ASSIGNMENT COVER SHEET

PROGRAMME	:	Bachelor of Information Systems (Honours) (Data Analytics)
SUBJECT CODE AND TITLE	:	EAC2014 ENTERPRISE ARCHITECTURE
ASSIGNMENT TITLE	:	GROUP ASSIGNMENT
LECTURER		Ts. Yeap Boon Han
ASSIGNMENT DUE DATE	:	26/03/2025

STUDENT'S DECLARATION

1. We hereby declare that this assignment is based on our own work except where acknowledgement of sources is made.
2. We also declare that this work has not been previously submitted or concurrently submitted for any other courses in Sunway University/College or other institutions.
   [Submit "Turn-it-in" report (please tick √): Yes __√__ No _____]

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1.0 Introduction

Enterprise Architecture (EA) is used by organizations to standardize and organize their IT infrastructure to align it with the business goals as it can support digital transformation, IT modernization and growth (White, 2022). By incorporating diverse business processes and IT systems, EA enables organizations to achieve their goals while also addressing operational challenges. The EA framework aims to optimize resources, integrate workflows, and utilize advanced technologies such as cloud computing and data analytics.

Trendy, which is a growing clothing and apparel enterprise, needs an EA strategy to facilitate and support business growth, optimize supply chain management, and enhance customer experience. This document outlines the background, operational challenges, and suggested improvements required to implement an effective EA solution for Trendy, supported by industry benchmarks and research findings.

1.1 Background

Trendy is a rapidly growing clothing and apparel company that specializes in modern, stylish, and sustainable fashion. Trendy, which is based in an urban area, was established five years ago, and has gained a reputation for offering high-quality, eco-friendly apparel that appeals to a diverse customer base ever since. Due to rapid demand, the company now expanded its operations through retail stores, an online platform, and have also formed global partnerships. Trendy's operations manage design, manufacture, distribution, and sales, with branch operations supporting retail, warehousing and production.

As an omni-channel retailer, Trendy sells product through multiple platforms like online marketplaces, physical stores and direct-to-consumer channels. Trendy's product lines include casual wear, formal clothing, and athleisure, for both men and women. By using eco-friendly materials and ethical manufacturing productions, the company emphasizes on sustainability.

As Trendy is expanding, the company is facing several challenges including inventory management and reverse logistics, which heavily impacts on the operational efficiency and customer satisfaction. Currently, Trendy's inventory management system is not centralized because inventory data is scattered across the IT system. This leads to multiple problems such as inaccuracies on stock visibility, poor restocking system, and having trouble handling demand forecasting.

Additionally, since Trendy is expanding globally especially on online platform, it has gained many more customers. However, man customers also mean increased number in product returns that could happen due to many factors such as wrong products were bought, or customer not satisfied with the product anymore and many more. Trendy struggles to handle these returns effectively because proper reverse logistics system has not been implemented yet. The current system is poor and needs to be updated. Without an integrated solution, processing the products returns or exchanges can be challenging.

IT infrastructure is lacking in Trendy for core business functions such as finance, HR, and procurement. Hence, fragmented data, data that are scattered across the systems, in supply chain, sales, and customer relationship management (CRM) hinder seamless operations. The company is planning a global expansion, requiring a scalable and efficient EA strategy. According to Hindardo (2024), the digital transformation of enterprise architecture in the apparel industry plays a crucial role by improving operational efficiency, strengthening innovation and competitive capacity through the integration of digital technologies.

1.2 Narrative

To develop Trendy's business model, other companies' strategies were analysed to make sure that Trendy has balanced efficiency, agility and sustainability. One if the approach is outsourcing production to maintain flexibility and make it cost efficient. We have also emphasized in-house production to ensure rapid response to market trends (Timurs et al., 2007). By studying these approaches, a hybrid model was crafted to leverage both outsourcing and in-house capabilities to allow balance efficiency and agility in Trendy. Additionally, Trendy have also incorporated circular business practices to ensure sustainability and resource efficiency (Barros et al., 2020). This comprehensive strategy positions our company to adapt swiftly to market demands while maintaining operational excellence.

Trendy faces several challenges that need to be addressed through a structured EA framework. Since Trendy is an omni-channel retailer, it has complexities handling product returns, or exchanges or disposal processes. Trendy lacks an integrated reverse logistics system hence leading to delays in processing returns or refunds, inefficient tracking of the items returned and have limited use of analytics for return patterns. Inefficient reverse logistics process can lead to increased operational costs, risk of dissatisfying customers and reputational damage which can be solved by implementing technology and building collaborative partnerships (Ermes & Niemann, 2023). According to Mirrorsize (2024), predictive analysis can help fashion companies to anticipate return trends by analysing the customer's past behaviour and product attributes. This allows them to refine product descriptions, enhance quality control, and proactively address potential returns. One example that a fashion company have been through this similar challenge have been studied by Wahab, Tan and Roche (2023). They studied the obstacles faced by a fashion company in handling cross-border reverse logistics (CBRL) in China. Due to the inefficient (CBRL) system problems like regulatory barriers, high return costs, and the absence of a seamless logistics infrastructure to facilitate returns across borders happened. This challenge is essential to be addressed for sustaining growth and ensuring long-term competitiveness.

Trendy also face inventory management challenges due to the lack of a centralized system, leading to overstock or lead to shortages of products, which tie up capital or lead to missed sales (Baxter, 2024). Managing both online and physical store is complex since it is difficult to get accurate forecasting and restocking. Artificial Intelligence (AI) is revolutionizing inventory management in the fashion industry by enabling real-time tracking and predictive

analysis, reducing inefficiencies caused by poor IT systems. AI-powered solutions improve supply chain visibility, forecast demand, and automate stock replenishment, ensuring optimal inventory levels and reducing overstock or low stock issues (Baukh, 2024). A similar case in fashion company saw $4 billion in unsold inventory because of its slow adaptation to digital advancements and the integration of a more efficient IT-driven supply chain system. This case highlights the importance of implementing advanced IT solutions into inventory management to maximize stock control, boost demand forecasting, and enhance overall business agility in a rapidly evolving retail environment.

Trendy also experiences data fragmentation which leads to information getting scattered across multiple systems. Vast amount of data can create significant problems as it impacts all from customer experiences to operational performance (Dillard, 2024). One of the few problems faced by this issue is that Trendy will be getting inconsistent data that can disrupt logistics, causing shipping delays and stock imbalances. Implementing Enterprise Resource Planning (ERP) solutions can unify fragmented operations and providing real-time visibility across business functions, reducing data silos and improving efficiency. As demonstrated by Grow Your Boat (2025), fashion companies often rely on disconnected systems for logistics, productions and inventory management that prevent seamless data integration. This issue is not due to the lack of data but rather the fact that crucial information is trapped in silos. This makes it difficult to gain a cohesive view of the operations. For example, this small fashion company experienced production delays which were caused by data conflict from separate sources. This illustrates how fragmentation can disrupt efficiency (Grow Your Boat, 2025).

2.0 Main Content

2.1 Discussion Points

2.1.1 Operating model

Trendy uses a standard system and data of business is shared across all sales channels include physical stores, website and mobile apps, and all warehouses to ensure consistency on business operations.

Unification in integrated reverse logistics system:

A reverse logistics system is a part of the supply chain process where products move backward from customers back to manufacturers or distributors. This process happens for product returns, repairs, recycling, or proper disposal. Its main goal is to recover value from these products while also reducing waste and environmental harm. Therefore, a unification operating model with high process standardisation and high data integration is applied in integrated reverse logistics system of Trendy.

For high process standardisation in reverse logistics system, Trendy will create a standard policy for return, repairs, recycling, and proper disposal in every sales channel include physical store, website and mobile app. Trendy will also provide a clear return and exchange procedures for customers, whether they buy online or in physical stores. For example, when a customer buys a jacket from Trendy app but wants to return it in physical store, the store follows the same return policy as on the Trendy app. The process of return, repairs, recycling, and proper disposal will also follow a standard workflow to prevent inconsistency. For instance, the return workflow includes submission of return, shipment return, quality check, return resolution and return restocking is standard in every physical store and online (Gomez, 2025).

For high data integration in reverse logistics system, Trendy has a centralized return tracking system by providing a digital platform for all return across every sales channel to have a real-time monitoring. It can streamline the return process, reduce delays on the reverse logistics operation and minimise error. The real-time return information of customers is shared across every warehouse and stores. The system will update instantly when a customer completes a return in store. For example, when a customer returns defective pants to Trendy's store in Kuala Lumpur, the system updates inventory across all warehouses. Also, customers data is shared to track for customer return history, reasons, and frequency to identify patterns and preferences using customer relationship management (CRM) tool (How Can You Manage Customer Returns with a CRM Tool?, 2023). For instance, when many customers return a specific jacket model, Trendy can analyse the data and adjust design recommendations.

As a result, a standard system or process help Trendy to streamline operations, ensure consistency and improve the efficiency of the reverse logistics system. Sharing data across different sale channels and warehouses helps Trendy to make informed decisions, monitor returned products in real-time, update stock levels accurately and increase customer satisfaction.

Unification in inventory management system:

An inventory management system enables Trendy to monitor stock levels across all physical stores (Pontius, 2025). This system helps to track the location of each product accurately, store information of supplier and record product specifications and its quantity (Pontius, 2025). Every warehouse, physical store, and online platform follows the same inventory rules and procedures to ensure efficiency and consistency. Therefore, a unification operating model with high process standardisation and high data integration is applied in inventory management system of Trendy.

For high process standardisation in inventory management system, Trendy has a standard rules, procedures and policies on inventory management system across all warehouses, physical stores and online stores. Trendy has a standardised stock replenishment process in all warehouses and stores that helps to monitor stock level to prevent stockout and ensure the product met the customer demand (Shopify, 2023). For example, if Trendy sold 100 jeans in one of the branches, the system would apply a replenishment order automatically from the nearest warehouse to prevent out of stocks. Also, Trendy will make sure that every product has a unique Stock Keeping Unit (SKU) and follows the same naming conventions across all sales channels. A unique SKU code acts as an ID number to help in stock replenishment and tracking inventory in different sizes, colours, and categories (Ramirez, 2023). For instance, Trendy has S size white colour long pants that having a code of “Long-Pants-White-S”, and this code is same across every physical store, warehouses and online stores. We also standardise our stock auditing and reporting where every location conduct inventory auditing and reporting such as annual physical inventory for full stock checking to compare the records with actual stock in the same way (Asha et al., 2024).

For high data integration, inventory management system that contains database allows inventory data to be shared in real time to every warehouse, physical stores and online platform. Every store, warehouse, and online platform has the access to inventory levels so that when customer order a product online, our system can check availability in all Trendy warehouses and selects the nearest one for fastest shipping. For demand forecasting, AI can analyse the sales history and trends for future demand. Trendy can collect sales data from physical and online sales and analyse social media trends with the use of AI technology. Moreover, the system also connects with suppliers to automate restocking based on demand. For example, when a type of handbag is popular and selling fast, the system will contact the supplier and places a reorder before stock runs out. Our system also updates the stock level in real-time across physical stores, online website, and mobile app to prevent overselling. For example, inventory management system can work with point-of-sale (POS) system to track the transaction in real-time. When a customer buys the last pair of heels in Trendy store, the online platform will update the product as “Out of Stock” within seconds.

Unification in enterprise resource planning (ERP):

An enterprise resource planning helps to streamline Trendy's business operations including finance, supply chain, manufacturing, sales and customer service. By integrating these functions into a single platform, the ERP system provides Trendy with a real-time, centralized view of all business activities (SAP, n.d.). A unification operating model with high process standardisation and high data integration is used in enterprise resource planning system.

High process standardisation of ERP helps Trendy centralised data from daily business activities include finance, supply chain, manufacturing, sales and customer service to reduce the issue of data fragmentation. The system also ensures that uniform procedure is implemented across all business operations. For example, when a customer wants to return a T-shirt, ERP system will streamline the return process and make it be centralised by automatically update the stock level, triggers the refund and allow customer service staffs to track returns, repairs, and refunds in real-time.

High data integration in ERP ensures the data is shared in real-time across all departments and locations to connect all business operations so that each department can run its operation efficiently (SAP, n.d.). For example, the sales department use ERP to collect, store and manage all orders from customers and the finance department needs ERP to collect sales data quickly such as transaction to calculate the revenues and expenses (SAP, n.d.). Also, ERP system can provide reliable financial data and analysis (SAP, n.d.). This enables stakeholders of Trendy to assess the company's financial health and profitability.

2.1.2 Business capabilities

2.1.3 Specific business needs

Business capabilities refer to how a business is able and has to power to carry out its function in order to achieve a certain outcome (Adel, 2012) Meanwhile, specific business needs refer to the specific requirements or demands that a business must take care of to achieve its business objectives and operate more effectively.

IT infrastructure plays an important role in assisting the business operations. These two sectors must work closely to maximize the efficiency and productivity. To remain competitive in the market, Trendy must develop capabilities that allow the business to have integrated IT systems, real-time stock tracking system and efficient reverse logistic system. It is important for Trendy to fix these problems quickly with the right IT systems to improve how the business operates.

Disconnected IT Applications & Need for an Integrated ERP System

Trendy current uses different software and systems to operate its business. However, these systems run independently without proper integration with other business operations. These isolated and disconnected IT applications reduce business efficiency, leading to inconsistency in data, and making the business more difficult to handle the operations.

To overcome these inefficiencies, Trendy needs an integrated Enterprise Resource Planning (ERP) system to help manage data and operations across departments. An ERP system consists of various business applications or modules that connects different parts of a business, like finance, accounting, manufacturing, and human resources into a single system. This helps all departments share and use the same information for smoother operation and collaboration (Beheshti, 2006).

ERP has a centralised data storage system that connects all departments to achieve data synchronisation. When any department enters new information, the ERP system automatically updates and synchronizes the data across all relevant modules. For example, when Trendy’s sales team receives a new order, the ERP system automatically updates inventory, finances, and notifies logistics. This ensures that everyone is on the same page without the need for manual updates. The system also provides real-time reports and analysis to help business management make data-driven decisions.

Once Trendy successfully sets up the ERP system, customer orders placed through the system will trigger automatic stock levels updates, the finance department can instantly view transactions details and enable the logistics department to arrange parcel packing and delivery. Automating these tasks instead of doing them manually will cut down on mistakes and delays, making sure that every order is completed on time with guaranteed accuracy and quality.

Lack of Real-Time Stock Tracking & Need for Inventory Management System (IMS)

As an omni-channel fashion retailer, Trendy operates in both online store and physical stores. Currently, Trendy faces challenges in obtaining accurate inventory data, such as the determining the exact stock levels and identifying which products are running low. The stock levels in the system do not align with the actual stocks in the inventory. The system might show that a product is in stock, allowing customers to place orders. However, the logistics team later found out that it is actually out of stock. As a result, customer orders may be delayed or cancelled due to outdated inventory information.

Inventory Management System (IMS) is designed to oversee warehouse inventory, aiming to minimize errors in recording product stock and improve the efficiency of tracking product inflows and outflows within the warehouse (Chan et al., 2023). It allows real-time monitoring and automatically manages the warehouse, solving problems Trendy currently faces. IMS synchronises data across departments, allowing the supply chain, sales, and inventory departments can all see the same information and work together. In this way, Trendy can respond faster to customer orders and enhance customer shopping experience in Trendy,

When a customer places an order, the system records the changes and updates the information. This updated data is shared with relevant departments such as procurement, sales, and warehouse management. If the system detects stock levels drop below the minimum threshold set by the business, it will alert the procurement team to restock. IMS also provides useful insights like product sales rates and trends, helping the business to identify which product has higher demand, and which product needs improvement in sales.

