Effectiveness of Strategic Decision-Making on IT Investment: Antecedents and Its Impacts on IT Investment Performance

Jong-Sung Park  
Graduate School of Information, Yonsei University, Seoul, Korea  
bizajou@yonsei.ac.kr

Jung-Hoon Lee  
Graduate School of Information, Yonsei University, Seoul, Korea  
jhoonlee@yonsei.ac.kr

Jung-In Yang  
Graduate School of Information, Yonsei University, Seoul, Korea  
inna07@yonsei.ac.kr

Bong-Gyu Lee  
Graduate School of Information, Yonsei University, Seoul, Korea  
bglee@yonsei.ac.kr

Abstract  
Many companies have taken the recent step of setting up an independent decision-making system, often called an ‘IT Investment Committee’, in order to maximize the performance of their IT investments. However, merely organizing such a committee in itself might not ensure good investment performance, owing to conflicts of interest or discord among its members. In this study, it was reviewed which characteristics of members are required for IT Investment Committee to have effective decision-making, by setting up a hypothesis based on Bounded Rationality Model and Politics Model which have been widely adopted in the strategic decision-making area and then conducting a survey on 152 companies. We found that Procedural Rationality and Political Behavior have statistically significant impact on the effectiveness of strategic decision-making on IT investment. Furthermore, degree of shared knowledge between business members and IT members participating in decision-making process and degree of two types of heterogeneity among them lead to higher level of Procedural Rationality and Political Behavior. These findings have a number of practical and theoretical implications.

1. Introduction

In recent years, given how indispensable IT has become in securing strategic business goals [55], a number of companies have markedly stepped up their investment in the IT side of their business [27]. As the monetary and nonmonetary risks of IT investment get higher, companies are attempting rationally to manage their spending through an ‘IT Investment Committee’ designed to make more effective IT investment decisions [36].

However, simply organizing such a committee by itself might not guarantee the effectiveness of decision making. As The Carnegie School has asserted, a person is an entity having bounded rationality [16], and an organization an assembly of individuals who have different goals and capacities [38]. From this viewpoint, it becomes necessary to understand the structure of conflict and cooperation that exists among the diverse individuals or teams making up IT investment committees (and similar functions) in order to review the requirements for the optimal compositions of such teams. This study aims to determine these characteristics, such as they can drive good IT investment performance, and specifically asks two questions:

I. What are the factors in team organization that affect effective decision making in strategic IT investment?

II. Does more effective decision-making in strategic IT investment cause IT investment to have a more significant impact on the overall performance of an organization?

To find the answers to these questions, several hypotheses were argued and statistically tested by making the research model based on ‘Bounded Rationality Model’ and ‘Political Model’ which have been widely adopted in the strategic decision-making area as conceptual models.

This study will make important contributions for IT Governance Field, where scholars and practitioners try to define and implement processes, structures and relational mechanisms enabling both business and IT people to execute their responsibilities in creating business value from IT [66].

2. Theoretical Background

2.1 Previous Research

In the IS field, there have been lots of studies related to IT investment. However, most of them have
focused on the ‘evaluating on the economical efficiency of information systems’, ‘developing and managing of indicators’ and ‘decision-making authority’ [54, 73], and concern about decision-making of strategic IT investment has rarely been treated [51].

Meanwhile, previous researches [e.g., 35, 56] have been based on the ‘Rational Model’ which has been used to set up a macroscopic theory in traditional economics as the basic assumption, of which view point is that ‘a human is an entity thinking logically and consistently based on all available information when making a decision. As Boynton and Zmud pointed out, this viewpoint may give a difficulty in observing the decision-making mechanism microscopically and finding out some significant implications from it [9].

2.2 Procedural Rationality (PR)

Limited by their knowledge and viewpoint, people tend to choose the option that seems most reasonable given a finite set of choices [16]. This does not only apply to an individual but to a group of multiple members who may fall into a bog of a group think (an excessive tendency to seek concurrence) if they have lack of information when they make a decision together [29].

Given that strategic decision-making is a composite and complicated process in which a number of variables have to be taken into account [40], it needs to upgrade the level of ‘Procedural Rationality’ in the process in order not to make a wrong assumption. ‘Procedural Rationality’ refers to ‘the extent to which the decision process involves the collection of information relevant to the decision, and the reliance upon analysis of this information in making the choice [60].’

It has confirmed through various existing literatures on decision-making that higher level of Procedural Rationality leads to more effective decision-making [17, 25, 51], which will apply to the decision-making process of IT investment.

