Information and Technology Governance Capability Analysis: Case Study of CV Wirelessindo

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ABSTRACT

Keywords: IT governance, cobit 2019, IT service provider.

The implementation of information and technology (IT) supports company sustainability. Large companies use IT as an integral part of their business model. Digital strategies must align with business strategies to achieve sustainability. Wirelessindo, established in 2007, provides IT solutions such as equipment, site surveys, network design and security, and tower installations. Its mission is to increase company productivity to win the competition in the era of Industry 4.0. It is used to enhance customer service and internal business process efficiency. Initial investigations found issues with IT function mismatches, financial losses due to data loss, IT equipment installation and configuration errors, and business process incidents caused by emerging risks. Identified root problems include employee knowledge gaps, risk management disparities, errors in defining business needs, and change management gaps. Based on these findings, IT governance evaluation was chosen as the research focus. This study aims to provide an overview of CV Wirelessindo IT capability levels and recommend improvements to meet expected levels. A mixed-method approach and COBIT 2019 were used in this study. The General Manager, IT Division Manager, Software Development Team, Network Monitoring Team, Project Manager, and HR Manager were selected as respondents based on the RACI chart guidelines. Of the nine selected objectives, BAI08 showed level 0. APO12, BAI02, BAI06, BAI07, and DSS01 showed level 1. APO07, BAI10, and DSS03 showed capability level 2. Therefore, 61 recommendations were provided to raise the IT governance capability level to level 3 for all objectives.

Introduction

The implementation of Information Technology (IT) brings added value and new opportunities to maintain sustainability for companies (Vidmar, Marolt, & Pucihar, 2021). The need to place IT as a medium to maintain corporate sustainability has already been practiced by large companies. It becomes an integral part of maintaining a

sustainable business model. Therefore, a company's digital strategy needs to be aligned with its business strategy. If this is realized, it will create the potential to build a more sustainable business model (Ramadhana, Izaac, Tangka, & Mambu, 2023).

Wirelessindo is an IT solutions provider company that has been established since 2007. Wirelessindo's business activities include providing equipment, site surveys, determining frequencies, network design, network security, installation, as well as tower and grounding solutions. One of Wirelessindo's missions is "To increase company productivity to be ready to win the competition in the era of the industrial revolution 4.0." Therefore, IT is utilized in Wirelessindo's business processes both to enhance service performance to customers and to improve the effectiveness of internal business processes.

As a company operating as an IT solutions provider, Wirelessindo is not immune to issues in its daily business processes. Therefore, problem identification through interviews is conducted to provide solutions to existing problems. The problem identification is carried out from the perspective of IT governance. Consequently, the interviewees are managers and staff from the IT Division of Wirelessindo. This aims to ensure that the interviewees have sufficient knowledge regarding the implementation and utilization of IT at Wirelessindo.

The interview was conducted from the perspective of IT governance in the company. Therefore, the findings obtained are grouped based on focus areas in IT governance (Putra, Sunyoto, & Nasiri, 2020). The focus areas of IT governance include strategic alignment, the added value provided by information technology (IT), resource management, risk management, and performance management. The results of incidents based on interviews recapped on Tabel I.

Table I
Incident, Problem, and Focus Area

No.	Incident	Problem	Focus Area
1	The E-Invoice application lacks the template selection feature needed for business processes.	Functions of IT that do not align with business needs result in time losses.	The added value provided by information technology (IT)
2	The E-Archive application does not contain important data that should be included.	Losing critical data can result in financial losses for a company.	Risk management
3	Errors in the installation and configuration of devices from the established settings.	Errors in the installation and configuration of IT devices result in a decrease in SLA ratings.	Resource management
4	Prolonged server downtime due to rain incidents.	Business processes halt during a disaster.	Risk management

