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Comparison of Information Technology Governance Maturity Levels Based on COBIT 2019 at PT Kereta Commuter Indonesia in 2023 and 2024

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Abstract

This study aims to analyze and compare the maturity level of Information Technology (IT) governance at PT Kereta Commuter Indonesia (KCI) between 2023 and 2024 using the COBIT 2019 framework. The background of this study is based on the operational complexity of KCI which serves a high daily passenger volume, so that the information system becomes the backbone of the smooth transportation service. The method used is a descriptive-comparative case study with a mixed approach, through interviews, Likert scale questionnaires, and internal document reviews such as IT audit reports and government regulations. The results of the analysis show a significant and consistent increase, where the level of IT governance maturity which was previously at level 2 (Managed) and 3 (Defined) in 2023, increased to level 3 and 4 (Quantitatively Managed) in 2024. The most prominent improvements were seen in the strategic domain EDM01 (Ensure Governance Framework Setting) and the operational domain DSS01 (Manage Operations), which successfully reached level 4. This success reflects top management's commitment and ongoing internal evaluation in strengthening IT governance strategically and operationally. The research findings confirm that annual evaluations serve as an objective benchmark for identifying governance gaps, developing digital strategies, and determining future IT investment priorities. Overall, this study confirms that regular assessments can improve the effectiveness of data-driven IT transformation and ensure alignment of IT implementation with the company's business objectives.

Keywords: *Annual Evaluation, COBIT 2019, IT Governance, KCI, Maturity Level*

1. INTRODUCTION

The rapid development of information technology (IT) over the last two decades has fundamentally changed how organizations operate, innovate, and interact with stakeholders [1]. In this era of digital transformation, IT not only supports operational activities but also serves as a primary driver for creating strategic value and competitive advantage [2]. Therefore, effective IT Governance systems are essential for modern organizations to ensure that IT investments and usage truly support both short-term and long-term business objectives [3]. Information technology governance is a part of corporate governance that focuses on the management and assessment of strategic IT resources [30]. Therefore, many companies are allocating investments to remain competitive and relevant in today's new and evolving business era [31].

IT governance is a set of structures, processes, and mechanisms designed to align IT strategy with organizational strategy, as well as to control risks and ensure accountability in IT resource management [4]. Good IT governance enables organizations to improve operational efficiency, decision-making transparency, stronger internal controls, and flexibility in responding to dynamic business environments [5]. In this context, the COBIT 2019 (Control Objectives for Information and Related Technologies) framework has become one of the most widely adopted frameworks globally due to its holistic and

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structured approach [6][7]. Recommendations are made to improve the current state of SPBE IT governance [26]. For this reason, it is deemed necessary to implement a framework in information technology governance to ensure that the implementation of information technology is possible in the government system, maximizing all existing benefits, various risks to information technology can be managed correctly and appropriately, and all resources related to information technology can be used by government officials responsibly [29].

The purpose of COBIT is to develop, research, and publish a generally accepted and up-to-date information technology standard for use in daily business activities [32]. COBIT 2019 provides comprehensive guidance for IT governance and management that aligns with corporate governance principles and stakeholder needs [8]. This framework not only facilitates the measurement of IT governance capability and maturity levels but also helps organizations identify gaps and formulate data-driven improvement steps[9][10]. Various studies show that the use of COBIT 2019 significantly contributes to strengthening IT governance in various industry sectors. In logistics, this framework helps improve risk management efficiency and optimize IT resource allocation [11]. IT governance not only functions as support but is also a part or determinant of the success of an institution or company [21]. In the education sector, COBIT 2019 has been proven to improve system reporting accuracy and the effectiveness of digital services to students [12]. Governance involves various elements, such as IT strategic planning, organization, policies and procedures, risk management, information security management, IT service management, IT system development and management, and IT performance oversight and monitoring [33].

