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Price concession process: consultancy analysis supported in a BPM approach using BPMN to improve organizational activity

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Master Thesis

presented as partial requirement for obtaining a Master's Degree in Data Science and Advanced Analytics

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by

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Master Thesis presented as partial requirement for obtaining the Master's degree in Data Science and Advanced Analytics, with a specialization in Business Analytics

Supervised by

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STATEMENT OF INTEGRITY

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration. I further declare that I have fully acknowledged the Rules of Conduct and Code of Honor from the NOVA Information Management School.

[Lisbon, July 14, 2025]

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ABSTRACT

This master thesis explores the field of Business Process Management (BPM) and how it is supported by Business Process Model and Notation (BPMN) modelling, can improve operational efficiency within Small and Medium-Sized Enterprises (SMEs). In the literature it was identified that although BPM is widely adopted in large organizations, its potential to optimize and streamline processes within SMEs remains underexplored and underutilized. With this in mind, this work aimed to understand how applying a BPM approach to a real business process could enhance efficiency and prepare the organization for future digital initiatives. It was applied the Dumas' BPM lifecycle with the support of interviews, to analyse and redesign a Price Concession (PC) process within an SME in the financial sector. The study involved the use of BPMN for modelling the AS-IS and TO-BE processes and it was identified critical inefficiencies including manual data extraction, repeated rework of PCs and unnecessary workload of the approval department. Two improvements were proposed: an editable field in the system to input the Annual Return Rate (ARR), enhancing a better pricing logic calculation, and automated PC approvals when gross margin thresholds are met. These changes contributed to streamlining the process, minimizing the number of rejected PCs, and lowering dependency on approval department. While the proposed redesigns did not include full automation, they establish a foundation for future research to explore technical implementations using automation technologies. This work demonstrates that even small improvements can generate significant benefits for SMEs. It also contributes to the BPM field by presenting a practical case of BPM application in an SME context and by offering a replicable BPM framework for similar organizations aiming to increase operational efficiency.

KEYWORDS

Business Process Model and Notation (BPMN); Business Process Management (BPM); Business Process Automation; Process Improvement; Process Modelling; Small and Medium Enterprises (SME)

Sustainable Development Goals (SDG):

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LIST OF ABBREVIATIONS AND ACRONYMS

AM - Account Manager

AMs - Account Managers

ARR - Annual Return Rate

BPM - Business Process Management

BPMN - Business Process Model and Notation

BPMS - Business Process Management Systems

CRM - Customer Relationship Management

CSE - Customer Success Executive

CSEs - Customer Success Executives

DMSs - Document Management Systems

ERP - Enterprise Resource Planning

EU - European Union

IT - Information Technology

PBI - Power BI

PBR - Published Return Rate

PC - Price Concession

PCs - Price Concessions

RPA - Robotic Process Automation

SKU - Stock Keeping Unit

SKUs - Stock Keeping Units

SME - Small and Medium-sized Enterprise

SMEs - Small and Medium-sized Enterprises

1. INTRODUCTION

In today's competitive business landscape, Business Process Management (BPM) involves both the creative and structured management of how work is carried out within an organization to achieve consistent results and identify opportunities for improvement. These improvements can take various forms depending on the organization's priorities, such as cutting costs, speeding up processes, reducing errors, or gaining a competitive advantage through innovation (Dumas et al., 2018).

As businesses face growing competition, technological improvements, and increased customer expectations, the pressure to optimize processes, reduce inefficiencies, and enhance performance becomes crucial to adapt to changing market demands (Dumas et al., 2018; Trkman, 2010).

To assess a process performance, it is necessary to measure the cost, time, quality and flexibility. Once a BPM team identifies which processes need to be optimize or improved according to these measures, they will be modelled for the team to better understand, in detail, how the business process is done in the organization. There are many languages to model business process but one of the most widely adopted standard is Business Process Model and Notation (BPMN) (Dumas et al., 2018).

BPMN modelling, provides a structured framework that enables organizations to identify bottlenecks, minimize errors, automate their process and improve task visibility. As a result, organizations can achieve greater agility, faster response times, and a significant reduction in operational costs (Dumas et al., 2018; Muñoz Solórzano et al., 2024).

In the master thesis it will be studied the importance and the impact of BPM in Small and Medium-sized Enterprises (SMEs) which often have limited resources and manual processes. By adopting BPM practices, SMEs can take advantage of its benefits to drive innovative approaches that align with their strategic goals, ensuring organizational survival and long-term success (Bandara & Opsahl, 2017).

Despite the widespread adoption of BPM in large organizations, there is a noticeable research gap in understanding its potential impact to optimize processes within SMEs. This gap results in many SMEs continuing to rely on manual processes, which are labour-intensive and prone to inefficiencies. Although BPM has proven its effectiveness in enhancing process efficiency and speed in decision-making, the application of these initiatives in SMEs remains an underutilized and underexplored approach (Dumcius & Skersys, 2019; Pejic Bach et al., 2019).

This research is significant for both academic and business, as it addresses a critical gap in BPM literature. By examining the role of BPM in improving and automating workflows within SMEs, this research contributes to academic literature by expanding the understanding of BPM's applicability and benefits beyond large corporations.

Therefore, to support this master thesis a case will be analysed: it will be about a Price Concession (PC) process for which Account Managers (AMs) and Customer Success Executives (CSEs) are responsible.

The PC process develops when an end-user (final customer) has a specific need and goes to the market to address it. This going to market represents an opportunity for suppliers to respond with their proposals. Supplier companies create an opportunity with products that are likely to be sold to the end-user and then generate a PC for those products. An opportunity can include multiple Price Concessions (PCs). Once created, the supplier submits the PCs as a response to the opportunity.

For example, a company called "XYZ" requires printers and, therefore, they go to the market. Manufacturers and/or vendors then respond by creating an opportunity called "XYZ Printers Q3 2025" and submit a PC, which includes specific pricing and conditions for the purchase.

XYZ evaluates the submitted PCs and decides whether to accept them. This evaluation is not only based on the price but also considers contract terms and added value, such as after-sales services and warranty.

PCs must be managed carefully, as they can impact both the company's profitability and its market reputation.

To analyse this case, the current process will be modelled using BPMN to find inefficiencies, areas for improvement, to optimize the process and reduce its completion time. Next, the process will be modelled again with the improvements, that were found in the previous phase, and in a more automated way without inefficiencies or bottlenecks. The contribution of this study will be to develop a TO-BE model within the collected stakeholders' ideas.

The organization´s manual approach involves tasks such as data extraction and data entry are handled without automation. These manual practices can lead to errors, omissions and slower completion times that can impact the business performance, as said by the stakeholder of the company. So, the manual nature of the PC process presents challenges common to SMEs, including reliance on labour-intensive workflows and susceptibility to errors and delays, therefore the importance of using this case to exemplify the problems that SMEs face.

In practice, this study provides insightful information for SMEs that find difficult to keep up with digital transformation in an increasingly competitive business environment. A suited guide of best practices will be developed, specifying different steps that an organization needs to follow to improve their processes. This case study is not intended to be applied specifically to this organization but to be a general solution for the Information Technology (IT) sector and a future example so other companies in different sectors, mainly SMEs, can follow the guide of this process developed.

After identifying the challenges that SMEs face with manual processes, the central focus of this research becomes clear, leading to the following research question:" *What is the impact of Business Process Management on process automation and digitalization in small and medium-sized enterprises*?". To have faster response reaction times, decrease inefficiencies, and boost overall business performance in SMEs, this question aims to investigate how applying BPM might convert manual processes into automated ones.

To explore and answer the research question, this study focuses on the following objectives:

- Evaluate the company´s automation needs: identify key areas within organization, AMs and CSEs, particularly in customer-facing roles where automation can add significant value by reducing repetitive, manual tasks and improving process efficiency.
- Identify operational inefficiencies: examine current workflows of AMs and CSEs to find specific inefficiencies caused by manual processes, such as data entry and extraction, that negatively impact productivity.
- Assess BPM's potential to simplify operations: assess how BPM can be applied to model using BPMN, redesign and optimize workflows, increasing the efficiency and accuracy of SMEs' operations.

This chapter serves as an introduction to the master thesis and provides a brief overview of the topic that will be studied.

2. LITERATURE REVIEW

In this section it will be provided an understanding of key concepts and challenges associated with BPM and its application in SMEs based on literature review on these topics. This review will be divided into three main themes. The first section will provide an overview, definition, characteristics and constraints or challenges that SMEs face in today's business environments. Next, the principles and the concept of BPM and his language to model business process, BPMN, as well as the potential impact of BPM on SMEs will be discussed. Finally, the role of digitalization and automation in transforming Small and Medium-sized Enterprise's (SME) processes through BPM and emphasizing their relevance for SMEs.

2.1. SMEs

SMEs, as their name suggests, comprise micro, small, and medium-sized enterprises. They are typically defined based on their number of employees, annual turnover, or annual balance sheet. Why is this a general definition? Because there is no unique definition of what is considered a company a SME, the concept can vary across regions and countries. In the European Union (EU), SMEs represent 99% of all businesses. The EU classifies SMEs into three categories:

Category	Number of employees	Annual turnover (max.)	Annual balance sheet (max.)
Medium-sized	< 250	50 million euros	43 million euros
Small	< 50	10 million euros	10 million euros
Micro	< 10	2 million euros	2 million euros

Table 1 -EU Classification of SMEs

These quantitative definitions of SMEs legitimized by the EU is the one used by most researchers (Berisha & Pula, 2015; Glazkova, 2021; SME Definition - European Commission, 2024).

Despite the differences from country to country regarding the quantitative criterion, the SMEs tend to display similar qualitative characteristics at various levels. So, they are often hindered by resource limitations and distinguished from larger organizations by a few attributes including manpower, management, limited time and financial resources (Berisha & Pula, 2015; Glazkova, 2021; Hudson Smith et al., 2001; Szelągowski & Berniak-Woźny, 2023).

However, due to their smaller size, SMEs tend to demonstrate greater agility and are more capable of quickly responding to digital innovation compared to larger corporations. This adaptability allows them to better adjust to changes in the market (Chan et al., 2019). In their flatter organizational structure generally, employees have a greater number of job role,

handling a wide range of tasks and responsibilities. In such environments, having a well-trained and highly motivated workforce is essential, requiring close attention to the management of human resources (Hudson Smith et al., 2001).

The financial aspect is equally vital for both large and smaller companies, however, SMEs face greater challenges as they often lack the financial safety needed to mitigate short-term market fluctuations. This makes managing financial resources especially critical for smaller businesses. Moreover, in addition to financial constraints, SMEs frequently experience shortages of personnel and have limited time to allocate investments in technological advancements or innovative management practices which are generally more accessible to larger companies (Hudson Smith et al., 2001; Szelągowski & Berniak-Woźny, 2023).

Regardless of the challenges and limitations faced by these companies, they can explore strategic approaches to overcome or mitigate these obstacles. One strategy is adopting a BPM approach (Muñoz Solórzano et al., 2024).

2.2. BPM

Although there is growing interest in how SMEs can develop competitive advantages through the implementation of BPM, the level of awareness and understanding of BPM within SMEs across various industries remains surprisingly low. This lack of knowledge highlights the need to clarify what BPM means and how it can be leveraged as a strategic approach for SMEs (Szelągowski & Berniak-Woźny, 2023).

