**DESIGNING OF GOVERNMENT RESOURCE MANAGEMENT SYSTEM (GRMS) USING THE COBIT 2019 FRAMEWORK FOR SMART CITY**

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**Abstract**

*Government Resources Management System is a digital application information system that is integrated with each other, the design of the Government Resources Management System (GRMS) governance is carried out with the aim of maximizing the importance of implementing IT, it requires an appropriate understanding of how the information system works, what technology is used and also the information system developed, management and manufacture of IT systems requires a guide that regulates how to use IT in the organization. In this case the party related to the design of the GRMS is the Office of Communication and Information (DISKOMINFO) which is an agency that carries out government duties in the field of communication and also Information Technology, one of the main goals of which is to create a Smart City. In this governance design using the COBIT 2019 framework with the identification of 11 governance design design factors obtained with the help of the COBIT 2019 design toolkit. The results obtained at DISKOMINFO Salatiga resulted in 9 relevant and accurate processes with the criteria of the assessment carried out. Based on these results, recommendations can be made in the form of designing a Government Resources Management System (GRMS) to create a Smart City.*

**Keywords:** Government Resouces Management System, Information Technology Governance, COBIT 2019 Framework, Design Factors, Smart City.

1.**Introduction.** The rapid development of the digital era affects the rapid development of the digital era affects the way of human life. Almost all aspects of human life are influenced by the development of increasingly modern technology. The development of digital technology affects the governance, economic, educational, cultural and political aspects of a country. This development encourages the transformation of human activities towards digitalization. The use of information technology by central and local governments requires specialized management, reliable resources, significant costs, and a high risk of failure if IT itself is disrupted. When it comes to IT in a governance environment, good governance is necessary to get the most out of it. IT governance is done to ensure that IT implementation truly supports the objectives and focuses on improving efficiency and appropriate resources [1] [2].

Innovative organizations often face great challenges, but innovate to improve the quality and dignity of public services. Integrated digital application system, often abbreviated as Government Resource Management System or GRMS [3-4]. In this case, Salatiga continues to develop various innovations, bureaucratic reforms, and improving the quality of human resources to become a smart city [5]. The obstacles faced by Salatiga Government Office related to the duties and functions of regional devices are that there are still many public services that have not utilized information technology and the uneven capabilities and infrastructure of information and communication technology of the community. In order to maximize the implementation of good technology governance, Salatiga Government Office needs a framework that can be used as an appropriate standardization. COBIT 2019 is the most complete governance framework for reference in making governance and information technology management [6-8], because there are already modules that are represented when we want to design information technology governance both within the scope of government and companies [9-12].

2. **Literature Review.** Government resource management systems (GRMS) are essential tools for public organizations to manage their resources effectively and efficiently. In this literature review, we will explore some of the key research on GRMS, including their benefits, challenges, and best practices [13]. COBIT 2019 provides a comprehensive set of guidelines and best practices to help organizations effectively manage their IT-related risks and optimize the use of technology to achieve their business goals. COBIT 2019 framework can be a valuable tool for designing effective IT governance in smart cities. By following its guidelines and best practices, cities can ensure that their IT systems are secure, reliable, and aligned with their goals and objectives, ultimately delivering real value to citizens. [14].

3. **Research Methodology.** Governance Resources Management System (GRMS) will focus on designing governance as a standard, guide and also a tool in the city government's efforts towards good governance [15] which in the end can realize a smart city. Referring to it then the approach that will be used in this study is a qualitative approach. Where research is carried out to obtain an overview of the e-Government system that has been run, is being developed or that has not been implemented properly.

3.1. **Planning**

At this stage of research and planning, we will identify problems first regarding what information technology is currently used, especially in the e-Government sector, in identifying related problems, information about technologies that are currently running or that have not been implemented properly is needed, therefore with a qualitative approach method, an interview with the relevant and competent sector is needed.

3.2. **Data Collection**

The next stage is data collection where at this stage after making a list of questions, an interview will be conducted with the sector concerned, after conducting a series of interviews, the results of the interview are documented and a narrative is formed so that it is easy to analyze the interview data.

