Barriers to Formal IT Governance Practice – Insights from a Qualitative Study

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Abstract

IT Governance (ITG) continues to be a top priority for organizations, public and non-public. While the level of awareness towards ITG is evident, it is hardly manifested in practice. The purpose of this study is to elicit factors that act as barriers to the adoption of formal ITG practice. This qualitative study consists of 9 semi-structured interviews with the key person in charge of ITG adoption and practice within their respective organizations. The interviews were analyzed using thematic content analysis, guided by themes previously obtained from the literature and from an earlier pilot study. Findings obtained supported previous findings and also reveal new factors noticeably absent from the ITG literature. The findings will provide useful input towards the development of a causal model on barriers to formal ITG practice.

1. Introduction

Without a doubt, IT underpins an organization’s operations, to an extent that any IT related failure or breach can lead to significant legal risks and issues. With this in mind, it is apparent why organizations are currently pursuing increase control of IT through the adoption of IT Governance (ITG) initiatives.

The perceived benefits of implementing sound ITG are numerous. Among them include efficiency and control of IT functions, clear allocation of roles and responsibilities for IT functions, effective management of IT, increase IT control and standards, prioritization of IT initiatives, alignment between business and IT, return on investment and competitive advantage [55].

Even though a considerable set of ITG good practices abound[49], [34], [50]; this study focuses on the adoption and practice of a specific set of governance and management standards and frameworks, or simply formal ITG practice. These standards and frameworks facilitates, supports, guides and provides a solid basis for ITG by addressing one or more elements of ITG, i.e.: strategic alignment, value delivery, performance management, and risk management [26]. Their adoption and practice is argued to be the most effective approach and guidance for organizations first considering proper implementation of ITG [58], [5].

Various definitions of ITG and its recent rebranding to Enterprise Governance of IT (EGIT) have been proposed by numerous researchers over the years. We adopt those put forward by Van Grembergen on:

IT Governance [48]:

IT governance is “the organizational capacity exercised by the board, executive management and IT management to control the formulation and implementation of IT strategy and in this way ensuring the fusion of business and IT.”

Enterprise Governance of IT [49]:

Enterprise Governance of IT is “an integral part of corporate governance and addresses the definition and implementation of processes, structures and relational mechanisms in the organization that enable both business and IT people to execute their responsibilities in support of business/IT alignment and the creation of business value from IT-enabled business investments”.

By extracting the more nuance elements from both of the above definitions – the act of controlling the formulation and implementation of IT and IT-related business processes, they signify what our pre-defined set of formal ITG practice set to achieve – which is control and how the element of control over IT and IT-related business processes can be defined and
implemented via the adoption of our set of formal ITG practice.

While we concur with Webb et al. [53], that simply implementing any formal ITG practice does not constitute proper IT Governance implementation, we argue that their implementation is a good indicator of proper IT Governance implementation. For example, implementing COBIT addresses most of the main tenets of ITG which are strategic alignment, performance management, value delivery, resource management and risk management [26]. Furthermore, a survey by IT Governance Institute (ITGI ) revealed that these formal ITG practice are among the key enablers for effective ITG implementation and that awareness and adoption of formal ITG practice relates to the level of ITG maturity and implementation effectiveness [26].

A recent survey highlighted the fact that while many enterprises have recognized the importance of formal ITG practice, many have yet to implement them [26]. The same sentiment has been echoed by other researchers through their own findings. Winniford et al. [59] in their survey of IT Service Management (ITSM) adoption by US companies found that less than half had implemented any type of IT Management standard or framework. Moreover, Fomin et al. [16] found that the level of adoption and certification of ISO/IEC 27001 was lower than similar management standards like ISO 9001 and ISO 14001. In addition, IT Governance Institute (ITGI) found that the adoption levels of formal ITG practice is even lower by organizations in developing countries [27]. This phenomenon begs to question whether there exist barriers\(^2\) that inhibit adoption of these standards and frameworks.