BPM looks at entire workflows, including sequences of events, activities, and decisions that, together, deliver value to the organization and its customers (Trkman, 2010). The principal idea of BPM centres on organizing and managing work through a process-oriented approach, providing a comprehensive view of how an organization functions. By doing this approach, businesses can better align their operations with strategic goals. Emerging in the late 1980s, BPM has since become a crucial method for improving organizational efficiency and driving innovation (Dumas et al., 2018; Muñoz Solórzano et al., 2024).

2.2.1. BPM Lifecycle

Before adopting BPM, it is important that every organization knows its background. But to use it effectively, it is important that the organization understands the BPM lifecycle and how to follow it in the organization environment. The lifecycle describes the major phases involved in the successful implementation and management of BPM.

It consists in numerous phases that are related to each other. The phases are organized in a cyclical structure, showing their logical dependencies. Each phase has its own set of methods, techniques and tools (Dumas et al., 2018; Weske, 2024).

There are several BPM lifecycle models, but the most widely adopted today is the framework proposed by Dumas (2018). However, it is possible to compare this model with the BPM lifecycle proposed by Weske (2024).

Weske divides the BPM lifecycle into broader stages: Design and Analysis, Configuration, Enactment, and Monitoring and Optimization. This lifecycle is technical and system-oriented, integrating IT architectures and highlighting the interaction between processes and technology. It also focuses on how business processes are integrated within enterprise systems for execution. Weske's lifecycle is suitable for organizations with a high level of digital maturity and robust IT infrastructure (2024).

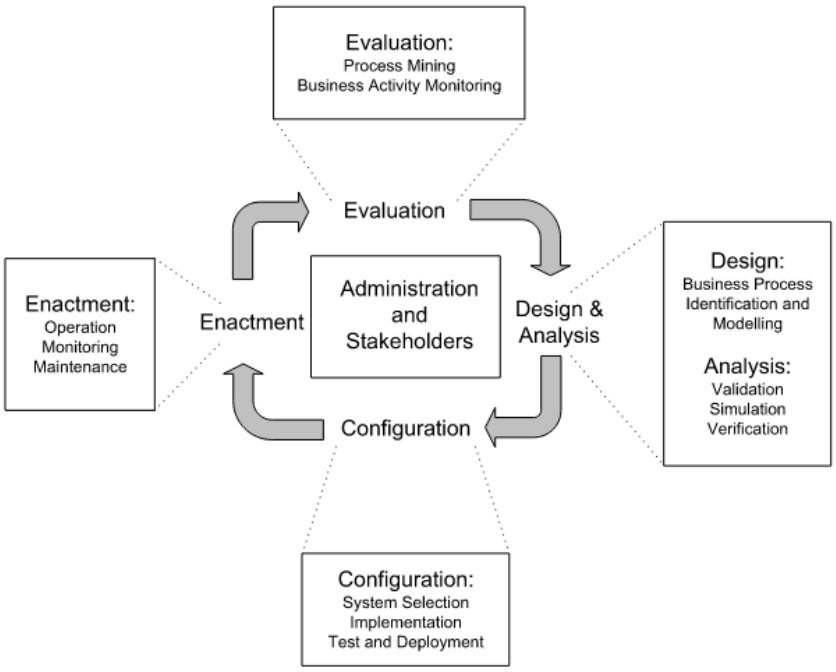

Figure 1 - BPM lifecycle proposed by Weske (2024)

On the other hand, Dumas divides the BPM lifecycle into six distinct stages: Process Identification, Process Discovery, Process Analysis, Process Redesign, Process Implementation, and Process Monitoring and Controlling. This approach is more user-centred and provides a strong foundation for integrating BPM into general management practices. It emphasizes the iterative nature of BPM and guides organizations in improving their processes using tools like BPMN for modelling processes. Dumas's perspective is more appropriate for organizations with limited knowledge of BPM, those aiming to enhance business efficiency with minimal IT investment and for companies in the early stages of BPM adoption (2018).

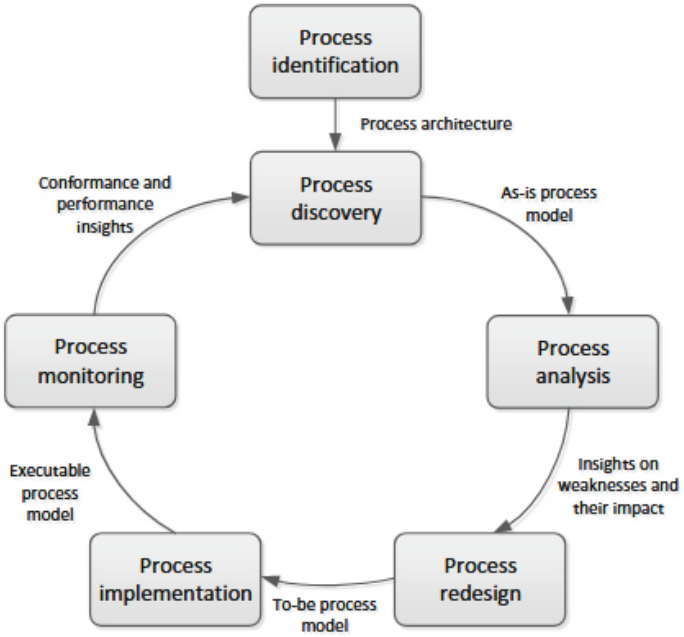

Figure 2 - BPM lifecycle proposed by Dumas (2018)

For these reasons, the BPM lifecycle proposed by Dumas is the one that will be described in detail in this master thesis.

The first stage of Dumas BPM lifecycle is **Process Identification** where a business problem is determined. Processes relevant to the addressed problem are identified, defined and interrelated. Since few organizations have the capability to model every process they have in detail there is the need to prioritize processes, so organizations evaluate which processes should be focused on BPM initiatives. The prioritized processes should be the ones that consistently lead to positive outcomes to its customers, thus providing maximum value to the organization, but how is it possible to measure the value of a business process? By assessing his performance metrics, that were referred in the introduction chapter, cost, time, quality and flexibility (2018).

The result of process identification stage is to design a process architecture, it represents the processes of the organization and their interrelations.

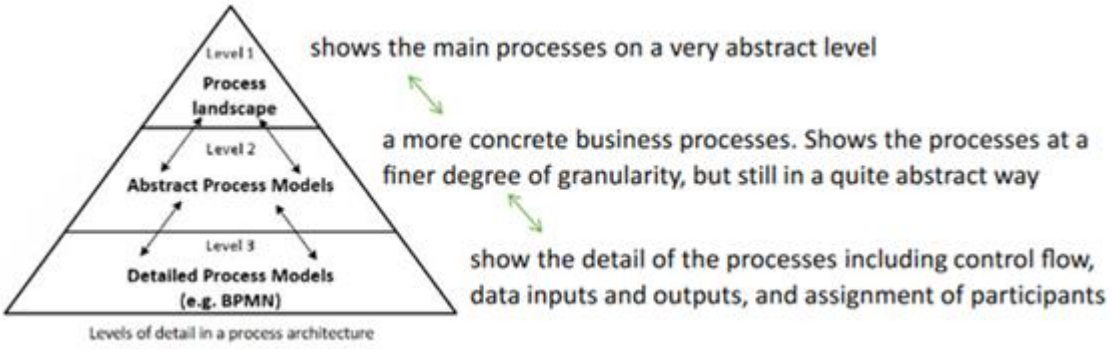

Figure 3 - A process architecture with three levels by Dumas (2018)

As described in the image, process architecture can be structured across three levels. At the highest level, the process landscape provides an overview of the core processes in a company, ex: marketing and sales. The middle layer focuses on support processes i.e. processes that enable the execution of these core processes, ex: human resource management, IT management and accounting. Lastly, at the most granular level, process models provide a detailed representation of the internal operations of both core and support processes. These may include activities such as strategic planning, budgeting and compliance (2018).

After producing the process architecture, the potential processes that need intervention are evaluated by a BPM team using the performance metrics (time, cost, quality and flexibility) they will select the processes that need to be dealt with in the first place.

In **Process Discovery** it is done information gathering about the chosen processes to learn how they work. Then they are modelled to create AS-IS models. It is a diagram that shows in detail the current flow of the business process including all issues that might exist. In the end, the objective is to reach a common understanding among stakeholders about how work is performed (2018).

The AS-IS models will be analysed to assess their performance, potential issues and space for improvement in the **Process Analysis** stage. In the analysis the process analyst will use those performance metrics mentioned earlier (2018).

The **Process Redesign** aims to re-organize business processes by identifying and analysing potential solutions for the issues identified in the previous stage. The idea of this phase is to propose a redesigned model of how a process will be performed i.e. a TO-BE process model (2018).

During the **Process Implementation** stage, the TO-BE process model obtained from the process redesign stage is reworked into executable process models to be interpreted and automatically executed by a software system, such as a Business Process Management Systems (BPMS) (2018).

Lastly, **Process Monitoring** is about using data generated by the execution of the process to verify its performance and to implement adjustments if necessary. The output of this phase provides a feedback loop to the discovery and analysis phases, ensuring continuous improvement (2018).

2.2.2. BPMN

As mentioned in process discovery, modelling business processes is essential. While there are various languages available for this purpose BPMN is the most widely used, as noted in the introductory chapter (Dumas et al., 2018). In BPMN and other languages, processes are described in terms of activities and possibly subprocess (van der Aalst, 2013). The latest version of BPMN is Business Process Model and Notation 2.0.2, It was released as a standard

by the Object Management Group in 2014 (About the Business Process Model and Notation Specification Version 2.0.2, 2024; Dumas et al., 2018).

BPMN is a standardized graphical notation that allows businesses to visually model and document their processes. The goal of BPMN is to provide a notation that is readily understandable by all business users, from the business analysts who create the initial draft of the processes, to the technical developers responsible for implementing the technology that will support the performance of those processes, and, finally, to the business people who will manage and monitor those processes (White, 2004; Dumas et al., 2018).

The notion of a process model is foundational for BPM. A process model aims to capture the different ways in which a process instance can be handled (van der Aalst, 2013).