Meanwhile, in academic management, this framework can be used to objectively assess the capability of IT-based services [13], including in primary and secondary education environments. In the IT consulting industry, COBIT 2019 is also used as a basis for assessing the capability level of services offered to clients. In the healthcare sector, this framework plays an important role in strengthening control over patient data privacy and security [14]. The integration of COBIT 2019 with other standards such as ISO/IEC 38500:2015 is also common practice in order to obtain more accurate and comprehensive evaluation results [15]. The function of information technology is not only to improve operational levels but also to provide competitive benefits and added value [27]. IT governance is a set of procedures and processes aimed at ensuring that IT implementation supports the achievement of organizational goals by optimizing the benefits offered by IT, controlling the use of IT resources, and managing risks associated with IT [28].

Not only in the private sector, but this framework has also been widely implemented in public organizations, including in the transportation sector, which heavily relies on the reliability and integrity of IT systems. In the Indonesian context, PT Kereta Commuter Indonesia (KCI), as the main provider of KRL services in the Jabodetabek area, faces various challenges that demand adaptive, secure, and accountable IT management. The high daily passenger volume and operational complexity make information systems the backbone of smooth transportation services provided [16]. IS/IT governance can support an organization's competitive advantage in facing competition and increasing organizational productivity/performance [22]. Effective information system management can be done by utilizing a framework in an agency to be able to evaluate company performance, one of which is Manage Human Resource (APO07), because one of the management practices of the human resource management process is timely and regular performance evaluation against individual goals that come from what the company wants to achieve [25].

The need for routine evaluation of IT governance maturity levels is very important for KCI to ensure that IT management remains in line with regulatory demands, public expectations, and the company's digital strategy. Previous research indicates that annual evaluations of IT governance maturity levels can be an objective benchmark for assessing the progress of policy implementation and

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the effectiveness of internal controls in the transportation sector [17]. Therefore, this study aims to compare the IT governance maturity levels at PT Kereta Commuter Indonesia between 2023 and 2024 using the COBIT 2019 approach. This comparison of two periods is expected to reveal areas showing increased capability as well as areas experiencing stagnation or decline. The results of this evaluation are not only important as a form of internal accountability but also as a basis for strategic decision-making related to future IT investment priorities and the direction of KCI's digital infrastructure development [18]. As evidenced in various studies, such a longitudinal approach provides significant benefits in understanding IT implementation trends more comprehensively and sustainably [19] [20].

2. METHOD

This research employed a mixed-methods approach with a sequential explanatory design, beginning with the collection and analysis of quantitative data, followed by an in-depth exploration with qualitative data to gain a more comprehensive understanding. This approach was chosen for its ability to provide a complete picture of the information technology governance maturity level at PT Kereta Commuter Indonesia (PT KCI), while also explaining the contextual factors influencing the results. The research framework references the COBIT 2019 Design Guide, but was modified to suit the characteristics and needs of the public transportation sector.

The study commenced with the identification of relevant COBIT 2019 domains, namely EDM (Evaluate, Direct and Monitor), APO (Align, Plan, and Organize), and DSS (Deliver, Service, and Support). The selection of these domains was based on PT KCI's operational considerations, which emphasize strategic oversight, IT planning and organization, and user services and support. After the domains were determined, the next step was the development of research instruments. Questionnaire instruments were designed based on indicators in COBIT 2019 and utilized a 5-point Likert scale (0–4) as recommended by ISACA. Additionally, interview guides were developed with reference to the COBIT Goals Cascade to elicit in-depth understanding from management and IT staff regarding governance implementation.

Data collection was conducted in three forms: distributing questionnaires to IT staff and relevant managers, conducting semi-structured interviews with key informants, and reviewing internal documents such as IT audit reports, annual reports, and government regulations, including Permen BUMN No. PER-2/MBU/03/2023. Quantitative data obtained from the questionnaires were then analyzed to calculate the maturity level. Subsequently, a gap analysis was performed between the actual condition and the maturity targets expected by PT KCI management and minimum SOE standards.

