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A Framework of IT Governance for Higher Educational Institutions in the Philippines Amid and Beyond COVID-19 Pandemic

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ABSTRACT

Higher Education Institution are complex organizations that require an adequate IT infrastructure and information systems to fulfill their mission. IT governance as 'an important part of enterprise (corporate) governance that articulates the 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'. It is evident that there is a lack of studies on IT governance for higher education and no studies conducted yet on this paradigm. Due to the considerable difficulty in implementing IT governance frameworks for different organizations, thus may require different solutions for IT governance. The propose model illustrates how IT governance align with enterprise governance and corporate governance of Philippines's Higher Education Institution. A Design Science Research (DSR) methodology was adopted which is extensively used in information systems research to solve complex problems. The researchers thus recommends that a combination of COBIT and ISO/IEC 3800 guidelines be adopted and used with a balanced scorecard for enterprise governance as IT Governance Framework for higher education institutions in the Philippines. This will ensure effectiveness and efficiency of IT processes as well as accountability to all stakeholder in the higher educational institutions.

Key words : IT Governance, Higher Education, COBIT 5, ISO/IEC 38500, COVID-19.

1.INTRODUCTION

Higher Education Institution are complex organizations that require an adequate IT infrastructure and information systems to fulfill their mission. The challenges are huge in managing that set of technologies in universities, even more when administrative burden put on budgets has to be reduced [1]. In fact, the Philippines government recognized the importance of ICT for the country's development and ICT in education is also expected to be a key catalyst for the transformation of education so as to contribute for the economic prosperity in the country [2]. However, The COVID-19 pandemic, which began in February 2020, has radically changed the processes related to higher education. The suddenness, uncertainty, and volatility of COVID-19 left the education system in a rush of addressing the changing learning landscape.

Considering the limitation on connectivity, the concept of flexible learning emerged as an option for online learning especially in higher institutions in the Philippines. Flexible learning focuses on giving students choice in the pace, place, and mode of students' learning which can be promoted through appropriate pedagogical practice [3]. This new reality has resulted in an increased risk of cybercrime and phishing attacks. Criminal actors are taking advantage of changing working conditions to commit fraud and steal sensitive information. Fear, uncertainty and doubt enable criminals to target users still trying to fully understand their new way of working. Although business continuity planning (BCP) is an established concept, that does not mean that the majority of organizations around the world have established BCP to deal with situations such as COVID-19. Many of the underlying BCP or disaster recovery planning (DRP) assumptions, such as availability of people to manage necessary operations, does not hold during this pandemic [2].

Different types of system, structure, process and technology can be found at the universities contributing for considerable complexity in managing IT. IT can act as a strong agent for change in teaching, research and knowledge generation and transfer to society, nuclear processes at universities [4]. The effective and efficient use of information technology at universities to support the research, teaching and administration requires appropriate IT [5]. IT governance is sometimes referred to as part of the bigger discipline of corporate governance [6]. Processes refer to, planning and strategic decision making of IT based on practices from ITIL, COBIT or Balanced Scorecard to name some examples, including techniques and appropriate tools to align business and IT for a good performance [7]. IT governance includes the creation of decision rights, setting of goals and objectives and building the capacity to meet these, and a system that reviews and improves these rights, goals, objectives and capacity [8].

In the Philippine Universities, The Information and Communications Technology Center (ICT) Center is tasked by the University to provide the Information and Communications Technology infrastructure of both the Main and the Cabadbaran Campus. The Center houses application programmers and developers whose primary tasks is to develop applications software as well as web-based solutions for the students, the administration, and for the decision makers. [9].

However, there has been neither governing committee nor governance guidelines that monitor the implementation of this ICT services if its achieve its the effective performance. Universities are such type of organizations, rather complex, that may benefit substantially from high level IT governance mechanisms, as suggested by for teaching, research and management activities [10]. However, the number of universities using frameworks for IT governance is limited [11].

Having this in mind, it is evident that there is a lack of studies on IT governance for higher education especially in the times of COVID-19 and beyond. These is due considerable difficulty in implementing IT governance frameworks, different organizations may require different solutions for IT governance, therefore there is a serious need to conduct a study.