Here is an order process model as an example:

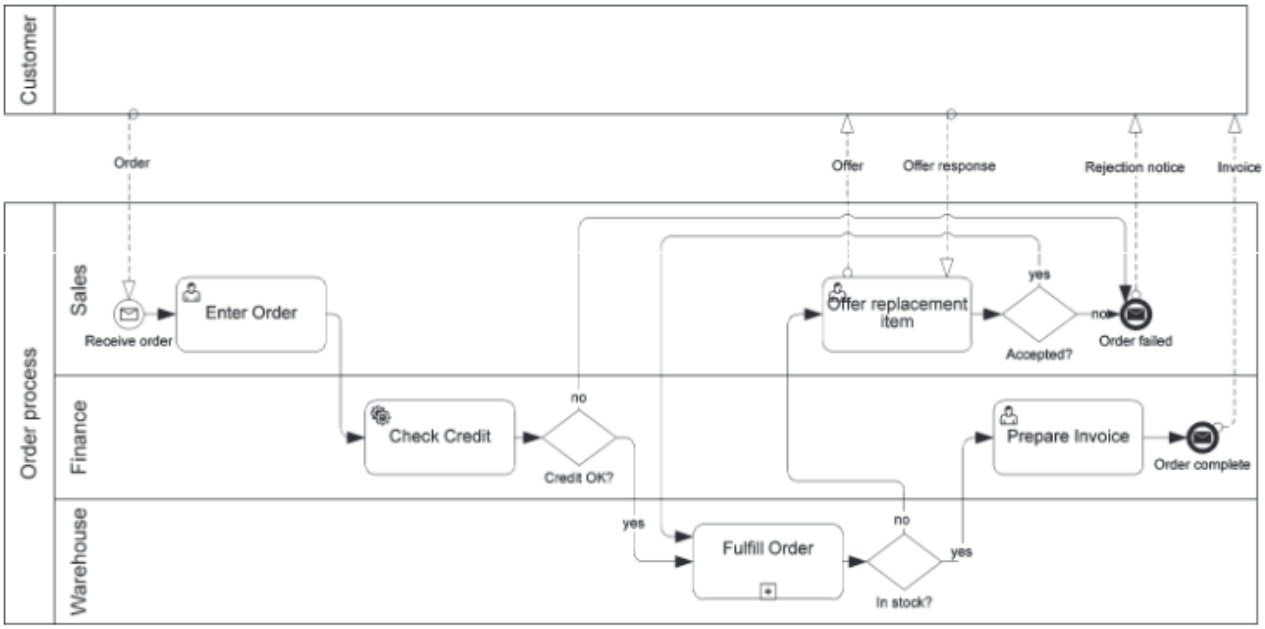

Figure 4 – Example of an order process by Silver (2011)

The order process model begins with the receipt of an Order message. It concludes with one of two possible outcomes: Order Complete or Order Failed. Failures occur due to issues such as insufficient credit or lack of stock when a replacement is not accepted. Each end state generates a distinct final status message that is sent back to the customer (Silver, 2011).

Despite the large use of this notation, a BPMN approach is not necessarily suitable for all usage areas and later it will be analysed if this is the case after learning how to approach and model the master thesis' case study (Aagesen & Krogstie, 2015).

2.3. AUTOMATION

Business process activities can be manually operated by employees, supported by information systems, or fully automated without human involvement (Weske, 2024).

Transforming designed processes into executable models is an essential phase in adopting automation in business operations. In fully automated processes, human intervention is not required. Weske, in his book *Business Process Management: Concepts, Languages and Architectures*, illustrates this with the example of ordering an airline ticket through the online shop. While the airline handles the process automatically, the customer still performs manual tasks, such as entering their address through a web interface. The degree of automation of a business process is related to its degree of repetition. Processes with a high degree of repetition justify investments in modelling and automation, as these efforts yield benefits across numerous instances of the process. A technology that is particularly suitable to enable this type of automation is BPMS (Dumas et al., 2018; 2024).

BPMS are systems designed to support the entire lifecycle of business processes, including their design, analysis, execution, and monitoring. The main goal of a BPMS is to manage automated business processes and ensure they are executed efficiently and consistently by assigning the right activities to the appropriate resources at the right time. This helps organizations improve their overall operational performance. Other IT tools, such as Enterprise Resource Planning (ERP) systems, Customer Relationship Management (CRM) systems, and Document Management Systems (DMSs), also support the implementation and execution of business processes (Dumas et al., 2018).

This system allows organizations to gain advantages regarding workload reduction, flexible system integration, execution transparency and rule enforcement. Workload reduction, automates repetitive tasks, freeing up employees to focus on more strategic activities. Flexible system integration allows more flexibility in managing business processes, which ensures more dynamic operations across departments. Execution transparency offers insights about the process performance and enables organizations to monitor workflows. Rule enforcement refers to the system's ability to ensure that business processes are executed exactly as they were designed, without deviation (Dumas et al., 2018).

A new approach has recently emerged which is based on clerical work and on software robots that mimic the human’s behaviour in desktop environments. This software tool automates tasks, or entire business processes and it is called Robotic Process Automation (RPA). This software automates highly repetitive tasks, so instead of a human user, there is a software robot that extracts data from one document to another, also automates tasks that are time-consuming for employees, low complexity task for quick bot implementation and error-prone tasks (Dumas et al., 2018; Moreira et al., 2024; Weske, 2024).

Once the choice of tasks of the process to automate it is important to reflect the success of the new scenario compared to the previous one. So, it will be used the process performance measures (time, quality, cost and flexibility) to evaluate the advantage that came from the automation (Moreira et al., 2024).

A sample process model of an RPA is shown in figure 5.

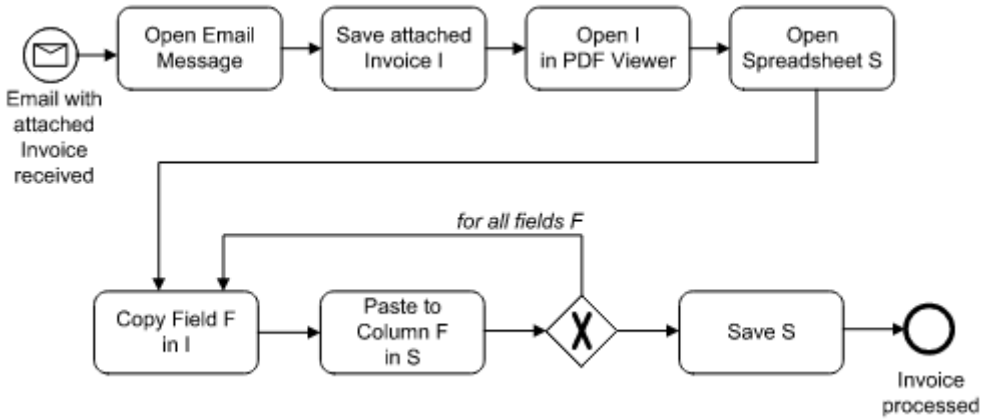

Figure 5 - Sample process model used in robotic process automation, representing typical user behaviour by Weske (2024)

The software robot is started once an email message with an invoice is received. The next activity is responsible for opening the email message, followed by saving the invoice I. Using a PDF viewing program, the invoice is opened, and a spreadsheet S is opened by the respective program. It's assumed that there is a list of fields that need to be copied from the invoice and pasted to the spreadsheet. Each of these fields are copied from the invoice and pasted to the spreadsheet. Once all fields are processed, the spreadsheet S is saved, and the process is completed. The information represented in the process model is not sufficient for execution by a software robot, there is still technical details that need to be added to configure the bot (Weske, 2024).

invoice id	*supplier*	*bank account*	*date due*	*net amount*	*VAT %*	*VAT*	*gross amount*
i123	Jones	DE52 2732 2932	01.02.2024	56.62 €	19.00%	13.28 €	69.90 €
i323	Easton	DE72 2939 2032	08.02.2024	74.31 €	7.00%	5.59 €	79.90 €
i035	Thomson	DE29 9438 3921	15.02.2024	105.22 €	19.00%	24.68 €	129.90 €
i128	Kurtz	DE47 8364 2734	03.02.2024	176.61 €	7.00%	13.29 €	189.90 €
i014	Gilles	DE12 3647 2833	27.01.2024	105.22 €	19.00%	24.68 €	129.90 €
i132	Daniels	DE32 9948 0020	08.02.2024	32.32 €	19.00%	7.58 €	39.90 €
i342	Mathes	DE83 2536 9339	11.02.2024	65.01 €	7.00%	4.89 €	69.90 €

Figure 6 - Spreadsheet containing invoice information, extracted from email attachments by robotic process automation by Weske (2024)

RPA can identify, extract, and analyse relevant information from a wide range of user interfaces, including legacy systems that rely on command-prompt interfaces and require screen-scraping techniques. This makes RPA a highly versatile and powerful technology. It is often used by organizations to free employees from repetitive tasks, particularly in handling standard cases, while also improving process scalability and reducing costs. However, configuring an RPA tool requires a clear understanding of the existing systems within the organization, as well as technical expertise to configure, train, and test the software robots that will mimic human behaviour (Dumas et al., 2018; Weske, 2024).

BPM supports the digitalization of SMEs' operations by identifying manual tasks that can be automated. By integrating technologies such as RPA and BPMS into BPM frameworks, SMEs can enhance their operational efficiency and streamline workflows. This approach to automation, focus on repetitive tasks and error-prone tasks, enabling SMEs to reduce costs, workload and increase accuracy (Dumas et al., 2018; Weske, 2024).

2.4. IMPACT IN SMES

For SMEs, BPM represents an opportunity to overcome the limitations of their resources and manual workflows.

By modelling a business process and analysing it, through a what if analysis, using simulation approach, management may get insights on the performance of the process and obtain improvement ideas in terms of cost reduction, automate repetitive tasks, optimize resource allocation, increase productivity and process efficiency (van der Aalst, 2013). With the support of process analysis phase and process simulation, BPM facilitates data-driven decision-making, providing organizations to refine their strategies effectively (Dumas et al., 2018; Weske, 2024).

Additionally, the integration of process models with existing systems such as CRM and ERP creates a consistent framework (van der Aalst, 2013). Moreover, one of the strengths of SMEs is their inherent agility and BPM enhances this, allowing them to respond quickly to changing market conditions (Chan et al., 2019).

BPM is a continuous effort, as stated in BPM lifecycle, that is, processes need to be managed, in case of changing circumstances it may be needed to adapt the process and generate a new analysis. Therefore, it is important to continuously monitor processes (van der Aalst, 2013).

BPM, with its focus on optimizing and analysing internal processes, can help SMEs by aligning their processes with market needs and their internal capabilities, SMEs can find BPM a valuable approach to deal with the constraints they face.

3. METHODOLOGY APPROACH

The purpose of the master thesis is to demonstrate that despite the constraints and difficulties faced by SMEs, it is possible to improve their processes by a BPM approach.

To support this purpose, it will be added to this work a case to study. It provides coherence by connecting the theoretical background of the literature review, to the practical implementation. The objective of the case study is to analyse a process and to automate it in the end. As it was referred before in chapter 1 – Introduction, this process has in its nature a manual approach resembling the usual processes of an SME company.

3.1. DEFINITION OF THE APPROACH

To define the methodology to follow in this master thesis, it is first necessary to know the different approaches that exist. And for this purpose, Castellan's (2010) article will be addressed, which compares two different approaches widely used in research: quantitative and qualitative research each serving distinct purposes.

Before moving on to descriptions of the two approaches, Castellan emphasizes that neither approach is ideal or superior to the other because the choice depends on what is being studied and the type of information the researcher is looking to find (2010).

While the quantitative and qualitative approaches are highly used, there is still another perspective that is a "hybrid" model that includes both approaches in one study. The use of a mix of approaches could be insightful, although the article states that it is difficult to maintain the integrity of each approach.

3.1.1. Quantitative approach

Quantitative research, rooted in positivism, seeks objective truths and the researcher is independent of that which is being researched.

The goal of quantitative research is to measure variables through statistical analysis to establish generalizable findings, show validation, prediction and control, and testing hypotheses.

