

Leveraging COBIT 2019 to Measure the Accounting Software Implementation in High Schools for Better Transparency

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Abstract: Technology is a tool that is always used in every human life today. Technology cannot just be used; technology must also be studied to find out whether it has played a good role or not. The research was conducted on business processes in secondary schools where the importance of technology is often underestimated, even though technology in schools also has an important role. In particular, technology analysis in the world of education will usually analyze applications or facilities related to the learning process. The aim of this research is to analyze accounting applications that help business processes in running school continuity, which is ultimately important for business continuity. implementation of accounting applications will help schools determine the increased level of capability and transparency. The analysis was carried out using the COBIT 2019 framework, where this framework has been updated with additional design factor analysis so that the audit will be carried out based on school priorities, focus, and strategy. In this research, data collection was carried out by means of observation and interviews with foundation administrators and school directors who had power in the school and had previously given research permission to the school concerned. The results obtained are a low level of ability with a high expected level of ability, namely at level 5, based on the design factors that have been carried out. Several recommendations are provided to help secondary schools achieve expected levels in each domain.

Keywords: Analysis, High School, COBIT 2019, Capability Level, Business Process, Recommendations

Introduction

In this era, technology is increasingly becoming an important need in every sector of human life (Gao and Xu, 2021). This makes every company want to survive and develop in the era of information technology (Andry *et al.*, 2023). Information technology is one of the supporting facilities in carrying out a required process such as a company's business process (Olteanu *et al.*, 2022). It has added value to influence companies in carrying out business processes (Madyatmadja *et al.*, 2020). Using and implementing IT standards and best practices, a company can achieve its goals and objectives (Tulus and Tanaamah, 2023). This also applies to educational institutions such as high schools.

In their business processes, high schools use and utilize technology to support and support academic

activities and business processes. Developing and adapting technology to accommodate innovation is also very important to create sustainable competitiveness as a decision support system in the world of higher education (Andry *et al.*, 2022) Implementing appropriate technology will help companies reduce the impact of risks that will occur (Andry and Gunawan, 2023). This research was conducted at a high school in Jakarta, Indonesia which has been established since the 1070s. The main business process of this high school is the teaching and learning process of students. However, in supporting processes, higher schools also implement technology, especially to support their financial business processes. In previous research, namely, research conducted by Nugraha and Syaidah (2022); Ishlahuddin *et al.* (2020), audits carried out in the world of education discussed the

implementation of applications or systems related to school learning which is the main business process. However, in this research, audits were carried out on supporting business processes which have received little attention even though they also have a big impact on the continuity of school business processes. This high school adopted an accounting application to help support its business processes.

Accounting software is an application program specifically designed to manage accounting work (Yu, 2021). Based on the author's observations and interviews conducted with school directors, this high school has several problems related to implementing this accounting application, namely that it is felt that the use of accounting software has not met their expectations and needs. Apart from that, the software is also not following best practices. These problems, the transparency of business processes is disrupted and can cause several problems in the future, because high schools do not yet know what their main strategy is regarding the world of IT and high schools have not yet taken steps to implement appropriate applications that suit the school's needs. Apart from that, the problem that can be formulated in this research is that the level of capability that schools have is not yet known, and the ways that can be taken to increase the level of capability in implementing technology.

To have and ensure an appropriate system that supports and satisfies all parties who support activities, it is necessary to carry out an audit of the implementation of the application being implemented. An IT audit is the assessment and evaluation of an organization's IT infrastructure, management, and procedures against recognized standards. Audits are also designed to evaluate the effectiveness of operational controls and identify and detect several system deficiencies (Moorthy *et al.*, 2011). Audits can be carried out in any organization with any business processes according to the needs of the organization concerned (Sandhiani *et al.*, 2019). The purpose of the audit is to determine the status of existing knowledge utilization in business processes and to work with the available evidence (Handa *et al.*, 2019). This audit will not only provide information regarding existing operational deficiencies but also provide recommendations and suggestions for future improvements and can help to find ways to resolve these problems (Zou, 2019).