Their study on IT governance for healthcare organizations, (Alharbi, Sabra, Alharbe, & Almajed, 2022) grouped determinant components into six categories: Regulation, IT Services, Strategy, IT Infrastructure, Organization, and Human. Strategy involves alignment steps between IT development, IT governance, and its business processes. IT Services encompass the activities of running IT services. IT Infrastructure refers to the components or tools used for providing IT services. Human includes human factors involved in the development, management, and implementation of provided IT services. Organization pertains to organizational interests in conducting business processes. Meanwhile, regulation adheres to policies and regulations that must be complied with both internally and externally. After determining the existing scope, the existing issues can be mapped in a diagram. The Fishbone Diagram, a graphical technique used to show several causes of a particular event (Coccia, 2020), is commonly used for cause-and-effect analysis to identify complex interactions of the causes of a particular problem or event in management science. Therefore, the initial problem analysis with the identified root causes can be visualized with a Fishbone Diagram as shown in Fig 1 below.
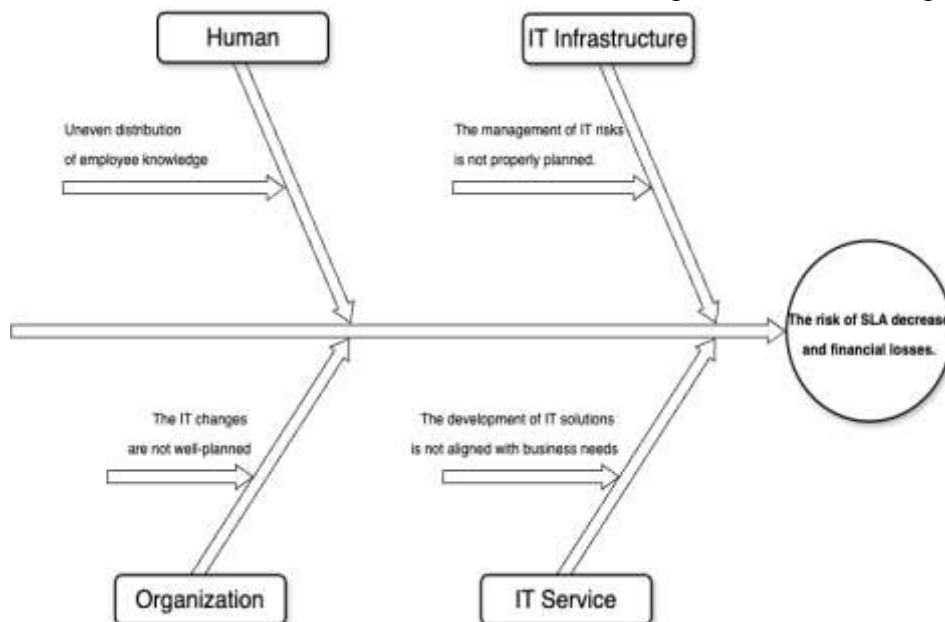

Fig 1 Fishbone Diagram

According to the analysis using the fishbone diagram, the issues that occur can be mapped based on the relevant dimensions. Upon further examination, these problems stem from IT governance that is not aligned and operationalized according to business needs. These issues fall within the focus areas of IT governance, such as adding value through IT, managing IT risks, and resource management (Arief, Natsir, Khairan, & Sensuse, 2020).

The research regarding IT governance in IT service companies has already been done in previous studies. (Martin, 2023) had already studied the IT Governance capability level using the COBIT 5 framework with EDM, DSS, and MEA as the focus of the study. (Imania, 2024) also had already done a study regarding IT governance evaluation on IT

service companies using COBIT 5 framework with the APO domain as the focus of the study. (Lubna, Muhammad, & Purwanto, 2023) also did a study identifying the level of IT governance and assessing the capability level of an IT service company using the COBIT 2019 framework, using the APO and DSS domain as the focus. Based on the description, the evaluation method and focus may differ, based on the needs of the subject company. Therefore, further studies regarding the IT governance capability level shall be done to determine the right method and the right solution.

This research was conducted to measure and evaluate the level of IT governance capability at CV Wirelessindo as an IT service company. The measurement results of this research are then used as a benchmark for researchers in proposing recommendations for improving governance that can be adapted by CV Wirelessindo. In addition to being aimed at improvement efforts for the object of research, it is also expected that this research will be useful for similar studies or other research focusing on the field of IT governance.

Research Methods

The case study in this research is CV Wirelessindo in Bogor City. The research focuses on the process of information technology governance at Wirelessindo to evaluate its management level. The evaluation results will be used as a basis for designing recommendations that can be implemented by CV Wirelessindo. It is hoped that the recommendations provided will have a positive impact by improving information technology governance in the company.

