0.228, p < 0.01$) and cognitive intelligence competency ($\beta =$

0.220, $p < 0.05$) displayed a significant and positive direct effect on project performance. Thus, **H1a** and **H1b** were supported. However, social intelligence competency had no effect on project performance. Hence, **H1c** was not supported. Emotional intelligence competency did not significantly impact team social capital. Therefore, **H2a** was not supported.

Regarding **H2b**, which deals with the relationship between cognitive intelligence competency and team social capital, the resulting coefficient provided support ($\beta = 0.379, p < 0.01$). Social intelligence competency maintained a positive impact on team social capital ($\beta = 0.405, p < 0.01$), supporting **H2c**. Likewise, team social capital had a significant positive relationship with project performance ($\beta = 0.527, p < 0.01$). Accordingly, **H3** was supported as well.

Squared multiple correlations (R^2) for endogenous constructs are presented in Figure 2. R^2 measures the percent of variance explained by independent constructs in the model. Independent constructs were found to explain a substantial portion of the variance in the dependent constructs. It is also found that project manager leadership explains 52.7 percent of the variance in project performance and 59.3 percent of the variance in team social capital.

5.3.2. Cases of Long-Term Projects

Figure 3 shows the results based on the point of view of long-term IS projects. It includes the path loadings, t-values of the paths, and R-square values. Four out of seven of the hypothesized paths were found to be significant at different levels.

Emotional intelligence competency was found to be positively associated with project performance ($\beta = 0.258, p < 0.05$), but it did not significantly impact team social capital. Hence, **H1a** was

TABLE 3. Discriminant Validity

Construct	CR	AVE	1	2	3	4	5	6	7
(a) Combined									
1 Emotional Intelligence Competency	0.930	0.726	0.852						
2 Cognitive Intelligence Competency	0.925	0.711	0.699	0.843					
3 Social Intelligence Competency	0.936	0.710	0.758	0.732	0.843				
4 Network Ties	0.944	0.807	0.567	0.664	0.673	0.898			
5 Shared Language	0.943	0.807	0.566	0.662	0.670	0.714	0.898		
6 Trust	0.946	0.813	0.546	0.591	0.602	0.739	0.687	0.902	
7 Project Performance	0.902	0.698	0.608	0.640	0.594	0.662	0.602	0.543	0.835
(b) Long-term IS Project									
1 Emotional Intelligence Competency	0.941	0.762	0.873						
2 Cognitive Intelligence Competency	0.938	0.751	0.756	0.867					
3 Social Intelligence Competency	0.937	0.714	0.780	0.751	0.845				
4 Network Ties	0.955	0.840	0.573	0.679	0.669	0.917			
5 Shared Language	0.947	0.816	0.604	0.633	0.678	0.796	0.903		
6 Trust	0.946	0.814	0.563	0.586	0.595	0.788	0.731	0.902	
7 Project Performance	0.896	0.683	0.628	0.598	0.621	0.698	0.618	0.591	0.826
(c) Short-term IS Project									
1 Emotional Intelligence Competency	0.917	0.688	0.830						
2 Cognitive Intelligence Competency	0.911	0.673	0.638	0.820					
3 Social Intelligence Competency	0.935	0.707	0.738	0.714	0.841				
4 Network Ties	0.934	0.779	0.580	0.649	0.683	0.882			
5 Shared Language	0.942	0.802	0.550	0.698	0.670	0.646	0.895		
6 Trust	0.946	0.814	0.543	0.601	0.614	0.695	0.654	0.902	
7 Project Performance	0.909	0.713	0.596	0.683	0.571	0.637	0.592	0.507	0.845

supported while **H2a** was not. Cognitive intelligence competency was found to be significantly related to team social capital ($\beta = 0.345$, $p < 0.05$) but it had insignificant effect on project performance. As a result, **H1b** was not supported while **H2b** was. Finally, social intelligence competency was significantly associated with team social capital. However it had no effect on

project performance. Thus, the results did not support **H1c** but did support **H2c**. Our results showed that team social capital has a significant effect on project performance ($\beta = 0.454$, $p < 0.01$), as expected. Hence **H3** was supported.

Project manager competency and team social capital variables accounted for 54.2 percent of the variance in project performance.

