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Research article

Data Visualization of the Maturity Level From the Perspective of Business-IT Alignment at PT. XYZ

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ABSTRACT

This article presents descriptive information about the results of the performance analysis and the maturity of the business-IT alignment process at PT.XYZ through the implementation of data-based visualization techniques within the SAMM perspective. This research is divided into four stages: preliminary research, data collection, data analysis, and organizational development analysis. Based on the results of the analysis using SAMM from the perspective of top-level management of an organization, PT. XYZ has achieved maturity in the attribute of good cooperation. This indicates that the company and organization understand the need for business-IT alignment for their development. However, the attainment level of maturity in the skills and communication attributes is less than optimal. This impacts the communication process and the distribution of information in the company's development through IT implementation. This research only provides data visualization of the maturity achievements of PT. XYZ's business alignment and information technology are based on the SAMM method. The process of analyzing the company's strategic alignment data and providing recommendations for implementing Information Technology to optimize the company's business was not included in this research.

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1. Introduction

Information technology plays an important role in supporting a company's business activities. The utilization of IT affects business processes, the way a company serves customers, and its communication with customers, suppliers, and even employees within the organization [1], [2]. The use of IT as a tool for achieving company goals must be balanced with efficiency in its management to increase superiority in business competition [2], [3], [4], [5]. The application of appropriate technology is not only limited to use but also requires alignment because this will impact the formation of a business strategy. [6], [7], [8]. Alignment between business and IT has become a concern for management in organizations throughout the world [3], [9], [10]. Currently, many organizations are aligning their business and IT strategies, especially those that rely on IT to support their business objectives [11], [12]. Research studies show that the right alignment of business and IT strategies can improve company performance [13], [14], [15]. Strategic alignment refers to the alignment between business strategy and IT as demonstrated through the correct and timely implementation of technology that is in harmony with business strategy, goals, and needs. [7], [8], [16]. It is the extent to which IT application processes, infrastructure, and organization are used to build strategies and business processes and develop them [3], [8], [9], [16].

PT. XYZ, founded in 2008 and still operating today, is a company engaged in the distribution of beauty equipment, salon supplies for hair care, spas, and similar services. The company is headquartered in Surabaya, and currently, PT. XYZ has two corporate branches located in Jakarta. PT. XYZ has been implementing IT since its inception. Initially, the system used by PT. XYZ was a recording and transaction system that operate separately and is considered incompatible with the current needs.

In 2019, PT. XYZ implemented changes by adopting a more integrated system to manage the company, with the hope that this new system would enhance development, add business value, and improve performance to provide more profits for the company. However, during the implementation of the system, obstacles and problems arose, preventing it from meeting expectations. According to the explanation from the Director of PT. XYZ, the company's management has so far lacked focus on controlling and maintaining IT systems, developing strategies for better IT utilization, improving security systems, and enhancing the organization's ability to adopt new technology.

Measuring the maturity of the alignment between business strategy and technology is essential to ensure system implementation supports existing business activities [1], [8], [11], [12], [15], [17]. By measuring business and IT strategies, companies can assess their current condition and determine the necessary steps to build better performance [4], [13], [14], [15], [18]. The SAMM model by Luftman is considered comprehensive and well-established for assessing the alignment between business and IT strategies [10], [16], [19]. This method is recognized for its comprehensiveness as it includes business and IT alignment factors and has been successfully applied to MSMEs, as well as small, medium, and large companies. [2], [3], [8]. In addition, the SAMM model is widely cited (with more than 500 citations on Google Scholar) and is capable of addressing alignment research questions, such as how an organization can assess the alignment of business and IT strategies. [7], [11], [16], [20].

This article presents descriptive information on how the results of the analysis of the performance achievements or maturity of PT. XYZ's business-IT alignment process through the implementation of data-based visualization techniques within the SAMM framework. This is in line with the objective of the data visualization analysis method, which is to derive insights from data. The visualization results, showcasing the maturity achievements of business and IT alignment in this research, can serve as a reference for developing PT. XYZ's business strategy. Additionally, the techniques used in the data visualization process can be applied as a data analysis tool for strategic alignment in the implementation of Information Technology to optimize the company's business.

