Action Research Literate
Vol. 8, No. 9, September 2024
ISSN: 2808-6988

DIGITAL BLUEPRINT FOR EXCELLENCE: PT. XYZ'S STRATEGIC IT TRANSFORMATION IN THE OIL INDUSTRY

Donny Wilfri Gultom, Sfenrianto
Bina Nusantara University, Jakarta, Indonesia
* Email untuk Korespondensi: donny.gultom@binus.ac.id, sfenrianto@binus.ac.id

Keywords:

ISSP, Oil Industry, Operational Efficiency, Ward & Peppard Methodology.

ABSTRACT

This study explores the essential role of Information System and Information Technology (IS/IT) strategic planning in optimizing organizational performance, focusing specifically on PT. XYZ, a leading national private company in the oil industry. PT. XYZ faces challenges such as the absence of a clearly documented IT development strategy, insufficient prioritization of IT system enhancements, and poor integration of existing applications, all contributing to operational inefficiencies. The primary aim of this research is to develop a comprehensive Information System/Technology Strategic Plan (ISSP) that aligns seamlessly with PT. XYZ's business strategies. Utilizing the Ward & Peppard methodology, this study conducts thorough analyses to maximize IT investments and ensure that IT strategies support the company's business objectives. The data collection and analysis methods include SWOT analysis, benchmarking, and synthesizing findings. The findings of this research provide PT. XYZ with a vital roadmap for IT development, prioritize IT initiatives in line with business goals, and enhance the integration of current and future applications, ultimately leading to improved operational efficiency.

INTRODUCTION

In today's rapidly evolving technological landscape, Organizations face a critical need for strategic planning when it comes to their Information Technology (IT) resources (Warner & Wäger, 2019). This necessity is exemplified by the challenges confronted by PT. XYZ, a national private company operating in the oil industry. PT. XYZ is currently grappling with issues arising from the absence of well-documented IT development strategies, a lack of prioritization for IT system development, and insufficient integration of existing applications. These challenges not only impede operational efficiency but also pose a potential risk to PT. XYZ's competitiveness within the oil industry (Chanias et al., 2019).

This research aims to explore the concept of IS/IT Strategic Planning and its relevance to PT. XYZ. Using the established Ward & Peppard methodology, the study seeks to develop a strategic IT plan that aligns seamlessly with the company's overall business goals (Zaoui & Souissi, 2020). Through a comprehensive process of data collection and analysis, involving techniques like SWOT assessments, benchmarking, and summarization, this research endeavors to provide PT. XYZ with a robust reference document for IT development (Yuwono & Ellitan, 2024). The goal is to realign IT priorities with business strategies, integrate existing and future applications, and ultimately enhance operational efficiency, securing the company's long-term success in the dynamic oil industry (Wessel et al., 2021).

The novelty of this research lies in its tailored approach to address the specific challenges faced by PT. XYZ, particularly in integrating existing applications and prioritizing IT system development. Unlike previous studies, which have generally focused on generic IT strategic planning frameworks, this research incorporates a detailed analysis of the unique operational environment and competitive landscape of the oil industry. It also introduces innovative strategies for leveraging new technological trends, such as advanced data analytics and cloud computing, to improve decision-making and operational processes within PT. XYZ. Additionally, the research proposes a phased implementation plan, which is specifically designed to accommodate the company's current infrastructure limitations and future growth objectives.

The problem statement for this research centers around PT. XYZ's need to enhance its competitive

edge by maximizing the benefits derived from Information Systems/Information Technology (IS/IT) (Kraus et al., 2021). Despite having an existing IS/IT infrastructure, the company has not yet realized significant benefits. Thus, the core question driving this research is: "How can an appropriate IS/IT strategic planning framework be formulated for PT. XYZ to optimize the benefits of IS/IT within the company?".

The primary objective of the research is to strategize the development of a Strategic Information/Technology Plan (SITP) for PT. XYZ. This plan is intended to produce a comprehensive document that aligns IT initiatives with the company's business strategies, thereby maximizing IT investments (Grillitsch et al., 2019). The research is beneficial to various stakeholders, particularly PT. XYZ, as the Strategic Information/Technology Planning document can serve as a vital reference for developing and utilizing IT applications. Moreover, it provides a useful resource for practitioners and academics conducting research on IT strategic planning (Baiyere et al., 2020).

The scope of this study is concentrated on the strategic planning of Information Systems/Technology aligned with PT. XYZ's business strategies, needs, and objectives (Albukhitan, 2020). The study employs the Ward & Peppard methodology, incorporating various analyses to optimize IT investments and ensure that IT strategies support the broader business objectives. By addressing these key areas, the research aims to provide actionable insights and recommendations to enhance PT. XYZ's operational efficiency and competitive positioning in the oil industry (Saarikko et al., 2020).

METHOD

This research at PT. XYZ focuses on developing a Strategic Information Systems/Information Technology (IS/IT) Plan for Future Excellence using the Ward and Peppard methodology (Zaki, 2019). This comprehensive approach involves a thorough analysis of both the internal and external business environments, as well as the internal and external IT/IS landscapes (Fischer et al., 2020). The primary objective is to align the Business IT Strategy, IT Management Strategy, and IT Strategy to construct a robust future application portfolio, which will eventually be integrated into the current operational framework (Brunetti et al., 2020). The research utilizes the Ward & Peppard methodology, leveraging various analytical tools and techniques, including SWOT Analysis, Critical Success Factors (CSF), Value Chain Analysis, Porter's Five Forces Model, McFarlan's Application Portfolio Matrix, and the Balanced Scorecard (Singh et al., 2020). These methodologies and tools are essential for identifying strategic opportunities and potential threats, ensuring that the IT initiatives align with the broader business goals of PT. XYZ (Tekic & Koroteev, 2019).

Based on this methodology, the specific steps taken in developing the IS/IT Strategic Planning (PSSI) for PT XYZ are well-defined and systematically organized to support long-term business objectives and enhance operational efficiency (Zaoui & Souissi, 2020).

