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The Strategic Role of Information Technology Leadership in XYZ

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Abstract

Information Technology involvement on an organization may vary. Based on McFarlan's IT strategic impact grid, it is being classified to be support, factory, turnaround, and strategic. Each quadrant has a different IT leadership position and IT role. XYZ is an institution with high dependency on IT, as they manage online activities, use website, and enter global market. This qualitative study focuses on XYZ's IT leadership implication and role of IT on the system used. The data collection was carried out by exploratory literature studies and semi-structured interview. The findings of this study show that XYZ is now in the strategic quadrant. It depicts from McFarlan application mapped which shifts to focus on strategic as The Role of IT, also dominant quadrant category of IT Leadership Implication is strategic.

A. Introduction

XYZ is an institution that provides infrastructure and oversight for the capital market, encompassing the listing and trading of various securities such as stocks, bonds, Collective Investment Contracts (KIK), and Asset-Backed Securities (EBA). Its vision is to be the leading stock exchange in the Southeast Asia region, with a mission to develop a professional, liquid, transparent, innovative Indonesian capital market that benefits all stakeholders [1]. The recent developments at the XYZ mark a significant transition phase in IT leadership, from the 'Factory' paradigm, which is oriented towards operations and efficiency, to the 'Strategic' paradigm, which focuses more on innovation and strategic development. This transition is triggered by the diversification of the trading portfolio at XYZ, which not only includes stock trading but also extends to other financial instruments such as carbon exchanges, retail, bonds, and sukuk. The dynamic nature of financial markets, characterized by rapid technological advancements, globalization, and a constant influx of data, has compelled XYZ to reevaluate their strategies and operations. At the heart of this transformation lies the pivotal role of Information Technology (IT) leadership.

XYZ has two areas of information technology infrastructure: trading infrastructure and office infrastructure. The trading infrastructure consists of systems for securities trading, transaction monitoring, and data dissemination. Meanwhile, the office infrastructure consists of systems used to support the company's business processes, such as the website, email services, financial and taxation information systems, procurement systems, helpdesk systems, and more. The systems in the office and trading areas are separated in terms of connectivity to maintain security levels. Some systems in the office area require data from the trading system for reporting, data warehousing, and internal data dissemination within the company, such as historical data, websites, and multimedia. Conversely, the trading system also requires input data from the office system for stock corrections, indices, stock suspension updates, corporate actions, and news updates to the trading system.

Information technology (IT) has become essential for managing transactions, analyzing data, disseminating knowledge, and playing a crucial role in supporting both economic and societal functions. For numerous enterprises, IT serves as a foundational element for sustaining, developing, and extending their operations. The role of IT within a company should strongly influence the approach taken to identify prospects, devise and implement IT-driven business projects, and oversee IT assets and experts. Two critical aspects should be taken into account: (1) the business impact of the existing collection of IT systems and applications; and (2) the business implications of the lineup of IT projects. The first dimension emphasizes the crucial role of current IT setups in the ongoing business operations, highlighting the need for flawless IT execution. In contrast, the second dimension assesses the significance of IT in advancing the business by shaping its future strategies and capabilities, underscoring the importance of efforts towards IT innovation [2].

This study aims to explore and elucidate the multifaceted responsibilities shoulder by IT leaders within the XYZ. It will dissect the challenges and opportunities presented by the intersection of technology and finance, highlighting the strategic initiatives that IT leadership must undertake to steer XYZ through the complexities of the contemporary financial landscape and highlight how XYZ can

increase the transaction amount referring to the transition in the role of IT leadership and manage the changing role of IT on the system used.

B. Theoritical Background

This section delves into the theoritical background shaping this study.

IT Leadership

Leadership is a process of guiding a group of people to work together towards a shared objective by influencing their decisions [2]. Information Technology (IT) leadership means that it involves the application of leadership skills and strategies into the context of Information Technology (IT) industries. There have been several prior studies regarding IT leadership. For example, [3] examines the role of IT leadership in a family-owned online business. Another example is [4] which examines the role of IT leadership in the IT role transformation within government institutions.

