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A Conceptual Hybrid Approach in Evaluating IT Governance Maturity Level

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ABSTRACT

This study aims to examine several evaluation standards of IT governance and management, so as to produce a work step that can be used to evaluate both simultaneously. The result of the research is a conceptual joint work step to evaluate IT governance in Higher Education: Studies in Private Universities. In achieving the Tridarma, Private Universities require good knowledge management in IT governance and management governance. As a form of business engaged in education, private universities must also be able to maintain their existence in the business world with increasingly fierce and rapid competition, universities have utilized technology in all aspects, both in the process of providing education and operationally supporting the activities of the tridharma of higher education. The current use of technology is certainly expected to be in line with the goals of higher education. This research proposes work steps that are expected to accommodate the need for evaluation of IT governance and management by combining several clauses contained in COBIT as an evaluation tool for IT governance and ISO 9001:2015 as a standard that focuses on Quality Management System. This study uses interview techniques and direct observation through audits to collect data and evidence using an instrument in the form of a list of questions that have been adjusted to the two standards used, namely COBIT and ISO 9001: 2015.

INTRODUCTION

The increasing amount of data availability in large quantities for organizations and the development of digitization of business processes in recent decades has led to the emergence of a term known as the "present economy". The opportunities and threats posed by digitization require organizations to strengthen their ability to identify, assess and prevent risks in a timely manner (Rakipi et al., 2021). Digital disruption is all around us, and the realization is that disruptive technologies can impact individual business models, or even entire sectors, in short time frames (Huygh and De Haes, 2019). IT must be managed and structured

along defined value chain processes, life cycles, service propositions, customer interactions, and cost control like any other area of the organization so as to measure performance or service quality and align company strategy and standard operating procedures with best practices. This is known as IT Governance which can function as a risk-based controller and with difficulty withstand static technology without losing competitive momentum (Tambo & Filtenborg, 2019).

IT governance impacts innovation and boards of directors and executive management are required to have IT competence to make quality strategic IT-related decisions. More importantly, IT-business alignment can enhance innovation,

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but organizations can remain mired in a business operations rut unless they demonstrate flexibility in aligning their IT to business, or else they risk losing ground in innovating (Héroux & Fortin, 2018). Effective IT governance is a major predictor that is very important in assessing the results to be achieved in IT investment in the organization, namely the potential for good benefits. IT governance as well as the missing potential risks or improper IT governance. For example, the failure of IT governance is mentioned in relation to information security breaches and IT investment failure. In other words, the organization must have clear interest and intention to strive for effective IT governance because this enables the creation and preservation of IT business value to the organization (Huygh & De Haes, 2019). According to Hakim in his research, a company often fails to achieve maximum returns from its IT investment, often due to a lack of control in IT management (Hakim, 2017).

Good control of IT management becomes important for the company to get the fit between business requirements and IT implementation. Control of IT is necessary in guarding IT investments, where often absorb enormous funds, but the results are very disappointing. IT management controlling was able to control IT project management also. It related to the process and results of IT investments. Only few IT projects failed due to failure in managing projects. Well management control of IT projects can also help companies have better knowledge and results from IT system and infrastructure (Hakim, 2017); (Huygh & De Haes, 2019). An integral part of corporate governance, which defines decision rights and an accountability framework to drive desired behavior in the use of IT as a defined and applied address to the processes, structures, and relational mechanisms in organizations that enable businesses and IT people to implement them. responsibility in supporting business / IT alignment and creating business value from business investments that support IT is a function of IT Governance (Héroux & Fortin, 2018). However in practice, there are several problems related to the transparency of IT governance that can harm the company.

