Business Process Modeling And Annotation

Khraim Fashion

Order-to-cash
including
Purchase-to-order Subprocess

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Introduction:

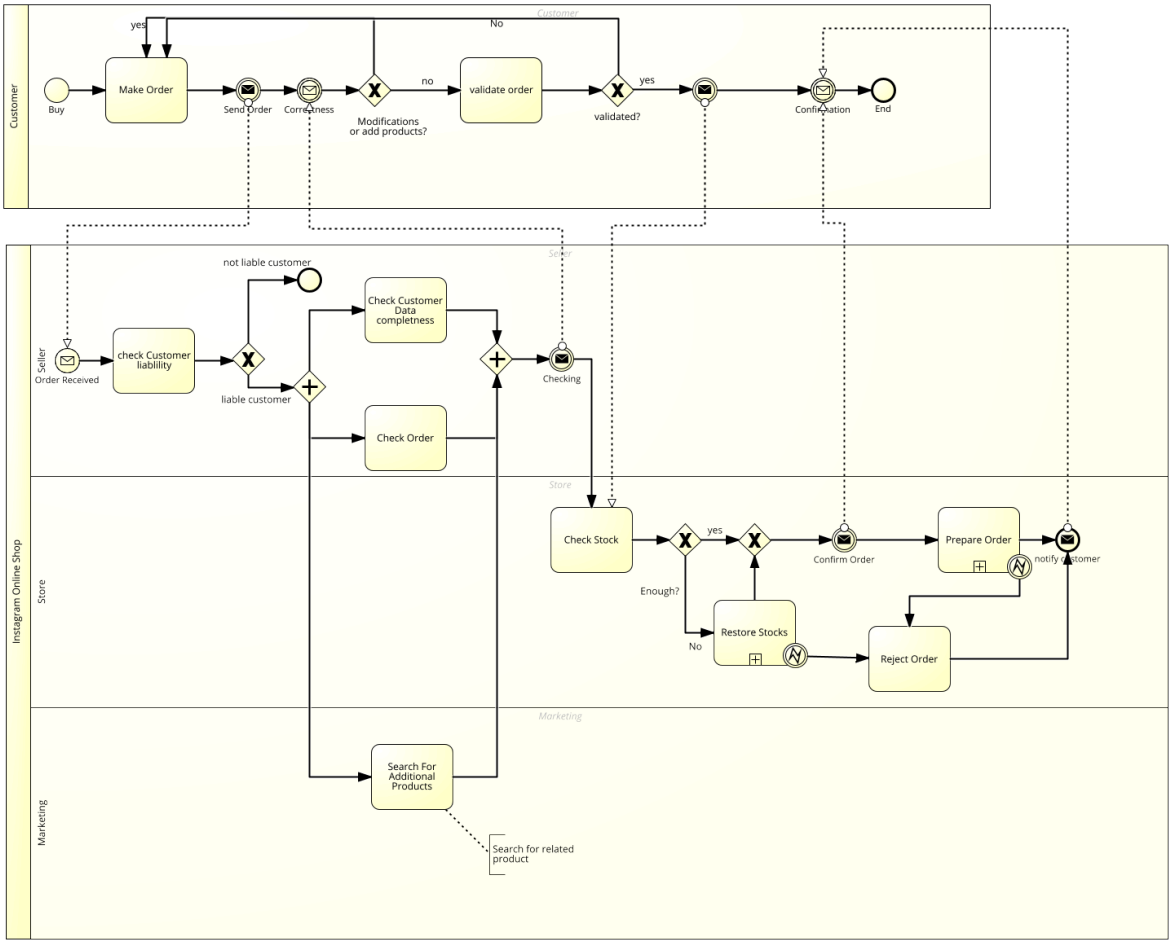
Khraim Fashion, a distinguished name in the apparel industry, specializes in the design, and retail of contemporary clothing. With a robust supply chain and distribution network, the company has established a significant presence in the market, catering to a diverse clientele looking for quality and style. In this document we present a comprehensive analysis of Khraim Fashion's current order-to-cash processes, critically evaluating the efficiency and effectiveness of these operations. In this report, we undertake a systematic examination of the existing business processes at Khraim Fashion using Business Process Modeling Notation (BPMN).
This approach will allow us to visualize and understand the workflows in detail, helping identify potential bottlenecks, inefficiencies, and areas ripe for enhancement.
The report includes both qualitative and quantitative analyses:

1. Qualitative Analysis - We employ value-added and waste analysis techniques to scrutinize each step of the order-to-cash process, from order initiation to fulfillment and billing. This analysis helps in pinpointing non-value-adding activities that contribute to delays or increased costs.