Prior research has yielded considerable insights into how organizations deal with issues related to the adoption and successful implementation of formal ITG practice. These studies have examined the benefits, critical success factors and drivers for their adoption: COBIT [19], ITIL [39], ISO/IEC 20000 [13]; and ISO/IEC 27001 [51]. However, very little emphasis is given towards identifying challenges and inhibitors to adoption.

A look into general research on barriers and inhibitors to innovation adoption reveal contrasting findings. Some researchers observe barriers or inhibitors as the absence of facilitators [30], while others treat inhibitors as strictly independent from enablers or facilitators [7].

Only recently have there been attempts to identify specific challenges that organizations faced in adopting formal ITG practice, and other ITG mechanisms. A recent empirical study by Lee et al. [32] uncovered factors such as ‘lack of IT principles and policies’, ‘lack of clear ITG processes’, ‘lack of communication’, and ‘inadequate stakeholder involvement’, as inhibitors of ITG implementation success. However, the context of their study was limited to Korean private sector companies and their focus was towards ITG implementation success. In another study, Jairak [28] identified several barriers to ITG implementation among Thai universities. Among the barriers identified include budget limitations, and lack of senior management support.

We attempt to distinguish our research by focusing on a pre-defined set of standards and frameworks facilitating ITG and also by identifying the specific barriers that inhibit its adoption and implementation.

The study of barriers is important as once identified, their effect is understood and pre-emptive actions can be taken to address them. Among the barriers previously identified from the literature as well as from our pilot study include lack of top management support, cost, lack of skilled human resource, complexity of the practice and lack of time.

To the best of our knowledge, no attempts have been made to reconcile the various factors identified as barriers to formal ITG practice into a coherent causal model of barriers to adoption. Furthermore, no studies have examined barriers affecting each stage of the adoption process.

Innovation adoption studies suggest that different factors that may act as barriers may exert their influences at different stages of the adoption process [17]. This qualitative study builds upon our previous pilot study by repositioning our earlier conceptualization of ITG as an outcome to a process, enabling the refinement of the adoption variable and thus rectifying the confusion of what constitutes adoption.

Consequently, this paper addresses the following research question:

1. What factors may act as possible inhibitors to formal ITG practice?
2. Do these factors exert themselves during different stages of the adoption process?

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\(^2\) To further assist with the discussion in this paper, we use the term barriers and inhibitors interchangeably to refer to factors that challenges, impedes, slows down or practically halts the adoption process.
2. Theoretical background

We view formal ITG practice as an innovation, a practice that is viewed as new to the adopting organization [10]. The adoption and diffusion of formal ITG practice is a complex process. This process view of adoption enables the identification of specific nuances apparent during specific stages of adoption.

Two broad approaches are commonly used in the literature to study organizational behavior in general, and innovation in particular: the variance theory and the process theory [36].

These approaches are consistently used in the study of formal ITG practice. Some researchers attempt a pure variance approach [32] while others prefer a pure process approach [24].

Another approach that has received extent interest of late is the stage approach: a variation of the process approach. It can be defined as “a sequence of stages through which an organization passes through before initiating a new technology within an organization” [41]. It combines both the strengths of the variance and process approaches. Previous IS studies that have utilized this approach include [21] and [24].

As noted by Kamal [29], existing research is satiated with frameworks and models theorizing stages of the process of adoption, ranging from as few as a two-stage to a more granular model of six or more stages. In most cases however, the adoption processes hold parallels, typically differing in the level of generalization. For instance, the two-stage process of adoption comprises Initiation and Implementation [20].

Initiation “consists of activities that pertain to recognizing a need, searching for solutions, becoming aware of existing innovations, identifying suitable innovations and proposing some for adoption”. Implementation “consists of events and actions that pertain to modifying the innovation, preparing the organization for its use, trial use, acceptance of the innovation by the users and continued use of the innovation until it becomes a routine feature of the organization” [11].

Initiation can hold parallel to three stages of Frambach and Schillewaert’s six stage model [17]: Awareness of the innovation, its Trial and its Evaluation, while the Implementation stage is analogous with the Decision for adoption of the innovation, as well as its Assimilation and Routinization. In this study, we adopt the 2 stage model, which is pre-adoptions (initiation) and post-adoptions (implementation).

