Identification of IT Governance and Management Objectives and Target Process Capability Level in Government Institution

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Abstract—This study attempts to review whether the organization's IT governance and management practices are appropriate, whether other practices are needed, and the level of capability required for the practices implemented. This study uses COBIT 2019 (Control Objectives for Information and Related Technology 2019) as a reference for guideline practices and COBIT 2019 design factors as a method to identify organizational IT governance and management objectives. Based on this research, it shows that organizational IT governance and management are in accordance with national policies. However, in implementation, it still needs improvement with several other IT governance and management practices according to COBIT 2019. Based on the final results of this study after refinement of the design factor, the proposed IT objectives and practices that meet compliance with a policy are APO 13, APO 12, BAI 08, BAI 06, BAI 09, APO 14, DSS 02, and APO 07. However, adjustments still need to be made by adding some of the practices that are in line with the characteristics of the organization, which are MEA 03, DSS 05, EDM 03, and BAI 11. This study identifies appropriate IT governance and management objectives in the Province of West Java, Republic of Indonesia.
Keywords— IT Government; IT Management; E-Government; COBIT 2019

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I. INTRODUCTION

In government practice in the Republic of Indonesia, government services are directed to be implemented in digital services in the form of e-government or SPBE (electronic government system). E-government is a practice carried out by government agencies to provide government services, especially public services that are supported by the use of information technology (IT) to make it more accessible, effective, efficient, and accountable [1]. E-government practices emphasize using digital tools to enhance the delivery of public services [2].

The application of e-government in Indonesia aims to realize a comprehensive and integrated electronic-based government system to create excellent public and government administration services and also the high-level performance of government agencies [3]. E-government implementation in Indonesia, which started in 2001, has provided many developments [4]. The implementation of Indonesian e-government in the era of disruption has provided several benefits from various social, economic, and governmental dimensions. The main benefit is the quality of public service improvements, such as increasing community satisfaction, service transparency, increasing participation in community empowerment, and cost savings [5]. However, e-government implementation in Indonesia still has many obstacles and problems including limited infrastructure, inadequate human resources, and an unsupportive environment including IT governance and management [6]. The issue of not realizing the public interest through the growth of e-government remains a challenge for information technology development in public administration [7]. Low trust in e-government management results in low use of e-government services [8]. The level of e-government implementation in Indonesia is still in the low category when compared to other ASEAN countries such as Malaysia, Singapore, Thailand, Vietnam, and the Philippines [9]. Whereas in e-government practice, IT governance and management are very important and influence the success of its implementation. IT governance and management is a practice that can support good IT-related decision-making to achieve company goals [10]. A crucial factor that must be taken into account for the successful growth of e-government in Indonesian municipalities is effective IT governance [11]. From the several problems related to e-government above, a particular concern in this study is aspects of IT governance and management practices in e-government in Indonesia, specifically in the local government of West Java province.

Several similar studies have previously been conducted in other organizations using COBIT 2019 to analyze and design IT governance and management: analysis of IT Governance on communication and information service of Papua Province [12], IT Governance Maturity Level on Master plan E-Government in Indonesia [13], evaluation of IT governance and management

in Directorate General of Higher Education, the Ministry of Education and Culture Indonesia [14], Design IT Governance System in Strategic Public Sector [15], e-Government maturity analysis at Ministry Of Law And Human Rights Indonesia [16], Identification of the level of IT governance in internet services in Indonesia [17], IT Governance Design in DevOps-Based E-Marketplace Companies[18] IT service quality capability measurement in Kabupaten Pamekasan e-Government [12] and the IT governance design of PT Telkom Regional VI Kalimantan [20]. Compared to previous studies, this study specifically analyzes IT governance and management in the province of West Java in the context of SPBE implementation. This study also conducted an analysis of SPBE management according to Presidential Decree No. 95 the year 2018 SPBE, whether it is in accordance with organizational needs. Based on this study, results indicated the need for several other IT management practices according to COBIT 2019.

National policies regarding e-government implementation in Indonesia have been established in the form of presidential regulation, Presidential Decree No. 95 the year 2018 SPBE. Based on the national policy, IT governance and management have been established. IT governance and management in the SPBE context is known as SPBE Management, which is defined as a set of processes to achieve an effective, efficient, and sustainable SPBE implementation and quality SPBE service [3]. SPBE management includes risk, information security, data IT asset, human resource, knowledge, change, and IT service management [13]. SPBE Management is a national reference and is an obligation to be implemented by all government agencies in the Republic of Indonesia

Although there are IT governance and management references that can be adopted by organizations, in practice there is no IT governance and management system that is already perfect for every type of organization that can be directly used without adjustments [13]. Although there are many frameworks used to assess IT governance in various organizations and institutions, each organization has its own characteristics characterized by the organizational goals and objectives that it seeks to achieve [14]. Every organization will have its own uniqueness and be different from other organizations, so in implementing references or best practices IT governance and management in an organization must be adapted to the characteristics and conditions of the organization [15]. Several adjustments were made related to the industrial sector, regulations, threat conditions, the role of IT for the organization, technology adoption strategy, solution development, and size of the enterprise [16]. IT governance and management references that can be adopted from references like SPBE Management and COBIT 2019, need to be adapted to adjust unique characteristics and conditions that exist in the organization [17]. The approach that can be taken to design an IT governance system in an organization is using COBIT 2019 process known as "designing the governance system for enterprise" [17]. This process is supported by a

tool: the COBIT 2019 Design Toolkit. From various previous studies, it can be concluded that COBIT 2019 is a comprehensive framework and provides flexibility in the implementation of IT governance and management [20]. COBIT has a long history and has gradually evolved into to a widely accepted method for implementing enterprise governance [18].