IMS can also be integrated into physical stores, where employees can use scanning devices to conduct inventory checks, with the system updating stock data in real time to reduce errors. With Point-of-Sale (POS) systems, which are part of IMS, inventory levels are automatically updated whenever customers make purchases at the counter.

By implementing an IMS, Trendy can effectively resolve inventory issues. Manual stocks checks become unnecessary, sales data is synchronised with inventory records, and management can monitor stock status at any time. The system also sends automatic alerts when stocks level drop below the minimum threshold. This is to ensure high demand products do not go out of stocks and reducing the burden of stockpiling.

Inefficient Reverse Logistics & Need for Returns Management System (RMS)

Reverse Logistics refers to the process of bringing goods from customer back to the business or distributor, for several reasons like order returns, product fixing, recycling, product renewing or reselling (Banihashemi et al., 2019). Trendy has inefficient reverse logistics that leads to several problems for the business. When returns are not processed efficiently, businesses face rising transportation, storage, and handling expenses. Slow refund or replacement processes can frustrate customers, damaging brand reputation and customer loyalty. Poor reverse logistics can also result in inventory management issues, causing stock inaccuracies that affect supply chain efficiency. Trendy with inefficient reverse logistics struggle to process returns quickly, leading to unsellable stock accumulation, increased storage costs, and unhappy customers.

Trendy requires a Reverse Management System (RMS) that helps to improve efficiency in handling returned items. Without a proper RMS, Trendy may face financial losses and create inventory management issues. By integrating RMS, when customers request a return with valid reasons such as product quality issues, incorrect size or damage in products, the system will automatically review whether the return complies with the return policies and decide whether to issue a refund, exchange the product, or repair it. Customers can either drop off the returned items at a physical store or opt for Trendy's delivery service to pick up the return from their address. The system will assign a tracking code to each returned item to make sure the products are not loss during the return process.

When the item is sent back to the inventory or maintenance centre, the system will classify it into different categories, such as, item that can be resold directly, item that needs refurbishment or repair, and item that needs recycling or disposal. The inventory will be updated with latest data, and sellable product will be listed again to prevent inventory backlog or shortages. RMS will also provide a personalised compensation plan based on the return reasons provided. For example, it may offer vouchers to encourage buyers to make another purchase. Additionally, RMS analyses return reasons, products malfunction and customer returns rates, enabling business to gain insights and improve product quality. AI integrated into the system will analyse which products are more likely to be returned, allowing adjustments to procurement and production plans.

RMS is not just a product return system, but also helps optimize the supply chain, lowering business costs and enhance customer experience. It enables businesses to turn returns from losses into opportunities.

2.1.4 Business process

Business processes refer to a set of specific tasks to be carried out by certain stakeholders in order to accomplish an objective or goal set by the organisation. Business processes outline measurable actions of stakeholders as well as the functions of IT infrastructure needed to perform these actions. To better understand the alignment between business processes and IT systems, the changes in organisation actions need to be outlined.

Business Processes for an Integrated ERP System

In order to address the inefficiencies caused by disconnected IT applications, Trendy must implement an Enterprise Resource Planning (ERP) system within the next 2 years, integrating data storage and aligning finance, Human Resource, sales, inventory, supply chain logistics, and CRM functions. By combining these tasks under a single, central system, Trendy can remove information silos, improve data correctness as well as raise business efficiency. The ERP system will replace the previous legacy software, to ensure smooth alignment of information between the departments and live access to key business operations.

One of the key changes needed is data handling. The current reliance on manual data entry causes data inconsistencies which include duplicate records, missing information and human errors. Trendy must adopt automated data-sharing mechanisms to eliminate these inefficiencies. The mechanisms should ensure consistent data updates across all departments. For example, when an order is placed, the ERP system should automatically update the inventory records, and the update must show the new stock levels. This same data should be accessible to other departments at the same time. The finance team should have real-time access to transaction details for accounting that is accurate and financial reporting. The supply chain logistics team should be notified instantly to start order packaging and delivery scheduling. This data synchronization in real-time will reduce processing delays, prevent errors and ensure order fulfilment

Furthermore, the inclusion of live reports, data analysis allows immediate access to details on customers, amount of stock, measures of sales success. Instead of reliance on old reports or data that is not complete or accurate, relevant stakeholders can decide on actions based on current insights. For instance, one can view sales trends to change pricing of products. Stock refilling can be improved to prevent over stocking or product shortages while customer behaviour analysis can inform targeted marketing campaigns. The ability to visualize and analyse business data changes will provide Trendy with a significant competitive edge.

To implement these changes, key upgrades to infrastructure are needed. A central database is required to allow data to sync in real-time for each department. Where migration from past systems could not be implemented, Application Programming Interfaces (APIs) can be used to act as a bridge. APIs ensures that data is synchronised efficiently between the new ERP system and previous systems still in use. A cloud architecture is to be

implemented to aid accessibility and growth of the business. This lets employees access business systems from anywhere with security. Furthermore, robust security protocols must be implemented, including data encryption, access controls, and regular security audits, to ensure the confidentiality of sensitive business information.

Business Processes Inventory Management System (IMS)

To mitigate inaccuracies and inefficiencies in reporting stock inventory, Trendy has to put in place an Inventory Management System (IMS) to allow tracking of stock in real-time across all business channels such as retail shops, e-commerce, and warehouses. Trendy will be able to tackle the problems associated with manual tracking, such as data discrepancies, lost inventory, and outdated stock information by automating stock updates and consolidating inventory data. IMS will enable Trendy to operate the inventories in a coordinated manner and thus operate the sales, purchasing, and distribution needs harmoniously.

Firstly, replacing the previous manual stock tracking with an automated system can help mitigate any errors and discrepancies between the reported and actual inventory lists. This automated system enables constant updating on stock levels when there are changes such as items being added, sold or returned. For instance, when an item is bought by a customer, whether online or in-store, the IMS would instantly update the records of stock quantity availability across all platforms. Further improvements can also include the use of scanning devices such as RFID readers to conduct real-time stock updates, thereby decreasing any human error issues or stock quantity discrepancies.

Moreover, the IMS should also enable notifications to the relevant department when products are low in stock to ensure that there would be no shortages issues. The IMS should also be connected to suppliers to allow fast restocking orders when the inventory level falls below the predetermined stock limit. Through this efficient system, loss of sales and customer dissatisfaction can be avoided as it prevents items from being sold out often. Thus, it will enhance the supply chain efficiency as it mitigates any overstocking or stockouts problems.

To facilitate these operational changes, Trendy needs to implement a cloud IMS integrated with advanced tracking systems like barcoding and RFID technologies. These technologies will allow accurate identification of stocks and guarantee accurate updates on all sales channels, including brick-and-mortar stores and virtual marketplaces. Furthermore, supervising stock sales at checkout through the integration of IMS and POS terminals will prevent the discrepancy in sales of products claimed to be in stock online but are out of stock in the store. This integration will grant customers accurate information on stock availability, which improves shopping experience whilst also minimizing chances of order cancelation due to unfulfilled stock availability.

In order to improve purchasing processes and speed up the restocking process, automated supplier integration should also be implemented. For the purpose of facilitating real-time order confirmations, shipment tracking, and delivery updates, the IMS should also

allow electronic data exchange (EDI) with suppliers. Through this, the business can benefit from better client satisfaction and improved business success which will also decrease operational inefficiencies and guarantee that products are available when needed. In addition to improving stock control, Trendy will obtain a competitive edge by increasing its efficiency and responsiveness to market demands by updating its inventory management procedures.

Business Processes for A Returns Management System (RMS)

To address the challenges caused by the inefficient reverse logistics, Trendy should utilise the Returns Management System (RMS) to improve the logistics and package tracking. The RMS should be fully integrated with the company's ERP system and IMS. The RMS would help manage the process of product returns, ensuring that all packages returned would follow the structured process instead of using the old system which have the tendencies of leading to inconsistent record keeping and processing delays. In the old system, customers would submit return requests through emails or by calling the company's hotline where customer service would have to manually verify the returns policies and eligibilities. There would also be no tracking system which could increase the risk of misplaced or lost items. However, the RMS would follow the strict process of first verifying the that the returns would comply with the return policies before processing the refunds and returns. The system would then create unique tracking codes for the returning package that allows the monitoring of the status of the package, mitigating the risks of lost items.

The RMS would also be replacing the old system whereby the returned products would be stored in warehouses without proper classification and organisation. This tends to lead to wasting valuable storage space and problems in stock management. Employees would have to manually inspect the items to categorise them as to be resold or to be disposed of. Overall, the old system can lead to stock discrepancies and slow, inefficient process time. Meanwhile, the RMS could streamline the process by automatically sort the products into the set category, whereby items that could be repaired were sent to be fixed while the other items were restocked or recycled and disposed of. This would provide real time inventory management and updates, preventing issues of stock inconsistency or categorisation error.

Additionally, the new Return Management system would also be connected to third-party logistics providers which would systemise the return pick-up schedules. This would replace the old system where return shipments were done manually, and communication would have to be done via phone call or emails by the logistics department. Refunds payments or replacements would also be done manually by the financial and customer service department, leading to risk of delays and information discrepancies. Customer satisfaction would be negatively affected due to the long wait time for refunds or replacement. The New RMS would automate the refunds and replacement process, connecting the financial, customer service and logistics departments for a more streamlined processing. Once returns were verified, customers can receive their refunds more efficiently as well as receive instant notification regarding their return status, providing a better shopping experience for the customer.

2.1.5 Business requirements

Business needs, goals, and plans are defined by Trendy's business requirements. It outlines the precise operation of an IT solution and suggests specific underlying system components that implement these specifications in hardware or software. The first requirement to be gathered is a business requirement. While functional requirements include particular details for activities, features, tools, and interactions, business requirements have high-level requirements.

Functional requirements an Integrated ERP System:

Every department should be able to access a centralized dashboard that pulls real-time data from the ERP system. This ensures everyone is working with the most up-to-date information. To streamline operations, order processing should be automated so that whenever an order is placed—whether online or in-store—the inventory is updated instantly, and the logistics team is notified to handle packaging and shipping.

The system should also include role-based access control, meaning employees can only view or interact with data relevant to their specific department. This helps maintain security and prevents unnecessary access to sensitive information. For the accounting team, the ERP system should provide real-time access to transaction records, expense reports, and revenue data, with automated financial reporting to save time and reduce errors.

Real-time data synchronization is another key feature. This ensures that any updates or changes made by one department are immediately reflected across all related departments, keeping everyone on the same page. Additionally, the system should offer customizable reporting tools, allowing teams to analyse customer behaviour, sales trends, and overall operational efficiency.

For businesses transitioning to the new system, APIs should be implemented to bridge the gap between the new ERP system and any legacy systems that can’t be phased out right away. This ensures smooth integration and avoids disruptions.

Finally, robust security measures are essential. The system should include features like data encryption, firewall protection, multi-factor authentication, and regular system audits to safeguard sensitive information and maintain compliance with security standards

Functional Requirements for Inventory Management System (IMS):

The inventory management system (IMS) needs to update stock levels in real time whenever an item is sold, returned, or restocked. To make this process efficient, employees should be able to use tools like barcode scanners or RFID readers to instantly reflect changes in inventory. Additionally, the system should automatically generate restocking orders when stock levels drop below a set safety limit, ensuring that items are replenished in a timely manner. It's also important for the system to notify the procurement team when stock is running low, so they can take action quickly.

To streamline procurement, the IMS should integrate with suppliers using EDI (Electronic Data Interchange). This would automate tasks like placing orders, tracking shipments, and confirming restocking updates. The system should also be capable of tracking inventory across multiple locations, such as retail stores, warehouses, and online platforms, providing a comprehensive view of stock levels.

Integration between the IMS and point-of-sale (POS) systems is crucial to ensure accurate stock tracking during transactions. For items like perishable goods or products with limited shelf life, the system should support batch tracking and monitor expiration dates to minimize waste. On the customer side, the IMS should display real-time stock availability online, allowing shoppers to check product availability before making a purchase.

Finally, the IMS should be cloud-based, enabling secure remote access so managers and employees can monitor inventory from anywhere.This flexibility ensures that inventory management remains efficient and responsive, no matter where the team is located.

Functional Requirements for A Returns Management System (RMS:

The returns management system (RMS) should make it easy for customers to submit return requests through an online portal or mobile app, removing the hassle of having to call or email. To streamline the process, the system should automatically check if the product is eligible for return based on predefined rules, ensuring only valid requests are approved.

Each return request should be assigned a unique tracking code, so customers can monitor the status of their return in real time. When returned items are received, the system should automatically update inventory records, categorizing them as restockable, repairable, or disposable. To improve accuracy, the RMS should use barcode scanning and RFID technology to track and categorize returns efficiently. For warehouse staff, the system should provide automated sorting instructions, guiding them on where to place returned items based on their condition. Integration with logistics providers is also important, as it should automate the scheduling of return pickups, minimizing the need for manual coordination.

Once a return is verified, the system should handle refunds or replacements automatically, ensuring customers receive their money back or replacement items within a set timeframe. To keep customers informed, the RMS should send automated updates via SMS, email, or mobile notifications about the status of their return and refund. The RMS must also integrate with the ERP and inventory management systems (IMS) to ensure that updates are synchronized across finance, customer service, inventory, and logistics teams. This helps maintain consistency and efficiency across departments.

Additionally, the system should include a reporting and analytics module, allowing management to analyze return trends, identify common reasons for returns, and measure processing efficiency. This data can be used to improve operations and reduce return rates over time. Finally, the RMS should have role-based access controls, ensuring employees can only access or modify information relevant to their department. This helps maintain security and prevents unauthorized access to sensitive data.

2.2 CSVLOD Model

The CSVLOD model, which was developed by Svyatoslav Kotusev, is a formalized approach in Enterprise Architecture (EA) that allows IT strategies to align with business objectives. It is made up of six key components: Consideration, which define high-level strategic principles that shape IT and business decisions; Standards, which outline the technical standards and best practices to support uniformity in IT implementation; and Visions, which provide conceptual images of what the future state of the form will be using roadmaps and architecture diagrams. These are what form the foundations of IT planning by offering the right strategic direction and technical guidance.

The model also then includes Landscapes, which reflect the current IT landscape, a basis for future development; Outline, which define top-level IT projects and link strategy to execution; and Designs, which contain in-depth technical specifications for the implementation of IT solutions. Interconnecting these, CSVLOD allows for systematic business vision to useful IT solutions conversion, technology investment and business goals aligned.

2.2.1 Consideration

Trendy's considerations define business and IT principles to ensure seamless business operations. Our IT planning helps to integrate technology into the business operations smoothly, from managing the online sales to streamlining the supply chain. Consideration ensures consistency of Trendy’s brand, improve efficiency, increase customer experience, and innovation while maintaining core values and competitive edge in the fashion industry.

2.2.1.1 Principles

Principles are general rules and guidelines to influence and improve decision-making in organization for the use of all IT infrastructure and assets across organization. Trendy has generated three principles to provide a guideline for the challenges we faced.

Principle 1: Optimisation on Reverse Logistics System

Statement: Trendy needs to make improvements on reverse logistics system include product returns, exchange, repairs, recycling, and proper disposal process by implementing an integrated reverse logistics system.

Rationale: Integrated reverse logistics system allows the business runs more efficiently by streamlining the return process, improving stock management, reducing operational costs through recycling, improving customer satisfaction and promoting environmental sustainability through proper disposal practices.

Implications:

- Trendy can invest in advanced tracking technologies, AI-driven analytics, and system integrations with logistics partners.
- Trendy can develop a customer-friendly return and exchange policy and build strong partnerships with trusted logistics suppliers to streamline the return process and increase customer satisfaction.