Previous IS research have also identified different antecedents acting at different stage of the adoption process [11]. For example, top management support has been shown to affect all stages of the adoption process while the size of the organization influences the implementation phase [35]. We assumed that this also holds true to the adoption of formal ITG practice.

3. Methodology

The research question was approached by analysing qualitative data obtained from interviews with 9 organizations in Malaysia, consisting of - 6 public and 3 non-public sector companies.

These organizations were specifically chosen via theoretical sampling, a method used to maximize the usefulness of the results. This method enabled a cross-case analysis between the organizations to be made, in addition to within case analysis.

The case organizations represent organizations with different levels and stages of adoption and implementation, and with different year of adoption.

The public sector organizations consist of those organizations overseeing health services, registration, modernization of the public sector, energy, green technology and water, natural resources, and a public university.

The inclusion of non-public sector organizations enabled a comparison between public and non-public sectors. The non-public sector organizations deal with a multitude of industries including oil and gas, provident funds, plantations and property development. Detailed information on the organizations studied is summarized in Table 1.

In all, they represented an interesting set of cases, partly due to a 2010 mandate by the Malaysian government that all public sector NCII’s (national critical information infrastructure) related organizations be ISMS certified to MS ISO/IEC 27001:2007 by 2013. The impetus was driven by the realisation that critical national information infrastructures represent the backbone of the nation, and any problems will significantly cause a domino effect, affecting other sectors. CNII refers to any IT assets, systems and functions that is deemed important to the nation, whereby if any disturbances to its normal operations will entail heavy losses in terms of nations economic strength, national image, defence and security, ability of the government to function and general health.

To date, only 14 out of about 300 CNII’s in Malaysia are certified to ISO/IEC 27001. Of that, only 6 public sector agencies have been certified to ISO/IEC 27001.

Semi-structured interviews were used to elicit information. The semi-structured interview research approach was chosen since it can capture the process
nature of the phenomena. The strength of the semi-structured interviews is in the richness of information, which can be obtained in real-life situations [56]. 9 interviews were conducted with a duration of about an hour each. In addition to the semi-structured interviews, we also included other sources for the purpose of triangulation. These sources include annual reports, newsletters and official organization websites.

Thematic content analysis was then used to analyse the data. Relevant information were extracted and then categorized into appropriate codes. Information was coded into existing themes previously identified in a pilot study conducted earlier. Other interesting and relevant information that emerge from the interview transcripts were identified and coded into new themes. Inter-coder reliability was used to ensure content analysis reliability [31].

4. Findings

Overall, the findings support previous findings on barriers to innovation in general, as well as findings from case studies on barriers to formal ITG practice that currently exist in the literature. We present a summary of the findings in Table 2. Next, we detail some of the factors previously identified in the literature (resistance to change, complexity, organizational politics, lack of knowledge and skills), as well as highlight new and emerging factors currently not present in formal ITG practice literature (lack of middle management support, mobility of management, lack of geographical proximity and receptivity to internal or external mandate), which we detail below:

4.1. Resistance to change

Resistance to change is defined as “the adverse reaction to a proposed change which may manifest itself in a visible, overt fashion (such as through sabotage or direct opposition) or may be less obvious and covert (such as relying on inertia to stall and ultimately kill a project).”

ITG adoption literature recognizes resistance to change as a barrier. Winniford et al. [59] in their survey found “avoiding that level of accountability” as a barrier. Cater-Steel et al. [6] through a case study of 5 organisations in Australia found that resistance to new documentation and communication process by technical staff impeded the implementation of ITIL.

Hirschheim and Newman [22] discussed several causes of resistance to IS change. Among them include innate conservatism and uncertainty. Our study shows the existence of innate conservatism and uncertainty emanating and causing resistance. MPU highlighted why middle management resisted change, even though they had ample resource and all was laid down before them, ready to be implemented. “Meaning that it was all ready, all laid down, but they did not want to implement because...there were a lot of requirements, they want to use the as-is processes. If they were to follow, it would require a lot of procedures, had to have a lot of documentations, proper network channels, must have emails - MPU.