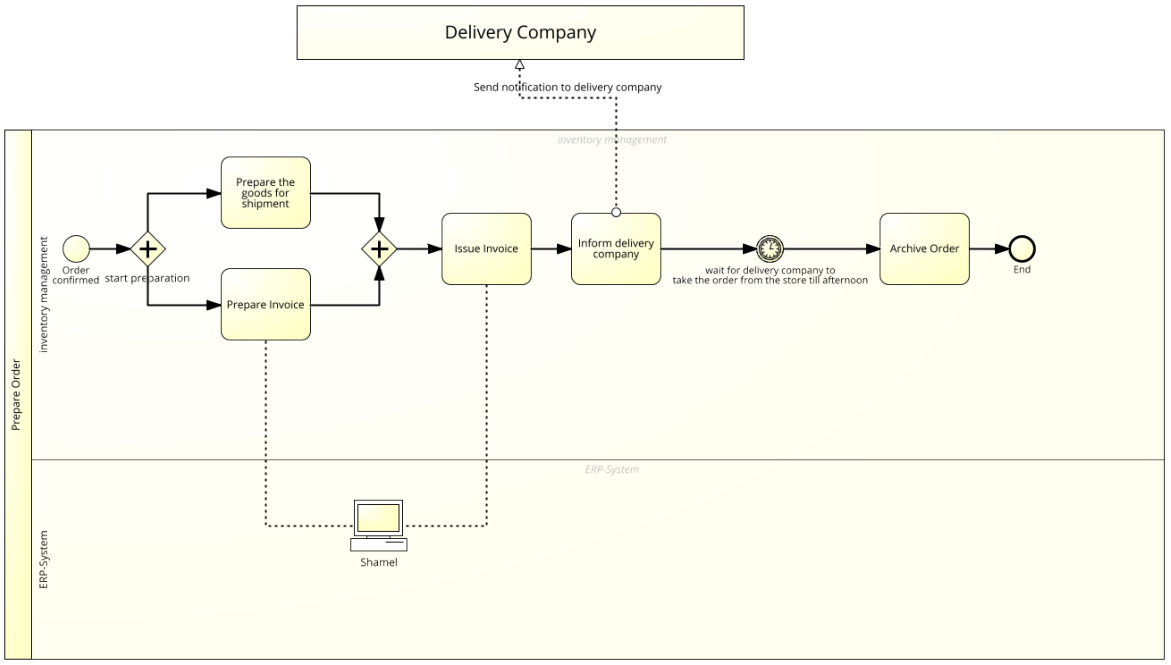
2. Quantitative Analysis - Using queuing theory and flow analysis, we will measure the performance metrics such as cycle times and processing times, providing a numerical basis to assess the efficiency of the current processes. Following the analysis, the report will propose a redesign of the business processes. This redesign, aimed at transformational improvement, will involve the development of to-be process models that integrate best practices and modern technologies. The proposed models will focus on enhancing the agility and responsiveness of Khraim Fashion's operations, improving customer satisfaction, and reducing operational costs. Additionally, the report will explore the integration of advanced IT solutions to automate and streamline processes. By reducing manual interventions, these technological enhancements will not only speed up the order-to-cash cycle but also reduce the likelihood of errors and inconsistencies. The outcome of this project will be a robust, efficient, and customer-centric order management system that aligns with the strategic goals of Khraim Fashion, ensuring the company remains competitive and continues to grow in a dynamic market environment.

Discovery Process -BPMN (Business Process Modelling & Annotation)
As-Is Process Model

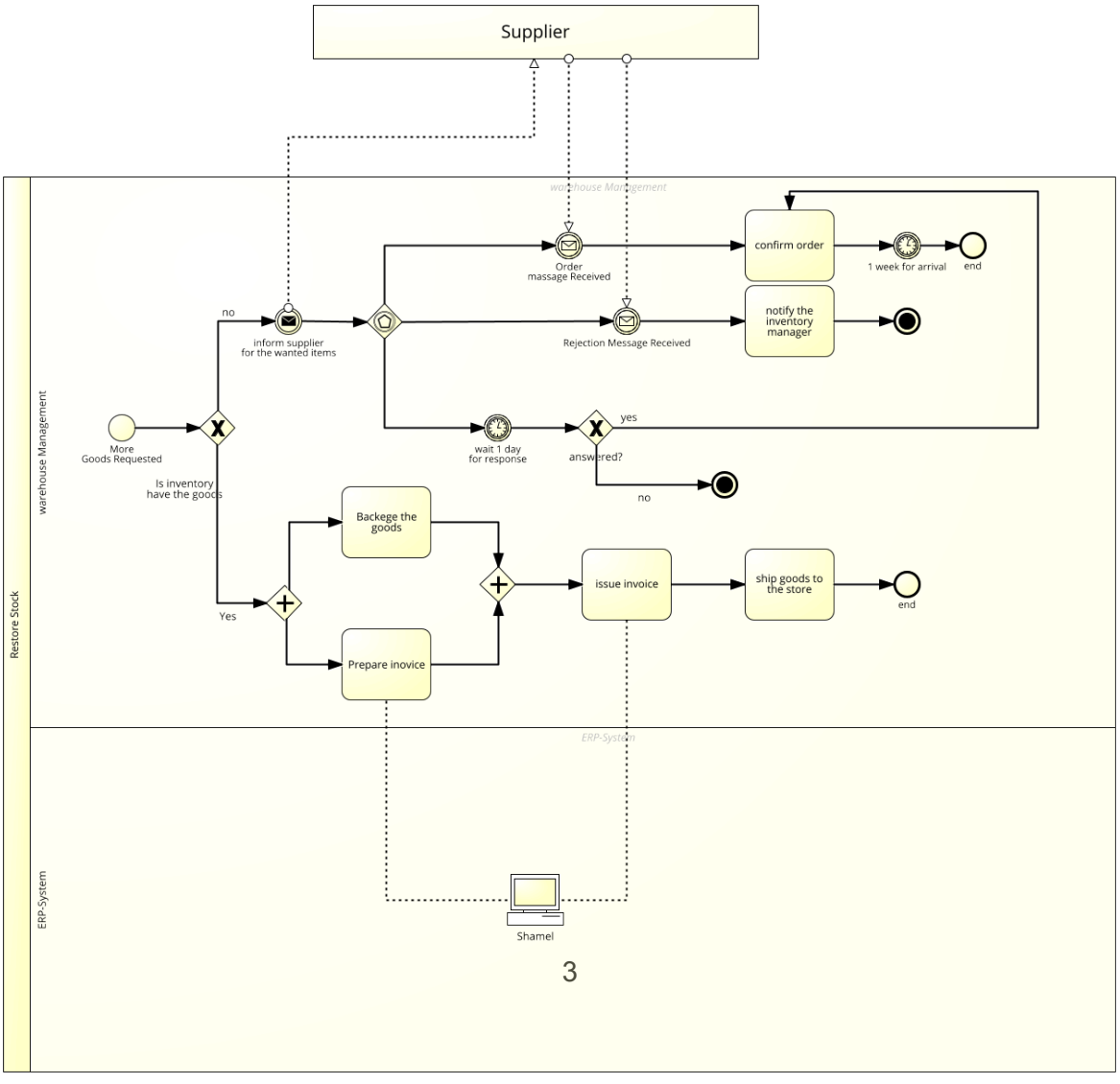
Khraim Fashion Order To Cash As-Is:



Prepare Order Subprocess As-Is:



Restore stock Subprocess As-Is (Purchase To Order):



Analysis Process- Qualitative Analysis - Value-Added & Waste Analysis insight on weakness and their impact

Value Added and Business Value Added

Task :**Make Order**

Steps	Classification
Customers choose products through the Instagram store.	VA
Customer send the Instagram store page about this product needed	VA

