Information Technology Governance in the Malaysian Electronics Manufacturing Industry

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Abstract:
Research indicates that information technology (IT) governance is attracting enormous attention from practitioners and academics. This is fueled by the growing importance of IT governance in the delivery of IT compliance and in its ability to create value for businesses. IT compliance minimizes risk while IT governance manages risks. This paper is a preliminary report on an electronic survey of 33 firms operating in Malaysian electronics industry. Three key frameworks underpinned the conceptual development in this paper. The findings indicate that IT governance is important to profit- and growth-oriented organisations in terms of cost efficiency, growth, asset utilisation and business flexibility. Organisations realise the benefits of IT governance but unfamiliar with the IT frameworks. Additional implications of these findings to the electronics manufacturing industry and policy makers in Malaysia are presented.

Background of Study

Information technology [IT] governance is relatively new in Malaysia. In fact, there are limited studies about IT governance in Malaysia. While organisations are getting bigger in terms of annual revenue or number of employees, the IT infrastructure in organisations becomes more complex. In this regard, proper management of IT is imperative to ensure that IT risks are mitigated and also that IT brings positive values to organisations.

The electrical and electronics industry is Malaysia's leading industrial sector, contributing significantly to the country's manufacturing output, exports and employment. In 2006, gross output of the industry totalled RM214.9 billion (US$63.2 billion), while the industry's exports of electrical and electronics products amounted to RM282.2 billion (US$83 billion) or 61.7% of total manufactured exports. The industry created 397,553 jobs opportunities, accounting for 36.6% of total employment in the manufacturing sector (www.mida.gov.my). This research, therefore, is an effort to determine the perceptions of organizations' IT governance practice in this industry. Thus, this research is tries to answer the research question: How aware are these firms about the impact of IT governance on Malaysian electronics manufacturing industry?

The following section reviews the literature relevant to the research topic. The methodology used is detailed before the results are presented. Finally, the findings are discussed and implications of the results are presented before the paper is concluded.

Literature Review

The popularity of information technology (IT) usage among companies has called for a specific focus on IT governance [3]. IT governance is important because it ensures sustainable system operations and reduces the organisation's vulnerability to crises resulting from system failures. IT is often the weakest link in an organisation's overall governance structure [1][8] and therefore deserves greater attention.

IT governance and IT compliance are two different concepts. Kennan [4] described IT compliance as a cost which, does not deliver any benefit to the business. On the other hand, IT governance delivers compliance and creates value for the business. Moreover, the objective of compliance is to minimise risk, whereas governance is to manage risk. Therefore, IT governance is more than mere compliance with regulatory requirements.

IT governance is about optimum returns from investment in IT and how to ensure that measurable and transparent long-term, sustainable stakeholder value is achieved [11]. Hence extracting maximum value from existing investment is imperative for IT governance [6]. IT Governance Institute [3] defines IT governance as the leadership and organisational structures and processes that ensure the organisation's IT sustains and extends the organisation's strategies and objectives. Weill and Ross [10] offered a simpler yet encompassing definition of IT governance as specifying the decision rights and accountability framework to encourage desirable behaviour in the use of IT.

Common Coordination of Decision-Making Mechanisms

There are various common coordination of decision-making mechanisms, including:

- A steering committee which comprises of either representatives from business, IT or a mixture of both.
- An IT relationship or account manager dedicated to specific business units or functions.
- An architecture committee to ensure business and technical standardisation and integration.
- A budgeting, investment or project decision committee to reconcile conflicting business needs requiring limited IT resources.

Monitoring Execution
Once decisions are made, monitoring and periodic reviews are necessary to ensure the execution is on the right path. The mechanisms for monitoring execution include:

- Architecture review or exception process
- Standard operation management processes for IT service support and delivery
- Service level agreements
- Organisation-wide project management methodology
- Cost forecasting and controlling processes
- Key performance indicators or balanced scorecard

Communication with Stakeholders
Communication encompasses announcements, advocates, channels, and education efforts that disseminate IT governance principles and policies and outcomes of IT decision-making processes [10]. These include:

- Communication sessions by senior business and IT management
- Electronic communication (e.g. announcements, newsletters, intranets)
- Personal involvement of senior IT management to ensure buy-in and compliance by renegades (managers who do not follow the rules, either due to ignorance or disagreement)

Industry Frameworks Related to IT Governance
There are three frameworks related to IT governance. The three frameworks are Control Objectives for Information and related Technology (CobiT), IT Infrastructure Library (ITIL) and Capability Maturity Model Integration (CMMI).