The information system audit in this research was carried out using COBIT 2019 is a framework or method that can be used by auditors in conducting audits. COBIT will guide auditors in carrying out a series of assessments in the school IT environment. It was the latest framework released from ISACA which can provide guidance and structured steps to create optimal value from IT. This framework allows companies to customize the design, operation, and improvement of governance systems

(Steuperaert, 2019). This audit will be carried out in the scope of the school's financial business processes, namely assessing the level of capability for implementing accounting applications. Based on these arguments, we focus on the core limitations of the research, namely the analysis of the implementation of accounting applications carried out using COBIT 2019 with design factor analysis to determine the focus of the high school strategy domain and assessment and measurement carried out using capability levels. The purpose of this research is to determine the conditions for implementing accounting applications and to know the important processes and domains that are the main focus of high schools. This research can also determine the level of capability and recommendations that can be a guide for increasing the level of capability.

Leveraging COBIT 2019

Leverage is the place to influence and make changes in a system in order to determine where a little energy could have a significant impact (Birney, 2021). Leveraging also means using something that will have an impact on something that will have a good effect. One of them is by leveraging the framework to measure something like in this case leveraging COBIT 2019. By measuring the performance of the information technology that is used, the contribution towards the future performance of the enterprise itself will be met (Ratih *et al.*, 2014).

Control Objectives for Information and related Technology (COBIT) was developed by ISACA for the first time in 1996 (De Haes *et al.*, 2020). It is one of the ISACA output frameworks that is often used by auditors to audit information systems (Kerr and Murthy, 2013). This framework has been created to design the best practices followed in the IT governance field and provides guidance on how to manage risk effectively. These audit tools are purposed to bridge the gap between business risks, control needs, and problems that can happen in IT technical (Fuada, 2019).

In 2019 they made the more effective version called COBIT 2019. The newest version makes a clear distinction between management and governance processes that are described comprehensively (Ahmet and Bensghir, 2019). It also allows the company to create, operate, and enhance governance systems that are suited to the company's requirements (De Haes *et al.*, 2020). There are five different domains such as EDM, APO, BAI, DSS, and MEA (Amore *et al.*, 2023).

Accounting Software

Accounting, sometimes known as the language of business, focuses on gathering, organizing, summarizing, reporting, and analyzing data pertaining to commercial

activities. Decision-making is aided by accounting data assistance for executives, auditors, investors, regulators, and others. Almost all business types need to keep accounting records to document daily financial information such as sales, income, purchases, and accounts payable (Purpura, 2019). Accounting is extremely important to any organization no matter how big or small because it helps business owners make wise decisions about their operations. A strong accounting system should be able to keep the records properly and be able to serve the information needs of internal and external decision-makers (Talahmeh, 2020). To maintain the records properly, it would be better if it was done automatically with the system and not manually. Software called accounting software is needed to help accounting work to be automated that can minimize errors that occur from human error. This software is a computer program that helps accountants and bookkeepers record and report a company's financial activities (Sibi and Merin, 2020). Accounting software is an essential tool for modern companies and businesses. Software facilitates quick reporting analysis and monitoring of financial activities. Accounting software also makes it possible to store vast amounts of data virtually, freeing up space. It is easier to do audits with accounting software, especially ones that require examining data from years in the past.

Better Transparency

The words "transparent" and "transparency" are beginning to appear in scholarly literature on politics and public affairs, as well as in everyday speech. Over time, especially in the wake of a water gate in the 1970s, new laws and administrative regulations have increased public access to government data, increased accountability for corporations, civil officials, and politicians, and increased transparency. Transparency is a value-laden that conveys honesty and integrity (Ball, 2009). Transparency is increased by any mechanism that leads to the public disclosure of information.

Each organization must take responsibility for its actions and act in full transparency by reporting on its activities, its stakeholders, and the organization more broadly (Chakir *et al.*, 2021). The term transparency is also used in contexts such as finance or accounting. Finance information transparency is a crucial component of company transparency. The quality of accounting information depends on the accuracy and the data provided (Hsieh *et al.*, 2011). Accounting information transparency may increase investors' and other employees' confidence in the company (Liu and Liyuan, 2016). Transparency in the accounting area will have various positive impacts such as increasing trust in the work environment, which will improve the quality of the

company. For this reason, it is important to improve accounting services to uphold better transparency.

Materials

The analysis in this research was carried out in high schools, namely in implementing their technology. The research was conducted using the COBIT 2019 framework where data collection was carried out by interviews with school directors and observations. The results of the data collection are then used to analyze the level of capability the school has in implementing technology, which will then also be given recommendations for improvement based on the framework guidelines.