The data used in a quantitative study is quantitative. Pre-established concepts and theories are used to determine what data will be collected. The way data is collected is trough questionnaires, surveys and tests, all in the form of numbers and statistics.

Numerical data is generated to represent aspects of the social environment, and statistical methods along with deductive reasoning are utilized to analyse data.

3.1.2. Qualitative approach

Qualitative research, aligned with post-positivism, focuses on exploring subjective experiences and constructing meanings from social contexts, often through narrative or thematic analysis. Also, it is referred to as interpretive research.

Qualitative approaches are more suited to understanding complex phenomena and providing rich, contextual insights and its goal depending on the conceptual framework of the study, can be to describe multiple realities and develop a grounded theory.

Typically, three kinds of data collection are used with qualitative research: interviews, observations, and written documents. The majority of data is obtained from fieldwork, in which the researcher spends time in the environment being studied. The researcher makes first-hand observations of activities and interactions, sometimes engaging personally in those activities. Data analysis is an inductive process where data are sorted, filtered, read and reread.

3.1.3. Method used

After analysing the various research approaches in education, this master thesis will adopt a qualitative approach, using BPM lifecycle (Dumas et al., 2018) as a support framework within a case to study.

To model the case study's process, the Bizagi Modeler tool will be used. This tool was chosen because it supports BPMN, the most widely used process modelling language, as highlighted in the literature review. Additionally, Bizagi offers an intuitive interface that enables organizations to create and document business processes to identify improvement opportunities (Bizagi Standards, 2025; Process Modelling Software - Bizagi Modeler, 2025).

4. CASE STUDY

The case study focuses on a real-world PC process from a SME. In this process an Account Manager (AM) or a Customer Success Executive (CSE) request internally via Salesforce the approval of a special price (discount). New sales are made by AMS and CSEs are responsible for renewals and upgrades.

AMs sells hardware, software, and maintenance services.

CSE renew maintenance services and renewable software licenses.

When requesting a PC for the renewal of a maintenance contract as a CSE, the Annual Return Rate (ARR) (number of repairs last 12 months / total install base) and the gross margin of the contract are required. So, it is necessary to use two external tools to Salesforce:

1. A Power BI (PBI), where through a "rolling window 12-months" dashboard the contract number is selected and the ARR is obtained. The Dashboard contains information accumulated over the last 12 months regarding a contract.
2. An Excel file called "Costing Tool", where the Stock Keeping Unit (SKU) (product identifier) for maintenance contract renewal is placed, the ARR taken from the PBI is also placed in a cell called "Manual Return Rate" and therefore the gross margin is automatically calculated for this contract. The Costing Tool serves as a simulation tool for CSEs to be aware of the margin resulting from the contract renewal, therefore they can have an idea of whether the PC of that contract will be accepted or not.

With this information, it is possible to assess the real gross margin of the contract and request more or less aggressive discounts.

On the other hand, AMs also perform this exercise in a similar way for new maintenance contracts, however instead of using ARR they are guided by the Published Return Rate (PBR). This rate is a reference return rate for a given SKU and usually it is higher than the ARR.

The PC process consumes about 1 day of work per week for AMs and CSEs.

4.1. PROBLEMS/PROPOSALS

When filling the PC in Salesforce the AMs and CSEs only have access to the discount they want to apply, the price discount (price per unit desired) and the minimum and maximum quantity that the client can order. Also, there is no field that gives immediate visibility of the actual margins of the products. This contrasts with the Costing Tool file, where the margin information is known.

After the PC is submitted, it will go for approval. In the approval process it is guaranteed the company's margin, and it is checked if the gross margin of the contract renewal is doubtful or not accepted (benchmarks that will be explained later).

The contract renewal is approved if the gross margin is above 60%, if it is between 40% and 60% it is considered doubtful, that is, it needs revision and below 40% the contract is not accepted. When the Gross margin of a contract is above 60%, a more aggressive discount can be applied, so there will be more benefits for the company. Therefore, it is not desirable that the PC goes for verification. There is space for this process to be optimized.

In the verification process for contracts with gross margins below 60%, it will be checked the actual incidence rate of the product, ARR, if this is lower than the PBR then the entity responsible for approving the PC will manually approve the discount by using the ARR instead of the PBR. The process then continues with the automatic calculation of the gross margin, which will eventually be higher because of the replacement of the return rate.

The idea in this initial problem is to add a field in Salesforce during the filling of the PC, where the gross margin value for the product(s) would be returned, similar to what happens in the Costing Tool. This would provide visibility of the margin and an idea if the PC would be approved. Additionally, after the PC submission, the system would analyse the gross margin field, and if it was greater than 60%, the PC would be automatically approved eliminating the need for manual approval, thereby reducing the workload of PCs received by the departments.

Another idea is, when AMs create the first maintenance contract, they use the PBR. However, if the customer, for example is a retail company, and the organization already has contracts with another company in the same sector, it would be possible to use the ARR for products common in both contracts. This way, since AMs are already familiar with the behaviour of the product or family of products, they would have greater flexibility to request a more aggressive discount. As a result of this change, the number of PCs accepted in a first submission would possibly increase. This improvement would enhance the margin calculations of PCs for AMs and the process of creating them.

To support this, a proposed solution is to implement an icon in Salesforce during PC creation that allows to choose between using the ARR or the PBR.

4.2. IMPLEMENTATION IDEA

In the first case, the gross margin would be calculated using the same formula as the Costing Tool, and the value would be returned after the PC is filled.

In the Costing Tool, there is a "Use Manual Return Rate" icon that, when selected, allows the ARR to be inserted, making it the rate used for calculations instead of the PBR. Therefore, as previously mentioned, the idea is to implement a similar icon during the PC creation process.

To implement these changes, it is required to get the necessary data by extracting the respective ARR from a database for the Stock Keeping Units (SKUs) included in the renewal contract. This way, when selecting the icon that allows choosing between using the ARR or the PBR, the calculations in the PC will be performed based on the selected option.

Through the implementation of this approach, the organization would minimize the following resources:

- Time/cost savings
- Information security
- Reduced communication
- Department workload

On other hand the PC process creation would improve by giving a greater visibility of the margin and improve calculation of the margin for the AMs.

These improvements are centred on hierarchical levels i.e., reducing the workload of other departments by not receiving a lot of emails and PCs to verify, which leads to a decrease in the total time of the PC process and in streamlining the work of both teams when creating the PC.

As stated on the prior chapter, the main model that determines the line of events of a successful implementation of a BPM approach is the BPM lifecycle. So, the case study will follow as a guiding framework this lifecycle. Each stage of BPM lifecycle will be used to structure and conduct analyses trough the case study, ensuring a systematic approach.

This method will allow case study's progress to be conducted in a logical manner, from the identification and modelling of processes, ensuring a comprehensive understanding for both researcher and readers of the study.

5. FIELD WORK

5.1. PROCESS IDENTIFICATION

This case study focuses on the PC process, which is critical to the organization's sales and customer success operations.

The PC process is fundamental in managing discounts and special pricing approvals within the company. It is primarily used by AMs and CSEs when negotiating conditions of a contract and pricing adjustments for customers. The process's efficiency is important since it has a direct impact on revenue, profitability, and customer satisfaction.

Currently, this process is reliant on manual operations, like sending emails to get data and the use of the pricing simulation tool, Costing Tool. The process consumes a significant portion of work hours, leading to delays and waiting times, potential errors, and increased workload on teams responsible for pricing approvals.

The following core activities belong to the PC process:

1. Request Initiation – AMs or CSEs create a PC within Salesforce.
2. Data Retrieval – Users gather pricing data from external sources such as PBI dashboards and an email with data from the file Costing Tool to determine the financial impact of discounts.
3. Submission for Approval – Once the PC is finalized, it is submitted for internal approval.
4. Approval Workflow – Depending on predefined margin thresholds (e.g., gross margins above 60%, between 40% and 60%, or below 60%), PCs either are approved, or may be rejected. In this last outcome there will be required an additional pricing adjustment by the user.

The process architecture of the case study is structured within three hierarchical levels:

Core Process Level: The overarching business function, i.e., Sales and Customer Success Management.

Support Process Level: The specific PC process, which enables the execution of sales and contract renewals.

Detailed Process Level: The granular steps within the process, including opportunity initiation, data retrieval and approval workflows.

These detailed steps can be evaluated using four performance metrics (time, cost, quality, and flexibility):

- Time: The process consumes approximately one full workday per week for AMs and CSEs or in extreme cases one week of waiting for the PC approval.
- Cost: Manual data extraction can lead to errors (e.g., manually retrieving data from PBI), increasing labour costs. The data in the email from the file Costing Tool can have errors.
- Quality: User may not reflect real information on the justification of the PC i.e. lacks good justification, which can lead to inaccurate financial reporting.
- Flexibility: The pricing policies and verification of PCs make the process difficult to changes in terms of automation.

5.2. PROCESS DISCOVERY

In this phase the current flow of the business process was modelled. To ensure a comprehensive understanding of its operation and to identify opportunities for improvement.

Before modelling the current processes, it was necessary to collect data to build an accurate knowledge of how the process operates in practice. To collect this information, multiple structured and informal interviews were conducted with a CSE who has deep knowledge of both his role and the AM's role in the process.

These multiple interviews were essential to ensure that the modelled processes accurately reflected the reality of the stakeholders' daily activities.

Throughout the interviews, the stakeholder highlighted certain inefficiencies and pain points within the processes, providing valuable insights. As a result, these observations created space to think about potential improvements while the AS-IS process was being modelled.

5.3. PROCESS ANALYSIS

Following the collection of data and the development of the AS-IS model of the PC process, in this section it is analysed the current process performance. This analysis is based on the four key performance metrics established in the literature.

5.3.1. Account Manager

The analysis is divided by role, beginning with a review of the AM's part, which is supported by the CSE at various stages.