There was clearly the existence of inertia or innate conservatism as mentioned by Hirschheim and Newman [22]. This is where “people do not like to be disturbed, they prefer to stay with the work they know, rather than take on a new assignment.”

Meanwhile, SD mentioned how resistance stemmed from the fact that people were afraid to commit to change, uncertain that they can successfully implement it and fearing that if they fail, they will be held accountable. “But, how long does it take, I do not know, because resistance is always there. Resistance can be, it is not in the form of resistance of people do not want to do it. This type of resistance is in the form of, if it’s complicated, no one dares to make a commitment. Because, if I do it wrong, then I’ll be on the chopping board.” - SD

4.2. Complexity

Complexity has been defined as “the difficulty to understand and use the innovation”. The literature provides ample evidence of complexity as a barrier to adoption. Wiander [56] through a case study of 4 organisations relate how people comprehend the standards as difficult to understand. The guidelines given in the standards were deemed multifaceted leading to confusion in the use of the terms. Some researchers lament the fact that these standards are to brief, and thus do not provide enough information to guide successful implementation [23]. This will in fact complicate the adoption process further as potential adopters and even consultants and assessors will make their own assumptions and interpretations of how the standard should and must be implemented and assessed.

IIU mentioned that adopting ISMS was not an easy task, citing the process that an organization has to go through to be certified. “If you’re talking about ISMS, it’s not an easy thing to implement...because eventually if you target the organization to be certified then they have to pass their policy, and they will have to be audited in terms of complying to those policies that they formulated.” – IIU.

Meanwhile, MOH relates how they had to approach an external consultant due the difficulty in understanding and comprehending the innovation. “The
first, my perception was, it is difficult... For people who are exposed first time to this standard, they would find it difficult. But, the difference in my case was that I had Ted Humphreys, and people here don’t. So, the perception it was difficult. In order to get over it is to find somebody to explain to you.” – MOH.

There exist several ways to overcome complexity. This includes devising a specific standard dedicated to SMEs (e.g.: ISO/IEC 27001 lite) [2]. This similar approach has been taken for the adoption of ITIL via the introduction of ITIL Lite [18]. The use of external consultants such as by MOH above have been advocated by some but not recommended by others as they will leave a significant knowledge gaps if the transfer of knowledge is not properly done.

4.3. Organizational politics

We define organizational politics as “behaviours strategically designed to maximize self-interests and therefore contradict the collective organizational goals or the interests of other individuals”.

According to PwC and ITGI [40], internal organizational politics may exert themselves, as the adoption and implementation of formal ITG practice will sometimes bring a shift in decision rights and associated powers that currently exist in the organization. Wilkin and Riddett [57] relate how politics effect different sectors trying to adopt and implement ITG.

SD relates how organizational politics would have acted as an inhibitor to adoption. Coming out fresh from a merger of 3 different organizational entities, they encountered a typical political situation whereby each group from the previous entity tries their best to influence top management through “behaviors strategically designed to maximize self-interests, and therefore contradicts the collective organizational goals or the interests of other individuals” [14]. Which projects that should be given a higher priority will be based on “who speaks the loudest” rather than “looking at the current business, what is the immediate need?”. They relate to how the 3 entities from their previous companies “each will want to show their power and ego”.

SD mentioned how this particular problem was avoided through the appointment of an external consultant, free from any influence and able to dictate the adoption process: “we have appointed an external consultant which is independent of everybody and enforcement by management, they tend to follow”. Other alternatives include awareness and training, establishing a conflict resolution plan, involving all stakeholders [38].

4.4. Lack of knowledge and skills

Lack of knowledge and skills can be viewed as “inadequate levels of comprehension and competency on that particular innovation”.

Marrone [33] in his study on ITIL implementation found that lack of knowledge and skills in ITIL presents a challenge. MPU relate her own experience and how she initially rejected heading the adoption team due to her lack of knowledge and skills. “When I was directed to implement the ISMS project on PRISMA and GCERT, at first I rejected it because I had zero knowledge on standards, because it was not my project. I really did not know.” – MPU.