The study sought to attain the following specific objectives to:

1. Conduct a critical review of literature on IT Governance adoption and implementation in higher educational institution
2. Identify the factors and barriers affecting the adoption of IT Governance in Higher Educational Institution.
3. Develop a comprehensive and conceptual IT Governance Framework that can be adopted by Higher Educational Institution in Philippines

2.REVIEW OF RELATED LITERATURE

A. IT Governance

IT governance is sometimes referred to as part of the bigger discipline of corporate governance [6]. It is vital to view corporate governance's importance in the same way that IT is vital to the business [12]. It provides a framework for setting an organization's objectives, coming up with ways of achieving these objectives, as well as how performance in relation to the objectives will be monitored.

De Haes and Van Grembergen [7] define IT governance as 'an important part of enterprise (corporate) governance that articulates the 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'. IT governance is also defined as 'outlining the framework for decision rights and accountabilities to encourage positive behavior and use of IT' [13] and 'as 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 [14].

B. IT Governance Framework

Weill and Ross [6] in their influential book on IT governance define IT governance to represent: "the framework for decision rights and accountabilities to encourage desirable behavior in the use of IT". This view of IT governance borrows concepts from corporate governance area. Weill and Ross [6] outline six governance classification called archetypes that include business monarchy, IT monarchy, feudal, federal, IT duopoly, and anarchy. Archetypes defined by them typically involved the area that made the decision. For instance, in IT monarchy the IT department made the decisions. They used the archetypes to explain decision making in five key areas that include IT decisions, IT principles, IT architecture, IT infrastructure strategies, business application needs, and IT investment and prioritization.

Brown and Grant [15] in their comprehensive review of research on IT governance identify two streams of research. The first stream focuses on the IT governance forms and the other streams focus on contingency factors that influence the choice of IT governance mechanisms. Along with the evolving body of knowledge on IT governance in the IS research, the ISACA (formerly, Information Systems Audit and Control Association) has progressively developed their COBIT framework.

C. COBIT 5 Framework

Information is a critical resource for all enterprises. Technology plays an important role in collecting and processing data and information, its availability to the right people in the right format and right time to support business decisions and strategic thinking, its storage, and lastly the destruction. Enterprises strive to optimize the cost of IT, maintain IT-related risk at an acceptable level, and comply with laws and regulations. Instead of IT simply playing a support function, business and IT must collaborate together, so that IT is included within the governance and management. "COBIT 5 provides a comprehensive framework that assists enterprises in achieving their objectives for the governance and management of enterprise IT" and "helps enterprises create optimal value from IT by maintaining a balance between realizing benefits and optimizing risk levels and resource use" [16].

According to ISACA [16], COBIT 5 has five key principles: a) Meeting stakeholder needs, b) Covering the

enterprise end-to-end, c) Applying a single, integrated framework, d) Enabling a holistic approach, e) Separating governance from management. These key principles are further elaborated in the COBIT framework. For instance, enabling a holistic approach includes enablers such as 1) Principles, policies and frameworks, 2) Processes, 3) Organizational structures, 4) Culture, ethics and behavior, 5) Information, 6) Services, infrastructure and applications, and 7) People, skills and competencies [16].

D. Balance Scorecard

The Balanced Scorecard, introduced by Kaplan and Norton in the early 1990s, is a framework for organizations to use to translate their missions and strategies into a comprehensive set of performance measures that enable hem to assess how much of their strategies they have achieved and how they can move towards their goals [17].These measures are normally known as key performance indicators. The conceptualization of the BSC was done with an underlying goal of linking business activities with the strategy, all directed towards achieving the ultimate end result which is organizational performance [18]. According to Kaplan and Norton In Mark[19], the BSC was introduced because exclusive reliance on financial measures could not drive sustainable value creation, as financial measures are lag indicators that report on the outcomes from past actions; and exclusive reliance on these measures encourages behavior that sacrifices long-term value creation for short-term performance.

E. ISO/IEC 38500

The objective of ISO 38500 is to provide a structure of principles for directors (including owners, board members, directors, partners and senior executives) to use when evaluating, directing and monitoring the use of IT in their organizations. This standard provides a structure for effective governance of IT to assist those at the highest level of organizations to understand and fulfill their legal, regulatory and ethical obligations regarding their organizations' use of IT. The scope of the standard is to provide guiding principles for directors of organizations on the effective, efficient and acceptable use of IT within their organizations. It is applicable for all organizations, from the smallest to the largest, regardless of purpose, design or ownership structure [20].

The following are the six principles for enterprise IT governance can be applied to the majority of organizations. These principles indicate that the preferred behavior to aid the decision making process. Statement on each principle refers to what is supposed to happen, but does not include, when or by whom these principles should be implemented. These include the six principles [21] namely: (a) Responsibility, (b) Strategy, (c) Acquisition, (d) Performance, (e) Conformance and (f) Human Behavior.