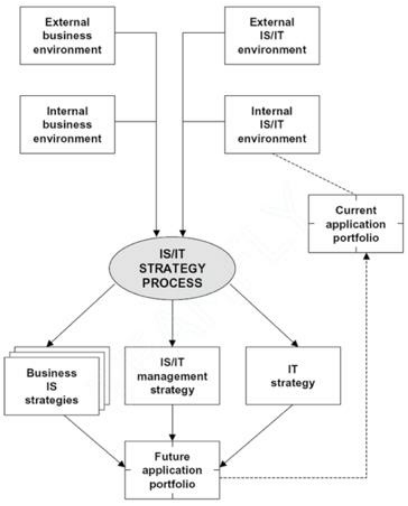

Figure. 1. Research Methodology

These steps are as follows:

1. Selection of the Research Subject

The first step involves selecting a company to serve as the subject of the research and development of IS/IT Strategic Planning. For this study, PT XYZ, a prominent entity in its industry, was chosen as the focus.

2. Identifying the Need for IS/IT Strategic Planning

An in-depth analysis was conducted to uncover the underlying reasons necessitating IS/IT Strategic Planning at PT XYZ. The analysis revealed three critical issues: a lack of strategic alignment between IT initiatives and business goals, inefficient use of existing IT resources, and inadequate integration of IT systems within the company's operational framework.

3. Literature Review and Methodology Selection

To address these identified issues and determine the most suitable approach for developing an effective IS/IT Strategic Plan, particularly for a manufacturing-oriented company, an extensive literature review was undertaken. This review aimed to gather relevant references and insights from existing research and methodologies.

4. Adoption of the Ward & Peppard Methodology

Based on the findings from the literature review, the Ward & Peppard methodology was selected as the framework for developing the IS/IT Strategic Planning for PT XYZ. This methodology provides a structured approach, as depicted in the accompanying methodology diagram, and is tailored to comprehensively address the specific needs of the company.

External Business Environment

Table 1. External Business Environment

Input	Interviews, Surveys, Company Documents
Tools	
PEST	In this step, an analysis will be conducted from the external business perspective of PT. XYZ using the PEST method, which comprises components including Politics, Economy, Social, and Technology. Each of these components will be analyzed, resulting in a function that serves as an alignment between business processes and the political, economic, social, and technological conditions.[6]
SWOT	SWOT analysis is conducted to identify the external factors of PT. XYZ to formulate the organization's strategy appropriately. Strengths and opportunities need to be maximized, while weaknesses and threats need to be minimized to obtain an optimal strategy.
Five Force Model	The Five Force Model analysis is conducted to assess the extent of competition among existing competitors, new entrants, substitute products or services, supplier bargaining power, and customer bargaining power on the sustainability of PT. XYZ's business.
Output	The results of identifying external factors for the company, such as competitors, customers, government, and regulations.

Internal Business Environment

Table 2. Internal Business Environment

Input	Interviews, Surveys, Company Documents
Tools	
CSF	Critical Success Factor analysis is used to structure the business framework for PT. XYZ. In this CSF analysis, the information requirements of each strategic goal will be explained.
SWOT	SWOT analysis is conducted to identify the internal factors of PT. XYZ to formulate the organization's strategy accurately. Strengths and opportunities need to be maximized, while weaknesses and threats need to be minimized to achieve an optimal strategy.
Value Chain	The Value Chain analysis is conducted to identify and categorize the primary and support activities of PT. XYZ's company.
BSC	The Balanced Scorecard analysis is performed to manage the performance of PT. XYZ and to formulate the company's strategy. The Balanced Scorecard analysis will examine the business objectives and key information requirements of the company. With these business objectives and key information requirements, the company can determine the type of business information system needed.

Output	Business goals, business strategies, business process mapping, and strategy integration within the company

External IS/IT Environment

Table 3. External IS/IT Environment

Input	Media Information
Tools	
Technology Assessment	This analysis is conducted to identify technology trends and applications that can support PT. XYZ in executing its business processes.
Output	Technology Trends and Application Trends

Internal IS/IT Environment

Table 4. Internal IS/IT Environment

Input	Interviews, Surveys, Company Documents
Tools	
Technology Assessment	This analysis is conducted to understand the technological and application conditions that support PT. XYZ in carrying out its business processes.
IS/IT Infra Structure Review	This review is conducted to assess the current state and capabilities of technology and applications at PT. XYZ.
McFarlan Matriks	This analysis is carried out to identify the existing technology and applications. They are categorized into four quadrants: Strategic, Key Operational, High Potential, and Support.
Output	IS/IT Objectives, Application Portfolio, IS/IT Infrastructure.

Based on a comprehensive analysis of business needs, information requirements, and emerging technology trends, a clear SI/TI (Information Systems/Information Technology) strategy can be formulated. This strategy will address management practices, SI Strategy, and IT Strategy, resulting in a detailed gap analysis. This analysis will highlight the differences between the current implementations at PT. XYZ and the recommended best practices based on the gathered data.

The steps to develop a strategic SI/TI planning document include:

1. **Business IS Strategy**

This component focuses on how each business unit or function utilizes SI/TI to achieve its objectives. It includes the development of an application portfolio and the design of information architecture.

2. **IS/IT Management Strategy**

This strategy outlines the overarching elements that the organization applies to ensure consistent implementation of necessary SI/TI policies,.

3. **IT Strategy**

This strategy encompasses the principles and methods for managing technology and human resources within the SI/TI domain. It ensures that IT infrastructure supports the overall business strategy and goals .

4. **Future Application Portfolio**

This involves proposing new applications that the organization should develop in the future. The aim is to integrate all organizational units and ensure that technological advancements align with the company's business development goals.

Data Collection

Data collection is a crucial first phase of this research, involving the systematic gathering of data for subsequent analysis. This process is divided into two primary activities:

1. **Literature Review**

This involves reviewing books and scientific articles related to IT/IS Strategic Planning. The literature review helps establish a theoretical foundation for the study and provides context for understanding industry best practices.

2. **Interviews**

Conducting interviews with consultants who have experience working on similar projects. These interviews cover various aspects such as project sustainability, challenges faced, future plans regarding IT/IS Strategic Planning, and feedback from the respondents.

Data Processing

The second phase of the research method involves data processing and analysis. The activities conducted in this phase include:

1. **SWOT Analysis**

Performing a SWOT analysis on the IT/IS Strategic Planning business unit of PT. XYZ. The results of the SWOT analysis provide critical insights that support the development of the IT/IS Strategic Planning framework architecture model.