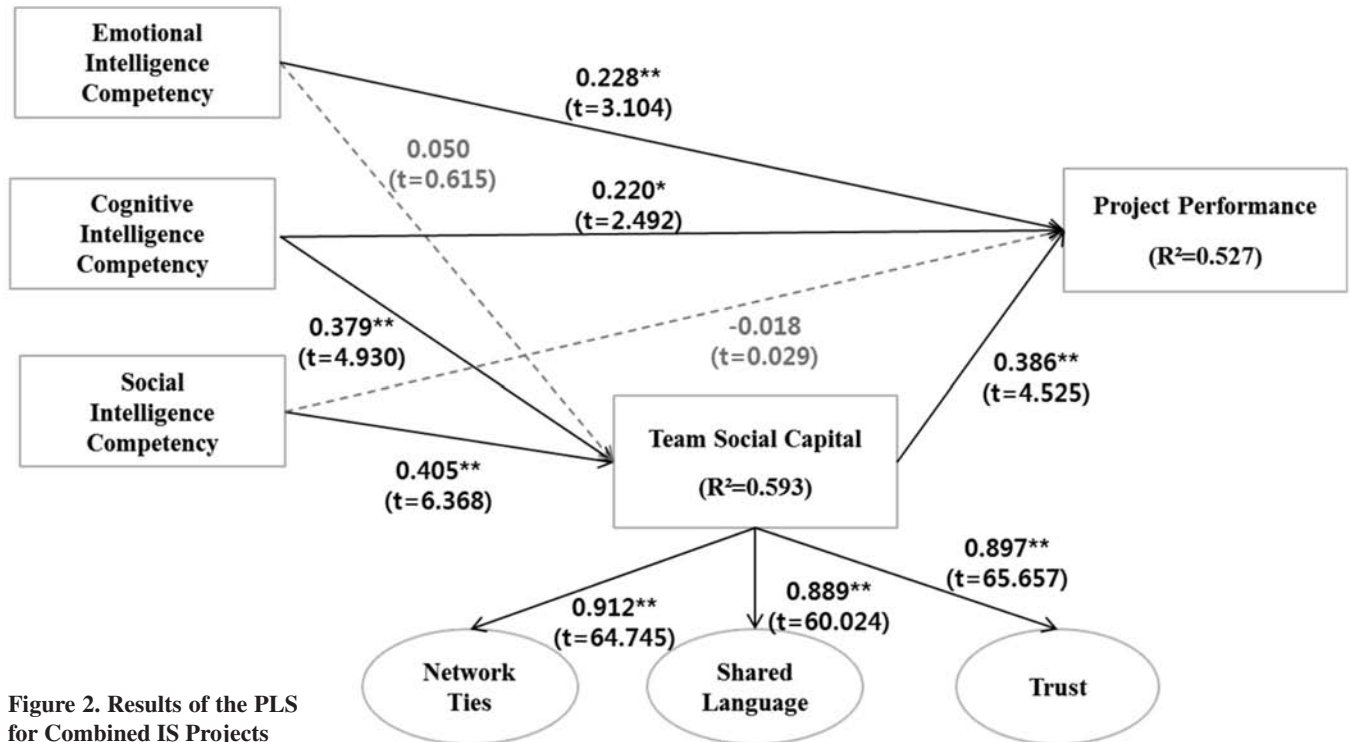


Figure 2. Results of the PLS for Combined IS Projects

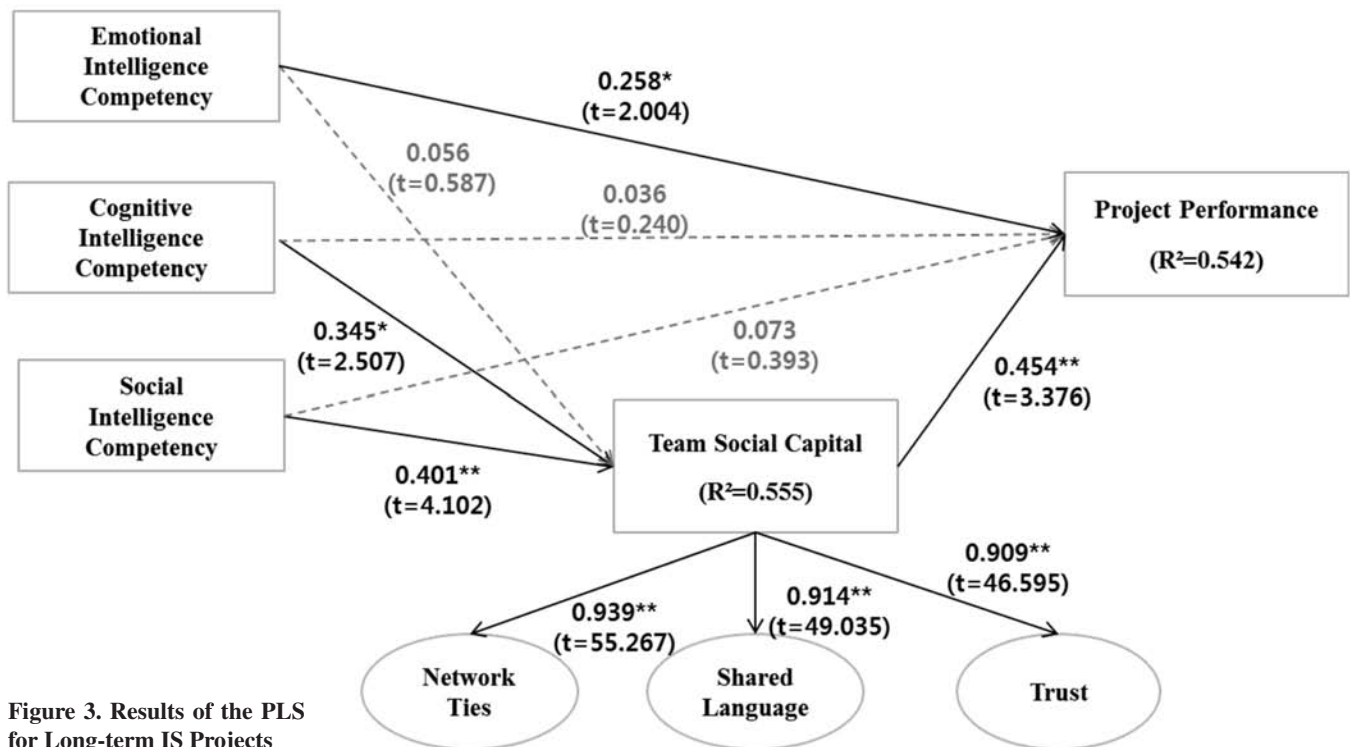


Figure 3. Results of the PLS for Long-term IS Projects

It was also found that a project manager's competency variables explained 19.6 percent of the variance in team social capital.

5.3.3. Cases of Short-Term Projects

The proposed model was then tested using the data collected from IS projects for six months, as shown in Figure 4. Out of the seven proposed hypotheses, five were supported. The effect of emotional intelligence competency was significantly related to project performance ($\beta = 0.233$, $p < 0.05$), but it had an insignificant effect on team social capital. Thus, **H1a** was supported while **H2a** was not. Cognitive intelligence competency was found to be positively associated with project performance ($\beta = 0.384$, $p < 0.01$) and team social capital ($\beta = 0.400$, $p < 0.01$), as expected. Hence, **H1b** and **H2b** were supported. Social intelligence competency was found to be significantly related to team social capital ($\beta = 0.394$, $p < 0.01$) but did not significantly impact project performance. As a result, **H1c** was not supported while **H2c** was. Finally, the level of the achievement of project performance is significantly affected by the degrees of team social capital ($\beta = 0.297$, $p < 0.01$). Thus, **H3** was supported. The project manager's competency variables and team social capital explain 54.2 percent of the variance in project performance and team social capital accounts for 64.3 percent of the variance in project manager's competency.

6. CONCLUSIONS

Leadership competencies of a project manager are critical for project success, especially in IT service projects. As projects in IT services involve multiple stakeholders with different backgrounds and a variety of expertise working in a cross-disciplinary manner, it is critical to select competent project managers [23]. The objective of this study was to measure IT project managers' leadership competencies with three underlying constructs —

emotional, cognitive and social intelligence competencies — and empirically explore the influence of these component competencies of leadership on project performance with the team social capital as a mediating construct in IT services.