3.3. **Governance Design**

The first governance design phase understands the organizational situation and strategy acquired in the previous phase, and builds on the COBIT Design Factor Standard 2019 to understand the organization's strategy, goals, and emerging issues related to information technology.

4. **Result and Discussion**

4.1. **Establishing the Initial Scope of Governance**

The identification results based on interviews, observations and also supporting documents are implemented into the COBIT 2019 factor design toolkit as follows: in design factor 1, this represents the strategy of an organization or company, each organization certainly has differences in the basic modeling of its strategy. Organizational strategy consists of 4 types, namely growth / acquisition, innovation / differentiation, cost-leadership and client service/stability. The results of the identification of design factor 1 in DISKOMINFO Salatiga can be seen in Fig. 1.

Figure 1. Enterprise strategy design factors

Based on Fig. 1 above, the focus of interest of DISKOMINFO Salatiga for organizational strategy is on client services/stability points which are worth 5, the assessment is based on the objectives and main focus of DISKOMINFO Salatiga which is stated in its vision and mission, namely "Improving the quality of public services and realizing good governance". In addition, growth is worth 3 because DISKOMINFO Salatiga will continue to develop both in governance and public services. Innovation is also included in the Salatiga DISKOMINFO strategy but in this case it does not make the main focus because basically the innovations made depend on the needs of the public. The value of cost leadership has point 1 because basically DISKOMINFO is a government service institution that operates according to agencies and facilities from the center regardless of how much costs are incurred.

In design factor 2, the strategy of an organization is used to achieve a set of goals. This goal can be described in the COBIT 2019 framework on the design of factor 2 Enterprise Goals, the identification results are as follows.

Figure 2. Enterprise goals design factors

Based on Fig. 2, it can be seen that the main focus of DISKOMINFO Salatiga is the customer-oriented services dimension contained in EG05-EG07 with point 4. Furthermore, in the dimension of compliance with the law contained in EG03, it also gets point 4 because as a government institution the duties and work under the orders of the central institute.

In design factor 3 is the identification of risks contained in an organization, the risk profile is a current issue related to IT that is currently being faced and indicates the most at-risk areas. There are 11 risk categories that must be considered, along with the results of the identification of risk profiles at DISKOMINFO Salatiga. Based on Fig. 3, the highest value is 25 which has a big influence if the risk occurs, the Logical attacks and Data & information management categories are assets that must be maintained and managed properly by DISKOMINFO because if there is hacking or data leakage will be very fatal as a result, population data, especially if it has entered the scope of the big data will be fatal to the government as well as the people. Furthermore, the technology-based innovation category also needs to be planned carefully, lest the existence of technology will actually complicate and complicate DISKOMINFO Salatiga in order to achieve the vision and mission and towards a smart city.

Figure 3. Risk profile design factors

Design factor 4 identifies a review of the problems currently faced by DISKOMINFO Salatiga, in this stage it is an assessment of the organization's IT by considering the IT-related issues or problems currently experienced.

Figure 4. I&T related issues design factors

The following is the result of the identification of IT assessments that are currently occurring. Based on Fig. 4, the most common issues experienced by DISKOMINFO are IT-related issues, including the lack of optimal implementation of pre-planned innovations, as well as the lack of ability from staff to be able to maximize technology to make innovations that can facilitate and assist in the management of government and also public services. In terms of data management, DISKOMINFO is also not optimal, especially in terms of managing big data and along with the security system.

4.2. **Improving the Scope of the Governance System**

The identification results based on interviews, observations and also supporting documents are implemented into the COBIT 2019 factor design toolkit as follows: Design factor 5 is a threat view that can be useful in identifying threats that can be at risk in the Salatiga DISKOMINFO operation. The identification results can be seen in Fig. 5.

Figure 5. Threat landscape

Based on Fig. 5, the percentage of normal threats to DISKOMINFO is 70% this is based on the results of the identification that has been carried out, namely in carrying out its duties and obligations DISKOMINFO Salatiga can still control operational threats which include disruption of internet connections, electrical problems and problematic devices. Furthermore, this 30% range is an external threat that can interfere with operations, one of which is system failure and data leakage.