2. **Benchmarking**

Conducting benchmarking involves comparing the results of each project by creating a comparison table. This helps in identifying best practices and areas for improvement.

3. **Summarization**

Summarizing the results of the benchmark analysis to draw conclusions regarding the key findings from the projects. These conclusions serve as the foundation for the creation and development of the IS/IT Strategic Planning framework architecture model at PT. XYZ.

RESULTS AND DISCUSSION

Internal IS/IT Environment Analysis - Current Applications/Information Systems

The following is the current application used by PT.XYZ:

Table 5. Internal IS/IT Environment

Application	Desc	Development	User
Production Process & Monitoring system	Applications used in the production process as well as controlling and monitoring production	Outsource	Production
XYZ Tracking System(CTMS)	Production Tracking System	Inhouse	QA,Production, Warehouse,PPC
Sql-Ledger	ERP	Opensource	Accounting, Warehouse, Purchasing
Purchasing Online	System for interorganization with domestic suppliers	Inhouse	Purchasing, Local Supplier
HRMS	Systems for Human Resources, Time management and payroll	Outsource dan Inhouse	HRD
Project Management System	System for creating and managing projects	Opensource	EDP
Zymbra Email System	Email	Opensource	All Departemen
SUSI(Sistem Urusan Sendiri-sendiri)	This system is used by all employees, such as inputting leave, overtime and approval of overtime and leave	Inhouse	HRD, Employee
Absensi	This system is used to record employee absences	Inhouse	HRD, Employee
Fix Asset	This system is used for asset management	Inhouse	Warehouse
XYZ Performance Reward	This system is used by management in calculating bonuses every 3 months	Inhouse	All Departemen

The results of analysis of the current application of this research conducted using McFarlan's Grid are as follows:

Strategic 1. *Online Purchasing* 2. *CT Performance Reward*	**High Potential**
Key Operational 1. *Production Process & Monitoring system* 2. *CTMS*	**Support** 1. *HRMS* 2. *Project Management System* 3. *Zymbra Email System*

Figure. 1. McFarlan Grid Current Application

Based on the analysis of the current applications at PT XYZ, conducted using McFarlan's Strategic Grid, the findings are categorized into four quadrants: Strategic, High Potential, Key Operational, and Support. The categorization helps in understanding the role and importance of each application within the company's operational framework and strategic planning.

1. **Strategic Applications**:

Online Purchasing: This application is crucial for enhancing procurement processes and ensuring timely acquisition of materials and services.

CT Performance Reward: An essential tool for tracking and incentivizing employee performance, directly impacting motivation and productivity.

2. High Potential Applications:

Currently, there are no applications classified under this category. This indicates an opportunity to explore and develop new applications that could potentially offer significant strategic benefits in the future.

3. Key Operational Applications:

Production Process & Monitoring System: Vital for overseeing and optimizing the manufacturing processes, ensuring efficiency, and reducing downtime.

CTMS (Clinical Trial Management System): Essential for managing clinical trials, ensuring compliance, and streamlining processes in a regulated environment.

4. Support Applications:

HRMS (Human Resource Management System): Supports HR functions such as payroll, recruitment, and employee data management.

Project Management System: Aids in the planning, execution, and monitoring of projects, ensuring they are completed on time and within budget.

Zymbra Email System: Provides a reliable communication platform for internal and external correspondence.

This categorization not only highlights the current state of the applications but also serves as a guide for future investments and upgrades, ensuring that the IT infrastructure supports the overall business strategy of PT XYZ.

After that to support the applications that have been described, the general hardware used by PT XYZ currently is:

Table 6. Internal IS/IT Environment

Category	Item
Hardware	• Workstations (PC) • Printer(Epson, HP,CANON) • Telephones & Faxes • Computer Server • UPS • Stablizer • Keyboard & Mouse Logitech
Data Storage	• Hard Disk

Networking	• LAN (Local Area Network) • Internet • Wireless Broadband Router Linksys, Cisco Router, Bandwidth Manager • Switch 3Com, Hub Linksys • Fiber Optic • ADSL • GSHDSL • VPN • VLAN
Database	• MySQL Server • Postgresql • MsAccess

The existing hardware infrastructure at PT XYZ is diverse and robust, catering to various operational and IT needs. Below is an overview of the current hardware setup:

1. Hardware

The company utilizes a range of workstations (PCs) and printers (Epson, HP, Canon) to support daily operations across departments.

Telephones and faxes are also in use, facilitating communication within and outside the organization.

For server management and data processing, PT XYZ employs multiple computer servers, supported by UPS systems to ensure uninterrupted power supply.

Stabilizers are in place to protect equipment from power surges, and Logitech keyboards and mice are standard peripherals used across workstations.

2. Data Storage

The primary data storage solution comprises hard disks, which are essential for storing operational data, system files, and backups.

3. Networking

PT XYZ has a comprehensive LAN (Local Area Network) infrastructure, facilitating internal communication and data exchange.

The organization has internet access through various means, including a wireless broadband router (Linksys), Cisco routers, and a bandwidth manager, which help manage network traffic and ensure stable connectivity.

The network infrastructure is further supported by switches (3Com), hub (Linksys), and fiber optic connections, providing high-speed data transmission.

For wide area network (WAN) connectivity, the company utilizes ADSL and GSHDSL technologies.

To secure data communication, VPN and VLAN are implemented, ensuring secure and segmented network access.

4. Database:

PT XYZ uses several database systems, including MySQL Server, PostgreSQL, and MS Access, to manage and store various types of data. These databases support the company's operational needs, ranging from transactional data to complex queries and analytics.

As seen in Figure 3, PT XYZ's network infrastructure connects users and clients via an intranet, using fiber optics between buildings and floors for reliable high-speed communication. The network employs a VPN model for secure international connections, linking the Batam office to Jakarta, Singapore, France, and the Netherlands. Despite its complexity and security, the current setup lacks server-client segregation, potentially causing IP conflicts. The network is secured by a multi-layered firewall system, with the main switch providing connectivity to all departments and IP devices. This infrastructure supports efficient operations but requires improvements in IP management to optimize performance and security.