Methods

Figure 1 explains the methodology used in this research. This research begins with a design factor analysis which includes management priorities, objectives, and component variations and focuses areas on the form of the main domain of high schools. After obtaining domain results, findings will be obtained based on domain activities which will be used as an assessment of the level of capability and the extent to which the high school carries out these domain activities. After obtaining the capability level, a gap analysis will be carried out, namely the difference between the current capability level and the expected capability level. To increase the level of capability, a series of recommendations will be given that can be implemented by high schools.

This type of research is done with a qualitative descriptive research design. Research methodology is the specific steps or techniques that are used to find, identify, process, and evaluate data about a topic. The methodology section of a research paper offers the reader the option to evaluate the study's overall reliability and validity. This high school auditing was carried out using a series of research stages that are shown in Fig. 2.

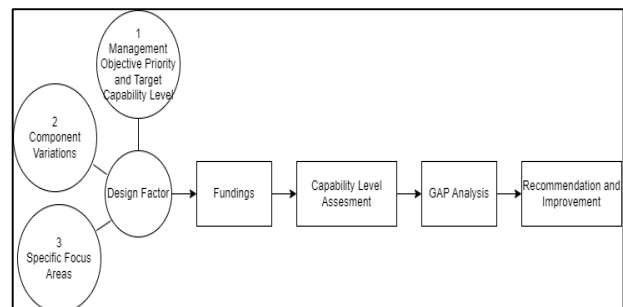


Fig. 1: Methodology

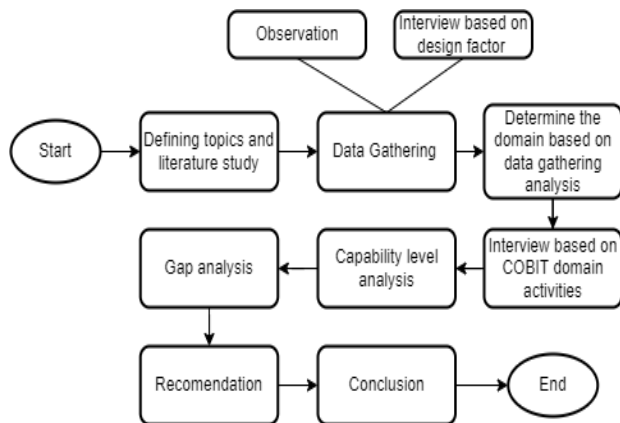


Fig. 2: Research flow

Based on Fig. 2, research flow, it is known that this research starts from:

1. Defining topics and literature study, define the topics to be audited and conduct a literature study relating to auditing using COBIT 2019
2. Data gathering, data collection through company observations and interviews based on design factors. The research was conducted at high schools and interviews were conducted with school directors who have direct contact with schools every day and understand the daily technology environment of high schools
3. Determine the domain based on data gathering analysis, from the interview done in the previous step, the domain will be obtained based on the results of the design factor analysis. Where in the interview there will be a broad but narrow discussion of the school's strategies and goals. The results of this analysis will obtain domains that are focused on school strategy
4. Interview based on COBIT domain activities, after the domain is determined, another interview was conducted based on COBIT domain activities that have been obtained. To find out how the school fulfills activities in this domain
5. Analysis of capability level, calculate the process capability mode to determine the school's capability in implementing accounting applications
6. Gap analysis, calculate and analyze the gap between the current capabilities level and the expected level. The expected level is obtained from the results of the domain values in the design factor analysis
7. Recommendation, provide some inputs, suggestions, and recommendations to the company regarding what can be done to improve the quality of their business process in each domain
8. Conclusion, make reports regarding the conclusions obtained from the results of the audit process

Results

In previous research, analyzing the use of technology in school focused on technology used in main business activities or processes, namely academic activities (Tulus and Tanaamah, 2023), as well as improving technology in the world of education is often carried out with the intention of focusing on improving the teaching and learning process (Ishlahuddin *et al.*, 2020).

In this research, it was investigated that it is not only technology implemented in main business processes such as the academic field that must have its capability level assessed, but supporting activities such as the financial activities also have an important role in the running of school business processes. This research will measure the level of school capability in implementing accounting applications whether they are in accordance with the company's needs and meet the expected level of capability or not.