This study attempts to analyze IT governance and management practices carried out in organizations, whether current IT governance and management practices and implementation according to national policies are appropriate, and whether improvements need to be made. The results of this study can provide suggestions for IT governance and management practices that are in accordance with organizational characteristics to be implemented according to best practices and can strengthen the current implementation in accordance with existing national policies. This research is limited to an analysis of organizational IT governance and management in the local government of West Java province using the 2019 COBIT reference.

II. RESEARCH METHOD

The research method in this study uses the COBIT 2019 process known as "Designing the Governance System for Enterprise". COBIT 2019 is a management guideline issued by ISACA (Information Systems Audit and Control Association) and ITGI (Information Technology Governance Institute). COBIT provides general steps as well as best practices used to help utilize the use of information technology in accordance with company goals [20]. COBIT 2019 is generally used for compliance assessment according to IT governance regulations [27]. COBIT 2019 has several improvements from the previous version COBIT 5 [28]. The COBIT 2019 framework consists of five practice domains to choose from, namely the DSS (Deliver, Service, and Support), MEA (Monitor, Evaluate and Assess) domains, and BAI (Build, Acquire, and Implement) [22]. The method in this study uses the 2019 COBIT factor design. Design factors are the identification and analysis of factors that can influence the design of an organizational governance system and determine the success of IT implementation in an organization [24]. Design factors consider several aspects of governance design and management of IT organizations, such as enterprise goals, enterprise strategy, threat landscape, IT risk profile, IT-related issues, compliance requirements, IT sourcing model, IT implementation methods, the role of IT in the organization, technology adoption strategy, and enterprise size [29]. The tools used in the design factor are the COBIT 2019 design toolkit. Several previous studies using the COBIT 2019 design factor included: the implementation of governance and management practices in small and medium enterprises [30], education organizations [31], and public organizations [32].

This study uses a combination of qualitative and quantitative methods. The qualitative method is used to obtain opinions from several personnel or experts who are considered to have knowledge and understanding regarding organizational characteristics and have competence related to IT governance and management in organizations. The opinions of experts are used to determine related factors that are important and influence the organization's IT governance and management, such as the organization's strategic direction, risk profile, IT-related Issues, and other design factors. This is done by conducting interviews with relevant personnel and experts. The information obtained from the interview results is confirmed by the literature/document study. The literature study was done by collecting and analyzing several internal organizational documents such as strategic planning documents, IT monitoring & evaluation reports or IT audits, and other documents. A quantitative approach is used to determine the value of each design factor that has been identified based on the previous qualitative approach. The quantitative approach is carried out by setting a value scale to determine priorities and their values for each factor design component [25]. The steps taken to compile a customized IT governance and management design according to COBIT 2019 are as follows:
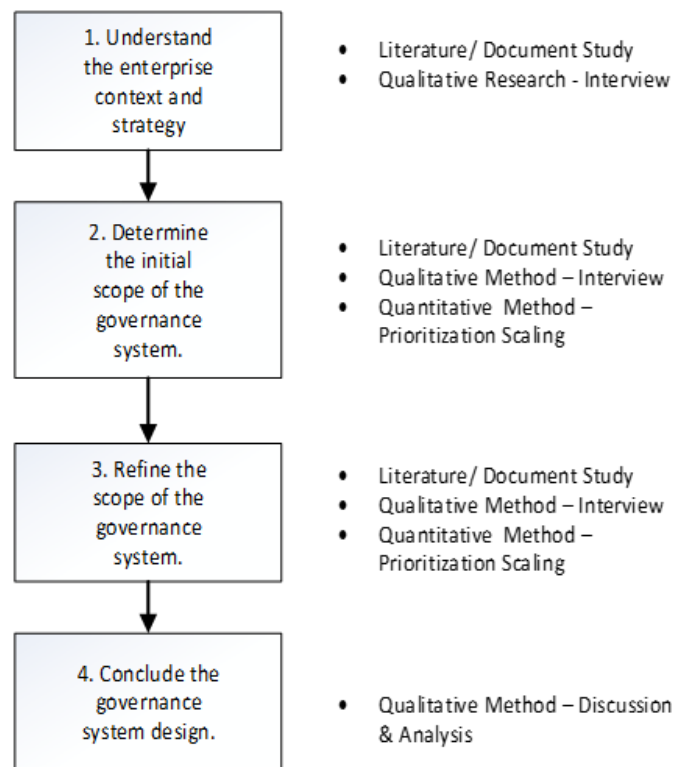

Fig 1. Research Method

The stages in the IT governance and management design process, as described in Figure 1., will result in recommendations to prioritize governance and management objectives or practices

that are appropriate to organizational conditions, to target level capabilities, or to adopt a particular variant of the governance system component. The first stage was carried out to identify the specific characteristics of the organization, especially the direction of the strategic context of the company and strategic organization. At this stage, the needs of the organization's strategy, organizational objectives, risk profile, and current IT-related issues are carried out. The second stage is carried out to synthesize the information collected during the first stage.