CobiT was developed in the early 1990s by Information Systems Audit and Control Association (ISACA) with the goal of providing a set of best practices that are meaningful and useful to IT staff, auditors, and customers. CobiT is organised into four domains: planning and organisation, acquisition and implementation, deployment and support, and monitoring with a total of 34 high-level control objectives. Each of the high-level control objectives is divided into detailed control objectives. CobiT identifies a broad set of 318 control points designed to provide reasonable assurance that certain objectives will be achieved [3].

ITIL was developed in the late 1980s by the UK's Office of Government Commerce (OGC) [5]. The OGC started the project in recognition of the fact that government organisations were becoming increasingly dependent on Information Technology. The objectives of the OGC in developing ITIL were to promote IT business effectiveness and to reduce costs while maintaining or improving IT services. The library includes scope of implementing ITIL processes through applying life cycle management and the core of ITIL IT operations processes. It has become the global benchmark by which organisations measure the quality of IT service management [5].

CMMI for software development was established in 1986 at Carnegie Mellon University by the Software Engineering Institute (SEI) [7]. It was originally developed for the U.S. Defence Department to manage large and complex development projects, but has gradually gained recognition in both the public and private sectors as a useful framework for improving software development processes and application quality. CMMI defines five stages of organisational maturity with respect to software development. Predictability, effectiveness, and control of an organisation's software processes are believed to improve as the organisation moves up these five levels [7].

Research Methodology
Questionnaire
This study is carried out using a set of questionnaire. Items in questionnaire are prepared based on literature as described in Section 2. Respondents can choose to complete the survey either online or through e-mail. Demographic items are evaluated using dichotomous scaling. All other variables are interval-scaled. There are three categories; coordination, monitoring and communication mechanisms (Section 2.1), monitor execution of IT decisions (Section 2.2), and communicate IT issues (Section 2.3). We measure the questions in these categories using 5-point Likert scale, ranging from 1=Never, 2=Rarely, 3=Sometimes, 4=Often and 5=Always. The IT governance frameworks (Section 2.4) are rated by 1=Currently Used, 2=Intend to Use, 3=No Intention to Use, and 4=Never Heard of.

IT governance performance are categorised into two parts. One part is about the importance of IT governance outcomes which is scaled as 1=Totally Not Important, 2=Not Important, 3=Quite Important, 4=Important and 5=Very Important. The second part concerns the influence of IT governance in business. The scales we used are 1=Totally Not Successful, 2=Not Successful, 3=Quite Successful, 4=Successful and 5=Very Successful.

Selection of Study Area and Sampling

We used simple random sampling method to select participants in this study. Respondents are randomly selected from the member directory of the Federation of Malaysian Manufacturers, which contains around 1000 members, as well as through industry contacts. The organisations included in this research are involved in the manufacture of one or more of the following products: diode, electronic, integrated circuit, memory product, resistor, semiconductor, sipmos, transistor, and wafer.

Care was taken in selecting participants from the population frame by removing obvious mismatches (e.g. "wafer" as a product of the food industry, as opposed to "wafer" fabrication in the semiconductor industry). The finalised population frame consists of 33 organisations. All selected organisations in the list are invited to participate in the survey which ran for approximately one month.

Analyses and Results

Out of 84 e-mails sent to respondents, 33 respondents answered the questionnaires online, while 2 declined to participate citing confidentiality as a reason. Therefore, 33 usable survey responses (N=33) were collected which represented 39.3% response rate.

Table 1 indicates the distribution of annual revenue. The table shows that the figures are skewed towards large corporations with over RM 50 million of annual revenue. Over half of the respondents (63.6 per cent) are from organisations with over RM100 million of annual revenue.

