How Can Steering Committees Manage Change Through Dynamic Capabilities to Increase System Satisfaction?

Kris Murphy
Case Western Reserve
University,
Cleveland, Ohio, United States
kam31@case.edu

Kalle Lyytinen
Case Western Reserve
University,
Cleveland, Ohio, United States
kjl13@case.edu

Toni Somers
Wayne State University,
Detroit, MI, United States
toni_somers@wayne.edu

Abstract

Enterprise-wide system implementations require organizations to think differently about how they approach project-based IT governance. Companies typically use executive steering committees to govern IT projects; yet, problems with user satisfaction linger. While scholars and practitioners have some understanding of what make steering committees successful, we do not fully understand what capability levers are available. This study contributes to the limited research on how project-based IT governance can manage change to achieve higher satisfaction with system usage. We find that steering committees can be more effective by stacking business IS capability with powerful antecedents of innovative culture and capable champions. Second, we find that business IS competence mediates the effects of innovative culture and capable champions on system quality. Third, we take a step forward in developing a change model based on dynamic capability for IT governance. We suggest several implications for practice and theory of project-based IT governance.

1. Introduction

Use of steering committees to organize and govern complex system implementations has evolved over the years. As an executive IT governance vehicle, steering committees are a critical factor in enterprise implementation success and IT sophistication [1-3]. A steering committee exhibits a form of project-based IT governance which involves prudent executive control for IS project management and enacts a valid "social process" to involve stakeholders [4, p. 215]. While some research on executive IT governance in the form of steering committees exists, in agreement with Kirsch, we argue that "desired outcomes, standards, and corrective actions are not always obvious" in IT

implementations hinting towards a "broader interpretation" of project-based IT governance [4, p. 216]. For example, existing studies have so far failed to incorporate the impact of change culture and change champions in explaining system usage. Moreover, understanding of associated change capabilities and project-based IT governance is inadequate [5-7].

The extant literature and IT Governance Institute broadly define executive IT governance (e.g. corporate boards, steering committees) as a vital component of enterprise governance consisting of organizational and leadership processes, which are concerned with implementing processes, the definition of said processes and creation of mechanisms to support strategic alignment between businesses and IT [5, 8-10]. While the literature supports that steering committees are a judicious IT governance mechanism, they can also be empowered change agents [2, 5, 11, 12]. The steering committee environment is a social system, so the quality of their role depends heavily on the interactions that take place within the cross-functional, cultural milieu. Organizational initiatives, such as project-based IT governance, fail to take root unless implemented with concerted effort to appropriately alter organizational processes due to cultures which are not accepting of innovation. Whereas a culturally inspired system implementation engenders innovation and "the practices that encourage that behavior" [13, p. 128]

Steering committees are in a unique position to drive change across functions, because they consist of high-level, cross-functional managers who are brought together to support the execution of an enterprise project [2, 14]. Research also shows that those who hold top management positions drive strategic change and possess the ability to bring forth organizational change [15-17]. According to Somers and Nelson, a steering committee fulfills a leadership role by offering guidance on allocation, coordination, and enlisting

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support across an organization [14]. While research on steering committee capability has made some steps forward, little is known of how management groups manage change. There is inadequate empirical research on the role of change champions and innovative culture and their respective impacts on project-based IT governance. Current literature is grounded in but a few studies of the structure and internal procedures of steering committees and related capabilities [2, 5, 6, 11, 12, 18]. A separate body of knowledge addresses the role of leadership and change management, but none of these studies link change capability to IT governance. Yet, while analyzing an IT governance context, Pult and Manwani argue that "the capability of managing business change increases the efficiency of IT governance" [7, p. 390]. We want to extend this line of research by looking into the factors that contribute to improved systems satisfaction through dynamic change capabilities. In particular, we ask the following research questions:

1. Can executive IT governance within steering committees use social levers of innovative culture and capable champions to affect system usage?
2. Does having capable change managers an innovative culture enrich business IS competence and promote improved project outcomes?