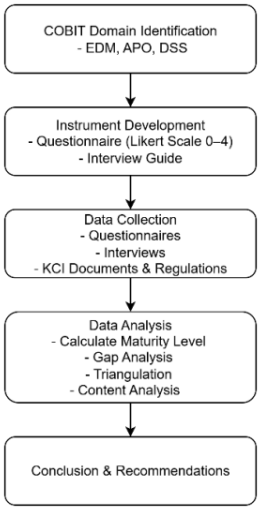

Figure 1: Research Method

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Meanwhile, qualitative data from interviews and documents were used to validate quantitative findings through data triangulation. Qualitative analysis was carried out using content analysis techniques to identify key themes that either hindered or drove IT governance implementation. The research process followed the flow depicted in figure 1, which illustrates the systematic stages from domain identification to the formulation of conclusions and recommendations. With this approach, it is expected that the research results can provide a complete picture of PT KCI's IT governance capability level while offering evidence-based recommendations for future improvements.

2.1. *IT Governance*

Information technology governance can be defined as a structure/process that ensures that information technology in an organization fully supports the organization's business needs, adds value to the services offered, and ensures that future steps taken are of maximum value for the organization's progress [23]. This study aims to determine the maturity level of the customer service information system at the Digibook online bookstore by conducting a current maturity assessment through questionnaires and interviews with respondents involved in IT management. This study aims to analyze and identify existing gaps and determine the steps to address these gaps [24].

2.2. *COBIT 2019*

One of the drivers of COBIT2019 is the management of data technology in organizations which is required to be more agile, fast, and support existing innovation [34]. COBIT 2019 plays an important role where information technology management has become the key to a company's development, so COBIT 2019 plays a role in maximizing the value of information and technology [35].

2.3. *Maturity Level*

Maturity level is used to control information technology processes using the COBIT framework with information on assessment/scoring methods. The aim is for the organization to know the current maturity level of information technology and the organization can continuously strive to improve its level to the highest level so that the governance aspect of information technology can run smoothly [36]. The purpose of the CMMI model is to assess the maturity of a company's processes and provide guidance in the form of textual recommendations on improving processes aimed at improving products and services and quality [37]. Processes within each governance and management objective can operate at varying levels of capability ranging from 0 to 5 [38].

2.4. *Annual Evaluation*

This makes it possible to assess the level of ability to implement IT governance, evaluate the performance of each governance management process, and find out which areas need improvement [39]. The evaluation was conducted in terms of compliance with existing regulations and handling of IT risks in the company without using the identification stage using 11 Design Factors COBIT 2019 [40].

3. RESULT

In this section, the results of the research and the tests that have been carried out can be described. Results section should be the chapters with the most content in a paper. Results content can reach 50-65% of the entire paper.

3.1. 2023 Measurement Results

The measurement of Information Technology (IT) governance maturity at PT Kereta Commuter Indonesia (KCI) in 2023 was conducted based on the COBIT 2019 framework, focusing on key domains that support the company's strategy and operations. The evaluation

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results indicate that most domains were at Level 2 (Managed) and Level 3 (Defined) , signifying that although IT processes were managed and documented, their implementation was not yet fully integrated throughout the organizational structure. The inability to reach Level 4 or higher suggests that the approach used was still operational in nature and not yet fully based on quantitative data or continuously optimized processes.

This maturity level also illustrates that the company has a reasonably good foundation for IT governance, but still requires improvements in performance measurement, consistency of policy implementation, and cross-functional synergy. Details of the scores for each domain can be seen in Table 1 below, which presents the maturity achievements for each analyzed process.

Table 1. 2023 Maturity Level Score

No	Domain	Domain Name	2023 score
1	EDM01	Ensure Governance Framework Setting	3
2	EDM02	Ensure Benefits Delivery	3
3	APO01	Manage the IT Management Framework	2
4	APO03	Manage Enterprise Architecture	2
5	APO12	Manage Risk	2
6	BAI01	Manage Programs and Projects	2
7	BAI06	Manage Changes	2
8	DSS01	Manage Operations	3
9	DSS05	Manage Security Services	2
10	MEA01	Monitor, Evaluate and Assess Performance	2
11	MEA03	Monitor, Evaluate and Assess Compliance	2

3.2. 2024 Measurement Results

This is an example of the use of sub-chapters in a paper. Sub-chapters are allowed to be included in all chapters, except in the conclusion.

