



ANALYSIS OF INFORMATION TECHNOLOGY INFRASTRUCTURE AT TOMORO COFFEE: MATURITY EVALUATION AND DEVELOPMENT STRATEGY

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Abstract :

Information Technology (IT) infrastructure plays a crucial role in supporting operations and competitiveness of companies in the digital era. This study aims to analyze the implementation of IT infrastructure at TOMORO Coffee, one of the rapidly growing modern coffee chain companies in Indonesia. The analysis was conducted using the 7 Components of IT Infrastructure framework by Laudon and Laudon (2022), which includes computer hardware platforms, computer software platforms, enterprise software applications, data management and storage, networking and telecommunications platforms, internet platforms, as well as consulting and system integration services. The research method employed was descriptive qualitative through direct observation at TOMORO Coffee outlets. The maturity level was measured using the COBIT model and supplemented with SWOT analysis, competitor analysis, and gap analysis. The findings indicate that TOMORO Coffee is at the Managed level (average score of 3.85) with strengths in operational digitalization through the integrated TOMORO Smart POS system. However, significant gaps were identified in AI Analytics, Predictive Reporting, Personalized CRM, and Zero Trust Security. A strategic IT infrastructure development plan for the 2026–2030 period is recommended to enhance the company's competitiveness.

Keywords : IT Infrastructure, TOMORO Coffee, COBIT, Laudon & Laudon, SWOT, Gap Analysis, Digital Transformation

INTRODUCTION

The development of information technology has brought significant changes to the way organizations carry out their business activities. In the current digital era, information technology is no longer viewed merely as an operational support tool, but has become a strategic asset capable of creating competitive advantages for companies. Organizations that can effectively integrate information technology into their business processes will have better capabilities in improving operational efficiency, customer service quality, and managerial decision-making (Laudon & Laudon, 2022).

One industry that has experienced significant digital transformation is the Food and Beverage (F&B) industry. Increasingly intense competition requires companies to provide fast, accurate, and high-quality services to



customers. To achieve this, companies utilize various technologies such as Point of Sales (POS), Kitchen Display System (KDS), Cloud Computing, Customer Relationship Management (CRM), Business Intelligence (BI), and various other digital technologies (Turban et al., 2021).

TOMORO Coffee is one of the rapidly growing modern coffee chain companies in Indonesia. The company adopts a technology-based approach in conducting its business activities. Based on field observations at TOMORO Coffee outlets, the use of the TOMORO Smart POS system was identified, consisting of various modules such as Order, KDS, Inventory, Transactions, Report, and Settings. This system demonstrates the integration of information technology that comprehensively supports the company's business processes.

This analysis utilizes the 7 Components of Information Technology Infrastructure framework by Laudon and Laudon (2022), which includes: (1) Computer Hardware Platforms, (2) Computer Software Platforms, (3) Enterprise Software Applications, (4) Data Management and Storage, (5) Networking and Telecommunications Platforms, (6) Internet Platforms, and (7) Consulting and System Integration Services. This study aims to evaluate the maturity level of TOMORO Coffee's IT infrastructure and develop strategic recommendations to enhance the company's competitiveness in the future.

RESEARCH METHOD

This study employs a descriptive qualitative method with a case study approach at TOMORO Coffee. Data was collected through direct observation at TOMORO Coffee outlets to examine the implementation of information systems used in daily operations. The observation focused on the use of TOMORO Smart POS along with all integrated modules within it.

Data analysis was conducted using several analytical frameworks: (1) the 7 Components of IT Infrastructure framework by Laudon and Laudon (2022) to map all infrastructure components used, (2) the COBIT (Control Objectives for Information and Related Technologies) model to measure the maturity level of IT governance, (3) SWOT Analysis to identify the strengths, weaknesses, opportunities, and threats of IT infrastructure, (4) Competitor analysis to compare TOMORO Coffee's position with similar companies, and (5) Gap Analysis to identify discrepancies between the current condition and the desired ideal state.

