

Chapter 2

IT Governance in a Malaysian Public Institute of Higher Learning and Intelligent Decision Making Support System Solution

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Abstract IT governance in public universities is yet to be fully appreciated. This is because IT governance is just evolving as a new paradigm to take care of the stakeholders' expectations in leveraging IT with business goals. This study explores issues of IT governance and the use of IDMSS in a public university in Malaysia. The interviews and documents were analysed to generate themes. The findings show the need for effective IT governance in the university. This will enable optimal usage of IT resources, which are expected to have an impact on the university's performance. Moreover, COBIT framework is presented to provide the benchmark of international standards and practices that the university can adopt in the future. Finally, two IDMSS methods are presented for application in this study. This empirical study on IT governance in the context of a public Institute of Higher learning in Malaysia attempts to document the role of IT and the evolution of its practices in the context of a university.

Keywords IT governance • COBIT • IT service management • IDMSS

1 Introduction

Information Technology (IT) is a term used to imply the infrastructure as well as the capabilities of organisations that establish and support it [10]. Nowadays, organisations have recognised their dependence on this infrastructure in their bid

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to achieve their stated objectives, mission and goals and strategic positioning necessary for successful leverage. However, in the face of the reality expressed on the need to spend less on IT and to see IT rather as a utility [3], the animosity that greeted investments in IT became a thing of concern. In redressing this conception, lot of reactions came up and of such is the strategic implication of IT [2].

From this concept of strategic value, it is understood that IT has the potential to deliver strategic value at all levels, and this is not only restricted to the back office applications alone but rather to the innumerable ways in which IT is being used [2]. In fact, it is now more of a strategic partner [22] and what has been the concern today is the ability to utilise IT facilities to place organisations in their right perspectives. This ability has given birth to the concept of the management or better still the governance of IT facilities in order to allay the fear of stakeholders on IT investment given the spate of IT project failures. Thus, IT Governance (ITG) which has to do with structures, processes and relational mechanisms for the IT decision making in an organisation [20] should necessarily exist in any organisations that deal with IT, on a daily basis, though its quality (of existence) may vary from one organisation to the other [17].

Interestingly, educational institutions, which have been adjudged on the same footings as other organisations, are also concerned over the need to govern its IT facilities and resources in the business of service provision to 'customers' in this world that tends to move towards service orientation by the day. Researchers [21] have adjudged universities as having features typical of established organisations. This is a fact in today's business world whereby the service orientation paradigm has to do with the satisfaction directed from the organisation to the customers, the employees as well as all the stakeholders.

Malaysia is a nation in the South East Asia continent which has maintained a stable and growing gross domestic product (GDP) in the last 30 years. Its government is concerned about efforts geared towards achieving the status of a developed nation by the year 2020 and is not leaving any stone unturned in this regards. It is therefore, not surprising to see scheme like Malaysia Super-Corridor (MSC) rolled out to ensure compliance to standard [23]. The Institutes of Higher Learning are also encouraged to play vital role in this regards. That is why it is not surprising to see the case organisation used in this study joining the race of becoming a world-class university. Yet, ITG in it, is new, experimenting and in its infancy stage.

The purpose here is to present empirical findings of how ITG is being implemented in the university. The findings depicts: a university with unique vision and mission, striving to be a world-class university, still lacking in strategic emphasis on IT as an enabler. It's IT resources are decentralised and remain uncoordinated though this shortcoming has recently been identified and there have been concerted efforts to improve. Thus, being a 'service provider' in the Education industry, the university like its other counterparts has found IT handy to the achievement of its set objectives. The two main categories of information systems (IS) implemented in most Institutes of Higher Learning (IHLs), centre on:

1. Educational Learning Systems that now extends to online systems of instruction whereby real-time teacher-students interaction takes place. Today, there has evolved numerous ways of establishing the sharing of information within the university community members, inter-educational as well as the larger public.
2. Administrative Systems of running an organisation are now being deployed as never before, notwithstanding the bureaucratic nature of the university. Varied Information Systems has been deployed in the administration of the IHL; some are usually the one used in the industry and are adapted to use or those that are specifically developed to aid administrative efficiency in an academic setting. For example, enterprise integrations of resource's implementation of Balanced Scorecard are now gaining acceptance in IHLs.