As a result, we can state the following hypothesis:

**H1. In decision-making processes in strategic IT investment, a higher level of ‘Procedural Rationality’ may lead to more effective decision-making.**

2.3 Political Behavior (PB)

The Carnegie School has defined an ‘organization’ as an assembly of individuals having various goals [38]. From their point of view, ‘decision-making’ is a political and social process taken by the interested people who are characterized by conflicting interests and unequal powers who come together to make a decision [18, 47].

‘Political Behavior’ in this context signifies ‘the degree of influence exercised intentionally by an individual or an organization in order to increase or protect own interest [2]’. Many studies have demonstrated that political behavior tends to impact negatively on the effectiveness of decision-making [19, 39].

As for the reasons of giving negative effects, it was discussed in two large aspects. One is because it takes much time to reach an agreement or to mediate a dispute in the decision-making process [19]; and the other reason is that group members can be likely reluctant to release accurate information or provide wrong information to protect the right and interest of theirs or their team’s although enough information should be fully shared and reviewed [16, 47]. Therefore, ‘Political Behavior’ may give negative effects on the effectiveness of decision-making of IT investment. Hence, we hypothesize that:

**H2. In decision-making processes in strategic IT investment, a higher level of ‘Political Behavior’ may interrupt effective decision-making.**

Furthermore, it can be predicted that a high incidence of ‘Political Behavior’ will reduce a team’s effectiveness in sharing and seeking out the information required in which to base intelligent decisions.

Hence, we propose the following hypothesis:

**H3. In decision-making processes in strategic IT investment, a higher level of ‘Political Behavior’ may lower the level of ‘Procedural Rationality’.**

2.4 Decision-Making Effectiveness (EF) and IT Investment Performance (IIP)

An agenda having far-reaching effect on a company and a high uncertainty requires comprehensive concerned information to make a rational decision [26], and human and material resources and capacity of corresponding level are needed to practice a decision [67].

Existing studies on decision behavior in IT investment and elsewhere have typically characterized effective decisions in three ways. First, effective decisions have generally distinguished in advance the opportunities (benefits) and risks of IT investment from an early stage of IT investment decision-making processes [17, 44]. Second, it means that the level of
satisfaction or understanding of members about the result of decision-making is high [3]. It is because that if a person is convinced that a decision was made through satisfactory discussion although own opinion was not adopted, he would probably accept the decision; otherwise there would be a big conflict thereafter. Third, effective decision-making is typically carried out promptly [8]. Even if comprehensive information is taken into account and a broad range of viewpoints from involved professionals obtained, it will difficult to arrive at a satisfactory outcome i.e., to meet a defined performance goal if the decision-making process is too prolonged.

In this aspect, it’s possible to hypothesized that the performance brought by newly invested/introduced IT and IS to the organization (i.e., performance of IT investment) will also become higher if decision-making of strategic IT investment is done effectively, since it becomes enabled to introduce IT and IS suitable for internal and external environment of an organization.

In measuring IT investment performance, this study collected data recording how respondents felt subjectively about their organization’s decision making processes i.e., without using any quantitative financial data. This was because a direct comparison of participating companies through some absolute standard of quantitative data was impossible given that the subjects of the study are companies in various business categories in which different accounting conventions and performance standards are adopted [50].

For these reasons, many researchers have measured the performance with own subjective measures as done in this study [e.g., 50, 57].

However, it should be assumed prior to measuring in this manner that respondents to the questionnaire will be aware of the financial and nonfinancial performances of their own companies, especially as this may have changed in response to IT investment. The respondents to this study are CFOs (Chief Financial Officers) participating in IT investment decision-making processes, who may be better positioned to assess the effectiveness of IT spend than other position-holders.

Hence, we propose that:

H4. Effective decision making in strategic IT investment may have positive effects on IT investment performance.

2.5 Shared Knowledge (BK1, IKB)

Once decision-making teams are put together, various viewpoints and knowledge may be shared, and new knowledge created in discussion [13]. Therefore, it will likely to bring about better results than the decision-making of an individual [11].

However, as many psychologists have asserted [62, 72], the participation of multiple members in a decision-making process does not itself ensure the processing of a greater amount of information and generation of a better decision. It is because two biases, sampling bias and repetition bias, are likely to distort decision-making processes.

Sampling bias means that sampled information used in the decision-making process is likely not held by only one member but commonly known by all the members [63]. On the other hand, Repetition bias means that information mentioned once or more in the decision-making process tends to be mentioned repeatedly thereafter [33]. These two biases suggest that that information unshared among members is difficult to be handled in the decision-making process.

