NOVA IMS Information Management School

HOME BURGER

ORDER TO CASH BUSINESS PROCESS HOME BURGER

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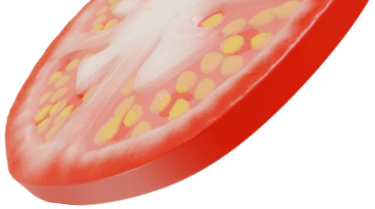

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0. Executive Summary

The objective of this project is to analyze and optimize the Order-to-Cash (O2C) process for Home Burger, a leading burger delivery company in Portugal. Improving **customer satisfaction,** solve **process inefficiencies**, and boosting **overall operational performance** are the objectives.

Using **Business Process Management (BPM) methodologies**, this study identified **crucial pain points**, including resource imbalances, high courier utilization, and process inefficiencies. For **process mapping and modelling**, advanced tools such as **Bizagi Modeler** were used, enabling a comprehensive **AS-IS analysis** and the construction of an optimized **TO-BE model.**

To streamline and automate processes while integrating inventory and order management systems, **Shopify Plus** was employed, as part of the optimization process. Roles were realigned to **balance resource utilization**, and outdated web-based ordering was replaced with a mobile app and self-service kiosks. These changes eliminated redundant tasks and significantly shortened cycle times.

With a **12% increase** in successfully **completed orders** and a **45% reduction** in the **average order cycle time**, the redesign is projected to drive a **19% revenue growth.** The financial analysis revealed a **236.3% Return On Investment (ROI)** within the **first year**, guaranteeing profitability and long-term sustainability.

By **modernizing** its Order-to-Cash process, Home Burger is well positioned to **maintain growth and successfully compete** in the dynamic **meal delivery market.**

Keywords: Order-to-Cash (O2C), Business Process Management (BPM), food delivery industry.

1. Introduction

This report aims to identify and redesign some of the pitfalls in the business process of the Home Burger Company. Several types of processes are considered, such as Quote-to-Order, which involves purchasing products from suppliers; Procure-to-Pay, which handles office material procurement; and Issue-to-Resolution, used for solving various problems. Among these, the focus is on the Order-to-Cash (O2C) process.First, we model the Order-to-Cash process, split it into core business processes of the Home Burger company, and link the organization with its customers. After this, we will conduct both qualitative and quantitative analyses, applying methods such as the Value-Adding Analysis and the Issue Register Method, in combination with simulations. During the simulation, we will test several hypotheses by changing various parameters and assumptions to consider different scenarios.

Finally, the last step is a redesign of the model through the use of heuristics in an attempt to enhance the efficiency of the original model, for four major variables: Cost, Flexibility, Quality, and Time. Multiple models are created to realize the best model. For example, after redesigning, further quantitative analysis will be made through simulations to verify if the processes redesigned have indeed given better results than originally mapped.
Our tool for modelling and analysing in this research is Bizagi Modeler, including BPMN for getting our results.

2. The Background

Home Burger is a novel service company, which was founded in Portugal in 2016 focusing on burger delivery, and has now grown to become one of the major services in the burger delivery market in that country. Its first outlet opened in late 2016 in Lisbon. Since then the company has expanded its business to: Porto, Santarém, Portimão, and two other outlets in the metropolitan area of Lisboa, hence a total of six.

HOME BURGER

Figure 1 - HomeBurger Logo

The company currently has a workforce of over **100 employees**, including kitchen and delivery staff, middle and top managers, as well as accounting and legal support teams. Home Burger offers three options for placing an order: by phone, online through its website, or at the nearest store. The company recognizes the need to **streamline its internal processes** for **greater efficiency**, especially given the heightened competition in the food delivery industry due to the COVID-19 pandemic.

This project aims to comprehend, structure, evaluate, and improve the O**rder-to-Cash (O2C) process** in the **Lisbon Central store**, one of its high-sales and high-order-volume locations. In this context, the O2C process encompasses receiving an order, delivering it, and processing payment, which are critical for both customer satisfaction and business operations. To achieve this, the company has engaged consultants to implement the phases of the Business Process Management (BPM) lifecycle as outlined by Dumas et al. (2013). This lifecycle includes the following stages: Process Identification, Process Discovery (AS-IS modeling), Process Analysis, Process Redesign (TO-BE modeling), Process Implementation, and Process Monitoring and Control.

Initially, the focus will be on AS-IS modeling to identify current practices, their strengths, and weaknesses. Improvements will then be proposed to reduce service costs and enhance customer satisfaction. This research is essential for Home Burger to sustain its market position and remain competitive in an increasingly saturated market.

3. Process Identification

In this section, we outline the steps taken to identify and categorize the O2C process at the Lisbon Center store. By recognizing distinct case types, defining business functions, and mapping the process architecture, we establish a structured understanding of the current workflow.

We first start by recognizing case types: The Home Burger order-to-cash (O2C) process can be initiated through three distinct channels:

- Phone Orders: Customers call the store to place their orders.
- Website Orders: Orders are placed through the company's online platform.
- In-Store Orders: Customers place orders in person at the store.

Then we identify **business functions:**

- Order Registration: Capturing and verifying order details.
- Preparation: Cooking the food and ensuring quality control.
- Packaging: Adding necessary items like napkins and cutlery.
- Delivery or Takeaway: Coordinating couriers for delivery or preparing orders for in-store pick-up.
- Payment and Completion: Receiving payments and completing the order process.

First level:

- General Process *(Figure 1)*

Second level:

- Register order by phone
- Register order by website
- Register order in-store
- Takeaway
- Prepare order
- Pack orders
- Deliver order

Third level:

- Order fulfillment

4. Process Discovery

Process Discovery is the **"act of gathering information about an existing process and organizing it in terms of an AS-IS process model".**

For this project, we employed the **Evidence-Based Discovery method** as the primary approach to process discovery. This method involves analysing existing documentation and records to construct a detailed understanding of the current (AS-IS) process. Given the availability of comprehensive documentation outlining Home Burger's order-to-cash (O2C) process, this approach enabled us to extract accurate and objective insights efficiently. Using this information, we employed Bizagi Modeler to visually represent the AS-IS process in a structured and standardized format.

Level 1 - Order to cash

Our general process, or the first level of the process, can be seen in the image below. The six levels that comprise our model are explained in the paragraphs that follow.

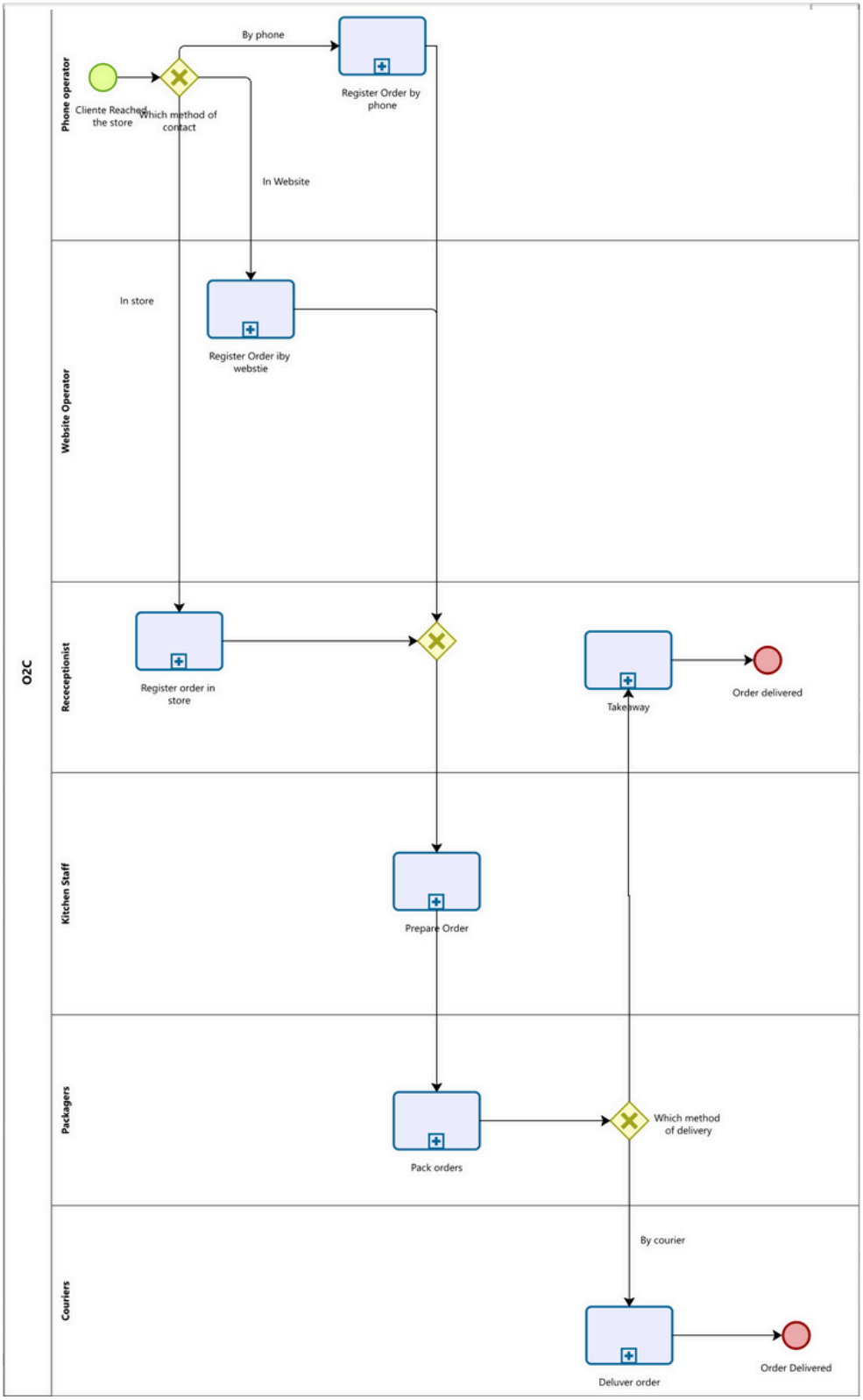

Figure 2 - AS-IS General Process

The process begins when a customer contacts the store to place an order, which can be done via phone, the website, or in person. Based on the contact method, a specific employee manages the customer's request: the Phone Operator registers orders placed by phone, the Website Operator processes online orders, and the Receptionist handles in-store orders. A decision gateway determines the order channel and routes it to the appropriate actor for processing.

Once the order is registered, it is passed on to the Kitchen Staff, who prepare the food. This stage is very important for ensuring quality and efficiency once any delays or errors during preparation can significantly impact further steps.

After preparation, the food is handed off to the Packagers, who are responsible for properly packaging the order to ensure it is ready for either delivery or takeaway. This step guarantees the order is appropriately packed for its final journey to the customer.

At this point, a decision gateway determines the delivery method. Customers can opt for Takeaway, where they pick up the order directly at the store, or Delivery, where the order is entrusted to the Courier, who completes the process by delivering it to the customer's specified location.

The process concludes when the order is either delivered to the customer or picked up in-store, successfully fulfilling the customer’s request.