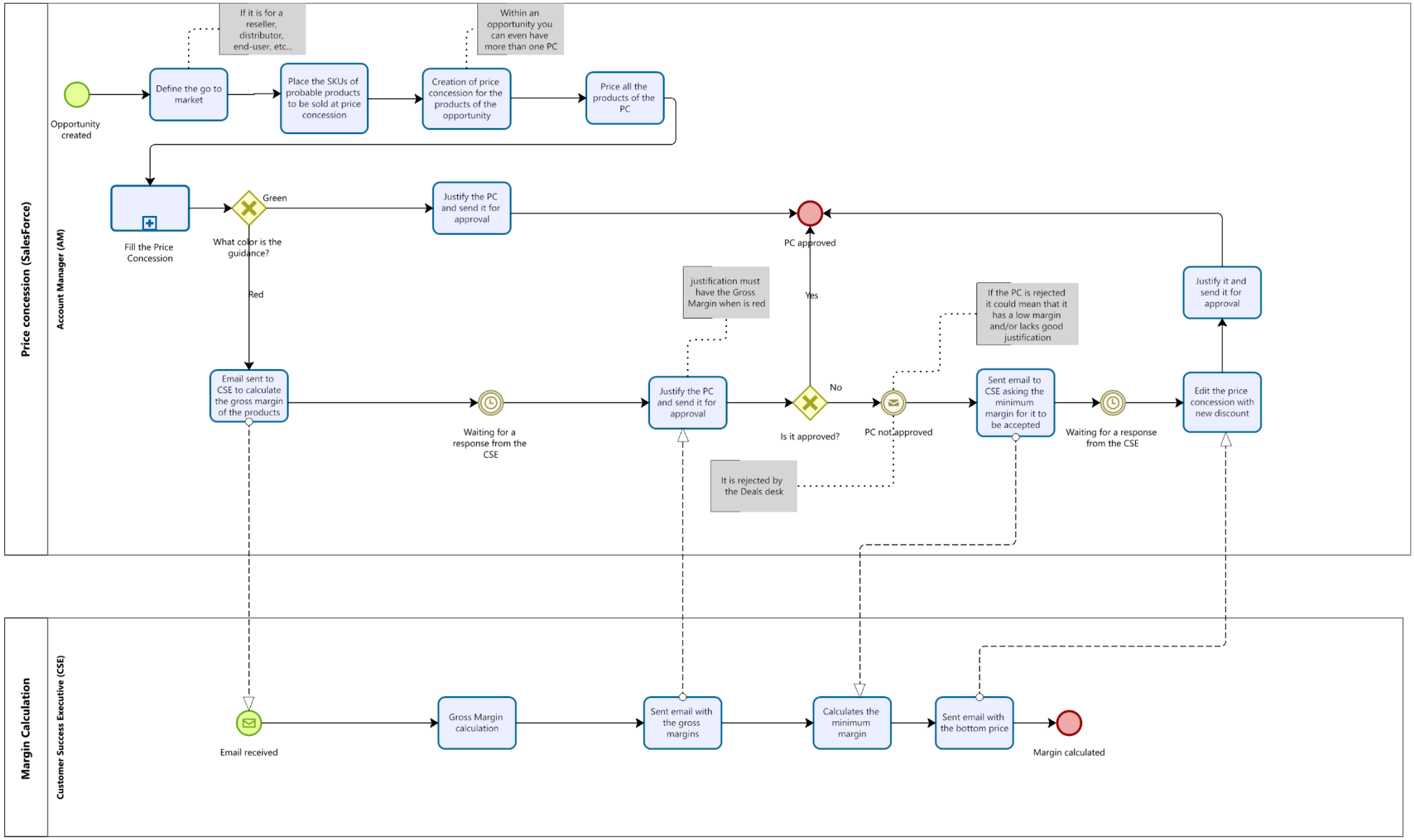

Figure 7 – AM AS-IS process model

The full process starts when an opportunity is created. Then the user needs to:

- Define the go-to-market – The AM writes in the system (Salesforce) for which user the PC will be directed to (e.g., reseller, distributor, end-user...)
- Place SKUs of the products – AM puts the SKUs of probable products to be sold or associated to a service, at PC.
- Create the PC – For the products of the opportunity
- Price all products – By clicking in the button “price all” the system gives the respective price for all the products.

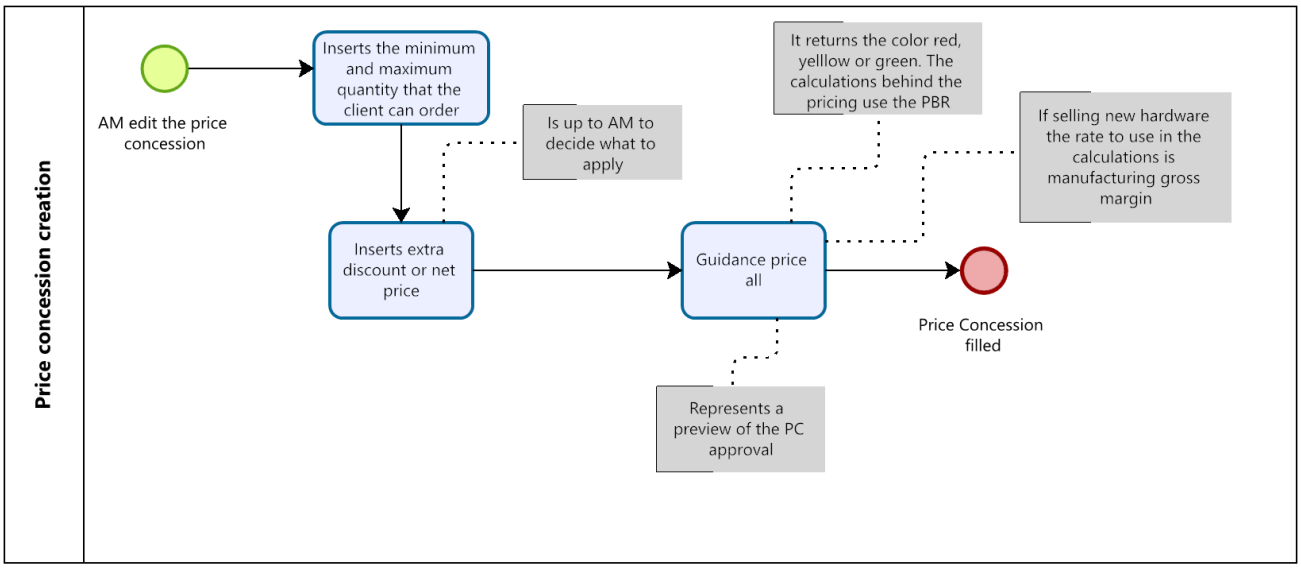

Figure 8 - AM AS-IS sub-process “Fill the PC”

A key subprocess, “Fill the PC”, captures the steps that the AM goes through to edit the PC. The user starts by inserting minimum/maximum order quantities, inserts the discount or net price that he wants to apply and finally, by clicking in “guidance price all” the system calculates a guidance approval colour (green, yellow, or red) and returns it in a field called “guidance”. The colour green means the gross margins is above 60%, between 40% and 60% the colour is yellow and below 40% the colour is red and also the colours represent a preview of the PC approval. The calculations behind the "guidance price all" use the PBR, the same applies for the CSE’s process.

If the PC's guidance result is green, the process moves with the AM justifying the PC and send it for approval.

However, if guidance is red, it requires communication with the CSE to calculate the gross margin in the Costing Tool file and after that the AM justify the PC with the gross margin and sent for approval. Even though the guidance is red, the PC could still be approved by the deals desk (approval department). If the PC is not approved by the deals desk it could mean that it has a low gross margin or lacks good justification. When this happens, the AM sends an email

to CSE asking the minimum margin for it to be accepted, CSE sends the bottom price, AM edits the PC with new discount and finally justify it and send it for approval.

By analysing the process by performance metrics:

Time

- Significant time is consumed waiting for responses from CSEs, when PCs receive a red guidance. The process of calculating and recalculating margins introduces major delays.
- The dependency on external email communications further prolongs decision-making time.

Cost

- Manual work performed by AMs and CSEs increases operational costs, primarily due to duplicated work (e.g., multiple margin recalculations).
- The data received in the emails from the CSE can have errors.

Quality

- Inconsistent or poorly justified PCs increase the probability of rejections, which negatively impacts approval rates and delays sales processes.

Flexibility

- The process is rigid and lacks dynamic adjustment based on real-time information (e.g., no visibility of the margin values during PC creation).
- The need for multiple manual interventions to correct PCs limits the flexibility to respond quickly to market opportunities.

5.3.2. Customer Success Executive

Finally, the CSE's AS-IS model will be analysed similar to the AM's part.

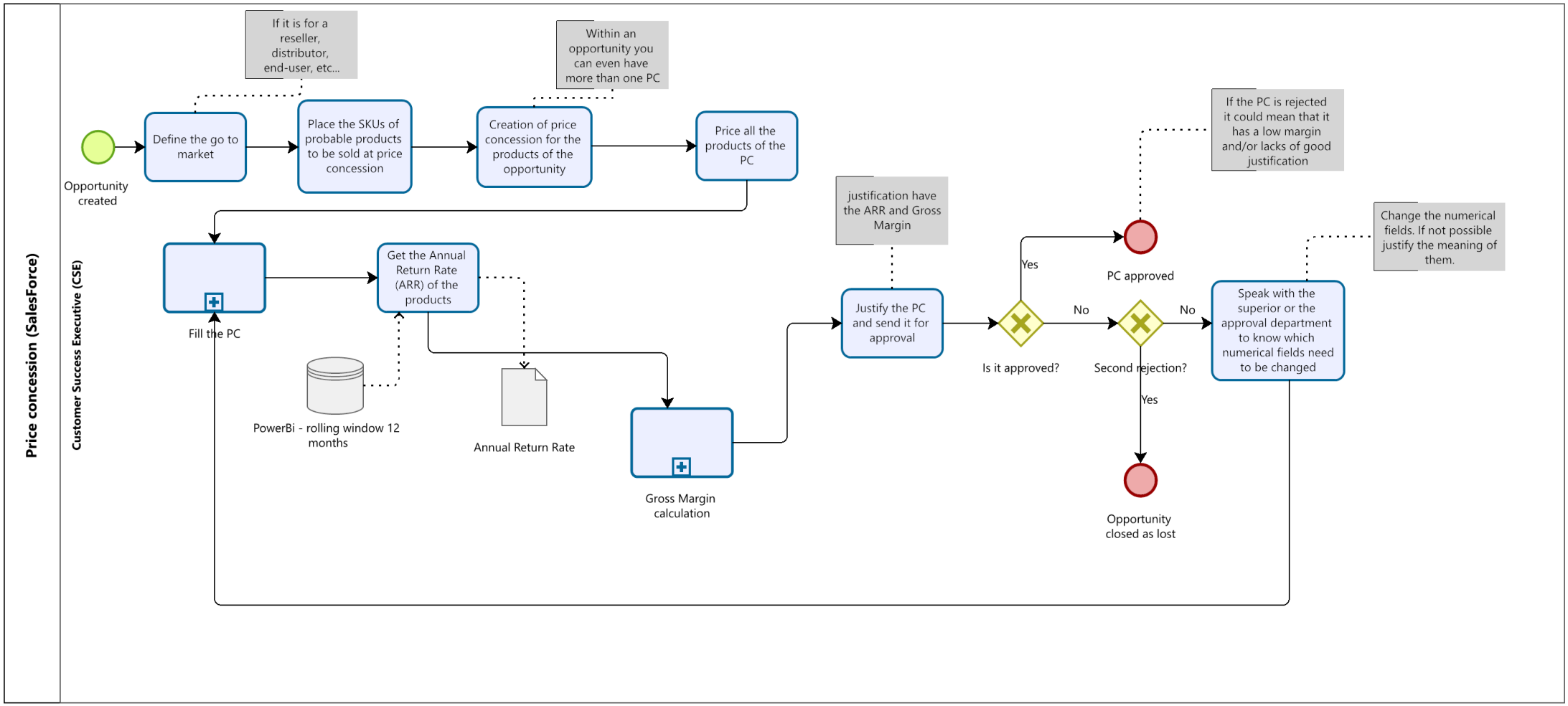

Figure 9 – CSE AS-IS process model

The process for the CSE begins as the same way as the AM's by defining the go-to-market, placing the SKUs of the products that are likely to renew the maintenance service, creates the PC for the products of the opportunity, and finally the system gives the respective price for all the products.

