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Critical success factors in BPM implementation: Creating AI supported decision engine for the business.

Victor Lipov

Master Thesis

presented as partial requirement for obtaining the Master Degree in Information Management

NOVA Information Management School

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Critical success factors in BPM implementation: Creating AI supported decision engine for the business.

by

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Master Thesis presented as the partial requirement for obtaining a Master's degree in Information Management, specialization in Information Systems and Technologies Management

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NOVA Information Management School

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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.

[Lisboa, 13/07/2024]

ABSTRACT

In today's rapidly evolving business environment, achieving operational efficiency, transparency, and market responsiveness is crucial for success. Business Process Management (BPM) is a critical tool in this pursuit, encompassing the design, configuration, enactment, and analysis of business processes to drive continuous improvement. Recent advancements in Generative Pre-trained Transformer (GPT) models offer new opportunities to enhance BPM through improved decision-making and progress-tracking capabilities. However, there is a significant gap in the literature concerning the systematic development of AI-powered decision engines to support BPM implementation.

This thesis addresses this gap by partially employing Design Science Research Methodology (DSRM) with some limitations described in the document to develop a decision engine artifact tailored for BPM adoption. The research utilizes concept of Critical Success Factors (CSFs) essential for BPM, incorporating AI to automate and optimize decision-making processes. The methodology involves a thorough literature review, the conceptualization and design of a decision engine model, and the development of a prototype. This prototype is evaluated through expert reviews, providing critical insights into its effectiveness and practical applicability.

The findings indicate that the integration of AI, particularly GPT models, can significantly enhance BPM by providing dynamic insights and automating complex decision-making processes. The developed decision engine prototype offers a structured approach to BPM adoption, tailored to different organizational stages and supported by a comprehensive list of CSFs. This research contributes to both academic knowledge and practical applications, offering a foundational framework for organizations to enhance their BPM efforts and advance the dialogue on data-driven decision-making in business process implementation.

KEYWORDS

Business Process Management; Artificial Intelligence; Decision Engine; Critical Success Factors

Sustainable Development Goals (SDG):

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LIST OF ABBREVIATIONS AND ACRONYMS

AI	Artificial Intelligence
BPM	Business Process Management
CSF	Critical Success Factors
DSRM	Design Science Research Methodology
GPT	Generative Pre-trained Transformer
LLM	Large Language Models
NLP	Natural Language Processing
ROI	Return on Investment
SDG	Sustainable Development Goals
DE	Decision Engine

1. INTRODUCTION

In an organization, business goals are achieved through the execution of business activities. As per M. Weske (Weske, 2012), coordinated sets of these activities are called business processes. Business processes can be executed by human or non-human (computer, robot) actors. Business Process Management (BPM) deals with business process improvements through the design, configuration, enactment, and analysis of business processes (Buh et al., 2015; Van Der Aalst, 2013).

In the dynamic landscape of today's business environment, BPM stands as a key component for organizations striving to enhance operational efficiency, transparency, and market responsiveness. Considering the recent emergence of Large Language Models (LLMs) with remarkable reasoning capabilities, LLMs can accomplish text-related BPM tasks (Grohs et al., 2023). These advanced AI models present a potential solution for improving the achievability, predictability, and automation of decision-making processes. Furthermore, they can shift the perspective from existing processes to new, optimized processes.

However, a notable gap exists in the literature concerning the systematic development of such AI powered decision engines to support BPM implementation.

This thesis aims to address this gap by employing Design Science Research Methodology (DSRM) (Venable, J. R., Pries-Heje, J., & Baskerville, R., 2017). The approach is to identify and utilize Critical Success Factors (CSFs) within BPM to develop a decision engine artifact that supports BPM's practical implementation.

Methodologically, this research will involve a thorough literature review to find CSFs essential for BPM, recent application of AI in BPM area, followed by the conceptualization, design, and development of a decision engine model using some components of Design Science Research Methodology (DSRM). The anticipated results include the development of a prototype with a list of CSFs and a theoretical decision engine model, which will be backed by critical reviews from experts with varying levels of expertise in the respective field of study.

This research aspires to contribute both to academic discourse and practical applications, offering a foundational framework for organizations to enhance their BPM efforts and advance the dialogue on data-driven decision-making in business process implementation.

2. LITERATURE REVIEW

This literature review aims to investigate the critical success factors (CSFs) and to find which CSFs are important at each stage in the implementation of Business Process Management (BPM) system (Buh et al., 2015; Castro et al., 2019) , focusing on the integration of AI-supported decision engines, specifically using Large Language Models (LLMs) like ChatGPT. This review will explore how AI can enhance BPM by identifying processes, developing implementation roadmaps, and tracking qualitative metrics such as sentiment and involvement (van der Aa et al., 2018).

A comprehensive search was conducted using databases like Google Scholar and Scopus. Keywords included “Business Process Management”, “BPM decision engine”, “CSF in BPM”, “AI in BPM”. Articles published between 2010 and 2024 were considered.

Since the area of AI, LLM, GPT etc. is quite new, we think it is important to describe specific acronyms. Therefore, the literature is organized into the following themes:

- Key Concepts and Definitions for AI-related things
- Detailed Explanations of AI Components
- Identification of current state of bpm adoption of legal entity
- Role of AI in BPM

2.1. KEY CONCEPTS AND DEFINITIONS FOR AI-RELATED THINGS

2.1.1. Artificial Intelligence (AI)

Artificial Intelligence, commonly referred to as AI, is the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. (Copeland, B. 2024).