Level 2 - Register Order By Phone

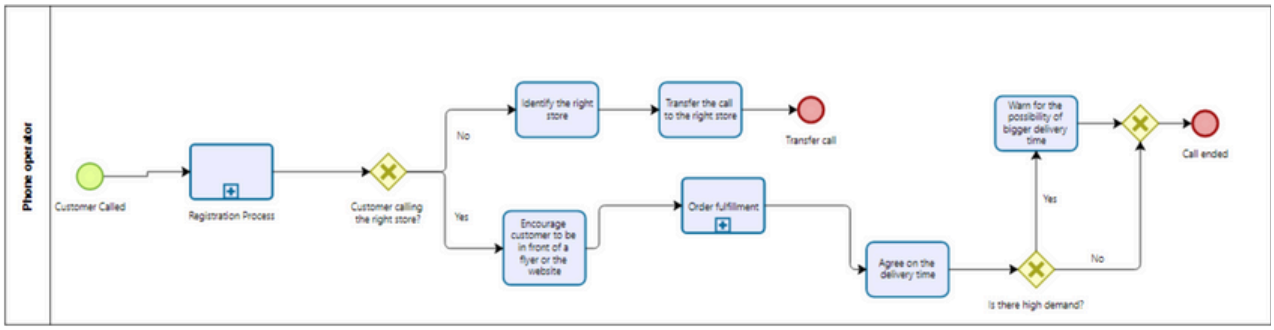

Figure 3- Register Order by Phone

This process begins when a customer places a call to the store. The Phone Operator initiates the *Registration Process*, ensuring the order details are properly logged. The first decision gateway checks if the customer is calling the correct store.

- If No, the operator identifies the correct store and transfers the call, ending their involvement.
- If Yes, the operator encourages the customer to have a flyer or website in front of them to confirm product and order details.

Once confirmed, the process advances to *Order Fulfillment*, where the delivery details are arranged. A critical step is agreeing on the delivery time, which ensures the customer is informed and expectations are aligned.

At this point, another decision gateway assesses whether there is high demand:

- If Yes, the customer is warned about the possibility of longer delivery times.
- If No, the order proceeds without delay.

The process concludes when the call ends, marking the completion of the phone-based order placement. This model emphasizes efficiency in verifying customer details and managing expectations during peak demand.

Level 2 - Register order in store

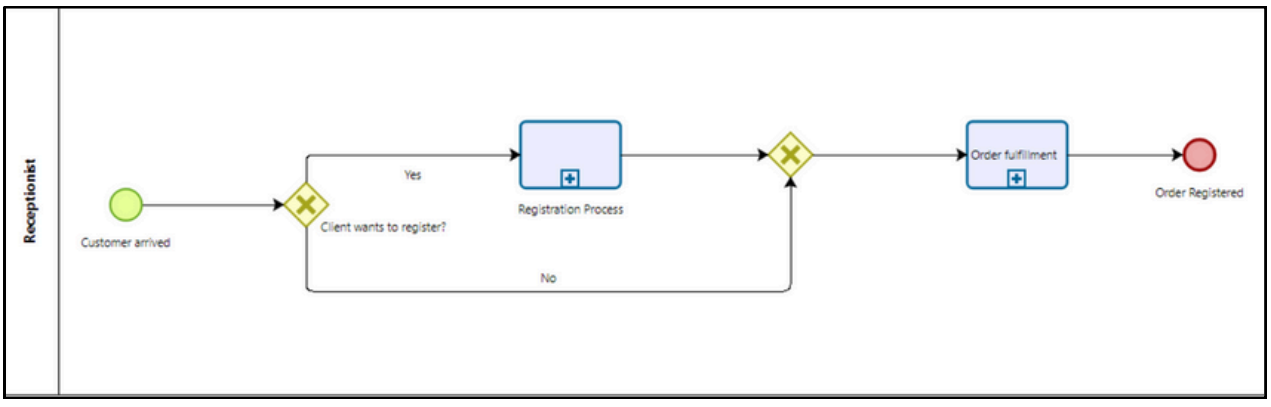

Figure 4 - Register order in store

The "Level 2 - Register Order in Store" process begins, the initial event, when a customer arrives at the store reception. Following this, there is a decision gateway to check if the customer wants to register ("Client wants to register?"). If the customer wants to register, the process moves to the "Registration process", where the receptionist records the customer's details in the system. If the customer does not wish to register, the process goes directly to the order fulfillment phase ("Order Fulfillment"), where the order details are organized and prepared for execution. The process concludes with registering the order ("Order Registered").

Level 2 - Register order by website

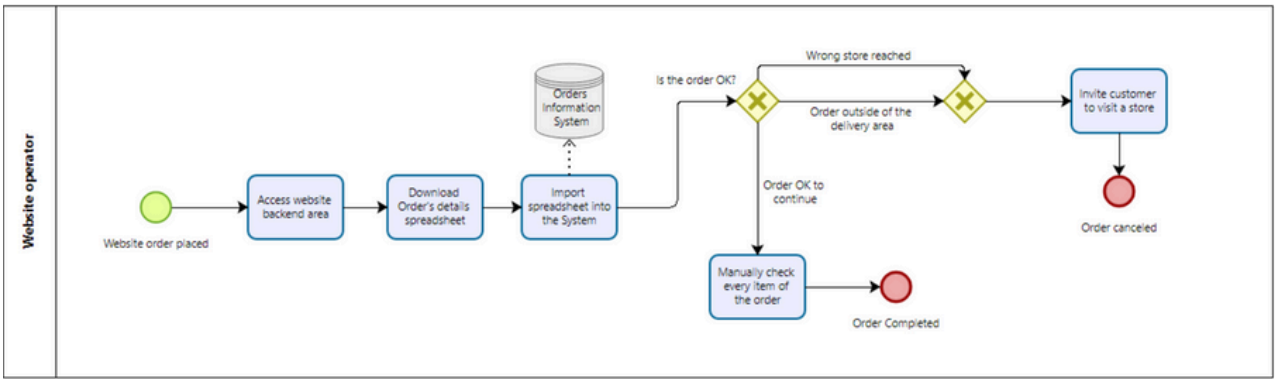

Figure 5 - Register order by website

The process begins when a customer places an order on the website, after which the responsible employee accesses the website's backend to retrieve the order details. These details are exported as a spreadsheet and subsequently imported into the Orders Information System, where the order is registered for tracking and further processing.
At this point, the system evaluates whether the order is acceptable. If the order meets all criteria, it proceeds to a manual check of each item to ensure accuracy, and upon successful verification, the order is marked as completed.
If the order is not acceptable, a further check is performed to determine if it falls outside the delivery area. For orders outside the delivery area, the customer is invited to visit a store, and the order is canceled. If the delivery area issue is resolved or does not exist, the process continues as usual. Ultimately, the process ensures that all orders are either fulfilled accurately or canceled when necessary.

Level 3 - Registration process

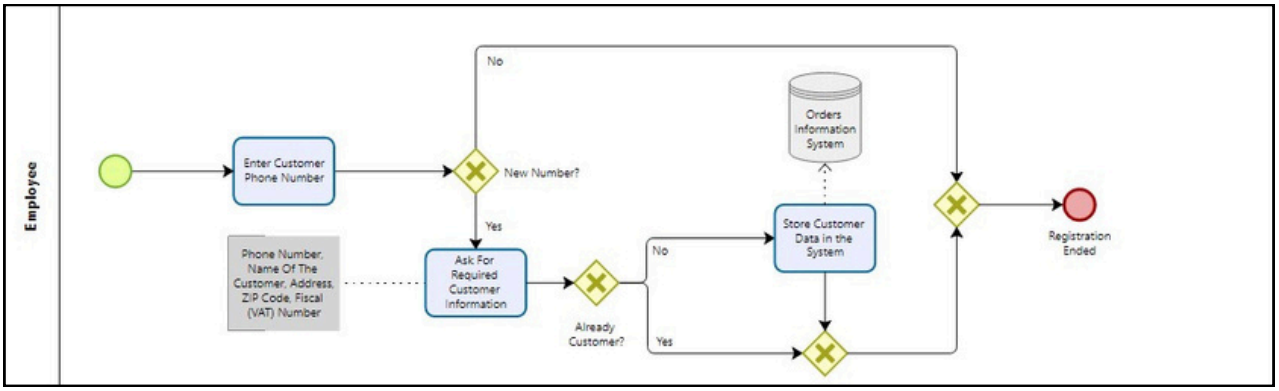

Figure 6 - Registration Process

The "Level 3 - Registration Process" starts when a new customer makes an order by phone/in store and wants to be registered.
The employee starts by entering the customer's phone number into the system, proceeding to check if the phone number is already associated with an existing customer record (New Number?).

- If Yes, the customer provides their personal information (Phone Number, ...)
- If No, the system retrieves the customer details fromthe database and the process ends, as the customer is already registered.

As we've referred before, after the confirmation that is a new number and the gathering of the information, there's another gateway: if its a new customer:

- If No, the customer data is stored in system.
- If Yes, the registration process ends.

After the storage of the customer data, the registration process ends. This ensures that the system accurately distinguishes new customers from existing ones, streamlining the registration process.

Level 3 - Order Fullfilment

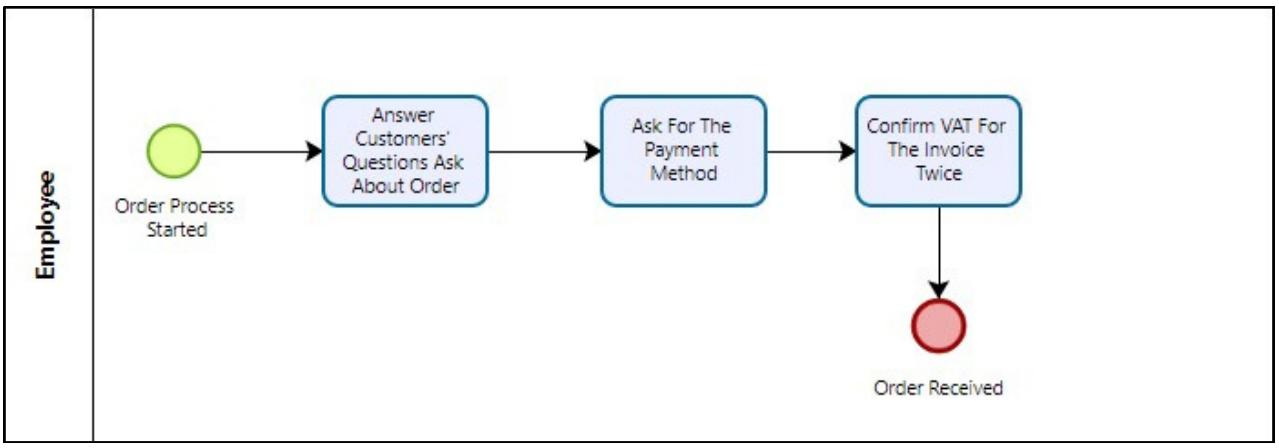

Figure 7- Order Fullfilment

The "Level 3 - Order Fullfilment" happens in both orders by phone and in-store.
It begins when a customer places an order, attended by the employee. Then, the employee answers the customer's questions - if there are any - ensuring that the client has all the necessaary information. After this, proceeds to the preferred payment method, confirming the VAT number for the Invoice twice. The VAT is confimed twice, to ensure accuracy, miniziming errors and ensuring compliance with tax regulations. The process is complete when all details are confirmed by the employee and the order is marked as received in the system.

