Cognitive social capital and project success: The role of knowledge acquisition and exploitation

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Abstract
Cognitive social capital (e.g., norms/values, trust, reciprocity), is expected to contribute to project success. However, the manner in which this occurs has not received much attention. Using data from Ghana we provide findings on the contributions of cognitive social capital to project success by way of knowledge acquisition and exploitation.

Keywords: Cognitive social capital, Knowledge management, Project success

INTRODUCTION

Social capital has been recognized in the general management literature as providing resources to organizations. In general, social capital refers to an individual's or group's ability to secure or obtain resources, knowledge, and information through relationships with and among other individuals and groups. There is also evidence in the literature to suggest that social capital contributes to project success. However, the manner in which the contribution occurs has not received much attention. We seek to address this shortcoming by proposing that knowledge acquisition and exploitation serve as mechanisms by which social capital contributes to project success. Our results seem to suggest that social capital contributes to project success because it (SC) enhances the knowledge acquisition and exploitation processes within organizations.

Broadly, there are three major dimensions of social capital: Structural, Relational, and Cognitive. This study is based on cognitive social capital. It refers to "what people feel (values and perceptions)" (Harpham 2008: 51). Cognitive social capital is a measure of the perception of the quality of the interactions between individuals. It also represents resources obtained from a common set of goals, a shared vision, and shared representations, interpretations, and systems of meaning among parties. This research examines the impact of cognitive social capital on project success through its relationship with the knowledge management process within firms.

This study is carried out using data from Ghana, a sub-Saharan African country. Ghana was selected for this study because, like other less developed countries, most projects within the country are government sponsored with attendant inefficiencies. Culturally, power distance is very high and it is not unusual to hear and read about high levels of corruption with regard to the award of contracts for government sponsored projects in the country. At the same time the strong family and social ties among individuals from the same ethnic groups provide a fertile opportunity for the study of the impact of shared norms and values, trust and other aspects of cognitive social capital.

It is not exactly clear how cognitive social capital influences the processes that lead to the attainment of project outcomes within organizations. We propose that knowledge management, in the form of knowledge acquisition and exploitation, is a mechanism by which social capital influences project success. Thus, an exploratory study that looks at individual relationships between social capital components and project success will contribute to an understanding on how social capital contributes to project success.

HYPOTHESES DEVELOPMENT AND RESEARCH MODEL

Enhanced project communication, knowledge acquisition and exploitation among team members in a project environment, between members of different project teams, and between team members and higher-ups are expected to bring efficiencies to project processes and thus contribute to project success. The historical relationships and the ties developed among team members facilitate access to broader sources of information, and ensures information quality, relevance and timeliness, and thus enhance the level of coordination and interactions with colleagues that lead to the attainment of project success. In addition, those interactions facilitate the acquisition and exploitation of knowledge among project participants (Yil-Renko, Autio, &

Sapienza, 2001). Thus, we propose the following hypotheses with regard to the impact of the acquired resources on the timely completion of projects, within budget and attainment of performance goals.

H1a: Norms and Values, as an element of cognitive social capital will have a positive on impact knowledge acquisition in project management environments

H1b: Reciprocity, as an element of cognitive social capital, will have a positive impact on knowledge acquisition in project management environments

H1c: Trust as an element of cognitive social capital will have a positive impact on knowledge acquisition in project management environments

H2a: Norms and Values, as an element of cognitive social capital, will have a positive on impact knowledge exploitation in project management environments

H2b: Reciprocity, as an element of cognitive social capital, will have a positive on impact knowledge exploitation in project management environments

H2c: Trust, as an element of cognitive social capital, will have a positive on impact knowledge exploitation in project management environments

H3: Knowledge acquisition will be positively related to project success

H: Knowledge exploitation will be positively related to project success

A summary research model is shown in the figure below.