2. Materials and Methods

2.1. Strategic and Business-IT Alignment

Strategic and Business-IT Alignment is a that integrated various strategies within an organizational unit. These strategies include IT units, planning, business processes, investments, and decisions to support the functions and goals of the target organization [21]. Strategic planning and business-IT alignment have been recurring research topics over the past three decades, largely due to the strong influence of IT investment on organizational performance [22]. The composition of business-IT alignment is divided into two levels, namely, strategic suitability and operational integration [23]. Alignment is considered successful if it is supported by several factors, especially decisions taken by business and IT to coordinate goals and operations within IT and across other organizational functions [24] [25]. When measuring alignment maturity, results will be obtained in the form of measurement levels. These results of calculating the level of alignment significantly influence the design of recommendations to overcome identified problems and opportunities [26].

2.2. Strategic Alignment Maturity Model (SAMM)

The SAMM model, introduced by Luftman, provides six dimensions or areas, with the number of components increasing to 39 [24], [27]. In SAMM, the alignment construct, as shown in Figure 2.3b, is formulated as a six-dimensional (formative) construct in which business and IT alignment activities are organized. These dimensions are: (1) Communication, (2) Competency/Value & Measurement, (3) Governance, (4) Partnership, (5) Scope & Architecture, and (6) Skills (Fig.1) [27].

Previous research concluded that SAMM provides a framework for measuring the maturity of aligning business strategy and IT strategy [29]. SAMM is recognized as the most comprehensive and established model for assessing business and IT alignment [28]. SAMM focuses on company activities to achieve comprehensive goals through the IT management unit as a technical unit and the business management unit as a functional unit [24].

Luftman defines the levels of maturity of the business and IT alignment maturity into five categories, namely Level 1 – Initial/ad hoc processes, Level 2 – Committed processes, Level 3 – Established processes, Level 4 – Improved-managed processes, and Level 5 – Optimized processes [29].

These five levels classify an organization based on the level of harmony achieved. Furthermore, these maturity levels can change over time in response to organizational conditions, especially those related to business and IT strategies in an organization.



Fig.1. The Luftman SAMM [28]

The output produced from this SAMM model is a value indicating the maturity level of IT and business alignment. This alignment value serves as a reference in developing recommendations to increase the level of alignment between business and IT strategies [30] [31]. This model allows organizations to identify weaknesses and strengths using a questionnaire where each factor is evaluated using a Likert scale from 1 to 5 [31]. In the latest version of Luftman's model, a Likert scale of 1 to 6 is provided, with the sixth option representing an 'unknown' response. The model employs six dimensions to group various factors and evaluates questions based on a total of thirty-nine attributes [30] [31].

3. Results and Discussion

3.1. Research Stages

This research is divided into four stages, namely preliminary research, data collection, data analysis, and organization development analysis. Preliminary research, also known as the initial stage, involves conducting instrument analysis and organizational analysis. Instrument analysis refers to the process of analyzing data from respondents involved in this research. Meanwhile, organizational analysis is the initial step aimed at gaining an overview of the object and scope of the research being conducted.

The next stage is the data collection process. This involves gathering data related to the research object, which is based on the SAMM perspective. Once the data is collected, it is analyzed to determine the maturity level of business and information technology alignment from the SAMM perspective. After the business-IT alignment maturity level is identified, an analysis is conducted to formulate the company's development steps or strategies. The research stages are illustrated in Fig. 2.

3.2. Preliminary Research

3.2.1. Research Instrument Analysis

This section outlines the scope of the research process. This scope includes the data or information collected from research respondents and the organizational structure of the research object. Data was obtained through interviews and field observations of the research object. The respondents' data involved in the research process ranged from top-level to middle-level management. Specifically, five individuals from top-level management and six individuals from middle-level management participated in this research. Details of respondent data are presented in Table 1, and the organizational structure of the research object is illustrated in Fig.3.