Level 2 - Prepare Order

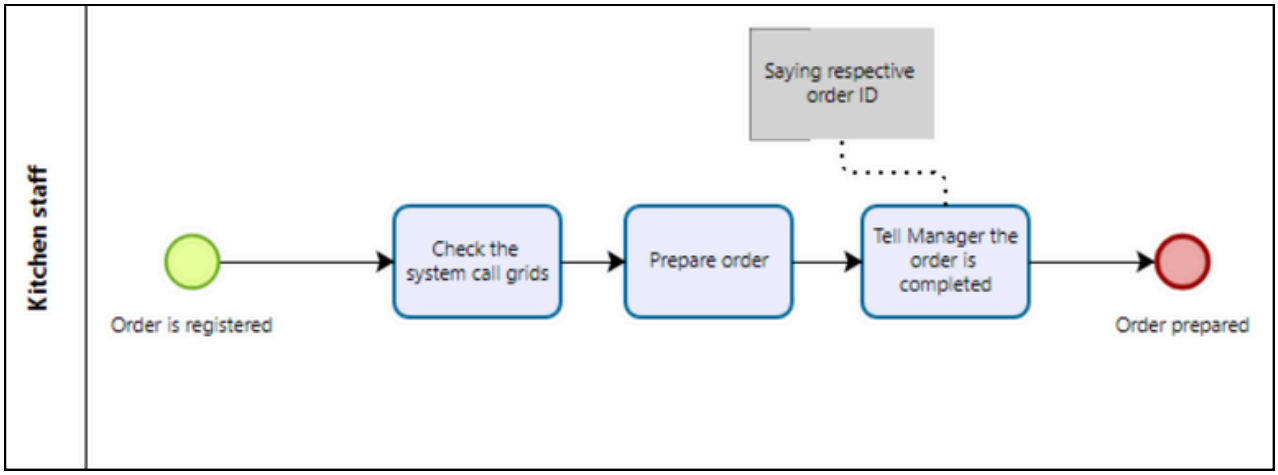

Figure 8- Prepare order

The "Prepare Order" subprocess is triggered immediately after an order is registered, regardless of the customer's chosen contact channel. The steps of the process begin when an order is registered into the system and sent to the kitchen staff. The staff then accesses the system to verify the order details on the call grids, ensuring that all requested items are correct. Once verified, the kitchen team begins preparing the order, following the specifications provided to ensure quality and accuracy.
After completing the preparation, the kitchen staff informs the manager that the order is ready. The subprocess concludes when the order is officially marked as "prepared," indicating that it is ready for packaging or delivery.
This stage is crucial as it connects the registration phase with the packaging and delivery steps, ensuring efficiency and minimizing delays that could affect customer satisfaction.

Level 2 - Order Packing

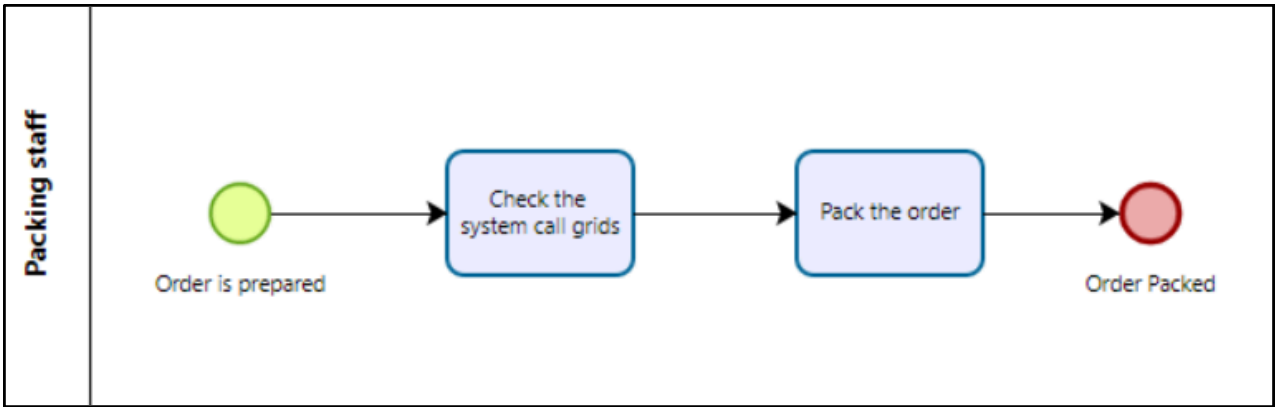

Figure 9- Order Packing

The "Pack Orders" subprocess is triggered immediately after the "Prepare Order" stage, once the kitchen staff has completed preparing the food. At this point, the order is given to the packing staff to ensure it is properly prepared for the next steps in the process.
The packing staff begins by accessing the system to review the order details on the call grids or lists. This verification step ensures that all items in the order are correct and that any special instructions or requirements are addressed. This is a critical step to avoid mistakes during the packing phase, which could lead to delays or customer dssatisfaction.
Once the order details are confirmed, the packing team carefully organizes and packages the items. Proper packaging ensures that the order is secure and maintains its quality during delivery or pickup. The packing process adheres to quality standards to enhance the customer's experience and satisfaction.
The subprocess concludes when the order is fully packed and marked as "Order Packed" in the system. This signifies that the order is ready to move to the next stage—either Delivery or Takeaway—depending on the customer's choice.

Level 2 - Takeaway

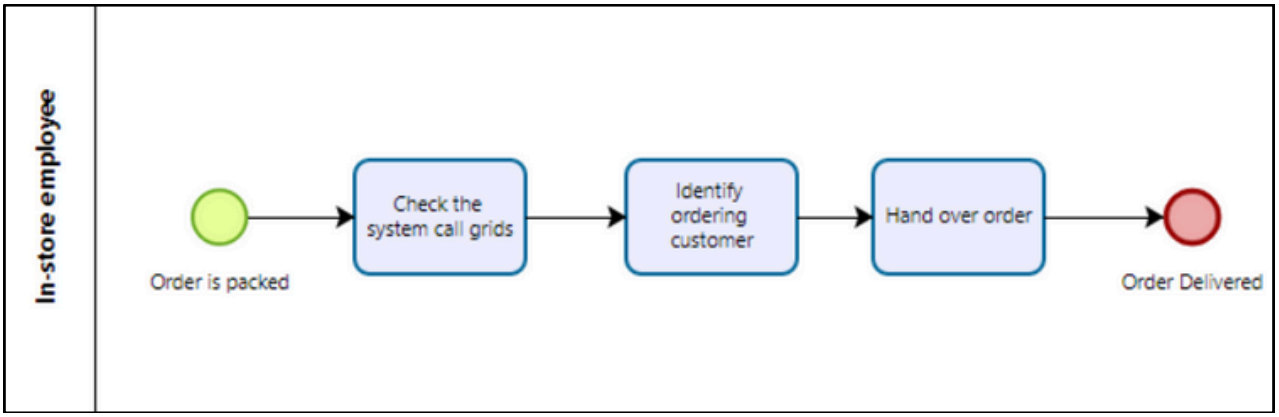

Figure 10- Takeaway

The Takeaway subprocess is triggered immediately after the decision gateway "Which Method of Delivery," once the order is marked as **"Order is Packed"** and ready for pickup. At this point, the customer will pick up their order directly from the store.
The store employee begins by confirming that the delivery method is Takeaway after the decision gateway. This confirmation ensures that the order will be picked up in-store by the customer, rather than being delivered by a courier.
The employee then accesses the system to check the customer's order details, **'Check the system call grids'** such as the order number and any additional relevant information, like the estimated arrival time.
After this , the employee confirms the customer's identity by verifying it with the order details **' Identify ordering customer'**. This verification step is crucial to avoid handing the wrong order to the wrong customer.
Once the customer's identity is confirmed, the employee hands over the order directly to them in the store **'Hand over order'**.
The subprocess concludes when the order is successfully delivered to the customer, and the system records that the Takeaway process is complete.

Level 2 - Deliver Order

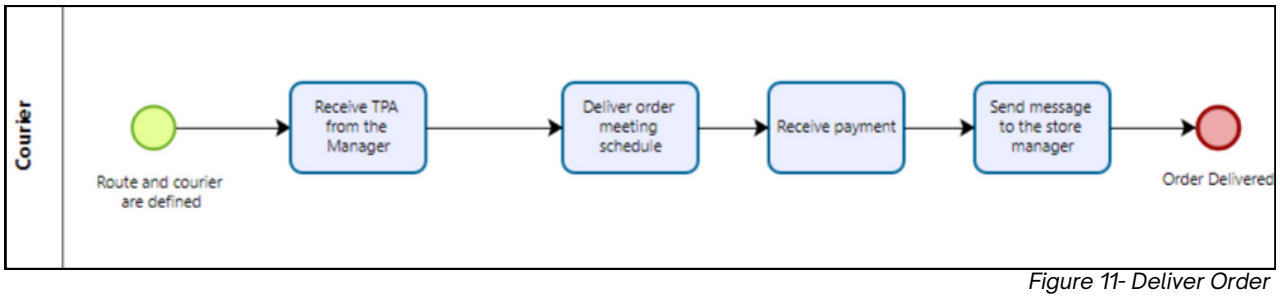

Figure 11- Deliver Order

The Order Delivery subprocess begins once the route and courier are defined. This subprocess ensures that the delivery of the order is carried out efficiently and accurately.
The courier starts by receiving the terminal de pagamento automático (TPA) from the manager. This step is crucial as it equips the courier with the necessary device to process payments upon delivery.
Next, the courier proceeds to deliver the order according to the predefined schedule. This step is essential for meeting customer expectations and ensuring timely delivery.
Upon arrival at the customer's location, the courier receives payment for the order. This includes processing the payment using the TPA device received earlier. After successfully receiving the payment, the courier sends a confirmation message to the store manager, indicating that the order has been delivered and payment has been received.

The subprocess concludes when the order is successfully delivered to the customer, and the system records that the delivery process is complete.

5.Qualitative analysis

In this section, we will conduct a qualitative analysis of the AS-IS order-to-cash (O2C) process in order to identify inefficiencies, bottlenecks, and areas for improvement. The analysis will focus on understanding the process's current state by decomposing its tasks and steps to classify them as value-adding (VA), business value-adding (BVA), or non-value-adding (NVA). This will help us pinpoint tasks that directly enhance customer satisfaction, those necessary for operational efficiency, and those that contribute no value and should be minimized or eliminated.