The results of design factors identification consist of business strategies, business objectives, risk profiles, and IT-related issues, which are analyzed to determine the components of IT governance that become organizational priorities and become the initial IT governance system that fits the characteristics of the organization. In the third stage identify refinements to the initial scope of IT governance and management systems, based on the remaining factor design sets as defined in the previous stages. In the third stage, it can be identified which design factors are really relevant for the organization, not all design factors can be applied to every enterprise. At the end of the third phase, will identify many potential improvements to the initial system of governance and brought them all to the canvas for integration in the fourth or final phase of the design workflow. In the fourth or final stage of the design process, a combined analysis of all inputs from the previous stages is carried out to conclude the design of an appropriate organizational governance system. At this stage, it is very likely that there will be conflicts between design factors, so they must be reconciled. The result of the final stage of the governance design workflow is a well-designed governance system that organizations can use and refer.

III. RESULT AND DISCUSSION

The results of this study using the COBIT 2019 process known as the "designing the governance system for enterprise" method are represented by the output of the analysis results using the COBIT 2019 design guide for all factor designs used. In the first two-stage of the governance design workflow, by evaluating corporate strategy, goals, risk profile, and IT-related concerns, the primary objectives are to establish the initial scope of the governance system. The first two stages evaluate the first four design elements to determine how they affected the governance system's initial design.

The first design factor is identifying the enterprise strategy of the Regional Government of West Java Province. This is done by referring to the organization's organizational strategy according to the strategic planning document, namely the latest RPJMD (Regional Long-Term and Medium Plans). The main organizational strategic focus is on improving public services [19]. The results of the identification and prioritization of organizational strategy can be seen in Figure 2.
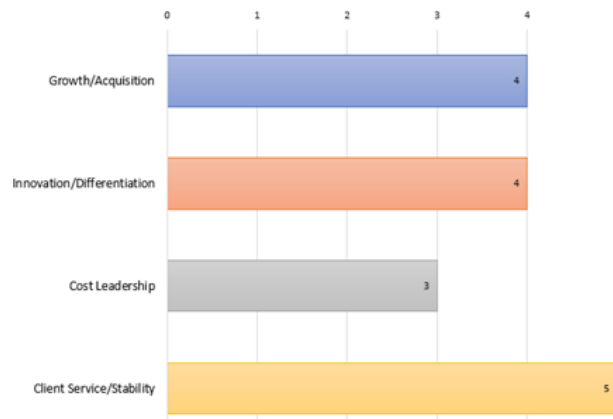
Fig 2. Design Factor 1 – Enterprise Strategy

The second design factor is identifying enterprise goals. This enterprise goal is also obtained based on the organization's strategic planning document. Organizational goals and objectives are mapped to enterprise goals generic at COBIT 2019 and then given a score according to the priority level of the enterprise goal in accordance with the direction of the organization's strategic planning. The results of identifying, mapping, and scoring organizational goals can be seen in Figure. 3.
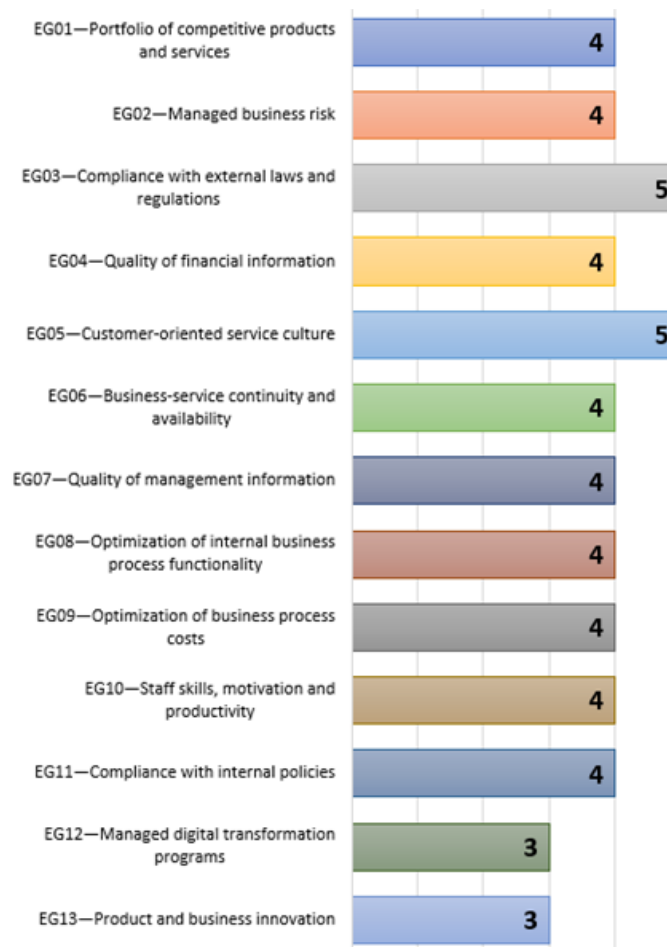

Fig 3. Design Factor 2 – Enterprise Goals

The main focus of the organization's goal is to create the best and most appropriate public service. The characteristics of government organizations are compliance with regulations. So from the results of mapping organizational goals to the COBIT 2019 goals, based on organizational planning documents validated by relevant personnel from the Organizational Bureau, the largest values are EG05 Customer-oriented service culture and EG03 Compliance with external laws and regulations.