Principle 2: IT infrastructure with Inventory Management System

Statement: IT infrastructure or system is important to be integrated in inventory management system such as software and hardware asset management, product discovery and scanning, product tracking and more.

Rationale: A strong IT infrastructure improves stocks visibility, enhances demand forecasting, and ensures product quality. IT systems also help to prevent overstock and shortage.

Implications:

- Trendy can implement a cloud inventory management system with order management system to access real-time transactional data.
- Trendy also can use cloud-based inventory management software to allow barcode scanning and tracking for each product. This can prevent shortage of stocks and meet customer demands.
- Cybersecurity measures must be implemented to protect all inventory and business data.
- Trendy can establish clear and standardise procedures and policies for inventory management across all warehouses and stores.

Principle 3: Centralised System in Business

Statement: A centralised system such as enterprise resource planning (ERP) system is helpful to Trendy to ensure better coordination across all business departments.

Rationale: ERP system can help Trendy to reduce issue of data fragmentation, increase productivity of employees, enhance collaboration between employees, increase efficiency on business daily operations due to high availability of information and save costs due to low manual data process.

Implications:

- Standardize processes across different departments.
- Apply cloud ERP system to access a large amount of data in real-time for analysis.
- Trendy can conduct a training for employees in using ERP tools.

2.2.1.2 Policies

Return and Exchange Policy

- Customers can request for return or exchange within 30 days from the date of delivery under the following requirements:
    - The product received has manufacturing defects, physical damage, or quality issues.
    - The product does not match the order specifications such as wrong size, colour, or style.
    - The order is marked as delivered but was not received.
- Process of return or exchange:
    - Contact customer support include email (trendy1234@gmail.com) and WhatsApp (+6012-3456789). Customer support can be found in official website (www.trendystore.com) and mobile app (Trendy).
    - Provide evidence such as photos or videos for verification to shows that the customer meets the return or exchange requirements.
    - Send a reception or rejection on the customer's request on return or exchange by email and phone number. If reception, return shipping details will be provided to the customer.
    - After checking the item returned, Trendy proceeds to refund or exchange of item with one week.

Refund Policy

- Customers can request for refund within 30 days from the date of delivery.
- Full Refunds can be requested for defective, damaged, incorrect, or lost items.
- Items purchased on final sale, customized items, or those returned in used, washed, or damaged condition are not refundable.

Repair Policy

- Customer can request for repair services within 60 days after purchase (after the delivery date/day of purchase in physical store) if the item has a manufacturing defect such as stitching issues, missing buttons, or fabric flaws.
- Customer can request for repair services within 90 days of purchase if there is a faulty in zippers, buttons, or fastenings.
- No repair services available if the items damaged due to misuse and improper washing.
- Repair Process:
    - Contact customer support include email (trendy1234@gmail.com) and WhatsApp (+6012-3456789). Customer support can be found in official website (www.trendystore.com) and mobile app (Trendy).
    - Provide photos or videos for verification to shows that the customer meets the repair requirements.

- Send a reception or rejection on the customer's request on return or exchange by email and phone number. If reception, repair shipping details will be provided to the customer.
- Repair services take 5 to 7 business days.
- After repaired, the repaired item will deliver back to the customer.

Recycling and Proper Disposal Policy

- Return old Trendy apparel through our drop-off locations that provide in our official website.
- Customer can receive a discount voucher for recycling old items.
- For non-recyclable items such as fabric-based items and synthetic materials, Trendy will donate those items to poor community or send to recycling centres for proper disposal.

2.2.1.3 Analytical Report

1. Enterprise Resource Planning System

Internal	**Technology Strength**	**Technology Weakness**
	Enterprise resource planning (ERP) system has a strength of improving the flexibility and scalability of business. Trendy uses a cloud-based ERP system can integrate applications both individually and as a unified system. This enables Trendy to streamline configuration and enhance scalability to support more functionalities (Hernandez, 2023). Also, ERP can increase the productivity of employees in different departments. ERP with the help of AI technology, machine learning and robotic process automation can automate tasks and reduce manual process. Employees can have more time to complete more important tasks and increased efficiency (Hernandez, 2023).	ERP also have weakness include complexity due to broad functionality and high customisation requirements. Trendy is required to do many plannings, configurations, tests and trainings to implement an ERP system (ERP Implementation Process: Preparation, Configuration, Customizations, and More, 2023). Sometimes organization's excitement in this ERP software can raise risk of rushed decisions such as choosing an ERP system without proper evaluation (Hernandez, 2023). Also, ERP system requires a high short-term cost including software, resources and trainings. This implementation process is highly time-consuming especially due to the high customization requirements (Hernandez, 2023).
External	**Technology Opportunities**	**Technology Threats**

	ERP system helps to ensure the transparency of Trendy by providing full access to all business operations and processes in one centralized system (Hernandez, 2023). It enables high level executive to access real-time data from every department to improving accuracy in decision-making and forecasting (Hernandez, 2023). ERP also strengthens business data security that ensures protected data and information. Transparency in business can improve transaction integrity and ensure the reputation of Trendy.	ERP system has cybersecurity threats at it stores many sensitive data and information such as customer data and transaction records. This will lead to cyberattacks and unauthorised access to these data and information. Moreover, Trendy will have downtime risk when Trendy faces technical issues such as compatibility issue on software and hardware, difficulties during integration and unfunctionally on systems during the implementation of ERP system (The Top ERP Implementation Risks: Avoiding Common Pitfalls, 2024). This can lead to project delays and failure.

2. Inventory Management System

Internal	**Technology Strength**	**Technology Weakness**
	Inventory management system helps to improve efficiency and productivity by reducing the manual process for employees (Martins Ajaero, n.d.). For example, bar code scanners read and decodes barcodes to retrieve product information. The system also helps Trendy to save labour costs, production costs by preventing overstocking and out of stocks and save time by keeping track of products manually (Martins Ajaero, n.d.). For example, the system can track the stock level in real-time.	The system may require a high implementation cost to set up the inventory management system (Martins Ajaero, n.d.). Trendy need to install specialised tools, software and hardware. This also requires a high investment on the IT technology and infrastructure. Additionally, the system does not prioritising quality inspections (Martins Ajaero, n.d.). This can lead to hidden production problems that makes the customer unsatisfied.
External	**Technology Opportunities**	**Technology Threats**
	Inventory management system ensures transparency and accountability of business. It allows all stakeholders include customers and employees to	Inventory management system can face cybersecurity risks. Data breaches can lead to the loss of inventory information and reduce

	have the access to overview the updated information of inventories or products in Trendy. It also ensures that each employee is responsible for their role and actions. It means that losses, discrepancies, or stock mismanagement can be traced back to the responsible employee or department. Inventory management system also promotes sustainability of business (Ali, 2023). The sustainable practises include reuse, reduce and recycling. This can provide a good reputation for Trendy.	customer trust. Also, ransomware attacks can lock business' important data while phishing scams trick employees into revealing confidential information or installing malware (Kado, 2024).

3. Integrated Reverse Logistics System

Internal	**Technology Strength**	**Technology Weakness**
	Reverse logistics system helps to improve the profitability of business. It can save costs in the reverse logistics process because the system will help to provide a more efficient shipping routes, thus save the return shipping costs. The system also helps the business to minimise risks as an efficient reverse logistics system ensures instant safety recalls (Luke, 2024). Some products such as flammable fabrics that may pose safety risks will be quickly removed from circulation and disposed correctly to prevent harmful risks.	The system may have complicated return flow include checking, testing repairs and repackaging (Luke, 2024). This requires a strong logistics coordination to make sure the return flow runs smoothly.
External	**Technology Opportunities**	**Technology Threats**
	Reverse logistics system integrates with IT technology such as AI and machine learning can detect fraud by identifying suspicious return behaviour (Acharya, 2024). These technologies also help to analyse data in real-time. This can improve the business performance and strengthen our	The system requires a strict environmental law that will increase the complexity in operational (Jenkins, 2024). Conflict can be happened between the decisions on handling returns and end-of-life products. For example, the cost of recycling will exceed the financial returns but reducing landfill waste.

	reputation in the industry by minimising fraud risks and ensuring integrity.	This becomes a challenge for Trendy as business need to balance cost efficiency with environmental responsibility. Consequently, Trendy needs to pay more money to invest in IT technology such as machine learning to address this challenge.

2.2.2 Standard

Standard artifacts are existing models, frameworks, and guidelines that businesses and IT architectures use to provide consistency, efficiency, and strategic alignment. They consist of technology reference models, guidelines, patterns, IT principles, and best practices. Business employees must follow these standard approaches to allow organisation to streamline the business processes, improve collaboration, and successfully adapt to digital transformation. This artifact also help businesses manage their IT systems, to ensure wise usage of resources, and avoid operation problem by providing clear instruction on how to handle technology, data and process flow.

2.2.2.1 Technology Reference Model

Delivery		**Channels**	
Fleet Management System	Third-Party Logistics (3PL) API	Mobile Shopping App	Augmented Reality (AR) Shopping
Applications and Integration			
Enterprise Resource Planning (ERP)	Inventory Management System (IMS)	Returns Management System (RMS)	
Databases and Information Management			
Cloud-based Data Warehouse	On-Premise SQL Database	NoSQL Distributed Database	
Security and Access Management			
Multi-Factor Authentication (MFA)	Zero Trust Security Model (RBAC)	Basic Role-Based Access Control (RBAC)	
Infrastructure and Networks			
Software-Defined Networking (SDN)	On-Premise Data Center	Hybrid Cloud Infrastructure	

**Colour-coding: Blue - Current system; Orange – Unsupported system; Green – Emerging system

The Technology Reference Model (TRM) is a strategic tool that helps architects, IT groups, and business stakeholders in selecting the right technologies for the business. By having a TRM, the company can see immediately what technologies the business currently has, allowing them to make adjustments to adapt to business changes.

Trendy has been adopting new technologies to improve its competitiveness in the market as now in technology. For example, Trendy uses Augmented Reality (AR) Shopping

technology that allows customer to experience virtual try-on clothes and determine whether they suit their preferences without having to visit physical stores. Meanwhile, NoSQL Distributed Databases help process large amounts of data faster, allowing the company to operate smoothly even during high demand period. These cutting-edge technologies allow Trendy to stay ahead of the competition, improving customer engagement and business performance.

Trendy can also identify old and outdated technologies by referring to the TRM. These inefficient technologies are less suitable to be used for long-term business growth, should be replaced as soon as possible. This includes systems like On-Premise SQL Databases, On-Premise Data Centres and Basic Role-Based Access Control (RBAC). Older technologies can slow down progress and cause additional expenses and should be upgraded to more modern solutions.

Most of the technologies Trendy is implementing are widely and actively used by other industries for business operations as well, such as, Enterprise Resource Planning (ERP) Systems, Inventory Management Systems (IMS), and Multi-Factor Authentication (MFA). By using industry-standard technologies and strategically adding emerging technologies to the business, Trendy can create a stable and flexible IT environment that support short-term and long-term requirements.

2.2.2.2 Guidelines

System Integration Standards	**Guideline 1:** Implement REST APIs (Representational State Transfer) for System Integration **Description:** REST APIs allows different systems to communicate over the internet using standard HTTP methods (Ehsan et al., 2022). It acts as a bridge to connect ERP with other systems like CRM or IMS, allowing them to share information smoothly. This approach making the collaboration process across departments simpler and able to enables efficient data exchange to support business growth.
	Guideline 2: Standardize JSON (JavaScript Object Notation) as the Data Format **Description**: Use JSON as the standard format for data exchange across systems to minimize errors. JSON is known for its simplicity as it is easily readable and understood by both humans and machines. JSON also works well with modern APIs and databases (Bourhis et al., 2017). Due to all these reasons, using JSON as the standard format can improve the speed of data exchange and allow more efficient communication.
Data Management Standards	**Guideline 1**: Enforce Data Validation with SQL Triggers **Description**: SQL triggers can be seen as automatic checkpoints inside a database. They check and verify data before it gets store to make sure everything is correct. This helps to keep information accurate and consistent across connect systems like ERP and IMS.
	Guideline 2: Enable Real-Time Data Synchronization with Apache Kafka **Description**: Apache Kafka is a stream processing platform that helps system send, receive, and process data in real time

	(Sharma, n.d.). It works like a messenger that quickly delivers information between different systems, making sure they stay updated instantly. In Trendy, Kafka can keep ERP, IMS, and CRM systems synchronized so that when inventory levels change, all systems reflect the update immediately preventing any from being left out and outdated.
Security and Compliance Standards	**Guideline 1**: Secure Data with AES-256 Encryption **Description**: AES-256 refers to 256-bit encryption, meaning the encryption key is 256 bits long. It is more secure to apply AES-256 for encryption, as a longer key contain more possible combinations, making it harder for unauthorised parties to crack the encryption. This helps Trendy safeguard sensitive customer and business information.
	Guideline 2: Implement Data Masking for Sensitive Information **Description**: Data masking is mainly used in non-production environment, such as during testing or backing up systems, to help protect sensitive information. By using this technique, only authorized people can see or access the full data, keeping it safe from unauthorized use.

2.2.2.3 Patterns

Pattern 1: Omni-Channel Inventory Synchronization
Description: It is important for an omni-channel business like Trendy, which operates both online and physical stores at the same time, to synchronise inventory data using data-driven approach (Pereira & Frazzon, 2020). Orders may come from multiple channels, so it is essential to ensure all channels are adequately stocked to fulfil all orders. Proper inventory synchronization helps prevent problems where the actual available stocks are different from what customers see on shopping platform (Johnson, 2022).
Applicability: This pattern applies whenever Trendy is unsure about the stocks they have purchased, the quantity of stock available, and their locations. It is also applicable for issues such as order delays due to insufficient stock or other issues that prevent stock from being delivered to customer. Furthermore, this pattern can be used when Trendy discovers that the number of items does not match with the actual number in storage. Regardless of whether the quantity is more or less than expected, both situations are not acceptable.
Rationale: Trendy will face many issues if it uses traditional inventory model that keeps data in individual compartments, including ineffective stocking, inaccurate stock reporting, and poor fulfilment abilities (Johnson, 2022). By having optimal inventory, the right amount of stock will be placed in the right places in order to fulfil orders from all channels (Harsha et al., 2023).
Solution: Trendy can use a centralised Inventory Management System (IMS) or Enterprise Resource Planning (ERP) system to achieve data synchronization in inventory. The IMS helps manage inventory with minimised errors and reduces the time and efforts required for inventory management (Madamidola et al., 2024).The ERP system also helps Trendy ensure all information is synchronised and allows business to plan inventory levels in advance based on buyer's real-time store-level data to prevent overstocking or stock shortages (Kelle & Akbulut, 2005).

Pattern 2: Automated Reverse Logistics Workflow

Description:

Automated reverse logistics is another essential part of the business. It is an after-sales service that ensures customers are able to proceed with returns if the products received have any issues. It is as important as forward logistics. By having effective reverse logistics, customers will have a good impression towards the company, as they know the business takes care of them whether they are purchasing products or returning them. As a result, they will be more willing to purchase from the business again (Lysenko-Ryba, 2017).

Applicability:

This pattern is applicable when Trendy is handling large volumes of product returns. For example, after a mega sale like the 11.11 or 12.12 festival, more products are sold than usual. At the same time, the number of product returns will also increase. Another situation where Trendy can use this pattern is when products are delivered incorrectly in bulk due to systems errors. In such emergency cases, automated reverse logistics is crucial for handling the return process smoothly and efficiently.