5.1. Value Added analysis

Subprocess	Performer	Step	Classification
Order fullfillment	Employee	Answer any question the customer ask about order	VA
		Answer any question the customer ask about order	VA
		Confirm VAT for the invoice twice	NVA
Registration Process	Employee	Enter Customer Phone Number	BVA
		Ask for Required Customer Information	VA
		Store Customer Data in the System	BVA

Subprocess	Performer	Step	Classification
Order by phone	Phone operator	Identify the Right Store	BVA
		Transfer the Call to the Right Store:	VA
		Encourage Customer to Be in Front of a Flyer or the Website	NVA
		Agree on the Delivery Time	VA
		Warn for the Possibility of Bigger Delivery Time	BVA
Order by website	Website operator	Access website backend area	NVA
		Download order's details spreadsheet	BVA
		Invite customer to visit a store	NVA
		Manually check every item of the order	BVA
Order Preparation	Kitchen staff	Check the system call grids	BVA
		Prepare order	VA
		Tell manager the order is completed	NVA
Order Packing	Packagers	Check the system call grids	BVA
		Pack the order	VA

Subprocess	Performer	Step	Classification
Deliver Order	Courrier	Receive TPA from the manager	BVA
		Deliver order meeting schedule	VA
		Receive payment	BVA
		Send message to the store manager	NVA
Takeaway	Recepcionist	Check the system call grids	BVA
		Identify ordering customer	VA
		Hand over order	VA

Figure 12- Value added analysis

5.2. Waste analysis

Now we will procede with a waste analysis. This approach allow us to have a **contrasting perspective** to Value-Added Analysis by examining process steps from a **negative standpoint**. The primary goal is to identify **waste occurring** within or between the steps. Waste is categorized into three main groups: **Move, Hold,** and **Overdo**, each with distinct sub-types.

Move waste relates to unnecessary movements within the process. Sub-types include **Transportation**, which involves sending or receiving materials or documents (physical or electronic) as inputs or outputs of process activities, and **Motion**, which refers to the internal movement of resources, more prevalent in manufacturing than in service processes.

Hold waste arises from delays or items being idle within the process. It includes **Inventory,** representing materials or Work-In-Process (WIP), and **Waiting**, which involves tasks waiting for materials, input data, or resources, as well as resources waiting for work.

Overdo waste stems from activities exceeding what is necessary to deliver value. Sub-types include **Defects**, which require corrections or compensations for errors and involve rework loops; **Overprocessing**, where unnecessary tasks or perfectionism do not contribute to the process outcome; and **Overproduction**, where excessive process instances produce outcomes that fail to add value.

	Move		Hold		Overdo			
Activity	Transportation	Motion	Inventory	Waiting	Defects	Overprocessing	Over-production	Explanation
Confirm VAT for the Invoice Twice						X		Redundant validation of VAT adds no value
Identify the Right Store						X		Compensatory action for an error
Transfer the Call to the Right Store							X	An extra step only necessary because earlier steps weren't efficient
Encourage Customer to Use Flyer/Website						X		Adds an unnecessary burden on the customer during the ordering process.
Download Order Details Spreadsheet		X						Manual downloading is time-consuming
Import spreadsheet into the system		X						Manual data import is inefficient

	Move		Hold		Overdo			
Activity	Transportation	Motion	Inventory	Waiting	Defects	Overprocessing	Over-production	Explanation
Manually Check Every Item of the Order						X		Manual verification is error-prone and time-consuming
Tell manager the order is completed		X						Adds unnecessary communication
Receive TPA from the Manager		X						Adds unnecessary task
Couriers Returning for Missing Items					X			Leads to inefficiencies, delays, and potential discounts or losses.

Figure 13 - Waste analysis

5.3. Issue Register

The issue register is developed as an ordered structure, where weaknesses detected in the processes of the burger store are organized and ranked in terms of their severity. It helps the company assess the qualitative and quantitative impact of systematic problems that arise with the normal functioning of the production . This order of priorities not only brings out the areas that require urgent attention but also gives direction on how to optimize the processes to improve customer service and reduce wastage of resources.

Issue	Priority	Description	Data and Assumptions	Qualitive Impact	Quantitive Impact
Courier Rework Due to Errors	1	Couriers return to the store for missed items, leading to delays and potential discounts.	20% of home delivery orders have errors requiring rework.	Delays other deliveries, increases fuel costs, and frustrates customers	It happens on average in 893 per month orders which represent 17% of the total of the orders
Missed Calls	2	Incoming calls are missed due to high demand or operator unavailability.	30% of all calls are missed during peak hours.	Lost sales opportunities, reduced customer satisfaction, and negative impact on business reputation.	It happens on average in 819 per month orders which is 15.6% of the total of the orders
Orders cancellation due to high demand	3	During peak times, deliveries exceed usual times, resulting in cancellations and dissatisfied customers.	It happens normally at Fridays and sports days	Lost revenue, negative customer reviews, and reduced repeat business.	
Transfering calls	4	When the employee has to transfer the call to the right store because client reaches the wrong store	15% of the calls received involve transfers to a different store	customer frustration, diminished satisfaction, burdening employees with redundant tasks	The inefficient call routing and transfers affect 15% of all calls
Website order done to different stores	5	Website orders done to different stores end up being cancelled	15% of the Website orders are done to the wrong store	Lost revenue, negative customer reviews, and waste of ressources.	15% of total website orders are cancelled

Figure 14 - Issue Register analysis

5.4. Root Cause Analysis

In this section we carried out a root cause analysis. This is essentially a set of techniques that help us to go deeper in an already identified problem to understand what's really causing this and other unwanted outcomes. It's a great way to pinpoint the issues that are holding a process back from performing better. By identifying these root causes, we can tackle them head-on and work toward making the process more effective. The first issue where we used this analysis was the '**Courier rework due to errors**' where we performed a Cause-Effect Diagram where we use the categorization for cause-effect analysis, which are the so-called 6 M's: Machine; Method; Material; Man; Measurement and Milieu.

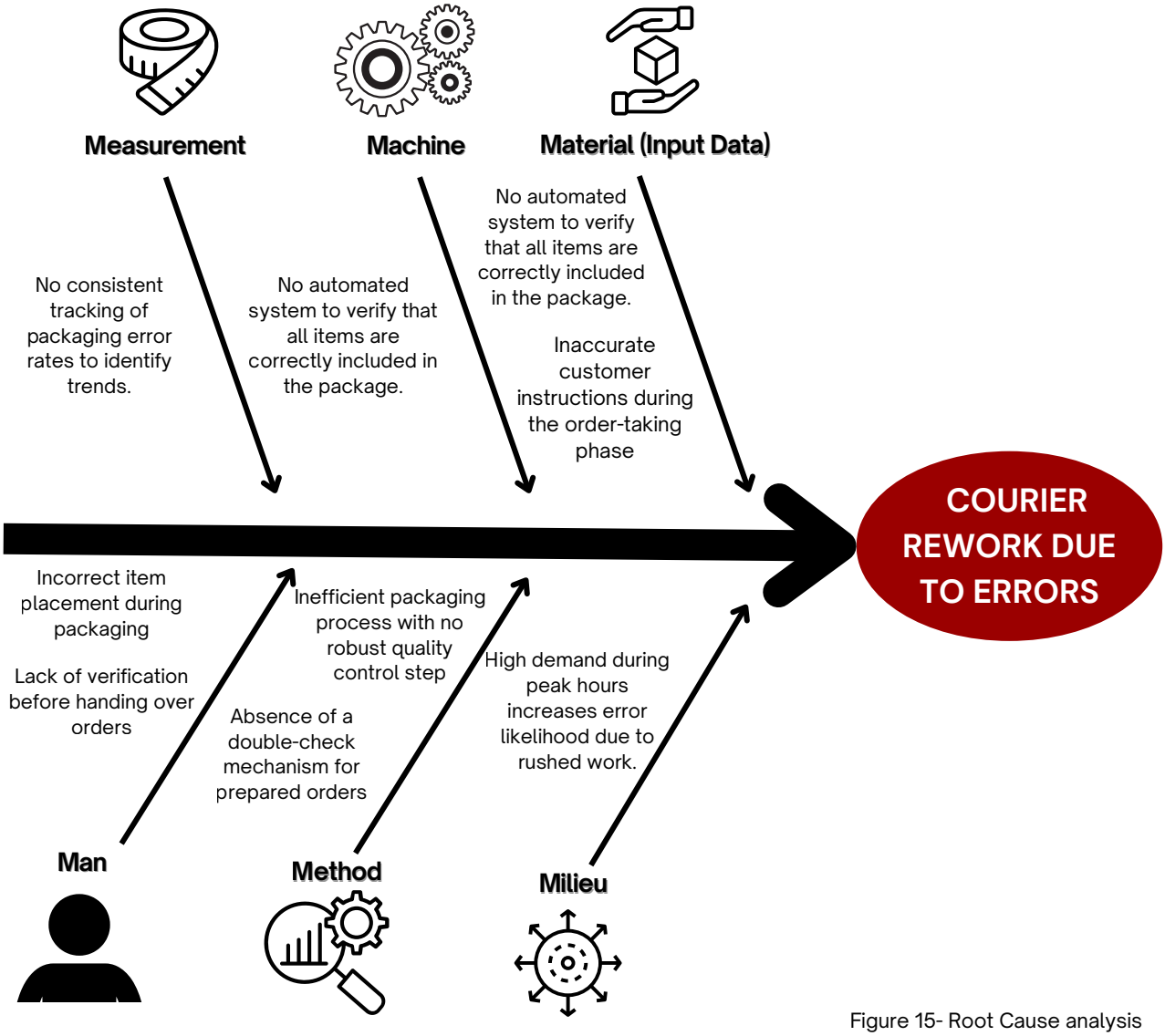

Figure 15- Root Cause analysis

Besides the previous problem, we also performed a Why-Why diagram on the issue of the '**Missed calls**'. This method is a tool for structuring brainstorming sessions to analyze the root causes of issues in a process. The method involves repeatedly asking "Why?" to explore deeper causes of a problem. This continues until it is clear what is the root cause.