In setting out our research, we focus on project outcomes defined as whether project goals were met and effective, delivered on time, inside desired budget limits and lead to adequate user adoption when measured by system usage [1, 19-23]. We utilize the resource-based view of the firm (RBV) throughout our investigation because this theory defines how managers can be organized based on a capability to create effective IT governance; thus, it creates a useful lens to analyze project outcomes [24, 25]. RBV broadens conceptions about corporate governance and explains how an innovative culture and change champions contribute to project success [26]. These combined theories, integrated in Figure 1, are used to explain project success outcomes: system quality and satisfaction with system usage [21, 23, 27].

The next sections of this paper are as follows: first, we conduct a literature review on theories of the RBV, enterprise systems project success, and organizational theories on project-based IT governance. Second, we construct a research model and posit several hypotheses, which blend RBV theory with IT project success. Third, we delineate research design, and create scales for proposed constructs and report sample and statistical analyses, Last, we synthesize our findings and discuss the study's shortcomings and review practical implications and future research.

2. Theoretical Foundations

We examine research on the following topics: 1) resource-based view; 2) enterprise system project success; 3) steering committee governance. We propose the following theoretical framework (Figure 1). We ground our reviews on multiple reference databases, scholarly search engines, and thorough review of several leading information systems (IS) journals. The key phrases and keywords we used while conducting our search were: "resource-based view", "socio-technical", "change champion", "change management", "steering committee", "IT governance", "IT success", "dynamic capability", "project success" and "change culture". Fifteen articles mentioned steering committees or executive project-based IT governance functions. The lack of research was a recurring point in identified articles [1, 2, 6, 28-30]. Currently, there is little research linking change capability and executive-level project-based IT governance.

Figure 1. Theoretical framework

2.1. Resource-Based View of the Firm

We leverage the RBV, which advocates that resources can be organized "to produce one or several firm capabilities" to improve "performance" which we define as project success [31, p.894]. In agreement with Judge and Elenkov, the RBV's most influential capabilities are the dynamic capabilities because they "adapt" to opportunities which may be presented by enterprise endeavors which promise improved strategic alignment to systems and corporate goals. Organizations having "dynamic capability thus reflect an organization's ability to achieve new and innovative forms" which can enhance project-based IT governance structures [32, p. 516, 33, 34]. We introduce innovative culture and capable champions as dynamic capabilities from the organizational capacity for change framework that Judge and Elenkov propose [31]. From a project-based IT governance perspective and the capabilities required to be successful, we include the business IS competence capability to link these powerful dynamic capabilities to project success [21].

2.2. Enterprise system project success

We adopt here Fisk et al.'s [21] governance effectiveness measures, which identify important success dimensions system quality and satisfaction with system use. Success, when created by steering committees in a resource-based framework, spans all dimensions of the time-effort-cost triangle and includes system quality and system usage [3, 35-37].

System quality. Implemented system quality is a key to project success when generated correctly. Saarinen, et al., argue that quality originates from the perspective of the user [23]. Part of Saarinen's model assesses the success of a project by assessing the quality of the information from the system product, along with various related services [23, 38].

Satisfaction with system usage. Success is also measured by users' satisfaction with system use. User satisfaction measures information system success in terms of "characteristics of the interaction of the user with the system" [21, p. 5, 23, 38]. Bailey and Pearson argued early on that user satisfaction combines all reactions—"positive and negative"—to the information system's factors that affect success [39, p.531].

## 2.3. Steering committee governance

Steering committees now frequently appear as part of best practices in guides for project management [18, 40, 41]. A steering committee is viewed as an instrumental governance mechanism which adds to sophistication of IT governance, and subsequently forms a key success factor [2, 6, 35]. Due to the importance of enterprise projects they often engage an executive steering group to oversee such projects [8, 10, 42]. The current research on steering committees concentrates on governance practices and functions, IT planning, and resource allocation aspects of such committees. Conversely, there is little research on the change capability aspect of such committees [6, 43-45]. Lechler and Cohen accordingly remind us that there is room to expand current understanding of steering committees [6]. Furthermore, some empirical research links steering group activities with business IS competencies as a required condition to achieve success [5, 8].