This research utilizes a mixed-method approach (Dawadi, Shrestha, & Giri, 2021). Qualitative methods are employed in the exploration phase, questionnaire development, collection of additional information, and necessary validation in research design. Meanwhile, the quantitative approach is implemented to collect data from questionnaires and calculate the level of IT governance capability. The research is designed by leveraging information from literature, documents, interviews, and questionnaires. Data from interviews and questionnaires are collected both directly and on online platforms such as Google Meet with stakeholders.

This approach aligns with the COBIT 2019 framework (ISACA, 2018a), which serves as the primary basis for data collection. Data to measure management level is collected through questionnaire completion. The questionnaires are filled out using interview methodology with guidance during completion to prevent misinterpretation by respondents, considering their content within the COBIT 2019 framework may be subject to debate. Questionnaire respondents are selected based on the RACI chart guideline, focusing on the IT Division and relevant parties directly involved with the IT Division at Wirelessindo to ensure precise targeting.

Objective Determination Phase

There is a new method introduced by Goals Cascading in COBIT 2019 compared to COBIT 5 (Fernandes, Almeida, & Mira da Silva, 2020). COBIT 2019 presents a methodology for prioritizing specific management objectives to align with the needs of

the organization. This methodology addresses accuracy issues present in COBIT 5. Thus, the Goals Cascading steps in COBIT 2019 are as follows (ISACA, 2018):

1. Mapping stakeholder needs to COBIT 2019 Enterprise Goals,
2. Mapping Enterprise Goals to COBIT 2019 Alignment Goals,
3. Mapping Alignment Goals to COBIT 2019 Governance Objectives and Management Objectives,
4. Prioritizing governance and management objectives according to the company's needs.

Stakeholder needs represent the needs of the company. These needs can include the company's vision, mission, or strategic goals (Nyoto & Nyoto, 2023). Meanwhile, the prioritization of governance and management objectives can be adjusted according to the goals or issues faced by the company related to IT governance. This aligns with the flexible methodology offered by COBIT 2019.

Data Collection Phase

After the prioritized governance and management objectives are concluded, the next phase shall be the data collection. The data collection was carried out by completing questionnaires on-site, and the questionnaires were filled out by the author based on the results of interviews and discussions with respondents. All involved respondents completed the questionnaires. Purposive sampling was used to determine the research informants based on their specialties (Mweshi & Sakyi, 2020).

Results and Discussion

The method of processing the questionnaire filling data is as follows:

1. If the level has not been determined, then:

The initial stage is to determine the level, which begins by calculating the questionnaire for capability level 2 from respondents 1 to N. After obtaining the questionnaire as shown in TABLE VIII, the ranking calculation is carried out.

Table 2
Rating Illustration

Objective	Level 0	Level 1	Level 2	Level 3	Level 4	Level 5
ABCXX						
Criteria Rating	FALSE	80% (L)				
Capability Level Achieved	-	1				

In the (1) formula used, "Number of Activities Performed" refers to the total "Yes" answer in the questionnaire. The "Total Activity" label in the measurement formula reflects the total of all activities for a capability level. For example, if four activities receive a "Yes" answer out of a total of five activities at capability level 2, then "Number

of Activities Performed" is 4, and "Total Number of Activities" is 5. This calculation will yield a value of 80% as the rating amount. The rating amount will be converted into one of the four ranking categories (N, P, L, F) as the result of the ranking measurement which is then displayed in the ranking results table as illustrated in Table 2.

2. If has not reached level 1 or the measurement results from the level 2 capability questionnaire ≤ 50%, then:

If the results of the rating measurement show a value of N or P, this indicates that capability level 1 has not been reached, therefore the achievement of capability is at level 0.

3. If has reached level 1 or the measurement results from the level 2 capability questionnaire > 50%, then:

If the results of the rating measure reach an "F" value, this indicates that the distribution of the questionnaire for the next level of capability can be continued. However, if the rating magnitude shows an "L" value, this indicates that the level of capability achieved is level 1, and there is no need to proceed to the deployment of the follow-up questionnaire.

4. If an advanced questionnaire is deployed, the data processing process returns to the first step, but the X level increases to level (X + 1) or corresponds to the level of measurement being analyzed.

After the data is processed and converted into recommendations, the last stage is to validate the recommendations. This activity is carried out to find out whether the recommendations can be accepted by stakeholders (Martin, 2023). In this study, the IT Division Manager of CV Wirelessindo was selected as a respondent using the purposive sampling method. This is because the IT Division Manager is interested in managing information technology in the company. Interviews are conducted to obtain information from each recommendation given. Illustrations of the information provided are in Table 3.