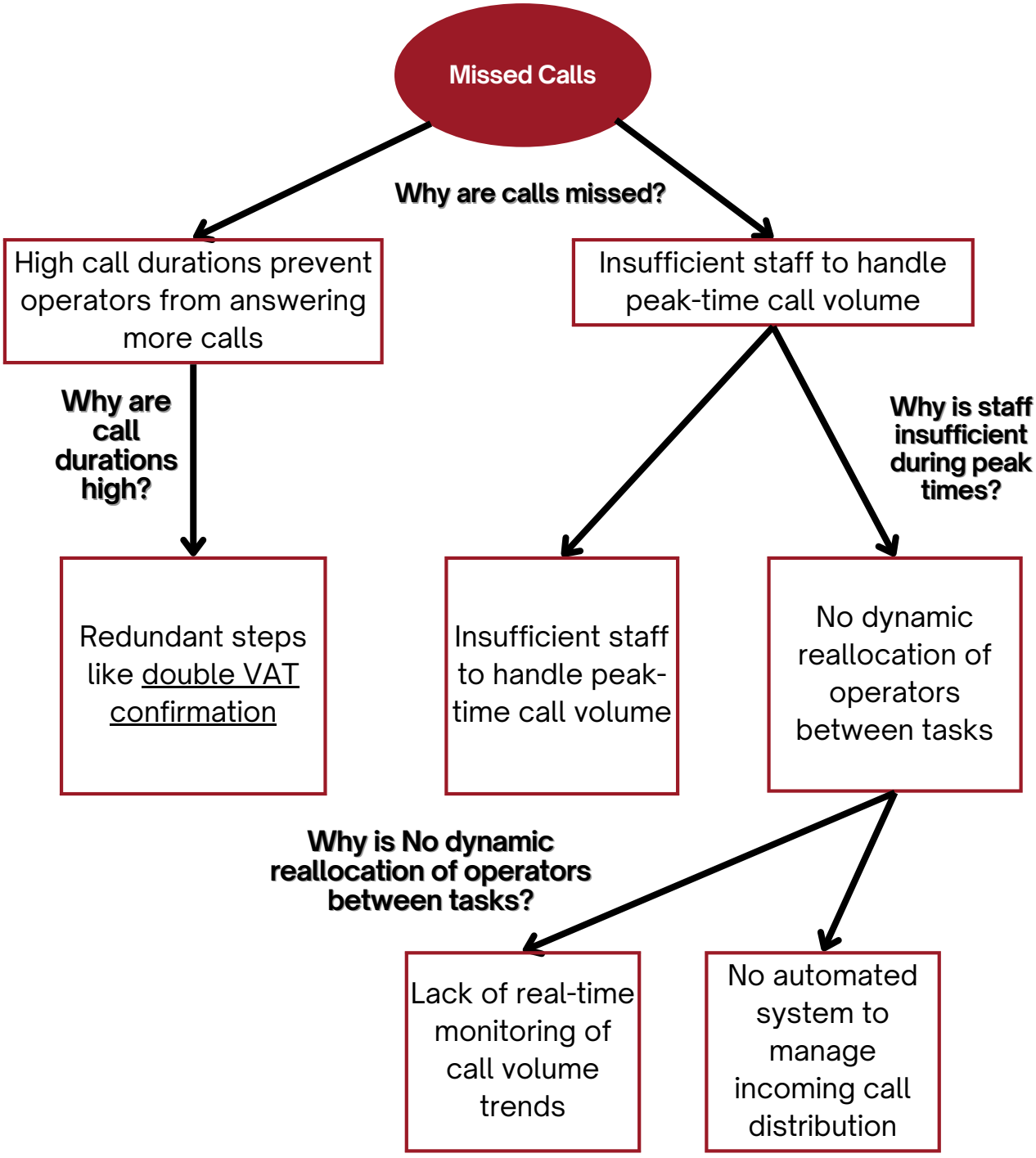

Figure 16- Why-why Missed Calls Diagram

6. Quantitative analysis

After the qualitative analysis we moved on to the quantitative analysis which focuses on evaluating the performance of the O2C process at the Lisbon Center store using the Process Simulation capacity of Bizagi Modeler. Key metrics, including resource utilization, cycle times, and process efficiency were analyzed to identify inefficiencies that impact overall performance.

In the simulation we had to give different inputs into 3 different levels: Process Validation, Time Analysis, Resource Analysis. Each level generates outputs related to waiting time, cycle time, and resource utilization.

These first evaluation is followed by the test of What-If Scenarios, where targeted adjustments are tested to address identified issues. These scenarios help to see in a more pratical way the impact of changes, guiding the development of a more efficient and optimized TO-BE process model.

In the first level (Process Validation), following the information given by the project description we divided the average orders per month the store receives by 30 days (as the business is open 7 days a week), which gives us 175 orders per day. The percentages used in the gateways ('Which method of contact' and 'Which method of delivery') were the ones provided in the description document. The duration of the shifts were assumed as 8 hours according to the store opening and closing hours, the currency is euros and we used seconds as the time metric, as this allowed for greater precision in processes with non-rounded durations

In Time Analysis we assigned different time distribution for each activity processing time. The starting event has a poisson distribution where we calculated the arrival interval with the following formula:

$$\text{Arrival Interval (seconds)} = \frac{1}{\lambda}$$

Figure 17 - Arrival Interval Formula

Where λ is the average arrival rate of orders per second.

$$\lambda = \frac{175}{28,800} \approx 0.00608 \,\text{orders per second.}$$

$$\text{Arrival Interval (seconds)} = \frac{1}{\lambda} = \frac{1}{0.00608} \approx 164.47 \,\text{seconds/order.}$$

Figure 18 - Arrival Interval Formula (Calculated)

So the arrival Interval of the starting event is 165 seconds per order. Besides this, the rest of the events we opted for normal distributions and truncated normal distributions with the following parameters:

Activity	Distribution	Mean	Std. Deviation	Minimum	Maximum
Order Registration by Phone	Normal Distribution	360	36	-	-
Order Registration by Website	Truncated Normal Distribution	75	40	35	115
Order Registration in store	Normal Distribution	360	30	-	-
Order Preparation	Normal Distribution	450	60	-	-
Order Packing	Normal Distribution	25	3	-	-

Where λ is the average arrival rate of orders per second.

Activity	Distribution	Mean	Std. Deviation	Minimum	Maximum
Home Delivery	Truncated Normal Distribution	1800	450	450	2700
Order Picking	Normal Distribution	30	3	-	-

Figure 19 - Parameters used in Time Analysis of AS-IS model

At last, we performed the Resource Analysis, we considered the human resources *Home Burger* has available and allocated them to all the events, in a basis context we assumed that every single step was performed by just one employee. Here we not only had to input the number of employees of each role the company have in handas but also the cost of each single one of them. We have assumed that each employee wroked 8 hours per day and 5 days per week to calculate the salary.

Role	Salary	Cost per Hour	Number of Employees
Phone Operator	1425	8.91€	3
Kitchen Staff	1875	11.72€	4
Couriers	1350	8.44€	8
Packager	1500	9.38€	1
Reception Employee	1500	9.38€	1

Figure 20 - Resources Availability and Costs

Results of AS-IS Model Simulation

The results of the first simulation revealed significant imbalances in resource utilization. While kitchen staff and reception employees operated efficiently, couriers were heavily overutilized at 94.65%, creating problems in the delivery process. In contrast, the packager role was underutilized at only 14.64%, indicating inefficiencies in task allocation. The average time recorded was 1h 1m 23s.

Resource	utilization (%)
Kitchen Staff	65.95%
Packager	14.64%
Reception Employee	77.71%
Phone Operator	32.65%
Couriers	94.65%

Figure 21 - Resources Utilization

6.1 What-If Analysis

After reviewing the results table, our team talked about a number of changes that could be made to our model in the WHAT-IF analysis. A table containing all of the scenarios that were produced will show the results of each scenario. Please be aware that the scenarios build up over time.

Scenario 1

There are a few variables that can be altered to improve our model by realocating resources.
In this specific scenario, by concluding the underutilization of the packager we realocated this employee to the recepetion, where now, the 2 employees are responsabile for the in-store order, website operation and packaging service.

Resource	utilization (%)	Number of Employees
Kitchen Staff	65.95% -> 66.95%	4 -> 4
Packager	14.64% -> X	1 -> 0
Reception Employee	77.71% -> 41.26%	1 -> 2
Phone Operator	32.65% -> 39.11%	3 -> 3
Couriers	94.65% -> 95.06%	8 -> 8

Figure 22 - Scenario 1 Simulation Results

This change not only reduced the Reception Employee utilization, as it also reduced the average time of the order to 52m 34s, in which 1 more order is completed compared with the previous scenario. Desoite most resources operating efficiently, couriers remain overutilized, (95.06%), needing immediate attention to reduce delivery delays and unsuccessful orders.

Scenario 2

In scenario 2, due to the overutilization of the courires and the slightly underutilization of the phone operators we opted for taking one phone operator keeping 2 employees performing the job, and add 2 more courires to the orginal 8 that existed.

Resource	utilization (%)	Number of Employees
Kitchen Staff	66.95% -> 66.94%	4 -> 4
Reception Employee	41.26% -> 41.28%	2 -> 2
Phone Operator	39.11% -> 58.61%	3 -> 2
Couriers	95.06% -> 85.65%	8 -> 10

Figure 23 - Scenario 2 Simulation Results

Here we can conclude that the alteration made the couriers utilization decrease to less alarming value, not placing the phone operators in a high utilization level.

Other advantages of this new allocation is the decrase in the average delivery time, which is now 40m 17s and an increase around 12% of successful orders in Home Delivery context.

One of the few things that can be improved is the utilization of the reception and phone operators, which can be optimized to a better distribution.

Scenario 3

As stated before the customer dealing staff utilization can be optimazed, in this way in scenario 3 we joint those two roles into a customer dealing employee, who will perfom the tasks both jobs had previously. Originally, this change would maintain 4 employees in this role, but we reckon that it would be accessible to have one less resource acting in this role, compensating the extra courier we added before. Besides this, in order to not overload the customer dealing staff we delegated the packing task to the kitchen staff.

Resource	utilization (%)	Number of Employees
Kitchen Staff	66.94% -> 67.23%	4 -> 4
Customer Dealing Emplooye	X -> 64.48%	X -> 3
Couriers	85.65% -> 83.83%	10 -> 10

Figure 23 - Scenario 3 Simulation Results

With this alteration we managed to join two resources with a slightly low utilization rate, and having the union as a balanced workload resource. The average time of an order as decrased to 37m 53s, which ultimately will increase customer satisfaction.

Summary of What-If Analysis

	Resource	Utilization Rate (%)	Initial Number of Employees	Average Delivery Time
SCENARIO 1	Kitchen Staff	66.95%	4	52m 34s
	Packager	X	0	
	Reception Employee	41.26%	2	
	Phone Operator	39.11%	3	
	Couriers	95.06%	8	
SCENARIO 2	Kitchen Staff	66.94%	4	40m 17
	Reception Employee	41.26%	2	
	Phone Operator	58.61%	2	
	Couriers	85.65%	10	
SCENARIO 3	Kitchen Staff	67.23%	4	37m 53s
	Customer Dealing Emplooye	64.48%	3	
	Couriers	83.83%	10	

Figure 24 - All Scenario Simulation Results

7. Redesign

After extensively analyzing Home Burger's Order-to-Cash processes and conducting both qualitative and quantitative analyses, we identified inefficiencies and issues that are causing Home Burger to underperform relative to expectations. These problems stem from inadequate allocation of human resources, inefficient process design, and entrenched bad habits that collectively result in poorer outcomes and an inability to achieve high profit margins.
Based on the insights gained during our analysis, we propose solutions to help Home Burger take the next step. Our recommendations include innovative business approaches combined with a more organized process model and a purposeful reallocation of resources to enhance efficiency and drive better results.

Software Solutions

In order to optimize the Order-to-Cash (O2C) process, puting in practice advanced software solutions is critical. These tools reflect in efficiency, reduction of manual intervention, and in streamline operations, ensuring Home Burger can meet customer demands while maintaining high service quality. are The proposed software solutions are the combination of an OSM (Order Management System) called Shopify Plus, integrate an mobile app and a Delivery Management System called onfleet.

Shopify Plus

Shopify Plus is an advanced e-commerce and order management platform designed to support high-growth businesses by centralizing and automating specific workflows.

Figure 21 - Shopify Plus logo

For Home Burger, Shopify Plus offers an ideal solution to streamline the Order-to-Cash process, integrating order management across web plantaforms, in-store operations, and phone orders. Its features include real-time inventory synchronization, allowing almost instant updates across channels to prevent stockouts and inaccuracies. Shopify Plus also automates order workflows, sending details directly to the kitchen and delivery staff, reducing manual intervention and associated errors. The platform offers advanced analytics, letting Home Burger monitor order trends, peak demand times, and operational congestion through a single dashboard. Besides those, the system can handle increasing order volumes without impacting performance, making it a future-proof investment. With Shopify Plus, Home Burger can increase operational efficiency, reduce costs, and improve the customer experience.