3. Research Model and Hypotheses

Overall, we posit that steering committees can promote project success by the inclusion of dynamic capability. Without capable governance, business IS competency (BISC), innovative culture (IC), and capable champions (CC) steering groups will be challenged to achieve implementation success—satisfaction with system quality (SSQ) and satisfaction with system usage (SSU). Therefore, we propose the following research model (Figure 2):

Figure 2. Research model
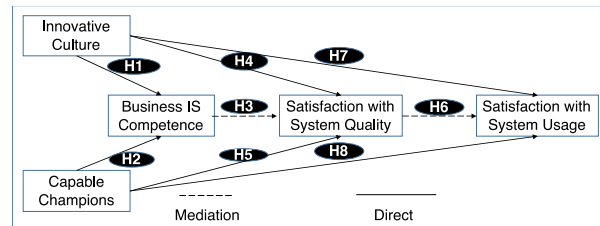
We hypothesize that the change capability constructs of IC and CC are critical and positive antecedents to BISC. Having a change capabilities underpinning increases the SCs willingness to build BISC.

Hypothesis 1. IC is positively related to BISC.
Hypothesis 2. CC is positively related to BISC.

We further hypothesize that and that, BISC positively mediates the effects of IC and CC on SSQ.

Hypothesis 3a. BISC positively mediates the relationships between IC and SSQ.
Hypothesis 3b. BISC positively mediates the relationships between CC and SSQ.

Likewise, we propose that a steering committee with an innovative culture will have a positive effect on system quality. Thus, we posit:

Hypothesis 4. IC is positively related to SSQ.

We also posit that having a steering committee with capable champions positively affects system quality.

Hypothesis 5. CC is positively related to SSQ.

A steering committee that produces greater system quality is able to positively mediate the effects of IC, CC, and BISC on satisfaction with system usage.

Hypothesis 6a. SSQ positively mediates the relationships between IC and SSU.
Hypothesis 6b. SSQ positively mediates the relationships between CC and SSU.
Hypothesis 6c. SSQ positively mediates the relationships between BISC and SSU.

A steering committee with a greater cultural tendency to innovate will have higher levels of satisfaction with system usage. Thus:

Hypothesis 7. IC is positively related to SSU.

Per our theoretical underpinnings, we propose that having capable champions on a SC will result in higher levels of satisfaction with system usage because they are vested participants who can relate to the users. We propose:

Hypothesis 8. CC is positively related to SSU.

4. Research Design and Methods

We conducted a quantitative survey to validate the research model by collecting data from steering committee participants who have recently guided an enterprise systems implementation.

4.1. Construct operationalization

Due to the limited research on project-based steering committees, we followed DeVellis [46] to systematically develop constructs and scale by using informational interviews, peer reviews, Q-sort, and pre- and pilot tests. We adapted established scales with modifications to reflect an enterprise steering committee context. All scales use a five-point Likert scale ranging from "strongly disagree" to "strongly agree."

Project success was modeled using two reflective constructs that measure SSQ and SSU. We adapted these two constructs from Fisk et al. [47] which is founded on DeLone and McLean's [38] research and Saarinen's [23] construct and the results of our qualitative study including a pretest and think-aloud session [48]. SSQ was modeled using 7 indicators and SSU was modeled using eight indicators.

IC was modeled as a reflective construct with two indicators based on work of Judge and Douglas [49]. IC measures "the ability of the organization to establish norms of innovation and encourage" change and is drawn from the work of Kotter and Heskett [49, p. 638, 50, 51]. CC was modeled as a reflective construct with six indicators based on the construct developed by Judge and Douglas and based on the work of Kanter [49, 52].

BISC was modeled as a reflective construct with five indicators from of Fisk et al. [47] which is based on the work of Bassellier, Benbasat, and Reich [53]. BISC measures a steering committee's ability to "acquire and apply IS knowledge effectively" [21, p. 3].