These tasks include learning from data, recognizing patterns, understanding natural language, and making decisions. AI systems can be categorized into narrow AI, which is designed for specific tasks (e.g., virtual assistants like Siri), and general AI, which possesses broader cognitive abilities like human intelligence.

2.1.2. Large Language Models (LLMs)

Large Language Model (LLM), a deep-learning algorithm that uses massive amounts of parameters and training data to understand and predict text. This generative artificial intelligence-based model can perform a variety of natural language processing tasks outside of simple text generation, including revising and translating content (McDonough, M. 2024).

These models can perform a variety of language-related tasks, such as translation, summarization, and text generation. An example of an LLM is GPT (Generative Pre-trained Transformer), developed by OpenAI. GPT models leverage deep learning techniques to predict and generate coherent and contextually relevant text based on input prompts.

2.1.3. GPT (Generative Pre-trained Transformer)

Generative Pre-trained Transformers, commonly known as GPT, are a family of neural network models that uses the transformer architecture and is a key advancement in artificial intelligence (AI) powering generative AI applications such as ChatGPT. GPT models give applications the ability to create human-like text and content (images, music, and more), and answer questions in a conversational manner. Organizations across industries are using GPT models and generative AI for Q&A bots, text summarization, content generation, and search (Amazon Web Services, https://aws.amazon.com/what-is/gpt/., 2024)

2.1.4. Business Process Management (BPM)

Business Process Management (BPM) BPM is a body of methods, techniques, and tools to identify, discover, analyze, redesign, execute, and monitor business processes in order to optimize their performance (Dumas et al., 2018)

2.1.5. Critical Success Factors (CSFs)

Critical Success Factors (CSFs) are key areas or activities that must be effectively managed and executed to achieve the desired outcomes in a project or organization. In the context of BPM, CSFs include elements such as top management support, employee engagement, and the alignment of BPM initiatives with strategic goals. Identifying and addressing CSFs is crucial for the successful implementation of BPM projects.(Castro et al., 2019)

2.1.6. Decision Engine

For this research, we define a decision engine as a software system that uses predefined rules, algorithms, and data inputs to make automated decisions or recommendations.

2.1.7. Sentiment Analysis

Sentiment analysis, also called opinion mining, is the field of study that analyzes people's opinions, sentiments, appraisals, attitudes, and emotions toward entities and their attributes expressed in written text (Liu, 2020). Sentiment analysis is often used to gauge customer feedback, employee opinions, and social media interactions.

2.2. Detailed Explanations of AI Components

2.2.1. Machine Learning (ML)

Machine learning algorithms typically consume and process data to learn the related patterns about individuals, business processes, transactions, events, and so on. In the following, we discuss various types of real-world data as well as categories of machine learning algorithms (Sarker, 2021).

Common applications of ML include recommendation systems, fraud detection, and predictive analytics.

2.2.2. Natural Language Processing (NLP)

Natural Language Processing (NLP) is a tract of Artificial Intelligence and Linguistics, devoted to make computers understand the statements or words written in human languages. It came into existence to ease the user's work and to satisfy the wish to communicate with the computer in natural language, and can be classified into two parts i.e. Natural Language Understanding or Linguistics and Natural Language Generation which evolves the task to understand and generate the text (Khurana et al., 2023).

2.2.3. Deep Learning

Deep learning provides a computational architecture by combining several processing layers, such as input, hidden, and output layers, to learn from data (Han et al., 2022). The main advantage of deep learning over traditional machine learning methods is its better performance in several cases, particularly learning from large datasets (Sarker, 2021)

2.3. IDENTIFICATION OF CURRENT STATE OF BPM ADOPTION OF LEGAL ENTITY

Search for the BPM returns more than 40000 results and BPM adoption keywords returns 309 results on Scopus. So, the topic of BPM is important and there are a lot of research regarding Business Process Management itself and Critical Success Factors (CSF) for BPM implementation.

BPM can be understood as a set of activities, methods, technologies and coordinated tools for a structured and analytical execution of processes aiming a continuous improvement (Skrinjar and Trkman, 2013). BPM implementation requires effort, dedication and discipline on the part of the various members of the organization (Štemberger et al., 2018)

It also requires productive communication across team, alignment with global strategy (organizations have difficulty in aligning strategic objectives with the objectives of each process (Skrinjar and Trkman, 2013), availability of resources and other factors.

Not a surprise, that between 60 and 80 percent of BPM implementation projects in companies are not successful because are interrupted by other factors (Trkman, 2010). That is, when the company cannot control some critical factor in implementation, either due to a lack of knowledge or a lack of preparation, BPM implementation does not happen effectively. (Castro et al., 2019)

Among the several reasons that contribute the most to the failure of BPM projects, the following stand out: lack of support from top management; little or no BPM training for end users; and lack of communication between departments (Trkman, 2010)

In research with 219 respondents, the lack of support from top management was the main CSF (Minonne and Turner, 2012). In addition to top management support, the support of managers is fundamental since it naturally manifest a more active participation (Ceribeli et al., 2013a).

Some authors also argue that the main factor hindering the implementation of BPM is human resistance to change. (Castro et al., 2019). The lack of definition of responsibilities and the non-commitment to metrics are inhibiting success factors (Imanipour et al., 2012).