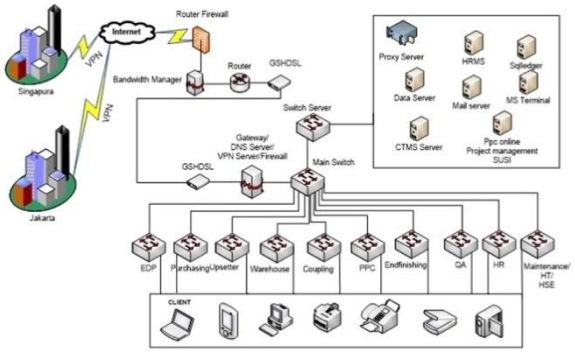

Figure. 2. Network Topology

External IS/IT Environment Analysis

To continually enhance operational performance, companies must prioritize establishing a scalable Business Intelligence (BI) foundation using advanced BI tools. These tools, exemplified by applications for financial analysis and operational manufacturing, provide critical insights into various aspects of business operations. For instance, they enable comprehensive analysis of service marketing, utilization, and customer acceptance, which is crucial for evaluating service profitability and cost-effectiveness across different market segments. By leveraging these insights, companies can drive improvements in service operations, refine sales and marketing strategies, and optimize customer management practices. Consequently, this leads to increased profitability and a stronger competitive edge.

Business Intelligence, as a dynamic strategy and evolving architecture, plays a pivotal role in aligning an organization's operations with its strategic business goals. It ensures that companies have timely and accurate access to vital information about business conditions, customer behaviors, financial metrics, and market trends. Successful organizations leverage BI to make informed decisions swiftly, streamline operations, reduce development cycles, maximize product value, anticipate market opportunities, and enhance relationships with both customers and suppliers.

To realize these objectives, the paper advocates for the thoughtful implementation of Enterprise Resource Planning (ERP) systems alongside BI tools. However, it emphasizes the importance of thorough planning before implementation, given the significant investment and organizational preparedness required. Rushing into ERP and BI deployments without adequate preparation can lead to inefficiencies and missed opportunities for value creation.

In addition to traditional BI and ERP systems, current technology trends offer further opportunities for enhancement. For instance, Web 3.0 architectures, incorporating machine learning, artificial intelligence, and blockchain technologies, promise to revolutionize data processing and security. Green IT initiatives focus on minimizing environmental impact, while Cloud Computing, particularly through Software as a Service (SaaS) models, offers scalable solutions for diverse business needs. Grid Computing facilitates large-scale problem-solving capabilities, and Wireless Technology enables efficient, cable-free data exchange. These advancements can significantly contribute to PT. XYZ's value proposition, positioning the company at the forefront of innovation and operational excellence.

In the context of the research findings, the implementation of these technologies aligns with PT. XYZ's strategic goals of enhancing IT infrastructure and operational efficiency. The study highlights the critical need for a comprehensive IT strategy that integrates advanced technologies and data analytics tools. By adopting these modern solutions, PT. XYZ can achieve a more agile and responsive operational framework, ultimately supporting its long-term growth and competitiveness in the oil industry. The insights gained from this research underscore the importance of strategic IT planning and the proactive adoption of emerging technologies in driving business success.

Internal Business Environment Analysis

The Balanced Scorecard analysis for PT XYZ, as detailed in Table 7, reveals important insights into the company's internal business performance across four perspectives: Financial, Customer, Internal Business Processes, and Innovation/Learning. The analysis shows that, under the Financial Perspective, PT XYZ's primary objective is to increase profits, meeting shareholder expectations. This goal is measured through profit margin value and operating cost value, which highlights the need for effective cost management and revenue optimization strategies.

From the Customer Perspective, the focus is on improving customer satisfaction, which is assessed through customer satisfaction scores and customer complaint analysis. These findings underscore the importance of maintaining high service quality and addressing customer issues promptly, which is critical to retaining customers and improving brand reputation.

In the Internal Business Process Perspective, the objective is to optimize business operations, with performance evaluated based on the level of achievement of quality targets. This demonstrates the need for continuous process improvement and increased efficiency to achieve operational excellence.

Finally, the Innovation and Learning Perspective emphasizes improving the quality of human resources, as measured by the achievement of individual work goals. This highlights the need for continuous employee training and development programs to ensure a skilled and capable workforce.

Based on the findings from the Balanced Scorecard Analysis detailed in Table 7, several managerial implications emerge for PT XYZ. First, there is a need for a strategic focus on cost management and improved profitability, which requires managers to implement tighter financial controls and explore new revenue streams. Second, customer satisfaction metrics indicate the need for better customer relationship management strategies, including improved complaint resolution processes and enhanced service quality. Third, the emphasis on internal processes requires managers to adopt lean methodologies and invest in technology to streamline operations. Finally, the focus on the quality of human resources underscores the importance of investing in employee development programs, which will enhance the capabilities of the workforce and align employee goals with those of the organization.

By addressing these areas, PT XYZ can improve operational efficiency, customer satisfaction, and overall business performance, thus positioning the company for sustainable growth and competitive advantage in the industry.

Table 7. Balance Scorecard Analysis

FINANCIAL	
What do shareholders expect?	
Objective	Measurement
Increase Profits	- Profit Margin Value - Value of operational costs
CUSTOMER	
How are we in the eyes of customers?	
Objective	Measurement
Increase Customer Satisfaction	- Customer Satisfaction Value - Assess Customer Complaints
INTERNAL	
What must we have to excel?	
Objective	Measurement
Optimizing Business Operations	Quality Target Achievement Level
INNOVATION/LEARN	
What must we do to achieve excellence?	
Objective	Measurement
Improving the Quality of Human Resources	Level of Achievement of Individual Work Goals

Based on table 8. the SWOT analysis for PT XYZ reveals several key strengths, including a clearly defined and measurable vision and mission, high standards in product and process quality, and the possession of a certification from the American Petroleum Institute (API), which enhances credibility. The company benefits from synergy among its corporate group companies and conducts transactions in multiple currencies, including Rupiah, US Dollar, and Euro. Additionally, PT XYZ has established strong relationships with suppliers and customers, provides direct training about products, and maintains a trained human resources team, contributing to a strong market image.