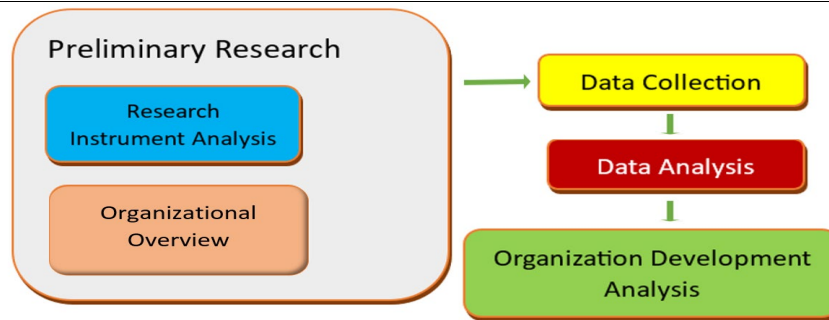


Fig.2. Research stages

Table 1. Respondent Data

Position	Position Structure	Quantity
Director	Company Leaders	1
Sales Manager	Management / Functional	1
PoS Manager	Management / Functional	1
Inventory Manager	Management / Functional	1
Finance Manager	Management / Functional	1
Operational Sales	Operational Supervisor	2
Operational PoS	Operational Supervisor	2
Equip & E-Commerce	Information Technology	2
Website Administrator	Employee	

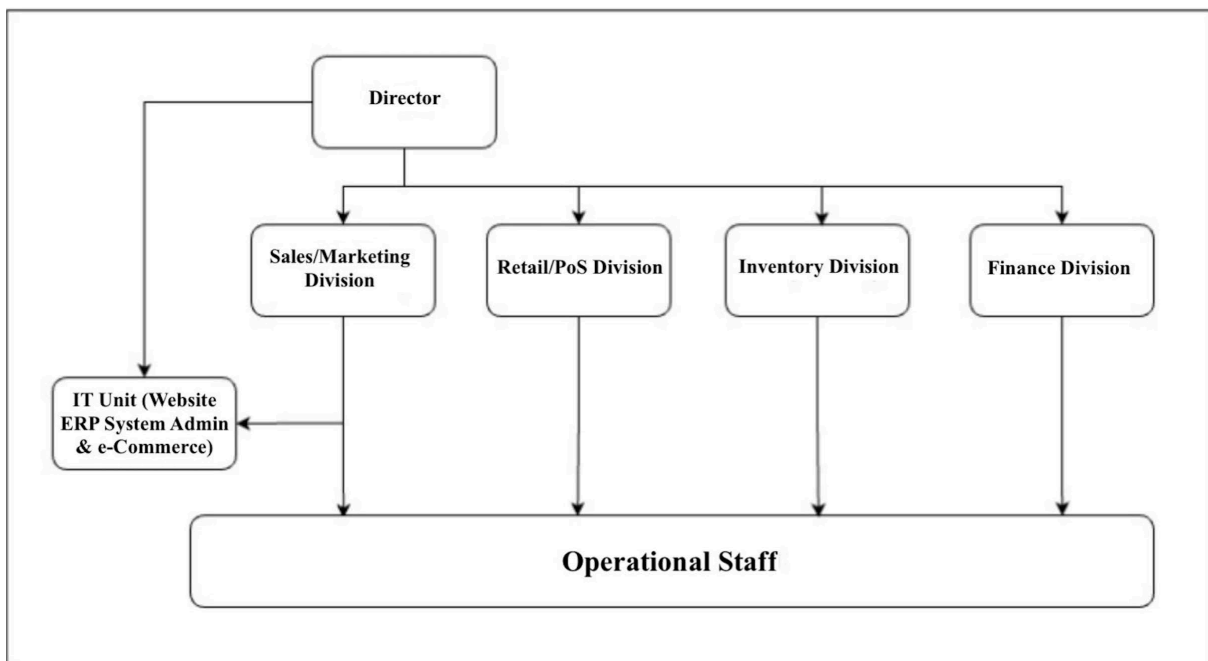


Fig. 3. PT. XYZ Organization Structure

3.2.2. Organizational Overview

Organization Analysis is a stage that outlines the vision and mission of the research object. This step is needed in the research process as it provides a foundation and reference for evaluating the Company's business and enterprise development. Below are the vision and mission statements of the research object.

