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Design of Information Technology Governance in Educational Institutions Using COBIT 2019 Framework

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Abstract

In the contemporary era, the role of information technology in the performance of organizations, institutions, and companies is of utmost importance. The implementation of information technology can effectively enhance decision-making efficiency and effectiveness. Educational institutions have been utilizing information technology to support their academic activities and business processes; however, the governance of this technology has never been audited before. This study aims to conduct an audit and analysis of information technology governance that employs the COBIT 2019 framework. The study's results suggest that educational institutions must improve risk and security management in the use of information technology and evaluate their business processes' implementation in accordance with the established regulations and requirements.

Keywords: COBIT 2019, Design Factors, Information Technology Governance, Educational Institutions

1. INTRODUCTION

In the current era, information technology plays a pivotal role in enhancing the performance of organizations, institutions, and companies [1]. Furthermore, the application of information technology can increase the effectiveness and efficiency of decision-making processes. Educational institutions have also incorporated the development of information technology to support their academic activities and business processes [2].

One such educational institution that has implemented information technology is involved in the advancement and utilization of information technology governance to ensure the sustainability of academic activities. Despite the implementation of information technology governance, an audit and analysis of its implementation have not yet been conducted. Information technology governance is a comprehensive system that organizations use, consisting of an information technology governance structure and an information technology

governance process that contains regulations, rules, and policies to ensure effective implementation, control, and goal attainment [3].

This study will undertake an audit process and analysis of information technology governance at educational institutions, utilizing the 2019 Control Objectives for Information and Related Technology (COBIT) framework. Governance audit is a systematic and objective evaluation process that aims to provide an assessment of the implementation of governance, determine its application level, and correct any errors that may occur in an organization [4]. The latest version of COBIT, COBIT 2019, will be employed in this study [5]. The IT Governance Institute (ITGI) developed COBIT, which is now part of the Information System Audit and Control Association (ISACA) [6]. COBIT 2019 incorporates design factors that function differently in aiding the process of conducting audits and analysis on the use of the COBIT 2019 design toolkit [7].

Renal Nur Rachman, Iqbal Santosa, and Lukman Abdurrahman conducted previous research on information technology audits, highlighting their crucial role in controlling information technology governance and risks within an organization [8]. By conducting an audit, risks within the field of information technology can be identified, and evaluation materials can be provided for future use. In a research study titled "Information Technology Audit Plan Using COBIT 2019 at Telkom University Isti Unit," Ruri Fadhilah, Iqbal Santosa, and Lukman Abdurrahman utilized the COBIT 2019 framework to assess the level of information technology capabilities employed in business processes [9]. The application of COBIT 2019 in the audit process enables the evaluation of IT governance and management, controlling and maximizing the value of information and technology within an organization, and optimizing risk. The COBIT 2019 framework is a valuable tool for auditors in the audit process. Faidatul Hikmah, Luthfi Ramadhani, and Ryan Adithya Nugraha also conducted research related to information technology governance audits, using COBIT 2019 as a framework for the audit process [10]. COBIT 2019 was chosen because it is the most comprehensive model of ISACA for reference in making governance and information technology management, as it represents all processes in each framework. The use of COBIT 2019 can provide guidelines and evaluations for the implementation of information technology governance to support business processes.

2. METHODS

The research methodology is a systematic process used to explain the stages to be carried out in a study. The following are the stages that will be conducted in this study:

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Figure 1. Research Methodology

This study uses qualitative methods. Data will be collected through interviews and literature studies. The first stage involves identifying problems to find out the existing conditions and problems by conducting joint interviews with educational institution stakeholders. The data gathered will be processed for auditing and analysis. After obtaining the existing conditions and problems, a literature study will be conducted to gather information related to the problem being studied and make comparisons with similar studies that have been conducted. The method analysis stage will then be carried out to use as an audit framework and analyze the application of existing information technology governance in educational institutions. The framework used in this study utilizes the 2019 Control Objectives for Information and Related Technology (COBIT). The next stage involves implementing the data processing into the COBIT framework, based on the results of interviews with stakeholders. The final results will provide an evaluation of the application of information technology governance in educational institutions, enabling them to become more efficient and effective in their application.