IT Role Classification

One of the most useful methodologies for determining the role of IT in an organization is the IT Strategic Grid, which was developed by McFarlan, et al [5]. made a classification of IT roles in an organization based on McFarlan's IT strategic impact grid [6], [7]. This classification identifies executive decision in governing, organizing, and managing IT functions based on two dimensions: Business Implication of IT Applications and Business Implication of IT Project Portfolio. Business Implication of IT Application assesses the impact of IT system to the current business operation while IT Project assesses the impact of IT system to the future business capabilities. Based on this assessment, IT roles are classified into four quadrants [8], [9], [10]:

- Support: IT role is only aiding current business operations and the organization's operations are not dependent on the IT itself.
- Factory: IT role is critical to the current business operations. The IT system is essential in performing the core activities of the organization.
- Turnaround: while the current business operation is not dependent on the IT system, future IT projects or innovations are intended to exploit future strategic opportunities.
- Strategic: IT role is very crucial to sustain the current and future business operations. The IT role in this quadrant also implies the significance of IT system in the organization's future strategies.

Impact of IT Leadership

Organizations must have a clear vision of how to manage their IT function in the organization. The IT leader must identify the current IT capabilities and their impact on the organization as its IT function has capabilities in impacting organization current and future business. [4] mentions that IT leadership is a crucial element in unlocking organization's business needs and capabilities. [6] identifies the IT leadership style that is needed in the organization for each IT role:

- Support: organization needs a generalist IT leader who is flexible in skills and expertise to support the various supporting areas of organization. The leader

needs to focus on keeping the IT function at a low cost since it is not crucial to the organization's business activities.

- Factory: organization needs an IT leader who has deep technical and industrial expertise. The leader needs to have a strong discipline in the execution and be able to perform in a reliable and cost-effective manner as the IT function is crucial to business activities.
- Turnaround: organization needs an entrepreneur IT leader who can identify and turn technological ideas into business opportunities. The leader needs to have a strong capability in handling uncertainty and ambiguity.
- Strategic: organization needs a businessman IT leader which have a deep technical expertise but also a general management expertise. The IT leader needs to use the IT function to scale the business and increase future market share.

IT Role Transition

Some organizations undergo changes in their IT role quadrant over time. This change is often driven by external or internal factors such as: shifting in organization strategies, technology advancement, or alignment of an organization's IT function with its core business activities [6]. To follow this transformation, the IT leadership approach of an organization also needs to change to maximize its IT system functionality. Commonly, an organization IT function starts at the support quadrant and then it is transitioning into a different quadrant.

- Turnaround Transition: managing executive-innovation tension in the organization is one of the challenges when transitioning into turnaround quadrant [6]. Most of the time, organization executives would not like to take too much risk. But, at the same time, turnaround transition would need a rapid innovation which has much ambiguity and uncertainty. Leaders need to ensure that turnaround initiatives can be delivered without much intervention. If previously organizations do not have the proper IT competencies for the transition, they can outsource an IT leader who is capable of handling the transformation [6].
- Factory Transition: IT function will be transitioning into a core function of the organizations. Many resources and investment will be redirected into the IT department to increase the reliability and quality of IT functions. Organization must ensure that this transition is handled by professionals who have deep understanding of technological expertise, and they must be able to keep the IT function in a cost-effective manner to ensure organization survivability [4], [6].
- Strategic Transition: in this transition, IT function is shifting into business functions as it will also support current and future business operations. Organization's funding will be shifted into technological assets that correlates with business operations. Maintaining the balance between the IT department and business group will be a key to the successful strategic transition. Leaders need to manage and watch the relationship between these two groups as they adapt into one IT-enabled business solutions [6].

C. Research Method

This research is a qualitative research to identify the role of IT leadership at XYZ. Here are the steps in this research:

1. *Literature Study*

This research started by a literature study to find out about the concept and knowledge of IT leadership. The literature used comes from books, research journals, and data owned by XYZ. For research journal sources, we use those were published from 2019 and above.