Control of IT governance must be carried out in line with the implementation of IT governance. Purpose of Information Control and related Technology (COBIT) also shows its importance ensuring stakeholder transparency in the IT context government. In the process reference model, COBIT describes this process as necessary to "ensure that the company's IT performance and conformity measurement and transparent reporting, with stakeholder approval

objectives and metrics and corrective action required (Huygh & De Haes, 2019); (Szczepaniuk et al., 2020). The Control Objectives for Information and related Technology (COBIT) is a set of best practices (framework) for IT governance and management that was created in 1992 by both the Information Systems Audit and Control Association (ISACA) and the IT Governance Institute (ITGI) (De Haes et al., 2013); (ISACA, 2017); (Jimbo Santana et al., 2017); (COBIT 5, 2011). COBIT is primarily published and used by the IT community. In the meantime, management guidelines have been introduced and COBIT became the international adopted framework on IT governance and control. COBIT provides IT managers, auditors and end-users with a set of commonly accepted metrics, indicators, processes and best practices that can help them to maximize the advantages of using IT and develop the appropriate IT governance as well as control within a company (Zaydi, 2021).

COBIT was first produced by ISACA and the IT Governance Institute (ITGI) and published in 1996. It was refined, and a second edition was published after consultation with practitioners in 1998. A third edition was published in 2000, although an online edition was available in 2003. At 2005, COBIT 4 was published. COBIT was previously a methodology for managing and controlling information and IT risks and vulnerabilities. COBIT however, shifts the framework towards achieving business goals rather than focusing on the process by building one integrated model that combines different models such as COBIT, Val IT, Risk IT, and aligns with other known frameworks such as COSO, Capability Maturity Model, ISO. / IEC 27002, and ITIL (ISACA, 2017); (Johanes Fernandes Andry, 2017); (Asmah, 2019).

The implementation of good IT governance is also in line with good corporate governance to achieve organizational goals. The ISO standards are a set of standards aimed at organizing the management of an organization in its various activities (from manufactured products to quality). These standards are defined by the International Organization for Standardization (ISO), which is focused on the creation of international standards to facilitate world trade. The ISO 9000 family of standards is a set of quality and Quality Management Standards (QMS) that specify the requirements for a QMS (Andres-Jimenez et al., 2020). Many studies focus on risk management processes from standards organizations, academic groups and industry bodies. The frameworks and models listed above define the risk management process and serve as effective references. However, they reduce the risk management programme to a

mere checklist. Although these frameworks seem excellent in theory, most do not provide clear guidelines on how to accomplish control security assessment (Al-Safwani et al., 2018). This study combines the concept of QMS with several clauses in ISO 9001: 2015 which are inserted in several domains that represent several domains in COBIT to get more detailed work steps in assessing IT management risks while still prioritizing risk management aspects of the company.

MATERIALS AND METHODS

In the search for reference sources for framework development, this study uses the literature review method, several journals and all forms of scientific writing with similar topics and problems as the basis for this research. Furthermore, primary and secondary data were collected according to their needs. Data collection was carried out as an evaluation of the conceptual work steps proposed in this study which were carried out through interviews and direct observations in related units. This research was carried out in the city of Palembang, precisely at University ABC in Palembang, the respondents in this study were representatives of the management, Quality Assurance institutions/units, and the operational division of University ABC with purposive and proportional techniques as sampling techniques. After the data is collected, the next stage in this research is the data processing and analysis stage. Analysis of the research data is divided into 2 parts, namely the analysis of the current maturity level, the expected maturity level analysis and the gap analysis. Analysis of the current maturity level (as is) Based on the data from the questionnaire, an analysis was carried out to assess the current maturity level (as-is) for the domain. In the analysis of the current maturity level (asis), an assessment of each activity is carried out. As for the results of the answers to the maturity level questionnaire, there will be 6 answer options with a value of 0 – 5 (Mutiaru et al., 2017).

This research was conducted through a series of stages as (Alić, 2018) (Tawafak et al., 2020): Reviewing the technical and non-technical policy documentation that forms the basis for the development of University ABC; Observations and interviews with related parties, interviews were conducted with related parties, namely the head of the IT Unit center, the head of the system development center, technical staff covering networks and hardware, the Head of Academic Affairs, teaching staff and students; Database analysis; Network analysis; Analysis of the findings; Submitting findings to Management.