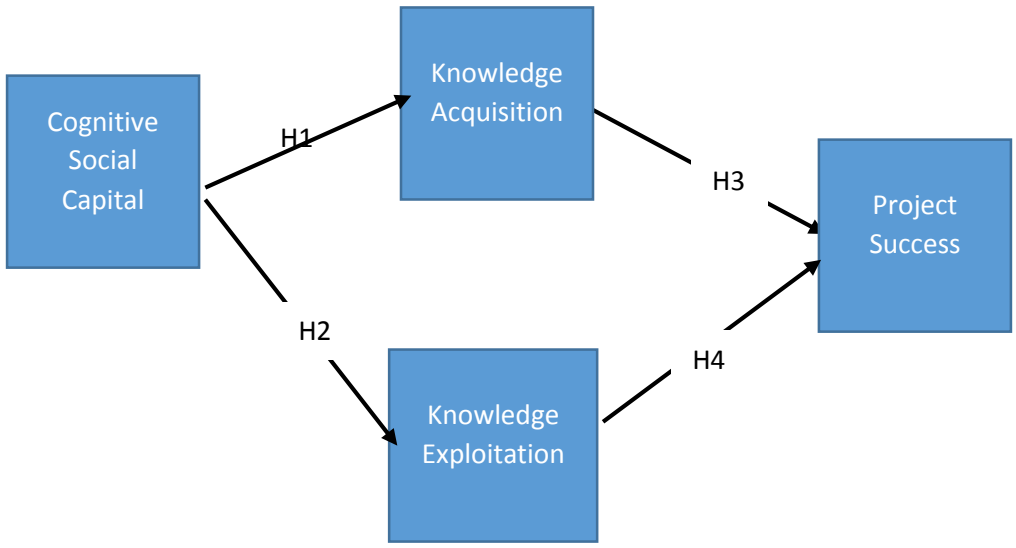

Figure 1: Research Model

METHODOLOGY

This study was carried out in Ghana using a survey of individuals in various organizations who have had some involvement with projects. The survey questionnaire was

made up of previously used and validated items obtained from the literature for the different constructs. Three operations management professors, one strategic management professor, and two operations management graduate students checked the instrument for content validity. A sample of students pursuing an MBA program at a local university with concentration in supply chain/ operations management were asked to check the questionnaire for clarity, ease of completion and readability. The suggestions were used to make modifications to the questionnaire prior to distribution to respondents.

The sample base consisted of graduate students pursing executive MBA programs, graduate students in a Master of Public Administration program at a national university in Ghana as well as individuals pursuing modular executive management programs at the same university. These students, who were all mostly fully employed within different organizations, have been members of project teams and/or served in various project management roles such as team leaders, project managers, sponsors, and team members and thus were deemed appropriate for a study of social capital in project environments. The students were also given additional questionnaires to give to other members in their organizations with some project management engagement. In all one hundred and eight-five (185) questionnaires were distributed. We received 145 completed surveys representing a response rate of 78.4% out of which 141 were found to be usable. The others were discarded because of incomplete responses.

The individuals responding to the survey are considered to be "respondents" (Van Weele & Van Raaij, 2014) given that the domain of social capital theory applies at both the individual level, and at organizational or community levels. The unit of analysis is the individual and his/her experiences within a project management context and his/her assessment of the success of those project engagements. *Cognitive social capital* has been measured using indicators focusing on general and interpersonal trust, shared goals, shared culture, reciprocity, feelings of safety, and views of multiculturalism to gauge the individual's tolerance of diversity. Measurement of social capital is less problematic at the individual level than at other levels because the focus is on the individual and therefore, there is no ambiguity in the indicators, which are derived from social network research. Measures of norms (including shared norms and values) are common at all levels. However, the focus at individual and organizational levels is on shared values, norms and goals in an organizatio*n*.

We checked for non-response bias by testing the number of projects that that the respondents had been engaged in, the average age of the respondents, as well as the gender of early respondents against late respondents and found no statistical differences on those measures (Lambert & Harrington, 1990). The late respondents serve as a proxy for those who did not respond to the surveys (Klein, Rai, & Straub, 2007). We also took steps to check for common method variance (CMV). Different pages of the four-page questionnaire had different groups of questions representing the different constructs and demographic measures. These techniques have been used in published management research to minimize CMV (Nunnally & Bernstein, 1994; Podsakoff, MacKenzie, & Podsakoff, 2003). Last, we used Harman's (1967) one-factor test to provide further absence of common method bias. We factor-analyzed all social capital and knowledge acquisition and exploitation variables and found multiple factors to be present indicating that common method variance may not be contributing to inflated correlations among the variables.

Measures

There are six constructs in this study all measured with multiple items. The items and the primary literature sources are shown in Table 1. Likert-type scales with responses ranging from 1 (strongly disagree) to 7 (strongly agree) were used. Three constructs were used to represent cognitive social capital: Norms and Values, Reciprocity, and Trust. Norms and values was

Table 1: Construct items and their sources

Constructs AND Items	**Source(s) adapted from**
Trust • Most of my co-workers (project or team members) can be trusted • Most of my co-workers (project or team members) are honest • The team members I work with are reliable • Overall, most of my team members are trustworthy	Chiu et al (2008); Leana and Pil (2006)
Reciprocity • Most of my co-workers (project or team members) would be willing to help if I needed it • There are team members on the project I trust to help solve problems on the project • Project team members are willing to help each other out	Chiu et al (2008)
Knowledge acquisition • Our organization obtains tremendous amount of knowledge and information within and outside of the organization because of our relationships with them. • Our organization obtains valuable information on project execution from our clients • Our organization obtains a great deal of technical knowledge from other teams within the organization and from our clients. • Our organization relies on our clients to acquire information that helps us execute the project successfully.	Yli-Renko et al (2001)
Knowledge exploitation • Our project team uses the knowledge and information we acquire from other teams and our clients to improve the project outcomes. • Our project team uses the knowledge and information we obtain from our clients to increase productivity on the project. • . In our project team, we share the knowledge and information from other teams and our clients with each other to encourage experimentation and creativity. • Our project team uses the knowledge and information from clients to improve the efficiency of our activities.	Yli-Renko et al (2001)
Norms and values • Team members share the same ambitions and vision. • Team members enthusiastically pursue collective goals and mission.	Leana and Pil (2006)