However, PT XYZ faces significant weaknesses, such as inefficient processes, high-cost production that is not competitive, reliance on obsolete equipment and infrastructure, and a lack of strong company culture implementation. Furthermore, data integration issues prevent a cohesive overview of operations.

In terms of opportunities, the company can capitalize on the promising growth of the gross domestic product (GDP), increasing demand for steel pipes, stable macroeconomic, political, and security conditions, and improving regulations in the steel industry. There are also opportunities in enhancing risk management strategies.

Conversely, PT XYZ must navigate several threats, including intense competition in the steel pipe business, the risk of unfair trade practices like dumping, unclear regulations, and the high unemployment rate.

The company's dependency on imported raw materials and limited product development and innovation also pose challenges.

To address these issues, the following strategic recommendations are proposed. For the SO (Strengths-Opportunities) strategy, PT XYZ should focus on recovering market share and building a robust brand reputation, increasing sales and production of high-value-added products, and expanding production facilities, including building new factories, to enhance working capital management and equity generation. The WO (Weaknesses-Opportunities) strategy suggests focusing on efficiency by maintaining plant reliability, enhancing utilization, revitalizing existing production facilities, integrating information systems, and implementing restructuring and reorganization initiatives alongside competency-based human resource development. A comprehensive monitoring system is also recommended.

The ST (Strengths-Threats) strategy involves securing the availability of raw materials and energy by entering the exploration industry and establishing long-term supply agreements, as well as innovating new high-value-added products to differentiate from competitors. Lastly, the WT (Weaknesses-Threats) strategy emphasizes improving supply chain management to mitigate risks associated with high costs and dependency on imports, and enhancing industrial health and environmental management to meet regulatory standards and societal expectations.

These strategic recommendations are designed to leverage PT XYZ's strengths and opportunities while addressing its weaknesses and mitigating potential threats, thereby sustaining growth and maintaining a competitive advantage in the industry.

Table 8. SWOT Analysis

	Strong	**Weakness**
	1.The company's vision and mission are very clear and measurable 2. Product quality and process quality 3. Has a certificate from API (American Petroleum Institute) 4.Synergy between companies in the CT group 5.Transactions in 3 currencies, Rupiah, US Dollar and Euro 6.Establish good relationships with suppliers and customers 7.Conduct direct training to customers about products 8.Have trained human resources 9.The company's image in the market is high	1. Inefficient process 2.High-cost production (cost competitive) 3.Obsolete equipment & infrastructure systems 4.Implementation of company culture and values 5. Data that is not integrated as a whole
Opportunity	**Strategy SO**	**Strategy WO**
1.Gross domestic product growth is quite promising 2.Demand for steel pipes is increasing 3.Macroeconomics, politics and security are quite stable 4.Improving regulations on the steel industry 5. Risk management	1. Carry out market share recovery and build total brand reputation 2. Increase sales and production of high value-added products 3. Expand production facilities (building new factories) and improve working capital management & equity generation	1. Focus on efficiency by maintaining plant reliability and utilization enhancement 2.Program revitalization projects for existing production facilities and integrated information systems 3.Carry out restructuring & reorganization as well as competency-based human resource development 4.Ensure the existence of a monitoring system
Threat	**Strategy ST**	**Strategy WT**
1. Competition in the steel pipe business is increasing 2.Unfair trade practice (dumping) 3. Unclear regulations and rules (law). 4.High unemployment rate 5.Dependent on importing raw materials 6.Low product development & innovation	1.Guarantee the availability of raw materials & energy by entering the exploration industry and implementing long term supply agreements 2. Innovate new high value-added products	1. Improve supply chain management 2. Improve industrial health and environmental management.

The following are the results of the CSF analysis conducted on the internal business environment of PT.XYZ which can be seen in table 9. This comprehensive review helps align the organization's efforts to achieve its vision and mission by focusing on key areas critical to success.

Table 9. CSF Analysis

What do you want to be? Vision / Mission / Strategic Goals / Critical Success Factors	
VISION/MISSION	
What do we want to become and what is our purpose	
Vision "To become a world class company, listed on the regional stock exchange and exporting more than 50% of production capacity throughout the world." Mission "Providing the best service to users of the company's services throughout the world by maintaining pride as a competitive and high-quality manufacturer."	
Strategic Goals	
What do we have to do to get there:	
#1 Stategic Business Unit : Board of Commissioners	
Strategic Goal : Increase competitive advantage	
Outcomes / Critical Success Factors	IS Needed
• Competitive advantage	• Availability of mature information systems • Monitoring and Forecasting System
#2 Strategic Business Unit: President Director	
Strategic Goal: Increasing Company Profits	
Outcomes / Critical Success Factors	IS Needed
• Operational cost efficiency • Increased pipe sales	•Cost Expenditure Information •Production Division Project Information • List of potential customers •Production Monitoring and Forecasting System
Strategic Goal: Optimization of Business Operations	
Outcomes / Critical Success Factors	IS Needed
Coordination between Divisions	Information on the activities of all strategic business units
#3 Strategic Business Unit: Marketing and sales	
Strategic Goal: Increase Product Sales	
Outcomes / Critical Success Factors	IS Needed
• Increase in marketing volume • Increased pipe sales	• List of potential customers • Production costs for each product • Information on the advantages of competing companies • Project tender information • Information on marketing of production results
#4 Strategic Business Unit: Accounting	
Strategic Goal: Efficiency and Accountability of financial reports	
Outcomes / Critical Success Factors	IS Needed
Production cost efficiency	• Supplier Data •Production process information • Amount of production input and output
#5 Stategic Business Unit : Purchasing	
Strategic Goal: Excellence in quality and price of raw materials	
Outcomes / Critical Success Factors	IS Needed
Quality and price of raw materials	• Supplier Data •Information on prices and availability of raw materials on the market
Strategic Goal: Get a bona fide supplier	

Outcomes / Critical Success Factors	IS Needed
Bona fide supplier	Information about Suppliers
#6 Stategic Business Unit : Production	
Strategic Goal : Increase the efficiency and effectiveness of the production process	