Rationale:

The traditional way of handling reverse logistics is ineffective. Employees have to manually check if the item and the reasons given fulfil the return policy, verify whether the returned products match the reasons provided by the customer, and update records in all related modules (Sureka et al., 2018). This is process is time-consuming and the parcel might get lost as there is no tracking system in place.

Automated reverse logistics can streamline the return process by automating these tasks, reducing costs, and improving the customer experience. It can help predict return patterns, allowing businesses to be better prepared (Zainal et al., 2024).

Solution:

Trendy can use Returns Management system (RMS) to automate the reverse logistics workflow. The system verifies return eligibility based on predefined business rules, helping to save time and reduce labour costs (Zainal et al., 2019). It can also track returned parcels using RFID tags to make sure the return process is monitored and prevent parcel form being lost or going missing (Unhelkar et al., 2022). Furthermore, RMS has AI sorting that helps categorise returned items into different categories. Business can also analyse return trends provided by RMS and make improvements to reduce the return rate (Zainal et al., 2019).

2.2.2.4 IT Principles

Applications	**IT Principle 1: Design IT Systems with a Focus on User Experience (UX)** **Description:** IT systems should be built with the user in mind, prioritising customer needs and preference. The IT designer needs to make sure the systems designed are easy to use, quick, and simple to navigate for the users. A good user experience (UX) helps keep customers happy and engaged as they are able to use the systems without issues like not knowing how to operate them. **Implication**: When businesses focus on user experience (UX) while designing their IT systems like e-commerce platforms, mobile applications, and helpdesk systems, they become more user-friendly for customers who may have no prior IT knowledge. This help customer receive quicker results and fewer issues will be raised. A great UX results makes customers feel more at ease and brings more loyal customers to the business. Furthermore, when the system is easy to use, customers require less assistance from support teams, which reduces the burden and allows them to spend more time on areas that needs improvement.
	IT Principle 2: Automate Repetitive Tasks **Description:** Automating routine IT tasks, such as sending email campaigns to customer, order confirmations, shipping and tracking updates, reduces the need for manual work and improve efficiency. This allows businesses to grow more effectively and use resources more strategically, rather than wasting time completing the repetitive tasks. **Implication**: Automation helps businesses improve operations by reducing manual work, increasing accuracy, and simplifying workflows. This makes operations faster, lowers costs, and allows employees to focus on more important work. By removing repetitive tasks, employees can focus on more important work that promotes innovation and business growth.

Data	**IT Principle 1: Implement Data Integration Tools to Centralize Information Across Systems** **Description:** Centralizing data means putting all your business information in one place, so that all the systems, like the ones for managing resources, customer information, and inventory, can get the same updated information. This way, everyone in the business is working with the same facts. For example, if one system shows 10 items in stock and another shows 5, it creates confusion. Centralizing the data ensures all systems have the same accurate number. **Implication**: By combining all your data in one place, different systems can access the same accurate information. This avoids problem of having data stored in different systems and helps teams work together more effectively (Patel, 2019). For example, in Trendy, the sales, inventory, and support teams need the same stock information. If one system is wrong, customers may order unavailable items. Centralized data ensures all teams see real-time updates, keeping everyone aligned.
	IT Principle 2: Maintain Real-Time Data Accuracy **Description:** Making sure data is accurate in real-time is important for making good decisions. Real-time data processing means analysing data instantly as it is created. Unlike traditional batch processing, which processes data in large chunks at scheduled times, real-time processing works continuously in small bits (Achanta, 2024). **Implication**: Accurate real-time data helps businesses make better decisions. With real-time data processing, businesses can instantly use new data to understand customer actions, track performance, spot market trends, and identify new opportunities as they happen (Ambasht, 2023). It also builds customer trust by providing correct and reliable information, making them more likely to purchase from the business.
Integration	**IT Principle 1: Use APIs for Seamless Integration Between Different Systems**

	Description: APIs allow different systems like ERP, CRM, and POS to talk to each other instantly, keeping the data the same across all platforms. It acts like a middleman that translate messages between systems that operate in different way to help departments work together smoothly. **Implication**: APIs help systems share information in real-time, ensuring everything stays consistent and up-to-date. This makes the business run more smoothly by automating data exchange, cutting down IT costs, and making it easier to connect new systems. APIs also help businesses adapt quickly to new technologies and meet changing customer needs.

2.2.3 Visions

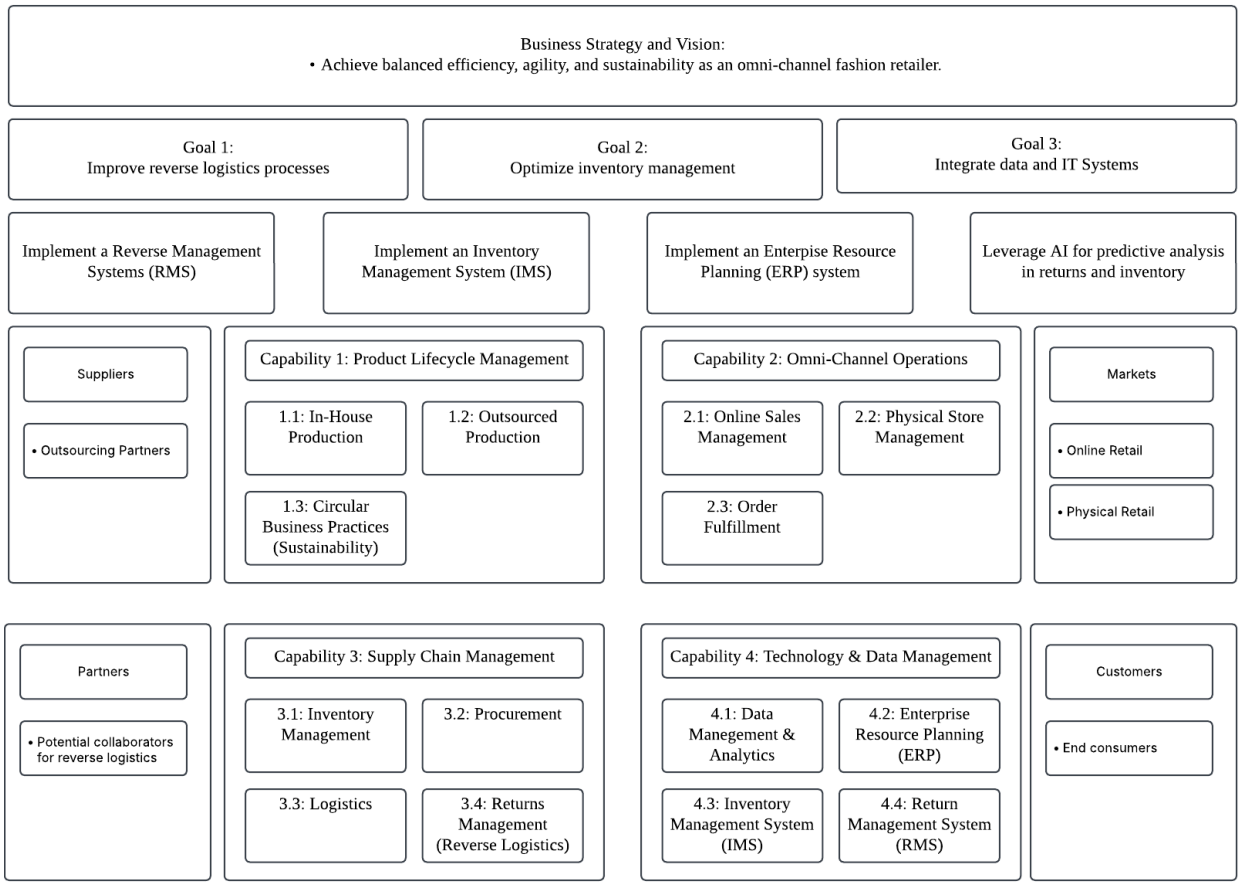
A Vision artifact is a high-level conceptual representation of an organization from a business standpoint that outlines strategic choices on what IT should deliver in long-term. Business leaders and architects collaborate to develop Visions that will serve as a guide for IT investments, assisting to identify, prioritize, and start new projects that align with long-term corporate goals. By making sure that technology investments complement the company objectives, Visions improve strategic alignment and boost the effectiveness of IT planning. In the end, they offer a structured framework to connect business needs with IT capabilities, driving sustainable growth and innovation.

2.2.3.1 Context Diagram

Trendy envisions a smooth integrated operational environment where its Inventory Management System (IMS), Enterprise Resource Planning (ERP), and Reverse Management System (RMS) collaborate to create an agile and effective business model. As a strategic blueprint, the Context Diagram demonstrates how the suppliers, warehouses, retail stores, online platforms, and customers work together to ensure real-time synchronization of data, orders, and logistics. Trendy achieves automated inventory tracking by implementing IMS with ERP to reduce stockouts and overstocking, whereas RMS improves reverse logistics efficiency, by streamlining returns and exchanges for a seamless customer experience. Trendy is positioned for a scalable growth, enhanced decision-making through predictive analysis, and an omnichannel customer experience where personalized engagement is driven by insights from CRM systems. In addition to highlighting current operational flows, the Context Diagram provides leadership with a roadmap for strategic IT investments, aligning technology with Trendy's long-term business objectives of great customer service and operational excellence.

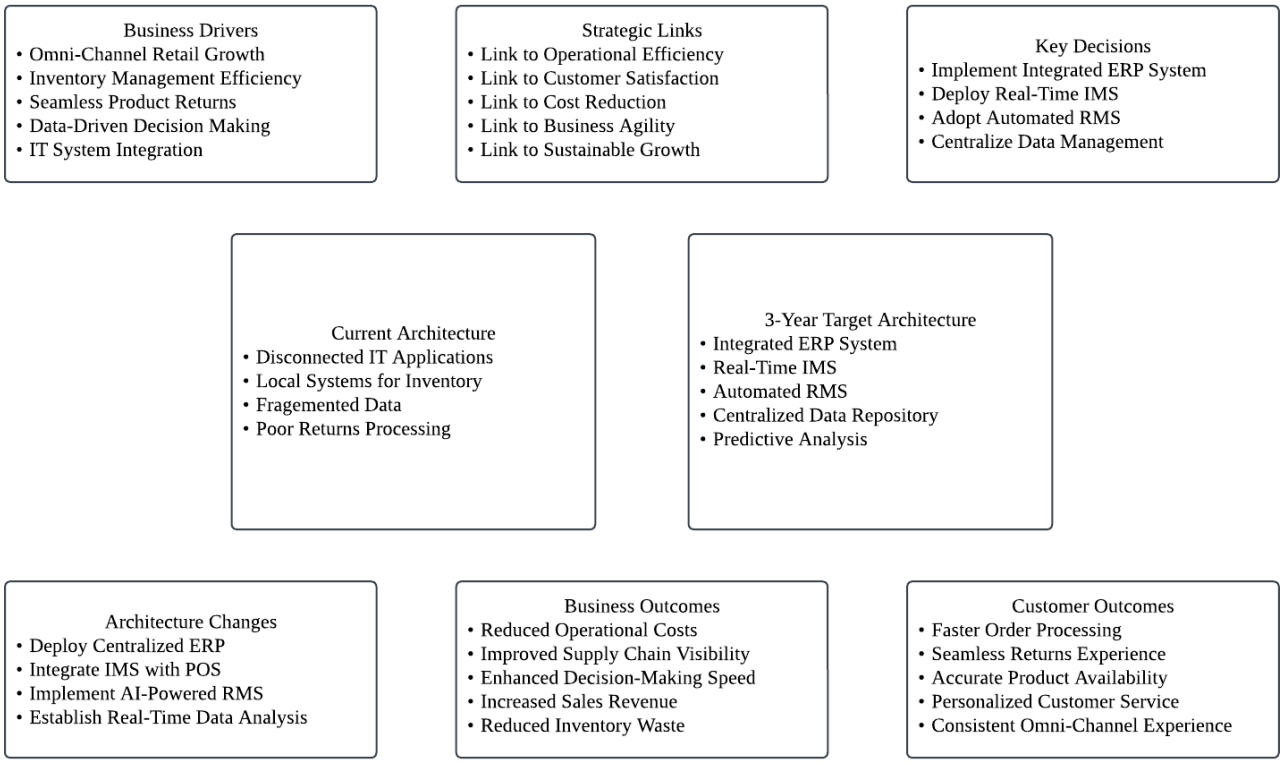
2.2.3.2 Business Capabilities Model

The Business Capabilities Model (BCM) helps Trendy to be successful from a functional perspective as it aligns business objectives with IT investment by outlining key capabilities that Trendy must develop or enhance to achieve its long-term goals. This artifact is structured with respect to 3 goals: to improve reverse logistics using RMS, to optimize inventories using IMS and to unify data using ERP and AI-supported predictive analytics. Four business abilities support these goals. Product Lifecycle Management ensures production efficiency and sustainability through ERP and IMS. Omni-channel operations supports both physical and online store using ERP and IMS to improve order fulfilment. Supply Chain Management controls inventory, procurement, logistics, and return through ERP, IMS, and RMS. Technology and Data Management employs ERP, IMS, and AI for analytics improvement, inventory tracking, and return management. Overall, the model demonstrates the integration of Trendy's IT services for an easy improvement of operations as well as customer satisfaction along with driving long-term business growth.



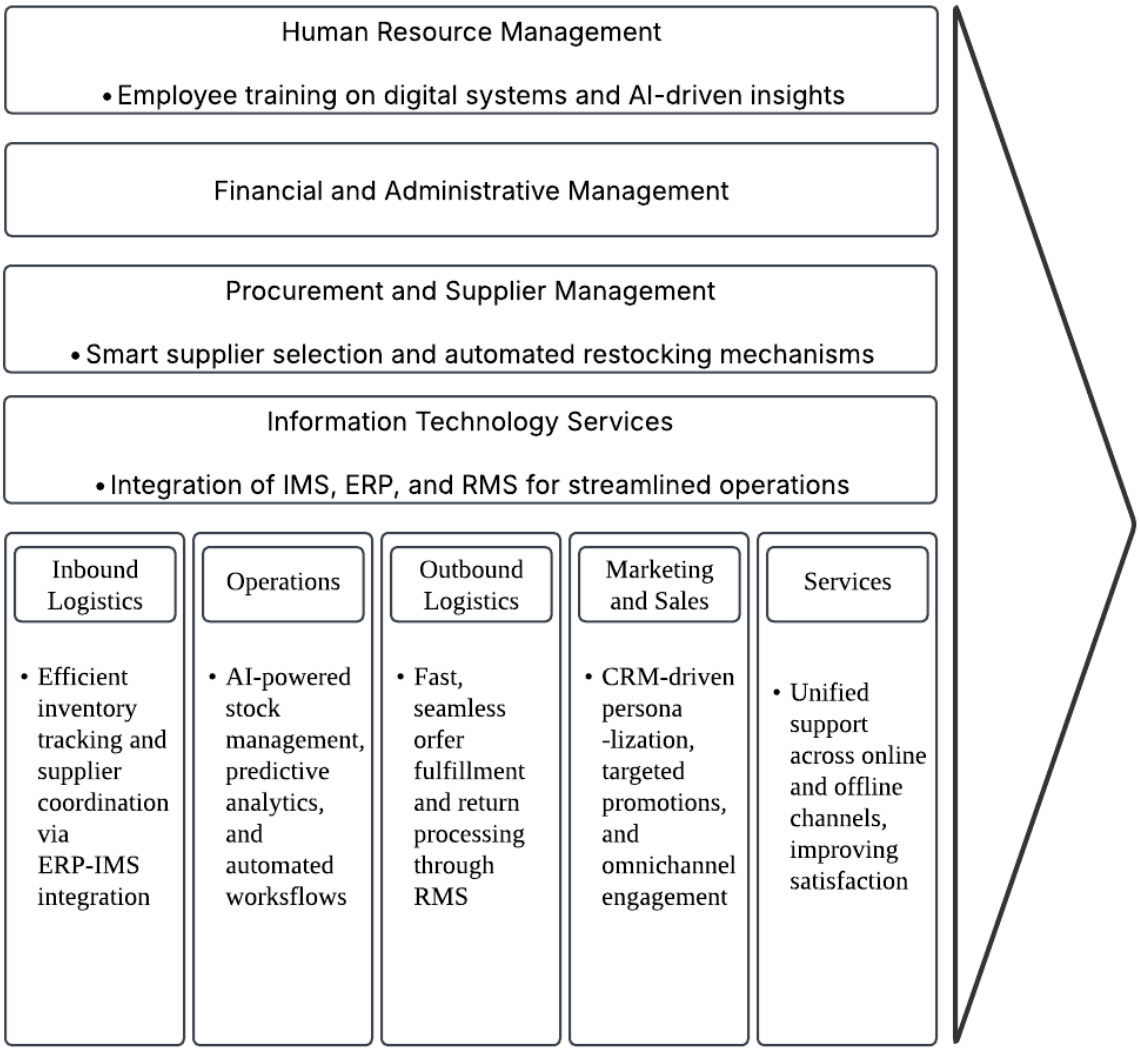
2.2.3.3 Target State

Before starting the Roadmap, Trendy must define its Target State which is an optimized future for business and IT. This involves AI-driven demand forecasting, real-time tracking for inventories, and integrated omnichannel retail experience. Reverse logistics that is automated ensures fast, and seamless returns whereas predictive analysis and AI enhance decision making. IMS, ERP and RMS should work in sync to fully integrate IT ecosystem to drive operational excellence. This Target States serves as a benchmark for measuring progress throughout the roadmap.