Vision

To become a prestigious hair care distributor that meets consumer needs and excels in Indonesia, with consumer satisfaction and the highest product quality as its main priorities.

Mission

To guarantee the best service and products to foster consumer loyalty and satisfaction; to provide products that align with current trends and address all hair care needs of the Indonesian people.

3.3. Data Collection

This section presents the results of data collection based on the SAMM perspective, which is divided into six variables. The variables involved in the research process include Communication, Competency/Value, Governance, Partnership, IT Scope and Architecture, and Skills. The maturity achievements for business-IT alignment are as follows: 2,578, 1.96, 2,736, 3,165, 2,506, and 2,281. Fig. 4 illustrates the data visualization of business-IT alignment maturity achievements based on the SAMM perspective.

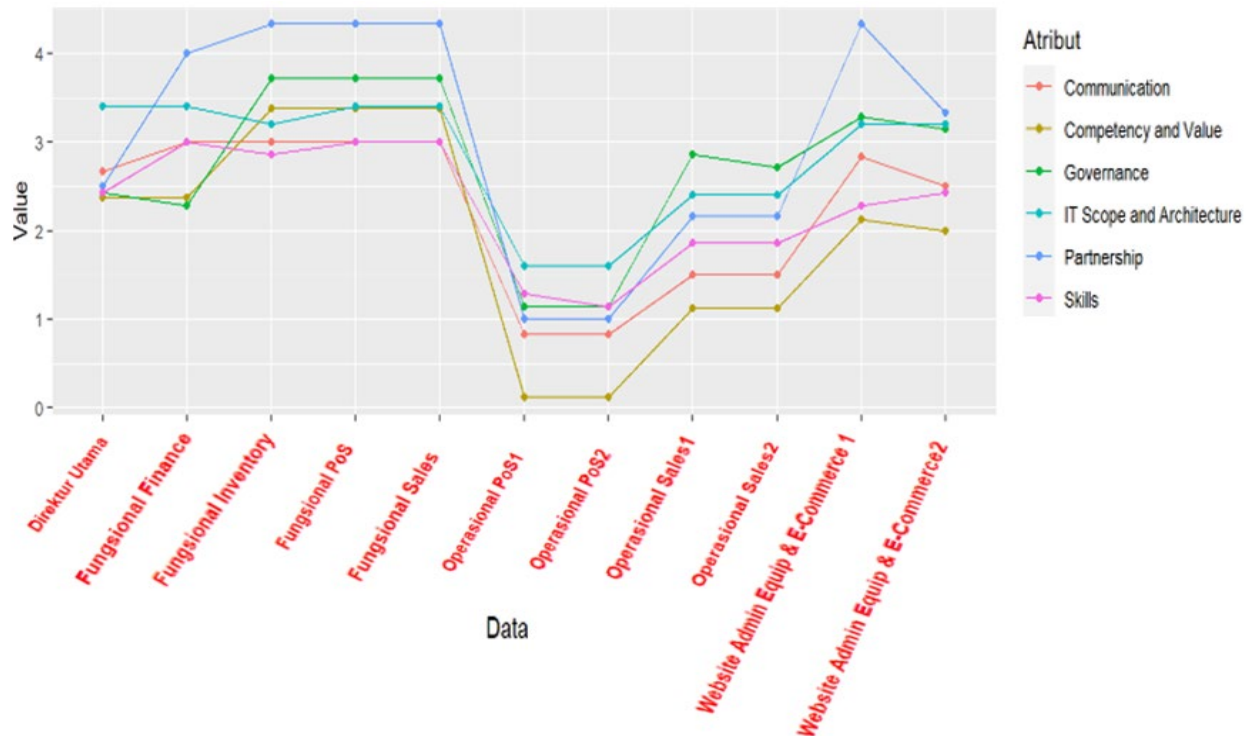


Fig. 4. Alignment Maturity Level Data Visualization

3.4. Data Analysis

After obtaining visualization of the data obtained in the previous stage, analysis was then carried out by extracting data on business and information technology maturity achievements based on the perspective of top-level management in the research object. The results of data extraction are then displayed in the form of a histogram visualization shown in Fig. 5.