F. IT Governance Framework in other Universities

Higher education institutions, in special universities from many countries, have increasingly recognized the importance of IT governance [11]. Each countries has its own guidelines how higher education integrates with strategic plans on a country. Llorens-Largo and Valverde-Alulema [22] propose a framework of corporative IT Governance and how a specific, simpler, progressive and scalable model can be a reference and used in the Ecuadorian public universities. The purpose is ensuring the correct use of the IT, generating business value. The main objective is converting the IT in an corporate strategic element, so that it can serve as a support for the corporate managers, allowing them execute actions and optimal decisions, targeted to the effective use of the IT [22].

Llorens and Martinez [23], also proposes an IT Governance Framework for Universities in Spain with reference to ITGI (2005) regarding the COBIT Framework. This is an enhancement to the IT Governance Framework (ITG4U) for the Spanish Association of University Rectors (CRUE in Spanish), published in December 2008, which is based on the JISC model and describes the principles and characteristics of the new international standard ISO 38500. The ITG4U framework is divided into three levels (Figure 6): the upper level contains the 6 ISO 38500 principles; the middle level includes seventeen IT objectives and their relationship with each of the ISO principles; the lower level consists of three types of metrics (maturity indicators, qualitative evidence indicators and quantitative evidence indicators) that will be used to measure whether IT objectives have been fulfilled [23],

Nugroho [24] also develop a conceptual model of IT governance for higher education based on COBIT 5 Framework. The proposed model illustrates how IT governance should construct aligned with enterprise governance which align with Indonesia's Law of higher education and an effort to achieve the goals and objectives (business goal) from the universities. The Conceptual model of IT governance is built based on the main principles that should exist in the process of governance with COBIT 5 framework guide as a reference how the governance of IT must be organized with attention to area governance and management areas, each rendered in a particular domain so that it will be a guide for higher education for developing IT blueprint that not only seen as supporting the IT aspects of academic and non-academic activities but look at the overall aspects of the scope of university governance [24].

3.METHODOLOGY

When the pandemic started, several organizations started working together. WHO started working with ITU to send text messages to people to help protect them from COVID-19. WHO is expecting "these text messages to reach billions of people that aren't able to connect to the Internet for

information. Many institutions around the world hold information related to COVID-19 and similar epidemics [31]. Relevant literature on IT Governance adoption and implementation in the context of higher educational institution will be critical review using literature survey as primary data. For the development of the model, a Design Science Research (DSR) was adopted which is extensively used in information systems research to solve complex problems. DSR is not only appropriate to solve organizational problems in specific domains but also adequate to produce artifacts as it is the case of our model. The design-science paradigm has its roots in engineering and the sciences of the artificial [25]. Design science knowledge is manifested in the form of artifacts—constructs, models, frameworks, architectures, design principles, methods, and/or instantiations—and design theories [26]. Using the six steps of DSR (Figure 1) as proposed by Peffers et al. [26], the model of IT governance for HEI has been design incorporating the appropriate structures, processes and relationship mechanism.

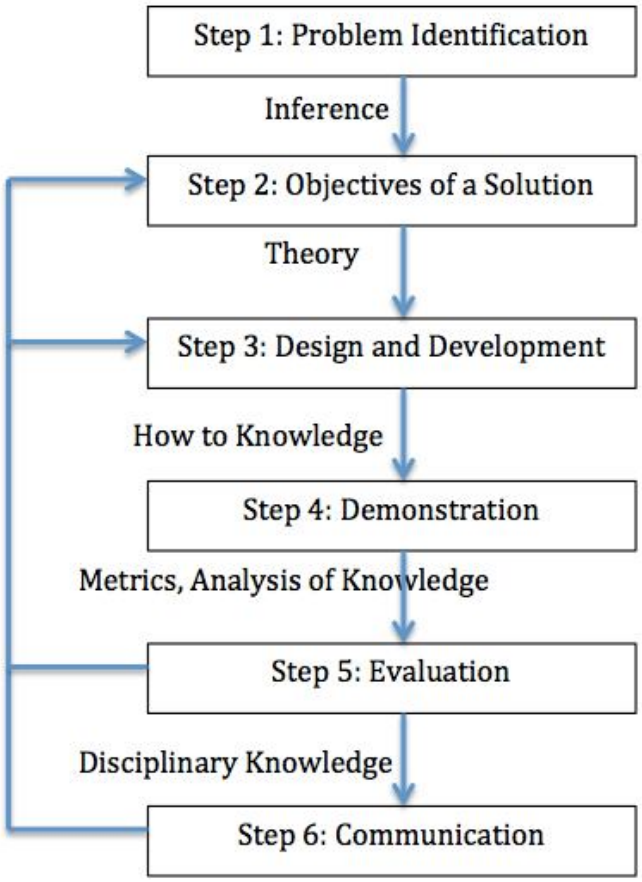

Figure 1. Steps of Design Science Research [25]