2.2.3.4 Value Chain Model

Trendy's Value Chain Model outlines its primary activities which are inbound logistics via ERP-IMS integration, stock management using AI-powered operations, fast outbound logistics using RMS for returns, and CRM-driven marketing and sales for personalization. This process will be supported by technology and IT for system integration, human resource management will be focusing on training for digital systems, smart procurement and supplier management, and the standard financial and administrative functions. This model helps how Trendy can create value across its business processes, at the same time, highlighting areas where strategic IT investments can be prioritized to enhance efficiency and gain a competitive edge.



2.2.3.5 Roadmap

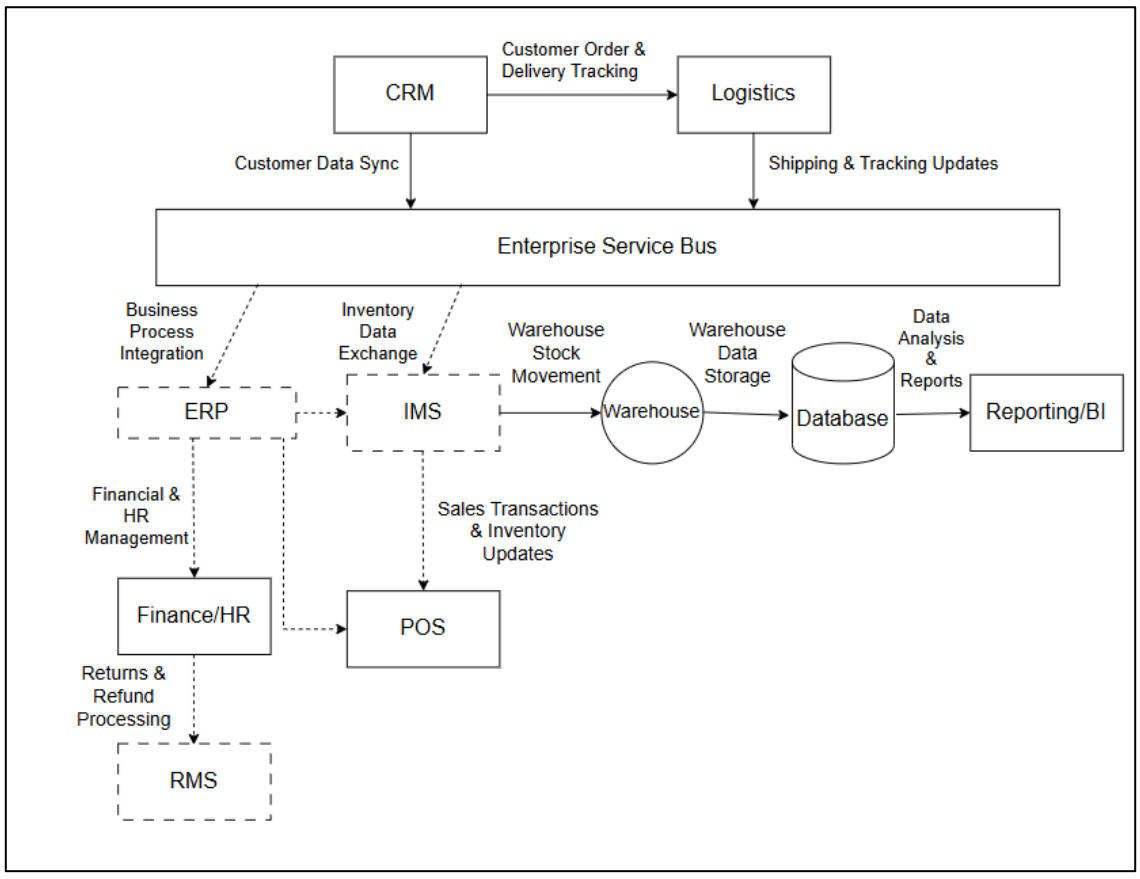
Trendy's Digital Transformation Roadmap outlines a phased approach to achieving seamless operations over the course of 2-to-3-year time through the integration of its IMS, ERP, and RMS. In Phase 1 (0-6 months), real-time inventory tracking, a centralized database, and initial RMS integration for more efficient returns processing will be the main enhancements. Phase 2 (6-18 months) will prioritize predictive analysis for demand forecasting, automated reverse logistics, and CRM improvements to personalize customer experiences. Finally phase 3 (18-36 months), aims for scalability with AI-driven supply chain optimization, expanding the RMS capabilities, and a fully omnichannel retail experience that integrates both physical and digital touchpoints. Trendy's vision is represented in this roadmap, ensuring IT investments will promote operational efficiency, customer satisfaction, and long-term business growth in a structured and strategic manner.

Capability	Phase 1 (0-6 months)	Phase 2 (6-18 months)	Phase 3 (18-36 months)
IMS – Inventory System Management (Strategic)	Initiative 1.1 – Real-time inventory tracking (Funded)	Initiative 1.2 – Centralized data repository (Approved)	Initiative 1.3 – AI-driven demand forecasting (Planned)
ERP – Enterprise Resource Planning	Initiative 2.1 – ERP integration with IMS & centralized data repository (Funded)	Initiative 2.2 – Automate stock visibility across all sales channels (Approved)	Initiative 2.3 – Dynamic stock level adjustments based on real-time demand (Planned)
RMS – Reverse Management System (Important)	Initiative 3.1 – Initial RMS integration for returns processing (Planned)	Initiative 3.2 – Automated reverse logistics (Planned)	Initiative 3.3 – Multiple location returns and exchanges (Planned)
CRM – Customer Relationship Management	Initiative 4.1 – CRM enhancements for order tracking (Planned)	Initiative 4.2 – Personalized shopping experience based on purchase history (Planned)	
Omnichannel Retail Experience		Initiative 5.1 – Unified physical and digital touchpoints (Planned)	Initiative 5.2 – Fully integrated omnichannel retail experience (Planned)

2.2.4 Landscape

Landscape artifacts are like a roadmap of a company's current technology systems. They show how technologies are set up now and give ideas about how the systems might change or improve in the future. Their purpose is to help business to understand and analyse the structure of IT landscape. Landscapes are permanent artifacts that are developed and maintained to track the evolution of IT landscape Kotusev (2017). These artifacts are useful references to help make decisions about technology planning.

2.2.4.1 Landscape Diagram



The diagram above shows Trendy's disconnected IT systems and the inefficiencies caused by the lack of integration between ERP, IMS, and RMS. Dotted lines and boxes represent inefficiency, while solid lines and boxes indicate efficient connections or data flow. The inefficiencies lead to consequences such as data isolation and inconsistencies, increase employee's workload, and delays in processes causing customer dissatisfaction.

Important systems like POS, CRM, and logistics software are essential for sales, customer service, and delivering orders, but because they are not connected to the main system (ERP), the flow of information is disorganized. The diagram shows the Enterprise Service Bus (ESB) at the centre. ESB is like a central system that helps different business applications talk to each other smoothly. It works by handling messages, sharing data, and

making sure everything gets to the right place without errors (Mínguez, 2012). This highlights the importance of the ESB in playing a role of central hub in the business, allowing data exchange in a standardized way.

Finance and HR are also involved because they depend on the ERP system for tasks like payroll, financial reporting, and budgeting. Without proper integration, financial data reconciliation becomes time-consuming (Ghanbari & Soleimani, 2019). HR processes like payroll calculations and workforce planning will be lacking real-time accuracy (Alhalboosi et al., 2021).

This landscape diagram helps identify critical gaps that need to be addressed, particularly the need for a fully integrated ERP system. Such an integration would improve inventory management, returns processing, and financial operations, ultimately enhancing efficiency, accuracy, and decision-making.

2.2.4.2 Inventories

Asset	Purpose	Owners	Cost (per year)	Problems	Action Plan
Application: POS	Handles point-of-sale transactions	Retail Team	RM 10,000	Outdated interface, lacks integration with ERP	**Invest** in upgrading to cloud-based POS that integrates with ERP
Application: CRM	Manages customer relations	Marketing Team	RM 15,000	Data siloed, no real-time updates with ERP	**Invest** in upgrading to integrated CRM system
System: IMS	Manages inventory across channels	Logistics Team	RM 20,000	No real-time data sync with POS and ERP	**Reuse** with integration to ERP and POS for real-time tracking
System: ERP	Manages company-wide processes	Operations Team	RM 50,000	Not integrated with other systems (IMS, POS)	**Invest** in integration with IMS and POS for seamless operations
Database: Inventory DB	Stores product inventory data	IT Team	RM 5,000	Not updated in real-time, limited scalability	**Reuse** with integration into new IMS system
Database: Customer DB	Stores customer information	Marketing Team	RM 7,500	Siloed data, not connected with CRM and ERP	**Decommission** and integrate with CRM and ERP

**Colour-coding: Green – Invest; Orange – Decommission; Blue – Reuse

2.2.4.3 Enterprise System Portfolio

Capability 1: Supply Chain Management		**Capability 2: Customer Relationship Management**	
Inventory Management System (IMS)	Logistics Software	Customer Relationship Management (CRM)	Point of Sale System (POS)
Warehouse Management System (WMS)	Inventory Tracking Software	Enhanced CRM with AI-driven insights	
Capability 3: Financial & Accounting Management		**Capability 4: Reverse Logistics & Returns Processing**	
Enterprise Resource Planning (ERP)	Finance & HR System	Returns Management System (RMS)	Manual Return Process

**Colour-Coding: Orange – Legacy; Green – Active; Blue – Strategic

The Enterprise System Portfolio serves as the basis for Trendy to choose and implement technology solutions that will help the business achieve its long-term goals and objectives. In the portfolio, it shows a clear structure of how different business capabilities are supported by the relevant systems. By categorising the systems under the business capabilities they support, Trendy can identify the weaknesses and strengths of the current IT systems, determine which outdated systems should be replaced, which systems should continue to be implemented in the future, and which business capabilities need more systems to assist.

For example, if Trendy still faces issues with the supply chain, management can review the systems that are currently supporting this business capabilities and evaluate whether IMS or WMS need enhancements by implementing AI in them or if the Inventory Tracking System needs to be replaced with a new system that can help address the issues.

This portfolio also helps Trendy decide if the systems can grow as it expands, whether Trendy is staying within budget when implementing IT systems, and the potential security risk of the systems. It ensures that any new technology Trendy adopts in the future will be successfully implemented while maintaining operational efficiency.

2.2.5 Outlines

Outlines are high-level summaries of individual IT initiatives, designed to be easily understood by business leaders. These documents are part of the Enterprise Architecture (EA) framework and focus on the mid-term future, typically looking 1 to 2 years ahead. They combine simple diagrams with clear, concise descriptions to provide an overview of potential solutions, evaluate different options, and propose new initiatives.

The main purpose of outlines is to show how specific IT initiatives could be implemented, helping decision-makers evaluate and approve them. They serve as temporary artifacts, created during the early planning stages of a project and then archived once the initiative moves forward or is finalized.

2.2.5.1 Solutions Overviews

Solution overviews are simplified explanations of complex IT solutions, designed to help business leaders easily grasp the proposed ideas. They include high-level concepts like architectural diagrams, process models, and key details such as goals, benefits, stakeholders, and requirements. These overviews highlight the differences between the current state of operations and the improved future state that the solution aims to achieve. Additionally, they provide a mini roadmap, outlining the timeline and order in which different parts of the solution will be implemented.

2.2.5.1.1 Overviews and Goals

Trendy is looking to modernize its operations by implementing a new IT solution that streamlines inventory management, enhances the customer shopping experience, and improves overall efficiency. The primary goal is to create a seamless connection between online and in-store operations, ensuring real-time stock updates, faster order processing, and better customer satisfaction. This solution will also help Trendy stay competitive in the fast-paced fashion industry by adopting innovative technologies.

2.*2.5.*1.2 Scope and Stakeholders

Key stakeholders include:

System	Primary Stakeholders	Responsibilities	Interactions
ERP	**Senior Business Executives**	- Strategic planning (For example: budgeting, supplier contracts) - Financial reporting and compliance	Approves high-level workflows and make sure business processes aligns with business goals.
	Finance Team	- Invoice processing - Cost analysis - Tax and audit management	Tax and audit management and works with procurement and sales teams.
	IT Team	- System configuration and implementation - User access management - Integration with other tools and systems	Supports all departments with ERP troubleshooting.
IMS	**Warehouse Staff**	- Receiving shipments - Barcode/RFID scanning - Inventory Tracking and management	Updates stock levels in real-time; alerts store managers of low stock.
	Store Managers	- Monitoring shelf stock - Placing manual reorders	Coordinates with warehouse for urgent restocks.
	IT Team	- IMS software maintenance - Hardware setup (scanners, printers) - Integration with other tools and systems	Ensures IMS-ERP synchronization.
RMS	**Customer Service**	- Processing return requests - Issuing refunds/credits	Liaises with customers and warehouse for item inspections.
	Warehouse Staff	- Inspecting returned items - Restocking or disposing of items	Flags defective items to suppliers via ERP.
	Security Team	- Reviewing Signifyd alerts - Investigating suspicious returns	Collaborates with CRM to block repeat offenders.
CRM	**Marketing Team**	- Creating personalized campaigns	Uses customer data from ERP/IMS to target promotions.

		- Loyalty program management	
	Sales Associates	- Accessing customer purchase history - Making in-store recommendations	Engages customers via mobile app or in-store tablets.

2.2.5.1.3 Essential Requirements

- Real-time inventory tracking across all stores and online platforms.
- Integration with barcode scanners and RFID technology for accurate stock updates.
- Automated reordering when inventory falls below safety levels.
- A user-friendly customer portal for checking product availability and tracking orders.
- Secure, cloud-based access for managers and employees to monitor inventory remotely.
- Compatibility with existing systems to minimize disruption during implementation.