Outcomes / Critical Success Factors	IS Needed
• Smooth product processing	•Production process information •Information on production equipment
#7 Strategic Business Unit: Quality Control	
Strategic Goal: Increasing product quality	
Outcomes / Critical Success Factors	IS Needed
Product quality	•Product standardization information • Product quality testing •Production process information
#8 Strategic Business Unit: Logistics	
Strategic Goal: Improve product delivery management	
Delivery on time	• Customer information • Transporter information • Product information • Information on goods delivery status
#9 Strategic Business Unit: Warehouse	
Strategic Goal: Improve storage management of production results	
Outcomes / Critical Success Factors	IS Needed
• Product storage management	• Warehouse information •Information on production quantities • Customer information
#10 Strategic Business Unit: Human Resource Division	
Strategic Goal: Increase HR Productivity	
Outcomes / Critical Success Factors	IS Needed
Training Provision of infrastructure	• Employee information • Company asset data
#11 Stategic Business Unit : Health Safety Environment.	
Strategic Goal : Improve work safety	
Outcomes / Critical Success Factors	IS Needed
• Training • Provision of infrastructure	• Employee information • Company asset data • Production process information • Information on HSE operational standards

IS/IT Strategy Formulation

Based on Table 8. The IS/IT strategy formulation for PT.XYZ highlights several critical challenges and opportunities that the company faces in its operational environment. One of the primary concerns is the high level of competition, which necessitates a focus on gaining a competitive advantage. This can be achieved by enhancing the company's market analysis and competitive intelligence capabilities through advanced information systems. Additionally, the lack of maturity in the IT strategy underscores the need for a comprehensive digital transformation plan that supports business operations and decision-making processes.

The analysis also reveals inefficiencies in the coordination between strategic business units (SBUs), particularly in the process of moving from raw materials to product delivery. Addressing this issue requires an integrated information system to streamline communication and workflow across different departments. Furthermore, large operational costs, especially those related to negotiations and material procurement, indicate a need for cost-effective digital solutions that can reduce expenses and improve negotiation processes.

Another significant issue is the failure to meet sales targets, which impacts overall profitability. This calls for an enhanced customer relationship management system and better marketing strategies to increase sales volume and market reach. In the purchasing department, the lack of careful supplier selection has led to increased costs, highlighting the importance of implementing a more rigorous supplier evaluation process

supported by data analytics.

The company's dependency on a limited number of suppliers is another area of concern. Expanding the supplier base and implementing a supplier management system can mitigate this risk. Additionally, issues with production machine durability and inconsistent production processes require attention to maintain product quality and efficiency. This can be addressed by upgrading equipment and standardizing production processes.

Lastly, the inability to accurately track deliveries and manage warehouse operations poses significant logistical challenges. Implementing a logistics management system and a warehouse management system (WMS) can provide real-time tracking and better inventory control, ensuring timely deliveries and efficient storage management.

Table 10. IS Strategy Formulation

No	Problem	Measurement	SWOT	CSF	Solution Code
1	High competition	Number of tender participants, target and profit.	T1,T2, T3, SO1, ST2	Competitive advantage	PS_1
2	Lack of Maturity of IT Strategy	Target and Profit	T3,WO2,W1, W3	Competitive advantage	PS_3
3	The process between SBUs is long	Time from receipt of raw materials to product delivery	WT1,WO3,W2, W5	Coordination between Divisions	PS_3
4	Large operational costs	Telephone & fax costs for negotiating material prices, purchasing approvals, ordering materials, shipping costs	T5,T6,T7,W2	•Operational cost efficiency • Increased pipe sales	PS_4
5	Sales target has not been achieved	Number of products sold	SO2,T7,ST2	•Increase in marketing volume • Increased pipe sales	PS_5
6	Purchasing is less careful in selecting suppliers	Total difference in overorder value compared to fair market price (per order).	O2,WO3	• Bona fide supplier • Quality and price of raw materials	PS_6
7	Limited suppliers	Pipe raw material manufacturing company	O2,SO1,	Bona fide supplier	PS_7
8	Production machine problems	Production machine durability	WO3,WT2	•Smooth product processing •Training	PS_8
9	The production process is less thorough	Product quality	WO3,WT1	Product quality	PS_9
10	Delivery cannot be tracked	Current Position	WO3	Delivery on time	PS_{10}
11	Lack of proper warehouse management	Location of raw materials and products in the warehouse	WO3	Product storage management	PS_{11}

Based on figure 5 the IS strategy analysis, PT.XYZ's future application portfolio, organized using McFarlan's Grid, encompasses Strategic, High Potential, Key Operational, and Support applications. The Strategic applications, such as Business Intelligence (BI), Decision Support Systems (DSS), Customer Relationship Management (CRM), and Supplier Relationship Management (SRM), are pivotal for enhancing decision-making and gaining a competitive edge. The inclusion of High Potential applications, particularly Knowledge Management, underscores the importance of harnessing organizational knowledge to drive innovation and efficiency.

Key Operational applications, including ERP modules for Controlling (CO), Production Planning (PP), Quality Management (QM), Warehouse (WHS), and e-Procurement, are critical for optimizing core business processes and operational efficiency. Support applications like the Portal Intranet, Email Applications, and Office Applications, alongside ERP modules for Human Resources (HR), Financial Accounting (FI), and Sales and Distribution (SD), provide the necessary infrastructure for smooth internal operations. This well-rounded portfolio aims to integrate and streamline PT.XYZ's business processes, ensuring sustainable growth and maintaining a strong market position.

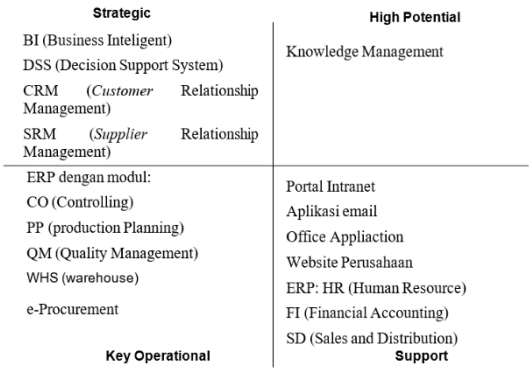

Figure. 3. McFarlan Grid Future Applications

Based on Table 11, The IT strategy formulation for PT.XYZ emphasizes creating a secure and accessible infrastructure to support various business functions, including procurement, customer service, warehouse management, manufacturing operations, and finance. A key aspect of this strategy is enabling web and mobile access for these applications (PS1 - PS11), allowing users to work remotely and flexibly. To ensure smooth communication and data exchange with business partners, the use of XML and PDF formats (PS4 and PS6) is mandated, promoting standardization and compatibility across different systems.