IIU mentioned bluntly that “one of the barriers would be, you know, the level of knowledge”. – IIU.

KeT indicated how from the discussions that they IIU mentioned how they overcame the knowledge barrier by being passionate, steadfast and having adequate training: “...my team here, they had zero knowledge on ICT security and I think maybe because we were steadfast and passionate about it, kept on putting into them, and I think now you ask them, they are very concerned with security...” “It’s the training, the knowledge, the coaching, the build-up, the know-how.” – KeT.

NRE mentioned how they overcame the knowledge barrier by being passionate, steadfast and having adequate training: “…my team here, they had zero knowledge on ICT security and I think maybe because we were steadfast and passionate about it, kept on putting into them, and I think now you ask them, they are very concerned with security...” “It’s the training, the knowledge, the coaching, the build-up, the know-how.” – NRE. SHL relate how hand-on support and face-to-face facilitation is needed to overcome the perceived lack of skills. “probably they lack skills [and knowledge] as well. So, if they don’t get hands-on support, face to face, to help them, it’s probably not gonna happen to that level as you wished to.” – SHL.

4.5. Lack of middle management support

We define lack of middle management support as “middle management does not demonstrate understanding or commitment to the adoption”.

While the role of top management support has received strong empirical support as an antecedent to formal ITG practice [58], [1]; the same cannot be said to the role of middle management. The middle management role is equally important, especially during the implementation phase due to their strategic location between top managers and frontline employees, their position gives them the potential to bridge gaps in information that might otherwise impede innovation implementation [3].

Research by Sayer [43] shows how middle managers revolted against the implementation of an innovation in a public sector organization in an effort to maintain their position and power, to the point of
bringing the innovation implementation as originally conceived by top managers to a halt. Meanwhile, Floyd and Wooldridge [15] detailed how middle managers impeded innovation implementation by ‘dragging their feet’ or pursuing other priorities. Sohal and Ng [45] in a survey 530 organizations in Australia found that projects failed due to the lack of commitment from middle management.

The role of middle management has often been overlooked in IS literature and specifically ITG literature. Exceptions include Willson and Pollard [58] and Sohal and Fitzpatrick [44]. Willson and Pollard [58], in their case study of large multinational corporations in Australia found support for Sohal and Fitzpatrick’s [44] findings in recognizing the importance and contribution of middle management to the success of ITG implementation.

Our study provide support to their findings. MPU describe how the lack of middle management commitment had nearly thwarted their initiatives of formal ITG practice adoption. “[middle management] did not want to implement because they said that they did not want to implement this project because there were a lot of requirements, they want to use the as-is processes.” – MPU. Meanwhile, NRE also reiterate that involvement from all staff, including middle management, lower level management and operational staff all had an important part as contributors to ITG implementation. “So, commitment of people, be it at the management level, at the team level, and the operational level is very key to making sure that it works”. – NRE.

4.6. Mobility of management

Mobility of management in its simplest term is meant as “job hopping”. The issue of mobility of management has received a lot of attention in the total quality management (TQM) literature, with Deming citing it as the fourth deadly disease that impedes transition to a stable total quality environment [12].

Mobility of management has been shown to be a barrier as it removes the constancy of purpose [46]. Researchers relate as to how the change of management will ultimately result in continuous improvement efforts being broken and disjointed as the new leaders come on board.

Moreover, with changes in leadership, there is frequently a change in management philosophy [12]. Previous researchers found evidence that mobility of management inhibit TQM adoption and implementation [46].

It was previously thought that this phenomenon is unique to non-public sector organizations. However, other researchers argue that it is also apparent in the public sector [46], where the issue of political influence may lead to changes in management personnel [4].

In our study, KeT pointed to the possibility of this barrier happening and its consequences in further delaying adoption: “Because we know that to get the standard, to implement the framework, certification ... So, it takes a long time, and sometimes, during that time we might have a situation whereby the person in charge, has to relocate or change to other ministries, so that might arise problems. Furthermore, it might be long after before his successor comes in, and he has to re-learn it.” – KeT.