The percentage of companies failed to adopt BPM practices is a central problem for BPM both for professionals and for scholars studying this field of knowledge. The more companies increase the statistics of failure, the more demotivation and less support the implementation of BPM will have in the market, causing less interest of academics to study this field of knowledge. (Castro et al., 2019)

There are the following top 10 factors affecting BMP implementation:

Table 2.3.1 - Top 10 factors affecting BMP implementation (Castro et al., 2019)

Factors identified in the literature	**Agree Fully (%)**	**Agree Partially (%)**	**Indifferent (%)**	**Disagree Partially (%)**	**Disagree Fully (%)**
Support of top management	97.3	2.7	0.0	0.0	0.0
Align goals and targets to strategic planning and executive support throughout the implementation stages	91.2	8.8	0.0	0.0	0.0
Control resistance to change	83.2	14.2	1.8	0.0	0.9
Clear and defined responsibilities	75.2	17.7	1.8	1.8	3.5
Investing in human capital	72.6	23.9	2.7	0.9	0.0
Align IT (software) and BPM (relevant information)	68.1	26.5	0.9	4.4	0.0
Structured and systematic methodology	64.6	29.2	2.7	0.9	2.7
Continuous measurement and monitoring	50.4	35.4	2.7	10.6	0.9
Controlling excessive bureaucracy	39.8	27.4	2.7	18.6	11.5

However, the adoption of Business Process Management (BPM) in legal entities varies significantly across different organizations. Studies have shown that BPM maturity levels range from initial stages, where processes are ad-hoc and chaotic, to optimized stages, where processes are well-defined, managed, and continuously improved. Therefore, it raises the question if stated above CSFs are valid for every stage?

While some legal entities have fully integrated BPM practices into their operations, others are still in the early phases of BPM adoption, struggling with process standardization and documentation.

Luckily for us, we have an opinion on this topic in the research done by Buh et al., 2015 (Critical success factors for different stages of business process management adoption – a case study). In his research he declares five stages of BPM adoption and highlights the most important CSFs at every stage.

Table 2.3.2 - CSFs for different stages of BPM adoption (Buh et al., 2015)

BPM adoption stage	Critical success factors
Awareness and Understanding of BPM	• Empowerment of Employees • Customer Focus • Openness to Changes
Desire to adopt BPM	• Involvement and Full Support of Top Management • Project Champion • Business Drivers (a Sense of Urgency)
BPM projects	• well-communicated and clearly defined objectives, purpose, and plan of the BPM project • professional guidance of external consultants • people who are willing and motivated to change
BPM program	• Involvement and Full Support of Top Management • Professional Guidance of External Consultants • Communication
Productization of BPM	• Involvement and Full Support of Top Management • Professional Guidance of External Consultants • Identified Key Performance Indicators and Persons Responsible for their Achievement • Educated, Trained and Motivated Employees

These factors with respective breakdown through BPM adoption stages resonates with our idea. We believe that understanding the current state of BPM adoption is crucial for tailoring implementation strategies that address specific organizational needs and challenges. Therefore, proposed breakdown will be used as a foundation for development of theoretical decision engine.

2.4. ROLE OF AI IN BPM

As being said, Business Process Management aims to improve organizational activities and their outcomes by managing the underlying processes. To achieve this, it is often necessary to consider information from various sources, including unstructured textual documents (Grohs et al., 2023).

BPM researchers and practitioners make use of diverse sources of information pertaining to business processes. These sources range from well-structured process models and event logs to unstructured textual documents (van der Aa et al., 2018)

Recent advancements in Artificial Intelligence, particularly pre-trained Large Language Models (LLMs), which have demonstrated remarkable reasoning abilities across diverse

domains and tasks (Teubner et al., 2023) and GPT-like models, have significantly enhanced the ability to analyze and identify both explicit and implicit processes within an organization. It means that you can apply GPT-like models to structured and unstructured data to dig the processes or develop solution to the problem.

In the research done by (Weinzierl et al., 2024), there are three frequent examples of using ML:

- providing decision support through predictions
- discovering accurate process models
- improving resource allocation.

Keeping this in mind, researchers have developed several BPM-specific solutions that extract information from textual documents using Natural Language Processing techniques. (Grohs et al., 2023)

In his research, Grohs et al., 2023 illustrated how LLM can be utilized for practical BPM tasks which required textual documents as input. ChatGPT4 was utilized for this task. For all three tasks, GPT4 performs similarly to or better than the benchmark, i.e., specific applications for the respective task (Grohs et al., 2023).

There are also increasing number of services to Convert between Process Models and Natural Language Text utilizing graphical modeling languages. It allows stakeholders to collectively describe executable business processes on a conceptual level. (Freytag et al., n.d.).

Comprehensive literature review being done on the topic of “Machine learning in business process management” by (Weinzierl et al., 2024). Resulted in enriched BPM lifecycle BPM lifecycle of Dumas et al. (2018). Which gives higher level practical view perspective on the areas, where AI can be applied.