Task :**Send Order**

Steps	Classification
Verify order details	BVA
Send order confirmation to customer	VA
Send order details to seller team	BVA

Task :**check Customer liability**

Steps	Classification
Retrieve customer history	BVA
Verify Account Authenticity	VA
Retrieve customer information	BVA

Task : **Search For Additional Products**

Steps	Classification
Identify missing or unavailable products	VA
Find Related Products and Present	VA
The marketing focuses on creating visually appealing displays that align with seasonal trends.	BVA

Task : **Check Customer Data Completeness**

Steps	Classification
Verify completeness of customer data	BVA
Redundant rechecks (Over-Processing).	NVA

Task: **Checking Order:**

Steps	Classification
Receive order details	BVA
Review order for accuracy	VA
Approve order for processing	BVA

Task :**Order Validation:**

Steps	Classification
Receive order details	BVA
Verify product availability	VA
notify order status	BVA

Task : **Checking Stock Availability**

Steps	Classification
Retrieve current stock levels	VA
Check Item Availability	VA
inform Customer if Item is Available	VA

Task: **Confirming Order**

Steps	Classification
Receive order details	BVA
Confirm order details with customer	VA

Task: **Restore Stock**

Steps	Classification
Identify stock shortages	(BVA)
communicating with the supplier what need goods	BVA
Place order for additional stock	BVA
Receive order message from supplier.	BVA
Confirm order with the supplier.	VA
Receive goods from supplier	BVA
Prepare an invoice and issue invoice	BVA
Ship Goods to the Store	VA

Task: **Preparing Order**

Steps	Classification
Retrieve order details	BVA
Order Submitted successfully	VA(supplier)
Prepare goods for shipment	VA(Customer)
Prepare Invoice and Issue invoice	BVA
Send notification to delivery company	BVA
inform delivery company ready for collection or deliver at due date from customer address	VA(Supplier)

Task: **Archive Order**

Steps	Classification
Ensure order fulfillment is complete	BVA
Update order status in the system	VA

Task **:Reject Order**

Steps	Classification
Identify issues with the order	BVA
Notify customer of order rejection	VA
Record reason for rejection	BVA

Non Value Added Analysis

Steps	Classification
validate order for condition correct if excessive validation	NVA
Resend order confirmation	NVA
Receive rejected products	NVA
Check data customer if incorrect	NVA
Check Order if the order over check and result incorrect and reject	NVA
Check the stock and result find and exist in stock (checking inventory itself)	NVA
Waiting much time for preparing order	NVA
Reject Order and Cancel	NVA
Search for Additional Products if unnecessary	NVA
waiting product to arrive from suppliers if not enough in the stock	NVA
Confirm order with supplier.	NVA
Wait for 1 week for goods to arrive	NVA
Receive rejection message from supplier	NVA
Receive goods and proceed to packaging	NVA

Waset Analysis

1. Move-Transportation:

- Sending order details from the customer to the seller.
- Forwarding order confirmations back to the customer.
- Transferring order details between different departments.
- Sending stock request details from the store to the supplier.

2. Move-Motion:

- Employees move between departments to handle orders and validations.
- Physical movement is required to check stock levels manually in the warehouse.

3. Hold-Waiting:

- Customer waiting for order validation and confirmation.
- Waiting for stock availability before confirming the order.
- Waiting for goods to arrive from the supplier to restock inventory.

4. Hold-Inventory:

- Insufficient stock leads to delays and an inability to fulfill orders promptly.

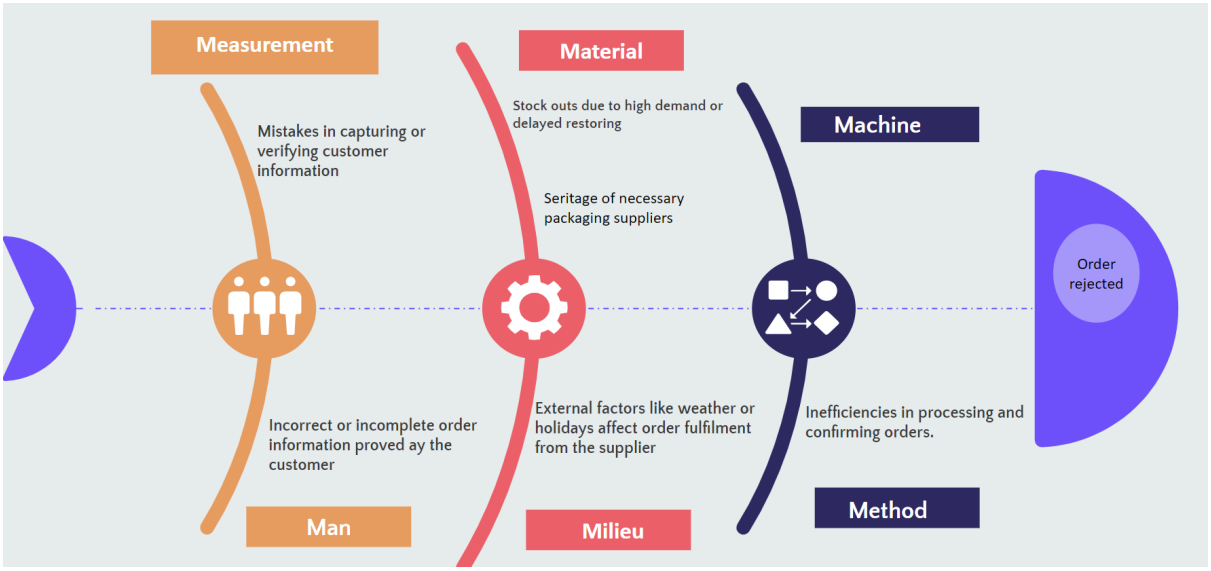
5. Over-do-Over-Processing:

- Double-checking customer data when initial checks were sufficient.

6. Over-do-Defects:

- An error may occur when we prepare an order.