New Mobile App

To address inefficiencies in the current Order-to-Cash (O2C) process, transitioning from a website-based order system to a mobile app is advisable. In the present context the use of web-sites as an ordering method starts to be really outdated considering the use of mobile apps.

The mobile app will serve as a platform for customers to place orders, replacing the current website. Developing a custom mobile app includes both the initial design and development phases. It will be developed features such as in-app ordering, delivery tracking, loyalty programs, and integration with the company's kitchen and inventory systems.

While the cost of a custom app is higher than pre-built solutions like Shopify, the investment is justified by its scalability and ability to deliver a unique customer experience. The app will help Home Burger differentiate itself in the competitive fast-food market by offering personalized features and streamlined operations, contributing to long-term customer satisfaction and revenue growth.

Hardware Solutions

To fully take advantage of the proposed software solutions the following hardware is required to ensure more efficient operations and an deeper customer experience. These hardware components support various stages of the Order-to-Cash (O2C) process, from order placement to delivery.

Kiosks for In-Store Self-Service

To upgrade in-store order placement, Home Burger should implement 2 self-service kiosks equipped with Shopify POS. These devices allow customers to place their orders directly, reducing waiting times and minimizing the workload on reception employees.
This ensures orders are synchronized with the kitchen and inventory systems in real time, eliminating manual entry errors. We choosed 2 since it is placed an average of 52 orders per day in store, by having 2 more available ways of placing an order, we hould have a total of 5 ressoureces to opt, which is enough for the daily demand.

Figure 26 - Example of a Kiosk

Kitchen Display Systems

Implementing a Kitchen Display System (KDS) might be a vital hardware solution to optimize Home Burger's O2C process. A KDS replaces paper tickets with digital displays, providing real-time visibility of orders and reducing errors, so customers receive the correct items. This enhances satisfaction and minimizes food waste by improving order accuracy.

Figure 27 - Example of a KDS

A KDS also helps reduce labor costs by automating communication between front-of-house and kitchen staff, allowing the restaurant to operate efficiently with fewer employees. It speeds up food preparation, shortens wait times, and improves inventory tracking by monitoring ingredients available and expiration dates. These improvements will increase efficiency, reduce operational costs, and increase revenue by delivering faster and more accurate service, resulting in satisfied customers who are more likely to return and recommend the restaurant.

Marketing strategy

To promote the new Home Burger mobile app and increase user engagement, a targeted billboard marketing strategy might be a good move. The campaign will utilize three premium static billboards located in high-traffic areas of Lisbon, such as Avenida 24 de Julho, Avenida da Liberdade, and Campo Grande, to maximize visibility among Lisbon people. Each billboard will contain engaging content, highlighting the app's features, such as easy ordering, fast delivery, and exclusive promotions.

The total cost for this campaign is estimated at €9,000 for a one-month duration. This includes €7,500 for renting the billboards and €1,500 for design and printing costs. The billboards aim to capture the attention of daily commuters and pedestrians to increase awareness of the app in its beggining, so we reckon that a duration of three months would fit perfeclly our goal.

8. TO-BE Model

Level 1 - Order to cash

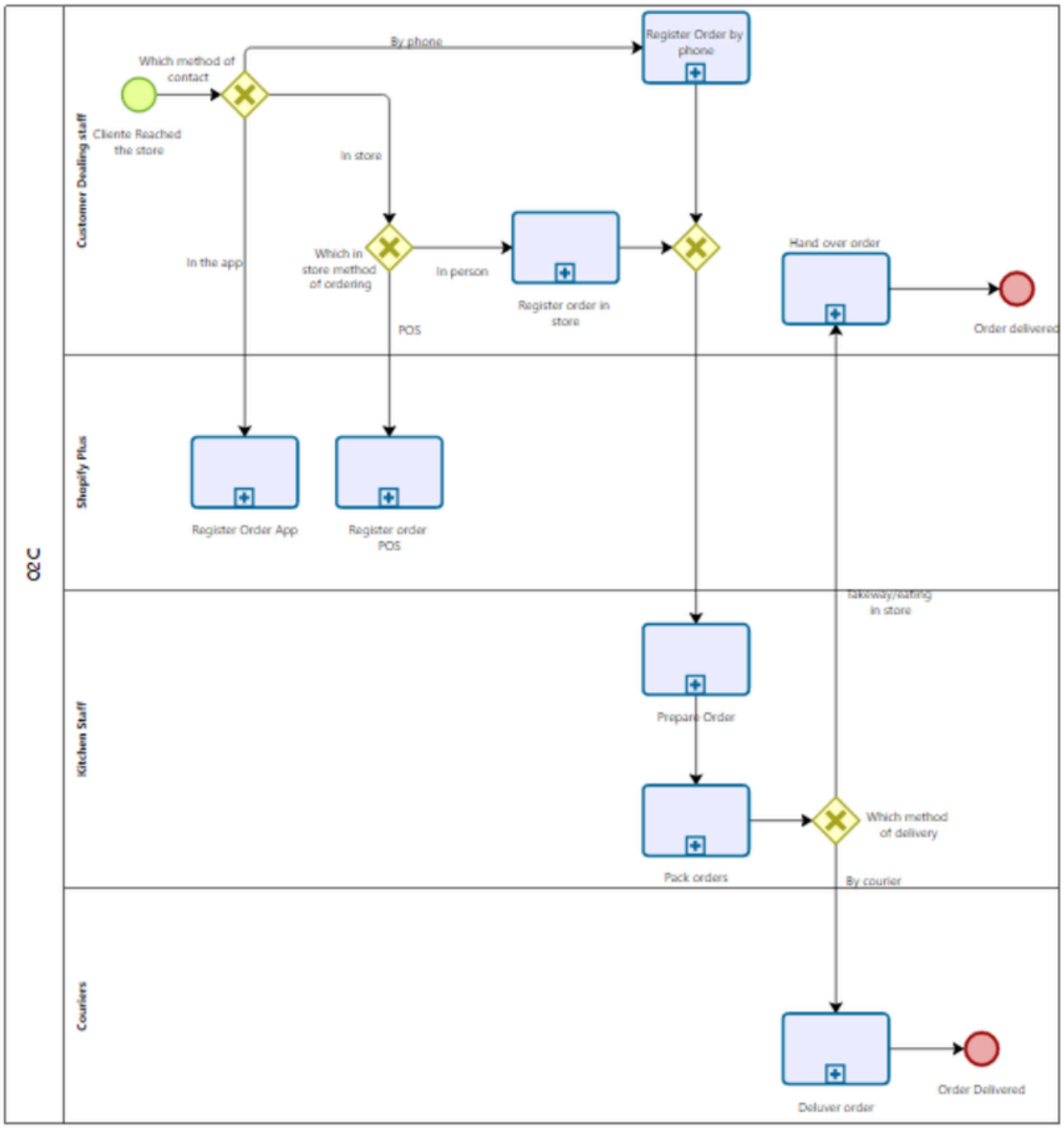

Figure 28 - Order to cash

In the Level 1 process, we reallocated resources to optimize efficiency. This began with the removal of Website Order Registration, as the website ordering method is being replaced by a **Mobile App**, as previously outlined.
We introduced the concept of a **Customer Dealing Staff** role, consolidating tasks previously performed by the receptionist and phone operator into a single position to streamline customer interactions. Additionally, we eliminated the Packager role, transferring the packaging responsibilities to the Kitchen Staff to reduce redundancies.
Finally, we created a new integration for the Shopify System, designed to handle in-store points of sale and the Mobile App. This adjustment aims to provide more precise data for future simulations and improve.

Level 2 - Order by phone

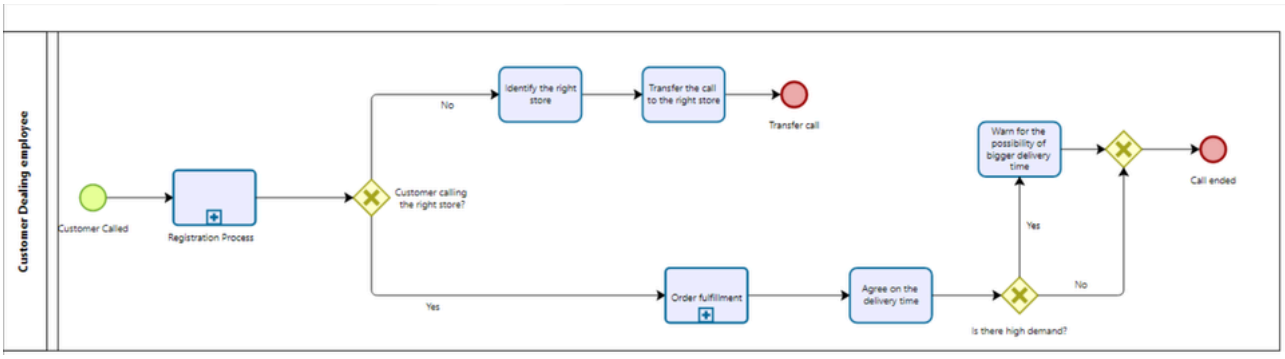

Figure 28 - Order by phone

On the Level 2-Order by phone we decided to remove the task of encouraging the customer to be in front of a flyer, as we think it does not bring any value to the business or the customer.

Level 2 - Order in store

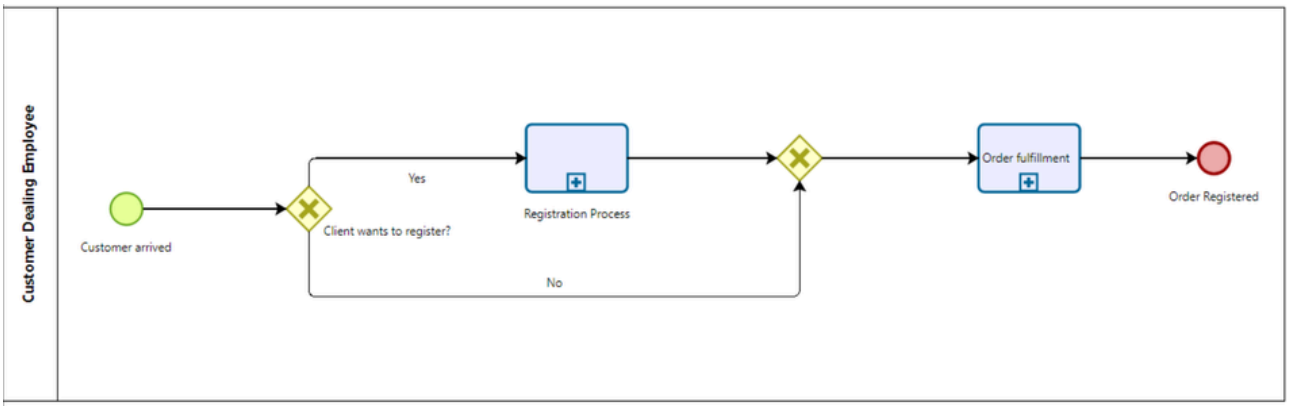

Figure 29 - Order in store

On the Level 2- Order in store there was not any alteration, besides the name change of the role who perfoms it, being now done by the Customer Dealing employee.