IT decision-making processes rely to a heavy extent on ‘Business Knowledge,’ which includes an understanding of the business strategy and industrial characteristics of a given company, and on ‘Strategic IT Knowledge,’ which encompasses a sense of the potential and limitations of an organization’s infrastructure, the strategic IT actions of its competitors, and the potential of emerging IT for an organization’s business [4, 10, 52].

In this sense, there will be a high possibility to fall victim to Sampling and Repetition Bias during discussions, if the business members participating in decision-making have ‘Business Knowledge’ only without ‘Strategic IT Knowledge’ or confidence to learn it, or if IT members have ‘Strategic IT Knowledge’ only without ‘Business Knowledge’ or confidence to learn it.

Hence, we hypothesize that:

H5. A high level of business knowledge of the IT members (BK1) participating in decision making IT investment may lead to a higher level of ‘Procedural Rationality’ in the decision making process.

H6. A high level of IT knowledge of the business members (IKB) participating in decision making of IT investment may lead to a higher level of ‘Procedural Rationality’ in the decision making process.

2.6 Task-related Heterogeneity (TRH)

The term ‘task-related Heterogeneity’ refers to ‘the level of heterogeneity in terms of career experience including career path, department (job), major at
undergraduate or graduate course, etc. which exist among the decision making members.’ As The Carnegie School has asserted, people have the limit of cognitive perception, therefore they tend to set up the system to understand a state or an event inductively and subjectively based on earlier experience in order to distinguish necessary and unnecessary information for decision making [59].

For the assembly of this ‘assumption on a social phenomenon’, cognitive scientists have used the expression ‘Cognitive Map’ in which multiple ‘Cognitive Maps’ can exist simultaneously and different maps are activated for different issues [70]. It may be that effective decision making in certain environments requires the cooperation of people with valuably overlapping cognitive maps.

People’s task-related experiences tend to form the cognitive maps they use in arriving at value judgments or decisions. Therefore, when a team of members have different career experiences or belong to different business departments, they tend to enter into conflict over tasks and task definitions [46]. This only means that each member is likely to express his/her own solution, knowledge, opinion, etc. to the others [22], with the consequence that much more information is likely to be reviewed in the course of any collective and multi-stage decision-making process. Therefore, we hypothesize that:

\[ H7. \quad \text{A higher level of ‘Task-related Heterogeneity’ among the IT investment decision makers will lead to a higher level of ‘Procedural Rationality’ in the decision making process.} \]

2.7 Social cohesion-related Heterogeneity (SRH)

The term ‘Social Cohesion-related Heterogeneity’ refers to ‘the degree of heterogeneity in terms of social position including age, title, working year in company, etc. which exist among decision-making members’.

If a team’s level of this heterogeneity is high, there will be a higher possibility of its incubating some emotional conflict possibly marked by jealousy, personal dislike or side-taking. Emotional conflict has been demonstrated to have negative effects on decision-making processes, unlike task conflict arising from differences in rational judgment [21, 31].

As for its reasons, first, team members tend to use their energy in observing or criticizing the behaviors and speech of the others in the relationship of prevailing emotional conflict, and it is highly possible not to view some information necessary for decision making with objective view point owing to biases [31, 58]. Second, each member is likely reluctant to share own useful information and knowledge so that information necessary for decision making cannot be fully considered and discussed [46]. Then, why does the ‘Social Cohesion-related Heterogeneity’ become a motive of emotional conflict?

The first reason can be found by focusing on the interrelationship between the ‘Risk-taking Propensity’ and the age [71]. The ‘Risk-taking Propensity’ means ‘the tendency that a decision maker consistently accepts or avoids a thing considered to be risky’ [61]. Elder people have more conservative tendency against risks, which is explained by scholars that people have resistance to a decision considered to be able to cause a major change or a risk therefrom since they care for own economic standing and career management more with aging [12, 68]. In this point of view, if a team is composed of members having big age gaps in addressing an investment project in IT which changes more quickly than any other areas, what’s more, in a large scale, there will be a definite emotional conflict among them due to a difference in the ‘Risk-taking Propensity’.

The second reason makes more sense in light of age norms, which are taken by social psychologists as one type of social norm. The expression ‘age norm’ refers to ‘expectations that the other person will behave according to the age [43]’, and a question ‘Is that person too young to take the role?’ is an example of judgment by the age norm [34]. Age norms consist of a kind of prejudice rather than a judgment based on the perceived objective characteristics of an individual such as ability and business knowledge [41], and may as such appear in various social systems [42].