The chapter is structured in the following orders. [Section 1](#) introduces to readers on the main topic. Then, [Sect. 2](#) provides a background literature on ITG concept, framework and its application in IHLs in Malaysian. [Section 3](#) briefly describes the qualitative methodology adopted for the study while [Sect. 4](#) provides detailed findings based on the analysis done. This is followed by [Sect. 5](#) showing examples of how COBIT can be applied in the university environment in order to enhance its IT governance. Finally, the chapter ends with a conclusion, and future research is identified.

2 IT Governance in Institutes of Higher Learning

IT usage, from the foregoing realities, is becoming pervasive in this ever dynamic business environment and thus, its management and control cannot be left to chances. Such needs for the management of IT resources to afford leverage for businesses are necessary considering the huge investment that it now involves. This gives birth to the concept of IT Management, which focused on the effective and efficient internal supply of IT services and products and the management of present IT operations. This also takes into consideration the need for control and by extension, making of policies and rules of governance. It has made how IT resources are governed an important issue in the university community. As stated by Yanosky and Caruso [27] on the need for ITG in IHLs that there has been increasing attention to how IT is governed in the institutions over the past few years. One reason for these is the significant impact IT systems have on how institutions' works get done. In addition, a revival of interest in corporate governance, fed by financial scandal and a new wave of corporate accountability has also put a spotlight on how organisations of all kinds ensure that the expensive, complex, indispensable and strategy-enabling domain of IT is appropriately governed.

The popularity of ITG given this exposition has grown over the year [12] as IT has become the backbone of many businesses and organisations these days, relying more on its central role in the enterprise. Organisations with high levels of ITG

could achieve more than 20 % greater profits than organisation with low implementation of the practices [25] and IHLs are no exception to this fact.

2.1 IT Governance Concept

The need for ITG, though a new concept [20], arose based on the fact that organisations have to think beyond IT and its infrastructures as a department, and that, there should be justifications for budget committed to the sustenance of such IT products and services. Thus, given this scenario, ITG, concentrates on performing and transforming IT to meet present and future demands of the business process (internal focus) and business customers (external focus). There have evolved various ways of defining ITG based on the perspective that is being considered, though, all revolve around the need to give direction and control on the use of IT and its resources. A review of some definitions prominently available in the literatures is provided in Table 1.

In summary, ITG is the apprehension experienced when exercising the rights on decision or policy-making: a function embedded in the corporate governance of an organisation, and the plan coupled with the will to carry out such decision on the structures and processes in executing organisations' goals. For this study, we shall use an operational definition adopted from these definitions ITG could be seen as: The control exercised by the Board of Directors and Managements in the formulation of right decisions, which enables the establishment of proper structures and processes thereby upholding best practices in order to enable strategic alignment of IT with the business thus ensuring that the organisations' IT sustains and extends its strategies and objectives in aiming for optimum usage well felt by its managed users which leads to good performance.

2.2 IT Governance Framework

A model that is usually referred here [20] is accompanied by a list of 33 best practices delineated as; 12 structures, 11 Processes, and 10 Relational Mechanism. In each of the layers of the model (strategic, management and operational), there are structures, processes and relational mechanisms (see Fig. 1).

Structure include organisational units and roles responsible for making IT decisions and for enabling contacts between business and IT management's (decision-making) functions (e.g. steering committees) [19]. This is best appreciated as an outline of how the Enterprise Governance of IT will be structurally organised. For example, does the CIO relates directly with the Executive Board or has to report to a CEO, who, in turn re-present the CIO's view at the Board?