The third design factor is the risk profile of the organization. The risk profile of this organization is determined based on the size of the impact on the organization and the likelihood of it happening. Identification of organizational risk profiles is carried out based on the results of studies on IT risk management and organizational information security. The results of identifying organizational risk profiles can be seen in Figure 4. Risk scenarios that should be the main concern of the organization are risk scenarios that have a high and very high rating. Based on the identification results of the risk profile design factor, risk scenarios that are included in the high category in the Regional Government of West Java Province are: program and projects life cycle management, IT expertise, skills & behavior, enterprise architecture, IT operational infrastructure incidents, noncompliance, and data & information management.
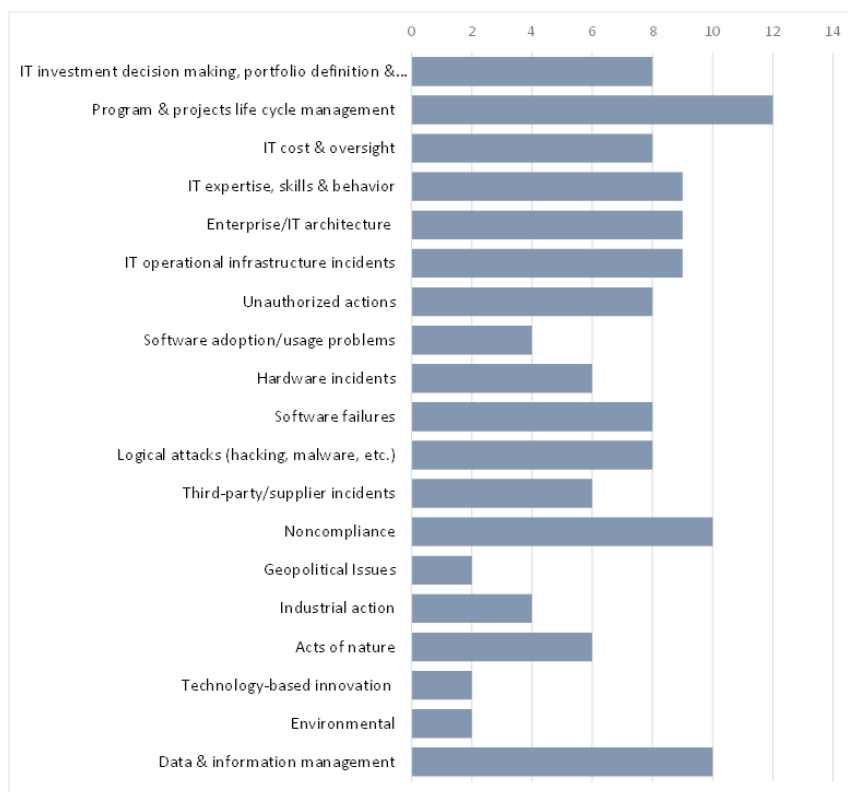

Fig 4. Design Factor 3 – Organization's IT Risk Profile

The fourth design factor is IT-related issues. IT-related issues are current issues related to IT or SPBE which are a concern within the organization. IT-related issues were identified by means