3. RESULT AND DISCUSSION

The following section presents the results of the information technology governance audit and analysis through 10 design factors using the COBIT 2019 framework based on the data obtained. The results are as follows:

3.1 Enterprise Strategy

The findings of the Enterprise Strategy diagram analysis are presented in Figure 2. Based on the collected data from stakeholders, the educational institution has a service-oriented strategy geared towards clients (students). The Innovation/Differentiation and Cost Leadership factors both received a score of 4. This indicates the institution's desire to constantly innovate and keep up with technological advancements, as well as its focus on managing operational costs to ensure continued operations. On the other hand, the Growth/Acquisition factor received a score of 3, indicating a moderate emphasis on expanding the institution's operations.

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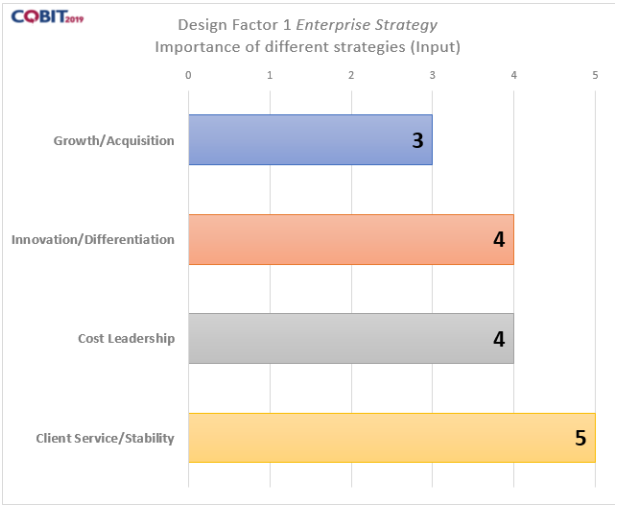

Figure 1. Design Factor 1 Enterprise Strategy

3.2 Enterprise Goals

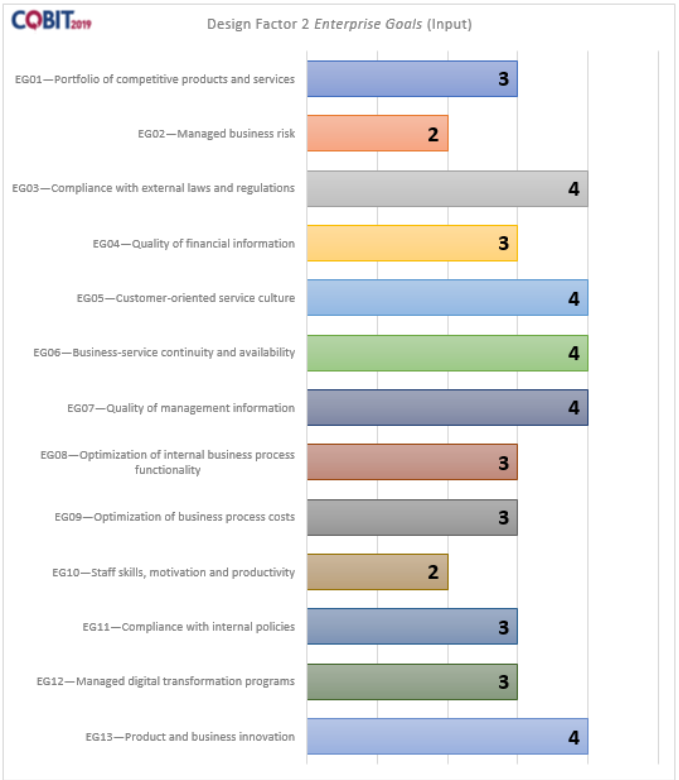

Figure 2. Design Factor 2 Enterprise Goals

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In Figure 3, the application of Enterprise Goals in educational institutions is explained. There are 13 Enterprise Goals in this study, where each section has data that can be generated and compared with company goals. Based on the results obtained, it can be concluded that educational institutions have five business goals that receive the highest scores, namely compliance with external laws and regulations (EG03), customer-oriented service culture (EG05), continuity of business services and availability (EG06), quality of personnel management (EG07), and business products and innovation (EG13).