Level 2 - Order by POS

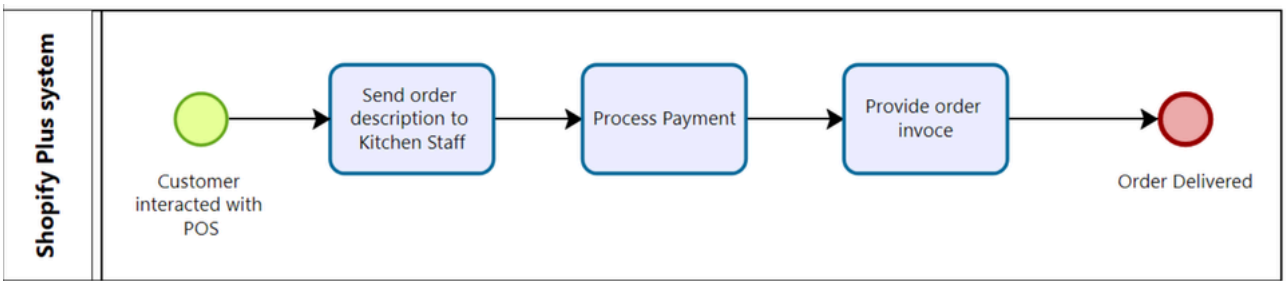

Figure 30 - Order by POS

As previously explained, we plan to incorporate **POS Kiosks** equipped with the **Shopify Plus system** as part of our solution. To ensure a precise simulation of the final implementation, we added a subprocess for ordering through one of these kiosks.

This subprocess is handled by the **Shopify Plus System,** which automates the order placement process. After the customer interacts with the kiosk to place their order, the system directly sends the order details to the Kitchen Staff, streamlining order reception. It then processes the payment and provides the customer with an order invoice, ensuring a seamless and efficient ordering experience.

No

Level 2 - Order with app

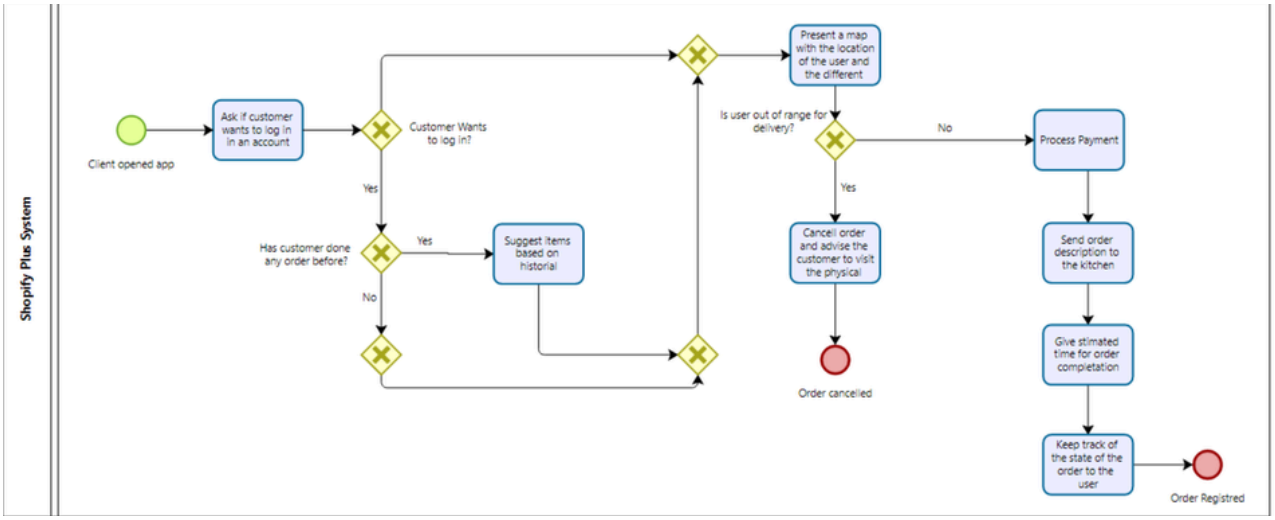

Figure 31 - Order with app

Besides the POS Kiosks, we also are looking forward to implement the Mobile App as an alternative to the discontinued Web site. In this sub-process after the client opening the app, it will be suggested to log-in into an existant account or to create one (with registration data requirements), the user can either opt for creating or not. In this case, if the customer has done any order before as a registered client it will be sent suggestion accordingly to the user historical.

To make sure it is chosen the right nearest store the app will show a map with the user location and the stores locations, if the customer is out of the delivery range the order is cancelled, and the app will invite the individual to visit a physical store. After choosing the right store, the app will procede to process the payment, send the order description to the store and finally give an estimated time for the order delivery, complemented with a real time track of the order state.

Level 3 - Registration process

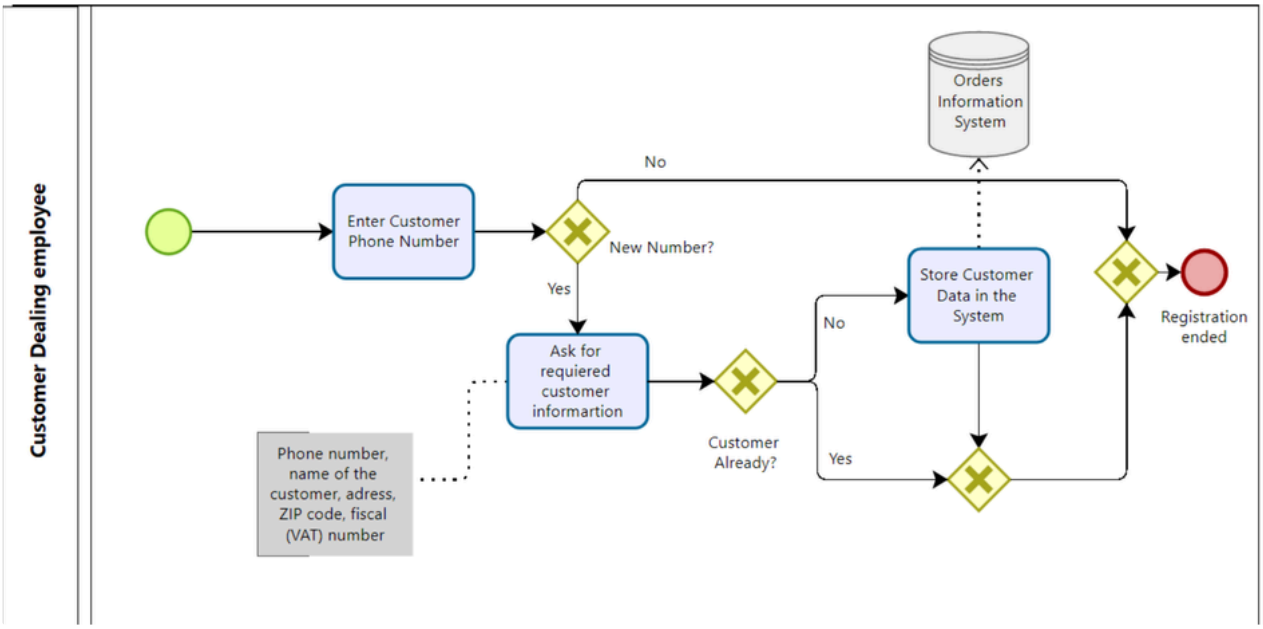

Figure 32 - Registration Process

The Level 3- Registration process had no alterations, besides the name change of the role who perfoms it, being now done by the **Customer Dealing employee**.

Level 3 - Order Fullfilment

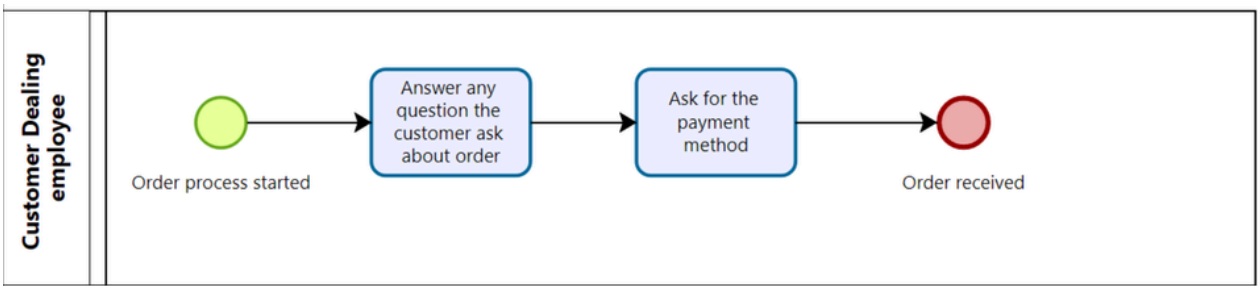

Figure 33 - Order Fullfilment

In the order fullfilment sub-process it was removed the double confirmation of the VAT (fiscal number) once we considered it a waste of time and an overprocessing activity, the name of the role changed to **Customer Dealing employee.**

Level 2 - Order Preparation

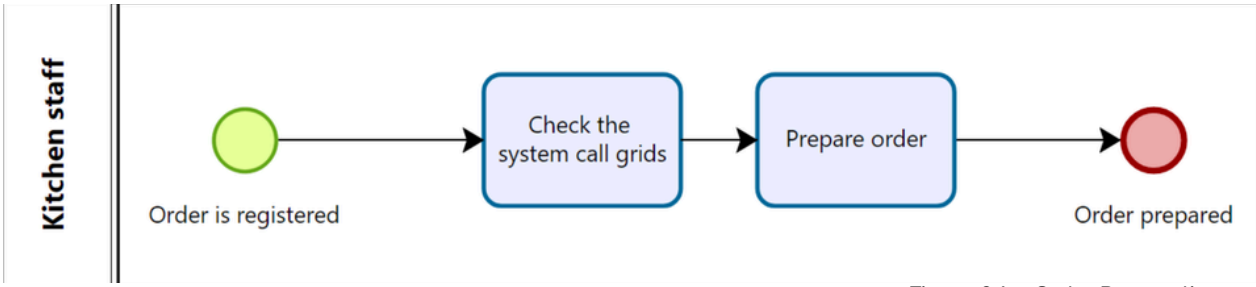

Figure 34 - Order Preparation

In the subprocess Level 2 - Order Preparation, we removed the event of notifying the manager that the order is prepared. This is due to the identification of this task as a motion waste, adding no value to the process.

Level 2 - Order Packing

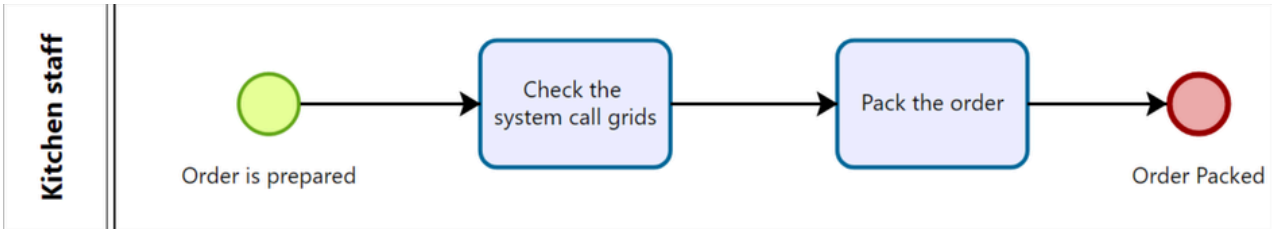

Figure 35 - Order Packing

In the subprocess Level 2 - Order Packing, with the objective of having a more balanced resources utilization we deleted the Packager role and passed its tasks to the Kitchen staff.