2. *Data Collection*

Data was collected from the documents from XYZ, such as annual report documents, company operational standards, policies, and guidelines related to IT leadership.

3. *Data Verification*

Data verification was necessary to confirm what has been obtained from the available documents in order to consider alternative explanations and the validity of the data [6]. Interviews were the approaches to do data verification. The source persons are Head of Enterprise Architecture and Head of System Management from XYZ.

4. *Data Analyzation*

The data obtained from interview and documents will be processed and analyzed using IT Strategic Impact Grid from McFarlan. After being mapped, the research will give more explanations about the strategic role of IT leadership in XYZ

D. Result and Discussion

IT Management and Operation in XYZ

IT organizational structure of the XYZ, the oversight of Development, Project Management, Support, and Information Technology Needs Fulfillment is under the Directorate of Information Technology and Risk Management, which consists of four divisions with different functions and roles. These divisions are the Information Technology Development Division, Risk Management Division, Strategy and Digital Information Division, and IT Operations Division. Digital environment of PT XYZ, the IT production operational is divided into two different divisions, namely the Business and Office IT Operations Division and the Trading and its Support IT Operations Division

The Role of IT in XYZ

The technological and system transformation at the XYZ over the years reflects a significant evolution from an IT leadership paradigm of "Factory" to "Strategic". Initially, the focus of XYZ was primarily on enhancing infrastructure and system reliability, evident from the hardware replacement of JATS and the development of JATS-Remote Trading starting in 2004, along with the construction of the Business Continuity Plan/Disaster Recovery Center (BCP/DRC) project [11], [12], [13]. The 100% reliability of the JATS system and its capacity enhancement indicate these efforts. The implementation of JATS-NextG in 2009 [14], capable of handling millions of orders per day, marked the peak of operational enhancement. This development consistently demonstrated the "Factory" orientation of XYZ's IT leadership, focusing on operational efficiency and reliability.

Moving towards 2010 and beyond, XYZ began showing a transition to a more "Strategic" IT leadership approach, with the adoption of new technologies and development of innovative services [15]. This includes the development of the Data Warehouse, enhancement of JATS-NextG capacity, introduction of XYZNet, and the launch of e-IPO and Virtual Trading in 2019 [16]. This transformation was further strengthened with the implementation of the FIX 5, ITCH, and OUCH protocols in 2022, enhancing the speed and efficiency of order processing [17], [18]. Additionally, the implementation of Direct Co-location in the same year allowed XYZ members to connect directly to the XYZ trading engine, reducing latency, and supporting faster order delivery. These steps not only demonstrate a focus on technological innovation for operational efficiency but also open up opportunities for new product development and service enhancement [17], [18]. Through this transformation, the IT leadership at XYZ has evolved from merely supporting operations to being a primary catalyst for strategic innovation and expansion in the capital market. Then XYZ's applications are mapped into McFarlan quadrant as on Figure1.

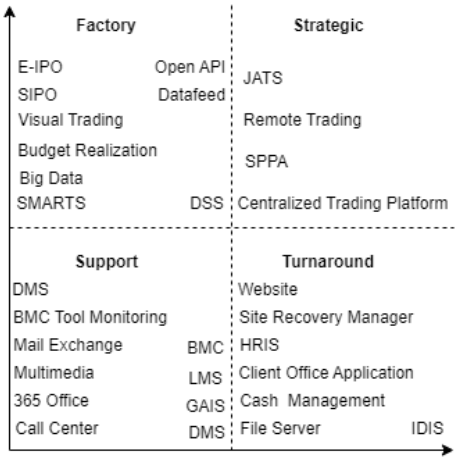

Figure1. McFarlan Application Mapping

1. Strategic System in XYZ

Strategic is a quadrant for applications that are critical to sustaining the company's future business success.