The design factor 6 Compliance Requirements are the compliance requirements that underlie an organization in carrying out its obligations and duties. The identification results can be seen in Fig. 6 below.

Figure 6. Compliance requirements

Based on Fig. 6, the percentage of normal compliance requirements at DISKOMINFO Salatiga is 60% because in its operations it has met the general requirements of the public and the government system based on applicable government regulations. The high percentage of requirements is 40% because in managing data and other supporting resource, there needs to be strict mechanisms and legal licensing.

Design factor 7 is the role of Information Technology for an organization. The identification results can be seen in Fig. 7 below.

Figure 7. Role of IT

Based on Fig. 7, the support and factory sectionget 4 assessment points because DISKOMINFO uses Information Technology in operating and carrying out its obligations and duties as a manager in the government system and also public services. Furthermore, strategic gets point 5 because the use of IT has a significant influence considering that DISKOMINFO is an institution that designs and implements IT into the digitalization era.

In design factor 8 is the procurement adopted by an organization. The identification results can be seen in Fig. 8 below.

Figure 8. IT sourcing model

The outsourcing percentage is worth 30% because some of DISKOMINFO Salatiga's IT services use third-party services to provide IT services, such as Internet services and Application development assistance. Also, cloud sharing is worth 30%. because DISKOMINFO stores data no longer in the form of files but in the form of cloud storage.

Design factor 9 is what method is adopted by the organization in implementing IT. The identification results can be seen in Fig. 9.

Figure 9. Implementation methods

Based on the results of the picture above, DISKOMINFO applies Agile development in formulating and also implementing information technology so that it gets a percentage of 90%. The DevOps share is worth 10% because DISKOMINFO also implements how DevOps works to build, deploy and operate software. This design factor is a strategy used by organizations in adopting new technologies used. The results of the identification of design factors can be seen from Fig. 10 below. Based on the identification results, the follower share is worth 50% because in DISKOMINFO Salatiga most of the innovations from the technology used follow from technology that has been developed from DISKOMINFO other big cities which will later be tried to be implemented to Salatiga. Furthermore, in the slow adapter section, it gets a 30% value because the Salatiga DISKOMINFO needs time to be able to adopt the technology that will be used whether it will be relevant to the state of Salatiga.

Figure 10. Technology adaption strategy

4.3. **Governance System Design Results**

Gathering input from the previous step will be used to complete the governance system design. The resulting IT governance design is in the form of a core model with priority objectives and functional levels. COBIT 2019 describes key processes based on priority and target capability level. A process with a priority score or score of >=75 has a capability level target of 4. Priority or process scores with a score of >=50 to <75 have a capability level target of 3. Priority scores or processes with a score of >=25 to <50 have a Level 2 capability target. 25, the process must reach the level 1 capability target. The results of the IT governance design obtained can be seen from the following Fig. 11. The results of the governance design are obtained from the identification at stages of design factor 1 to design factor 10 that have been carried out previously. A high positive value means that the process is a major focus for DISKOMINFO Salatiga. Then for the negative, it means that the process is not the main focus for DISKOMINFO Salatiga. The core model or main focus on DISKOMINFO Salatiga with known values ≥50 is APO12, APO14, BAI02, BAI03, BAI06, BAI07, BAI10, BAI11, DSS05.

Figure 11. Governance design results

5. **Conclusions.** This study was conducted to identify design factors that can affect governance and provide a workflow for planning appropriate and relevant governance structures for salatiga disco information. The results of planning or governance design at DISKOMINFO Salatiga produce nine very important processes by which evaluation criteria are applied. Processes with level 3 capability targets include APO12, APO14, BAI02, BAI07, BAI10, BAI11 and also DSS05. Furthermore, the targets that are at level 4 capabilities are BAI03 and BAI06 where these two processes are related to determining solutions, designing and implementing according to needs and managing all changes related to changes in digitalization related to business processes and organizational infrastructure. The results of the IT governance design research can be given a recommendation suggestion that DISKOMINFO Salatiga requires the design of a Government Resources Management System (GRMS) in order to realize a Smart City. Furthermore, from the research on governance planning of the Government Resources Management System at DISKOMINFO Salatiga, it can be further implemented in the next research to improve and improve the level of IT governance capabilities at DISKOMINFO Salatiga.