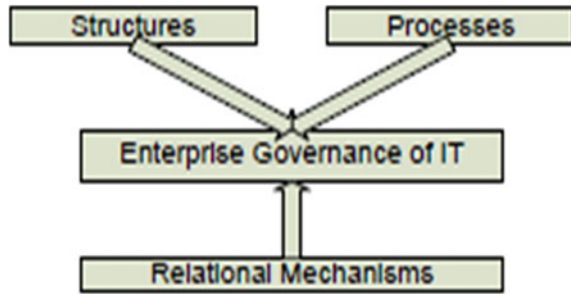
Process means to formalise, and institutionalise IT strategic decision-making or IT monitoring procedures. Accordingly, this is to ensure that the day-to-day

Table 1 IT governance definitions

Author(s)	Definitions	Import(s) from definitions
ITGI [10]	“...The responsibility of the board of directors and executive management. It is an integral part of enterprise governance and consists of the leadership and organisational structures and processes that ensure that the organisation’s IT sustains and extends the organisation’s strategies and objectives”	Alignment of IT with the enterprise and realisation of the promised benefits Use of IT to enable the enterprise by exploiting opportunities and maximising benefits Responsible use of IT resources Appropriate management of IT-related risks
Weill and Ross [26]	Specifying the decision rights and accountability framework to encourage desirable behaviour in using IT	Cost-effective use of IT Effective use of IT for asset utilisation Effective use of IT for growth Effective use of IT for business flexibility
Van Grembergen et al. [20]	ITG 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 ensure the fusion of business and IT	Enterprise Governance of IT: the sound management of IT as part of Corporate Governance, the responsibility of the board of directors, business management, and IT management to a merger between business and IT to come Strategic Alignment: aligning business strategy, IT strategy, business processes and IT processes so that the objectives of the IT organisation support optimal Value Creation: realising business value from IT-enabled business investments
Webb et al. [24]	The strategic alignment of IT with the business such that maximum business value is achieved through the development and maintenance of effective IT control and accountability, performance management and risk management	ITG is seen as evolving to be part of the Corporate Governance (the ways companies are directed and managed in a bid to monitor risk, meet set objectives and achieve an optimised performance) especially when the concept of Strategic Information System Planning (utilisation of information technology as a source of competitive advantage, and as a means of enabling and directing strategic moves of an organisation) is adhered to [6]

dispositions are consistent with the policies and provides input back to decisions for example [19]; the IT Balanced Scorecard (BSC was a management way of measuring organisation performance as popularised by Kaplan and Norton [11].

Fig. 1 The three layers of enterprise IT governance [20]



This involves supporting the business to be executed in an orderly manner; e.g. what are the interdependence of key performance indicators and the reporting and evaluation processes? Relational mechanism means active participation and collaborative relationship between Corporate Executives, IT as well as Business Managements. This includes announcements, advocacies, channels and education efforts [19].

2.3 IT Governance in Malaysian Higher Learning Institutions

It is an acclaimed fact that information plays a major role in the delivery and creation of knowledge (McRobbies and Palmer as cited in [9]) especially in knowledge-based environments like a university. However, empirical study on the influence of ITG on IT success in public organisations is scarce and worse still when the focus is on the HEIs. This is likely due to the recentness of the phenomenon and the lack of clear understanding of the concept of ITG [14]. An example is a recent study in a Malaysian university [9] where he observes that despite the IT infrastructures on ground, the university, in question, lack proper IT planning team structure. This goes to show that despite realising the pervasiveness of the IT yet little credence is given to its proper governance.

3 IT Governance in Institutes of Higher Learning

We adopted a qualitative study fashioned along on a single case organisation. The technique of data collection was through interview and extractions of some facts from the archives of the organisation. This was done with the mind of finding out: what is “in and on someone else’s mind” or to find out from them those things we cannot directly observe... We have to ask people about those things that cannot be ordinarily observed in order to allow us to enter into their perspectives [15].