FINDINGS AND DISCUSSION

Organizational Profile of TOMORO Coffee

TOMORO Coffee is a modern retail coffee company that adopts the digital business concept in its operations. The company combines premium product quality with cutting-edge information technology to create a better and more efficient customer experience. The business model used is a retail coffee chain, where the company operates multiple outlets managed with uniform operational standards and supported by a centralized information system.

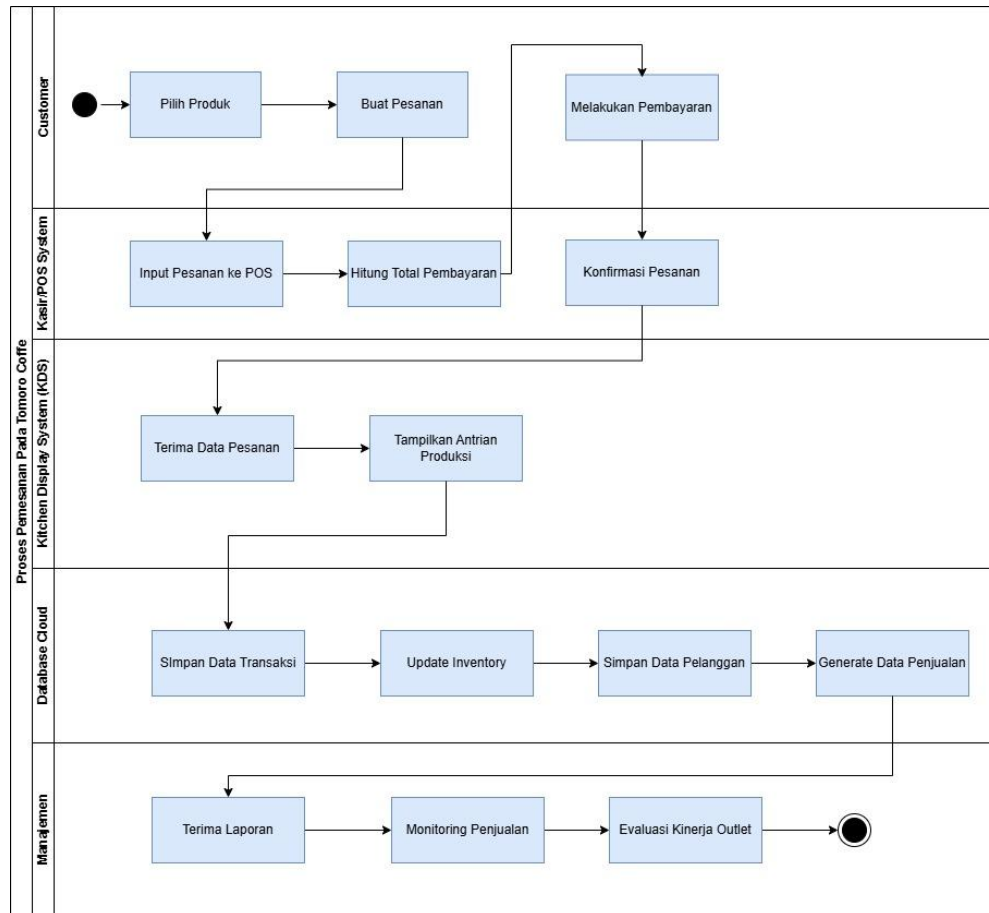


Figure 1. Framework of the 7 IT Infrastructure Components (Laudon & Laudon, 2022)

The business process begins when a customer selects a product and places an order. The order information is then entered into the POS system, where the total payment amount is calculated. After the customer completes the payment, the system confirms the order and sends the order data to the production service center. The service center receives the order and displays it in the production queue for processing.

Next, the system stores the transaction data in the database, updates inventory levels based on the items sold, and saves customer information. The database also generates sales data that can be used for analysis and reporting. Finally, management receives sales reports, monitors sales performance, and evaluates outlet performance to support operational improvements and strategic decision-making. The process ends once the evaluation has been completed.