Design Factor

The first analysis stage carried out was design factor analysis. Design factors are steps to analyze important factors in a company, the results of which will be used to obtain a domain that suits the company's activities. Design factors use the COBIT 2019 design guide which designs and provides information technology solutions that can help users design solutions for companies by considering all important factors. The final result of this analysis is that important high school priority domains or processes are obtained which will be used in the next stage of analysis.

Enterprise Strategy

Enterprise strategy is the suggested method and proper strategy creation process for incorporating social and stakeholders' expectations, values, norms, and standards (Steyn and Niemann, 2010). This high school certainly also has an enterprise strategy for the continuity of the company. After data gathering using the interview method based on the COBIT 2019 design factor, enterprise strategy at this high school's highest score is in growth and acquisition, meaning that the high school is very concerned about growth and becoming a higher quality school from any aspect. It can be seen in Fig. 3.

Enterprise Goals

Having targets and goals is very important for a company. For this high school, the company's goal is to focus on EG01's portfolio of competitive products and services. Because the school wants to continue to provide the best service to customers by continuing to be competitive with other schools. The organizational objectives of the high school can be seen in Fig. 4. The Risk profile is used to identify and know what types of

risks are facing the organization nowadays. In this risk profile, the results are obtained from analysis of the impact level of the risk if it occurs and multiplied by the level of probability that the risk will occur. In this school, the high-risk profile is at the value of 12, and the risks are related to programs and projects and IT needs such as software. It can be seen in Fig. 5.