of interviews with IT operational managers and the SPBE implementing team in the organization. Apart from this, IT-related issues were also identified from several incidents and problems that became highlights as well as from the SPBE monitoring and evaluation report. Identification of IT-related issues which are the design factors in this study can be seen in Figure 5. According to the findings of the identification process, failures to comply with IT-related contractual or regulatory requirements, duplications or overlaps between initiatives or other instances of resource waste, a lack of IT resources, staff with insufficient skills or staff, or employee burnout or dissatisfaction, business users and information technology specialists speaking different languages, data quality, data integration from diverse sources and the gap between business and technological understanding are IT related issues with the greatest concern.
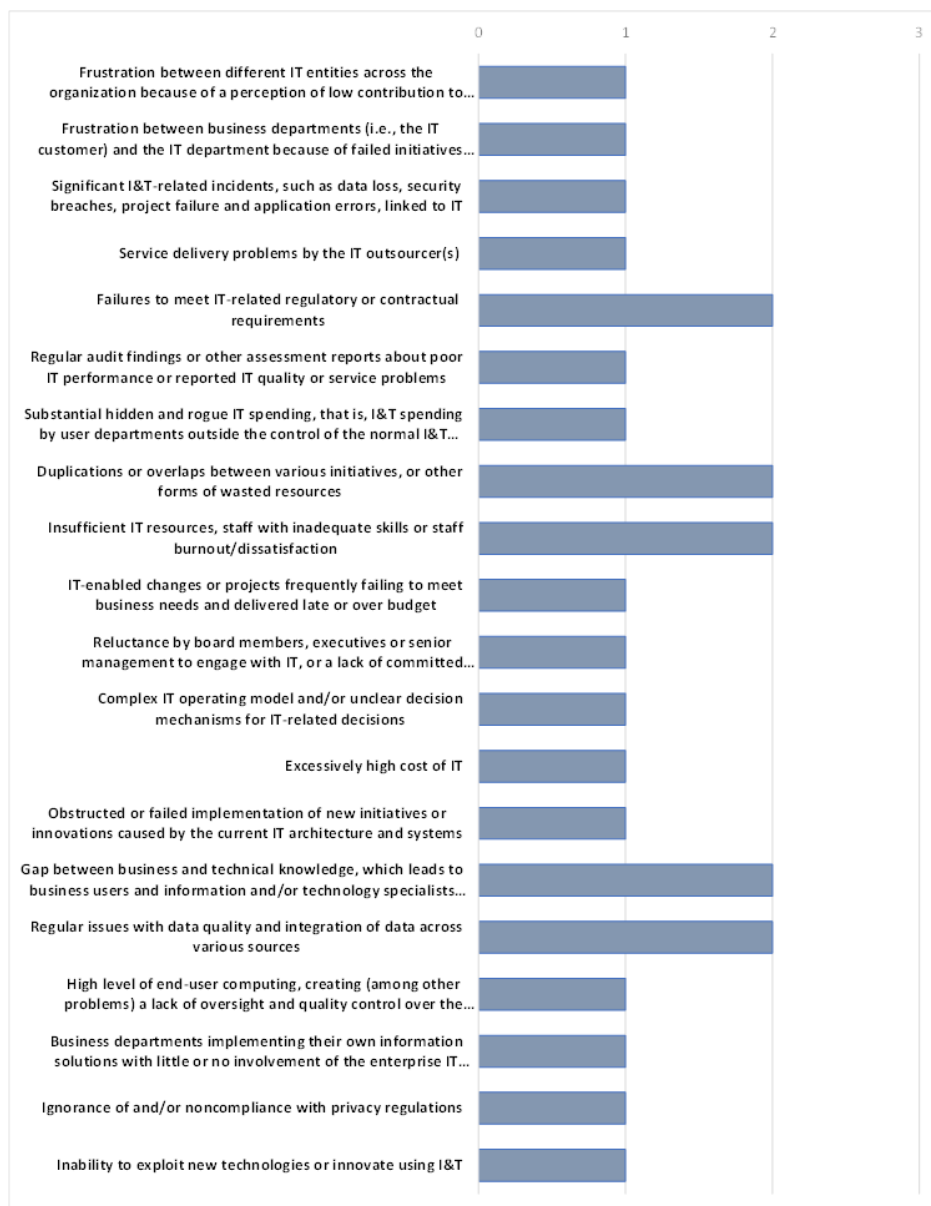

Fig 5. Design Factor 4 – IT Related Issues

The fifth and subsequent factor designs are prepared for stage 3: Refine the Scope of the Governance System. The fifth design factor is the threat landscape which is an identification of possible IT threats to the organization. The threat landscape to the organization, for the high category is 50% while for normal conditions is 50%. IT threats are in the high category, especially for public services and government administration, which are critical, and data and information that are classified as confidential and excluded from the public must be managed properly. The results of the identification of landscape threats as a design factor can be seen in Figure 6.
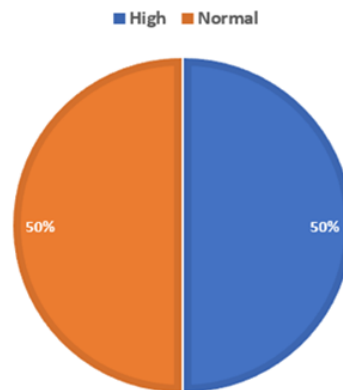

Fig 6. Design Factor 5 – IT Threat Landscape

The sixth design factor is a compliance requirement. Compliance requirements at 70% of organizations are in the high category because, for government agencies in the Republic of Indonesia, there are already SPBE national policy guidelines that must be followed by all government agencies. 30% compliance is included in the normal category, which is a requirement related to international standards which are best practices but are not mandatory. The findings of the sixth design factor identification are in Figure 7.
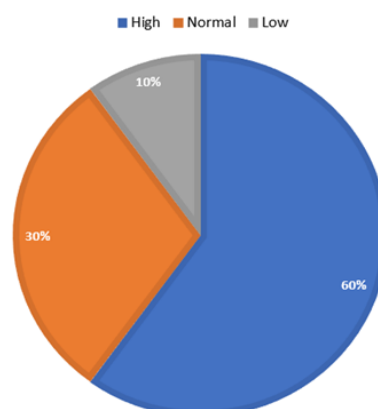