Team members of a similar age cohort, meanwhile, tend to enjoy a feeling of homogeneity on the basis of similar social experiences, and to act with a similar attitude and sense of values which are distinguished from those of other generations [53]. Lawrence (1988) points out that, for this reason, there may be a categorization phenomenon by age cohorts, leading to factions and possibly disunity, in groups where there are marked age differentials.

This categorization is not caused by age gap only. As Pelled et al. (1999) asserted, however, age gap likely causes and fixes categorization because a difference of view point by age gap is caused by time gap so that it can’t be reduced by physical efforts differently from other gaps [46].

According to the ‘Social Identity Theory’, once categorization is fixed, members are likely to stick or side with their cohort, and to be prejudiced against the viewpoints of other cohorts [64, 65]. These differences can spill over into anger, resentment, etc. among team members who are categorized in this way [45].
It is also reasonable to assume that this emotional conflict works as a motive intensifying individuals’ and groups’ Political Behavior in the decision making process.

Hence, we hypothesize that:

**H8. A higher level of ‘Social Cohesion-related Heterogeneity’ among decision makers in IT investment may lead to a higher level of ‘Political Behavior’ in the decision making process.**

2.8 Committee Chairman’s Power (CCP)

Power imbalance among team members has been treated in the decision-making literature as a critical factor which can trigger Political Behavior in a similar way to (emotional) conflict [e.g., 19]. Power, by definition, means decision making authority [49] and the capacity to direct other team members’ actions [37].

In general, one can get power when s/he is in a high rank in an organization or has control over resources [5]. What power is imbalanced in a team means is that a chairman with powerful authority drives the decision making process in his/her own way to carry his/her points. In terms of it, it’s different from leadership [20].

The more powerful a chair is, furthermore, the more likely s/he is to turn to Political Behavior to maintain his or her power [19]. In coping with those situations, other members in a team will be inclined to put their own goals first [48], again taking up a form of Political Behavior [19].

Framing this insight, we can propose the following hypothesis:

**H9. A high level of power on the part of an IT Investment Committee’s chair may lead to a higher level of ‘Political Behavior’ in the decision making process.**

3. Methodology

3.1 Instrument Pretest and Data Collection

To ensure the content validity of this study, semi-structured interviews were conducted with four professors and related industrial workers. They proceeded to respond the questionnaire structured in a 7-point Likert’s scale so that indefinite or inappropriate measurement items were excluded from the final measurement list. The unit of analysis is a company and personal interviews and phone-call surveys were conducted with the CFOs of the top 300 Korean companies. Companies were selected on the basis of market price, and we allowed CFOs to answer the questions only when they have IT Investment Committee or other committees having almost the same functions and participants from both business and IT units but having different names, and only when they are participating in IT Investment Committees. The response rate was 50.7% (152 companies), and the distribution of respondents’ business categories as seen in Figure 1. On the questionnaire item concerning the number of members attending IT Investment Committee meetings, the response of ‘3 to 5 persons’ ranked first with 62.5%, and ‘5 to 10 persons’ ranked second with 23%.

![Figure 1. Distribution of respondents](image)

3.2 Operationalization of Variables

The operational definitions of the construct and measurement items used in this study are given together with their sources in Appendix A.

4. Analysis and Results

In this study, the method of ‘Partial Least Squares (PLS)’ was used as the following reasons.

First, PLS allows both the formative and reflective constructs [23]. Explanations about what construct we designed as the formative construct will be presented in the Measurement Model section.

Second, it allows researchers to carry out an analysis with relatively fewer samples than Covariance-based Structural Equation Modeling methods, such as LISREL. However, it does not mean that PLS is free from the sample size issue. Any statistical technique including PLS relies on a sufficient sample sizes to maintain the necessary Statistical Power level (0.8 or more is generally accepted level). In that sense, we got the proper sample size by referencing the standard Cohen [14] suggested.
By doing so, we found that 85 samples are adequate for this research and it is well below the sample size we actually used (152 samples).

To ensure the validity and the reliability of measurement items, the measurement model and then the structural model were evaluated in order to test statistically the validity of cause and effect relations between constructs.

4.1 Measurement Model

The study’s construct for ‘Decision Making Effectiveness’ was put together along the lines of the norms suggested by Jarvis et al. (2003). This particular construct was composed of three sub-constructs, namely ‘the degree to which decisions identify opportunities and risks (OR) faced by the organization in planning IT investment’, ‘the degree to which decision makers claim to understand the rationality of their decisions (US)’, and ‘the degree to which decisions are made promptly and in good time (TL)’. However, these were factors making up Decision Making Effectiveness, not phenomena taken to result from it, meaning that there was no need to demonstrate the correlation of these sub-constructs; further, one could change without necessarily affecting the others [30]. All other constructs in the study were formed as Reflective constructs.