4.7. Lack of geographical proximity

Geographical proximity refers to the automatic spread of innovations between individual actors who are in close geographical contiguity, such as within rural or urban communities or countries located within the same geographical region [54].

It is generally estimated as the relative rate of adoption between geographically spaced actors. Because proximity can affect the frequency of communication and the personal nature of interactions between actors, it enhances the spread of information and ideas and facilitates imitation behaviours [54].

In our study, SHL relate to how the lack of geographical proximity acted as a barrier due to their difficulty in reaching out to all of their operational entities located in distant places to transfer knowledge and skills required for the adoption. “Yeah, we had, as I’ve said, training, we had communications around it, websites where you can find all the background, all the materials and etc. But I believe that is not enough to really implement it in a complex organization... So, if they don’t get hands-on support, face to face, it’s probably not gonna happen to that level as you wished to. But that didn’t take place, you know the entities, because it’s quite costly and time consuming to go out to the, probably 150 locations” – SHL

4.8. Receptivity to internal or external mandate

Our study found evidence that “the interpretation of mandates is a political activity that hinges in part on how the mandate fits with existing norms and how it might shift resource allocations in the organization”[9].

KeT justified the reason they have yet to adopt a formal ITG practice, even though a circular by MPU has been distributed requiring critical national information infrastructures (CNII) to be certified. This exemplify how a circular (mandate from government agency), an external mandate is overruled by the lack of an internal mandate (mandate from top
management). “it’s actually,...because if we did receive a directive to get certified, we will follow...once we receive a directive, only then will we look into it” – KeT. This phenomenon is partly due to top down organizational structure and culture of the organization whereby decisions and directives are handed hierarchically down the line with motivation to adopt only coming from directives of their immediate superiors.

5. Discussion

In reference to Table 2, all but one organization managed to identify one or more barriers to adoption. The one organization which failed or which did not identify any barriers state that the nature of their top management directive which was to “implement it by whatever means necessary- EPF” represents the total support of top management and the need to accomplish the task, whatever it takes. While other organizations do obtain management support, they may not constitute total support or the support may not be followed through the entire adoption process, leading to the emergence of other barriers.

Our results suggest that public sector organizations do exhibit more barriers in comparison to non-public sector organizations. By and large, this points to some support for the arguments stating that ITG implementation in the public sector is more complex [4].

The most highly rated barriers include lack of resources, lack of knowledge and skills and lack of awareness. Lack of time, human and financial resources remain the most salient factor among all organizations. The lack of knowledge and skills are more apparent in public sector organizations.

Meanwhile, there were 2 public sector organizations that identified more barriers as compared to the others. IIU mentioned more barriers due to their extensive experience of going through the pre-adoption, post-adoption and discontinued adoption stages, therefore having a more holistic experience. MPU managed to highlight more factors due to their extensive experience in implementing in their organization as well as through consulting other public sector organizations. On the other hand, 2 organizations mentioned the least number of factors; these can be attributed to them having effective champions, pro-actively pushing for adoption. For example, MOH related how he pushed for adoption by obtaining firsthand knowledge from the Convener of ISO/IEC 27001 standards himself, Prof. Ted Humphreys: “We invited Ted Humphreys twice. Twice to give us a talk at an ICT-ISO Conference, he gave the opening presentation. Of course it attracted a lot of interest, and then we invited him again...where we sat down, and we planned with him how to go about implementing ISMS in the public sector. So, to that extent we went.” – MOH.

Our study provides empirical proof that there exist factors that exert themselves during different stages of the adoption process. Respondents highlighted 2 factors that only acted as a barrier during the pre-adoption phase. They include lack of mandate and mobility of management. Others highlighted factors that were only evident during the implementation or post-adoption stages: lack of middle management support, unsuitable IT organizational structure and lack of facilitation. Most of the respondents identified factors as affecting both pre-adoption and post-adoption stages.