3.3 Risk Profile

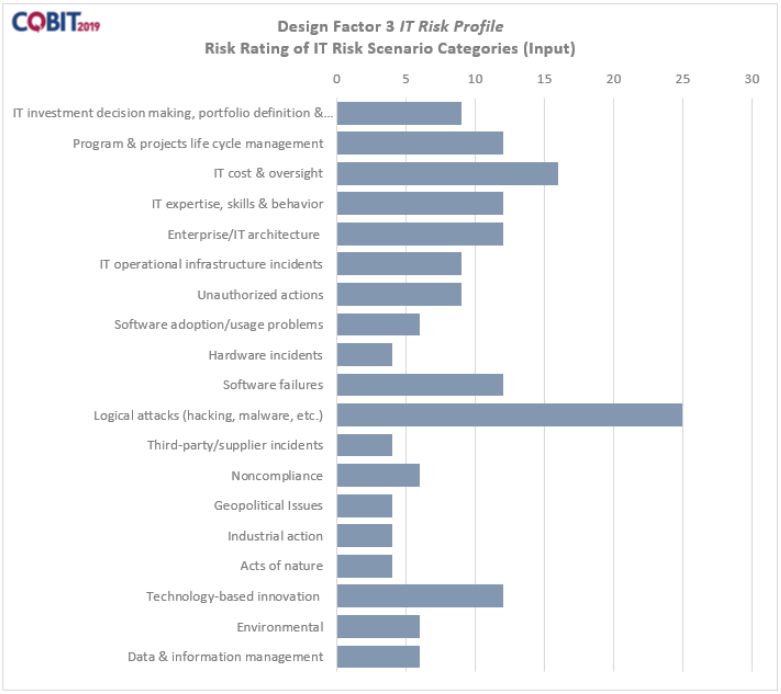

Figure 3. Design Factor 3 IT Risk Profile

The next stage in the audit process is the risk analysis stage, which aims to identify potential risks that may impact business processes and evaluate their potential impact on educational institutions. The results of this stage reveal that logical attacks pose a significant risk to the institution, as they have shown a very high value. This is attributed to the frequent attacks on the institution's website by malicious actors who aim to compromise the security of the website by altering its appearance. As a result, the institution must take necessary measures to strengthen its security infrastructure and prevent unauthorized access to its information systems.