2.2.5.1.4 Business Benefits

- Improved Customer Experience: Real-time stock visibility and faster order processing will lead to happier customers.
- Operational Efficiency: Automated inventory management reduces manual errors and saves time.
- Cost Savings: Better stock control minimizes overstocking and reduces waste.
- Increased Sales: Faster restocking and accurate inventory data ensure popular items are always available.
- Data-Driven Decisions: Advanced reporting tools provide insights into sales trends and customer behaviour.

2.2.5.1.5 Involved Partners

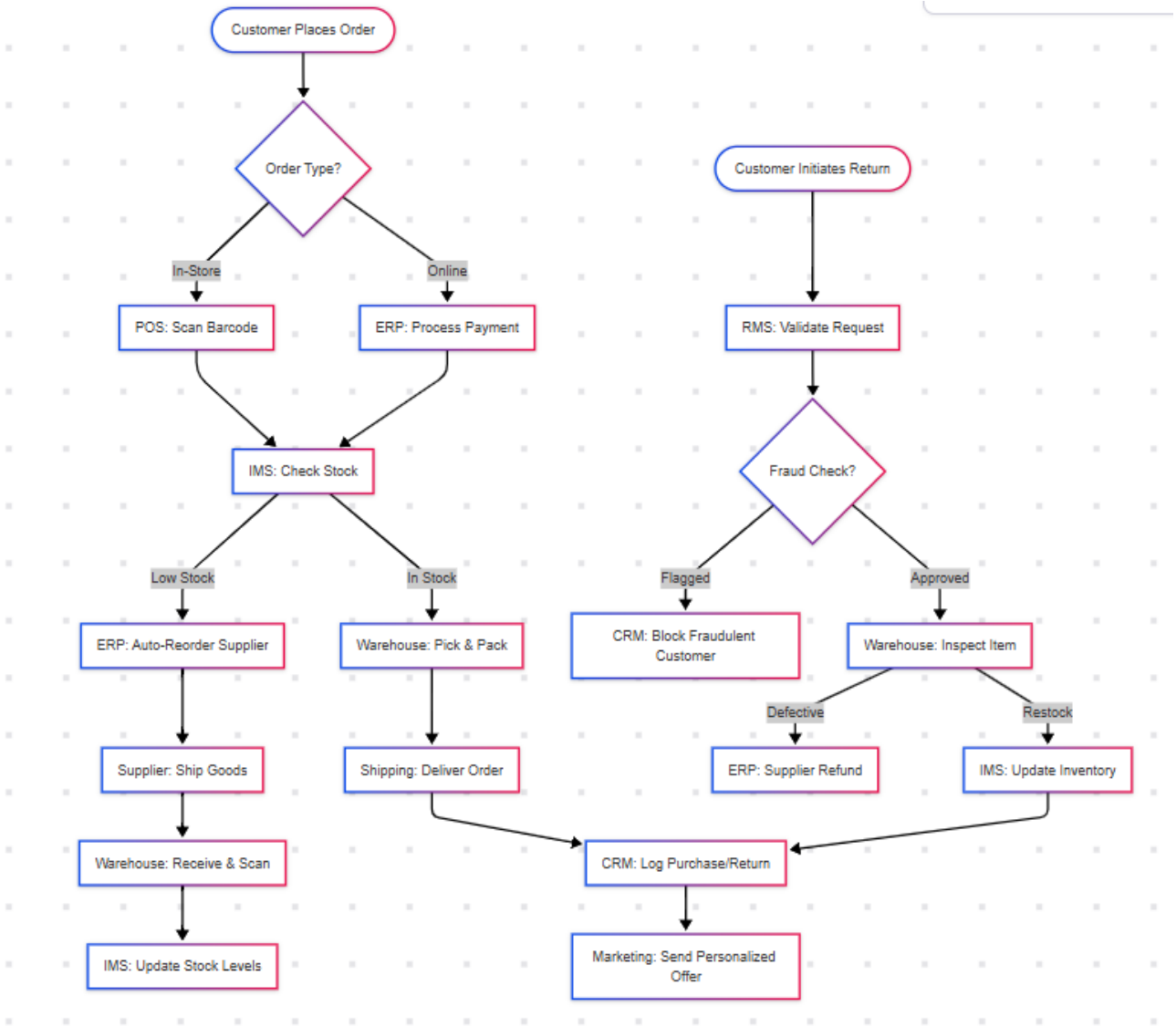
Software Vendor: Providing the core inventory management system.

IT Consultants: Assisting with implementation and customization.

Logistics Providers: Ensuring seamless coordination for restocking and deliveries.

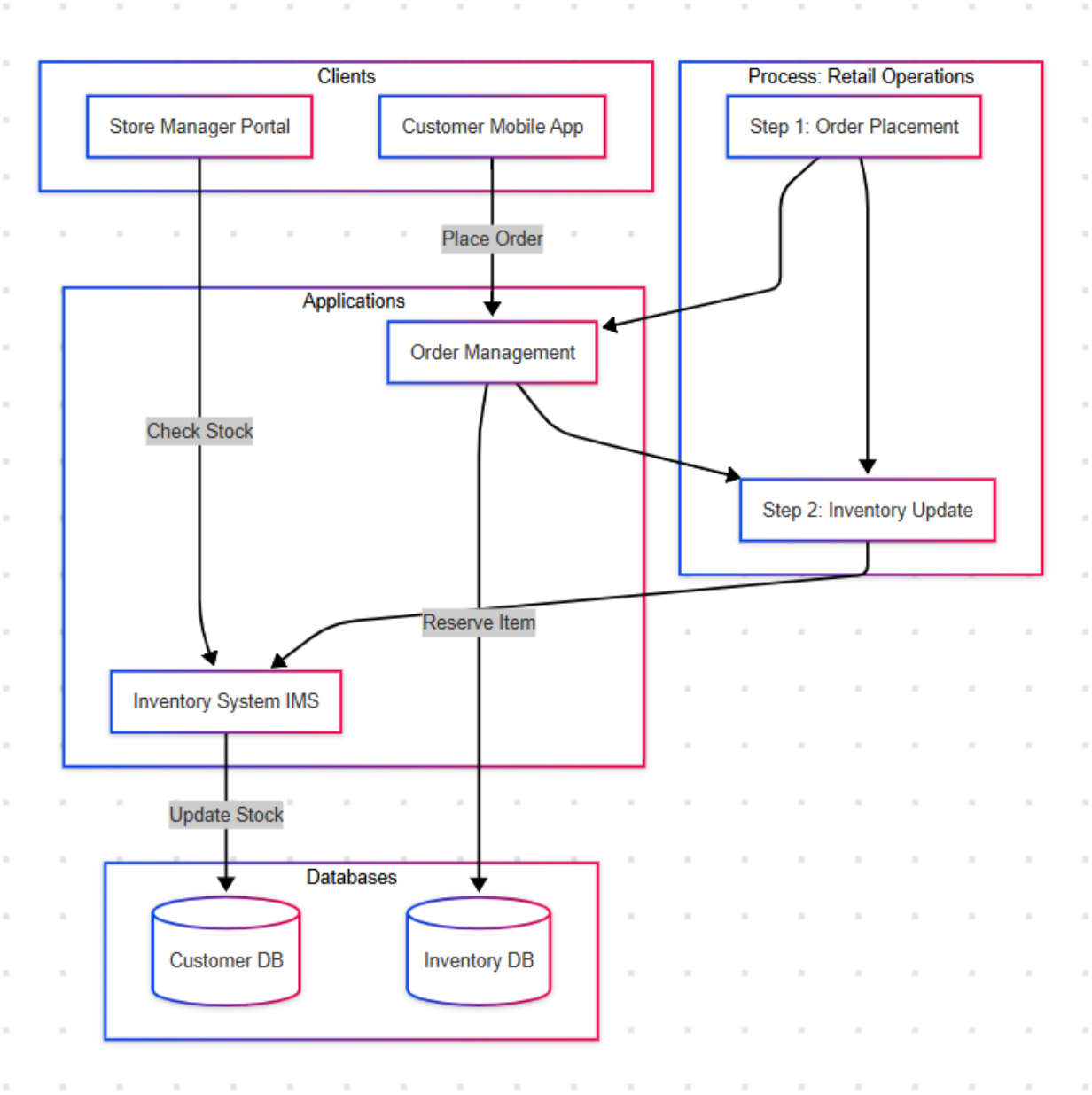
Suppliers: Integrating their systems for automated order placement and tracking.

2.2.5.1.6 Business Process Changes



This diagram shows how Trendy's retail system works from start to finish. When a customer places an order (online or in-store), the ERP processes the payment while the IMS checks stock—sending items to the warehouse for packing if available or auto-reordering from suppliers if stock is low. If a return is requested, the RMS checks for fraud, the warehouse inspects the item, and the system updates inventory or issues refunds. Meanwhile, the CRM tracks purchases and returns to send personalized offers. Every step connects smoothly, ensuring orders, inventory, and customer data stay in sync across all departments.

2.2.5.1.7 Architectural Overview



Trendy's system connects customers and store managers to a cloud-based platform. When a customer places an order, the Order Management app reserves the item and updates the Inventory Database. Store managers use the Inventory System to check stock levels in real time. All data flows smoothly between apps and databases, keeping everything in sync so Trendy can serve customers quickly and accurately.

2.2.5.1.8 Key Risks

Implementation Delays: Potential challenges in integrating the new system with existing tools.

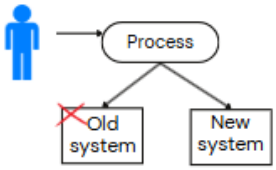
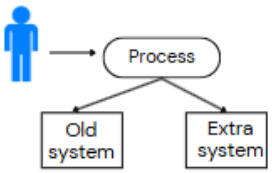
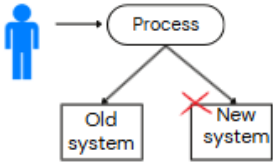
Employee Resistance: Staff may need time to adapt to new processes and technologies.

Data Security: Protecting sensitive customer and business data in a cloud-based system.

Cost Overruns: Unforeseen expenses during customization or rollout.

Supplier Coordination: Ensuring all suppliers are aligned with the new system for smooth restocking.

2.2.5.2 Options Assessments

Options	Score
Solution 1: New System  Time: 8–13 months Cost: $2.0–3.5 million Advantages: • Scalability solution with advanced capabilities. • Aligns with business strategic growth plans. Disadvantages: • Expensive and time-intensive. • Potential operational downtime during transition. Risks: High costs and prolonged rollout time, leading to employees' resistence	Functionality: • High (Score: 5/5) • Comprehensive features and integration Feasibility: • Low (Score: 2/5) • Complex implementation, may lead to disrupting current operations. Alignment • Moderate (Score: 4/5) • Fits long-term goals but requires significant adaptation. Total score: 11/15
Solution 2: Extra System (Hybrid)  Time: 4–7 months Cost: $1.0–1.7 million Advantages: • Faster and cheaper than Option 1. • Minimal disruption to current workflows. Disadvantages: • Lacks advanced features for future growth. • Potential compatibility issues with existing tools. Risks: Potential Synchronization issue and data integrity issue	Functionality: • Moderate (Score: 3/5) • Partial automation; gaps in integration. Feasibility: • Moderate (Score: 3/5) • Easier to implement but limited scalability. Alignment • Low (Score: 1/5) • Addresses immediate needs but not long-term vision. Total score: 7/15
Solution 3: Maintaining Old System  Time: No implementation required Cost: $0 (no investment required) Advantages: • Zero upfront cost • No staff retraining needed Disadvantages: • Increasing operational costs over time • Unable to support business growth • Manual work leads to more errors • Poor customer experience (out-of-stock issues) • Risks: Falling behind competitors, Inefficiencies costing more long-term	Functionality: • Low (Score: 1/5) • Manual processes, prone to errors Feasibility: • Immediate (Score: 5/5) Alignment • Poor (Score: 1/5) • does not fit long-term goals Total score: 7/15

Trendy faces a critical decision in modernizing its IT infrastructure, with three solutions. The first and most comprehensive option is implementing an entirely new system, which would provide full automation, seamless integration, and scalability for future growth.

While this solution scores highest in functionality (5/5) and aligns well with long-term goals, it comes with significant costs ($2-3.5 million) and an extended implementation period of 8-13 months. The substantial investment and potential operational disruption during transition represent real challenges, but the payoff would be a future-proof system capable of supporting Trendy's growth ambitions.

As a middle ground, the hybrid approach offers a compromise solution. By adding new components to the existing system at a lower cost ($1-1.7 million) and shorter timeline (4-7 months), this option minimizes disruption while delivering some immediate improvements. However, its moderate functionality score (3/5) reflects limitations in both integration capabilities and long-term viability, potentially requiring another upgrade sooner than anticipated. The risk of synchronization issues between old and new components is particularly noteworthy.

The third option - maintaining the current system - presents a superficially attractive no-cost, no-disruption alternative, but carries hidden expenses. While scoring perfectly in immediate feasibility (5/5), its poor functionality (1/5) and alignment (1/5) scores reveal fundamental shortcomings. The manual processes and lack of integration would increasingly hinder operations as Trendy grows, likely resulting in higher operational costs, more errors, and deteriorating customer experiences over time.

Each option presents a classic trade-off between immediate costs/efforts and long-term benefits. The new system demands the most upfront investment but positions Trendy best for future success. The hybrid model offers quicker, cheaper improvements but may prove inadequate as needs evolve. Maintaining the current system would avoid short-term pain but would also guarantees complications in the near future. For a fashion retailer in today's competitive market, the comprehensive new system likely represents the wisest strategic investment despite its greater initial demands.

2.6.1 Designs

Designs Artifacts in Trendy's Enterprise Architecture are created through collaboration by architects, project teams, and business leaders. These design documents serve as blueprints, helping project teams turn plans into implementable actions by guiding the technical steps. Unlike early-stage planning documents, design artifacts come into play later in the process. They ensure the final solution meets both business needs and technical standards. Once their job is done, these documents are filed away, having served their purpose in shaping the finished product.

2.6.1.1 Solutions Designs

Solution Designs are detailed plans that help turn approved IT projects into actionable plans for technical teams. They specify exactly how a system should be built such as software and infrastructure, so developers and engineers have clear direction that aligns with the business goals and IT infrastructure. These documents ensure all stakeholders agree on how the solution will work before implementation begins. They bridge the gap between high-level planning and hands-on coding or configuration.

2.6.1.1.1 Brief Overview

At Trendy, our Design Artifacts are like the instruction manuals for bringing tech projects to life. Created collaboratively by architects, project teams, and business leaders, these documents bridge the gap between high-level ideas and real-world implementation. They don't just sit on a shelf—they actively guide teams through the technical nitty-gritty, ensuring every solution aligns with Trendy's business goals and tech standards. Once a project goes live, these artifacts gracefully retire to the archives, their mission accomplished.