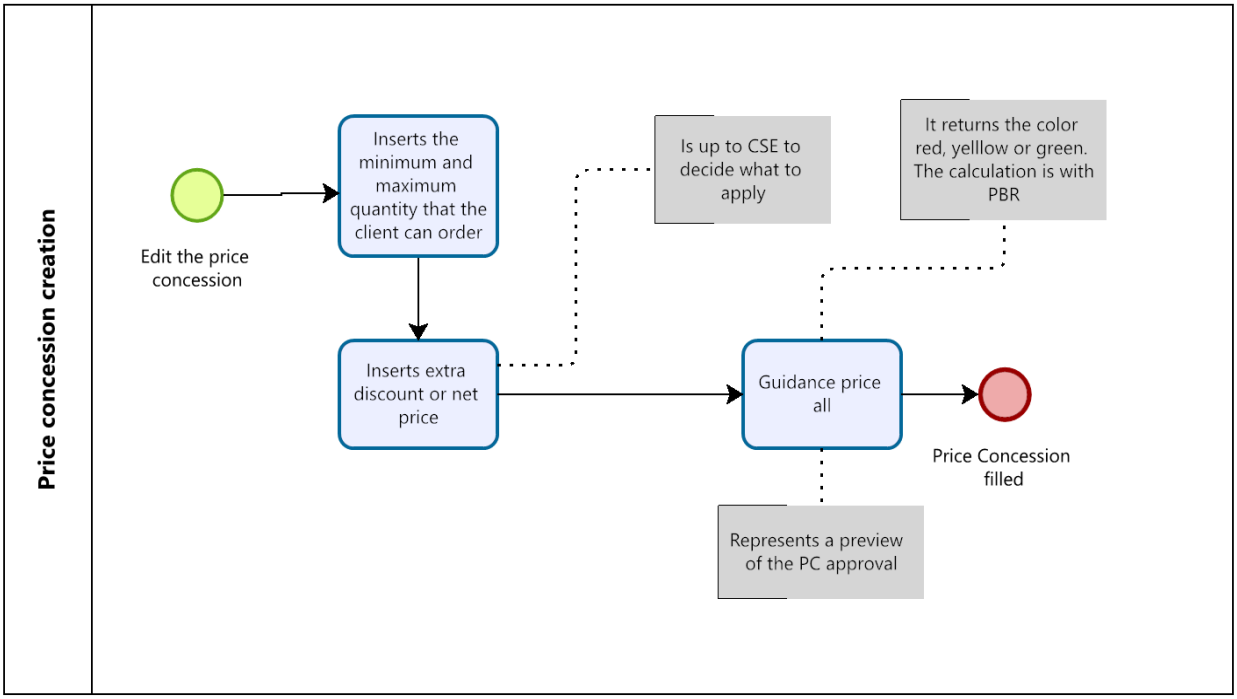

Figure 10 – CSE AS-IS sub-process "Fill the PC"

During the Fill the PC subprocess the CSE does the same process as the AM to edit the PC.

After filling the PC, the CSE retrieves the ARR of the PC's products from the PBI dashboard. This ARR will be used in two activities, in the following subprocess "Gross Margin Calculation" to calculate the gross margin and to justify the PC.

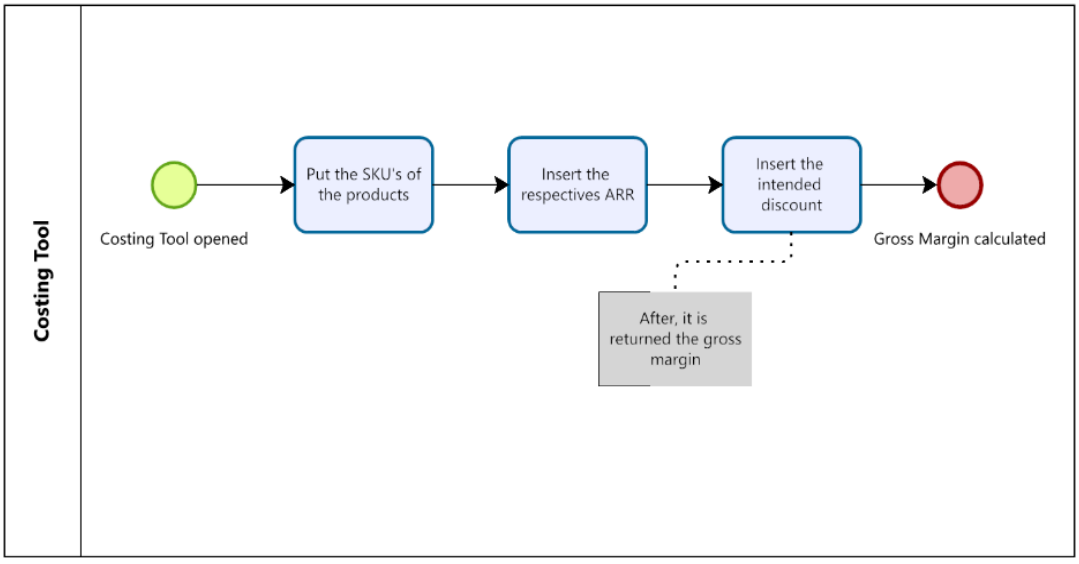

Figure 11 - CSE AS-IS sub-process "Gross Margin Calculation"

The second subprocess, is performed using the file Costing Tool:

- The CSE inputs the SKU codes, the corresponding ARR values, and the intended discount.
- The tool then calculates and returns the gross margin.

Finally, the CSE incorporates the calculated gross margins and the ARR into the PC justification and sends it for approval.

If the PC is rejected after submission, the CSE should discuss with the approval team (deals desk) or with his superior to identify which numerical fields need to be adjusted. This involves a series of interactions where the CSE consults his superior or the deals desk. During these discussions, they review the feedback provided on the rejected PC and highlight the necessary adjustments to meet the approval criteria.

If a second rejection occurs, the opportunity is closed as lost.

Analysing the CSE's process by performance metrics:

Time

- The need to manually extract ARR data from PBI and input it into the Costing Tool results in process delays.
- Reworking PCs after rejection (including further calculations and adjustments) further extends process completion time.
- Waiting for feedback or new instructions after rejection creates additional downtime.

Cost

- The need for frequent interactions with the deals desk or superiors to adjust numerical fields after a PC rejection adds operational workload, potentially increasing labour costs.
- The iterative nature of the process, especially when dealing with rejections and subsequent adjustments, can lead to increased resource utilization and higher overall costs.

Quality

- Reliance on manual data entry (retrieving ARR from PBI) introduces a high risk of inaccuracies in margin calculations.

Flexibility

- The process lacks dynamic capabilities to adjust or calculate margin data automatically during the PC creation phase.

- After a rejection, the absence of automated recalculations forces the CSE to manually rework the margin or modify discounts.

The analysis of the current PC process, from both the AM and CSE perspectives, reveals a series of inefficiencies. While AMs face repetitive cycles of editing and justifying PCs, especially when guidance is red, which leads to dependency on CSEs for margin calculation. The lack of real-time visibility into gross margins and the reliance on email exchanges result in substantial process delays.

On the other hand, CSEs are responsible for retrieving and calculating accurate margin data, but they rely on external data sources and systems such as PBI and an Excel file. Their process is equally constrained by repetitive tasks and limited system integration, especially when dealing with rejected PCs that require numerical field revisions and coordination with the approval department.

In both cases, the absence of system automation and real-time data visibility leads to delays, additional workload, and inconsistencies that compromise process quality and responsiveness. These limitations highlight the need for a redesigned, streamlined workflow that leverages automation and digital integration to address the identified issues.

5.4. PROCESS REDESIGN

In the initial process analysis, the AMs and CSEs are responsible for configuring the PC by entering quantities, discounts, or net prices, and then relying on the system-generated pricing guidance. However, because the guidance calculations are based on the PBR, this approach often results in a limited number of "green" guidance outcomes, which reduces the probability of pre-approved PCs.

The major constraint identified and highlighted by the stakeholder was the inflexibility in using only the PBR for price calculations. This metric is used by default in the system and the user is restricted from using a different rate such as the actual ARR of the products instead of the default one (PBR). This limitation can lead to fewer pre-approved PCs.

As previously stated in the case study discussion, one of the proposed ideas was to use the ARR of products common in existing contracts with companies in the same sector, rather than the PBR, when AMs create the first maintenance contract.

5.4.1. Account Manager

To address the proposed idea, the redesign introduces a new editable field in the PC editing interface that allows the AM to input the ARR for the products of the PC.

The AM will retrieve the ARR from the PBI (12-month rolling window) and then put it manually into the new editable field. Now, when the AM selects “guidance price all”, the system will use the inserted ARR instead of the PBR for its calculations.

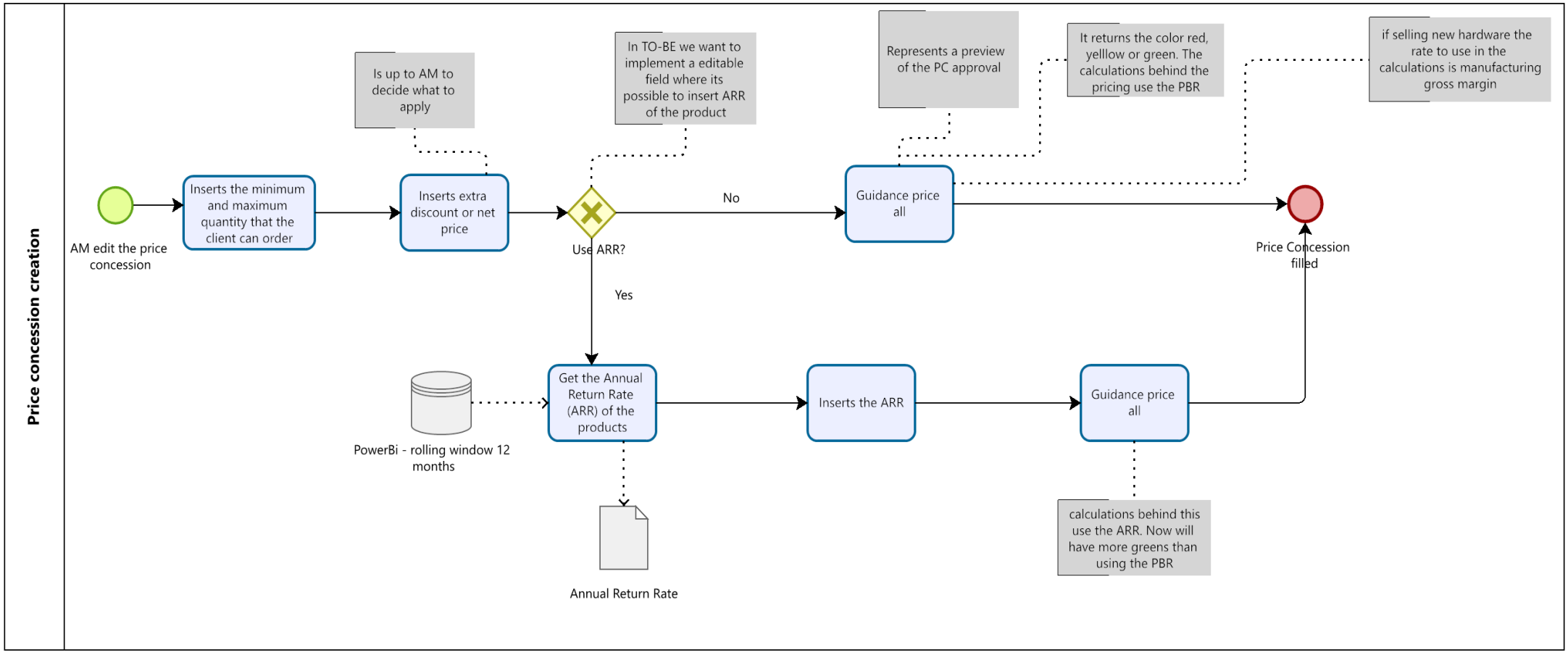

Figure 12 – AM TO-BE sub process model “Fill the PC”

This small yet impactful modification would allow AMs to request more aggressive discounts, potentially increasing the number of PCs accepted on the first submission and improving both the margin calculation and the process of creating the PC. Also, it reduces the need to iteratively communicate with the CSE for margin calculations and adjustments.