Cause-effect (Fishbone) diagram:



Analysis Process- Quantitative Analysis

Flow analysis

Task name	Cycle time	Processing time
Customer Makes Order	5 minutes	2 minutes
Order Sent for Validation	1 minutes	1 minutes
Order Validation	5 minutes	1 minutes
Order Confirmation	1 minutes	1 minutes
Check Customer Liability	6 minutes	3 minutes
Check Customer Data	5 minutes	3 minutes
Check Order Details	60 minutes	30 minutes
Check Stock Availability	20 minutes	10 minutes
Order Confirmation to Customer	1 minute	1 minute
Notification to Customer about Order Status	1 minute	1 minute
Search for Additional Products (Marketing)	5 minutes	5 minutes
Stock Replenishment (if needed)	8 days	15 minutes
Is inventory have the goods?	1 minute	1 minute
Inform supplier for the wanted items	5 minutes	5 minutes
Order message received	1 minute	1 minute
Rejection message received	1 minute	1 minute
Wait 1 day for response	1 day	0
Check if answered	1 minute	1 minute
Confirm order	1 minute	1 minute
Notify the inventory manager	2 minute	1 minute

1 week for arrival	7 days	0 minutes
package the goods	70 minutes	60 minutes
Prepare invoice	20 minutes	15 minutes
Issue invoice	4 minutes	2 minutes
Ship goods to the store	40 day	30 minutes
Order Preparation	20 minutes	15 minutes
Order Confirmed / Start Preparation	10 minutes	5 minutes
Prepare the Goods for Shipment	25 minutes	15 minutes
Prepare Invoice	15 minutes	7 minutes
Issue Invoice	3 minutes	1 minutes
Inform Delivery Company	5 minutes	5 minutes
Wait for Delivery Company to Take the Order	8 hours	0
Archive Order	5 minutes	2 minutes

Main process cycle time

- **Process Time Calculation**
  - **CustomerLiability** = 0.7 * Max(3,30,5) = 21
  - **Customer Not Liability** = 0.30 * 0 = 0
  - **ModificationAndAddProdctifnoEdit (No/Yes)** = 0.80 * (ValidateOrder = 1) + 0.20 * (MakeOrder =2) = 1.2
  - **Validate(Yes/No)** = 0.20 * (MakeOrder=2) + 0.80 * (CheckStock=10) = 8.4
  - **Prepare Order Process time** = Max(15,7) + 1 + 3+ 420 + 2 = 441
  - **Restore Stock Process time** = 0.30 * (.60 * 5+.10 * 1+.30 * 7day) + .5/.50
  - **PT=** (MakeOrder = 2)+(CheckCustomerLiability =3)+(CustomerLiability=21)+CustomerNo Liabili+ModificationAndAddProdctifnoEdit(No/Yes)+Validate(Yes/No)+0.70*(Prepare Order PT)+0.30*(Restorestok)+(RejectOrder=1)= **6 hours**

- **Cycle Time Calculation:**
  - **CustomerLiability** = 0.70*Max(5,60,10)
  - **Customer Not Liability** = (0.30*0)
  - **ModificationAndAddProdctifnoEdit(No/Yes)** = 0.80*(ValidateOrder=5)+0.20*(MakeOrder=6)
  - **Validate(Yes/No)** = 0.20*(MakeOrder=5)+0.80*(CheckStock=20)
  - **Prepare Order Process time** = Max(25,15)+3+6+480+5)
  - **Restore Stock Process time** = 0.70*(max(20,70)+4+40)+0.30*(.60*10+.10*2+.30*480)+10/.50
  - **CT =** (MakeOrder=5)+(CheckCustomerLiability=6)+(CustomerLiability)+CustomerNo Liabili+ModificationAndAddProdctifnoEdit(No/Yes)+Validate(Yes/No)+0.70*(Prepare Order PT)+0.30*(Restorestok)+(RejectOrder=1)=**8 hours ⅓ day**
  - **Cycle Time Efficiency (CTE)=(PT= 6 hours)/ (CT= ⅓ day)=77.66%**

So, the process time is approximately 364.824, the cycle time is approximately 469.504, and the cycle time efficiency is approximately 77.66%.

if you know that your arrival rate is 17 new orders per day and your cycle time is 2 days, then the average WIP would be:(**λ = 2.18 Order per hour)**

WIP(work in progress)= λ ×CT

WIP = 2.18×8

WIP = 18 Order

Queueing System Analysis Using Omni Calculator

Understanding these dynamics helps make informed decisions on how to manage resources and potential expansions. Using calculations to determine the impact of changes in arrival rates or the number of servers provides analytical insights, allowing for an assessment of whether increasing resources will achieve the desired balance between cost and efficiency.

- Calculating the Arrival Rate (λ) for the Company "Daily Order Arrival Rate":
    - Represents the average number of orders arriving at the system each hour.
    - In our company, we receive between 15 to 20 orders per day, with 8 working hours per day.
    - Thus, the hourly arrival rate (λ\lambdaλ) is calculated as:
    - (λ) arrival rate = Number of daily orders / Number of working hours
    - Average daily orders in the company: 15 to 20 orders per day, averaging at 20+15 / 2 = 17.5 orders per day
    - Therefore, the (λ) arrival rate = 17.5 orders per day / 8 working hours = 2.18 orders per hour.

$$\lambda = 2.18$$

- Calculating the Service Rate (μ) mu for the Company:
    - Indicates the number of orders that an employee can process per hour. In our company, each employee can handle 3 orders per hour.

$$\mu=3$$

- Calculating the Number of Servers (S) in the Company:
    - Indicates the number of employees available to work. In our company, there are 1 to 2 employees processing the orders.

$$S=1 \text{ or } S=2$$

Numerical Analysis and Results:

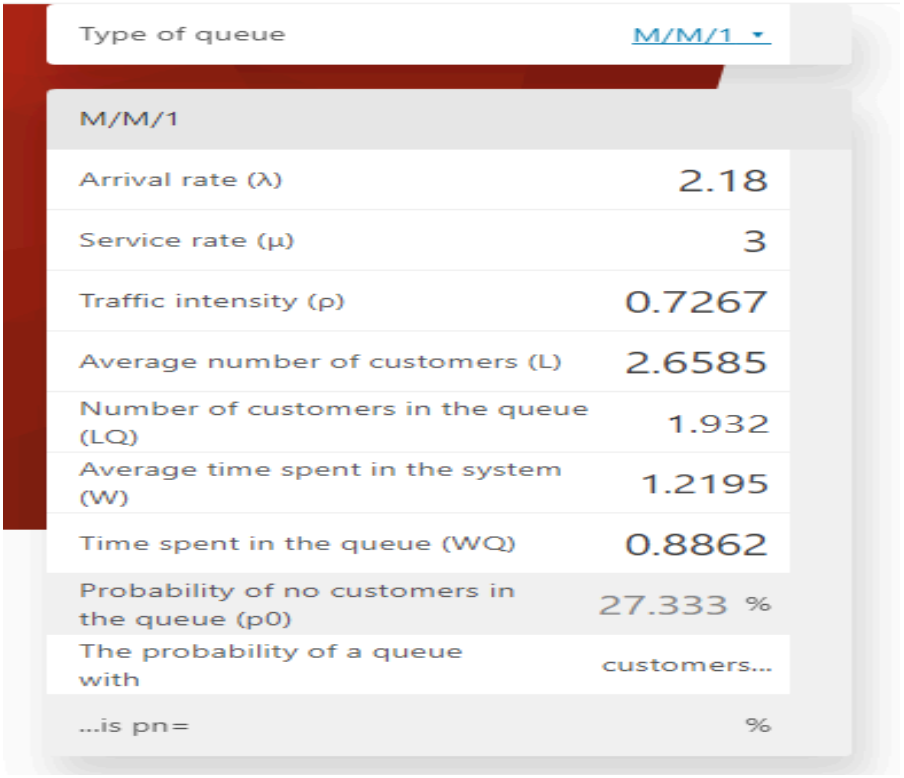
Applying calculations using the Omni Calculator site:-

We have two scenarios for analysis:

- Scenario with one employee
- Scenario with two employees

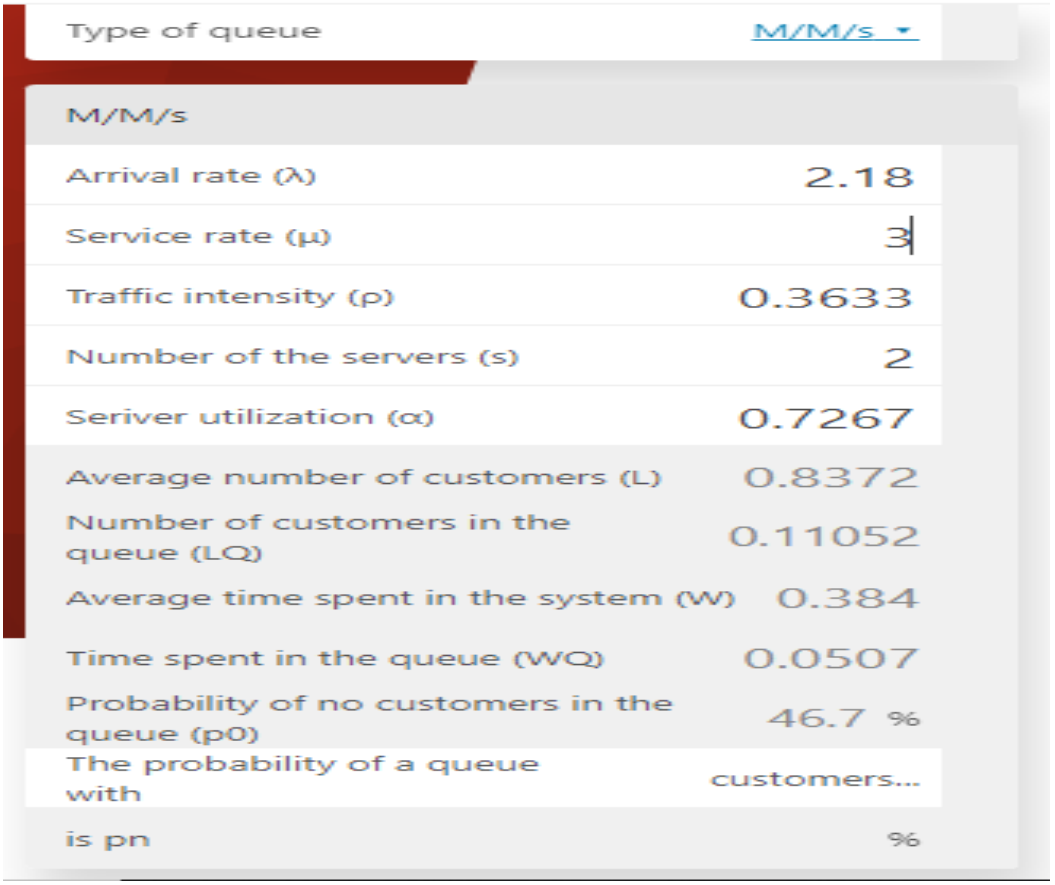
Application on the Program:

- **Scenario 1: With 1 employee (S=1)**



Type of queue	M/M/1
M/M/1	
Arrival rate (λ)	2.18
Service rate (μ)	3
Traffic intensity (ρ)	0.7267
Average number of customers (L)	2.6585
Number of customers in the queue (LQ)	1.932
Average time spent in the system (W)	1.2195
Time spent in the queue (WQ)	0.8862
Probability of no customers in the queue (p0)	27.333 %
The probability of a queue with	customers...
...is pn=	%