Fig 7. Design Factor 6 – Compliance Requirement

The seventh design factor is the importance factor of the role of IT. The most important role of IT for the organization is strategic. IT is critical to the continuity and innovation of an organization's business processes and services. The role of IT in the second position is a

turnaround. IT is viewed as a catalyst for innovation in commercial operations and services. There is currently no critical reliance on IT for the running and continuity of business processes and services. The next IT role is factory. When IT malfunctions, it directly affects how corporate services and procedures operate and continue. However, IT is not seen as a driver to innovate in business processes and services. The last IT role position is as support, where IT is not essential to the organization's ongoing operation and provision of services and business operations. The results of the identification of the seventh design factor are in Figure 8.
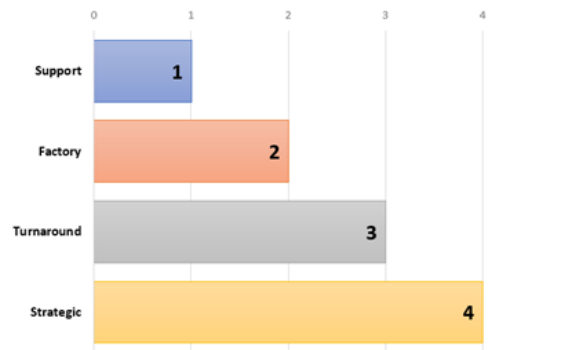

Fig 8. Design Factor 7 – Role of IT

The eighth design factor is the Sourcing Model for IT. Sourcing Model for IT is a model that organizations use to provide IT services to customers. The sourcing model for IT organizations consists of insourced, cloud, and outsourcing. Based on the SPBE national policy going forward, the provision of application services is directed to use national data centers as cloud services. However, in current conditions within the Regional Government of West Java Province, the majority of IT services especially applications, still use data centers that are owned and managed by the Office of Communication and Informatics. Services that still use the outsourcing model or from third parties are the provision of internet connections. The identification results of the eighth-factor design can be seen in Figure. 9.
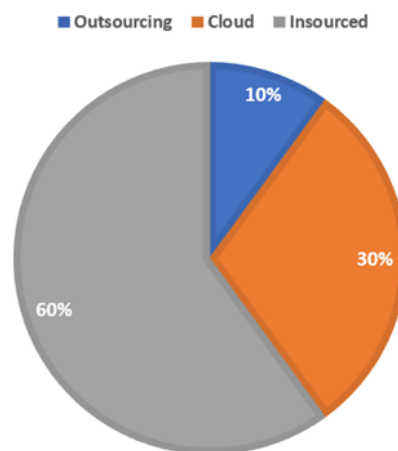

Fig 9. Design Factor 8 – IT Sourcing Model

The ninth design factor is the IT implementation method. The IT implementation method explains how an organization builds, develops, and deploys IT services, especially applications. The IT implementation method used by organizations can use traditional, DevOps, or agile methods. In system development practice, organizations still use the traditional method, using the waterfall method. Software development activities are generally still separate from operations. In the DevOps method, Organizations use the development-operation work method to build, deploy, and operate the software. On the agile method, the organization uses the agile development work method for its software development. In some application services, organizations have started to adopt more modern approaches using agile and DevOps methods. In public application services, for example, Sapawarga and one data service, DevOps practices have been used. However, the majority of application development still uses the traditional waterfall approach. The results of the identification of the ninth-factor design can be seen in Figure 10.
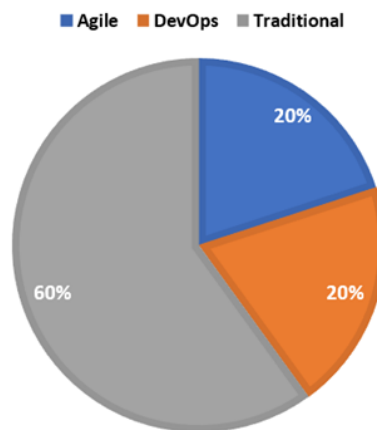

Fig 10. Design Factor 9 – IT Implementation Methods

The tenth design factor is the technology adoption strategy. Technology adoption strategy shows the IT adoption strategy carried out by the organization, whether it is included in the category of the first mover, follower, or slow adapter. Based on the organizational characteristics of government agencies, the technology adoption strategy is mostly follower because technology implementation will refer to the SPBE architectural directives which refer to national references, so it will be less likely to become a first mover, but also not lead to slow adopters. The results of the identification of the tenth factor design can be seen in Figure 11.
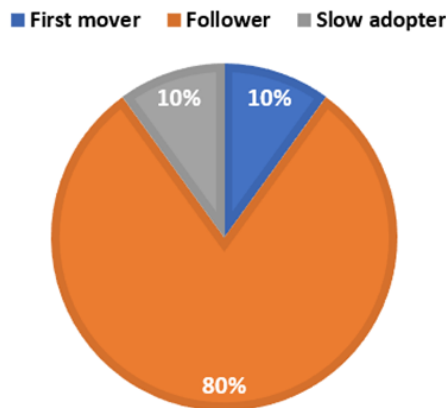
Fig 11. Design Factor 10 – Technology Adoption Strategy