Since ‘Decision Making Effective’ is a Second-order construct, the study tested for the Convergent Validity, Internal Consistency and Discriminant Validity of its first-order constructs were tested, before proceeding to test those of its second-order constructs in the same manner.

Analysis demonstrates, as shown in Table 1, that the factor loadings of all items came in above the reference value, 0.7 [24], and that the Average Variance Extracted (AVE) value was also above 0.5 [24], suggesting that each first-order construct secured convergent validity.

<table>
<thead>
<tr>
<th>Item</th>
<th>OR</th>
<th>US</th>
<th>TL</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR1</td>
<td>0.715</td>
<td>0.236</td>
<td>0.083</td>
<td>45.150</td>
</tr>
<tr>
<td>OR2</td>
<td>0.841</td>
<td>0.339</td>
<td>0.517</td>
<td>10.218</td>
</tr>
<tr>
<td>OR3</td>
<td>0.922</td>
<td>0.465</td>
<td>0.348</td>
<td>48.708</td>
</tr>
<tr>
<td>OR4</td>
<td>0.695</td>
<td>0.147</td>
<td>0.463</td>
<td>17.583</td>
</tr>
<tr>
<td>US1</td>
<td>0.171</td>
<td>0.739</td>
<td>0.361</td>
<td>32.345</td>
</tr>
<tr>
<td>US2</td>
<td>0.327</td>
<td>0.707</td>
<td>0.083</td>
<td>30.711</td>
</tr>
<tr>
<td>US3</td>
<td>0.247</td>
<td>0.730</td>
<td>0.537</td>
<td>47.619</td>
</tr>
<tr>
<td>TL1</td>
<td>0.387</td>
<td>0.213</td>
<td>0.833</td>
<td>39.078</td>
</tr>
<tr>
<td>TL2</td>
<td>0.183</td>
<td>0.060</td>
<td>0.745</td>
<td>11.989</td>
</tr>
<tr>
<td>TL3</td>
<td>0.140</td>
<td>0.354</td>
<td>0.899</td>
<td>32.557</td>
</tr>
</tbody>
</table>

Meanwhile, as shown in Table 2, Composite Reliability was above the reference value, 0.7 [24], and the square root of AVE (as shown in bold numbers on the leading diagonal) came in at a higher value than the Inter-construct Correlations, securing both constructs’ Internal Consistency (Reliability) and Discriminant Validity.

<table>
<thead>
<tr>
<th>First-Order</th>
<th># of Item(s)</th>
<th>Composite Reliability</th>
<th>OR</th>
<th>US</th>
<th>TL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opportunity and Risk</td>
<td>4</td>
<td>0.738</td>
<td>0.801</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Understanding</td>
<td>3</td>
<td>0.872</td>
<td>0.242</td>
<td>0.753</td>
<td></td>
</tr>
<tr>
<td>Timeliness</td>
<td>3</td>
<td>0.794</td>
<td>0.298</td>
<td>0.467</td>
<td>0.781</td>
</tr>
</tbody>
</table>

Next, the reflective constructs’ reliability and validity were tested through an analysis of the latent variable scores of the first-order constructs. Since PLS did not support second-order analysis in the model, the study took as its measured items the multiple measurement scores of first-order constructs [1]. As shown in Appendix B, the factor loadings of the first-order constructs forming ‘Decision Making Effectiveness’ came in above 0.7, and, with the exception of a few items, most items from other constructs were loaded on each construct above 0.7.

Further, Composite Reliability scored at above 0.7 and the square root of AVE was bigger than Inter-construct Correlations, securing second-level constructs’ internal consistency and discriminant validity.

4.2 Structural Model

After examining measurement validity, the study employed PLS to test the structural model. The significance of paths was determined using the t-statistic calculated by the bootstrapping technique.
As shown in Figure 2, it was found that Business Members’ Knowledge of IT (0.129, p < 0.01), IT Members’ Knowledge of Business (0.175, p < 0.1), and Task-related Heterogeneity (0.142, p < 0.05) had a statistically significant effect on Procedural Rationality, to an explanatory power of 38.1% (thus H5 through H7 are supported). Further, Social cohesion-related Heterogeneity (0.115, p < 0.01) appeared to have a statistically significant effect on Political Behavior, explaining 12.5% of outcomes (H8 is supported). On the other hand, the degree of the Committee Chairman’s Power (0.162, p > 0.1) did not emerge as having a statistically significant effect on Political Behavior (H9 is rejected).