Emotional intelligence competencies refers to personal traits concerning emotional stability such as efficiency orientation, planning initiative, attention to detail, flexibility, and self-confidence, while cognitive intelligence competencies refers to the capabilities to understand projects and perform cognitive tasks, including connecting and applying relevant concepts, systematic thinking and recognizing patterns. Social intelligence competencies refer to the capabilities concerning networking, empathy with others, negotiating, persuading and managing team members' relationships. Team social capital in this study is measured by network ties, shared language, and trust among team members.

Analysis of data collected from practitioners by a questionnaire revealed four critical points: (1) emotional intelligence competencies of a project manager directly influence the project performance, (2) social intelligence competencies of a project manager affect the project performance only via team social capital regardless of team size and project length, (3) cognitive intelligence competencies of a project manager directly affect the project performance only when the team social capital is not mature — in shorter term projects, and (4) in longer term projects, cognitive intelligence competencies affect the project performance only through the nurtured team social capital.

Emotional intelligence competencies have a direct influence on project performance at all times, irrespective of length of projects. It can be interpreted that emotionally stable behavior of project manager help team members to focus and concentrate on project tasks in hand without distractions caused by emotionally instability of leaders. In this regard, emotional intelligence competencies directly relates to project performance.

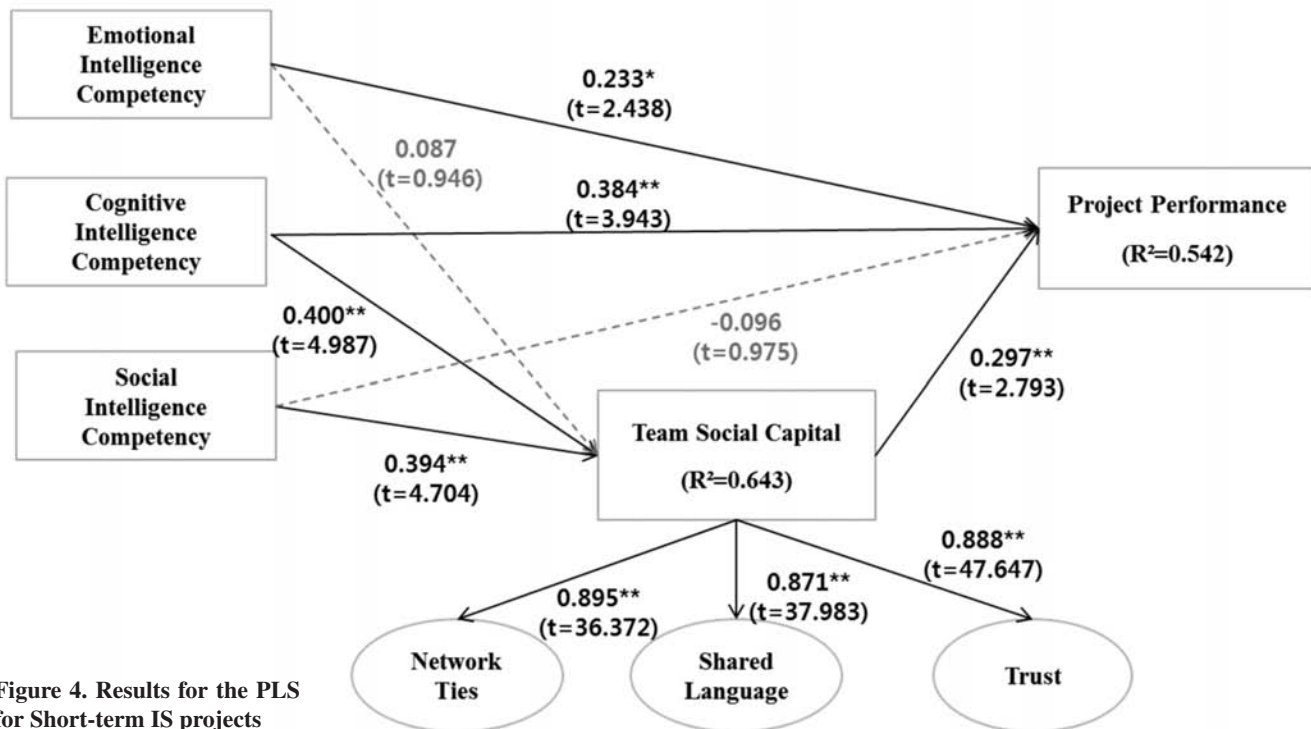


Figure 4. Results for the PLS for Short-term IS projects

In contrast, social intelligence competencies seem to help the team to form and nurture the team social capital, and this team social capital helps the team to achieve project performance. Social intelligence competencies do not affect project performance directly, but only through team social capital. Team social capital is a mediator between social intelligence competencies and project performance, regardless of the project length, and this is the only path for social intelligence competencies towards team project performance.