Table 1. Business Characteristics of TOMORO Coffee

Aspect	Description
Business Type	Food & Beverage (F&B)
Business Model	Coffee Chain with Multi-Outlet
Target Market	Students, Employees, Communities (18–35 years old)
Sales System	Offline (Dine In, Take Away) & Online (Delivery Platform)
Core Technology	TOMORO Smart POS, Cloud System, Inventory Management
Payment Methods	Cash, QRIS, E-Wallet, Debit/Credit Card

Implementation of the 7 IT Infrastructure Components

Based on the Laudon and Laudon (2022) framework, IT infrastructure consists of seven main components that are interconnected. The following is an analysis of the implementation of each component at TOMORO Coffee.



Figure 2. Framework of the 7 IT Infrastructure Components (Laudon & Laudon, 2022)

1. Computer Hardware Platforms

TOMORO Coffee utilizes mobile and cloud-based hardware comprising Android POS Tablets for order input and transaction calculations, Thermal Printers for receipt printing, QR Scanners for digital payments and membership, Cash Drawers for cash storage, Kitchen Display Systems (KDS) for displaying orders to baristas, Routers and WiFi Access Points as networking infrastructure, and virtual Cloud Servers for data storage and synchronization.

Table 2. TOMORO Coffee Hardware Devices

No	Category	Device	Function
1	Front Office	Android POS Tablet	Order input, transaction calculation
2	Front Office	Thermal Printer	Receipt printing
3	Front Office	QR Scanner	Digital payment & membership scanning
4	Production	Kitchen Display System	Display orders to baristas
5	Network	Router & Access Point	Network management & WiFi
6	Server	Cloud Server (Virtual)	Data storage & synchronization

2. Computer Software Platforms

The software platforms used include Android OS on the client side (POS tablets) and most likely Linux Server along with a Cloud Platform on the server side. The main advantage is the capability for centralized updates, where system changes can be deployed from headquarters to all outlets simultaneously. High scalability facilitates the addition of new branches, and maintenance can be performed remotely. However, there are risks of vendor lock-in and potential downtime due to software bugs.

3. Enterprise Software Applications

TOMORO Coffee uses TOMORO Smart POS as its primary platform, encompassing six integrated modules: Order (order recording), KDS (production queue management), Inventory (raw material stock control), Transactions (transaction recording), Report (reporting and analysis), and Settings (system configuration). The key advantage is the automatic inter-module integration – when a customer places an order, the POS system records the transaction, KDS immediately receives the order, Inventory deducts the stock, and Report logs the sales data simultaneously.

Table 3. TOMORO Smart POS Enterprise Software Modules

	Module	Primary Function	Output
1	Order	Customer order recording	Order data, payment calculation
2	KDS	Beverage production queue management	Real-time order display for baristas
3	Inventory	Raw material stock control	Stock status, minimum stock alerts
4	Transactions	Complete transaction recording	Transaction history, payment receipts
5	Report	Management reporting and analysis	Dashboard, sales reports
6	Settings	System configuration and setup	System parameters, outlet profiles

4. Data Management and Storage

Data is a strategic corporate asset managed through cloud infrastructure. TOMORO Coffee manages four main data categories: sales data (products, prices, transaction times), customer data (membership, transaction history), inventory data (raw material stock in and out), and operational data (operating hours, outlet productivity). Data is utilized at three levels: operational level (daily transaction monitoring), tactical level (branch performance evaluation),

and strategic level (business expansion decisions).

5. Networking and Telecommunications Platforms

The network serves as the connecting medium between all TOMORO Coffee branches and headquarters. Network components include Internet Service Providers (ISP), routers for network traffic management, WiFi as the device communication medium, and cloud connectivity to link branches to headquarters. The main business functions include real-time transaction synchronization across branches, outlet monitoring from headquarters, and centralized menu price updates. The primary weakness is the single point of failure — if the internet goes down, synchronization and monitoring are disrupted.