Based on the identification results of the overall design factors, the scores obtained for IT practices and objectives are in accordance with COBIT 2019 which can be seen in Figure 12.
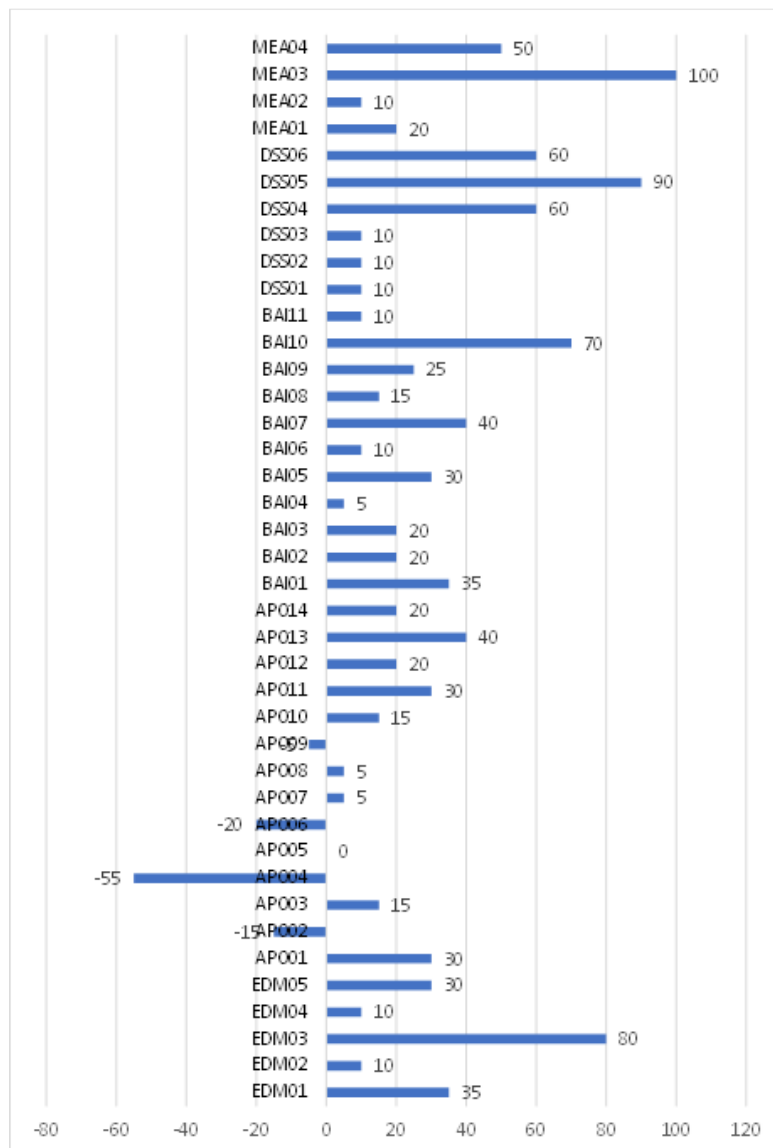

Fig 12. Result From All Design Factors

After completing the identification of the overall design factor, the next step is to proceed to stage 3 the refinement of the organization's governance system. Refinement of the organization governance system at stage 3 is carried out based on the next remaining design factors. Not all design elements are applicable to all organizations at this stage, so they can be ignored. Improvements to the factor design at this stage are specifically carried out on the aspect of compliance requirements. In the SPBE implementation, a national policy has been established that regulates obligations for the implementation of SPBE management in 8 areas of management including asset management, data, risk, information security, HR, service, change, and knowledge. At the end of stage 3, The organization identified many potential improvements to its initial governance system and put them all together on a canvas for integration in stage 4 of the design workflow. The results of design factor refinement at stage 3 can be seen in Figure 13.

As the final stage in the organization's IT governance system design process, stage 4 combines all the inputs from the previous stages to design a final comprehensive governance system. This final governance system will produce IT governance and management practices and objectives in accordance with the characteristics of the organization. The results of the governance system design can be used as a guide or reference for implementation in the organization.
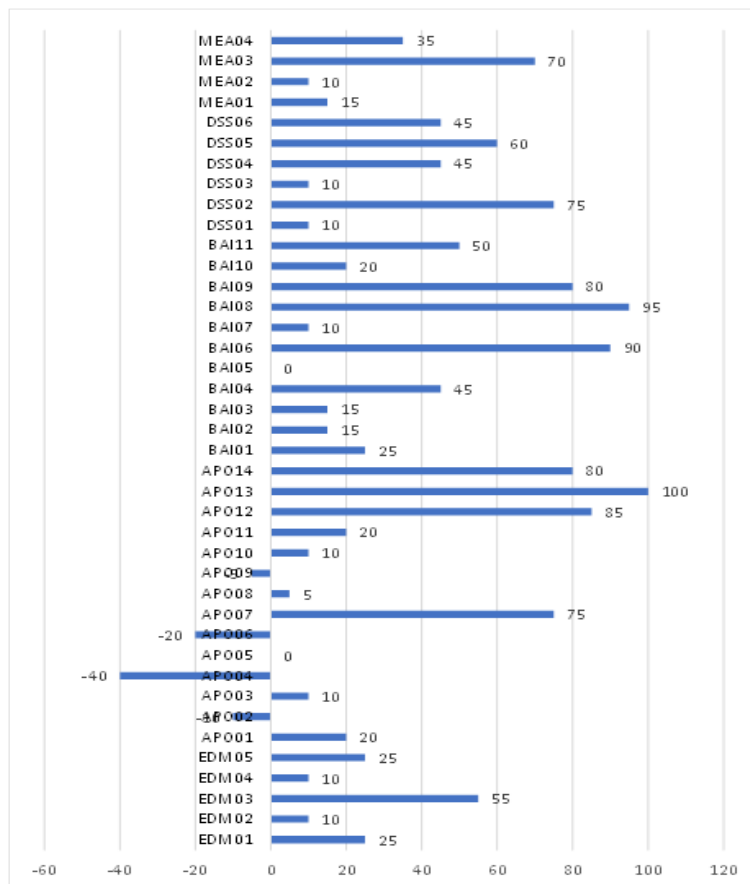