5.4.2. Customer Success Executive

Following the same improvement suggested for the AM, the CSE process also incorporates an editable field directly within the PC interface. Also, another improvement was modelled in this part, that was the automatic approval of PCs when the guidance is green.

During the "Fill the PC" subprocess, an editable field is introduced that allows CSEs to input the ARR of the products, ensuring that this data is used during the system price guidance calculations. By using ARR, which more accurately reflects the product return rate, the pricing guidance becomes more aligned with real margins.

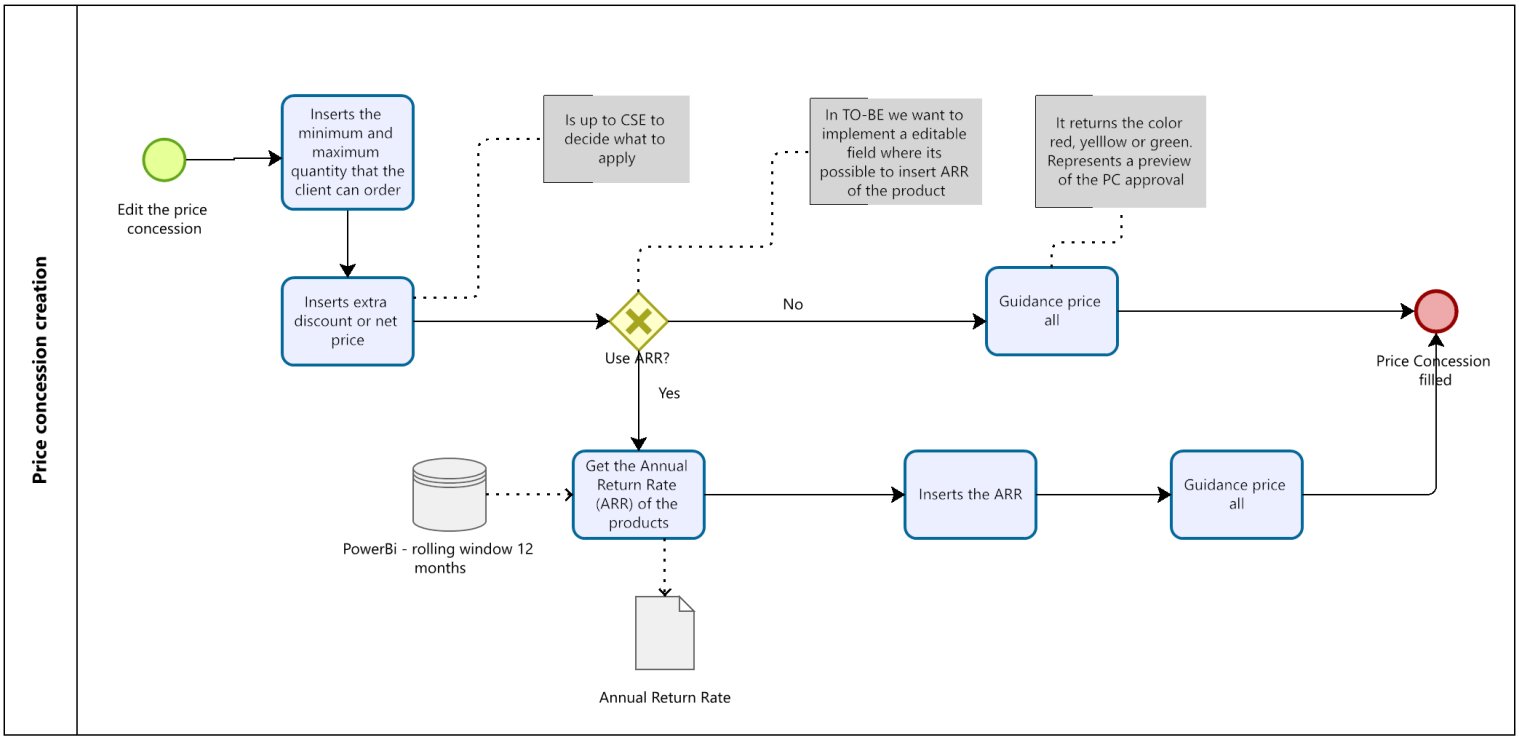

Figure 13 - CSE TO-BE sub process model "Fill the PC"

Unlike the AM process, where PCs with green guidance require justification, an additional improvement was incorporated for CSEs. If the system returns a green guidance, the PC is automatically approved by the system without the need to introduce any justifications. This automation optimizes the approval process by eliminating the need to justify when the margin is considered acceptable, thereby reducing unnecessary workload and minimizing delays.

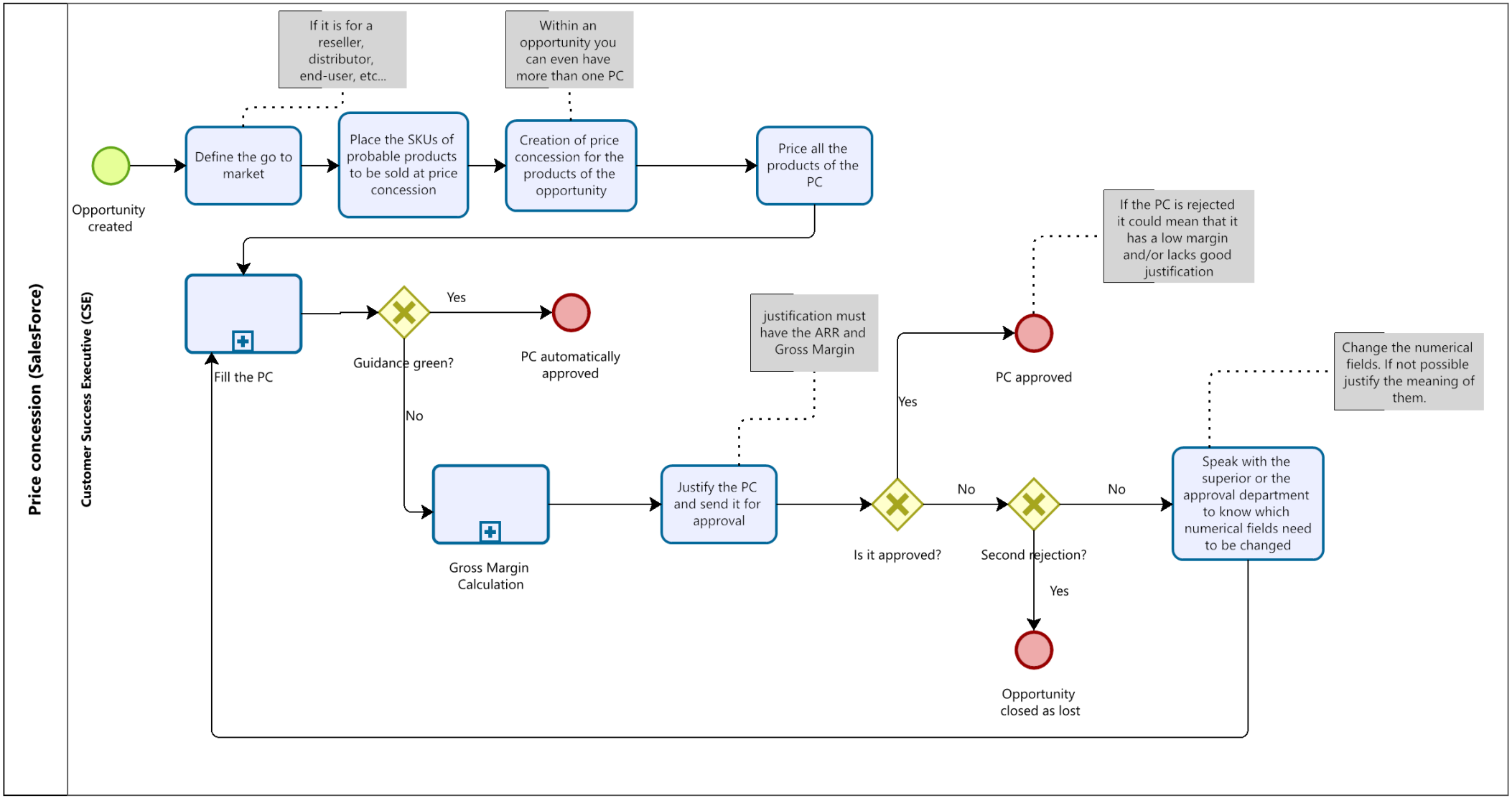

Figure 14 - CSE TO-BE process model

5.5. RECOMMENDATIONS TO SME SUPPORTED WITH A BPM APPROACH

This chapter provides practical recommendations for SMEs based on the findings of the case study and the application of the BPM lifecycle. The goal is to offer a consultancy analysis that SMEs can use as a reference when considering process optimization and digital transformation initiatives.

The table below summarizes the proposals developed in this case to study, highlighting the issues addressed, the proposed solutions, and the expected benefits.

Process Area	Identified Issue	Proposed Improvement	Expected Benefit
Fill the PC (AM & CSE)	Inflexibility in using only the PBR for price calculations	Editable field to input ARR	More flexibility and accurate margin calculations; request more aggressive discounts; Increase of PCs approved on the first submission; Reduces communication with CSE
PC Approval (CSE)	Manual approval even when margin is acceptable	Automatic approval for green guidance	Reduced workload for deals desk; faster approvals

Table 2 - Overview of process improvement proposals and expected outcomes

Based on the case study findings, the following recommendations are proposed for SMEs:

1. Start with Process Mapping: Use BPMN to document and understand the current processes. This will help identify inefficiencies and areas for improvement.
2. Prioritize High-Impact Processes: Focus on processes that are repetitive, time-consuming, or prone to errors, these are the ones that will need improvement or optimization.
3. Introduce small Improvements: Before investing in automation tools implement structural changes such as suggested in the case, the editable fields.
4. Plan for Gradual Automation: Use the TO-BE models as a foundation for future automation. Begin with tasks such as data retrieval using tools like RPA.
5. Promote collaboration between departments: Ensure the departments involved in the process are aligned and communicate effectively during implementation.

6. RESULTS AND DISCUSSION

The suggestion of the TO-BE models for both the AM and CSE gives several benefits for the organization. These improvements, though simple in design and model, provide efficiency, gives users more freedom, and better use of operational data.