In carrying out the evaluation, several steps are taken, namely:

- ✓ Determination of the Audit Plan In determining the audit plan, there are steps taken, namely:
 - Understand the vision and mission of University ABC, objectives, goals and processes.
 - Identifying policies, standards, guidelines and procedures of University ABC.
 - Conduct a risk analysis.
- ✓ Determining the audit scope and audit objectives In determining the audit scope and audit objectives the authors do the following:
 - Define IT audit objectives.
 - Selecting control objectives that will be used to test the effectiveness of existing IT processes.
 - Documenting the existing architecture in University ABC.
 - Define the IT processes to be studied.
 - Define IT components in University ABC.
 - Conducting a study at University ABC The study will be conducted using the existing guidelines in conducting an information technology review/IT assurance guide. This study includes detailed control objectives adapted to the circumstances of University ABC (based on high level control objectives). The study will be carried out using the audit approach that has been made. After the assessment process is complete, the next step is to document the audit findings.

After the study is carried out, the next step is to analyze the findings obtained. It is hoped that the results of this analysis phase will get a conclusion about the reasons for the occurrence of problems and solutions to these problems.

RESULTS AND DISCUSSION

Describing University ABC thoroughly and objectively, in this study trying to see from two sides of the university profile, namely from the general profile and the profile of Information Technology. University ABC is one of the largest private universities in Palembang (Faradillah, 2018). In carrying out the educational process, the university divides the program into two categories, namely the regular program and the employee class program. There are 5 faculties and 15 study programs for the S1 and D3 levels, while for the Masters level there is 1 study

program. The number of students studying at PTS ABC until the 2019/2020 academic year is 3200 students. With more than 100 permanent and contract employees, as well as more than 130 permanent lecturers, Univeristy ABC is a leading private university in Palembang City and has been accredited "Sangat Baik" by BAN PT.

ABC University already has a portal containing general university information, currently the University has a special portal for Lecturers that contains teaching and learning activities, including e-learning for each of the effective courses. Likewise, a special portal for students which contains academic, administrative, e-learning activities for each course taken as well as criticism and suggestions as feedback to lecturers and teaching staff, the implementation and development of portals that have not been maximized has caused several problems in the field related to documentation. which is the main problem in filing a repository.

The IT Strategic Plan, although still lacking, is sufficient to outline the high-level strategy to which IT development will be directed. Based on the IT Strategic Plan document, there are 8 strategic areas for IT development, namely: Academics, Management of facilities and infrastructure, Human Resources, Quality, Alumni, Marketing / Public Relations, Business and Finance. Because the core business of University ABC is educational services, what will be developed first is the academic system, administration, finance, and human resources. Lecture facilities are centralized at ABC University, where buildings B and C are equipped with elevators, one of which functions to facilitate those with special needs. Laboratories and administrative and financial services are located in building A and B, while the library is in building C, ABC University Campus. Maintenance and development of information systems is carried out periodically as a form of control and evaluation of information technology facilities as outlined in the annual ABC University financial, facilities and infrastructure evaluation and monitoring report.

The availability of ICT systems aims to: Facilitate problem solving, increase creativity, effectiveness, and efficiency in work; Technology, information, and communication make work more effective and efficient; Collecting data that is accurate, accountable and kept confidential; Managing and holding learning media using technology, information and communication. Uniersity ABC has adequate IT infrastructure in detail as: Hardware owned by IGM University for learning activities, among others: (a) PC 303 unit; (b) Rackmount 3 units; (c) Wireless Router and Access Point 34 units; (d) Switch HUB 20 units; (e) Server 12 units; (f)