Fig 13. Result From All Design Factors After Refinement

This study was conducted using approach that can be taken to design an IT governance system in an organization is using COBIT 2019 process known as "designing the governance system for enterprise". From the results of the stages prior to refinement, the results obtained from several practices and objectives that have high scores indicate their suitability and importance to be implemented by organizations which include: MEA 03 Managed Compliance with External Requirement, DSS 05 Managed Security Services, EDM 03 Ensured Risk Optimization, APO 12 Managed Risk, APO 13 Managed Security, BAI 11 Managed Project, BAI 04, Availability & Capacity Management, DSS 04 Managed Continuity and DSS 06 Managed Business Process Control.

Refinement to the design factor in this study is specifically carried out on the aspect of compliance requirements. In the SPBE implementation, a national policy has been established that regulates obligations for the implementation of SPBE management in 8 areas of management including asset management, data, risk, information security, HR, service, change, and knowledge. Based on initial identification before refinement, APO 12 Managed Risk, and APO 13 Managed Security are already included. Based on the results of the refinement, it was obtained IT objectives or practices according to COBIT 2019 which were identified as appropriate, having the highest scores are: APO 13 Managed Security, BAI 08 Managed Knowledge, BAI 06 Managed IT Change, APO 12 Managed Risk, BAI 09 Managed Asset, APO 14 Managed Data, DSS 02 Managed Service Request and Incident, APO 07 Managed Human Resources, MEA 03 Managed Compliance with External Requirement, DSS 05 Managed Security Services, EDM 03 Ensured Risk Optimization and BAI 11 Managed Project. Based on the results obtained, all SPBE management practices according to government policies are still accommodated.

There are several proposed IT governance and management practices in addition to those that are in accordance with the policies, namely: MEA 03 Managed Compliance with External Requirement, DSS 05 Managed Security Services, EDM 03 Ensured Risk Optimization, and BAI 11 Managed Project. The COBIT 2019 explains that a design factor score of 80 and above requires a capability level of 4, while 40 requires a capability level of 3. Based on this, the organization's IT Governance and Management Objectives and practices which must have a capability level of 4 are APO 13 Managed Security, APO 12 Managed Risk, BAI 08 Managed Knowledge, BAI 06 Managed IT Change, and BAI 09 Managed Asset. IT Governance and Management Objectives and practices that must have a capability level of 3 are APO 14 Managed Data, DSS 02 Managed Service Request and Incident, APO 07 Managed Human Resources, MEA 03 Managed Compliance with External Requirement, DSS 05 Managed Security Services, EDM 03 Ensured Risk Optimization, and BAI 11 Managed Project.

Based on the results of this study, the final results were obtained after the refinement process which showed that all IT governance and management practices in accordance with the SPBE policy had been fully fulfilled including risk management, (APO12), information security management (APO 13), data management (APO 14), IT asset management (BAI 09), service management (DSS 02), change management (BAI 06), knowledge management (BAI 08), HR management (APO 07). Based on this research, the results show that there are several other IT governance and management practices that are important and need to be implemented by organizations, including MEA 03 Managed Compliance with External Requirement, DSS 05 Managed Security Services, EDM 03 Ensured Risk Optimization, and BAI 11 Managed Project. All IT management practices in accordance with SPBE regulations have been identified and some have a high score indicating that Indonesia's SPBE management policies are appropriate and good. However, to identify other practices that are needed and in accordance with the characteristics of the organization, adjustments must still be made to identify other necessary governance and management practices. This is in accordance with the facts explained in COBIT 2019.

IV. CONCLUSION

Based on the results of the study, shows that the COBIT 2019 process known as the "Designing the Governance System for Enterprise" approach can be used to design organizational government systems by identifying IT government and management objectives that are in accordance with the conditions, characteristics, and needs of the organization. Based on the final results after the refinement of the design factor, it shows that the proposed IT objectives and practices in the organizational environment that meets compliance requirements which are mandatory according to regulations are: APO 13 Managed Security, APO 12 Managed Risk, BAI 08 Managed Knowledge, BAI 06 Managed IT Change, BAI 09 Managed Asset, APO 14 Managed Data, DSS 02 Managed Service Request and Incident, and APO 07 Managed Human Resources. However, adjustments still need to be made by adding a number of practices that are in accordance with the characteristics of the organization which are: MEA 03 Managed Compliance with External Requirements, DSS 05 Managed Security Services, EDM 03 Ensured Risk Optimization, and BAI 11 Managed Project. This becomes the novelty of this research in identifying appropriate government and management objectives in the Province of West Java, Republic of Indonesia. Implementation of IT governance and management objectives in accordance with the design is expected to support the role of IT in achieving company goals. Further research that can be carried out is how successful the implementation of IT governance and management practices is in accordance with the policy directives and research proposals, whether it can bring better IT

performance improvements and contribute to improving IT services and achieving overall organizational goals whether it can bring better IT performance improvements and contribute to improving IT services and achieving overall organizational goals

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