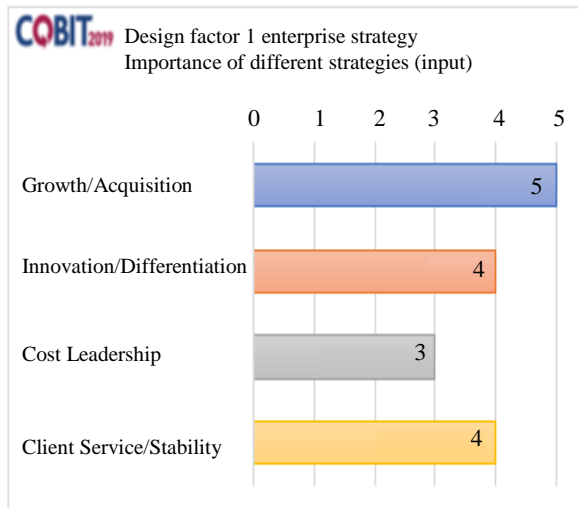


Fig. 3: Design factor 1 enterprise strategy

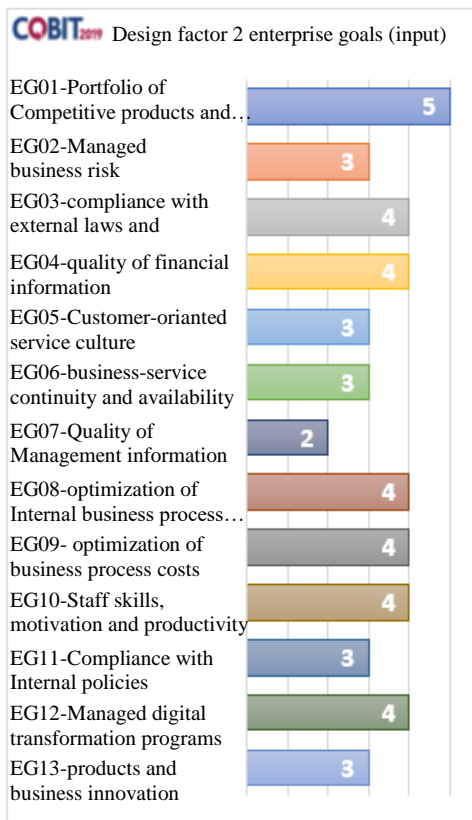


Fig. 4: Design factor 2 enterprise goals

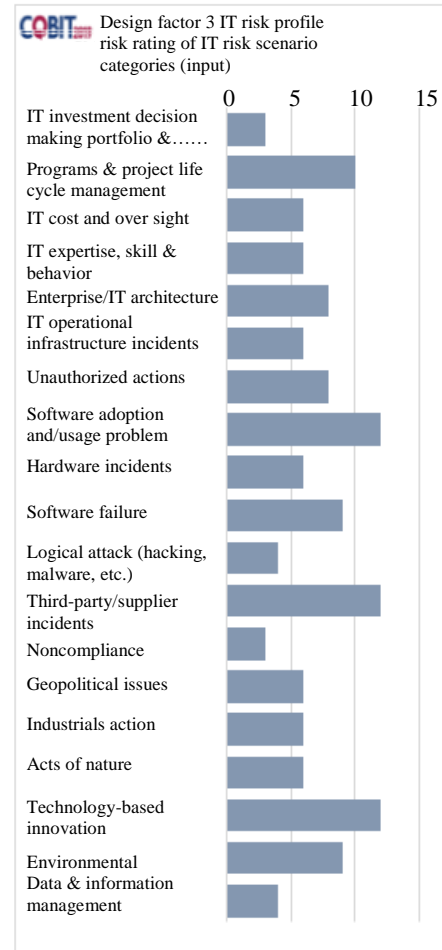


Fig. 5: Design factor 3 IT risk profile

Risk Profile

Risk profile used to identify and know what types of risk that facing the organizational nowadays. In this risk profile, the results are obtained from analysis of the impact level of the risk if it occurs and multiplied by the level of probability that the risk will occur. In this school, the high-risk profile is at value of 12, that the risks are related to program and projects and IT needs such software. It can be seen in Fig. 5.

IT Related Issues

In assessing a company's IT risk, it is necessary to know the level of problems in each of the existing IT-related issues. This factor assessment is needed to identify and assess the level of importance of the IT issues whether it is not a problem, a problem, or poses a serious problem to the company. The greater the value indicates the greater the level of the problems that occur. In this case study, the average of IT-related issues is 2, meaning that the company should consider and be responsive to the issues. The related issues can be seen in Fig. 6.

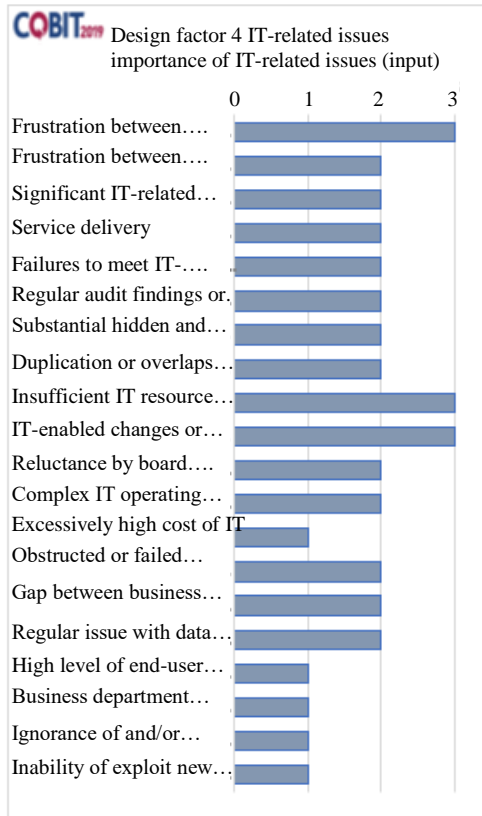


Fig. 6: Design factor 4 IT-related issues

Table 1: Design factor 5 IT threat landscape

Strategy	Value %	Baseline %
High	0	33
Normal	100	66

Table 2: Design factor 6 compliance requirements

Strategy	Value %	Baseline %
High	20	0
Normal	80	100
Low	0	0

Table 3: Design factor 8 IT sourcing model

Strategy	Value %	Baseline %
Outsourcing	70	33
Cloud	20	33
Insourced	10	34

Table 4: Design factor 9 implementation methods

Strategy	Value %	Baseline %
Agile	0	15
DevOps	0	10
Traditional	100	75

Threat Landscape

Analyzing the landscape of the threat was the type of threat experienced by the company, resulting -in the threat landscape graph of the high school being normal because

all the threats such as connection interruption and small bandwidth can be solved and handled by themselves. The results of the threat analysis can be seen in Table 1. The results obtained show that the threats experienced so far are 100% normal threats that can still be resolved.

Compliance Requirements

Process specifications that can help to manage the independent adaptation (Turetken *et al.*, 2012). Analysis of compliance requirements that identify the compliance demands that the company complies with. The compliance requirements of the high school can be seen in Table 2.

Role of IT

Analyzing the company's IT role, resulting in the role design of IT. The school has a strategic and turnaround role in creating the best quality of the school with some strategy and innovation. The role design can be seen in Fig. 7.