- **Scenario 2: With 2 employee (S=2)**

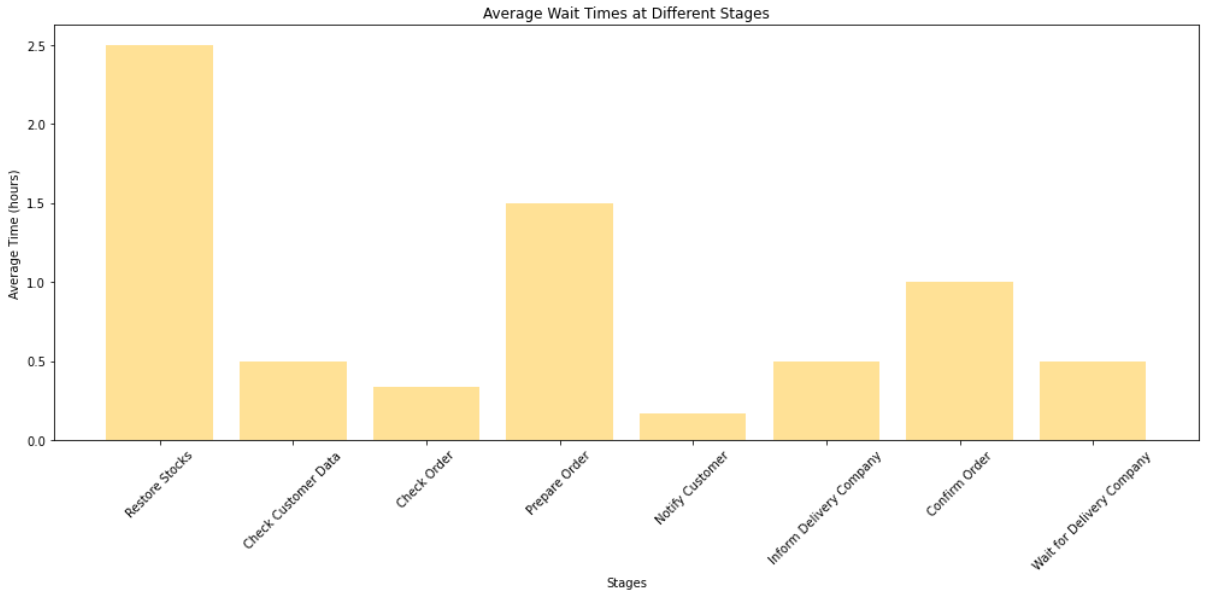


Type of queue	M/M/s
M/M/s	
Arrival rate (λ)	2.18
Service rate (μ)	3
Traffic intensity (ρ)	0.3633
Number of the servers (s)	2
Seriver utilization (α)	0.7267
Average number of customers (L)	0.8372
Number of customers in the queue (LQ)	0.11052
Average time spent in the system (W)	0.384
Time spent in the queue (WQ)	0.0507
Probability of no customers in the queue (p0)	46.7 %
The probability of a queue with	customers...
is pn	%

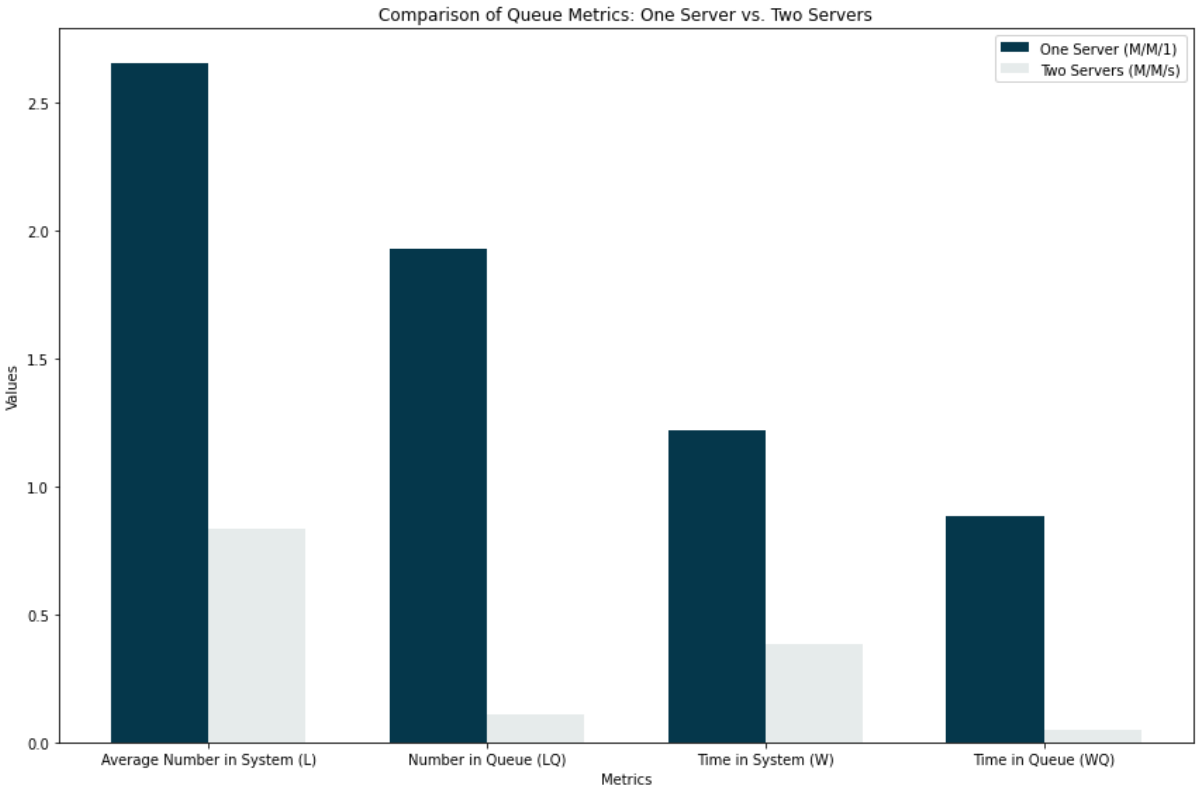
Charts

Charts are not just visual tools; they are quantitative representations that allow for a deep understanding of the effects of changes in the system and how to plan better for the future based on accurate data.

- The graph displays the actual average wait times for this stage of the process.



The following chart shows the differences between using one employee and two employees to process requests in a company using the M/M/1 and M/M/s queueing models.



The chart shows the differences between using one employee and two employees in processing requests in terms of several key measures:

- Average number of customers in the system (L): Using two employees greatly reduces the number of customers in the system at any time, showing improved system efficiency.
- Number of customers in the queue (LQ): It shows a significant improvement in the number of customers waiting in the queue, as using two employees greatly reduces this number.
- Average time a customer spends in the system (W): The chart shows that the time customers spend in the system decreases significantly when using two employees, enhancing service speed.
- Time a customer spends in the queue (WQ): As expected, the waiting time in the queue decreases significantly when two employees are used instead of one.