Emotional intelligence and social intelligence competencies of project manager support and augment each other in that emotional intelligence competencies help team members to recognize cool and rational responses from their project manager while social intelligence competencies help team members to build shared language and trust. In some sense, they may be interpreted as two different sides of the same coin — cool as well as caring behavior of project managers.

When it comes to the influence of cognitive intelligence competencies of a project manager, it seems that the length of project produces striking differences. In shorter term projects of less than six months, cognitive intelligence competencies maintain a significant and direct influence on project performance without indirect path through team social capital, whereas in longer term projects, the cognitive intelligence competencies are fully mediated by the team social capital, losing direct link to project performance. In other words, the study findings indicate that managers' cognitive intelligence is a factor that can produce direct performance in short-term projects, whereas in relatively long-term projects, the elements of team-level social capital work to drive project success as it becomes accumulated among team members.

Academic implications: Thus far, there have not been many studies of social capital. In particular, few studies have dealt with the social capital at the team level and less than few attempted to analyze the mediating roles of team social capital between project managers' leadership competencies and team project performance, empirically. This study examined nomological relations among project managers' competencies, team social capital and project performance. On theoretical side, theoretical differentiation among emotional, social and cognitive competencies are empirically and successfully replicated and confirmed. Also, different impact of these competencies on project performance are revealed: direct effect of emotional competencies, indirect effect of social competencies (only through team social capital), and the dynamic aspect of cognitive competencies. Cognitive competencies maintain direct effect on project performance at the beginning, but as team social capital grow, it becomes more of an indirect source, only working through the team social capital towards team performance.

Leaders with high cognitive and social intelligence can help the team to form and nurture teams' social capital, the capabilities to complete projects successfully. However, this needs to be validated through more studies — qualitative analyses and observations of projects with longer terms.

Practical Implications: For business practice, it is almost tautological to mention criticality of appointing competent managers for tasks or projects to be successful. This study explores the different competencies of leadership and respective association of these competencies with actual performance. In detail, as indicated by the results of this study, a project can

be successfully delivered in the short run by a manager with outstanding cognitive intelligence, but cognitive intelligence competencies by themselves may have limits in the long run. Short-term successes can be achieved by cognitive-intellectually competent leaders, but for longer term projects, attentions need to be paid to the formation and nurturing of team social capital. As project progresses longer, direct influence of cognitive competencies of the project manager weakens while the role of team social capital grows stronger. Internally accumulated know-hows and efficiencies of shared language based on stronger trust among team members are becoming more critical than cognitive leadership.

Project managers' leadership competencies are emerging as an important element that helps form team social capital among members. In this study, although project performance social intelligence competencies concerning members' interactions had no direct influence on project performance, managers' social and cognitive intelligence competencies were found to contribute to project performance by forming and nurturing social capital among members. It is, therefore, necessary to find institutional and technical ways to build team social capital as part of leadership development [29]. In practice, there will be a need to select and cultivate project managers with balanced skills and abilities to promote interactions between members and the accumulation of knowledge at the same time.

Limitations and further studies: This study used cross-sectional survey to empirically test hypothesized relationships among different leadership competencies, team social capital, and project performance. Future studies need to examine the relationships between leadership competencies and team social capital from a long-term perspective and further explore the mechanisms of social capital formation in addition to simple influence relationships.

APPENDIX A

Leadership Competency

Emotional Intelligence Competencies

1. PM is efficiency-oriented.
2. PM promotes work in a planned manner.
3. PM promotes work with the initiative.
4. PM is good at self-control and restraint.
5. PM is flexible.