Interview sessions were held with the Director of IT function that oversees all affairs of IT in the university, and with Head of ITG department with questions prepared beforehand which, “should not exceed ten...and has the advantage of allowing a certain degree of flexibility and allows for the pursuit of unexpected lines of enquiry during the interview” [8]. These questions were both structured in a way to gain insight to the followings:

1. The impact of the IT structure on ITG practices in the university.
2. The level of managements’ control on IT resources in the university.
3. The level of impact of IT structure and management control on ITG.

4 Research Findings

4.1 Case Background

It is an acclaimed fact that information plays a major role in the delivery of services. The university was established in the 1980s with the vision of becoming a leading international centre of educational excellence that seeks to restore the dynamic role of its products in all branches of knowledge. It started at a mini campus but now has a main campus where central administrative activities take place with a host of academic programmes. The university, aside from retaining the maiden campus also resides in other campuses.

Through generous support from Malaysian Government, its facilities are kept up-to-date to the changing demands of its core businesses; teaching and learning, research and consultancy. It operates under the directive of a Board of Governors with representatives from government and other international bodies. As of December, 2012, it has the growing population of over 1,900 academic staff and more than 1,800 non-Academic staff with Student’s population of over 22,000 undergraduate and more than 5,000 postgraduate.

Given the spread of the campuses and the attendant use of IT resources to impact knowledge and affect the lives of the citizenry by community services, thus the need for ITG cannot be overemphasised. This is because all the university’s facilities and establishments run on IT-enabled systems to afford better management. The need for governance is enhanced by the need to use resources of IT to enable this educational essence of the university.

4.2 Themes’ Generation

The themes that were uncovered from the interviews, learning from the wealth of knowledge and experiences of the respondents in the field, are best appreciated within the context of data analysis of a case study as enumerated thus:

1. Organisation of detail about the case.
2. Categorisation of data.
3. Interpretation of single instances.
4. Identification of patterns.
5. Synthesis and generalisations [5].

The data collected are interpreted and scrutinized digging out their underlying themes. These themes are carefully likened to the coding of the qualitative data; a process described... as a summative, salient, essence-capturing... [16] of data collected from interviews, participant observation field notes, artefacts, etc. and also such coding could be likened to analysis of the data [13].

The facts that were thus recorded were, firstly, organised orderly to reflect the objective of the study. The data were then categorised in such a way that they might make meaning and its specific information were analysed in each of the sections to throw light on such an instance. A sense of what the data meant was made by identifying the patterns at which they occur in the whole exercise and that informed their being grouped together to reflect that. Finally, data were mixed, separated and simplified to form a general idea, of how they apply to the case, exposure to facts at the university as well as what has been discovered through the exploration on the university's website as presented in Table 2.

No doubt change is a very difficult phenomenon to get by, but experience has shown that changing for better always leads to the desired goals and objectives. If only there would be a change on the management level to the way IT is been viewed as a department to its being seen as a partner in the business of the university, then to achieve and sustain the goal of university for world recognition would be less stressful. For that to be the case, all hands will have to be on deck to ensure that IT is seen as a partner in progress. From this study, we learn the following facts:

1. The management is yet to come to terms with the need to exercise control on the IT resources as things are left to the discretion of IT department.
2. This inability to appreciate the need for control has weighed more on the IT department as it is doing much but has less impact.
3. The decision making on IT resource's usage is at the mercy of individual champions in their respective faculties/functions because of the decentralised IT structure. Thus making it difficult to measure optimality of their usage at the university level to determine how objectives of the university are being affected by commitment on IT.
4. There is need for authority to support a university-level IT policy with its implementation on an enterprise-wide scale.
5. The IT function needs to achieve buy-ins of stakeholders as well as the required authority from management for IT policy to be effective in the university. This will ensure that users carry the IT function along in their IT investments as it will be prioritised in line with the university business processes, and all systems will be harmonised together.