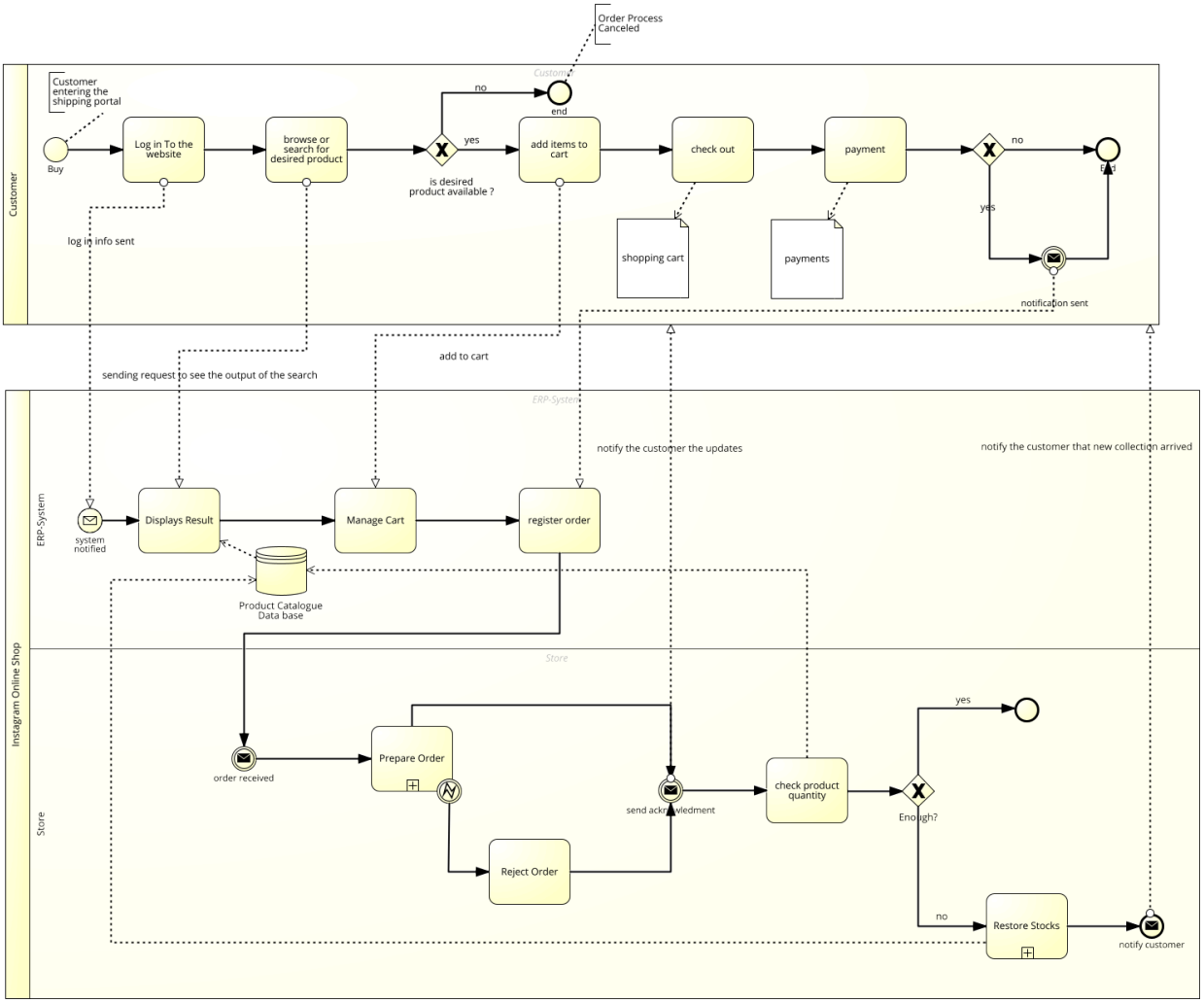
Color explanation:

- light Blue: represents values for the scenario using one employee (M/M/1).
- Dark Blue: represents values for the scenario using two employees (M/M/s).

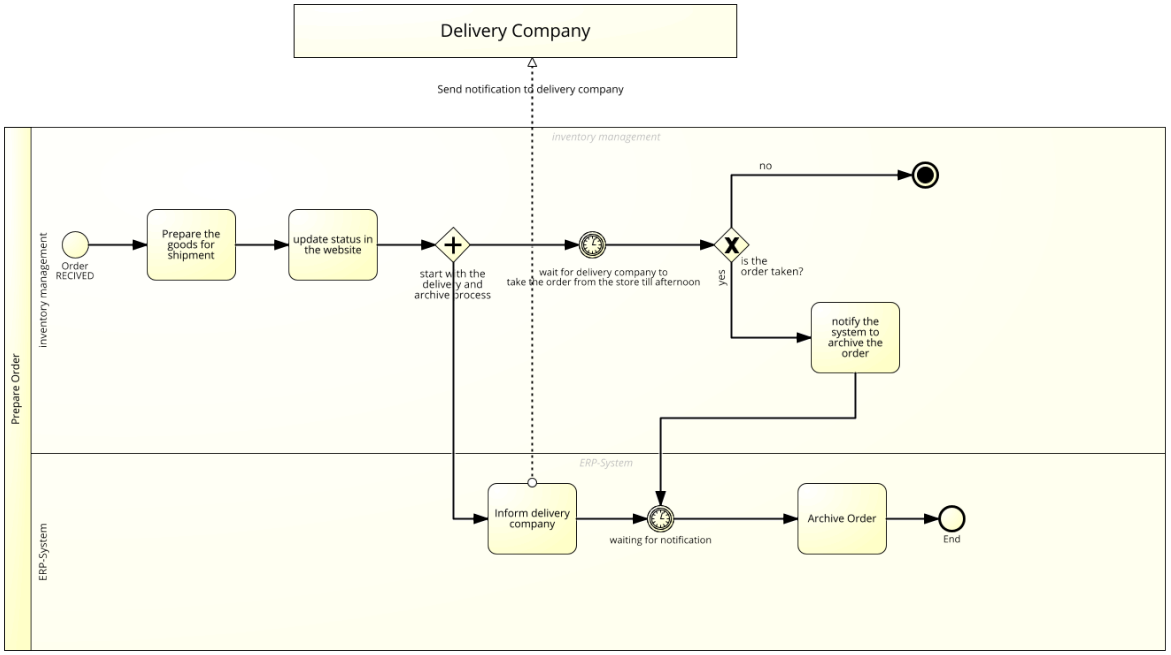
Conclusion: The chart clearly shows the benefit of increasing the number of employees in improving the efficiency of the request processing system. Reducing congestion and increasing efficiency greatly improve customer experience and reduce employee burdens, enhancing the overall productivity of the company.