Table 3
Validation Recommendation Illustration

Validation Recommendations	Activity	Not Required	Not Capable	Capable with efforts	Fully Capable	Information
ABCXX Efforts Recommendations Towards Level 3	Provide employee training on performance and behavior upheld by the company.			Y		Training needs careful planning because it has to match the schedule of each branch

The recommendations given can be grouped into four categories: (1) not required, (2) not capable, (3) capable with effort, and (4) fully capable (Setiyowati, 2019). If the answer is between (1) to (3), Things that hinder the company from being able to carry out

the recommendations given can be taken from the results of the validation of recommendations that are not fully capable.

The selected COBIT 2019 objectives were used as the basis for creating the questionnaire. To identify these objectives, the process started by matching XYZ's strategic alignment with COBIT 2019's Enterprise Goals (EG). Eleven strategic alignments (SA) were identified from XYZ's Company Profile documents. There are 13 Enterprise Goals for COBIT 2019 (ISACA, 2018b). From this alignment, EG01, EG02, EG05, EG06, EG08, EG10, and EG13 were identified as the relevant Enterprise Goals. The mapping of strategic alignment into enterprise goals is shown in Fig 2.
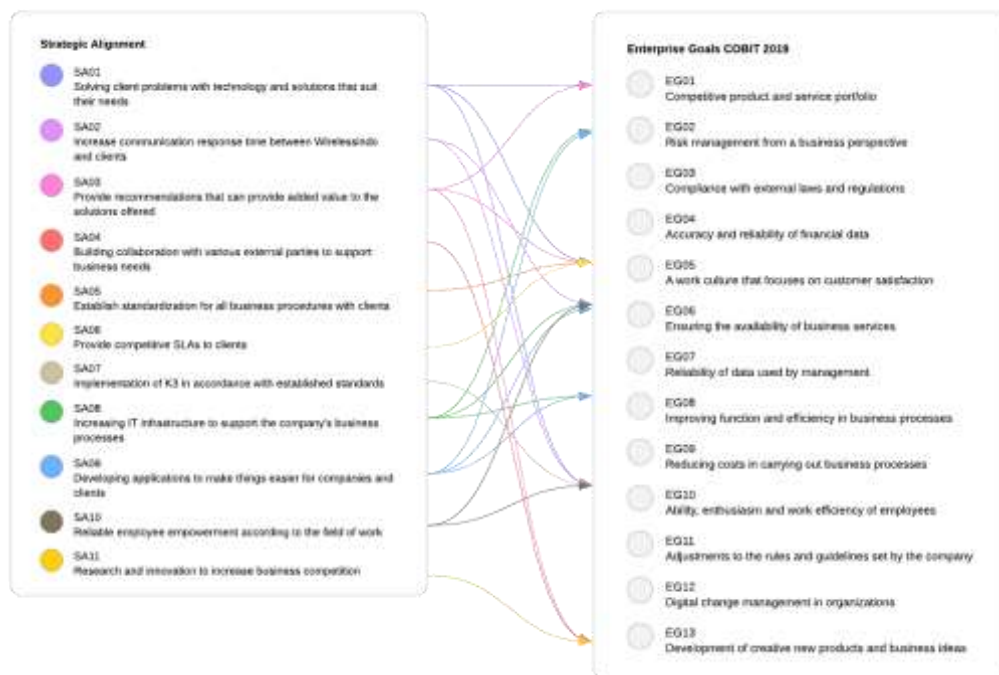

Fig 2 Strategic Alignment to Enterprise Goals Alignment

Next is the mapping between the selected enterprise goals to the alignment goals of COBIT 2019. The mapping carried out on seven enterprise goals resulted in eight selected alignment goal points from the COBIT 2019 framework: AG02, AG05, AG06, AG07, AG08, AG09, AG12, AG13. The eight selected alignment goal points are marked with a green line in the "COBIT 2019 Alignment Goals 2019" column. A summary of the results of this mapping is listed in Table 4.