JATS

JATS (*Jakarta Automated Trading System*) was designed as a paperless trading system, replacing the manual paper-based trading system. This was a significant step in the modernization of the Indonesian stock market, enabling electronic transactions, increasing speed and accuracy, and reducing the likelihood of errors often seen in manual systems. In 2005, the JATS version was upgraded to version 6, allowing for increased stock trading capacity and wider implementation of remote trading [13]. The capacity of this system continued to be enhanced, and in 2009, JATS-NextG was implemented, marking a major advancement in trading technology with significantly increased capacity to handle up to 1,000,000 orders and 500,000 transactions per day [14].

Remote Trading

The transformation of remote trading within the Jakarta Automated Trading System (JATS) is evident in the rapid increase in the number of member brokers (Anggota Bursa, AB) who connected to the system over a few years. Initially, in 2004, with the completion of JATS-Remote Trading (JATS RT) development, 24 AB had become remote trading members, and 9 more were preparing to join. This number significantly increased by the end of 2005, with 68 AB connected, marking a 65% increase from the previous year. By 2006, the adoption of remote trading had escalated remarkably, with 99% of all AB actively engaged in stock trading using the system. This rapid integration and near-total adoption of remote trading technology within a span of just two years reflect a major shift in trading practices from a central, physical trading floor to a more decentralized, digital, and accessible environment, greatly enhancing operational efficiency and expanding market participation across various regions of Indonesia [12], [13], [19].

SMARTS

SMARTS stands for Surveillance, Monitoring, and Analysis Real-Time System. SMARTS is a software platform developed by Nasdaq. This platform is used by XYZ to monitor and analyze the risks associated with securities transactions, such as detecting suspicious transactions, preventing market manipulation, and protecting investors from losses.

CTP

The CTP (Centralized Trading Platform) system encompasses two major services: the Securities Transaction Reporting Service, which consists of the Securities Transaction Reporting Receipt Application (PLTE) and the Securities Transaction Reporting Monitoring Application (Daily Watching), and the Main Dealer System Service, which is the Ministry of Finance Inter Dealer System (MOFIDS) application that can be utilized by Main Dealers for the auction process of Government Bonds.

2. Factory System in XYZ

The "Factory" quadrant encompasses applications crucial for daily operations but not unique to the company's competitive advantage, focusing on efficiency and standardization.

E-IPO

E-IPO stands for Electronic Initial Public Offering. E-IPO refers to the process of an Initial Public Offering (IPO) conducted electronically, where shares of a company going public are offered to investors through an electronic platform or online system [18].

Open API XYZ

Open API is a form of development for a platform and infrastructure designed to accommodate an effective, efficient, and secure data exchange mechanism, both between internal systems at XYZ and with external systems. This platform is an upgrade from the previously functioning Service Oriented Architecture (SOA), which served as limited middleware between internal systems at XYZ. With API

Management, Gateway, and Services, this service will also be accessible as a service for external parties, in addition to internal use. This development aligns with XYZ's roadmap to expand data services and integration with AB systems, SRO, Fintech, financial institutions, and other external parties as needed [17].

FIX 5, ITCH, and OUTCH

A system or platform that allows users to simulate stock trading, serving primarily as an educational and training tool for novice investors. It facilitates an understanding of stock market dynamics without financial risk, by providing realistic market data in a controlled environment. Users can practice buying and selling stocks, develop strategies, and understand market analysis as well as risk management. The XYZ virtual trading platform offers features like a stock list, historical data, and analytical tools, providing an experience similar to real trading and helping users hone their skills. This initiative not only assists XYZ in reaching a broader population in Indonesia for capital market education but also contributes to the development of a more inclusive and knowledgeable capital market [17].

IT Leadership Implications of the Role of IT

1. *Time Horizons*

The role of information technology at XYZ in the time horizon category is primarily dominated by the "Strategic" quadrant. XYZ has a vision of developing IT innovations in the field of stock exchange and financial trading. To achieve this goal, XYZ has a Rencana Strategis Jangka Panjang Perusahaan (RSJPP) or a Master Plan every 5 years.