Redesign Process -Transformational Redesign To-be process model :

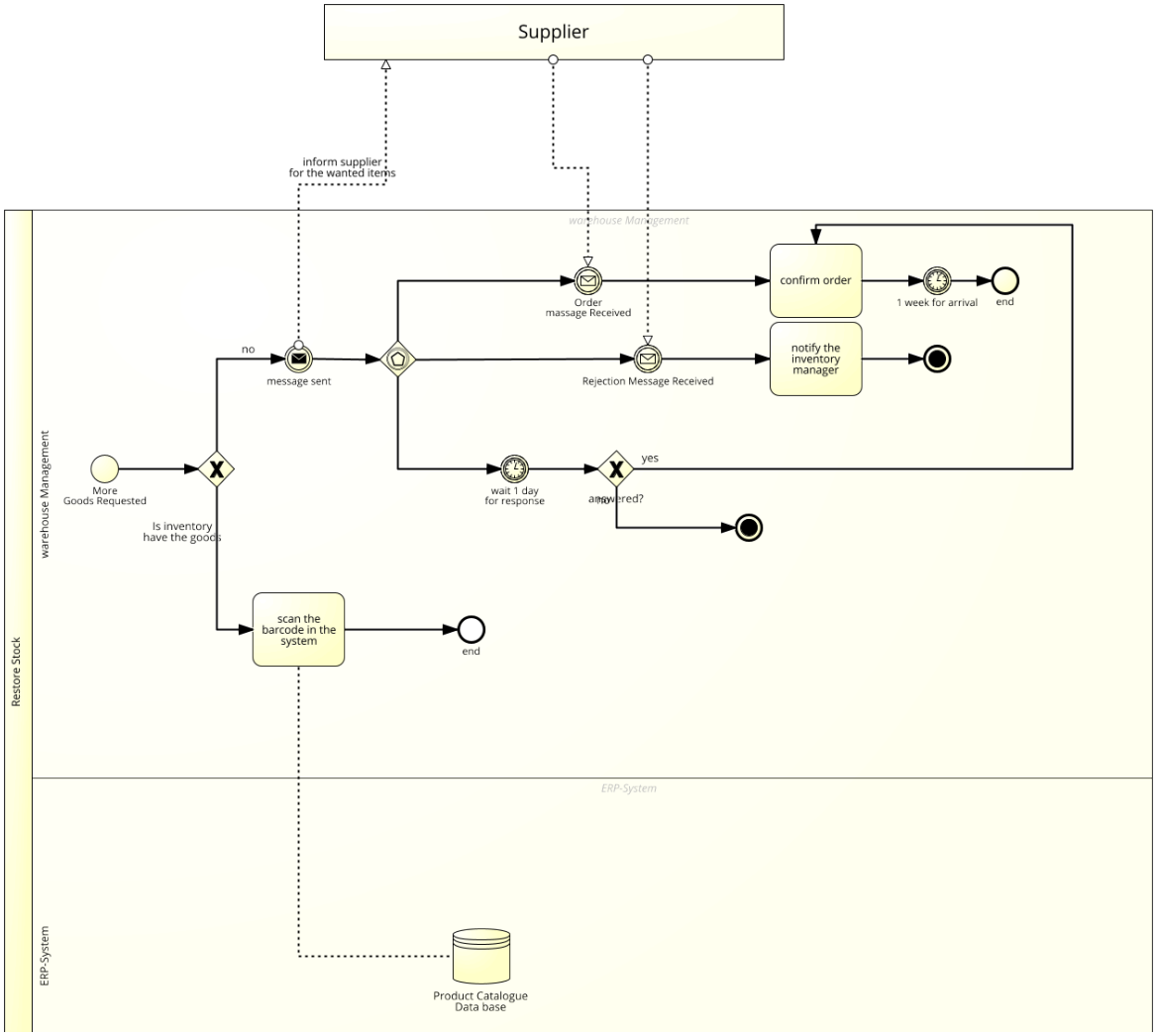
Khraim Fashion Order To Cash To-be:



Prepare Order Subprocess To-be:



Restock Subprocess To-be (Purchase To Order):



Process Measures (Cost ,Quality ,Time and Flexibility) :

Cost

- **Reduced Costs:**

  - **Task Elimination:** Automation of tasks such as order validation, order confirmation, and stock checking reduces labor costs by minimizing manual interventions.
  - **Task Composition:** Combining tasks reduces the number of handovers and the associated administrative costs.
  - **IT Investment:** There may be an initial increase in cost due to investments in automation technology and systems integration, but these costs are expected to be offset by long-term savings.

Quality

- **Improved Quality:**

  - **Automated Validation:** Automated systems reduce the likelihood of errors in order processing and stock management, leading to higher accuracy and fewer defects.
  - **Consistent Processes:** Standardized automated processes ensure consistent quality and reduce variability in the output.
  - **Customer Satisfaction:**Faster and more accurate processing improves customer satisfaction by reducing errors and delays.

Time

- **Reduced Cycle Time:**

  - **Task Elimination:** Automation of order entry, validation, and confirmation speeds up the process significantly.
  - **Task Composition:** Combining related tasks reduces the time required for transitions between different process steps.
  - **Parallel Processing:** Tasks such as customer liability checks and order validation can occur simultaneously, further reducing overall processing time.

Flexibility

- Increased Flexibility:

- Automated Systems: Automation allows for easier adjustments and scalability in response to changes in demand or process requirements.

- Integrated Systems: Seamless integration between ERP, store, and delivery systems enhances the ability to adapt to changes quickly.

-Reduced Human Dependency: Less reliance on manual processes increases the ability to handle a higher volume of transactions without additional staffing.

References:

PowerPoint