In 2024, the re-evaluation of the Information Technology (IT) governance maturity level at PT Kereta Commuter Indonesia showed a significant increase across all analyzed COBIT 2019 domains. All domains experienced a one-level increase in maturity compared to the 2023 results, with most domains successfully reaching Level 3 (Defined) and some even achieving Level 4 (Quantitatively Managed). This improvement indicates that the organization has successfully implemented various initiatives to strengthen IT governance in a more systematic, documented, and measurement-based manner.

Generally, this increase reflects progress in integrating IT policies into business processes, enhancing risk management effectiveness, and establishing a more structured performance monitoring

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and evaluation system. The adoption of a more quantitatively data-driven approach shows that the company is beginning to rely on performance metrics and key indicators as part of strategic decision-making in IT management. One of the most prominent indicators of success is in the EDM01 and EDM02 domains, which reached Level 4, signifying that strategic governance aspects and the delivery of IT benefits are now managed quantitatively and have consistently monitored performance indicators.

Furthermore, the improvement in the DSS01 (Manage Operations) domain from Level 2 to Level 4 is an important signal that the operationalization of IT services at KCI has undergone significant reform, both in terms of efficiency, responsiveness, and the reliability of information systems supporting transportation services.

This increase also demonstrates that the organizational improvement and learning process is continuous, supported by top management commitment and the participation of relevant work units. This achievement is expected to be a strong foundation for continuing the journey towards the highest maturity level, while also strengthening KCI's position as a reliable and adaptive digital-based transportation service provider.

Details of the scores for each domain can be seen in Table 2 below:

Table 2. 2024 Maturity Level Score

No	Domain	Domain Name	2024 Score
1	EDM01	Ensure Governance Framework Setting	4
2	EDM02	Ensure Benefits Delivery	4
3	APO01	Manage the IT Management Framework	3
4	APO03	Manage Enterprise Architecture	3
5	APO12	Manage Risk	3
6	BAI01	Manage Programs and Projects	3
7	BAI06	Manage Changes	3
8	DSS01	Manage Operations	4
9	DSS05	Manage Security Services	3
10	MEA01	Monitor, Evaluate and Assess Performance	3
11	MEA03	Monitor, Evaluate and Assess Compliance	3

3.3. Comparison of Maturity Levels 2023 vs 2024

The comparison of results for 2023 and 2024 shows a consistent upward trend in all domains. No domain experienced a decrease in maturity level, which indicates that the consistently improved its IT governance processes.

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Table 3. Comparison of Maturity Levels

No	Domain	2023	2024	2024 Score
1	EDM01	3	4	+1
2	EDM02	3	4	+1
3	APO01	2	3	+1
4	APO03	2	3	+1
5	APO12	2	3	+1
6	BAI01	2	3	+1
7	BAI06	2	3	+1
8	DSS01	3	4	+1
9	DSS05	2	3	+1
10	MEA01	2	3	+1
11	MEA03	2	3	+1

The radar visualization below illustrates the comparison of scores between the two years.

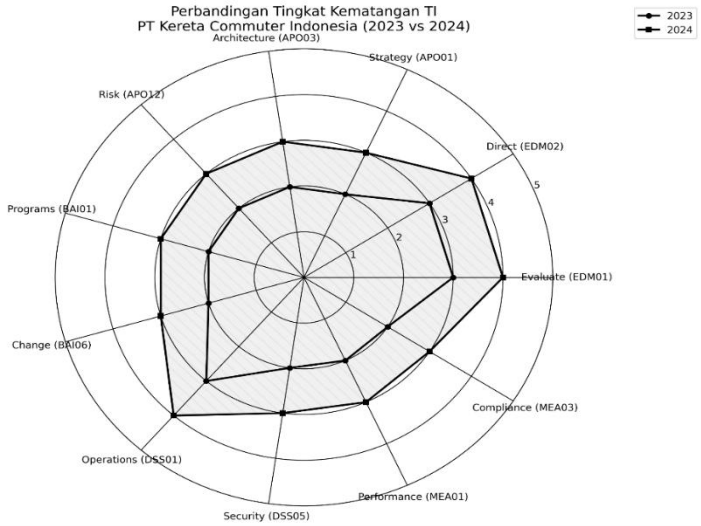

Figure 2: Score Differentiation Chart 2023 and 2024

3.4. Discussion of Assessment Results

3.4.1. Analysis of Maturity Level Changes

The improvement in several domains reflects PT KCI's commitment to continuous strengthening of IT governance. This is evident from:

- EDM03 (Ensure Risk Optimization): The increase from level 2 to 3 indicates that PT KCI has begun systematically documenting IT risk management policies and has implemented them in several key projects. In 2024, there is evidence that risks are beginning to be mitigated proactively, not just reactively.