2. *Business Focus of IT*

XYZ's role in the IT business focus category is primarily dominated by the "Strategic" quadrant. Almost all of its operations heavily rely on applications. Currently, everything is conducted online to expedite processes and enhance customer satisfaction. In this context, maintaining operational continuity is of paramount importance. XYZ's core business is providing securities trading platforms and financial services. Existing IT functions are more focused on improving services for customers and market participants. The direction of IT development is to provide integrated services in a gradual manner.

3. *Key Business Challenge*

XYZ's role in the category of key business challenges is primarily dominated by the "Strategic" quadrant. The success of IT functions is measured based on time, budget, and performance achievements. Existing IT functions primarily support technical units, especially in terms of ease and speed. In the 1990s, trading still used the outcry method, but after the implementation of JATS Remote Trading, XYZ continued to update its system, as outlined in the IT draft master plan. XYZ earns 0.18% of revenue from each transaction, both for buying and selling.

4. *Key Technical Challenge*

XYZ's role in the category of key technical challenges is primarily dominated by the "Factory" quadrant. Existing IT functions are associated with technical needs. The IT functions will be integrated with the main systems within XYZ's program framework. Additionally, XYZ has already implemented ISO 27001, ISO 9001,

22301, and 37001 certifications as the basis for implementing Good Corporate Governance (GCG).

5. Organization and Management Approach

XYZ's role in the category of organizational and management approach is primarily dominated by the "Factory" quadrant. Control over IT functions at XYZ is centralized. Budgets for IT functions are created based on needs and planned annually. Modifications to IT functions are budget-driven through careful planning and risk management. In terms of infrastructure, maintenance is performed routinely, taking into consideration product end-of-life (EoL). On the other hand, XYZ utilizes outsourced personnel from vendors to enhance services, mainly due to the limited number of human resources available within PT XYZ.

6. Profit Impact of IT Function

XYZ's role in the category of profit impact from IT functions is primarily dominated by the "Strategic" quadrant. Every IT budget expenditure provides benefits in terms of efficiency, effectiveness, quality improvement, and company profits. IT plays a critical role in stock trading operations, and any IT-related issues can have a significant impact on losses, not only for the company but also for stakeholders and even the government.

7. IT Leader Attributes

XYZ's role in the category of IT leader attributes is primarily dominated by the "Strategic" quadrant. Led by an experienced Director of Information Technology and Risk Management in the capital market industry, this leadership profile reflects the essential attributes of an IT leader. XYZ is guided by a Director of Information Technology who possesses strong general management expertise, as demonstrated through various leadership roles at PT Kliring Penjaminan Efek Indonesia and PT Kliring Depositori Efek Indonesia. Their deep technical expertise is evidenced by experience in risk control and securities transaction clearing.

8. Managerial Talent Approach

XYZ's role in the category of managerial talent approach is primarily dominated by the "turnaround" quadrant. Existing IT human resources are given opportunities to undergo technical training and guidance. Existing IT human resources are also encouraged to move towards Specific Functional Positions (JFT). Essentially, the IT human resources at XYZ are outsourced, allowing risk control to be transferred to partners.

9. Corporate Involvement

XYZ's role in the realm of corporate involvement predominantly falls under the "Factory" quadrant, emphasizing a focus on operational efficiency and stability. This is evident in the IT master plan, which features a committee structure incorporating external expertise and IT consultants to guide and oversee IT initiatives. In line with corporate engagement, there is always an element of continual IT infrastructure renewal. This means that as part of their corporate strategy, XYZ consistently involves updating and modernizing their IT infrastructure to stay abreast of technological advancements and maintain their operational efficiency. This approach ensures that the organization remains competitive and capable of adapting to evolving market demands and technological changes.

10. Selection of Performance Measure

Performance measurement selection at XYZ is primarily dominated by the "Strategic" quadrant. In this context, the Strategic application is one of the Company's Key Performance Indicators (KPIs), ensuring Availability SLA for the Strategic application.