Meanwhile, it was demonstrated that Procedural Rationality (0.182, p < 0.01) and political behavior (-0.151, p < 0.05) affected Decision Making Effectiveness to a statistically significant degree, explaining 45.2% of investment effectiveness, and furthermore that political behavior (-0.131, p < 0.01) had a negative effect on Procedural Rationality (H1 through H3 are supported).

Finally, Decision Making Effectiveness (0.154, p < 0.1) appeared to be a significant predictor of IT Investment Performance (H4 is supported).

5. Discussions and Conclusion

The study set out to determine which factors are consequential in the effectiveness of investment decisions taken by IT Investment Committees. It developed its analysis based on major theories, especially a Bounded Rationality Model and Politics Model, which are widely used in strategic management and organizational theory to test hypothesis through the framing of a conceptual model.

The study’s analysis was studied to derive the following implications:

First, as asserted by The Carnegie School and confirmed by a number of studies, it was found that a higher level of Procedural Rationality and a lower level of Political Behavior in decision-making processes positively affect the effectiveness of IT investments. What’s more, the introduction of new forms of IT and IS as proposed by strategic investment committees can have a significant positive impact on whole-firm performance. This again conforms the results of existing studies, suggesting that the operational mechanisms of decision making within organizations count as an important factor affecting the performance of IT investment.

Second, the study found that, in order to process a large amount of information in its decision making processes, an investment committee should ideally be composed of both business and IT team members, who should share business and IT technical knowledge above a certain level. This matches the results verified by many psychologists including Stasser [62, 63]. It may be the case that team members broadly informed of each other’s skills and job responsibilities will clash on matters of task definition and investment priorities, but this task conflict is not necessarily harmful to IT investment effectiveness.

This study can make two suggestions in this regard. The first is that potential team members absorbed in their own field only should not attend IT investment committees. Those who attend these meetings should be able to understand the strategic use of IT from their own point of view, typically meaning that IT staff who participate should be aware of companies’ business characteristics and able to conceive IT in terms of its contribution to business goals. The second suggestion is that, Systems of Knowing [4] is that business and IT-based team members need to have a formal or informal channel of communication channel through which they can share domain knowledge and a discussion of relevant issues affecting both sides. The existence of such a channel should permit more prompt and thorough decision making re IT investment.

The study finally determined that keeping teams’ level of task-related heterogeneity high and level of social cohesion-related heterogeneity low is helpful in generating effective decision making. Furthermore, the attendance at IT investment committees of members from different departments is needed not only for reasons of checks and balances but in order to make decisions’ data collection process more comprehensive and discussions on possible investments deeper. While the study would encourage, however, the attendance of a variety of team participants, companies should bear in mind the risks of negative social cohesion effects arising from the teaming of employees too diverse in terms of age, time served and job seniority. Restricting the cohort of team participants in these parameters may serve to hold back potential emotional conflicts.

On the other hand, it seems that excessive power on the part of the Committee Chairman does not trigger Political Behavior among committee members. One possible interpretation would be that the Committee Chair’s power does not significantly influence the decision making process. An alternative explanation is that the power of the chair serves as a catalyst rather than an obstacle for IT investment decisions, which may need to be made more swiftly and decisively than other team member’s intention. This is the seemingly more persuasive explanation, but it may only hold good in some cultural contexts and should be checked through future research works.
The above results can be taken to contribute to academic research and business practice in the following ways:

Academically, the findings will serve to extend the range of discussions relating to IT and other investment planning; this is especially true since the study confirmed existing results in the fields of strategic management and organization theory by applying a conceptual model to a significant body of subjective data pertaining to IT investment decision making.

For practitioners, the study suggests practical guidelines for structuring IT Governance Mechanisms relating to IT investment decision making, through having identified the main factors affecting the effectiveness of the strategic IT investment decision making process.