Table 1: Annual revenue of company (N=33)

Items	Freq.	%	Valid %	Cum. %
> RM 1-10 mil	3	9.1	9.1	9.1
> RM 10-50 mil	3	9.1	9.1	18.2
> RM 50-100 mil	6	18.2	18.2	36.4
> RM 100 mil	21	63.6	63.6	100.0
Total	33	100.0	100.0	

Table 2 shows the distribution of strength of workforce in organisations. Many respondents (63.6 per cent) have more than 1000 employees. From the amount of annual revenue and size of workforce, it can be concluded that organisations that participated in this study are considerably big.

Table 2: Strength of workforce in company (N=33)

Items	Freq.	%	Valid %	Cum. %
> 100 up to 1000	12	36.4	36.4	36.4
> 1000	21	63.6	63.6	100.0
Total	33	100.0	100.0	

In the quest for a new customer base and product innovation, growth-oriented organisations require extremely agile IT systems and flexible IT services to deal with fast-changing business requirements. On the other hand, organisations with profit as the primary goal strive to maximise profit through operational efficiencies and economies of scale by standardised and tightly controlled processes and tools. Table 3 indicates that the numbers of respondents with profit or growth oriented are almost equal in this study. There are 18 organisations (54.5 per cent) which emphasise profit as organisation goal while 15 organisations (45.5 per cent) see growth-oriented as their focus in business.

Table 3: Primary goal of company (N=33)

Items	Freq.	%	Valid %	Cum. %
Profit	18	54.5	54.5	54.5
Growth	15	45.5	45.5	100.0
Total	33	100.0	100.0	

Table 4 shows that budgeting or investment committee and project decision committee often or always participate in making decision on IT activities. Architecture and steering committee sometimes get involved in IT decision making while IT relationship managers is the least to get involved.

Table 4: Coordinate IT decision-making activities (N=33)

Items	Mean	Std. Dev.
Steering committee which comprises of either representatives from business, IT or a mixture of both	3.45	.617
IT relationship/account manager dedicated to specific business units or functions	3.09	.843
Architecture committee	3.48	.834
Budgeting or investment committee	3.61	.827
Project decision committee	3.70	.728

Table 5 indicates that there are four matters that are often monitored during IT decision executions. Cost forecasting and controlling process (Mean=3.82), key performance indicators (Mean=3.73), service level agreements (Mean=3.70) and standard operation management process (Mean=3.64) are the IT decisions that are often being monitored. These four criteria are main focus of IT monitoring during decision makings.

Table 5: Monitor execution of IT decisions (N=33)

Items	Mean	Std. Dev.
Architecture review process	3.42	.751
Standard operation management process	3.64	.699
Service level agreements	3.70	.918
Project management methodology	3.39	.827
Cost forecasting and controlling process	3.82	.950
Key performance indicators or balanced scorecard	3.73	.876

Table 6 indicates IT issues are often communicated through electronic communication. This is the most frequently used communication medium compared to the other two. Electronic communication is considered to be the best medium to bring IT issues and decisions to busy senior business and IT management and managers.

Table 6: Communicate IT issues (N=33)

Items	Mean	Std. Dev.
Communication sessions by senior business and IT management	3.82	.846
Electronic communication (e.g. announcements, newsletters, intranets)	4.64	.489
Personal involvement of senior IT management to ensure buy-in and compliance by managers who do not follow the rules, either due to ignorance or disagreement	3.91	.678

Table 7 indicates that many respondents either have no intention to use or have never heard of the three IT governance frameworks. However, based on the findings, the three frameworks are equally important because the numbers of current users for the three IT governance frameworks are almost equal. There are 5 current users for CobiT, 4 current users for ITIL and 5 current users for CMMI. There are almost equal numbers of users as well who intend to use the different frameworks in future. However, it is surprising that many respondents are not aware of these frameworks

Table 7: Awareness and usage frequency of various industry frameworks related IT Governance framework (N=33)

Items	Mean	Std. Dev.	Currently Used (N)	Intend to Use (N)	No Intention to Use (N)	Never Heard of (N)
CobiT	2.88	1.083	5	6	10	12
ITIL	2.73	0.911	4	7	16	6
CMMI	2.73	1.069	5	9	9	10

IT governance performance is measured by two methods. One method measures respondents' expectation for implementing IT governance. The Mean values in Table 8 indicate that all respondents feel that IT governance is very important in bringing positive values to cost, growth, asset utilisation and business flexibility to business. Table 9 shows the breakdown of their response on each item.