Table 2 Summarised issues emanating from the transcribed interviews and archive

Theme	Issues	Remarks
Role and structure	The role of IT	Relegated to advisory role or order takers
	Impact of structure on ITG	No central coordination of IT resources
	Empowerment and awareness	No distinct ownership of processes
		Role of CIO not well felt
		Effective efforts from management on creation of awareness for adoption of technology is not seen
		The IT function seeks the buy-ins of stakeholders so that best practices can be entrenched
Top management perspectives	Management presence in IT committees, and decision making	Need for awareness on understanding business process before going for IT facilities
		Bulk of responsibilities pass on to the IT
	Role and impact of the CIO	There is lack of platforms to discuss IT problems
		Biasness to IT issues
		The need for the office of CIO and the filling of the post over time shows a need to “fill in the gap” in order to abide with the government’s directives
Challenges in enabling IT resources’ governance	Effective usage of resources	There has been a communication breakdown between CIO and reality on ground at the IT level
		Decentralised IT structure and budget: IT planning and procurements not necessarily dictated by business process needs
	IT policy formulation control and enforcement	Effective measure of IT asset usage has been hindered
	The use of tools and best practices	The users sees the IT policy as IT’s department policy
	Users’ relations: Feedback mechanisms	Difficulties in measuring the feedback is because of the ad-hoc nature in the way things are being presently done
		Dearth of manpower to handle and propose better methods to the situation on ground
	Manpower management	Need for coalition among all IT staff of the university

6. There is a need to ensure that accountabilities on IT resources are put into university functions, in their interaction with IT. This will evolve a university-level adoption of benchmarking control’s frameworks like ITIL, ISMS, COBIT, Val IT, BSC IT.
7. There is need for top management to define the road map whereby processes are assigned their respective owners.

5 Aligning IT Governance to COBIT Framework

Control Objectives for Information and related Technology (COBIT) [4] and ISO 17799 have been used as reference frameworks for Information Security governance and hence, ITG in real practices. This section, however, will limit and only delve on COBIT as a reference framework while at the same time acknowledging the importance of other international reference standards such as ISO 17799.

COBIT is a ‘tool for information technology governance’ [4]. COBIT is therefore, not exclusive to information security—it addresses Information Technology governance, and refers among many other issues, to information security. COBIT divides Information Technology governance into 34 processes, and provides a high level Control Objective (CO) for each of these 34 processes. Each CO is again divided into a set of Detailed Control Objectives (DCOs), which specify the way the high level CO must be managed, in more detail. In total, 316 DCOs are defined for the 34 processes. The rationale is that if each of these 34 processes is managed properly, good Information Technology governance will result. Nevertheless, COBIT is in many cases preferred by IT auditors and IT Risk Managers as a framework of choice.

The COBIT framework contributes to these needs by:

- Making a link between the business requirements and IT through goals,
- Defining the responsibilities for obtaining the goals,
- Organizing IT activities into a generally accepted process model,
- Identifying the major IT resources to be leveraged,
- Measuring the maturity levels of IT processes,
- Defining the management control objectives to be considered.

COBIT defines IT activities in a generic process model within four domains. These domains are Plan and Organise, Acquire and Implement, Deliver and Support, and Monitor and Evaluate. The domains map to IT’s traditional responsibility areas of plan, build, run and monitor. The COBIT framework provides a reference process model and common language in an enterprise to view and manage IT activities. Incorporating an operational model and a common language in all parts of the business involved in IT is one of the most important and initial steps toward good governance. It also provides a framework for measuring and monitoring IT performance, communicating with service providers and integrating best management practices.

A process model encourages process ownership, enabling responsibilities and accountability to be defined. To realise the IT strategy, IT solutions need to be identified, developed or acquired, as well as implemented and integrated into the business process. In addition, changes in and maintenances of existing systems are covered by this domain to make sure the solutions continue to meet business objectives.

The application of COBIT in an organisation varies on its IT systems and infrastructure’s complexities. Depending on the formulation of an organisation’s

information system, an auditor assesses on all control objectives outlined in COBIT using any assessment methods on the IT general and application controls. For small and medium-sized organisations, it is unlikely that the conditions prevail in big organisations, which are more complex. Nevertheless, with the application of COBIT in strategic, tactical and operational levels, many organisations have benefited from their successful formulation and implementations.