Cognitive Intelligence Competencies

1. PM is fully aware of project-related concepts.
2. PM is fully aware of project-related technologies.
3. PM does systems thinking, taking into account all project-related things.
4. PM recognizes and makes use of work patterns appearing while at work.
5. PM is good at written communication.

Social Intelligence Competencies

1. PM is good at networking with project members.
2. PM is good at managing the project team.
3. PM is good at negotiating with project members.
4. PM sympathizes with project members' thoughts and words.
5. PM has the ability to develop project team members.
6. PM is good at oral communication.

Team Social Capital

Network Ties

1. I maintain close social relationships with teammates.
2. Team members effectively communicate with one another.
3. Team members share necessary information with one another.
4. I work closely with teammates and supervisors.

Shared Language

1. Members try to use common terms for work.
The members use common terms or jargons.
2. Members try to use easily understandable communication during a meeting or discussion.
Members use understandable communication patterns during discussions.
3. Members talk about documents in an easily understandable manner.
Members use understandable narrative forms to post messages or articles.
4. Members try to understand each other during work cooperation.

Trust

1. I believe in my teammates.
2. I believe in my boss/supervisor.
3. I trust colleagues other than my project team members.
4. I trust my subordinate team members.

Project team Performance

1. Quality of the project team's deliverables
2. Project team's achievement of project objectives
3. Project team's adherence to the budget
4. Project team's adherence to the schedule

ACKNOWLEDGEMENT

This work was supported by the National Research Foundation of Korea Grant funded by the Korean Government (NRF-2012S1A3A2033474).

REFERENCE

- [1] Bass BM, Avolio BJ. *The Multifactor Leadership Questionnaire*, Mind Garden, CA, 1995.
- [2] Bolino MC, Turnley WH, Bloodgood JM. "Citizenship Behavior and The Creation of Social Capital in Organizations," *Academy of Management Review*, 27:4, 2002, 505-522.
- [3] Bourdieu P. *The Forms of Capital*, Greenwood Press, NY, 1986, 241-258.
- [4] Bowles S, Gintis H. "Schooling in Capitalist America Revisited," *Sociology of Education*, 75:1, 2002, 1-18.
- [5] Boyatzis R. *Assessing Emotional Intelligence Competencies*, Novas Science Publishers, NY, 2007.
- [6] Boyatzis RE, Ratti F. "Emotional, Social and Cognitive Intelligence Competencies Distinguishing Effective Italian managers and Leaders in a Private Company and Cooperatives," *Journal of Management Development*, 28:9, 2009, 821-838.
- [7] Chin WW. *The partial least squares approach for structural equation modeling*, Lawrence Erlbaum Associates Publishers, NY, 1998, 295-336.
- [8] Chin WW, Marcolin BL, Newsted PR. "A Partial Least Squares Latent Variable Modeling Approach for Measuring Interaction Effects: Results from a Monte Carlo Simulation Study and an Electronic-Mail Emotion/Adoption Study," *Information Systems Research*, 14:2, 2003, 189-217.
- [9] Crawford LH. *Assessing and developing the project management competence of individuals*, People in Project Management, UK, 2003.
- [10] Croninger RG, Lee VE. "Social Capital and Dropping Out of High School: Benefits to At-Risk Students of Teachers' Support and Guidance," *Teachers College Record*, 103:3, 2001, 548-581.
- [11] De Vries MFRK, Florent-Treacy E. "Global Leadership from A to Z: Creating High Commitment Organizations," *Organizational Dynamics*, 30:4, 2002, 295-309.
- [12] Fiedler FE. *A theory of leadership effectiveness*, McGraw-Hill, 1967.
- [13] Fornell C, Larcker DF. "Structural Equation Models With Unobservable Variables and Measurement Error: Algebra and Statistics," *Journal of Marketing Research*, 18:3, 1981, 382-388.
- [14] Goddard RD. "Relational Networks, Social Trust, and Norms: A Social Capital Perspective on Students' Chances of Academic Success," *Educational Evaluation and Policy Analysis*, 25:1, 2003, 59-74.
- [15] Goleman D. *The new leaders*, Harvard Business School Press, Boston, 2002.
- [16] Hair Jr. J, Anderson R, Tatham R, Black W. *Multivariate data analysis: with readings*. Prentice-Hall, Inc. Upper Saddle River, NJ, 1995.
- [17] Hanifan LJ. "The Rural School Community Center," *Annals of the American Academy of Political and Social Science*, 67, 1916, 130-138.
- [18] Henderson JC, Lee S. "Managing I/S design teams. A control theories perspective," *Management Science*, 38:6, 1992, 757-777.
- [19] Heo MS, Cheon MJ. "A Study on the Impact of Employee's Person-Environment Fit and Information Systems Acceptance Factors on Performance: The Mediating Role of Social Capital," *Asia Pacific Journal of Information Systems*, 19:2, 2009, 1-42.
- [20] Hersey P, Blanchard K. *Management of organizational behavior*. Prentice-Hall, NJ, 1993.
- [21] Higgs MJ, Dulewicz SV. "The design of a new instrument to assess leadership dimensions and styles," *Selection and Development Review*, 20:2, 2010, 7-12.
- [22] House RJ. "A Path Goal Theory of Leader Effectiveness," *Administrative Science Quarterly*, 16:3, 1971, 321-339.
- [23] Jurison J. "Software project management: the manager's view," *Communications of the Association for Information Systems*, 2:3, 1999, 2.
- [24] Kayworth TR, Leidner DE. "Leadership Effectiveness in Global Virtual Teams," *Journal of Management Information Systems*, 18:3, 2001, 7-40.
- [25] Kerzner H. *Strategic Planning for Project Management Using a Project Management Maturity Model*. John Wiley, NY, 2001.
- [26] Lee H, Park J-G, Lee J. "Leadership Competencies of IT Project Managers : from Team Social Capital Perspective,"