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3.4 IT Related Issues

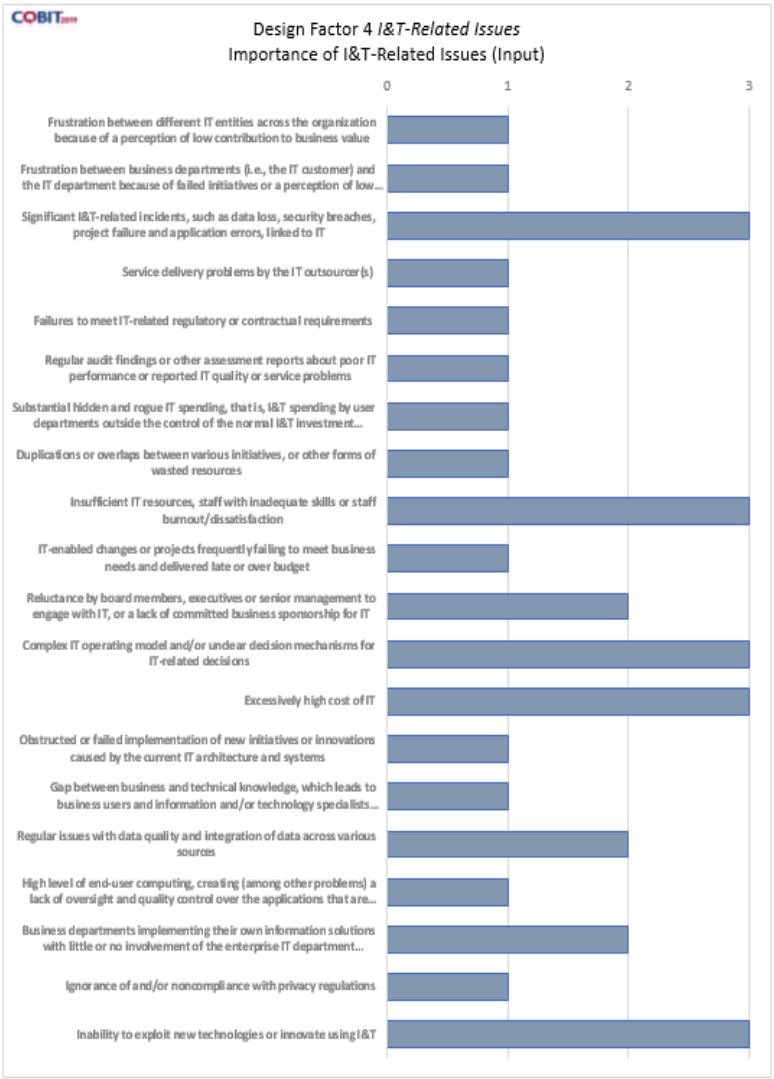

Figure 4. Design Factor 4 IT Related Issues

Identifying IT problems is crucial in improving information technology governance in educational institutions. These problems can be used as audit reports for management or related stakeholders to address the issues and take corrective measures, as shown in Figure 5. From the results of the analysis obtained, it is evident that IT problems that are often found include data loss, security breaches, and inadequate IT resources in the storage and management of data of students, staff, and teachers.

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Among these problems, data loss and security breaches are significant and need to be addressed immediately. Data loss can occur due to various reasons, such as hardware failure, software bugs, or accidental deletion. Educational institutions need to have proper backup and recovery systems in place to ensure that data is not lost permanently. On the other hand, security breaches can lead to the unauthorized access of sensitive information, such as personal information and academic records. Educational institutions need to ensure that their systems are secure and protected from such breaches by implementing adequate security measures, such as firewalls, antivirus software, and regular security audits.

Another common problem that needs to be addressed is the lack of staff skills in managing IT resources. Educational institutions need to invest in training programs to enhance the IT skills of their staff and ensure that they are equipped to manage the IT infrastructure efficiently. By addressing these IT problems, educational institutions can ensure the smooth functioning of their IT systems and provide better services to their stakeholders.

3.5 IT Threat Landscape

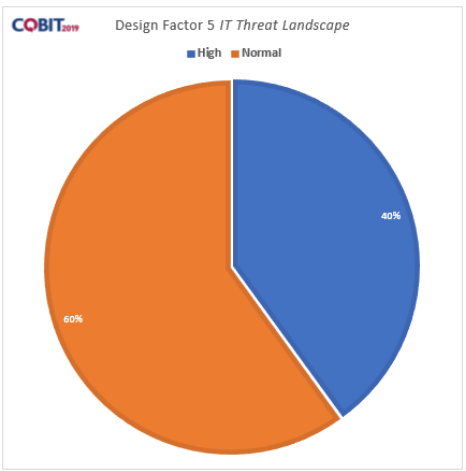

Figure 5. Design Factor 5 IT Threat Landscape

By referring to the threat landscape diagram shown in Figure 6, one can gain an understanding of the threat standards encountered by educational institutions. The identified threats are categorized into two groups, namely those with a high level of risk and those with a normal level of risk. The analysis reveals that 60% of the threats fall into the normal level category, while the remaining 40% belong to the high-level category. This suggests that the application of the Threat Landscape model is relatively normal, as there are no major threats that pose a significant risk to the institution's data.