6. Conclusions

As a conclusion, the results of our study mostly support the currently dispersed literature on barriers to formal ITG practice. Furthermore, we managed to uncover new and emerging factors not previously identified in the ITG literature. We specifically took a sample of 9 organizations, interviewing 1 respondent (from the IT side) in charge of ITG adoption and implementation. Organizations studied consist of 6 public sector and 3 non-public sector organizations. Since there were a limited number of organizations involved in the study, therefore we caution against interpreting these results and generalizing them. However, we believe that they significantly contributed to the identification of new factors that were not present in the literature and our pilot study. Moreover, our results show the usefulness of conducting further qualitative studies to reinforce and discover new factors that may be present within the scope of study. While we believe the results are not specific to the Malaysian context, generalizations to other developing countries should be made with caution.

Given the stated limitations above, we suggest the following future research: (1) Replication of this study to include more non-public sectors representing the financial, manufacturing and telecommunications sector. (2) Conduct more interviews in each organization, specifically obtaining information from the business perspective. (3) Replication of this study to other countries so a valid comparison between the factors identified within this study can be made. The next step of this research would be to use the results of this study as a basis for further development and testing of a causal model. Results obtained from the causal model will then be used to come up with useful recommendations for current and potential adopters of formal ITG practice.
Table 1 Summary of case organizations

<table>
<thead>
<tr>
<th>Organization Codename</th>
<th>SD</th>
<th>EPF</th>
<th>NRE</th>
<th>MPU</th>
<th>CSM</th>
<th>MOH</th>
<th>KeT</th>
<th>IIU</th>
<th>SHL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sector</td>
<td>Non-public</td>
<td>Non-public</td>
<td>Public</td>
<td>Public</td>
<td>Public</td>
<td>Public</td>
<td>Public</td>
<td>Public</td>
<td>Non-public</td>
</tr>
<tr>
<td>Stage of adoption</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>I</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Type / extent of adoption</td>
<td>Cf</td>
<td>Cf</td>
<td>Cf</td>
<td>Cf</td>
<td>Cf</td>
<td>Fi</td>
<td>Na</td>
<td>Di</td>
<td>Pi</td>
</tr>
</tbody>
</table>

Legend:
Standard / framework adopted:
A - ISO/IEC 27001, B - ISO/IEC 20000, C - COBIT, D - ITIL
E - Finalizing, F - Has plans, G - Discontinued, H - Customized

Stage of adoption:
I - Initiation, M - Implementation

Type / extent of adoption:
Cf - Certified, Fi - Full implementation, Na - Non-adoption, Di - Discontinued implementation, Pi - Partial implementation

Table 2 Summary of findings for each case organization

<table>
<thead>
<tr>
<th>Factors</th>
<th>Literature support</th>
<th>SD</th>
<th>NRE</th>
<th>MPU</th>
<th>CSM</th>
<th>MOH</th>
<th>KeT</th>
<th>IIU</th>
<th>SHL</th>
<th>Stage</th>
</tr>
</thead>
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<tr>
<td>Lack of top mgmt. support</td>
<td>[58],[1]</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>XP</td>
</tr>
<tr>
<td>Lack of middle mgmt. support</td>
<td>[58],[44]</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>P</td>
</tr>
<tr>
<td>Resistance to change</td>
<td>[59],[6]</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>XP</td>
</tr>
<tr>
<td>Complexity</td>
<td>[56],[23]</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<td>✓</td>
<td>✓</td>
<td>XP</td>
</tr>
<tr>
<td>Low priority</td>
<td>[4], [57]</td>
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<td>XP</td>
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<tr>
<td>Organizational politics</td>
<td>[57],[38]</td>
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<td>XP</td>
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<td>Lack of knowledge and skills</td>
<td>[37],[33]</td>
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<td>Lack of resources</td>
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<td>Lack of mandate</td>
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</tr>
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<tr>
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<td>Lack of geographical proximity</td>
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Legend:
Stage - Adoption stage affected:
X - Pre-adoption (initiation, adoption decision), P - Post-adoption (implementation)
*EPF was not included in Table 2 due to the non-existence of barriers identified by the respondents

7. Acknowledgment
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8. References