Table 1 presents that details description of each of the step in DSR in the formulation of IT Governance model for HEI. It starts by understanding that there has been no IT Governance model adoption by HEI, followed a propose model that incorporates structures, processes and relational mechanisms, then develop the model through critical review of literatures of established IT governance model adopted by other countries. Next is the demonstration of the model to ICT Directorate people in HEI, then conduct evaluation of appropriate of the model and finally, communication and dissemination of the model through scholarly and professional publication.

Table 1: DSR-based steps in developing IT Governance Framework

Steps	Description
Step 1: Problem Identification	There has been no adoption of IT Governance in Higher Educational Institution in Philippines
Step 2: Objectives of the Solution	Propose an appropriate model of IT Governance that suits Philippines Educational System for its adoption in terms of structures, processes and relational mechanisms.
Step 3: Design and Development	Develop a model through critical review of literature and comparing IT governance model adopted by universities in other developed countries
Step 4: Demonstration	Demonstration of the develop model with ICT Directorate people and higher official to different Philippines Higher Educational Institution
Step 5: Evaluation	Evaluating the model by observing its success through surveys, workshops and interviews with stakeholders
Step 6: Communication	Scholarly publication and professional publications through conferences and symposium

4.IT GOVERNANCE FRAMEWORK AND DISCUSSION

The propose model as presented in Figure 2 illustrates how IT governance align with enterprise governance and corporate governance of Philippines Higher Education Institution. In the top, the IT Governance is constructed based on the principles of COBIT 5 [16] namely a) Meeting stakeholder needs, b) Covering the enterprise end-to-end, c) Applying a single, integrated framework, d) Enabling a holistic approach, e) Separating governance from management. With this framework, COBIT makes the distinction from the management of IT from the governance of IT. While the drivers towards enterprise governance lies with balance scorecard for performance management, which according to Grembergen [27] is a measurement and management system that is very suitable for supporting the IT governance process and the IT/business alignment process. The scorecard provides the Board with crucial control measures on IT expenses, user satisfaction, efficiency of development and operations, expertise of IT staff [27].

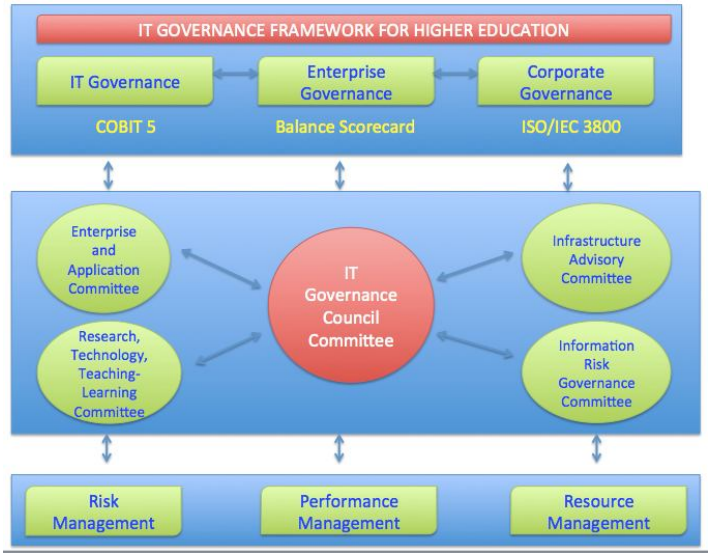

Figure 2. Model of IT Governance for Educational Institution

The corporate governance is driven by the ISO/IEC 38500 that provides guiding principles for directors of organizations (including owners, board members, directors, partners, senior executives, or similar) on the effective, efficient, and acceptable use of Information Technology (IT) within their organizations. The ISO/IEC 38500 standard, which was issued by the international organization for standardization (ISO) and the international electro-technical commission (IEC) is an attempt to bring out a framework to make IT governance a critical component of corporate governance. With this standard's implementation, IT governance can demand more accountability from corporate boards [28]. With this standard's implementation, IT governance can demand more accountability from corporate boards.