• There is a commonality of purpose among team members. • Team members are committed to the goals of the team. • Team members view themselves as partners in charting the team's direction. • Everyone is in total agreement on our team's vision.	
Project success • The projects have typically been completed within the planned time • The projects have typically been completed within the planned budget • The projects have typically achieved the planned objectives • The customers of the projects have generally been satisfied with the outcomes of the projects	Meredith et al (2014) Jiang et al (2002)

measured with five items that assessed the extent to which project team members subscribed to the project vision, were committed to the project goals and felt a sense of agreement from other team members. Reciprocity was based on willingness of team members to provide help to others and could be trusted to by their team members to solve project related problems. There were four items for trust assessing the trust among team members, their honesty, reliability and could be trusted to solve project related problems. We measured knowledge acquisition with four items on technical and other knowledge acquired from other teams (within and outside the organization, and from clients. Knowledge Exploitation had 4 items each that assessed how team members used information acquired from others to improve project management performance, improve productivity, efficiency and creativity. Project success had four items dealing with completion time, within budget, planned performance, and customer satisfaction.

Measurement Analyses

Data analysis was carried by means of the Partial Least Squares (PLS) structural equation modelling technique (SEM), a multivariate statistical technique widely used in research in the marketing, strategic management, information systems, and operations management fields (Klien et al., 2007; Hair, Sarstedt, Ringle, & Mena, 2012). PLS is a variance –based SEM approach which is particularly useful for exploratory research (Hair et al. 2014). Although the study uses previously validated measures and examines a subject matter that has been widely studied, it is considered exploratory given the environment in which the study is carried out. Unlike covariance-based approaches, PLS is less restrictive on measurement scales and sample size, in addition to making no distributional assumptions (Chin, 1998). PLS approach is a robust method, providing both measurement and structural information in terms of indicator loadings and path coefficients. PLS's latent variables are weighted composite scores of the indicator variables, leading directly to explicit factor scores. PLS parameters are estimated using a resampling approach (i.e., bootstrap or jackknife) since it lacks the classical parametric inferential framework. Finally, we chose PLS because its ability to enable us assess the predictive abilities of social capital on project management success (Hair, Hult, Ringle, & Sarstedt, 2013).

All our constructs were measured reflectively and thus we evaluated our measurement model through assessments of the reliability and validity of the constructs. Though this study

adopted previously validated measures, we fully retested the consistency of the research instrument as recommend in methodological research (Straub, 1989; Malhotra & Grover, 1998). Internal consistency reliability was measured using the Cronbach alpha which measures the extent to which the items for each construct are related to each other. With the exception of the Reciprocity construct, all Cronbach alphas are above 0.70. The alpha for Reciprocity is 0.66 which is still above 0.60, the generally accepted minimum threshold for research in relatively new environments (Nunnally & Bernstein, 1994), At the same time, given that the Cronbach alpha underestimates the scale reliability and is dependent on the number of items for the construct, we used the composite reliability measure to provide further evidence of internal consistency reliability. The composite reliability takes into account the different outer loadings of the indicator variables compared to Cronbach alpha's implicit assumption that all indicator items have equal outer loadings on the construct (Hair, Hult, Ringle, & Sarstedt, 2012). As evident in Table 2, the composite reliability for all constructs is greater than 0.80, indicating good internal consistency and further none was higher than 0.95 indicating that there were no redundant items for each construct.

Table 2: Construct reliability

Constructs	AVE	Composite reliabilities	Cronbach alpha
Knowledge Acquisition	0.630	0.871	0.803
Knowledge Exploitation	0.707	0.906	0.862
Norms and Values	0.599	0.898	0.861
Project Success	0.616	0.865	0.791
Reciprocity	0.592	0.813	0.658
Trust	0.614	0.862	0.795

Convergent validity is the extent to which the measures for each construct are related to each other. The convergent validity was assessed by means of the average variance extracted. Table 2 shows the average variance extracted (AVE) for all seven constructs in our model. All the AVEs are above 0.50 indicating that each construct explains more than 50% of the variance of its indicators (Hair et al, (2014). The next validity test was the discriminant validity which was assessed using is the Fornell-Larcker (1981) criterion (F-L). The Fornell-Larcker criterion compares the square root of the AVE values of each construct and its correlations with other constructs. If the square root of each construct's AVE exceeds its correlation with any other construct, then discriminant validity exits. As shown by comparing the square root of the AVEs and the correlations among constructs in Table 3, the square root values (diagonally bolded) are greater than the correlations among constructs (off-diagonals). This indicates that all constructs share more variance with their measures than with other constructs in the same model, thus providing evidence of discriminant validity.