- Journal of *Korea Society of IT Services*, 10:4, 2011, 133-147.
- [27] Lohmoller J-B. "The PLS Program System: Latent Variables Path Analysis with Partial Least Squares Estimation," *Multivariate Behavioral Research*, 23:1, 1988, 125-127.
- [28] Lyytinen K. "Expectation failure concept and systems analysts' view of information system failures: Results of an exploratory study," *Information and Management*, 41:1, 1988, 45-56.
- [29] McCallum S, O'Connell D. "Social capital and leadership development: Building stronger leadership through enhanced relational skills," *Leadership and Organization Development Journal*, 30:2, 2009, 152-166.
- [30] Mehra A, Dixon AL, Brass DJ, Robertson B. "The Social Network Ties of Group Leaders: Implications for Group Performance and Leader Reputation," *Organization Science*, 17:1, 2006, 64-79.
- [31] Miguélez E, Moreno R, Artís M. "Does Social Capital Reinforce Technological Inputs in the Creation of Knowledge? Evidence from the Spanish Regions," *Regional Studies*, 45:8, 2010, 1019-1038.
- [32] PMI. *A Guide to the Project Management Body of Knowledge..* Project Management Institute, PA, 2008.
- [33] Putnam RD. "Tuning In, Tuning Out: The Strange Disappearance of Social Capital in America," *Political Science and Politics*, 28:4, 1995, 664-683.
- [34] Schwalbe K. *Information Technology Project Management*. Thomson Course Technology, Cambridge, 2009.
- [35] Sherif K, Hoffman J, Thomas B. "Can technology build organizational social capital? The case of a global IT consulting firm," *Information & Management*, 43:7, 2006, 795-804.
- [36] Tansley C, Newell S. "Project social capital, leadership and trust: A study of human resource information systems development," *Journal of Managerial Psychology*, 22:4, 2007, 350-368.
- [37] Thompson JA. "Proactive Personality and Job Performance: A Social Capital Perspective," *Journal of Applied Psychology*, 90:5, 2005, 1011-1017.
- [38] Turner JR, Müller R. "The Project Manager's Leadership Style as a Success Factor on Projects: a Literature Review," *Project Management Journal*, 36:2, 2005, 49-61.
- [39] Weill P, Olson MH. "An Assessment of the Contingency Theory of Management Information Systems," *Journal of Management Information Systems*, 6:1, 1989, 59-85.
- [40] Zaccaro SJ, Rittman AL, Marks MA. "Team leadership," *The Leadership Quarterly*, 12:4, 2001, 451-483.
-

Copyright of Journal of Computer Information Systems is the property of International Association for Computer Information Systems and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.