IT Implementation Methods

Technology implementation is thus the most crucial stage in creating business performance to promote corporate growth and enhance business performance. Therefore, the IT system's implementation is the most important component for improving the results (Haseeb *et al.*, 2019). There are methods that can be selected and used as the basis for implementation reasons. The methods of the high school IT implementation can be seen in Table 4. Technology implementation methods that the high school used are traditional. It says that because the company keeps its software development and operations separate.

IT Sourcing Model

IT sourcing model identifies the source of the applied IT model. The results can be seen in Table 3. The 70% shows that the school uses outsourcing software from a third-party supplier 10% shows that the school insourced IT in the form of providing IT staff.

Enterprise Size

There are 2 types of enterprise sizes, large enterprises and small medium enterprises. The high school is a small and medium enterprise because it has less than 200 employees.

Current Capability

Figure 8 shows the result of the design factor. After obtaining the COBIT 2019 domains that were prioritized during the school business process, the next step will be an assessment of the current high school IT governance capabilities based on the domain results obtained previously. From the design factor that was carried out, the domain was obtained from a combination of all the 10-factor designs resulting in a value of 100 that shows the expected capability of the domain was at level 5. Three selected processes were obtained because of the mapping, namely APO10, BAI03 and BAI11.

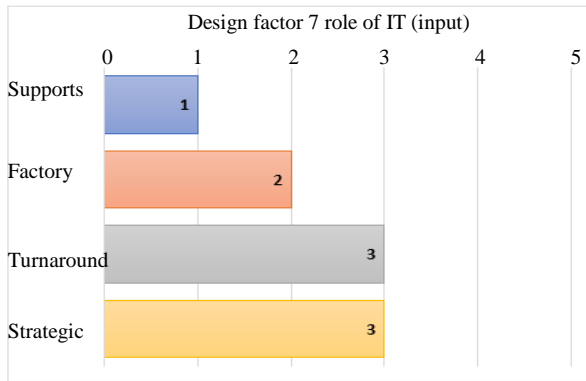


Fig. 7: Design factor 7 Role of IT

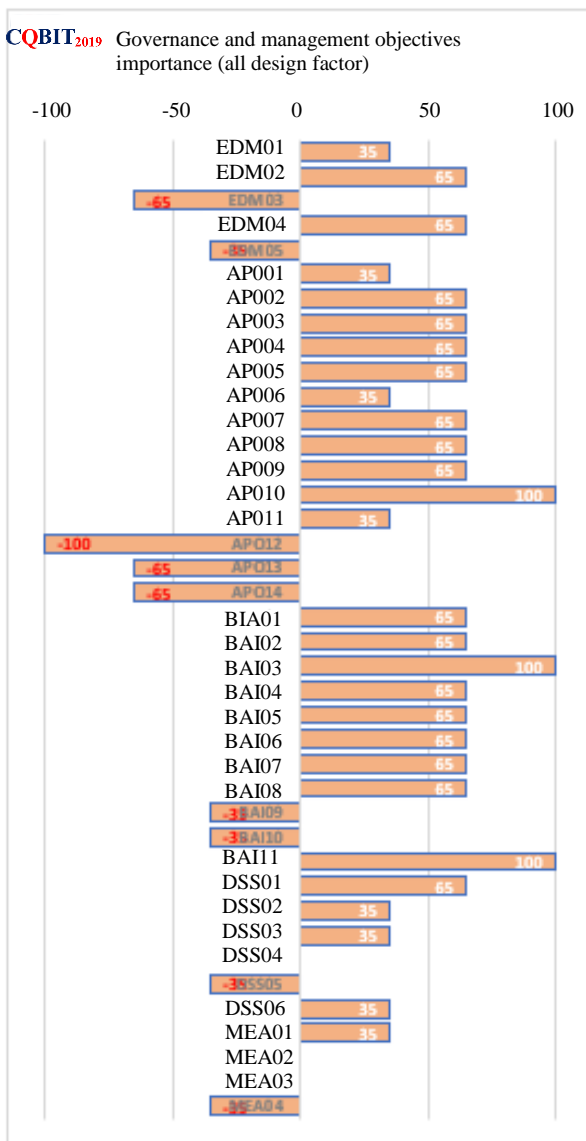


Fig. 8: Result of the design factor

Table 5: Design factor 10 technology adoption strategy

Strategy	Value %	Baseline %
First mover	0	15
Follower	80	70
Slow adopter	20	15

Technology Adoption Strategy

Technology adoption is a significant factor in a nation's economy since it enables individuals to interact with goods and services and also generate income for society that be a crucial indicator of the level of economic growth (Hooks *et al.*, 2022). There are some strategies behind the implementation of the technology adoption which is the base for the strategy. The Table 5 shows that the high school in 80% using follower strategy that they use technology that other companies have used before and consider it before adopting it.