Based on the results of the analysis using SAMM from the perspective of top-level management, PT. XYZ has demonstrated maturity in the attributes related to good cooperation, indicating an understanding of the importance of business-IT alignment for organizational development. However, the analysis also reveals that the attainment level of maturity in the skills and communication attributes is less than optimal. In other words, PT. XYZ still faces limitations in organizational skills and knowledge for developing a business through IT implementation. These deficiencies negatively impact the communication process and effective distribution of information necessary for IT-driven company development.

3.5. Organization Development Analysis

The organization development analysis stage outlines the results of data analysis to develop and optimize the company's IT performance, specifically PT.XYZ. This stage provides strategic recommendations in the form of strategic steps that are selected by considering the results of achieving alignment maturity using the attributes in SAMM. By evaluating the achievement values and visualization of the achievement of the maturity level of business-IT alignment for each indicator in the attribute or variable, development priorities are obtained by identifying attributes with the highest gap values. These gap values represent the differences between the current achievement levels and the targets set by PT. XYZ, guiding the focus towards areas requiring the most improvement to align business and IT strategies effectively.

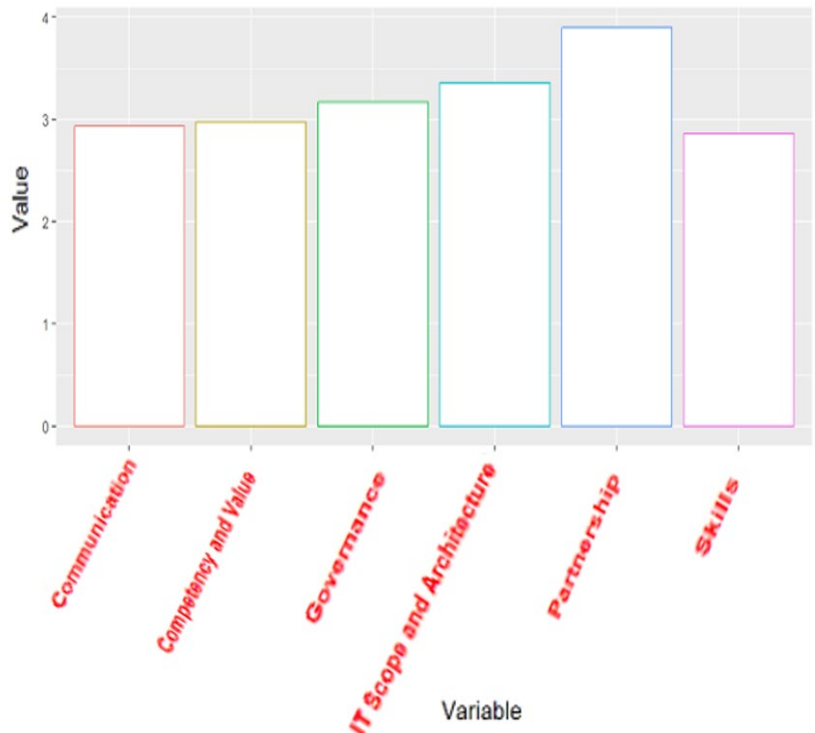


Fig. 5. Visualization of Alignment Maturity Levels based on the Perspective of Top-Level Management