By introducing an editable ARR field into the PC editing phase, both AMs and CSEs acquired more flexibility to interact with the system influencing margin calculations. The use of ARR, in place of the previously one (PBR), allowed for more accurate and realistic margin calculations. This adjustment alone could result in a higher rate of green guidance outcomes, meaning more PCs are likely to be pre-approved without requiring additional adjustments and with fewer communications with the CSE.

In the CSE process the same suggestion of an editable field was modelled. Additionally, another suggestion was added that was an automatic PC approval rule for green guidance. This step allowed the cases where margin is desirable (guidance green) to proceed directly to a status of an approved PC. While this could not be implemented in the AM process model due to internal policy limitations, the structural benefits modelled for the CSE illustrate the automation potential for future reference.

The TO-BE process models for both AM and CSE roles developed several shared benefits:

- Streamlining of processes: The reduced frequency of redundant interactions, particularly email chains related to margin calculations, adjustments, and revisions with the deals desk, has contributed to a more streamlined workflow.
- Reduced lost time: By minimizing the number of rejected PCs, the time required to identify necessary adjustments and the waiting time for approval, the overall time of the processes is improved.
- Reduced pressure on the deals desk and upper management: With higher gross margins and improved guidance outcomes, the need for deals desk approvals and upper management interventions is decreased. This frees up strategic decision-makers and minimizes numerical field revisions in the PC.

While the proposed changes do not yet include the use of any IT tools or automation technologies, such as BPMS, RPA they open the way for future digital transformation initiatives in the context of SMEs. As stated in the literature review, “BPM supports the digitalization of SMEs’ operations by identifying manual tasks that can be automated.” the redesign of the PC process identifies areas and critical activities where these automation technologies could later be implemented.

Furthermore, as stated in the literature, BPM's focus on internal process optimization helps SMEs align their workflows with both market expectations and internal resource limitations. In this case, the redesigned processes for AMs and CSEs show that even without full automation, meaningful improvements in time, efficiency, and usability can be achieved. This confirms that BPM not only supports immediate enhancements in operational workflows but also encourages continuous improvement and awareness for upcoming digital tools, as highlighted in the literature.

7. CONCLUSIONS AND FUTURE WORK

This master thesis investigated the application of BPM within SMEs, focusing on the optimization and improvement of a PC process. The BPM lifecycle proposed by Dumas was used as a guiding framework and the process was examined through different stages: process identification, process discovery, process analysis, and process redesign. This structured sequence, served as a foundation to demonstrate how a systematic BPM approach can reveal inefficiencies and support process improvements.

The case study focused on the roles of AMs and CSEs, whose processes consume a lot of time to be completed. Through stakeholder interviews, process modelling and analysis, various topics were identified: PCs with green guidance are not being automatically approved, data is manual retrieved from external sources, and frequent interactions between departments, especially when PCs were rejected.

To address these issues, two key improvements were modelled in the TO-BE process:

- The creation of an editable field to insert the ARR, which allows for more precise margin calculations.
- The automatic approval of PCs with green guidance in the CSE process, reduces workload and streamlines the approval flow.

Although the proposed improvements are relatively small and do not involve the use of automation technologies, they significantly enhance data visibility and traceability, improve decision-making efficiency, and reduce workload across departments. These suggestions, applied to both AM and CSE, demonstrate how even low-tech interventions can add meaningful value to business processes.

The objectives defined at the beginning of this master thesis were successfully addressed through the case study and with the support of the BPM lifecycle.

- **Evaluate the company's automation needs**: Through the case study investigation and stakeholder interviews key areas within both roles were identified where automation and digital improvements could add value. Specific tasks such as margin calculations, ARR extraction, and the approval of PCs were recognized as time-consuming and repetitive, highlighting the need for future automation.
- **Identify operational inefficiencies**: The process analysis phase revealed clear inefficiencies caused by excessive communication between departments and waiting times. The processes lack integration between systems (Salesforce, Excel Costing Tool, PBI) requiring users to manually retrieve data, which is time-consuming and increases the risk of human error. Additionally, the processes

offer little flexibility for users to select or adjust the rates they want to apply, which led to the recommendation of implementing an editable field during the redesign phase to address this limitation.

- **Assess BPM's potential to simplify operations**: By using the BPM lifecycle as a support methodology and modelling the processes using BPMN, the research demonstrated how BPM can help redesign workflows. The resulting TO-BE models improved the processes in efficiency, flexibility, and established a foundation for the integration of future automation solutions.

7.1. CONTRIBUTIONS TO SMES AND THE ACADEMIC FIELD

In the context of SMEs' operations, this research contributes to process optimization by presenting a replicable methodology for assessing and redesigning business processes using BPM principles. The redesigned processes for AMs and CSEs demonstrate that even in the absence of advanced automation tools, SMEs can achieve significant operational improvements by modifying process logic and data usability.

The redesigned processes served as a practical example and established a foundation for SMEs, demonstrating how BPM can be an effective approach for improving operational processes. By applying BPM principles, SMEs can gain greater control over their processes, detect inefficiencies, and make focused adjustments that directly address those issues. Moreover, these processes reveal opportunities for automation and provide a framework for SMEs to begin integrating automation technologies, supporting a gradual transition toward digital transformation. Finally, this research, with the support of the case study, not only contributes to process improvement but also promotes innovation and increase the adoption of digital tools within SMEs.

While BPM has been extensively studied in the context of large organizations, its relevance and adaptability to SMEs remain underexplored as noted in the introductory chapter. This master thesis provided value to the underexplored topic on BPM applications within SMEs. Additionally, the study helped to fill that gap by showing how BPM's structured and iterative approach can be adapted to SME constraints. It also highlights the various automation technologies and their potential as practical tools to support SMEs in process optimization. Furthermore, the study supports the value of using BPMN as a modelling language to visualize and redesign processes, offering a replicable framework for future academic investigations focused on BPM implementation within SMEs.

In alignment with Dumas and Weske, this research supports the view that BPM is not only a tool for improving efficiency but also a strategic enabler of digitalization.(2018; 2024)

7.2. LIMITATIONS

Throughout the development of the master thesis, certain limitations were encountered that affected the scope and depth of the research. These constraints influenced the choices made during the process redesign and limited the extent to which some improvements could be proposed.

One limitation was the incapacity to propose partial automation of the redesigned processes using the automation technologies referenced in the literature review, such as RPA. Initially, the intention was to suggest how it could be integrated to optimize and automate the processes. However, through interviews and considering the researcher's own technical capabilities, there was insufficient expertise available to support the suggestion of automation tools within the case study and the master thesis. Therefore, the improvements proposed in this study remain focused on process logic and structural redesign, with the recognition that the TO-BE processes have the potential for future automation.

The redesign of the AMs' process presented one limitation that impacted the scope of proposed improvements. While the redesigned process for CSEs allows for automatic approval of PCs when the guidance result is green, this same automation could not be proposed to AMs. Due to internal policy restrictions, it is required that all PCs submitted by AMs be reviewed and validated by the Deals Desk. Since AMs are responsible for new sales, it is necessary to have control by the Deals Desk to ensure that the company's profit margins are maintained. As such, even in the TO-BE model, PCs created by AMs must remain under the control of the approval department, preventing the implementation of automated approval mechanisms in that process.

Two early improvement ideas were referred in the case study chapter:

One initial proposal involved adding a field in Salesforce during the PC completion phase that would return the gross margin value of the product(s), similar to the calculation currently done in the Costing Tool file. The intention was to give AMs real-time visibility of the margin value to help them understand whether a PC was likely to be approved. However, when this idea was presented, the stakeholder clarified that AMs are not permitted to have visibility of gross margin data. As a result, this improvement could not be included in the redesign.

Lastly, the other early proposal was the automation of ARR extraction. To get the necessary information the system would automatically retrieve the ARR data from the relevant database for the SKUs included in the renewal contract. A selectable icon would be introduced in Salesforce, allowing users to choose between ARR and PBR. The system would then calculate the pricing guidance based on the selected rate. However, this automated approach was not proposed. Instead, the final redesign suggested the use of an editable field where users can manually enter the ARR retrieved from PBI. The margin is then calculated based on the entered rate. The decision not to propose full automation for ARR extraction was again due to the technical limitations of the researcher.

7.3. FUTURE WORK

The improvements proposed throughout this study have demonstrated clear benefits, but they remained centred on process logic and structural redesign.

While this master thesis adopts a consultant perspective, future studies could take a more technical direction. For instance, in future research a case to study could be conducted in a more technical perspective in which a process within an SME is optimized using the automation technologies discussed in the literature such as RPA to extract and process data and BPMS to execute and monitor the process. This would lead into application of the last two phases of the BPM lifecycle: Process Implementation and Process Monitoring. In the implementation phase, it would be investigated with IT department of the company the technical requisites for these tools to be implemented. Finally, in the monitoring phase, the TO-BE models could be validated using data generated during process execution to assess their performance and make necessary adjustments, ensuring continuous improvement.

This would allow SMEs to compare between two distinct approaches: the one presented in this master thesis, focused on structural and logic-driven improvements, and a technical-driven approach centred on automation. These two types of work would offer valuable insights into how SMEs can improve their processes using complementary strategies.

Another future research would be to apply the methodology developed in this master thesis to a different industry sector. While the current study was focused on a case from the financial sector, a similar BPM-based consultancy approach could be implemented in another SME operating in a distinct sector. This would allow for the development of a comparative matrix that evaluates the effectiveness, adaptability, and outcomes of the approach across sectors. For instance, order-to-cash, inventory management, and HR-related processes, are examples of common processes from different sectors that could benefit from BPM initiatives (Dumas et al., 2018). A cross-sectoral comparison of these applications would offer valuable insights into how BPM can support the creation of more generalizable and practical frameworks for process improvement in SMEs.

Lastly, future research could explore the use of Process Mining as an alternative to BPMN for process discovery and analysis. Instead of relying on stakeholder interviews for modelling, process mining could be used to improve real processes by extracting insights and information from event logs available in information systems. The event logs are generated during the execution of a business process. Process mining offers a more objective and detailed understanding of how processes are executed. Integrating process mining into future studies would enhance the accuracy of process analysis and support continuous monitoring and improvement, making it a valuable complement to traditional BPM approaches (Dumas et al., 2018).

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APPENDIX

APPENDIX A - ETHICS COMMITTEE REPORT

This is to certify that
Project No.: **INFSYS2025-7-33231**
Project Title: **Price concession process: consultancy analysis supported in a BPM approach using BPMN to improve organizational activity**
Principal Researcher: **João Afonso Pascoal Maia**

according to the regulations of the Ethics Committee of NOVA IMS and MagIC Research Center this project was considered to meet the requirements of the NOVA IMS Internal Review Board, being considered **APPROVED** on 7/3/2025.

It is the Principal Researcher's responsibility to ensure that all researchers and stakeholders associated with this project are aware of the conditions of approval and which documents have been approved.

The Principal Researcher is required to notify the Ethics Committee, via amendment or progress report, of
- Any significant change to the project and the reason for that change;
- Any unforeseen events or unexpected developments that merit notification;
- The inability of the Principal Researcher to continue in that role or any other change in research personnel involved in the project.

Lisbon, 7/3/2025

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