- APO01 (Manage the IT Management Framework): The rise from level 2 to 3 reflects an improvement in aligning IT policies, procedures, and frameworks more appropriately with the company's strategic direction. PT KCI has begun to integrate a COBIT framework-based approach more comprehensively into their IT management cycle.
- APO12 (Manage Risk): Similar to EDM03, the improvement in this domain shows the strengthening of risk management mechanisms, including stakeholder involvement in risk identification and evaluation processes, as well as the formation of an internal risk committee.
- BAI01 (Manage Programs and Projects): From the assessment, it appears that PT KCI has increased the use of more standardized project management practices (such as PMBOK and Agile). This provides more measurable results for IT project delivery.
- DSS01 (Manage Operations): This domain showed the highest performance, reaching level 4 in 2024. This indicates that IT operations are already well-defined, measured, and monitored. PT KCI has also begun implementing automation in IT operational processes to increase service efficiency.
- MEA01 (Monitor, Evaluate and Assess Performance and Conformance): The increase from level 2 to 3 indicates that PT KCI has begun to implement more formal IT performance measurement with defined Key Performance Indicators (KPIs) that are reported to management periodically.
- APO07 (Manage Human Resources): This domain did not experience an increase. This is due to the continued limited certified training and career development for IT staff. The absence of competency pathways and systematic management of IT human resource capabilities hindered the increase in this domain's level.

3.4.2. Comparison of 2023 and 2024

In general, there was a significant increase from 2023 to 2024. The year 2023 was dominated by processes at level 2, meaning that processes were being carried out but were not yet fully documented, standardized, or monitored. In contrast, in 2024, most processes reached level 3, indicating the organization's awareness to consistently define and control processes.

- This increase can be attributed to several internal factors, such as:
- Top management commitment to digital transformation.
- Implementation of IT governance strengthening programs based on the COBIT 2019 roadmap.
- Regular evaluations and internal audits of IT controls.

However, challenges remain. There are still gaps in comprehensive documentation, human resource training, and full alignment of IT strategy with business objectives.

3.4.3. Evaluation against Ideal Target

The ideal target for this assessment is to achieve level 4 (Quantitatively Managed) consistently across all relevant domains. Based on the results above, only one domain (DSS01) has reached level 4, while the others are at level 2 or 3. This indicates that PT KCI is still in the foundational strengthening phase of IT governance and is not yet fully mature strategically and operationally.

This gap suggests that the company needs to continue its transformation efforts with a focus on:

- Standardization and comprehensive documentation of all IT processes.
- Improving human resource competence and certification.
- Integrating IT risk management into core business strategy.
- Increasing stakeholder involvement in IT evaluation and control.

3.5. Implications of Assessment Results

The assessment results of the IT governance maturity level at PT Kereta Commuter Indonesia show several strategic implications that are important to follow up on for the continuous development

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of IT governance. One of the main implications is the need to set strategic priorities, especially for domains that received low scores. For example, the APO07 (Manage Human Resources) domain, which had the weakest performance, needs to be the main focus of short-term improvements. This is crucial to encourage alignment between human resource management and information technology strategy, thereby supporting the achievement of business objectives more effectively.

Furthermore, continuous measurement is needed in the form of a periodic evaluation cycle based on the COBIT 2019 framework. This assessment should be conducted annually so that the company can consistently monitor the development of its maturity level. With routine measurements, management will find it easier to identify significant changes occurring over time and evaluate the effectiveness of corrective actions that have been taken.