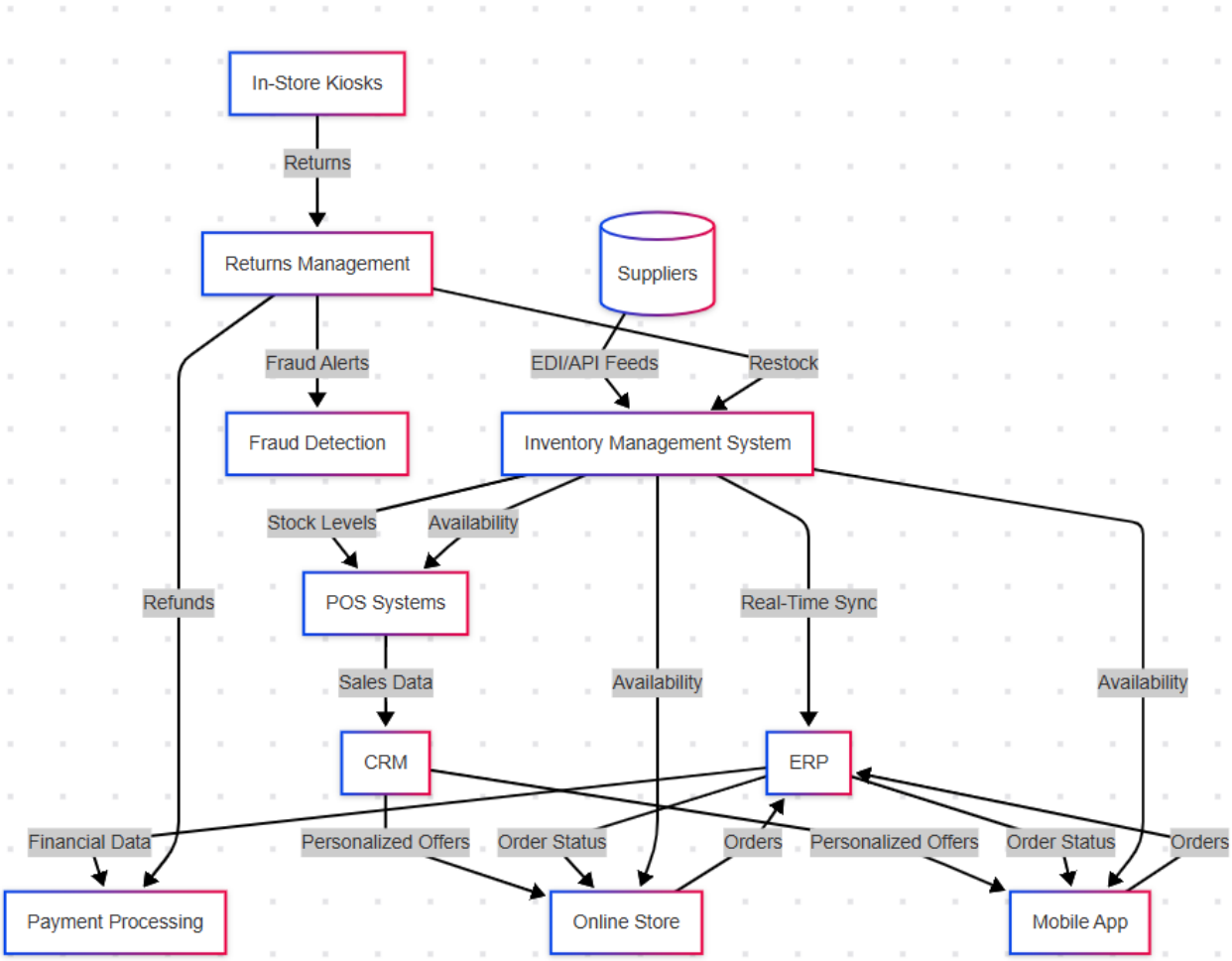
2.6.1.1.2 Detailed Requirements

1. Cloud Based Enterprise Resource Planning	**Software: Cloud-Based ERP System (SAP S/4HANA Cloud)** Trendy will use SAP S/4HANA Cloud, a fully managed ERP system that runs in the cloud, to connect all departments—from inventory to sales—in real time. This software eliminates the need for on-premise servers, letting Trendy scale effortlessly while automating processes like order management and financial reporting. (LeanIX, n.d.)
2. Returns Management System (RMS)	**Software:**

	- **SAP's Advanced Returns Management (ARM)** - **Signify** For hassle-free returns, Trendy will deploy SAP's Advanced Returns Management (ARM), which handles everything from return requests to refunds (SAP, n.d.). To combat fraud, Signifyd's AI-powered platform will analyze returns in real time, flagging suspicious activity such as repeat offenders (Signifyd, n.d.). **Hardware:** - **Tablets/iPads** for staff to process returns anywhere in the store. - **Self-service kiosks** so customers can start returns without waiting. - **Smart scales** to catch fraud (e.g., a box returning bricks instead of jeans). - **RFID tags** to track bulk returns of seasonal items.
3. Inventory Management System (IMS)	**Software: SAP Integrated Business Planning (IBP)** SAP Integrated Business Planning (IBP) will predict stock needs, automate reorders, and sync data across all locations (SAP, n.d.) **Hardware:** - **Barcode scanners** (like Zebra or Honeywell models) to track inventory as items move through stores. - **RFID readers** (optional) for high-volume warehouses to scan entire pallets at once. - **Label printers** for shipping and receipts, ensuring smooth logistics. - **Smart shelves** with weight sensors to alert staff when stock runs low.
4. Customer Relationship Management (CRM)	**Software: SAP Customer Experience (CX)** SAP Customer Experience (CX) will unify customer data from online and in-store purchases, enabling

	personalized marketing (e.g., “Your favourite brand just dropped new arrivals!”). A customer data platform (CDP) like Segment will tie this into Trendy’s mobile app for seamless shopping.
5. Backend Infrastructure	**NoSQL databases** **Software: MongoDB or Cassandra** - To handle high-speed data from websites, apps, and IoT devices. **REST APIs** **Software: Built with Node.js** - To connect all systems—ensuring inventory updates instantly reflect online purchases.

2.6.1.1.3 Solution Context



Supplier Integration and Inventory Management

The foundation of Trendy's operations lies in its supplier networks and inventory systems. Suppliers feed real-time product data into the Inventory Management System (IMS), which tracks stock levels across warehouses, retail stores, and e-commerce platforms. This system is further synchronized with the Enterprise Resource Planning (ERP) platform, ensuring that procurement, financials, and logistics remain aligned. By maintaining accurate, up-to-date inventory data, Trendy minimizes stockouts, reduces overordering, and optimizes supply chain responsiveness.

Omnichannel Retail and Point-of-Sale Systems

Trendy's brick-and-mortar stores and digital storefronts are not siloed but rather function as a unified retail network. When a customer places an online order for in-store pickup, the system immediately reserves the item, preventing overselling. The Point-of-Sale (POS) systems process transactions while simultaneously updating inventory records, ensuring that sales data flows seamlessly between physical and digital channels. This integration enhances operational agility and provides customers with a frictionless shopping experience.

Customer Data and Relationship Management

Customer interactions whether through mobile apps, websites, or in-store purchases—generate valuable data that feeds into Trendy's Customer Relationship Management (CRM) system. This platform consolidates purchase history, browsing behavior, and preferences, enabling personalized marketing and loyalty rewards. For instance, a customer who frequently purchases activewear may receive tailored promotions for new arrivals in that category. By leveraging this data, Trendy strengthens customer retention and drives repeat business.

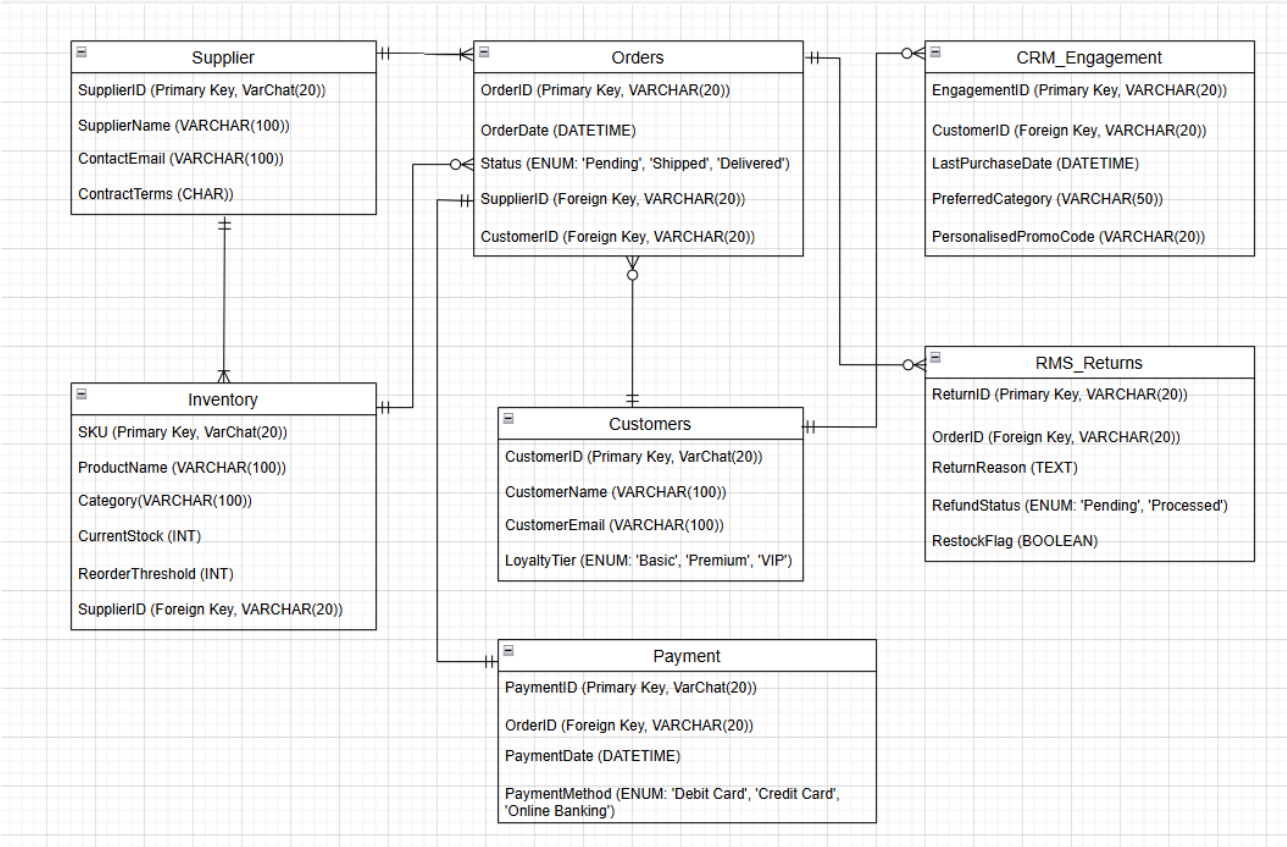
Returns and Reverse Logistics

The Returns Management System (RMS) streamlines the post-purchase experience by automating return approvals, restocking decisions, and refund processing. When a product is returned, the system evaluates its condition (e.g., resellable, defective, or needing repair) and updates inventory accordingly. Advanced fraud detection algorithms analyze return patterns to identify and mitigate potential abuse, protecting profitability while maintaining customer trust.

Scalability and Future Innovations

As Trendy explores new technologies—such as AI-driven product recommendations or augmented reality fitting rooms—the enterprise architecture ensures these innovations integrate smoothly with existing systems. Design artifacts serve as blueprints, mapping out dependencies, data flows, and potential impacts before deployment. This proactive approach prevents disruptions and ensures that new enhancements align with both technical capabilities and business objectives.

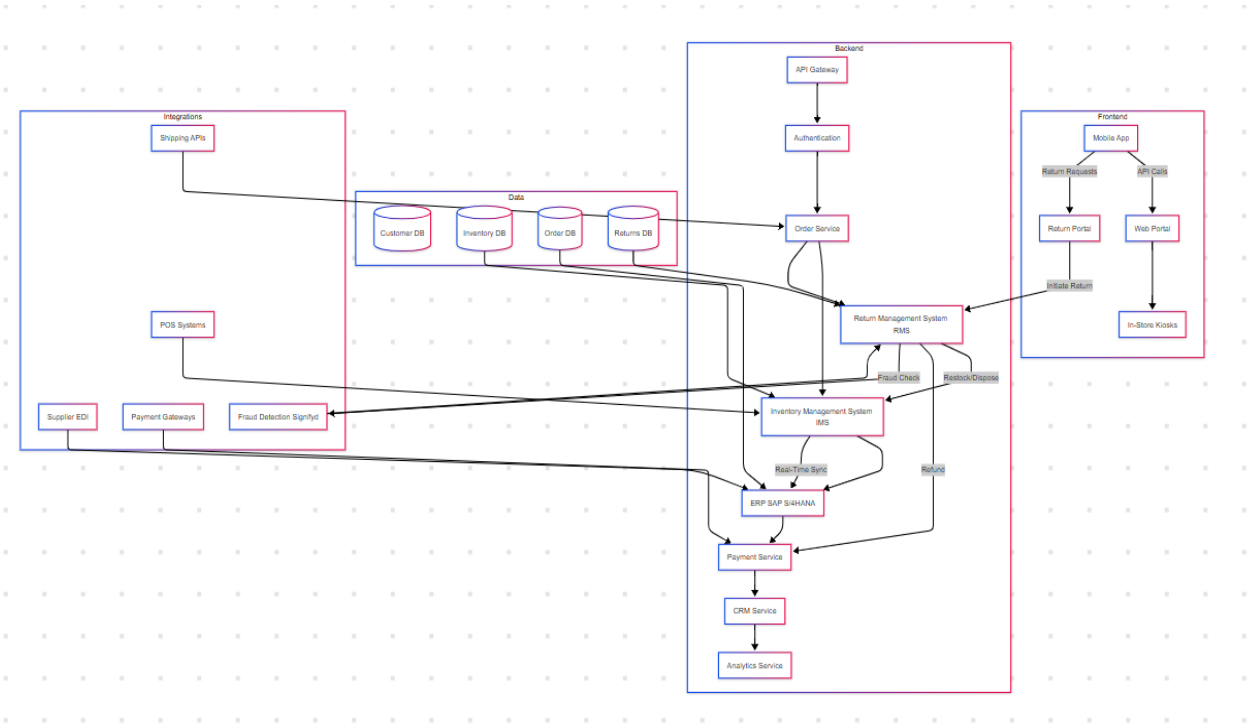
2.6.1.1.4 Data Architecture



Entity Relationship Diagram Relationships:

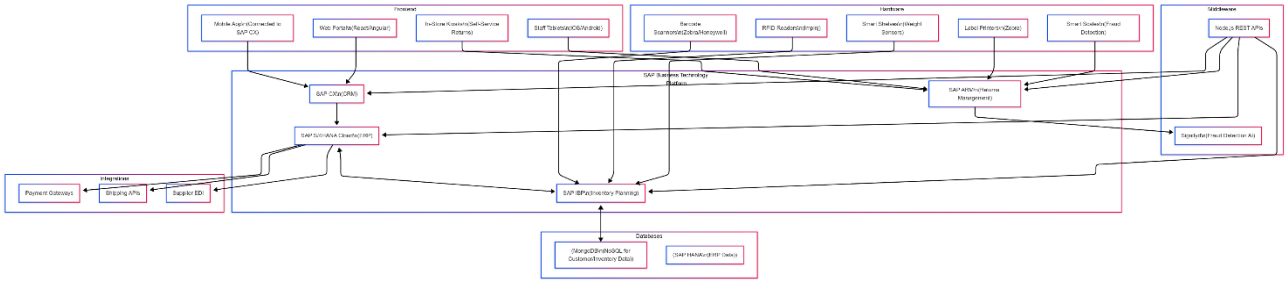
1. **Supplier** (1) PROVIDES (M) **Inventory** (Mandatory)
- Each supplier must provide at least one inventory item.
2. **Inventory** (1) FULFILLS (M) **Order** (Optional)
- Inventory items can fulfil multiple orders, but an inventory may exist without being ordered.
3. **Customer** (1) PLACES (M) **Order** (Optional)
- A customer can place multiple orders but is not required to.
4. **Order** (1) TRIGGERS (M) **Return** (Optional)
- An order can have multiple returns, but returns are optional.
5. **Order** (1) REQUIRES (1) **Payment** (Mandatory)
- All orders must have a payment associated with it.
6. **Customer** (1) HAS (M) **CRM_Engagement** (Optional)
- A customer can have multiple CRM interactions (Example: promotions), but it is not required.
7. **Inventory** (1) BELONGS_TO (1) **Supplier** (Mandatory)
- Every inventory item must be linked to one supplier.