6. Internet Platforms

The internet serves as the primary foundation for TOMORO Coffee's digitalization. Internet utilization encompasses Cloud POS for transaction storage, integration with delivery platforms (GoFood, GrabFood, ShopeeFood), customer membership data synchronization, and real-time branch monitoring. The business value generated includes operational efficiency, high scalability, and data visibility.

7. Consulting and System Integration Services

The final component encompasses services that help the company manage and develop its systems. The parties involved include the POS vendor, cloud provider, payment gateway, and IT consultants. The benefits of these services include maintenance, updates, and security. However, vendor dependency is a weakness that needs to be addressed through internal system documentation and internal human resource training.

Operational Data Transformation

The operational data analysis demonstrates how TOMORO Coffee transforms raw data into strategic information for decision-making. This transformation process serves as evidence of the IT infrastructure's effectiveness in supporting managerial decision-making.

Table 4. Data Transformation into Strategic Information

Level	Example	Usage
Data	Americano sold 500 cups/week	Sales volume recording
Information	Americano is the best-selling product	Product trend identification
Knowledge	Customers prefer black coffee over other variants	Customer preference understanding
Decision	Increase coffee bean stock and create Americano promotions	Strategic management decisions

Competitor Analysis

A competitor analysis was conducted to determine TOMORO Coffee's position compared to similar companies in terms of IT infrastructure. Three main competitors used as benchmarks were Fore Coffee, Kopi Kenangan, and Starbucks.

Table 5. IT Infrastructure Comparison with Competitors (Scale 1–5)

Aspect	TOMORO	Fore Coffee	Kopi Kenangan	Starbucks
Digital POS	5	5	5	5
CRM	3	4	4	5
AI Analytics	2	4	4	5
Data Warehouse	3	4	4	5
Customer Experience	4	4	4	5
Average	3.4	4.2	4.2	5.0

IT INFRASTRUCTURE MATURITY COMPARISON: COFFEE COMPANIES

Comparative Assessment Across 5 Strategic Axes

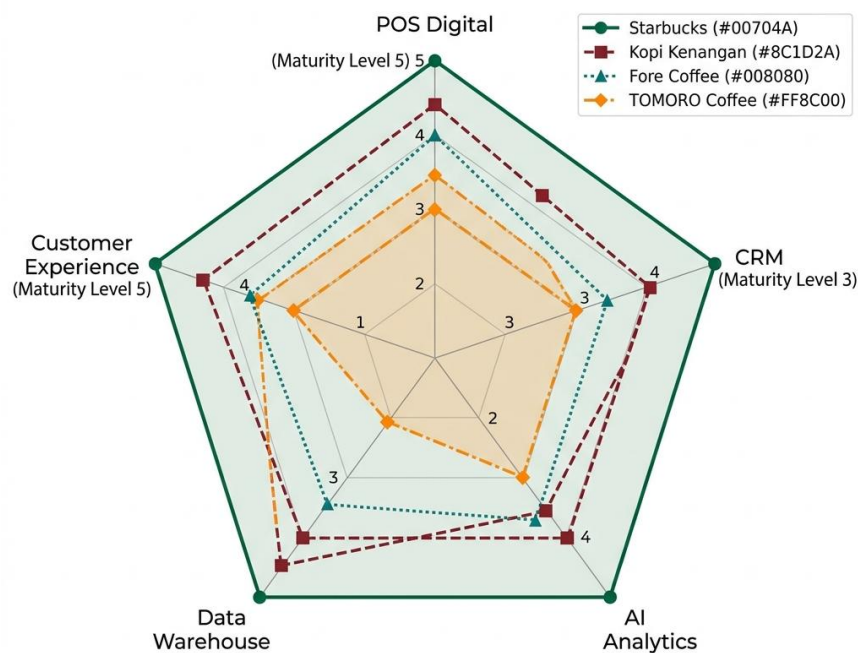


Figure 3. IT Infrastructure Comparison – Competitor Radar Chart

Based on Table 5 and Figure 2, TOMORO Coffee already excels in the area of operational digitalization (Digital POS). However, it still lags behind in the areas of CRM, AI Analytics, and Data Warehouse compared to competitors. Starbucks, as the global market leader, has the highest scores across all aspects. TOMORO Coffee needs to accelerate the development of Business Intelligence and AI to remain competitive.