Printer 31 units; Univeristy ABC has an official website with the domain <http://ptsabc.ac.id/> which contains all information related to the development of PTS ABC. In addition to university information, the official PTS ABC website consists of: (a) e-journal portal; (b) PMB Online; (c) Lecturer Portal; (d) Student Portals; (e) Portal Alumni Tracer Study Questionnaire; (f) Email Portal; (g) e-learning portal. In addition, PTS ABC also utilizes social media such as Instagram, Facebook, Twitter, and Whatsapp Groups; University ABC implements an information system called Enterprise Resource Planning (ERP) in managing all financial, academic, and non-academic activities and activities. In detail, the contents of the ERP system are: (a) New Student Admissions Module (PMB); (b) Academic Module; (c) bro; (d) Alumni Module; (e) Report Module. This system can be accessed for those who have usufructuary rights at the address <https://erp.ptsabc.ac.id> ; Lecture activities are also supported by lecturer and student portals which can be accessed at <https://lecturer.ptsabc.ac.id/> for lecturer portals. The activities of uploading lecture materials, filling out teaching minutes, filling out and approving credits per semester, giving assignments and quizzes, attendance, and inputting final grades of courses are carried out through this portal. Address <https://student.ptsabc.ac.id/> for student portals in accessing the academic process, including inputting the Study Plan Card (KRS), class schedules, List of Value Collections (DKN), and viewing bill payments; University ABC Library already has support for IT services such as: (a) Digital catalog system (Winlsys); (b) Digital final report; (c) Access to domestic and international journals; (d) The distribution of libraries at the faculty level and regional libraries; (e) Support for hardware terminals as public service venues for digital libraries. The digital library can be accessed through the address <https://library.ptsabc.ac.id/>. University ABC has a specific unit in maintaining the quality of University ABC, namely the Quality Assurance (QS) institution which is in charge of controlling, maintaining and guaranteeing the quality of University ABC in general in accordance with the quality management system of Indonesian higher education. As a QS department, of course, evaluation is always carried out annually on a regular basis to assess the implementation of standards and procedures applicable in University ABC to what extent the effectiveness of the Quality Management System (QMS) in University ABC uses the BAN PT accreditation assessment standard as an audit instrument. This has been going well, but IT governance in University ABC not been evaluated in detail in

accordance with IT governance standards (ITGI). Some of the domains and variables contained in COBIT 4.1 are used in evaluating IT governance but these have also been included in several processes that are the focus of QMS evaluation through ISO 9001: 2015, so this study compiles conceptual joint work steps that can marry the two standards with their advantages. each standard has as shown in Figure 1 (Al-Safwani et al., 2018); (Sembilla et al., 2018); Kaban, 2015); (Zhang & Fever, 2013); (da Fonseca et al., 2019); (Domingues et al., 2019).

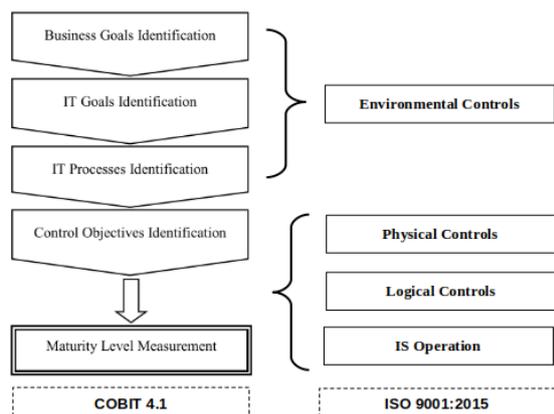


Figure 1

Linkage of COBIT 4.1 and ISO 9001: 2015

Based on the linkages shown in Figure 1, the conceptual work steps proposed in this study can be seen in Table 1.

Table 1
Matrix of conformity of ISO process and domain in COBIT 4.1

COBIT	ISO	ITG-QMS
Business-IT Goals, IT Process Identification: Domain Plan and Organise: <ul style="list-style-type: none"> PO3 Determine Technological Direction PO5 Manage the IT Investment PO9 Assess and Manage IT Risks PO10 Manage Projects 	Environmental Controls: <ul style="list-style-type: none"> Security Policy System Access Control Communication & Operations Management 	Control 01
Control Objectives Identification: Domain Acquire and Implementation <ul style="list-style-type: none"> AI1 Identify Automated Solution AI7 Install and Accredited Solutions and Changes Domain Delivery and Support DS3 Manage	Physical – Logical Controls, IS Operations: <ul style="list-style-type: none"> System Development and Maintenance Physical and Environmental Security Compliance Personnel Security 	Control 02