4.2. Social desirability

Since limited work exists with regards to IT steering committees, and we used a mono-method approach, we designed *ex-ante* procedures to avoid common method bias (CMB) [54]. In addition, we nested within the survey measures of social desirability to control for CMB, which improves our ability to detect CMB over that of an unmeasured common latent factor. We chose Hays, Hayashi, and Stewart's 5-item scale (i.e. SDRS-5) [55, 56].

4.3. Controls and demographics

Controls were selected based on prior IS and steering committee research and the degree of significance in these prior studies [1, 5, 57, 58]. We controlled for solution type—packaged versus proprietary and implementation methodology.

4.4. Data collection

Data collection was facilitated through Qualtrics—an online survey research tool—over a three-month period from November 2014 to January 2015. Qualifying questions within the survey ensured that only enterprise systems steering committee participants continued past the introduction. The unit of analysis is an engaged, project-based steering committee. The survey respondents were asked to participate only if they had served on a steering committee within the last three years. Data was obtained from multiple steering committee roles that were previously identified through our literature review, qualitative and quantitative studies [1, 59]. Participants were recruited through the primary researcher's network of information system practitioners, executives, researchers, and alumni of two notable consulting firms which are known for implementing enterprise software. Candidates were identified through a careful process of resume review that was available on the alumni network and LinkedIn to ensure that they held a key position. The survey candidates had titles of project/program manager, program director, IT director, VP, CIO, CFO, CEO, senior manager, senior director of leadership. 164 steering committee participants provided usable responses resulting in an effective response rate of 4.1%. Sample demographics for the data are shown in Tables 1 and 2.

Table 1. Sample: Organization size

Item	Size of Organization	Number	Percent
1	Greater than $25 billion	29	17.7%
2	Between $5 billion and $24 billion	55	33.5%
3	Between $1 billion and $4.9 billion	32	19.5%
4	Under $1 billion	30	18.3%
5	Private	18	11.0%
	Total	164	100.0%

Table 2. Sample: Education level

Item	Highest Level of Education	Number	Percent
1	Associate's degree	5	3%
2	Bachelor's degree	51	31%
3	Master's degree (e.g. MBA, MS or other)	95	58%
4	PhD	8	5%
5	High school diploma	5	3%
	Total	164	100%

Due to the nature of these boards and the frequency at which enterprise projects are undertaken, it was quite challenging to find steering committee participants. Unlike corporate boards, there are no governing bodies for steering committees. When we did identify someone, they tended to have served on multiple steering committees—5.5 on average. Only 6% indicated that their highest level of education was an Associate's degree or high school diploma. Most of the respondents held at least a Master's degree (63%).

4.5. Data analysis

The hypothesized relationships among constructs were analyzed using consistent partial least squares algorithm (PLSc) and SmartPLS application version 3.2.4. The decision to use PLSc, rather than a covariance-based structured equation model (SEM) was based primarily on the nature of the study, limited sample size, and inclusion of consistent analysis methods within the newer version of the product which produces similar results to a covariance-based SEM tool using a nomological network. Lacking theories that apply directly to a steering committee makes PLSc a suitable parameter estimation methodology [60, 61].

4.6. Exploratory factor analysis

An exploratory factor analysis (EFA) was performed to explore the extent to which the indicators meet the *a priori* expectations of factorability (see Table 3). Most items loaded on their respective factors with values greater than 0.50, considered to be the minimum conservative value for practical significance and in cases where the threshold was not met the items were removed and are discussed next [62]. All remaining items cross-loaded with differences from the value of the loading on the primary factor by more than 0.20, indicating sufficient discriminate validity. Cronbach's alphas were above the 0.70 threshold recommended by Hair et al. [62]. As a result of the new PLSc algorithm, we identified some indicators that needed to be removed to improve the nomological model. We removed three indicators from CC because they loaded below 0.50 and negatively affected construct reliability. Four indicators were removed from SSU because they loaded below 0.50. One

indicator was removed from SSQ because it significantly loaded below 0.50.