6. References


## Appendix A. Operationalization of Variables and Measure Items List (69 Questions Used)

<table>
<thead>
<tr>
<th>Construct</th>
<th>Operationalization</th>
<th>Measure Items</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procedural Rationality</td>
<td>Degree of comprehensively considering the information necessary for judgment in the decision making process and of systematically analyzing based on the concerned information.</td>
<td>Comprehensiveness of the information considered in decision making.</td>
<td>[16, 17]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Comprehensiveness of the information considered prior to decision making.</td>
<td>[8, 17]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Possibility of using a scientific analyzing method in decision making.</td>
<td>[17]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Degree of decision making done by members through discussion and consultation.</td>
<td>[17, 48]</td>
</tr>
<tr>
<td>Political Behavior</td>
<td>Degree of influence exercised by attending members in the decision making process to achieve a personal goal rather than an organizational goal.</td>
<td>Degree of the attitude of committee members to achieve a personal goal rather than an organizational goal.</td>
<td>[2, 17, 48]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Degree of members’ open mind to others’ opinions or assertions.</td>
<td>[19, 47, 48]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Degree of authority or influence of a certain members in the decision making process.</td>
<td>[17, 47, 48]</td>
</tr>
<tr>
<td>Business Member’s Knowledge on IT</td>
<td>Degree of cognition by business members of the strategic value and role of IT, and degree of their confidence in addressing and accepting new IT knowledge and issues</td>
<td>Degree of cognition by business members of the strategic value and role of IT.</td>
<td>[4, 52]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Degree of their confidence in addressing and accepting new IT knowledge and issues.</td>
<td>[7, 15]</td>
</tr>
<tr>
<td>IT Member’s Knowledge on Business</td>
<td>Degree of understanding by IT members about the business strategy and industrial characteristics of the concerned company, and degree of their confidence in addressing and accepting new business issues</td>
<td>Degree of understanding by IT members about the business strategy and industrial characteristics of the concerned company.</td>
<td>[4, 35, 52]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Degree of their confidence in addressing and accepting new business issues.</td>
<td>[7]</td>
</tr>
<tr>
<td>Task-related Heterogeneity</td>
<td>Degree of heterogeneity in terms of career path, department (job), major at undergraduate or graduate course of members participating in decision making</td>
<td>Degree of heterogeneity in terms of career path of members participating in decision making.</td>
<td>[32, 45, 46]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Degree of heterogeneity in terms of department and job of members participating in decision making.</td>
<td>[28, 32]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Degree of heterogeneity in terms of major at undergraduate or graduate course of members participating in decision making</td>
<td>[32]</td>
</tr>
<tr>
<td>Social cohesion-related Heterogeneity</td>
<td>Degree of heterogeneity in terms of age, title and working years of members participating in decision making</td>
<td>Degree of heterogeneity in terms of age of members participating in decision making.</td>
<td>[28, 46, 71]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Degree of heterogeneity in terms of title of members participating in decision making.</td>
<td>Newly developed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Degree of heterogeneity in terms of working years of members participating in decision making.</td>
<td>[71]</td>
</tr>
<tr>
<td>Committee Chairman’s Power</td>
<td>Degree of centralization of power to the Chairman and degree of other member’s perceptions about the Chairman’s influence on decision making process</td>
<td>Degree of empowerment and distribution of roles and responsibilities among members participating in the committee.</td>
<td>[19]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Degree of other member’s perceptions about the Chairman’s influence on decision making process</td>
<td>Newly developed</td>
</tr>
<tr>
<td>Decision-Making Effectiveness</td>
<td>Degree of being able to find an opportunity or risk factor to be faced by an organization through decision making, degree of understanding of members about the rationality of a result of decision making, and degree of decision making done promptly and timely</td>
<td>Degree of being able to find an opportunity or risk factor to be faced by an organization through decision making.</td>
<td>[17, 44]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Degree of understanding of members about the rationality of a result of decision making.</td>
<td>[3]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Degree of decision making done promptly and timely.</td>
<td>[8]</td>
</tr>
</tbody>
</table>
### IT Investment Performance

- Degree of helpfulness of newly invested/introduced IT/IS in improving the productivity, sales and profit of company and in obtaining the superiority strategically over the competitor.
- Degree of helpfulness of newly invested/introduced IT/IS in increasing the sales of company.
- Degree of helpfulness of newly invested/introduced IT/IS in improving the profit of company.
- Degree of helpfulness of newly invested/introduced IT/IS in improving the total performance of company.