Table 3: Discriminant Validity Results –Fornell-Larcker results

	Knowledge Acquisition	Knowledge Exploitation	Norms & Values	Project Mgt. Performance	Reciprocity	Trust
Knowledge Acquisition	**0.7935**					
Knowledge Exploitation	0.6298	**0.8405**				
Norms & Values	0.2810	0.4349	**0.7738**			
Project Success	0.3294	0.4032	0.4563	**0.7847**		
Reciprocity	0.3889	0.2400	0.4275	0.2757	**0.7692**	
Trust	0.3138	0.1981	0.4054	0.1976	0.6095	**0.7838**

RESULTS

We used SmartPLS3 to test the relationships among the constructs in the study. A bootstrapping technique was used to test the significance of the path coefficients by running 1000 simulations each with resampling procedure to generate percentile bootstrap *p* values. Table 4 provides details on the path coefficients from the bootstrapping analysis. The results show that reciprocity has a significant impact on knowledge acquisition (β=.239, *p*=0.061) while norms & values, and trust have no significant impact on knowledge acquisition. We therefore find partial support for **H1.** Among the social capital components, norms and values is the only one with a significant impact on knowledge exploitation (β=.335, *p*=0.001), again indicating partial support for **H2**. Collectively we observe that norms & values is important for enhancing knowledge exploitation in project environments while reciprocity is important for knowledge acquisition. Trust does not appear to have a significant impact on either knowledge acquisition or exploitation. Knowledge acquisition does not have a significant linkage with project management success and thus Hypothesis 3 was not supported by our data. Our results suggest that knowledge exploitation contributes significantly to project success within organizations. The results of the hypotheses tests are provided in Table 5.

Table 4: Path Results

Path	**Observed Mean**	**Bootstrapping Mean**	**Standard Error**	**T Statistics**	**P Values**	**95% CI**
Knowledge Acquisition => Project Success	-0.007	0.000	0.129	0.053	0.958	-0.272, 0.252
Knowledge Exploitation => Project Success	0.259	0.256	0.133	1.956	**0.051**	0.015, 0.528
Norms & Values => Knowledge Acquisition	0.007	0.021	0.113	0.058	0.954	-0.189, 0.247

Norms & Values => Knowledge Exploitation	0.335	0.335	0.100	3.352	**0.001**	0.133, 0.533
Reciprocity => Knowledge Acquisition	0.239	0.234	0.127	1.878	**0.061**	-0.033, 0.471
Reciprocity => Knowledge Exploitation	-0.093	-0.082	0.086	1.086	0.278	-0.258, 0.091
Trust =>> Knowledge Acquisition	0.024	0.016	0.101	0.233	0.815	-0.200, 0.193
Trust =>> Knowledge Exploitation	-0.067	-0.067	0.080	0.840	0.401	-0.222, 0.085

Table 5: Summary of Hypotheses Testing Results

Hypothesis		Results
H1	Cognitive social capital is positively related to knowledge acquisition in project management environments	Partially Supported
H2	Cognitive social capital is positively related to knowledge exploitation in project management environments	Partially Supported
H3	Knowledge acquisition contributes significantly to project performance	Not supported
H4	Knowledge exploitation contributes significantly to project success	Supported

DISCUSSION, CONCLUSIONS AND LIMITATIONS

This study focuses on the impact of social capital on project success. We have demonstrated that cognitive social capital is important for achieving project success because it enhances primarily knowledge exploitation within project environments. In particular, norms and values as expressed in the form of sshared vision, aspirations and goals about projects and the commitment to the purpose of the project appear to contribute to project success. Thus, management should focus on expending efforts toward the enhancement of norms and values within their project environments. With regard to knowledge management processes, our results show that knowledge acquisition contributes less to project success compared to knowledge exploitation. This study did not examine the extent to which other constructs moderate and/or mediate the relationships between social capital and knowledge management. For example, culture might influence the manner in which trust, reciprocity and norms/values affect the way people within a society acquire and exploit knowledge within their organizations. Also, although knowledge acquisition does not influence project success directly, it might do so through knowledge exploitation and thus such relationships need to be examined in future research.

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