Level 2 - Order Handover

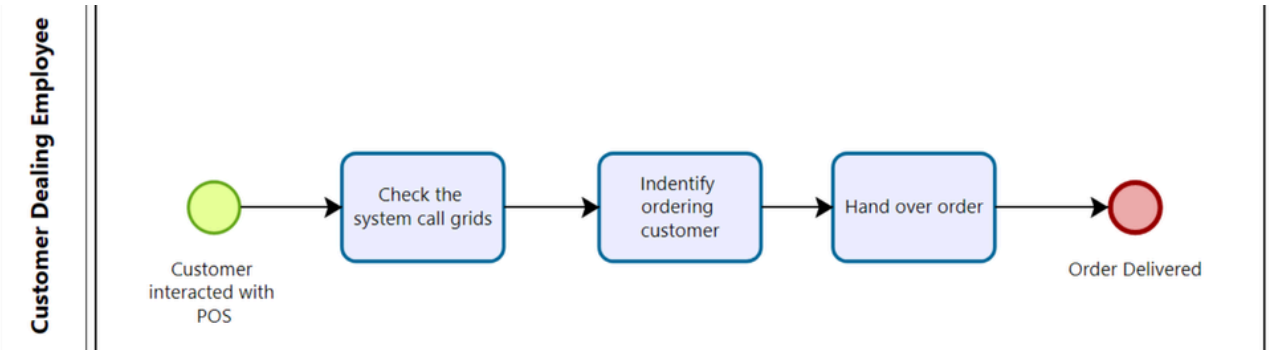

Figure 36 - Order Handover

In this sub-process, the only change implemented was the reassignment of responsibilities, with the tasks now being performed by a **Customer Dealing Employee** instead of the previously designated roles.

Level 2 - Deliver Order

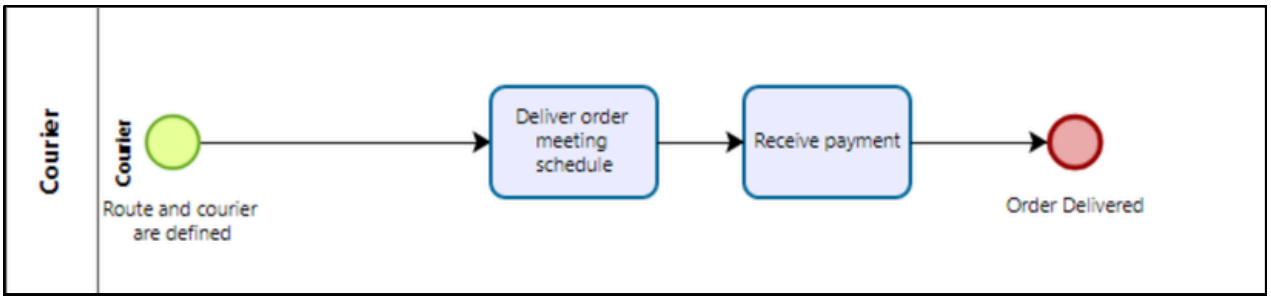

Figure 37 - Deliver Order

In the subprocess Level 2 - Deliver Order, we aimed to simplify the process, by taking out the motion waste events of receiving the TPA and warn manager of the completation of the order.

8.1. TO-BE model simulation

With our TO-BE model completed we performed a simulation in Bizagi Molder in order to access the real impact of the refined model.

The comparison between the original and TO-BE models highlights significant improvements achieved with the redesign of Home Burger's O2C process. In the original model, the average cycle time was 1 hour, 1 minute, and 23 seconds, and only 144 of 175 started instances were completed (82%), reflecting inefficiencies in task flow and resource utilization. In contrast, the TO-BE model reduced the average cycle time to 33 minutes and 31 seconds, reducing the ordering process in 27 minutes and 52 seconds. Adding to this, the number of completed instances increased to 164 (94%), demonstrating a more efficient and effective process.

9. Financial Analysis

The financial analysis goes into the monetary impact of the changes implemented in Home Burger's O2C process. Our solution includes transitioning from a website to a mobile app, implementing Shopify Plus for order and inventory management, and optimizing roles through resource reallocation.

This analysis considers both the **costs associated with these changes**, such as software subscriptions, hardware investments, and potential staff training, and the **financial benefits**, including increased revenue from improved service efficiency and cost savings from optimized resource utilization. By quantifying these factors, this section demonstrates how the proposed solutions can enhance profitability while maintaining service quality.

Resource	Monthly Salary	Number of Employees	Total
Kitchen Staff	1875€	4	7500€
Customer Dealing Emplooye	1500€	3	4500€
Couriers	1350€	10	13500€
			25 500€

Figure 38 - Resource Costs

9.1. Software costs

The implementation of Shopify Plus is crucial to the redesign that we proposed for Home Burger's O2C process. Shopify Plus has the advantage of focusing in e-commerce and order management platform, being designed to automate and optimizing critical business workflows. By adopting Shopify Plus, Home Burger can centralize its operations, integrating mobile app orders, in-store transactions, and inventory management into a unified system.

Shopify Plus pricing starts at 2 175€ per month for standard setups with a 3-year commitment or 2 364€ per month for a 1-year term, this plan includes access to all features and priority support. We will opt for the chepear longe term option.
Besides the software it is key to teach the staff how to use the new system, where instead of paying training for all the employees Home Burger would pay only training for one employee of each role, the price per participant is usually 100€ per each learner which would represent an investment of 300€.

Developing a custom mobile app is estimated to cost 60 000€, which includes both the initial design and development phases. Additionally, an annual maintenance and update fee of approximately 7 000€ is expected to ensure the app remains functional, secure, and up-to-date with new technologies and user demands.

9.3. Hardware costs

The hardware solution required for the redesigned O2C process includes devices for self-service kiosks, delivery management, order preparation, and packaging accuracy. Each device has been carefully selected to align with the operational needs and integrate with the proposed software solutions.

For self-service kiosks, the Elo Wallaby Self-service Floor Base is an excellent choice, costing 149€. This stand pairs with an iPad Air (4th generation), which costs approximately 599€. Together, they create an intuitive self-service station for customers to place orders directly. In total, by having 2 POS kiosks, the total price would be 1496€.

Costs Resume	Original Model	New Model - First Year	New Model - Next Years
Employees salaries	25 575€	25 500€	25 500€
Software	0€	69 775€	9 475€
Hardware	0€	1 496€	250€
Marketing	0€	27 000€	7 000€
Total	**25 575€**	**123 744€**	**35 225€**

Figure 39 - Software and Hardware Costs

9.4. Projected Revenue Growth

After analyzing all costs sources, we compare the costs of the new model and the original one, we can see that the new represents a costly investment, but that will certainly pay off, ending up by turning it itslef into profit.

Given by the project description we assumed that the average revenue per order is about 34€ (180 00€/5250). Additionally we also concluded that with our suggested model Home Burger Store would complete 20 more orders (164-144), this represents a **680€ of daily revenue growth** and, consequently, a **monthly 20 400€ revenue growth**. Besides those, with a better allocation and by taking some of the burden off employees who answer pohnes (Custmoer Dealing staff) with the POS's, Home Burger could answer 50% of missed calleds they originally had. Knowing that in average there is 175 orders per day, we can conclude that on average arround 14 order calls (175 x 0,52 x 0,15) will now be answered which represents a **growth of 476€**, which turns into a **montlhy revenue growth of 14 280€** which adding to the 20 400€ will turn in an **anual growth of 416 160€** (19% growth).

9.5. Return of Investment

After comparing the initial and ongoing costs of these implementations with the anticipated revenue gains and cost saving we will calculat the return on investment (ROI) for the first year, the financial benefits generated relative to the costs of implementing a project or solution. This analysis evaluates the profitability of the changes introduced in Home Burger's O2C process, like the integration of Shopify Plus, the transition to a mobile app, and the adoption of new hardware and software solutions, the ROI reflects the financial success and sustainability of the redesign.

$$\text{ROI}(\%) = \left(\frac{\text{Net Gain from Investment}}{\text{Cost of Investment}} \right) \times 100$$

Figure 40 - ROI Formula

Our investment is defined by the software and hardware solutions, which have a cost in the first year of **123 744€**. The Net Gain is already calculated and, as stated before, is about **416 160€.**

$$ROI(\%) = \frac{416,160 - 123,744}{123,744} \times 100$$

$$ROI(\%) = \frac{292,416}{123,744} \times 100 \approx 236.3\%$$

Figure 41 - ROI Formula (Calculated)

With changes made to the Order to Cash (O2C) process at Home Burger store, the impressive 236.3% ROI reflects not just the adjustments to the workflow, but also the improvements in business efficiency, software integration, and strategic initiatives. The original process was marked by inefficient and confusing sub-processes, which likely led to missed opportunities and lower profitability.

Our solution incresed operational capacity, which has not only reduced inefficiencies but has also unlocked the potential for a better customer experience, faster order fulfillment, and optimized inventory and financial management.
The substantial ROI achieved is a direct result of these efforts, reflecting the value added through both process optimization and investment. With these improvements in place, Home Burger is positioned for increased profit generation, ensuring long-term success in a competitive market.

10. Conclusions

By analyzing our project, the optimization of Home Burger's Order-to-Cash (O2C) process represent a great improve in store's operational efficiency, customer satisfaction, and overall business performance. Through detailed analysis, including both qualitative and quantitative assessments, we identified crucial inefficiencies and designed a wasteless and truly value adding TO-BE model that addresses these challenges effectively.

The implementation of advanced software tools like Shopify Plus and a mobile app, combined with strategic resource reallocation, has resulted in great improvements. These include a 45% reduction in average order processing time and a 12% increase in successfully completed orders, enhancing customer satisfaction and loyalty. Financially, the redesign projects a remarkable 19% revenue growth and an impressive ROI of 236.3% within the first year, demonstrating the profitability and sustainability of the proposed solutions.

In conclusion, this project not only resolves current inefficiencies but also drives Home Burger's future growth in a competitive market. By investing in technology and process innovation, Home Burger is now in a better position to meet customer expectations and drive sustained success.

11. Limitations

During the development of this project, we found different limitations and challenges, including:

- **Insufficient Information in the Project Description:** One significant limitation we faced was the lack of detailed information in the project description. This affected our ability to accurately model the AS-IS business process and propose well-founded improvements for the TO-BE process.

- **Complexity of Bizagi Usage:** The general usage of Bizagi was difficult and time-consuming, which may have hampered the design of the sub-processes. Specifically, we encountered challenges in simulating the Level 2 sub-processes within Bizagi.

- **Data Accuracy and Assumptions:** We could not provide precise values for certain metrics such as mean and standard deviations, relying instead on logical assumptions and predictions. This reliance on assumptions may have resulted in less accurate analysis and simulations compared to real-world data

- **Financial Data Access:** We did not have access to detailed financial data, including the exact net profit and specific expenditures of the department, limiting our ability to conduct a comprehensive financial analysis.

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