Table 8: Importance of IT governance Outcomes (N=33)

Items	Mean	Std. Dev.
Cost	4.55	.506
Growth	4.27	.452
Asset utilisation	4.18	.584
Business flexibility	4.27	.452

Table 9: Breakdown of importance of IT governance outcomes

Items	Very Important	Important	Quite Important	Not Important	Totally Not Important
Cost	18	15	0	0	0
Growth	9	24	0	0	0
Asset Utilisation	9	21	3	0	0
Business Flexibility	9	24	0	0	0

Table 10 shows the influence of IT governance on the same 4 items as depicted in Table 8. Again, respondents view the influence of IT governance in business with respect to the 4 items is successful. Table 11 shows the breakdown of their response on each item.

Table 10: Influence of IT governance (N=33)

Items	Mean	Std. Dev.
Cost	3.55	.666
Growth	3.27	.452
Asset utilization	3.27	.626
Business flexibility	3.55	.666

Table 11: Breakdown of Influence of IT Governance

Items	Very Successful	Successful	Quite Successful	Not Successful	Totally Not Successful
Cost	3	12	18	0	0
Growth	0	9	24	0	0
Asset Utilization	3	3	27	0	0
Business Flexibility	3	12	18	0	0

Discussions and Implications

The monitoring of IT decisions is important especially during the IT investment forecast process. IT investment as initial process of IT project rollout may need more thoughts to ensure smooth planning and controlling in the ensuing phase. Thus, this study indicates that two committees; project decision committee and budgeting or investment committee play important roles in IT decision making activities.

Organisations prefer using electronic communication to discuss IT issues. This result is not surprising because of the popularity of information technology like the Internet. In order to make sure that IT issues are disseminated to everyone, senior business and IT management as well as managers must be in the communication loop.

This study indicates organisations have no intention or never heard of IT governance. This may be because organisations commonly have IT department, which oversee the IT systems and operations in organisations. The IT department manages, avoids and contains IT risks but not to the extent of bringing IT values to organisations.

However, although the many organizations are somewhat unfamiliar to the three frameworks, IT governance is found to be very important in bringing expected outcomes in terms of cost, growth, asset utilisation and business flexibility particularly in IT area. Moreover, proper IT governance according to most respondents will help organisations succeed in cost cutting, faster growth, more efficient use of assets and to be more fragile and flexible in the industry.

Conclusions and Suggestions for Future Research

This exploratory study is beneficial to academic researchers and industry players who are interested in understanding the as-is situation of IT governance level in electronics manufacturing industry in Malaysia. There is limited prior academic research on IT governance in Malaysia, and in particular within this industry. More researches are expected in future to bring more in-depth insights into the practice of IT governance in industries in Malaysia. Moreover, future researches can perform inferential analyses to explore more concrete findings.

From the perspective of the bigger picture of regulatory requirements on corporate governance, this research serves as a starting point for IT organisations embarking on this journey. Today, IT governance is already recognised as an integral part of corporate governance. Therefore, organisations and policy makers should devise plans to implement and govern IT in business. This is to avoid any potential pitfalls and taking earlier remedial measures. For example, the string of corporate scandals starting with Enron led to the subsequent passage of the Sarbanes-Oxley Act in the United States in 2002. Organisations were forced to re-examine their overall corporate governance structures and the underlying individual governance frameworks to ensure proper fiscal accountability to shareholders and stakeholders [9].

This study also serves to remind top management, particularly CEOs and CIOs in Malaysia to give higher commitment towards IT governance in their organisation. Alignment between business and IT objectives will position IT for strategic partnership towards achieving business goals. This is in line with the two fundamental concerns of IT governance stated in the beginning: IT's delivery of value to the business and mitigation of IT risks.

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