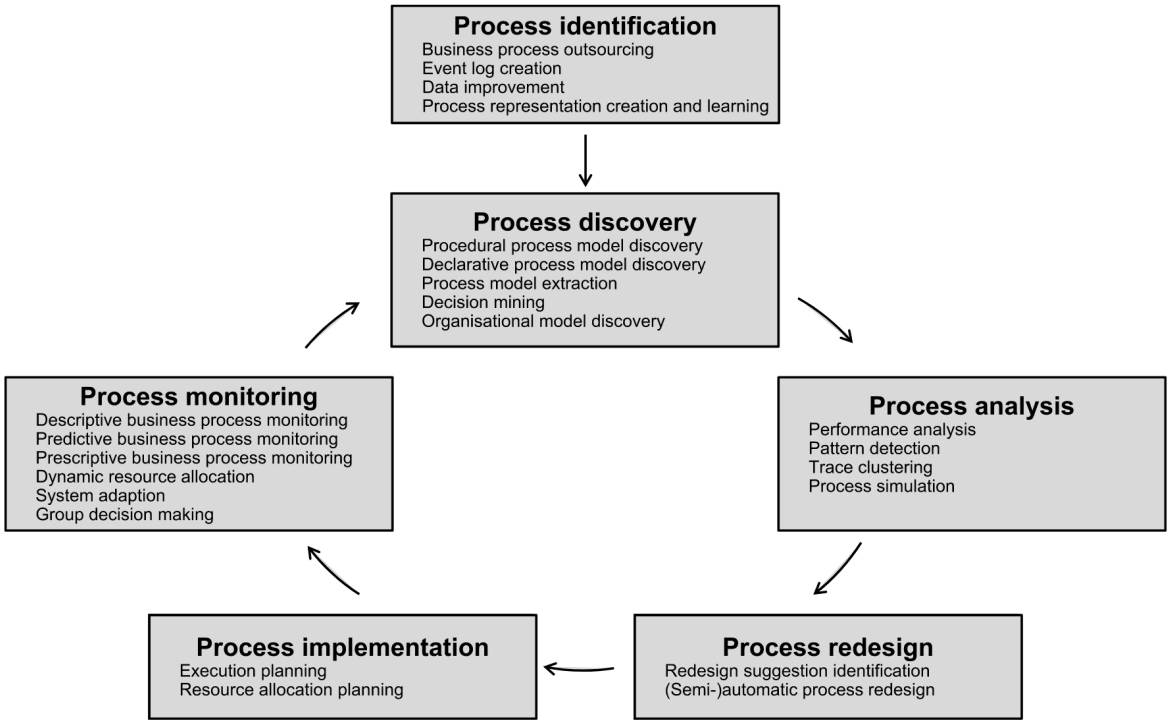

Figure 2.4.1 - BPM lifecycle enriched with AI

From the perspective of our research, it helps to understand better the ongoing processes in the organization and track the processes which are adopted to BPM.

Machine Learning (ML) has been particularly useful in improving certain parts of Business Process Management (BPM). These improvements mostly happen in areas where there is a lot of data, such as discovering new processes, analyzing them, and keeping an eye on them over time. In these areas, data about business activities is usually available in detailed records, which ML can easily use (Sarker, 2021; Weinzierl et al., 2024).

However, researchers suggest that we could make even more progress by using techniques from fields like natural language processing (NLP) and computer vision. NLP helps computers understand and work with human language, while computer vision helps them understand images and videos. By combining these techniques with ML, we could create new and better ways to manage business processes that go beyond just using data logs. This could lead to innovative solutions that are more effective and versatile.

Weinzierl et al., 2024 also propose to consider the enterprise process network instead of isolated business processes. In doing that, ML applications receive input data from multiple data sources, including control-flow information from different business processes and process context information related to the business processes.

Leveraging LLMs and GPT models facilitates comprehensive process identification, dynamic roadmap development, real-time implementation monitoring, and the tracking of qualitative metrics. These capabilities address significant gaps in traditional BPM approaches, paving the way for more effective and efficient systems. By continuously integrating AI-driven insights, organizations can ensure their BPM initiatives are not only successful but also adaptable to future challenges and opportunities (Grohs et al., 2023; Weinzierl et al., 2024).

In addition to traditional performance metrics, tracking qualitative metrics such as sentiment and involvement (how people feel and how involved they are in their work) is vital for comprehensive BPM evaluation. AI technologies, including sentiment analysis and engagement tracking tools, can analyze qualitative data to provide deeper insights into employee morale, customer satisfaction, and overall organizational engagement. These insights provide a deeper understanding of the workplace atmosphere and customer experiences, allowing organizations to pinpoint areas that need improvement and take specific actions to enhance overall BPM results.

3. METHODOLOGY

This section outlines the methodology adopted for this research, aiming to identify and utilize Critical Success Factors (CSFs) within BPM to develop a decision engine artifact that supports BPM implementation.

The initial idea was to apply Design Science Research Methodology (DSRM) as a framework for this study (Hasan & Sharifzadeh, 2020; Hunziker & Blankenagel, 2024). However, due to the lack of access to a real-world company, it was not feasible to accomplish stages of DSRM such as Demonstration and Evaluation fully. Nevertheless, some parts of DSRM were applied, such as Problem Identification, Objectives of a Solution, Design and Development. Detailed description provided below:

3.1. PROBLEM IDENTIFICATION

Objective: The primary goal at this stage is to identify the current challenges and gaps in BPM implementation. This involves a deep dive into existing literature and research to pinpoint areas where BPM practices are lacking, particularly focusing on the systematic development of AI-supported decision engines. The objective is to establish a clear understanding of the problems faced by organizations in adopting and optimizing BPM systems.

Approach: A comprehensive literature review was conducted to gather insights into the current state of BPM adoption, common challenges, and the potential role of AI in enhancing BPM. This involved analyzing various scholarly articles, industry reports, and case studies to identify recurring themes and issues. The literature review also included an examination of existing AI technologies and their applications in BPM, providing a foundational understanding of how AI can be leveraged to address identified challenges. At this stage we identified importance of CSFs for BPM adoption as well as breakdown of BPM adoption to different Stages (states of organization).