In the middle the implementer, monitoring and quality assurance are handle by IT Governance Committee which is responsible for all major Higher Educational Institution IT decision-making, provides guidance and monitoring as well as sets IT priorities in harmony with the Institutions strategic goals and mission. It is composed of four major sub-committee namely: (a) Research, Technology and Teaching-Learning Committee that oversight and sets priorities for the use of educational technologies that support the learning, teaching, technology transfer and research activities, (b) Enterprise and Application Committee that assess, review and assure that potential enterprise and institutional data systems projects are evaluated against the impact on the Higher Educational Institutions mission and strategic goals and objectives, (c) Infrastructure Advisory Committee that ensure alignment of IT infrastructure services such as data and voice network, corporate email, database, data center monitoring, servers, storage with academic and administrative direction, goals, and priorities, and (d) Information Risk Governance Committee that provides campus for institutional governance of information risk such as autonomy privacy, information privacy and information security. Integration of COBIT, COSO and ITIL were also adopted for international control improvement for creating good governance in Indonesia [29].

The bottom represents the focus areas towards IT governance implementation as suggested by PricewaterhouseCoopers [30] namely performance management, resource management, and risk management. Performance management by improving the education level of IT support staff and business managers as well as the measurement of IT delivery of promised business value [30]. Risk management by protecting IT assets, planning disaster recovery and ensuring service continuity while resource management by optimizing and utilizing IT resources including human resource skills.

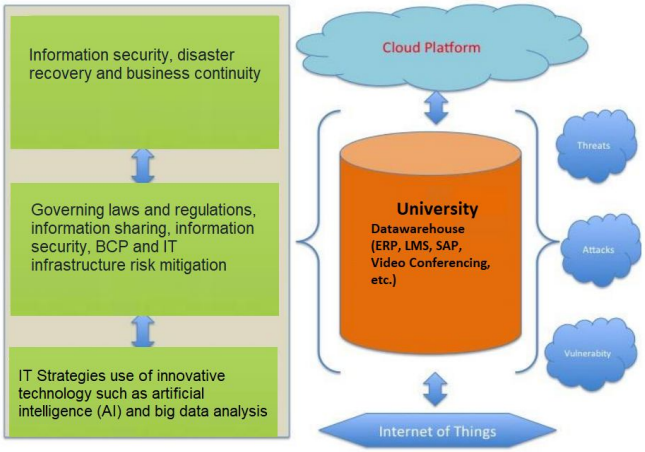

Figure 3. IT Governance Model Implementation in University Information System

Figure 3 emphasize the implementation of the IT Governance Model in University Information System. Information security, disaster recuperation and business continuity are indispensable processes in this mechanism. The risk of cyberattacks and inadequately implemented BCP can be considered as high jeopardy. The peril can be minimized by implementing obligatory security policies, training employees on security principles, and applying, detecting and immunizing implements. There have been recent perturbances because of inadequate capacities of communication networks and some information security threats. One such critical infrastructure that requires to be available at all times is the Internet. Infrastructure, applications, accommodations, skills and competency are essential to run the mechanism. Building up administering laws and directions, data sharing, data security, BCP and IT framework hazard relief are a few of the imperative zones to consider in a situation such as a widespread. Compliance with pertinent laws, directions and guidelines, and legally binding understandings is another fundamental viewpoint in overseeing IT at both the national and worldwide levels. IT methodologies will be reformulated from time to time concurring to changing objectives. Pertinent IT

administrations are created to bolster the techniques and objectives of the administration handle. Individuals of society over the globe are partners of the IT administration component. Administration rests with the center administration group.

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4.CONCLUSION AND RECOMMENDATION

This research is deeply rooted with the main gaps that there has been no adoption and implementation of IT Governance in Philippines Higher Educational Institution. Bearing this in mind, it is timely that prior to its implementation an conceptual framework for IT governance for higher educational institution context be drafted to guide ICT Center Director, Universities Officials and Administrators their role in ICT adoption. IT support in higher education should be seen, as a broker of services as far as is fair, feasible and sustainable. The researchers thus recommends that a combination of COBIT and ISO/IEC 3800 guidelines be adopted and used with a balanced scorecard for enterprise governance as IT Governance Framework for higher education institutions in Philippines. This will ensure effectiveness and efficiency of IT processes as well as accountability of management to all stakeholders.

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