Table 4
Mapping of Enterprise Goals to Alignment Goals COBIT 2019

Alignment Goals COBIT 2019	Code	Code Enterprise Goals
IT compliance that supports business compliance with government or external laws and regulations	AG01	EG02-S
Organizational IT risk management	AG02	EG02-P, EG06-S
Realization of benefits from IT services investments and portfolios	AG03	EG01-S, EG05-S

Quality of the organization's financial information related to technology	AG04	
Delivery of information technology services that have been tailored to the business	AG05	EG01-P, EG05-S, EG06-S, EG08-S
Agility in transforming business needs into operational solutions	AG06	EG01-P, EG05-S, EG08-S, EG13-S
Information security, applications, infrastructure, and privacy security	AG07	EG02-P, EG06-P
Integration of applications and technology to support business processes	AG08	EG01-P, EG05-P, EG08-S, EG10-S, EG13-S
Timely program delivery, according to cost, quality standards, and business interests	AG09	EG01-P, EG05-S, EG08-S, EG13-S
Quality of IT information management	AG10	
IT compliance with internal rules and regulations	AG11	EG02-S
Competent employees who understand technology and business	AG12	EG05-S, EG10-P
Understanding, knowledge, and effort in building business innovation	AG13	EG01-P, EG13-P

Data collection at this stage was conducted using a questionnaire that included activities from the nine mapped objectives. The entire content of the questionnaire for the nine objectives was prepared based on the guidance in Chapter 4 (detailed guidance) from the book "COBIT 2019 Framework: Governance and Management Objectives" (ISACA, 2018a). The activities from the objectives listed in the guidance were translated and organized according to the objectives and their levels. The selection of respondents has been described in section II.II. The criteria for responsibility have been adjusted to match the scope of expertise and responsibilities at the case study location. Calculations performed on all objectives yield the following calculation results:

1. APO07 capability level 2 objective rating = $17/18 \times 100\% = 94,44\%$ (Fully).
2. APO07 capability level 3 objective rating = $6/12 \times 100\% = 50\%$ (Largely).
3. APO12 capability level 2 objective rating = $4/6 \times 100\% = 66,67\%$ (Largely)
4. BAI02 capability level 2 objective rating = $.4/5 \times 100\% = 80\%$ (Largely)
5. BAI06 capability level 2 objective rating = $4/8 \times 100\% = 50\%$ (Largely).
6. BAI07 capability level 2 objective rating = $11/22 \times 100\% = 50\%$ (Largely).
7. BAI08 capability level 2 objective rating = $0/5 \times 100\% = 0\%$ (Not).
8. BAI10 capability level 2 objective rating = $5/5 \times 100\% = 100\%$ (Fully).
9. BAI10 capability level 3 objective rating = $4/6 \times 100\% = 66,67\%$ (Largely).
10. DSS01 capability level 2 objective rating = $9/12 \times 100\% = 75\%$ (Largely).
11. DSS03 capability level 2 objective rating = $9/9 \times 100\% = 100\%$ (Fully).
12. DSS03 capability level 3 objective rating = $6/8 \times 100\% = 75\%$ (Largely).

The findings from each selected objective show a variation in the levels of IT governance capability at Wirelessindo. After calculation, it was found that out of the nine objectives, one objective has a capability level of 0, five objectives are at capability level 1, and three objectives are at capability level 2. Based on a confirmation interview with the IT Division Manager of Wirelessindo, it was revealed that the expected IT governance capability level is currently level 3 for all objectives. A summary of the findings regarding the capability levels and the expected capability levels is presented in Fig 3.
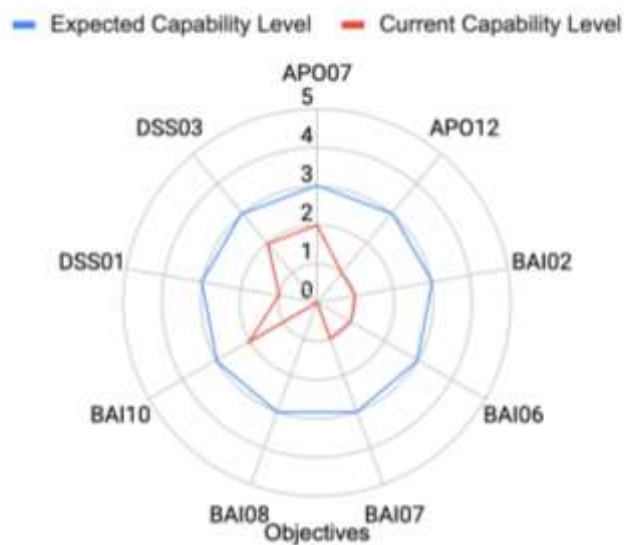