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3.6 Compliance Requirements

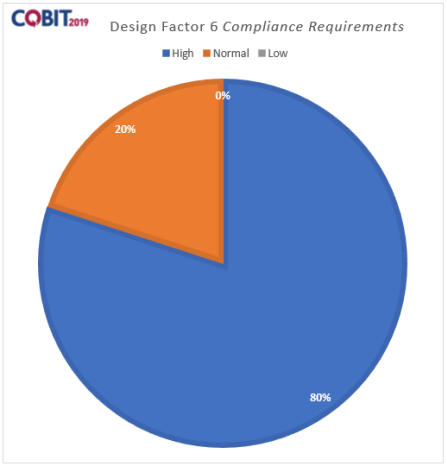

Figure 6. Design Factor 6 Compliance Requirements

Referring to Figure 7, Compliance Requirement involves the identification and fulfillment of critical requirements and regulations that must be adhered to. Based on the implementation of Compliance Requirement in educational institutions, it is evident that 80% of the results indicate a high level of compliance with the relevant rules and regulations that govern the educational environment. This serves the important purpose of aiding in the development of students' characters to meet the highest standards of quality and qualification.

3.7 Role of IT

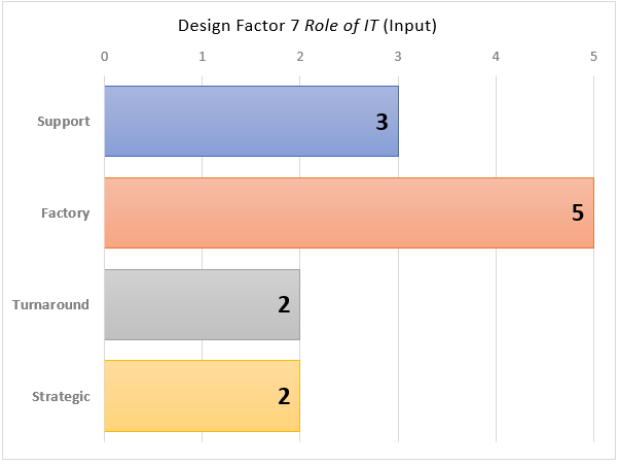

Figure 7. Design Factor 7 Role of IT

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The role of IT plays a crucial part in the efficient execution of services and business processes within educational institutions. The identification of the Role of IT, as depicted in Figure 8, indicates a relatively high rating in the factory section. This suggests that the implementation of IT applications at the institution may not have incorporated an effective strategy for the development of internal applications. It is apparent that the school still relies heavily on the services of third-party providers to facilitate the creation and management of school services.

3.8 IT Sourcing Model

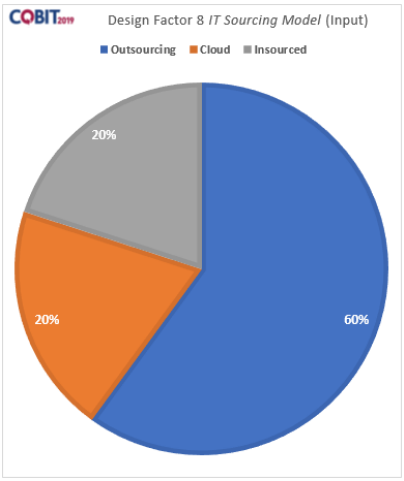

Figure 8. Design Factor 8 IT Sourcing Model

Figure 9 serves as a reference for the IT capital sources that are available to companies. It showcases three types of IT sources, which are outsourcing, cloud, and insourcing. In the context of educational institutions, the capital sources used primarily involve outsourcing, where IT technicians from outside the school are hired to provide IT support, and a cloud database server is utilized for the storage of school data.

Outsourcing is a popular option among educational institutions due to its cost-effectiveness and flexibility. By outsourcing IT support, schools can access a wider range of expertise and services that might not be available in-house. Additionally, outsourcing enables the school to focus on their core competencies and educational services, leaving the IT management to external experts. Cloud computing, on the other hand, provides a secure and scalable solution for the storage and management of large volumes of data, reducing the need for expensive physical infrastructure and maintenance costs. The use of these IT capital sources can help educational institutions optimize their IT capabilities and services while reducing costs and improving efficiency.