SWOT Analysis of IT Infrastructure



Figure 4. SWOT Analysis of TOMORO Coffee IT Infrastructure

Strengths: TOMORO Coffee has an integrated system that connects POS, Inventory, KDS, Transactions, and Reporting within a single platform. The cloud-based system enables real-time reporting and cross-branch synchronization. The digitalization of customer services through the QR membership feature also represents a notable strength.

Weaknesses: Internet dependency is the primary weakness, as most systems require an internet connection. Furthermore, dependence on the POS system vendor and cloud provider limits flexibility. AI utilization has also not been maximized.

Opportunities: Implementation of Artificial Intelligence for sales forecasting, stock prediction, and customer behavior analysis. Business Intelligence Dashboards can help management understand business performance more deeply. Customer Analytics can be used for personalized promotions and customer segmentation.

Threats: Cyber attack threats (data breaches, ransomware, phishing), technological competition from digital competitors continuously improving their systems, and the potential for customer data leaks that could cause financial losses and reputational damage.

Infrastructure Maturity Analysis (COBIT)

The COBIT (Control Objectives for Information and Related Technologies) model was used to measure the maturity level of IT governance. The assessment results indicate that TOMORO Coffee is at the Managed level

with an average score of 3.85.

Table 6. TOMORO Coffee Maturity Level Assessment

No	Component	Score	Level
1	Hardware Platform	4	Managed
2	Software Platform	4	Managed
3	Enterprise Applications	4	Managed
4	Data Management	4	Managed
5	Network Platform	4	Managed
6	Internet Platform	4	Managed
7	Analytics & AI	3	Defined
Average		3.85	Managed

The assessment results demonstrate that IT processes at TOMORO Coffee are well-documented, running stably, and monitoring is conducted in a measured manner. However, the company has not yet reached the Optimized level – AI and Machine Learning have not been widely used to continuously optimize business processes.

Gap Analysis

Gap Analysis was used to compare the current IT infrastructure condition with the ideal condition to be achieved. This analysis identifies areas that need to be developed to enhance the company's competitiveness.

Table 7. Gap Analysis Matrix

Area	Current Condition	Ideal Condition	Gap
Reporting	Historical Reports	Predictive Analytics	High
CRM	Basic Membership	Personalized CRM	High
Inventory	Manual Monitoring	Smart Inventory (AI)	Medium
Security	Standard Security	Zero Trust Security	High
Analytics	Basic Dashboard	AI-Powered Analytics	Very High

Based on Table 7, the largest gaps are found in the areas of Analytics (AI), Reporting (Predictive), CRM (Personalized), and Security (Zero Trust). These areas need to be prioritized in TOMORO Coffee's IT infrastructure development plan.

Future Infrastructure Blueprint

The evaluation of the current infrastructure indicates that TOMORO Coffee has a strong digital foundation at the operational level. Operational efficiency is high due to POS and KDS integration, data flows automatically between modules, and management can monitor all branches in real-time. However, data utilization has not been optimal – extensive data is collected but has not been maximally leveraged for predictive analytics.