3.2. OBJECTIVES OF A SOLUTION

Objective: The next step is to define the goals and requirements for the AI-supported decision engine. This involves setting clear, measurable objectives that the decision engine aims to achieve. The objective is to ensure that the proposed solution addresses the identified challenges and gaps in BPM implementation effectively.

Approach: Insights from the literature review and expert interviews were utilized to outline the objectives. The objectives were refined through iterative feedback, ensuring they are aligned with the needs of organizations and the capabilities of AI technologies. This approach ensured that the solution is both theoretically sound and practically relevant.

3.3. DESIGN AND DEVELOPMENT

Objective: The primary goal here is to develop the decision engine artifact based on the identified CSFs and the defined objectives. This involves a detailed design and

development process, ensuring that the decision engine is robust, scalable, and capable of addressing the identified challenges in BPM implementation.

Stage 1: Identification of Current State of BPM Adoption

Approach: The current BPM adoption stage of the organization was assessed using a structured framework. This framework was derived from the research of Buh et al. (2015), which categorizes BPM adoption into various stages and identifies associated CSFs for each stage.

Stage 2: Identify CSFs for Respective State

Approach: The list of critical success factors (CSFs) was condensed from Buh et al. (2015) research to focus on the most relevant factors for each BPM adoption stage. This involved prioritizing CSFs that have the highest impact on BPM success and are most applicable to the organization's current state. This process included:

- Reviewing the detailed descriptions and justifications of each CSF.
- Evaluating their applicability based on the organization's specific context and needs.
- Engaging with subject matter experts to validate the selection and prioritization of CSFs.

Stage 3: Develop a Scoring Approach for Respective State

Approach: The scoring approach was developed with the support of GPT-4 through a series of prompts and practical experience. This process involved:

- Defining clear criteria for each CSF based on literature and expert input.
- Developing a rating scale (e.g., 1 to 5) for each criterion to quantify the level of achievement or performance.
- Testing the scoring approach through simulated scenarios and expert validation to ensure its reliability and validity.

Prompts example:

- Please suggest list of criteria which can be used for scoring {proposed scoring approach}.
- What kind of scales can be applied to {measurement criteria}.

Responses were critically analyzed and adopted to the topic.

Stage 4: Critical Evaluation

Approach: Interviews with experts across different levels of the corporate hierarchy were conducted to evaluate the prototype from various perspectives. This included:

- Conducting structured interviews with CEO level, CFO level and line managers to gather diverse insights.
- Analyzing the feedback to identify common themes, strengths, and areas for improvement in the decision engine.

3.4. SUMMARY OF ANTICIPATED OUTCOMES

The anticipated outcomes of this research include:

- A list of Critical Success Factors (CSFs) for BPM implementation, tailored to different stages of BPM adoption.
- A theoretical model for an AI-supported decision engine that incorporates these CSFs, providing a structured approach to enhance BPM practices.
- Critical insights from experts across different levels of expertise in BPM.

This research aspires to contribute to both academic knowledge and practical applications in BPM. By providing a foundational framework for AI-enhanced BPM implementation, it aims to support organizations in achieving higher levels of operational efficiency, transparency, and market responsiveness.

4. EMPIRICAL STUDY

4.1. APPROACH TO DECISION ENGINE PROTOTYPE

Development of Decision Engine (DE) can address complexity and add transparency to the process of BPM adoption. As per definition, decision engines are sophisticated software systems designed to automate the decision-making processes within an organization.

It operates by analyzing input data through a set of predefined rules, algorithms, or machine learning models to make decisions or recommendations without human intervention (purely based on available data). These engines are particularly valuable in scenarios where fast, consistent, and accurate decisions are crucial, such as in credit scoring, fraud detection, customer service, and many other operational processes.

For this paper, we decided step aside from generalized factors and align decision engine with different stages of BPM adoption. To do this, we developed the prototype in the following logic:

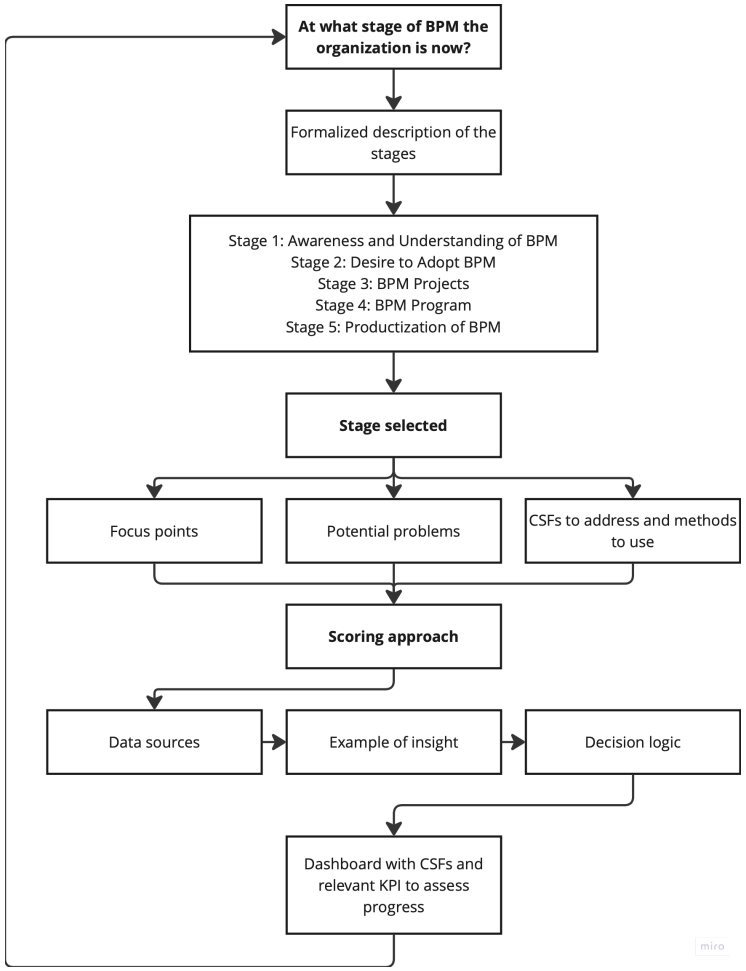

Figure 4.1.1 - DE prototype logic

The idea behind is that before we start, we should understand where we are now. When we understand where we are, we can decide what to do next and how to do it.

4.2. DECISION ENGINE PROTOTYPE

From our perspective decision engine prototype should be adoptable and practical. It should guide the end user through the different stages; therefore, it should help answering two initial questions:

- Where the organization is now?
- What should it do next?

To answer to the first question the prototype includes description of BPM adoption stages as per Buh et al., 2015. Identification, and Moving forward actions were derived with support of ChatGPT4 using prompts like:

- based on your experience, how can organization be identified at {Stage}
- please suggest possible actions for the organization to advance further

and summarized to the table below:

Table 4.2.1 - BPM Adoption Stages

Stage	Description	Identification	Moving Forward Actions
Awareness and Understanding of BPM	Organizations recognize the importance of BPM. Process improvement is ad hoc, reactive, and unstructured.	BPM is a new concept or there is limited understanding of process management principles organization-wide.	Introduce formal BPM training and establish a sense of urgency for process improvement.
Desire to Adopt BPM	Organizations are motivated to adopt BPM and are beginning to plan their initiatives.	Management shows interest in BPM, and initial resources are allocated.	Secure top management support, appoint a project champion, and define business drivers.
BPM Projects	Organizations execute specific BPM projects with defined objectives and plans.	Clear objectives, plans, and external consultant guidance are in place.	Communicate objectives, seek professional guidance, and motivate team members.
BPM Program	BPM is integrated into the organization's broader strategy and programs.	Continuous top management support, professional guidance, and effective communication are evident.	Ensure ongoing support, maintain consultant partnerships, and identify KPIs.
Productization of BPM	BPM practices are standardized and	Key performance indicators (KPIs) are	Focus on training, securing top

	productized within the organization.	defined, employees are educated and motivated, and BPM is embedded in decision-making.	management endorsement, and refining processes based on KPIs.

For example:

Stage 1: Awareness and Understanding of BPM

- **Description**: Organizations at this stage have begun to recognize the importance of BPM. Process improvement is typically ad hoc, reactive, and unstructured. The organization recognizes BPM as a potential value-add and begins to understand its principles and benefits.
- **Identification**: If BPM is a new concept or if there is limited understanding of process management principles organization-wide, it's likely at this stage.
- **Moving Forward**: Introduce formal BPM training and establish a sense of urgency for process improvement.

If the description matches the type of organization, the organization can become aware of focus points and suggestions relevant for the stage. In our example:

- **Focus**: Education on BPM importance and its impact on performance.
- **Education and Communication**: Conduct workshops and training sessions to educate stakeholders about the benefits and principles of BPM.
- **Visible Executive Support**: Secure and showcase executive endorsement to highlight the importance of BPM within the organization.
- **Case Studies and Success Stories**: Share case studies of successful BPM implementations to illustrate potential gains and encourage buy-in.

The same applies to potential problems. As a result, the organization gets a list of CSFs to consider. In our example, for the first stage of BPM adoption, CSFs include empowerment of employees, customer focus, and openness to changes (Buh et al., 2015).

Table 4.2.2 - Critical Success Factors (CSFs) for Stage 1

CSF	**Focus Points**	**Actions**
Empowerment of Employees	Training and workshops to enhance understanding of BPM.	Conduct monthly BPM training sessions and interactive workshops.

Customer Focus	Implement feedback loops to align processes with customer needs.	Introduce surveys and feedback forms post-customer interactions.
Openness to Changes	Encourage a culture of adaptability and continuous improvement.	Develop and communicate a structured change management plan, implement a recognition program for successful changes.

By knowing CSFs, the organization can develop scoring approaches, measurement criteria, scales, etc.

Below is a flowchart representing the progression through different stages of BPM adoption, highlighting key actions and focus points at each stage.

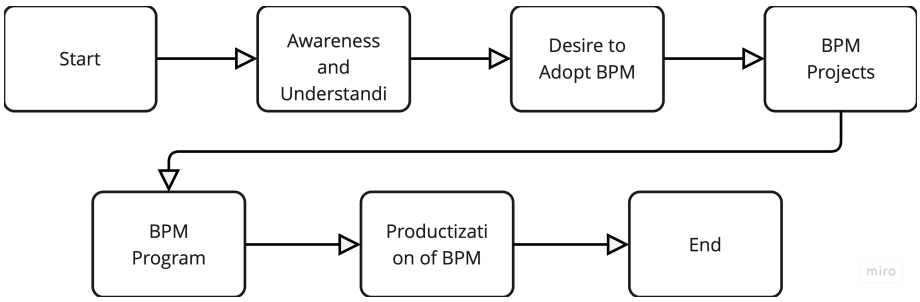

Figure 4.2.1 - BPM Adoption Stage Progression

A radar chart showing the scoring of different CSFs helps visualize the strengths and areas for improvement for each factor.