Security is a central focus of the strategy, with stringent measures such as user-specific IDs and passwords, managed centrally by the IT department, to maintain accountability and enable audits (PS1 - PS11). Additionally, all internet access is protected by Secure Socket Layer (SSL) encryption to safeguard data integrity. The architecture also includes placing database, application, and web logic servers behind a firewall in a Demilitarized Zone (DMZ) environment, ensuring physical separation and enhanced security (PS1 - PS11). The use of mirroring ensures data redundancy and system reliability, providing a safeguard against data loss and system failures (PS1 - PS11). This comprehensive strategy aligns with PT.XYZ's goals of enhancing operational efficiency, maintaining security, and supporting business continuity.

Table 11. IT Strategy

Principles of Architecture	Solution Code
All application functions (procurement, customer service, warehouse management, manufacturing operations, finance) can be accessed via the internet (web enabled) and mobile application.	PS_1 - PS_{11}
Sharing information with business partners (suppliers and customers) must use XML and PDF-based formats.	PS_4 and PS_6
Application access is protected by a user login system. • Users must have a unique userid and password • Centralized user administration management carried out by the IT department for accountability audits.	PS_1 - PS_{11}
Access via the internet must implement data encryption at least using secure socket layer (SSL).	PS_1 - PS_{11}
Database servers, application servers and web logic servers must run behind a firewall. Each server is physically separate and located in a Demilitary Zone environment.	PS_1 - PS_{11}
Using the mirroring concept.	PS_1 - PS_{11}

1. Information Systems Gap Analysis

Based on Table 12, The gap analysis of PT.XYZ's current application system portfolio identifies areas where systems need optimization, customization, or new development to align with the company's strategic objectives and operational needs. The analysis is presented in three categories: Optimize, Customize, and New Development.

Optimize: The email system is identified as needing optimization. Enhancements in this system could include improving security features, increasing storage capacity, and ensuring better integration with other communication tools to enhance internal and external communication efficiency.

Customize: Several systems require customization to better meet the specific needs of PT.XYZ. These include the Human Resources (HR) system, which could be tailored to handle unique employee management and payroll requirements. The Enterprise Resource Planning (ERP) system may need adjustments

to accommodate specific financial and operational processes unique to the company. The Financial Management (FM) system could also benefit from customization to better align with the company's financial reporting and analysis needs. Additionally, the portal web and monitoring systems might be customized to enhance user experience, data accessibility, and real-time reporting capabilities.

New Development: There are critical areas where new systems need to be developed to fill existing gaps. A new Supply Chain Management (SCM) system is necessary to streamline and optimize the supply chain processes. The Customer Relationship Management (CRM) system requires new development to enhance customer engagement and relationship management. A tracking system is also needed to provide real-time tracking of goods and services, improving logistics and customer satisfaction. Furthermore, a Location Management system should be developed to manage the geographic distribution of assets and resources effectively. The Electronic Document Management System (EDMS) and Material Management (MM) systems also need to be developed to facilitate document storage and retrieval, and optimize material usage and inventory management.

Table 12. IS Needs Gaps Analysis

		INFORMATION SYSTEM NEEDS ANALYSIS		
		Optimize	**Customize**	**New**
CURRENT INFORMATION SYSTEMS	SCM			x
	HR		x	
	CRM			x
	ERP		x	
	FM		x	
	Portal web		x	
	EMAIL SYSTEM	x		
	MONITORING		x	
	Tracking System			x
	Location Management			x
	EDMS			x
	MM			x
	SCM		x	

Based on table 13, The gap analysis of PT.XYZ's current IT portfolio highlights areas requiring optimization, customization, and new development to better support the company's operational and strategic needs. Optimization is necessary for systems such as the network infrastructure, PC servers and clients, bandwidth, firewall, desktop applications, and antivirus software. These enhancements aim to improve connectivity, system performance, cybersecurity, and overall user experience.

Customization is recommended for the barcode scanner system, portal web, VPN, desktop applications, and Linux servers. These systems need to be tailored to better integrate with existing workflows and meet specific organizational requirements. Additionally, new development is necessary for the PC server infrastructure to accommodate increased data and application demands, as well as implementing a Single Sign-On (SSO) system to streamline user access and improve security. This comprehensive approach to addressing IT gaps will enable PT.XYZ to strengthen its technological infrastructure, enhance operational efficiency, and provide a secure environment for business operations.

Table 13. IS Needs Gaps Analysis

		INFORMATION TECHNOLOGY NEEDS ANALYSIS		
		Optimize	**Customize**	**New**
CURRENT INFORMATION TECHNOLOGY	Network Infrastructure		X	
	PC Server	X	X	X
	PC Client	X	X	X
	Barcode Scanner	X	X	X
	Bandwidth	X		
	Portal web		X	
	Firewall	X	X	

VPN	X	
Linux Server	X	
Desktop Application	X	
PHP	X	
Java	X	
Anti virus		X
SSO		X

Application Development Road Map

Based on table 14 the McFarlan matrix analysis, PT.XYZ has outlined a comprehensive application development roadmap for the years 2024 to 2026. This roadmap provides a timeline for the development, implementation, and optimization of various systems categorized into Support, Key Operational, and Strategic applications.

Support Applications:

1. **Portal Intranet:** The development and optimization of the Portal Intranet are planned to begin in early 2024 and continue into 2025, enhancing internal communications and access to company resources.
2. **Human Resources (HR) and Financial (FI) Systems:** The HR system will be enhanced starting from mid-2024 through to 2026, focusing on better employee management and payroll functionalities. The FI system will undergo similar enhancements, starting in early 2024 and continuing into 2025, to improve financial reporting and analysis capabilities.

Key Operational Applications:

3. **Controlling (CO), Production Planning (PP), Quality Management (QM), and Warehouse Management (WHS):** These systems will be developed and optimized from early 2024 through mid-2025. The focus will be on integrating these modules for better resource planning, production scheduling, quality control, and warehouse operations.
4. **Material Management (MM):** Development and optimization are scheduled to begin in late 2024 and continue into 2025, streamlining inventory and procurement processes.