Table 3. EFA measurement model results

Construct	# of Items	Loadings > 0.5	Cronbach's Alpha's >.0.7
Innovative Culture	2	.916, .801	0.847
Capable Champions	3	0.614, 0.812, 0.712	0.760
Satifaction with System Quality	6	0.761, 0.744, 0.615, 0.722, 0.781, 0.706	0.869
Satifaction with System Use	4	0.747, 0.738, 0.653, 0.738	0.810
Business IS Competence	5	0.716, 0.73, 0.681, 0.792, 0.729	0.853

4.7. Confirmatory factor analysis

Next, we a conducted confirmatory factor analysis to evaluate the validity of the initial measurement model. The initial analysis addressed the factorial validity of the reflective constructs. The significance of parameters was assessed using asymptotic t-statistics generated by resampling techniques [60, 63, 64]. SmartPLS enables this operation by its consistent bootstrapping procedures in which we tested using 5,000 subsamples. In addition, we assessed CMB, which is discussed before the structural model analysis.

We tested for convergent validity of the factors using three tests recommended by Fornell and Larker and new criterion presented by Henseler, Ringle, and Sarstedt for the use of PLSc [65, 66]: item reliability, composite reliability, average variance extracted (AVE), and Heterotrait-Monotrait Ratio (HTMT). All items demonstrated standardized loadings on their respective factors greater than 0.50, demonstrating item reliability [62]. Composite reliability for each of the five reflective constructs was greater than 0.70, indicating internal consistency [62]. For each of the five factors, AVE was greater than 0.50; the minimum threshold recommend by Hair et al. [62]. Discriminate validity is demonstrated when if the HTMT value is below 0.90 or the more conservative 0.85 criterion (See Table 4) [65]. A summary of our test results and the correlation matrix are shown in Table 4.

Table 4. Tests of Discriminate Validity and Heterotrait-Monotrait Ratio

Construct	Business IS Competence	Capable Champions	Implementatio n Methodology	Innovative Culture	Satisfaction with System Quality	Satisfaction with System Usage	Solution Type - Packaged vs Proprietary
Business IS Competence	.730						
Capable Champions	.554	.717					
Implementation Methodology	.074	.086	1.000				
Innovative Culture	.643	.549	.051	.861			
Satisfaction with System Quality	.524	.295	.041	.433	.724		
Satisfaction with System Usage	.737	.555	.095	.660	.745	.720	
Solution Type - Packaged vs. Proprietary	.100	.124	.083	.028	.074	.049	1.000
Composit Reliability >.7	.851	.758	1.000	.851	.868	.811	1.000

Values along diagonal are the square root of AVE

4.8. Common method bias

We tested for CMB by comparing standardized regression weights of factor loadings with and without a marker variable [54]. The differences in factor

loadings in the models with and without the marker variable were all significantly less than 0.20, indicating the lack of meaningful CMB. Moreover, examination of the correlations between the latent variables does not indicate significant concern. All correlation values are well below the suggested maximum threshold of 0.90 [67]. All method factor path coefficients are not statistically significant. Hence, the method effects are unlikely to be a significant concern for our study. Therefore, we chose to remove the social desirability construct from the final structural equation model.

4.9. Structural model analysis

Because our structural model is complex with many indicators, our matched sample size of 164 is small given the complexity of our model [67]. Mediation effects were checked using a product-of-coefficients test [68]. The mediation effects were tested using MacKinnon et al. [69] procedures to calculate asymmetric confidence intervals on the product of two mediation path coefficients (i.e., Sobel test). In addition, we used the Preacher and Hayes bootstrapping test to confirm the significance of the observed mediation effects [70]. The total effects of each factor on SSU range between 0.246 and 0.558. The dynamic capability factors had total effects of IC 0.494, CC 0.289 and BISC 0.246.

A summary of hypothesis test results is provided in Table 5.