APO10-Manage Vendors

This domain focuses on managing IT products and services. The IT products are provided by parties that we called vendors to meet the company's requirements. This domain process includes the finding and selection of vendors, some management processes, and monitoring vendor performance to produce the effectiveness of the company's business processes. The purpose of the domain process is to maximize IT capabilities to support the business IT strategy and reduce the risk that is produced by the nonperforming vendors.

Based on the APO10 evaluation, these weaknesses were obtained:

- IT products and services provided by the vendors do not include training services so the software users who never used the product and did not comply with the product training will have difficulty carrying out their work
- The vendor only provides products or services that are ready-made and ready to use, so the product can't be customized and changed according to the company's needs and cannot perfectly cover the high school's required needs
- Before or while looking for a suitable partner or vendor, schools have not carried out regular company scans to look for the school's IT strategy needs
- The high school has not selected and implemented vendors that best suit the requirements, and the implementation of the accounting application is not in accordance with the requirements
- High schools have not carried out broader assessments, namely identifying and monitoring risks related to vendors and other services, and they never conducted an audit of the practice and implementation of accounting applications

BAI03-Manage Solutions Identification and Build

This domain focuses on maintaining and establishing IT products and services that also include business processes and workflows in line with the company's requirements. The purpose of the domain process is to measure the technology products and services that are agile and scalable and define the cost-effective solutions capable of supporting the company's strategic and operational objectives.

Based on the BAI03 evaluation, these are the weaknesses that were obtained:

- a. High schools have never conducted an audit of the implementation of accounting applications so that the role of these applications can be known
- b. High schools have not assessed the impacts and risks that could occur if they adopt the solution
- c. High school has never created and designed application requirements in detail and made changes to software or applications that are more appropriate so that they can meet business needs

BAI11-Managed Projects

This domain focuses on managing all projects initiated within the company that are in line with the company's strategy in a coordinated way based on a typical project management approach. This domain also includes initiating, planning, controlling, and executing the business project. The purpose of the domain is to realize defined project outcomes, reducing the risk of unforeseen delays and costs. This domain also ensures the value and quality of the project outcomes.

Based on the BAI11 evaluation, these are the weaknesses that were obtained:

- a. The high school has not fully utilized the resources and skills that are required in managing business solutions. It is marked by the resources are not fully qualified in the field that they carried out
- b. High schools have not carried out reviews and evaluations to assess whether the implementation that has been carried out so far has fulfilled and provided the desired results or not
- c. The high school has not appointed a specific manager for the project who has the necessary understanding of technology and business
- d. High school has not assigned personnel who have the right skills to be responsible for implementing the risk management process

From the weaknesses found in the research and analysis carried out, the results obtained are the level of capability possessed in each sub domain. The results obtained are then compared with the activities in each domain and obtain the average results in the form of capability levels shown in Table 6. Sub domains APO10 and BAI03 have a capability level of 1 and Sub domain BAI11 has a capability level of 2.

Table 6: Conclusion process current capability level

Subdomain	Capability Level					
	L0	L1	L2	L3	L4	L5
APO10						
BAI03						
BAI11						

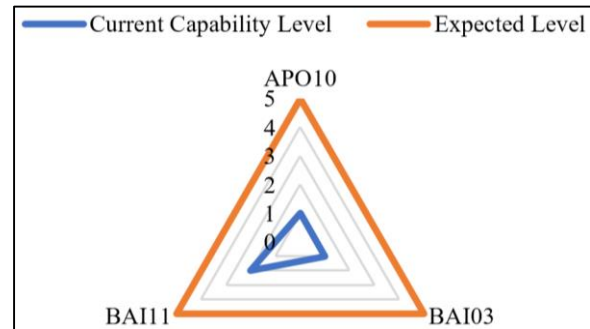


Fig. 9: Gap analysis

Gap Analysis

Gap analysis is a method that is useful to examine the current state of the technology currently used and to see the difference from the ideal conditions desired by the company (Fourie *et al.*, 2021). The gap analysis for the high school can be seen in Fig. 9. The blue line shows the current capability level and the orange line shows the expected capability level. The level that the high school expected is level 5 based on design factor results.