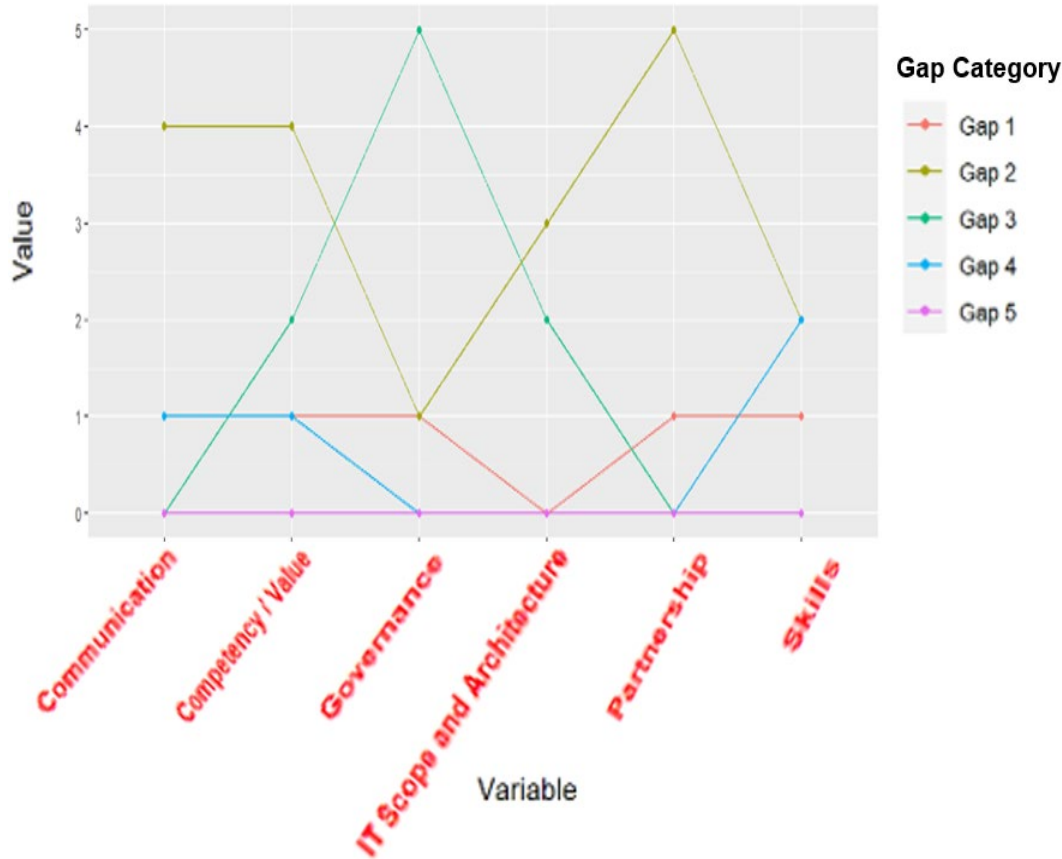


Fig. 6. Achievement of Alignment Maturity Level Gap

Fig. 6 visualizes the Achievement of the Alignment Maturity Level Gap to determine the priority attributes used to formulate company development strategies in the form of recommendations. These recommendations include improving the quality of knowledge and skills of the company's human resources through targeted skills training. This recommendation is a strategic target to ensure that the human resources at PT. XYZ possess the abilities and expertise necessary to support and understand

the development of the company's business through IT implementation. Furthermore, the recommendations focus on preparing, designing, and determining a comprehensive company development plan or strategy as well as the required evaluation process. The goal is for the company to achieve its objectives and aspirations. Finally, recommendations are provided for fostering business innovation aligned with IT implementation based on an evaluation of the company's performance achievements.

4. Conclusion

The results of measuring the maturity level of business-IT alignment reveal the gap between the current conditions and the company's goals and aspirations. This gap can then be utilized as a reference for developing company development strategies. In particular, this research found that the variables that influence the formulation of company development strategies are partnership, communication, and skills.

This research provides data visualization on the maturity achievements of PT. XYZ's business alignment and information technology based on the SAMM method. However, the process of analyzing the company's strategic alignment data and making recommendations on how to implement Information Technology to optimize the company's business was not conducted in this study. Further research is needed to analyze how IT implementation can optimize a company's business.

Author Contributions

O. Juwita: Conceptualization, formal analysis, funding acquisition, investigation, methodology, supervision, validation, visualization, writing – original draft, and writing - review & editing. F. N. Arifin: Conceptualization, formal analysis, methodology, validation, visualization, writing – original draft, and writing – review & editing. R. Ailsya: Data curation, methodology, resources, software, writing – original draft, and writing - review & editing. T. A. Nugrahani: Formal analysis, funding acquisition, methodology, project administration, writing – original draft, and writing - review & editing.

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Declaration of Competing Interest

We declare that we have no conflict of interest.

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