Table 5. Summary of research hypotheses

Hypotheses	Path Coefficient & p Value	Supported?
H1	0.484, p<0.000	**Yes**
H2	0.297, p<0.003	**Yes**
H3a	P1: 0.484, p<0.000 P2: 0.440, p<0.002 Sobel: p<0.009	**Yes**
H3b	P1: 0.297, p<0.003 P2: 0.440, p<0.002 Sobel: p<0.031	**Yes**
H4	0.172, p<0.241	No
H5	-0.041, p<0.758	No
H6a	P1: 0.172, p<0.241 P2: 0.558, p<0.000 Sobel: p<0.247	No
H6b	P1: -0.041, p<0.758 P2: 0.558, p<0.000 Sobel: p<0.760	No
H6c	P1: 0.440, p<0.002 P2: 0.558, p<0.000 Sobel: p<0.004	**Yes**
H7	0.279, p<0.009	**Yes**
H8	0.239, p<0.032	**Yes**

The structural model results, with path coefficients, is presented in Figure 3.

Figure 3. Structural model results
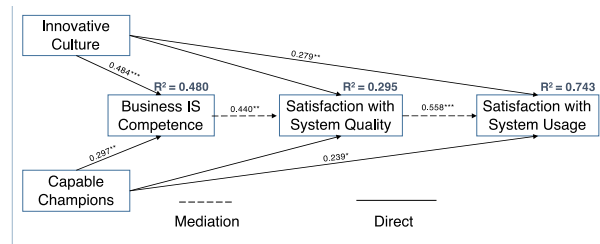
Note that only the significant paths are shown (*** p < 0.001, ** p < 0.01, * p < 0.05).

5. Discussion

Project-based IT governance in the form of steering committees or corporate boards can be a critical success factor for enterprise system implementations. Research suggests that having these project-based governance bodies increases IT sophistication. Yet, not much is understood in terms of the dynamics of this governance function and how project outcomes can be positively affected. Given the complexity of implementing modern technologies, we argue that dynamic change enabled, project-based IT governance is required.

We found that having an innovative culture and capable champions on a steering committee does have a direct and positive influence on BISC and SSU and a mediated effect on SSQ. The mediated effect means that senior managers are more motivated to build BISC and achieve high system quality through oversight if they have a higher stake in the project. Satisfaction with system usage increases because the steering committee is organized based on dynamic capability to drive change and improve processes. The R^2 value of 0.743 for SSU indicates that the model explains a substantial amount of variance. The two factors with the highest total effects on SSU were IC at 0.494 and SSQ at 0.558.

In agreement with Jewer and McKay, we found that BISC is a significant indicator of good IT governance and does impact performance through its direct affect on SSQ and indirect effect on SSU. Having SC managers with no IS implementation knowledge places an extra burden on the expanded project team [8]. Surprisingly, we found that there is no direct effect of change capability on system quality (i.e. SSQ is not directly impacted by IC or CC). We feel that this insignificance is due to the importance of BISC on the traditional measure of system quality in terms of meeting the requirements of the system which, unlike SSU, may not require direct input from IC and CC.

Based on our findings, we feel that project-based IT governance steering committees must be designed with dynamic change capability in mind. Reliance on

typical project management levers may mean that the project is headed in the wrong direction.

6. Limitations and Future Research

This study is limited due to the lack of preexisting research and proven constructs in a steering committee context. Our study is also limited in that we only captured one level of respondents from a project team. Our research moves a step forward in our understanding of steering committee capability and design but is limited by sample size. Additional research is required to further the development of other capabilities that may influence project success. Furthermore, research is required to build a change model that is valid across multiple levels.

7. Conclusion and Implications for Practice

This research opens a new dimension to our understanding of how steering committees can operate more effectively. Our findings have implications for both practitioners. For the practitioner, design of their committee should consider the dynamic change forces that are required for implementation success. We recommend that organizations carefully consider the impact of project-based IT governance and implications of each steering committee role relative to the degree of business IS competency required and the amount of change impacting the organization.

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