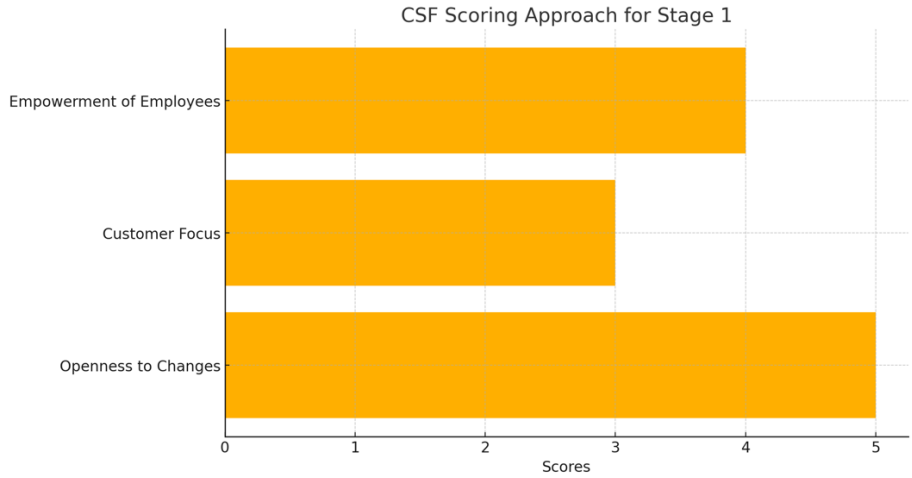

Figure 4.2.2 - CSF Scoring Approach

Including these tables and charts enhances the clarity and practicality of the prototype, making it easier for organizations to navigate through the stages of BPM adoption.

4.3. SIMULATED EXAMPLE OF PRACTICAL APPLICATION.

With the support of ChatGPT4 we have done series of practical simulations on how it can be applied to the real-world scenarios.

Company Profile:

Name: Tech Innovators Inc.

Industry: Technology Solutions

Current BPM Adoption Stage: Awareness and Understanding of BPM

The company decides to start BPM adoption smoothly by focusing on two key processes: the Customer Support Process and the Product Development Process.

Prompts used:

- Please generate list of possible tasks for {step} of {action / task} of {stage}
- What possible results/ outcomes can be for {step} of {action / task} of {stage}

Table 4.3.1 - BPM adoption simulation

Step	Action/Task	Expected Result
1. Initial Assessment		
Surveys	Conduct internal surveys to gather insights from employees.	Clear understanding of current BPM knowledge and engagement.
Interviews	Conduct interviews with key stakeholders.	Identify pain points and opportunities for improvement.
Document Review	Analyze existing process documentation, training records, and performance metrics.	Identify gaps and areas needing enhancement.
Outcome	The assessment revealed that while there was an acknowledgment of the need for BPM, the process improvement initiatives were ad hoc, reactive, and unstructured. This placed Tech Innovators in the "Awareness and Understanding of BPM" stage.	
2. Define CSFs		
Empowerment of Employees	Enhance employees' understanding of BPM and encourage contributions.	Improved employee engagement and participation in BPM initiatives.
Customer Focus	Implement mechanisms to gather and act on customer feedback.	Better alignment of customer needs with support processes.

Openness to Changes	Foster a culture that values adaptability and continuous improvement.	Increased flexibility and responsiveness to change.
3. Develop Scoring Approach		
Employee Empowerment	Number of BPM-related training sessions held; Employee participation rate in BPM training and workshops.	Measurable increase in employee empowerment and engagement scores.
Customer Focus	Existence and utilization of customer feedback mechanisms; Number of process improvements driven by customer feedback.	Enhanced customer feedback integration and process improvement rates.
Openness to Changes	Existence and utilization of change management strategies; Number of process improvements driven by feedback.	Higher adaptability and lower resistance to change within the organization.
4. Implement Decision Engine		
Employee Empowerment Actions	Conduct monthly BPM training sessions and interactive workshops.	Increased understanding of BPM principles among support staff.
	Implement an idea management system for process improvement suggestions.	20% increase in employee suggestions for process improvements.
Customer Focus Actions	Introduce surveys and feedback forms post-customer interactions.	Feedback indicates key areas for improvement.
	Analyze feedback data and integrate insights into process improvement plans.	15% reduction in average resolution time for customer issues.
	Regularly communicate changes and improvements based on customer feedback.	Enhanced customer satisfaction and engagement.
Openness to Changes Actions	Develop and communicate a structured change management plan.	Increased willingness to adopt new methodologies.
	Implement a recognition program for successful change initiatives.	10% reduction in development cycle time.
5. Evaluation and Results		
Employee Empowerment Evaluation	Measure increases in employee empowerment score from 2 to 4.	Significant improvement in employee participation and engagement.
	Track participation in BPM training and workshops.	High attendance and active involvement in BPM initiatives.