Performance and Capacity <ul style="list-style-type: none"> DS4 Ensure Continuous Service DS6 Identify and Allocate Cost DS10 Manage Problem DS11 Manage Data DS12 Manage the Physical Environment Domain Monitor and Evaluate ME1 Monitor and Evaluate IT performance ME2 Monitor and Evaluate Internal Control ME3 Ensure Regulatory Compliance ME4 Provide IT Governance 	<ul style="list-style-type: none"> Security Organization (Information Security) Asset Classification and Control Business Continuity Management 	
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Based on Table 1, it can be seen that several domains in COBIT 4.1 were mapped according to the process in ISO 9001: 2015 and then a conceptual work step was obtained in this study which was then used as an instrument during an assessment to measure the maturity level of IT and QMS governance at University ABC.

The IT process is assessed to determine the maturity level according to the Maturity Model in COBIT 4.1 and ISO 9001: 2015 which consists of Control 01 and Control 02. How well these developments should depend primarily on the IT objectives and the basic business requirements that are supported. The scale in the maturity model will help IT management see existing management deficiencies and set targets for improvement if needed. A good maturity model is influenced by the company's business results, the operational environment and industrial practices. Based on the assessment carried out through interviews and observations, the results are as summarized in Table 2.

Table 2
The results of the assessment using a conceptual framework

Domain	Process	Index
Control 01	<ul style="list-style-type: none"> Clarity of security policies, rules, regulation Clarity of general organizational structure and IT managers Clarity of Technology planning Clarity of IT Investment Management Clarity of IT Project Management 	2.6

	<ul style="list-style-type: none"> • Clarity of the form of system control • Clarity of information management • Clarity of problem solving mechanism Clarity of problem solutions and documentation of problem solving	
Control 02	<ul style="list-style-type: none"> • Clarity of form of Sustainable Service • Clarity of Cost Allocation • Clarity of problem management • Clarity of data management mechanisms and physical assets • Clarity of the form of monitoring and evaluation which is reported periodically • Clarity of Compliance with Regulations • Clarity of the asset maintenance mechanism which is reported periodically • Clarity of asset use in periodic reports 	2.55
Average Index		2.55

Based on Table 2, it is found that the average maturity level of the two Controls is at level 2.55, which means that IT and QMS governance at University ABC are at Repeatable but Intuitive (Hakim, 2017). Based on interviews and observations, it was also found that University ABC already has a clear organizational structure, as well as a clear division of work fields. There is already a division of work according to their fields, both circulation and management already has a policy on the use of information systems, and socialization has been carried out to users so that the information system can run properly, has a maintenance schedule for the tools used in accordance with existing equipment maintenance policies, the location of access and use of information systems is already safe located, The information system equipment is the latest and in accordance with the system usage policy used in University ABC, Computer equipment has been installed with antivirus, to avoid attacks that result in failure, Antivirus installed and used regularly updated, system information tools there is already a distribution of access rights in accordance with the main tasks and authorities. In general, everything in Control 01 and Control 02 has been carried out but University ABC does not yet have documentation of regular and structured activities, some activity reports are not regulated periodically, monitoring and evaluation activities are carried out incidentally and only documented through Chat Groups. Planning in the form of work programs has also not been structured regularly, so that it

is difficult to assess performance achievements. Based on these findings, several recommendations have been prepared and submitted to University ABC.

CONCLUSIONS AND SUGGESTION

This study proposes the hybrid framework in evaluating both IT governance and Quality Management system based on COBIT and ISO 9001. The results of this study are in the form of a conceptual work step that is used to evaluate IT governance and Quality Management System. Based on the evaluation results obtained that University ABC is at level 2.55 (Repeatable but Intuitive). This research was conducted on one research object, with several work units. In further research, the work steps of this research can be used in several companies, given the form of higher education with business processes that focus on the process of providing education.

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