6 Intelligent Decision-Making Support Systems for IT Governance

Control IT governance is a broad concept and a comprehensive framework is needed to account for it. With thousands of input nodes and decision trees that a system must calculate to find the best solution path, an artificial intelligence or fuzzy logic based on a mathematical formula or expert system has become a feasible option. Nonetheless, management must know how to operate the system as well. The ITG paradigm aims at providing the decision-making structures, processes, and relational mechanisms, needed in order that IT supports and perpetuates the business. Hence, formulating an intelligent decision making support system (I-DMSS) for ITG is essential in order to capture all important scopes for management decision making. Management only needs to see the core criteria embedded in the system and consequently, decide on the best solution. The adjacent discipline of enterprise architecture provides a broad range of frameworks and tools for model-based management of IT. Enterprise architecture is a commonly and successfully used approach, but the frameworks need to be adapted with respect to the concerns at stake in order to become truly useful [18].

Decision-making Support systems (DMSS) are Information Systems designed to interactively support all phases of a user's decision-making process. There are various notions about all aspects of this definition. There can be individual, group, and other users. Support can be direct or indirect. The decision-making process can be viewed in various ways. User-computer interaction can have a variety of dimensions. The information system offering the support can involve many technologies drawn from several disciplines, including accounting, cognitive science, computer science, economics, engineering, management science, and statistics, among others.

Many approaches for ITG decision-making support systems can be applied. We recommend here two methods or approaches that can be applied for designing, developing and constructing ITG IDMSS. One method is using mathematical foundation of the prediction apparatus that is using a Bayesian network which is based on statistical data to support ITG decision making. The method relies on best-practice frameworks, including the Control Objectives for Information and related Technology, COBIT and Weill and Ross [26] method for ITG performance assessments. In addition, the method takes ITG two steps further. Firstly, it

combines ITG with a modelling approach inherited from the enterprise architecture discipline. Secondly, it provides information about statistical correlations between an IT organisation's internal effectiveness, and the effect thereof as perceived by business stakeholders. The method features an ability to assess ITG maturity and performance. Further, it incorporates a framework for prediction of ITG performance given ITG maturity, which makes it suitable for decision making support concerning IT organisation matters [18].

Another approach to designing, developing and constructing IDMSS systems is by using the logic-semiotic apparatus. Golovina [7] proposed an approach to designing the IDMSS based on Pospelov's theory of semiotic modelling in comparison of Bayesian network approach described earlier. The SETRIAN modelling subsystem is based on Trincon version 9.0. It comprises four main components, including:

1. Subsystem for modelling the controlled object;
2. Subsystem of strategic planning for defining the initial and final states of the controlled object; planning the ways to reach the target state of the controlled object; choice of the best way to reach the target state of the controlled object;
3. Infological subsystem used to define the ontology of the knowledge domain (objects, relations, axiomatic), as well as to define the structure of the controlled object, information about its modes of operation, and so on; and
4. Diagnostic subsystem explaining the causes of emergencies at the controlled object and monitoring the outcomes of the decisions made in the course of modelling the dynamic controlled object.

The developed fuzzy-model editor is distinguished by using methods for extraction of imprecise fuzzy information, neuron networks for extrapolation of values upon constructing the membership functions, modifiers for obtaining new membership functions (values of the linguistic variables), and parallel representation of the membership functions and support of the 3D-graphics. These functional capabilities enable one to construct in shorter time the membership functions that are adequate to the expert's judgment of the operation of the controlled object [7].