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**REFERENCES**

1. A. Rocky Tanaamah, A. Fritz Wijaya, S. Ayu Maylinda, U. Kristen Satya Wacana, and P. Correspondence, “Information Technology Governance in the Public Sector: Alignment of Information Technology with Leadership Vision (Case Study: Salatiga City and Bengkayang Regency) Information Technology Governance in the Public Sector: Information Technology Alignment Wi,” vol. 8, No. 6, pp. 1319–1330, 2021, doi: 10.25126/jtiik.202185379.
2. L. N. Amali, “Effective IT Governance in Local Government Organizations,” *semin. Nas. Sist. Inf. Indones.*, pp. 37–43, 2013.
3. E. H. Fanida and F. Niswah, “Government Resource Management System (Grms): Public Service Innovation in Regional Financial Management in Surabaya City Government,” *Publik, J. Adm.*, vol. 12, no. April, pp. 35–44, 2015.
4. M. Huda, “Public Service Management Innovation through Government Resources Management System (GRMS) in Central Java Province,” *JPW (Journal of Polit. Walisongo)*, vol. 2, no. 2, pp. 67–82, 2020, doi: 10.21580/jpw.v2i2.6658.
5. N. Widodo, “Development of e-Government in Local Government in the Context of Realizing Smart City (Study in Malang City Local Government),” *J. Ilm. Adm. Publik*, vol. 2, no. 4, pp. 227–235, 2016, doi: 10.21776/ub.jiap.2016.002.04.15.
6. ISACA, “COBIT 2019 Governance System Design Workbook — Instructions COBIT ® ® 2019 Governance System Design Workbook — Instructions,” 2020.
7. ISACA, “COBIT® 2019: Designing an Information and Technology Governance Solution,” 2018.
8. S. Y. Lee, A. Ramasamy, and J. H. Rhee, “Introduction and Methodology,” 2014. doi: 10.1007/978-3-642-55058-4\_1.
9. M. Gilang Ginanjar, L. Ramadani, and R. Adhitya Nugraha, “Designing Information Technology Governance Using the Cobit 2019 Framework at DISKOMINFOSAN Sukabumi Regency,” *Smart Comp Jurnal nya Orang Pint. Compute.* , vol. 10, no. 3, pp. 160–166, 2021, doi: 10.30591/smartcomp.v10i3.2943.
10. E. Nachrowi, Y. Nurhadryani, and H. Sukoco, “Evaluation of Governance and Management of Information Technology Services Using Cobit 2019 and ITIL 4,” *J. RESTI (Engineering Sist. and Teknol. Information)*, vol. 4, no. 4, pp. 764–774, 2020, doi: 10.29207/resti.v4i4.2265.
11. M. Solehuddin et al., “Information Technology Governance Planning Using the Cobit 2019 Framework on DPMPTSP,” *J. Ilm. Computing*, vol. 20, no. 2, pp. 155–164, 2021, doi: 10.32409/jikstik.20.2.2750.
12. S. Fitrasha Bayastura, S. Krisdina, and A. Puji Widodo, “Information Technology Governance Analysis Using the Cobit 2019 Framework at Pt. Xyz,” *JIKO (Inform. Journal and Computers)*, vol. 4, no. 1, pp. 68–75, 2021, doi: 10.33387/jiko.v4i1.2977.
13. S. E. Condrey, “Human Resource Management in Government Second Edition,” *A Wiley Imprint*, 2015.
14. H. Hammanur, A. P. Irfan, M. Musyirifah, “Mapping IT Governance Based on COBIT 2019 on the Enterprise System Architecture Smart Tourism PT. YoY Management International,” *J-Icon: Jurnal Komputer dan Informatikam*, 2022.
15. R. Khoirunnisak, D. Arishanti, and D. D. Vebrianti, “Application of Surabaya City Government E-Budgeting in Achieving Good Governance,” *Pros. Lemonmen. Nas. and Call Pap. Economy. and Business*, vol. 2017, pp. 249–250, 2017, [Online].