Based on Fig. 9, shows that the capability results obtained are in the APO10 and BAI03 domains, the capability level is at level 1 and in the BAI11 domain, the capability level is at level 2. The expected capability level in the three domains is level 5, which shows that there is a large gap difference.

Discussion

According to the results of the capability level, there is a gap between the current level and the expected level. It is necessary to make recommendations for improvements from the three subdomains which are expected to help the company:

- a) APO10-manage vendors

These are some recommendations that can improve the APO10 process to reach the expected level:

- a. Periodically scan the company in terms of needs, strategy, and company foals to find out requirements that suit the school. If the accounting application used is felt to no longer follow the

company's strategy and needs, consideration can be made to adopting a new application

- b. Search for and adopt the application that best suits the school's business process needs. If costs are sufficient, it is recommended to purchase an application made specifically for High schools so that the application will match what is requested and needed
- c. Improve communication with vendors providing accounting application services regarding desired service improvements and discuss whether there are services or methods that can be implemented to achieve the desired services

b) BAI03-manage solutions identification and build

These are some recommendations that can improve the BAI03 process to reach the expected level:

- a. Carry out audits on the implementation of accounting applications so that the role of the application can be known. If it is felt that the results are not good, then it can be a consideration for changing the solution
- b. Assess the impacts and risks that could occur if you adopt the solution. Including conducting impact assessments when implementing accounting applications. It can be seen whether implementation is still effective or not
- c. Create and design application requirements in detail and make changes to software or applications that are more appropriate so that they can meet business needs

c) BAI11-manage projects

These are some recommendations that can improve the BAI11 process to reach the expected level:

- a. In designing and executing a project, it is recommended to appoint a dedicated manager who has the appropriate understanding and skills to be responsible for the project
- b. Conduct a post-implementation review to find out and assess the results of the project, namely whether the implementation of the accounting application that has been carried out has fulfilled and provided the desired results or not!
- c. If there are changes that must be made, as much as possible to implement changes that remain in line with the initial project framework and objectives

Conclusion

Based on analysis carried out at high schools, it is known that these schools implement accounting applications to support their business processes. After

analyzing the implementation, it was found that there were 3 important process domains obtained from the design factor assessment. The three domains are APO10 (manage vendors), BAI03 (manage solutions identification and builds), and BAI11 (manage projects). The capability level results obtained by Saint John schools based on these three domains are as follows:

1. In the APO10 domain, the results showed that high school capability in managing the domain process reached level 1 with the expected results in this domain being level 5
2. In the BAI03 domain, the results showed that high school capability in managing the domain process reached level 1 with the expected results in this domain being level 5
3. In the BAI11 domain, the results showed that high school capability in managing the domain process reached level 2 with the expected results in this domain being level 5

After carrying out an analysis and assessing the level of capability of high schools in implementing accounting applications, a gap or discrepancy was obtained with the expected level of capability obtained based on the results of the design factor analysis. The results obtained were that the level of capability in high school was low with the expected level being high, and still requires a long series of processes, namely having to increase 3-4 levels of capability to reach a level that is in accordance with the results of the design factor analysis. To help high schools increase their capability level, recommendations are given for each sub-domain activity in the previous section which, if implemented, is expected to increase their capability level to further reach the expected level.

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Author's Contributions

Jennifer Felicia: Defined the reasons for conducting analysis in high schools, initiated the research concept, conducted a literature review, collected data by conducting interviews with the source person, interpreted results, and prepared the manuscript.

Johanes Fernandes Andry: Formulated questions for interviews, formulated the results of designed factors, interpreted the results of analytical research in high schools, and prepared the manuscript.

Fransiskus Adikara: Formulated the findings obtained in the high school audit and the conclusions obtained in this research.

Devi Yurisca Bernanda: Formulated findings and recommendations to increase the level of high school capability.

Kevin Christianto: Analyzed the results of high school capability level and formulated recommendations that can be used to increase the level of high school capability Analyzed the results of high school capability level and formulated recommendations that can be used to increase the level of high school capability.

Ethics

This article is original and unpublished. Corresponding authors confirm that all other authors have read and agree that the manuscript does not involve ethical issues.

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