### Appendix B. Internal consistency, Convergent validity and Discriminant validity

<table>
<thead>
<tr>
<th>Construct</th>
<th>Loading</th>
<th>t-value</th>
<th>CR</th>
<th>AVE</th>
<th>Discriminant Validity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Procedural Rationality</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PR1 0.917 PR2 0.817 PR4 0.789 PR7</td>
<td>0.732</td>
<td>43.386</td>
<td>0.732</td>
<td>0.666</td>
<td>0.816 PR PB BK1 IKB TRH SRH CCP EF HIP</td>
</tr>
<tr>
<td><strong>Political Behavior</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PB2 0.885 PB3 0.842 PB5 0.856 PB6</td>
<td>0.778</td>
<td>15.828</td>
<td>0.717</td>
<td>0.122</td>
<td>0.847 PB2 (0.122)</td>
</tr>
<tr>
<td><strong>Business Member's Knowledge on IT</strong></td>
<td>0.700</td>
<td>11.121</td>
<td>0.739</td>
<td>0.232</td>
<td>0.799 BKI1 BKI2 BKI4 BKI5 BKI6</td>
</tr>
<tr>
<td>BKI1 0.824 BKI2 0.850 BKI4 0.739</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>IT Member's Knowledge on Business</strong></td>
<td>0.732</td>
<td>27.015</td>
<td>0.649</td>
<td>0.106</td>
<td>0.806 IKB1 IKB2 IKB4 IKB6</td>
</tr>
<tr>
<td>IKB1 0.868 IKB2 0.810 IKB4 0.809</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Task-related Heterogeneity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRH1 0.813 TRH2 0.884 TRH3 0.812</td>
<td>0.750</td>
<td>12.327</td>
<td>0.612</td>
<td>0.138</td>
<td>0.782 TRH1 TRH2 TRH3</td>
</tr>
<tr>
<td><strong>Social cohesion-related heterogeneity</strong></td>
<td>0.818</td>
<td>20.525</td>
<td>0.605</td>
<td>0.057</td>
<td>0.782 SRH1 SRH3 SRH4 SRH6</td>
</tr>
<tr>
<td>SRH1 0.784 SRH3 0.732 SRH4 0.894</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>IT Investment Committee Chair's Power</strong></td>
<td>0.708</td>
<td>29.558</td>
<td>0.674</td>
<td>0.197</td>
<td>0.778 CCP1 CCP2 CCP3 CCP5</td>
</tr>
<tr>
<td>CCP1 0.914 CCP2 0.822 CCP3 0.811</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[50, 58]
<table>
<thead>
<tr>
<th>Decision-making Effectiveness</th>
<th>OR</th>
<th>US</th>
<th>TL</th>
<th>N/A</th>
<th>0.724</th>
<th>0.255</th>
<th>(0.315)</th>
<th>0.162</th>
<th>0.211</th>
<th>0.291</th>
<th>(0.220)</th>
<th>(0.334)</th>
<th>0.851</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Investment Performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IIP1</td>
<td>0.815</td>
<td>10.218</td>
<td>N/A</td>
<td>45.150</td>
<td>0.761</td>
<td>0.683</td>
<td>(0.283)</td>
<td>0.189</td>
<td>0.093</td>
<td>0.021</td>
<td>(0.119)</td>
<td>(0.218)</td>
<td>0.131</td>
</tr>
<tr>
<td>IIP2</td>
<td>0.841</td>
<td>14.196</td>
<td>N/A</td>
<td>14.196</td>
<td>0.761</td>
<td>0.683</td>
<td>(0.283)</td>
<td>0.189</td>
<td>0.093</td>
<td>0.021</td>
<td>(0.119)</td>
<td>(0.218)</td>
<td>0.131</td>
</tr>
<tr>
<td>IIP3</td>
<td>0.957</td>
<td>18.377</td>
<td>N/A</td>
<td>18.377</td>
<td>0.761</td>
<td>0.683</td>
<td>(0.283)</td>
<td>0.189</td>
<td>0.093</td>
<td>0.021</td>
<td>(0.119)</td>
<td>(0.218)</td>
<td>0.131</td>
</tr>
<tr>
<td>IIP4</td>
<td>0.948</td>
<td>29.217</td>
<td>N/A</td>
<td>29.217</td>
<td>0.761</td>
<td>0.683</td>
<td>(0.283)</td>
<td>0.189</td>
<td>0.093</td>
<td>0.021</td>
<td>(0.119)</td>
<td>(0.218)</td>
<td>0.131</td>
</tr>
<tr>
<td>IIP5</td>
<td>0.766</td>
<td>11.188</td>
<td>N/A</td>
<td>11.188</td>
<td>0.761</td>
<td>0.683</td>
<td>(0.283)</td>
<td>0.189</td>
<td>0.093</td>
<td>0.021</td>
<td>(0.119)</td>
<td>(0.218)</td>
<td>0.131</td>
</tr>
</tbody>
</table>

1 Decision-making Effectiveness is formative construct. Therefore reliability measure is not relevant.