11. Summary of Results

A recap of each category and quadrant can be seen in Table II. Based on Table II, it can be observed that the role of IT at XYZ falls into the "Factory" quadrant in 3 categories, the "Strategic" quadrant in 6 categories, the "Turnaround" quadrant in 1 categories. Since most of the categories fall into the "Factory" and "Strategic" quadrants, it can be concluded that the role of IT at XYZ is primarily in the "Strategic" quadrant, which is in the process of transforming towards a strategic approach. To create Table 1 Quadrant that refers to study [20] and book [6].

Table 1. Quadrant

No	Category	Quadrant	Dominant Quadrant
1	Time Horizons	1. Medium Term Vision 2. High Levels of urgency	Strategic
2	Business Focus of IT	1. Support Core Business 2. Incremental Process Improvement	Strategic
3	Key Business Challenges	Support: Achievement of cost plans. Strategic: 1. Achieving performance targets. 2. Discovering new revenue through efficient operations, shared services, and infrastructure.	Strategic
4	Key Technical Challenges	1. Build the business and scale quickly 2. Manage rapid growth and complexity 3. Boundary management and integration across business and functions	Factory
5	Organization and Management Approaches	1. Strong Centralized infrastructure and operations management 2. Focus on systems availability and reliability 3. Annual budget and plans 4. Outsource to gain economies of scale, better service quality and geographical scalability	Factory
6	Profit Impact of IT Function	1. Invest to accelerate and sustain growth, and improve asset efficiency 2. Substantial profits may be a few years in the future	Strategic
7	IT Leader Attributes	Business Builders: 1. Proficient in general management 2. Expert in specialized technical skills 3. Driven to expand and upscale 4. Concentrated on increasing revenue 5. Implement plans for both short and mid-term goals 6. Oriented towards achieving high performance	Strategic

8	Managerial Talent Approach	1. Ensure responsibility and empower with authority while incentivizing growth. 2. Offer chances to boost personal wealth via cash bonuses and participation in equity.	Turnaround
9	Corporate Involvement	IT Executive Steering Committee 1. Allocate resources for IT-driven business expansion. 2. Tackle issues related to scaling IT infrastructure and operations.	Factory
10	Selection of Performance Measure	Efficient and Profitable Growth with Capital 1. Maximizing asset utilization 2. Increasing market share 3. Acquiring new customers 4. Efficiency in capital investments 5. Anticipated net present value	Strategic

E. Conclusion

The study of IT leadership's role in the XYZ has highlighted its evolution from a supportive to a strategic function, emphasizing the growing importance of technology in business strategy and operations. This research's findings demonstrate the importance of effective IT leadership for integrating technology with overall business goals, transforming IT into a critical component of organizational success.

For future research, there are several areas to explore. A future study could provide invaluable insights into the long-term effects of strategic IT leadership. Comparative studies across different financial institutions could help understand the varied challenges and successes in IT leadership transitions. Research into the effect of IT leadership on organizational culture and employee engagement would reveal the impact on crucial aspects of strategic IT management. Moreover, examining specific technology adoption decisions could reveal the effectiveness of diverse IT strategies.

The Analytic Hierarchy Process (AHP) would be an ideal methodology for future studies, particularly in assessing the decision-making processes in technology adoption and strategic IT initiatives. AHP's structured framework for organizing and analyzing complex decisions could help in quantitatively evaluating the factors influencing IT leadership decisions. Additionally, qualitative methods such as in-depth interviews and studies would provide a deeper understanding of changes in organizational dynamics and culture, while surveys and performance data analysis could offer actual evidence of business impact.

Case studies, especially focusing on specific aspects of technology adoption and strategic initiatives under IT leadership, would allow for a detailed exploration of processes, challenges, and outcomes. These case studies could utilize a combination of AHP for decision analysis and qualitative approaches for contextual understanding.

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