Fig 3 Findings on the IT Governance Capability Levels at CV Wirelessindo

The findings on objective APO07 (Managed Human Resource) indicate that seventeen out of eighteen activities at capability level 2 have been completed, resulting in a score of 94.44% (Fully). This is supported by various documents, including Meeting Minutes with All Wirelessindo Branches, Job Application Documents, Employee Recruitment Standards, Third-Party Work Contracts, Employee Work Contracts, and others. The questionnaire was then continued to capability level 3, where six out of twelve activities were completed, yielding a score of 50% (Largely). This is backed by Job Application Documents, Minutes of HR and Project Division Meetings, NSA Certification Documents, and others. The recommendation is given for the company to reach Level 3 on this objective mainly conducting training for employees, managing the knowledge in the company, and enhancing the evaluation activities for the employees. The calculations of the capability level are detailed in Table 5.

Table 5
Summary of Findings for Objective APO07

Objective	Level 0	Level 1	Level 2	Level 3	Level 4	Level 5

		Level 1	Level 2	
APO07	False if capability level =/> 1			
Criteria Rating	FALSE	94,44% (F)	50% (L)	
Achieved Capability Level	-	1	2	

The findings on objective DSS03 (Managed Problems) show that nine of the nine activities for level 2 capabilities have been carried out. Therefore, the objective rating at level 2 capability level reaches 100% (Fully). Supporting findings related to this are the existence of Auto Mail, Network Monitoring System Reports, Corrective Service Forms, Training Documents, and others. The next questionnaire is for assessing level 3 capability levels. Findings show that four of the six activities have been carried out. Therefore, the objective rating at level 3 capability level reaches 66.67% (Largely). This finding is supported by Visit Data Reports, Corrective Service Forms, Disturbance Reports, and others. This shows that the capability level for DSS03 is at level 2. The recommendation given for the company to reach Level 3 on this objective mainly prioritizes solutions for every problem based on the impact given and defining permanent change for every change management. The calculation regarding the objective capability level is according To Table 6.

Table 6
Summary of Findings for Objective DSS03

Objective	Level 0		Level 1	Level 2	Level 3	Level 4	Level 5
BAI10	False if capability level =/> 1						
Criteria Rating	FALSE		100% (F)	75% (L)			
Achieved Capability Level	-		1	2			

After recommendations for the company are formulated, the recommendations are then discussed with stakeholders at CV Wirelessindo. At this stage, the intended resource person is the IT Division Manager from Wirelessindo. The recommendations given are grouped into four categories: Not Required, Not Capable, Capable with Efforts, and Fully

Capable. Based on the results of the discussion of the 61 recommendations provided, the results are as follows:

1. Fully Capable with 51 recommendations.
2. Capable with Efforts 8 recommendations.
3. Two recommendations are Not Required.

To create documents, and procedures, and manage knowledge effectively, Wirelessindo must first organize its existing information and knowledge. Recommendations for training require additional effort because Wirelessindo's offices are spread across several branches, each with its schedule. Merging internal and external knowledge poses challenges since knowledge is a commodity in Wirelessindo's industry, necessitating careful budgeting to acquire valuable knowledge. Lastly, the recommendations for emergency changes and configuration matching are deemed unnecessary by Wirelessindo, as all IT changes are currently managed solely by the IT Division.

Conclusion

This research analyzes the IT capabilities at CV Wirelessindo by selecting nine objectives through a cascading goal process based on the company's strategic targets. Of the twenty-five objectives that correspond to cascading goals, nine were selected to address emerging IT problems. Research findings show the capability level of each objective, with BAI08 (Managed Knowledge) at level 0, APO12 (Managed Risk), BAI02 (Managed requirements definition), BAI06 (Managed IT Changes), BAI07 (Managed IT Change Acceptance and Testing), and DSS01 (Managed operations) at level 1, and APO07 (Managed human resources) and DSS03 (Managed problems) at level 2. Discussions revealed that CV Wirelessindo expects IT capabilities at level 3 for all selected objectives, but the results of the questionnaire show that none have yet been achieved. reach that level. Improvement recommendations are provided and validated to stakeholders, including steps to achieve IT capability level 3 in stages according to gaps in each objective, to ensure the possibility of future implementation.

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