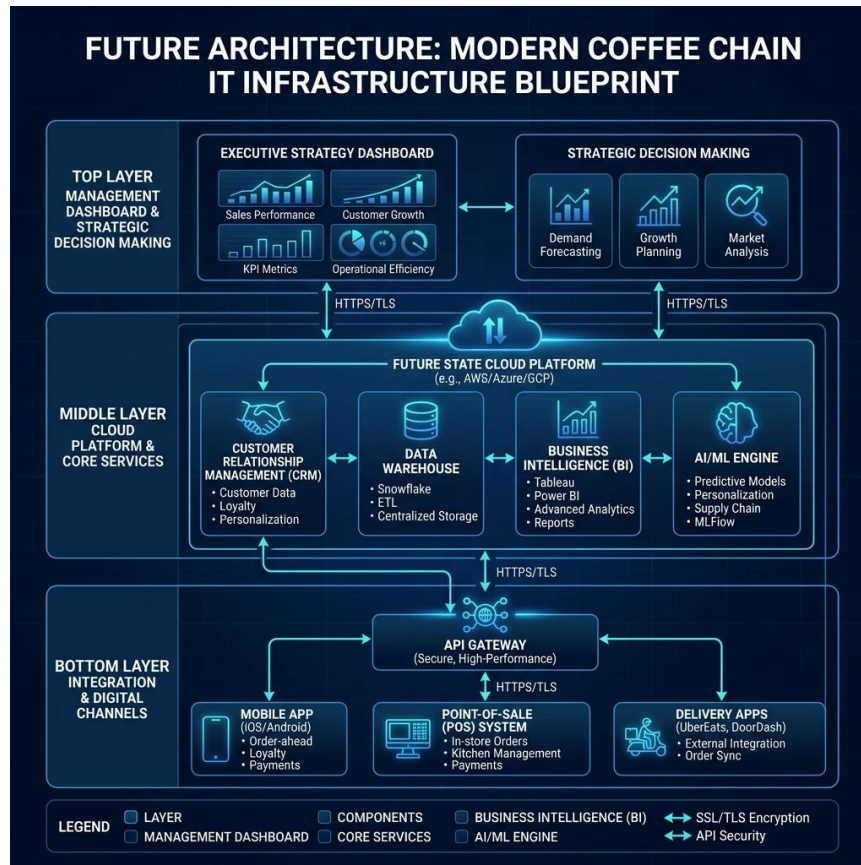


Figure 5. Future IT Infrastructure Blueprint of TOMORO Coffee
IT Strategic Plan 2026–2030

Based on the comprehensive analysis conducted, the following is the strategic plan for IT infrastructure development at TOMORO Coffee over the next five years.

Table 8. TOMORO Coffee IT Strategic Plan 2026–2030

Phase	Year	Focus	Key Programs	Allocation
1	2026	Core Infrastructure Strengthening	Internet Backup, Server Backup, DRP	25%
2	2027	CRM Enhancement	Loyalty System, CRM Platform, Customer Database	25%
3	2028	Business Intelligence	Data Warehouse, Executive Dashboard, KPI Monitoring	20%
4	2029	Artificial Intelligence	AI Forecasting, Smart Inventory, Customer Analytics	15%
5	2030	Smart Store	IoT Monitoring, Self-Ordering Kiosk, Recommendation Engine	15%

CONCLUSION

Based on the analysis conducted, TOMORO Coffee has implemented a fairly mature and integrated Information Technology Infrastructure. This is evident from the use of a digital POS system (TOMORO Smart POS), Kitchen Display System (KDS), Inventory Management, Reporting System, and cloud-based data storage that are interconnected within a single ecosystem. Based on the analysis of the seven IT Infrastructure components according to Laudon and Laudon, all components are available and effectively support the company's operational activities.

From the maturity level analysis using the COBIT approach, TOMORO Coffee is at the Managed level with an average score of 3.85. This indicates that the company's information system is well-documented, measurable, and running consistently. However, the company still has development opportunities, particularly in the areas of Business Intelligence, Customer Relationship Management, Artificial Intelligence, and Cyber Security.

The competitor analysis demonstrates that TOMORO Coffee has been able to compete in the area of operational digitalization. However, compared to Starbucks, Fore Coffee, and Kopi Kenangan, TOMORO still needs to enhance its utilization of customer data and analytical technology to gain greater competitive advantage. The IT strategic plan for 2026–2030, which encompasses core infrastructure strengthening, CRM development, Business Intelligence implementation, Artificial Intelligence, and the Smart Store concept, is expected to serve as a roadmap for the company to achieve the Optimized level and strengthen its competitive position in the Indonesian F&B industry market.

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