There are several versions of the Trincon development tool for fuzzy decision-making support systems which each is a functional extension of the older version. Developed in the late 1999, Trincon version 9.0 is an integrated tool for developing fuzzy decision making support systems. The Trincon version 9.0 comprises the:

1. Inference system based on the generalised Modus Ponens adjusted to the Tnorms and T-conorms;
2. Subsystem for loading the source data such as the linguistic variables whose values are described by the membership functions and fuzzy production rules, as well as the initial tests;
3. Subsystem for logging the operation of the fuzzy control system developed using Trincon; subsystem for adjusting inference to the hybrid T-norms;

4. Subsystem for visualising operation of the decision-making system and supporting 2D- and 3D-graphics; subsystem of semantic modification of the T-norm;
5. Subsystem supporting semiotic modelling based on fuzzy logic;
6. Information-and- control system providing the decision maker with missing information;
7. Multitasking-support subsystem; and
8. Help subsystem [7].

The most important component of the IDMSS is the information extraction and predictive capability. Information extraction is the capability to extract the useful information from the abundance of information. This information will serve as the input to IDMSS that will be presented to the user in a meaningful format. The IDMSS predictive capability will use and analyse the information into a pattern which represents a trend of the event. This trend will be learned and will be used to predict the future event. These facilities exhibit intelligent behaviour of the IDMSS and are very useful in assisting the decision maker.

Hence, the second approach provides an IDMSS for ITG that can be adopted by the organisation. The IDMSS can solve the ITG themes or areas in intelligent manners by using predictive capability for example. Senior management needs a system that can trigger the key points for them to make decisions. Using IDMSS will summarise important information for decision making for ITG. Each issues emanating from every single unit, centre or faculty will be handled by the fuzzy logic in Trincon, for instance. Then, a few triggers can be generated from the fuzzy IDMSS in order to assist the senior management in their ITG decision making.

7 Conclusion

The contribution of this study on ITG in Malaysian universities, its limitation and future works are presented.

Without doubt, universities combine some of the features of both private (profit-based) and public (non-profit) organisations' orientations in that though they are not entirely profit-making but have set targets to achieve while making good their contribution to humanity. It is also independent because of degree of freedom on its way of doing things, and this has a lot on its output. With this in mind, this study shows the way such a unique organisation will have to be dealt with. It is an attempt that represents an empirical study on ITG in the content of Institutes of Higher Learning Institution in Malaysia.

For a university is expected more in terms of practicing the best and making good use of knowledge. It is a case of how wisdom is a lost treasure of the Wise one, so he is its rightful owner at its discovery. Thus, this study portends that:

1. The management needs a renewed interest in the systematic way of exercising control on the IT resources so that the IT department will be able to govern the resources effectively with their support.
2. The IT department needs to appreciate that getting stakeholders' buy-ins for best practices in an educational outfit is important. The leadership has to understand that it is not a case of one cap fits all. It is one thing to think of new ways of doing things; it is another thing to get the buy-in from the stakeholders as its adoption will affect ways of doing things [1].
3. The university members need to appreciate that adopting the right course in dealings with IT resources will imply contributing one's quota to knowledge and self-satisfaction as members of the community and the nation at large.
4. More research and development on IDMSS needs to be done in public and private Institutes of Higher Learning in Malaysia.

There is still a room for improvement on the current study as it is limited by the fact that:

1. It is a single case study; so scientific generalisation may not be all that possible [28].
2. The perspective of the users is yet to be explored. The users constitute a good proportion of the community, and their input would help form a holistic view of the ITG in the organisation and a contribution to the body of knowledge.
3. We restrict ourselves to interview, available facts from the archives and the website as a form of technique in gaining insight to the raised questions.
4. The proposed conceptual IDMSS needs to be applied to the university ITG environment in order to test each technique's suitability and efficiency.

We suggest a further study that can complement the present one as a way of extending the search light to the users of the IT facilities. It is also hoped that an elaborate comparative study of a multi-case study research could be conducted further on Malaysian Universities to see how university's processes have become stable, to the extent that they can enjoy some further benefits over their contemporaries. Here, there is a need to share experiences. In addition, each IDMSS system needs to be tested in more sample sites so that the system developed will be more inclusive and robust for all environments.

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Mora, M.; Marx Gómez, J.; Garrido, L.; Pérez, F.C. (Eds.)

2014, XII, 232 p. 64 illus., Hardcover

ISBN: 978-3-642-39927-5