Finally, increasing operational efficiency and effectiveness is an important implication of these assessment results. Processes that have reached maturity levels 3 and 4 need to be optimally utilized to encourage operational strengthening. This can be achieved through the application of automation, system integration, and simplification of technology-based business processes. Thus, PT KCI can increase productivity, reduce operational costs, and provide more reliable and responsive public services.

4. DISCUSSIONS

Secara In general, there was a significant improvement from 2023 to 2024, with most processes moving from level 2 (managed) to level 3 (defined). This improvement was driven by top management's commitment to digital transformation, the implementation of a COBIT 2019-based IT governance strengthening program, and regular internal evaluations and audits.

- Maturity Level Change Analysis: Improvements in several domains reflect PT KCI's commitment to continuously strengthening IT governance. Domain
  DSS01 (Managing Operations) demonstrated the highest performance, reaching level 4 in 2024, indicating that IT operations are well-defined, measurable, and monitored. Significant improvements also occurred in the risk domain, IT management framework, and project management. However, domain.
  APO07 (Managing Human Resources) did not experience improvement due to limited certified training and career development for IT staff.
- Comparison between 2023 and 2024: In 2023, processes were predominantly at level 2, meaning they were already in place but not yet fully documented and standardized. In contrast, in 2024, the majority of processes reached level 3, demonstrating the organization's commitment to consistently defining and controlling processes.
- Evaluation of the Ideal Target: The ideal target is to consistently achieve level 4 across all relevant domains. Currently, only domain.
  DSS01 has achieved this target. This indicates that PT KCI is still in the process of strengthening its IT governance foundation. To achieve this target, the company needs to focus on process standardization, improving HR competencies, integrating IT risk management into core business strategies, and increasing stakeholder engagement.
- Implications of the Assessment Results: These assessment results imply the need for strategic prioritization, especially in domains with low scores such as APO07 (Managing Human Resources). Furthermore, a regular annual evaluation cycle is needed to consistently monitor progress. Mature processes at levels 3 and 4 need to be optimized to drive operational efficiency and effectiveness through automation and system integration.

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5. CONCLUSION

Based on the results of the evaluation and comparison of Information Technology (IT) governance maturity levels at PT Kereta Commuter Indonesia (KCI) using the COBIT 2019 framework, it can be concluded that there was a significant and comprehensive increase in all analyzed domains between 2023 and 2024. The increase in maturity levels across all domains reflects a strong commitment from management to develop IT governance that is more professional, measurable, and aligned with business needs and applicable regulations.

In 2023, the majority of domains were still at level 2 (Managed) and some had reached level 3 (Defined), indicating that although processes were planned and documented, their implementation was not yet fully consistent or integrated across the entire organization. Meanwhile, in 2024, there was a clear increase where all domains successfully rose to level 3 and even some important domains reached level 4 (Quantitatively Managed). This signifies a systematic approach to IT management supported by clear data and performance indicators.

The most notable improvements were seen in the EDM01 (Ensure Governance Framework Setting and Maintenance) and EDM02 (Ensure Benefits Delivery) domains, which rose to level 4, indicating that the aspects of oversight and value creation from IT investments have become a primary focus of management. Furthermore, the DSS01 (Manage Operations) domain also improved to level 4, reflecting an increase in the quality of IT operational services and maturity in day-to-day process management. This shows that KCI not only strengthened the strategic dimension of IT governance but also made real improvements in technical and functional aspects.

These advancements are inseparable from the implementation of several initiatives such as internal training, the formation of more structured IT policies, improved monitoring of service performance, and the utilization of technology supporting decision-making. Annual evaluations of maturity levels have proven to be an important tool in measuring the effectiveness of digital transformation programs, as well as a reference for designing long-term IT strategies oriented towards value and risk.

Overall, this achievement places PT Kereta Commuter Indonesia in a solid position to develop adaptive and competitive IT governance, in line with current demands and the expectations of public transportation service users. However, to reach the highest level (level 5, Optimizing), KCI needs to emphasize the importance of cross-functional integration, the application of continuous improvement based on analytical data, and the strengthening of a collaborative governance culture at all organizational levels. This step will ensure that IT processes not only run efficiently but are also able to proactively create sustainable innovation and added value for the company and the public transportation users.

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