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3.9 IT Implementation Methods

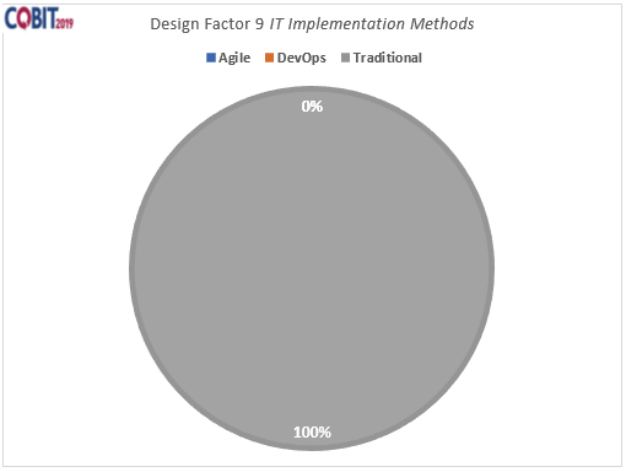

Figure 9. Design Factor 9 IT Implementation Methods

The results of the IT implementation methods analysis, as illustrated in Figure 10, highlight the existence of three primary approaches - Agile, DevOps, and traditional. In the context of educational institutions, the implementation of IT methods currently relies on traditional systems, which have been rated at 100% in terms of value.

While traditional IT implementation methods can be effective, the shift towards more agile and DevOps methodologies is gaining popularity in the industry due to their potential to deliver greater efficiency and faster delivery of services. Agile methodologies are known for their iterative approach to development, which emphasizes collaboration between stakeholders and a flexible, adaptable approach to project management. DevOps, on the other hand, emphasizes collaboration between development and operations teams, and aims to deliver high-quality software in a more automated and streamlined manner. The adoption of such methodologies by educational institutions could offer numerous benefits, including faster time-to-market, better quality control, and increased collaboration between teams.

3.10 Technology Adoption Strategy

The Technology Adoption Strategy employed by educational institutions is depicted in Figure 11. According to the analysis conducted, the institution falls into the category of a follower, as it has obtained a score of 70%. This is largely due to the fact that the educational institution is aligned with the direction

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provided by the Ministry of Education and Culture, with regards to the application of technology.

Being a follower in terms of technology adoption is not necessarily a negative outcome. It signifies that the educational institution is keeping pace with the industry trends and adopting technologies that are widely accepted and proven in the field. Additionally, following the directives provided by the Ministry of Education and Culture ensures that the institution is adhering to national policies and standards. This also facilitates greater compatibility with other institutions, making it easier to share resources and collaborate on initiatives that can have a wider impact on the education sector.

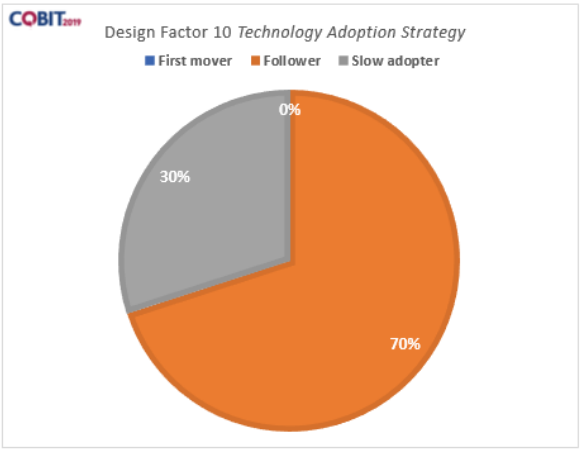

Figure 10. Design Factor 10 Technology Adoption Strategy

4. CONCLUSION

In conclusion, the audit and analysis of information technology governance in an educational institution have revealed that the institution needs to focus on improving risk management and security in the use of information technology to maintain the integrity of information and data both internally and externally. Additionally, the implementation of business processes supported by information technology should be evaluated and aligned with the regulations and requirements that have been set to ensure proper compliance. It is also recommended to conduct regular reviews of the implementation of guarantees, in line with the objectives, regulations, and requirements, to provide more efficient and effective measures. By addressing these areas, the educational institution can enhance its information technology governance and strengthen its position in the education sector, ultimately contributing to the quality of education and the success of its student.

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