2.6.1.1.5 Application Architecture



Trendy's system connects all business operations together seamlessly. Customers interact through mobile apps, web portals, or in-store kiosks, which connect to backend services for processing orders, payments, and returns. The Inventory Management System (IMS) tracks stock in real-time, while SAP ERP handles finances and supplier coordination. The Return Management System (RMS) automates return processing, fraud checks, and inventory updates. Customer data flows to the CRM for personalized service, and analytics provide business insights. All components are connected through APIs, ensuring data consistency across sales, inventory, and customer interactions.

2.6.1.1.6 Infrastructure Architecture



Trendy's IT infrastructure runs primarily on SAP's cloud platform, which connects all parts of the business. The main system is SAP S/4HANA Cloud which helps in handling finances, orders, and supplier processes. It connects to the other SAP tools like Inventory Planning (IBP) for stock management, Customer Experience (CX) for personalized marketing, and Advanced Returns Management (ARM) for efficient refund processing.

The system connects seamlessly with stores and customers. Employees use tablets and kiosks to process returns, while barcode scanners and smart shelves track inventory automatically. Customers shop through the mobile app or website, which pulls data from SAP to show recommendations and process orders. Suspicious returns are flagged by AI fraud detection, protecting Trendy's profits.

For the backend infrastructure architecture, Node.js APIs link frontend apps to SAP's cloud, while MongoDB handles high-speed data like customer preferences. Hardware like RFID readers and label printers' feeds into SAP, ensuring warehouses and stores stay efficient. This setup lets Trendy focus on growth for scalability, stability and efficiency.

3.0 CONCLUSION

The enterprise architecture framework for Trendy is used as a strategic approach to address operational challenges, including the lack of a centralised system, poor inventory management, and inefficient reverse logistics system. By implementing an enterprise resource planning (ERP) system, an optimized reverse logistics system, and a strengthened inventory management system, Trendy can ensure a seamless integration of business operation and overcome the challenges faced. The five discussion points include operating model, business capabilities, specific business needs, business requirements and business processes enable a structured analysis of how these solutions support the CSVLOD model. This model shows how IT infrastructure and technologies are used so that Trendy can operate the business effectively.

The CSVLOD model plays an important role to structure the implementation of IT systems to address the challenges faced and to achieve the business goals. The model provides guidelines, vision, and a well-defined technology landscape to show how ERP, inventory management system, and reverse logistics system can be implemented to solve the challenges and make the business operation more effectively. Through this structured approach, Trendy can have an idea on how to improve the current IT systems with technologies or implement a new IT system to achieve long-term business growth. Overall, by leveraging an enterprise architecture framework, Trendy can achieve efficient business operations and long-term sustainability by integrating IT infrastructure and systems to align with business goals.

4.0 REFERENCES

Achanta, M. (2024). The Impact of Real - Time Data Processing on Business Decision - making. International Journal of Science and Research (IJSR), 13(7), 400–404. https://doi.org/10.21275/sr24708033511

Acharya, N. (2024, December 11). *How Are Artificial Intelligence & Machine Learning Transforming Reverse Logistics in 2025* . Fulfillment IQ. https://fulfillmentiq.com/ai-machine-learning-revolution-reverse-logistics-2024/

Adel, M. (2012). Business capability and its strategic impacts. Science Engineering Faculty School of Information Systems. https://www.academia.edu/99087314/Business_capability_and_its_strategic_impacts

Alhalboosi, F. H. A., Al-halboosi, I. A. M., & Mawlood, S. J. (2021). Role of ERP Systems in Improving Human Resources Management Processes. Review of International Geographical Education Online, 11(4). https://doi.org/10.48047/rigeo.11.04.155

Ali, M. (2023, October 9). *Sustainable Inventory Management: A Guide for Businesses*. CFBLOG. https://cashflowinventory.com/blog/sustainable-inventory-management/

Ambasht, A. (2023). Real-Time data integration and analytics: Empowering data-driven decision making. International Journal of Computer Trends and Technology, 71(7), 8–14. https://doi.org/10.14445/22312803/IJCTT-V71I7P102

Asha, Malati, Anita, Pravallika, Deepthi, & Ashwini. (2024, May 31). *What is Annual Physical Inventory? (Methods and Procedures)*. Erp-Information.com. https://www.erp-information.com/annual-physical-inventory.html

Barros, M. V., Salvador, R., Francisco do Prado, G., Carlos de Francisco, A., & Piekarski, C. M. (2020). Circular economy as a driver to sustainable businesses. *Cleaner Environmental Systems*, *2*(2), 100006. https://doi.org/10.1016/j.cesys.2020.100006

Baukh, O. (2024, September 11). *How Artificial Intelligence is Revolutionizing the Fashion Industry*. Techpacker Blog. https://techpacker.com/blog/design/how-artificial-intelligence-is-revolutionizing-the-fashion-industry/

Baxter, T. (2024, January 11). *The Hidden Costs of Fragmented Fashion Wholesale Processes*. Joor. https://www.joor.com/insights/the-hidden-costs-of-fragmented-fashion-wholesale-processes#common-challenges-in-fragmented-wholesale-processes

Beheshti, H. M. (2006). What managers should know about ERP/ERP II. Management Research News, 29(4), 184–193. https://doi.org/10.1108/01409170610665040

Bourhis, P., Reutter, J. L., Suarez, F., & Vrgoc, D. (2017). JSON: Data model, Query languages and Schema specification. Proceedings of the 36th ACM SIGMOD-SIGACT-SIGAI Symposium on Principles of Database Systems, 123–135.

Chan, C. W., A/P Ramiah, S., & Razali, N. F. (2023). Inventory Management Systems (IMS). Journal of Applied Technology and Innovation, 7(3), 2600–7304. https://www.researchgate.net/publication/372653862_Inventory_Management_Systems_IMS

Dillard, A. (2024, November 11). *Solving Retail Data Fragmentation: The Key to Consistent Customer Journeys*. Stibo Systems. https://www.stibosystems.com/blog/solving-retail-data-fragmentation-the-key-to-consistent-customer-journeys

Ehsan, A., Abuhaliqa, M. A. M. E., Catal, C., & Mishra, D. (2022). RESTful API Testing Methodologies: Rationale, Challenges, and Solution Directions. Journal of Applied Sciences, 12(9), 4369. https://doi.org/10.3390/app12094369

Ermes, T., & Niemann, W. (2023). Managing omni-channel reverse logistics risk during supply chain disruption recovery in the South African fashion industry. *Journal of Transport & Supply Chain Management*, *17*, 1–14. https://doi.org/10.4102/jtscm.v17i0.932

ERP Implementation Process: Preparation, Configuration, Customizations, and More. (2023, September 13). Facilisgroup. https://facilisgroup.com/erp/erp-implementation-process/

Ghanbari, A. M., & Soleimani, L. (2019, October 30). The Impact of ERP Implementation on Financial Processes: A Case Study. https://www.researchgate.net/publication/336899078_The_Impact_of_ERP_Implementation_on_Financial_Processes_A_Case_Study

Gomez, S. (2025, February 18). *How to create a good return management flow: Steps and tactics*. Outvio. https://outvio.com/blog/returns-management/

Harsha, P., Subramanian, S., Koc, A., Ramakrishna, M., Quanz, B., Shah, D., & Narayanaswami, C. (2023). An Optimistic-Robust Approach for Dynamic Positioning of Omnichannel Inventories. ArXiv.org. https://arxiv.org/abs/2310.12183

Hernandez, J. P. (2023, November 22). The advantages and disadvantages of ERP systems. IBM. https://www.ibm.com/think/insights/enterprise-resource-planning-advantages-disadvantages

Hindarto, D. (2024). Building the Future of the Apparel Industry: The Digital Revolution in Enterprise Architecture. *Sinkron : Jurnal Dan Penelitian Teknik Informatika*, *9*(1), 542–555. https://doi.org/10.33395/sinkron.v9i1.13260

How can you manage customer returns with a CRM tool? (2023, September 22). Linkedin. https://www.linkedin.com/advice/1/how-can-you-manage-customer-returns

Jenkins, A. (2024, October 31). *13 Reverse Logistics Challenges & How to Overcome Them*. Oracle NetSuite. https://www.netsuite.com/portal/resource/articles/inventory-management/reverse-logistics-challenges.shtml

Johnson, S. (2022). CREATING SEAMLESS OMNICHANNEL EXPERIENCES IN ECOMMERCE: BRIDGING ONLINE AND OFFLINE RETAIL. *International Journal of Engineering Management and Economics*, *7*(3), 68–99. https://www.researchgate.net/publication/386463706_CREATING_SEAMLESS_OMNICHANNEL_EXPERIENCES_IN_ECOMMERCE_BRIDGING_ONLINE_AND_OFFLINE_RETAIL

Kado, M. (2024, July 9). Cybersecurity in Inventory Management. Logixsaas Consultancy Limited. https://logixsaas.com/cybersecurity-in-inventory-management-protecting-your-data-and-systems/

Kelle, P., & Akbulut, A. (2005). The role of ERP tools in supply chain information sharing, cooperation, and cost optimization. International Journal of Production Economics, 93-94, 41–52. https://doi.org/10.1016/j.ijpe.2004.06.004

Kent, S., & Crump, H. (2019, July 1). *Inside H&M's $4 Billion Inventory Challenge*. The Business of Fashion. https://www.businessoffashion.com/case-studies/news-analysis/hm-inventory-retail-supply-chain/

Kotusev, S. (2017). The Relationship Between Enterprise Architecture Artifacts. https://kotusev.com/The%20Relationship%20Between%20Enterprise%20Architecture%20Artifacts.pdf

Luke, T. (2024, August 26). *The Advantages and Disadvantages of Reverse Logistics*. Dropoff. https://www.dropoff.com/blog/advantages-and-disadvantages-of-reverse-logistics/

Lysenko-Ryba, K. (2017, January). The Impact of Reverse Logistics on Customers Satisfaction. ResearchGate. https://www.researchgate.net/publication/321724743_The_Impact_of_Reverse_Logistics_on_Customers_Satisfaction

Madamidola, O., Daramola, O., Akintola, K., & Adeboje, O. (2024). A Review of Existing Inventory Management Systems. International Journal of Research in Engineering and Science, 12(9), 40–50. https://www.researchgate.net/publication/383947700_A_Review_of_Existing_Inventory_Management_Systems

Martins Ajaero, T. (n.d.). Advantages and Disadvantages of Inventory Management. ProfitableVenture. https://www.profitableventure.com/advantages-disadvantages-inventory-management/

Mínguez, J. (2012). A Service-oriented Integration Platform for Flexible Information Provisioning in the Real-time Factory. https://www2.informatik.uni-stuttgart.de/bibliothek/ftp/ncstrl.ustuttgart_fi/DIS-2012-04/DIS-2012-04.pdf

Mirrorsize. (2024, October 3). *How AI is Slashing Fashion Ecommerce Returns by 60%: The Secret to Happier Shoppers and Higher Profits*. Mirrorsize.com. https://www.mirrorsize.com/blogs/reduce-e-commerce-returns-in-fashion-industry-with-ai

Patel, J. (2019). Bridging Data Silos Using Big Data Integration. International Journal of Database Management Systems, 11(3), 01–06. https://doi.org/10.5121/ijdms.2019.11301

Pereira, M. M., & Frazzon, E. M. (2020). A data-driven approach to adaptive synchronization of demand and supply in omni-channel retail supply chains. *International Journal of Information Management*, *57*(1), 102165. https://doi.org/10.1016/j.ijinfomgt.2020.102165

Pontius, N. (2025, February 15). What is an Inventory Management System? Definition of Inventory Management Systems, Benefits, Best Practices & More. Camcode. https://www.camcode.com/blog/what-is-an-inventory-management-system/

Ramirez, J. P. (2023, June 23). What is SKU? A Guide to Organized Inventory. AutoStore. https://www.autostoresystem.com/insights/what-is-sku-a-guide-to-organizing-inventory

SAP. (n.d.). Managing customer returns. SAP Learning. https://learning.sap.com/learning-journeys/exploring-functions-and-innovations-in-sap-s-4hana-sales/managing-customer-returns_f224d287-07ad-41fe-9897-2eb2ee4b33dc

SAP. (n.d.). What Is ERP | Enterprise Resource Planning Definition | SAP Insights. SAP. https://www.sap.com/sea/products/erp/what-is-erp.html\

SAP. (n.d.). SAP Integrated Business Planning (IBP). https://www.sap.com/australia/products/scm/integrated-business-planning.html

Sharma, A. (n.d.). Apache Kafka. The truth is the log (R. Gómez, Ed.). Https://Cs.ulb.ac.be/Public/_media/Teaching/Infoh415/Student_projects/2019/Kafka.pdf.

Shopify. (2023, December 8). Stock Replenishment Methods: How to Replenish Inventory - Shopify Malaysia. Shopify. https://www.shopify.com/my/retail/stock-replenishment

Signifyd. (n.d.). Signifyd: Guaranteed fraud protection for ecommerce. BigCommerce Apps. https://www.bigcommerce.com/apps/signifyd/

Sureka, G., Bandara, Y. M., & Wickramarachchi, D. (2018). Factors Affecting the Efficiency and Effectiveness of Reverse Logistics Process. *Journal of International Logistics and Trade*, *16*(2), 74–87. https://doi.org/10.24006/jilt.2018.16.2.74

Timurs, H., Authours, U., Göransson, S., Jönsson, A., & Persson, M. (2007). *Extreme Business-Models in the Clothing Industry -A Case Study of H&M and*. https://www.diva-portal.org/smash/get/diva2:230949/FULLTEXT01.pdf

Unhelkar, B., Joshi, S., Sharma, M., Prakash, S., Mani, A. K., & Prasad, M. (2022). Enhancing supply chain performance using RFID technology and decision support systems in the industry 4.0–A systematic literature review. International Journal of Information Management Data Insights, 2(2). sciencedirect. https://doi.org/10.1016/j.jjimei.2022.100084

Wahab, S., Tan, A., & Roche, O. (2023). Comparison of Cross-Border Reverse Logistics of a Fast Fashion Brand in China. *Operations and Supply Chain Management: An International Journal*, *16*(1), 25–35. https://doi.org/10.31387/oscm0520370

White, S. K. (2022, November 23). *What is enterprise architecture? A framework for transformation*. CIO. https://www.cio.com/article/222421/what-is-enterprise-architecture-a-framework-for-transformation.html

Zainal, F., Baharudin, H., & Khalid, A. (2024). Artificial Intelligence in Reverse Logistics forE-Commerce: Streamlining Returns Processing and Ensuring Supply Chain Efficiency. International Journal of Social Analytics, 09(11). https://norislab.com/index.php/ijsa/article/view/105/99

Zainal, F., Baharudin, H., Khalid, A., Karim, N. H., & Mustapha, L. (2019). Applying Artificial Intelligence in E-Commerce Reverse Logistics: Enhancing Returns Management, Supply Chain Efficiency, and Sustainability Through Advanced Technologies. International Journal of Social Analytics. https://www.researchgate.net/publication/386869122_Applying_Artificial_Intelligence_in_E-Commerce_Reverse_Logistics_Enhancing_Returns_Management_Supply_Chain_Efficiency_and_Sustainability_Through_Advanced_Technologies