Strategic Applications:

1. **Business Intelligence (BI) and Decision Support Systems (DSS):** These critical systems will be developed from mid-2024 through 2025, providing enhanced data analysis and decision-making support.
2. **Customer Relationship Management (CRM) and Supplier Relationship Management (SRM):** CRM development will focus on improving customer engagement and sales processes, starting in late 2024 and continuing through 2025. SRM will follow a similar timeline, enhancing supplier interactions and procurement efficiency.
3. **Knowledge Management and Supply Chain Management (SCM):** The implementation of Knowledge Management systems will begin in mid-2025, aiming to capture and utilize organizational knowledge effectively. SCM system development will focus on optimizing the supply chain processes and is scheduled to start in late 2024 and continue into 2026.

Security and Infrastructure:

1. **Security Systems:** The roadmap includes continuous improvements in security systems, focusing on enhancing data protection and system integrity.
2. **Database System and Network Infrastructure:** These foundational systems will be continuously optimized from 2024 through 2026, ensuring robust and reliable infrastructure support for all applications.

This roadmap reflects PT.XYZ's strategic approach to developing and enhancing its IT systems to support business operations, improve efficiency, and secure data and processes. The phased implementation allows for focused attention on each system, ensuring that each one meets the company's evolving needs and supports its long-term objectives.

CONCLUSION

This study provides a comprehensive analysis and strategic framework for improving the Information Systems and Information Technology (IS/IT) infrastructure at PT XYZ. The findings and recommendations aim to optimize the company's operations and strengthen its competitive position. Some key conclusions from this study include: first, system integration to improve communication. To improve internal and external data communication, especially between clients and suppliers, PT XYZ needs to integrate its systems. This step will speed up the process, reduce data handling time, and improve communication efficiency. Second, increasing competitive advantage through IT infrastructure. Analysis of PT XYZ's IS/IT infrastructure shows the need for additional applications and infrastructure updates, which are important to strengthen the company's competitive

advantage in responding to market needs and operational challenges. Third, the IS/IT Strategic Planning document as a roadmap. The preparation of this Information Systems/Information Technology Strategic Planning (PSSI) document is an important roadmap for the development of the company's IS/IT for the next three years, with a structured approach to prioritizing and implementing technological advances. Fourth, determining development priorities. With a roadmap, PT XYZ can set clear development priorities based on specific business needs and timelines, so that resource allocation is more efficient and important projects get the attention they need. Fifth, system integration assurance through ISSP alignment. Following the Information Systems Strategic Planning (ISSP) framework ensures that all new applications and systems are designed to be fully integrated, creating an IT environment that supports smooth operations and company data flow. Based on these conclusions, some recommendations for PT XYZ include: further study of the budget. It is recommended to conduct an in-depth study of the budget requirements in implementing new applications and infrastructure in order to more accurately estimate costs and allocate the necessary financial resources. In addition, further research is needed to evaluate the efficiency and effectiveness of ISSP implementation on business processes, comparing operational performance before and after implementation to assess its impact and benefits. These recommendations aim to help PT XYZ improve IS/IT infrastructure and maximize its strategic potential. Successful implementation of this strategy will not only improve operational efficiency, but also put the company on a path of sustainable growth and competitiveness in the industry.

REFERENCE

Albukhitan, S. (2020). Developing digital transformation strategy for manufacturing. Procedia Computer Science, 170, 664–671.

Baiyere, A., Salmela, H., & Tapanainen, T. (2020). Digital transformation and the new logics of business process management. European Journal of Information Systems, 29(3), 238–259.

Brunetti, F., Matt, D. T., Bonfanti, A., De Longhi, A., Pedrini, G., & Orzes, G. (2020). Digital transformation challenges: strategies emerging from a multi-stakeholder approach. The TQM Journal, 32(4), 697–724.

Chanias, S., Myers, M. D., & Hess, T. (2019). Digital transformation strategy making in pre-digital organizations: The case of a financial services provider. The Journal of Strategic Information Systems, 28(1), 17–33.

Fischer, M., Imgrund, F., Janiesch, C., & Winkelmann, A. (2020). Strategy archetypes for digital transformation: Defining meta objectives using business process management. Information & Management, 57(5), 103262.

Grillitsch, M., Hansen, T., Coenen, L., Miörner, J., & Moodysson, J. (2019). Innovation policy for system-wide transformation: The case of strategic innovation programmes (SIPs) in Sweden. Research Policy, 48(4), 1048–1061.

Kraus, S., Jones, P., Kailer, N., Weinmann, A., Chaparro-Banegas, N., & Roig-Tierno, N. (2021). Digital transformation: An overview of the current state of the art of research. Sage Open, 11(3), 21582440211047576.

Saarikko, T., Westergren, U. H., & Blomquist, T. (2020). Digital transformation: Five recommendations for the digitally conscious firm. Business Horizons, 63(6), 825–839.

Singh, A., Klarner, P., & Hess, T. (2020). How do chief digital officers pursue digital transformation activities? The role of organization design parameters. Long Range Planning, 53(3), 101890.

Tekic, Z., & Koroteev, D. (2019). From disruptively digital to proudly analog: A holistic typology of digital transformation strategies. Business Horizons, 62(6), 683–693.

Warner, K. S. R., & Wäger, M. (2019). Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal. Long Range Planning, 52(3), 326–349.

Wessel, L., Baiyere, A., Ologeanu-Taddei, R., Cha, J., & Blegind-Jensen, T. (2021). Unpacking the difference between digital transformation and IT-enabled organizational transformation. Journal of the Association for Information Systems, 22(1), 102–129.

Yuwono, M. A., & Ellitan, L. (2024). Comprehensive Strategic Analysis for Determining Strategic Policies at Pt. Lmc. International Journal of Management, Accounting & Economics, 11(8).

Zaki, M. (2019). Digital transformation: harnessing digital technologies for the next generation of services. Journal of Services Marketing, 33(4), 429–435.

Zaoui, F., & Souissi, N. (2020). Roadmap for digital transformation: A literature review. Procedia Computer Science, 175, 621–628.