Customer Focus Evaluation	Measure increases in customer feedback integration score from 2 to 4.	Positive feedback from customers on improved support experience.
	Track reduction in average resolution time for customer issues.	15% improvement in resolution times.
Openness to Changes Evaluation	Measure increase in openness to change score from 3 to 4.	Enhanced adaptability and engagement in the recognition program.
	Monitor change management strategy implementation and its impact.	Successful adoption of new methodologies and improved process efficiency.

By applying the decision engine prototype, simulated Tech Innovators Inc. successfully enhanced its BPM practices in the Customer Support Process. The structured approach ensured that the organization addressed key success factors at the "Awareness and Understanding of BPM" stage, leading to tangible improvements in operational efficiency and stakeholder engagement. These initial successes provide a solid foundation for further BPM adoption across the organization, demonstrating the practical value of the decision engine in real-world scenarios.

5. RESULTS AND DISCUSSION

In this chapter, we synthesize the empirical results obtained from the development and application of the AI-supported decision engine prototype for BPM implementation. This includes an exposition of the empirical results, validation through expert interviews, and a discussion of the findings in the context of the current BPM literature and practical implications.

5.1. EXPOSITION OF EMPIRICAL RESULTS

The empirical study focused on developing and testing a decision engine prototype designed to support BPM adoption. The prototype was structured to guide organizations through different BPM adoption stages, from awareness to productization, with tailored recommendations and scoring mechanisms. The key empirical results are summarized as follows:

- **Assessment of Current BPM Adoption Stage**: The decision engine accurately identified the BPM adoption stage of the case study organization, Tech Innovators Inc., as the "Awareness and Understanding of BPM" stage.
- **Identification of CSFs**: The engine effectively identified and prioritized critical success factors (CSFs) relevant to each BPM adoption stage. For the initial stage, these included employee empowerment, customer focus, and openness to changes.
- **Development of Scoring Approach**: A robust scoring mechanism was developed and validated, enabling the organization to measure progress in BPM adoption. The scoring approach was based on qualitative and quantitative metrics, such as the number of BPM training sessions and customer feedback integration.
- **Practical Application and Results**: The practical application of the decision engine at Tech Innovators Inc. led to significant improvements in BPM practices, including increased employee engagement, enhanced customer feedback mechanisms, and improved adaptability to change.

5.2. VALIDATION OF EMPIRICAL RESULTS

Validation was conducted through interviews with three experts from different levels of the corporate hierarchy.

The experts provided critical feedback on the stages of BPM adoption, focus points, potential problems, critical success factors (CSFs), and the proposed scoring system. This chapter summarizes the key insights from these interviews, highlighting areas of agreement, disagreement, and recommendations for improvement. In total there were 3 persons on different level of corporate hierarchy and expertise.

5.2.1. CEO

CEO acknowledged the critical nature of the initial awareness stage but warned against overhyping BPM, advocating for clear and realistic communication to build a solid foundation. He preferred practical workshops and hands-on training sessions led by example from leadership as effective methods to educate employees. Regarding the decision engine prototype, he emphasized the need for it to manage expectations and ensure that any changes genuinely improve processes without overwhelming teams.

He highlighted clear communication, leadership commitment, and realistic goal setting as crucial focus points, suggesting the decision engine include these elements to effectively guide users. He proposed adding flexibility and adaptability to the focus points, with the engine allowing for feedback and adjustments based on real-world challenges.

He also suggested to leverage AI in identification of Business Processes and redesign.

Employee engagement was identified as the most challenging potential problem. He stressed the importance of genuine leadership commitment and real human interaction, with AI serving as a support tool. He recommended the decision engine incorporate features to facilitate human interaction and trust-building.

He agreed with the basic critical success factors but cautioned against over-reliance on technology, emphasizing the need for strong, empathetic leadership and clear communication. He proposed managing expectations and hands-on involvement from employees as additional critical success factors. The scoring approach of the engine should be adaptable and practical, incorporating a mix of qualitative and quantitative measures. He suggested expanding data sources within the engine to include broader inputs like customer feedback and market trends. Example insights should be adapted to specific contexts, and decision logic should balance data-driven insights with human judgment.

5.2.2. CFO

The CFO emphasized the importance of the initial stage in ensuring everyone understands the financial benefits of BPM, which justifies investment and support. He recommended financial workshops, ROI presentations, and regular updates on financial metrics as effective methods.

He suggested that the decision engine include rigorous financial oversight and regular financial reviews to keep BPM initiatives on track. Ensuring BPM initiatives deliver promised financial benefits was identified as a significant challenge, and the CFO recommended the engine include thorough cost-benefit analyses and transparent communication about potential layoffs, balancing cost savings with reskilling programs.

He agreed with the identified critical success factors but emphasized the need for clear financial metrics. The decision engine should incorporate financial KPIs to track performance and demonstrate ROI. The scoring approach should include financial performance metrics to make it comprehensive and practical. He suggested expanding

data sources to include detailed financial impact reports and external benchmarks within the engine.

Example insights and recommendations were valuable but needed to be grounded in solid financial analysis. The decision logic should incorporate financial decision-making frameworks. For organizations beginning their BPM journey, the CFO recommended starting with a clear financial plan, pilot projects, continuous financial oversight, and transparent communication about financial impacts, all of which should be supported by the decision engine.

5.2.3. Manager

The Manager stressed the importance of the initial stage for understanding and gaining buy-in for BPM. He advocated for practical, hands-on training and real-life examples as the most effective methods.

He suggested that the decision engine include regular feedback sessions and clear career development opportunities to help employees feel that BPM is improving their work lives and offering new growth opportunities. The potential for layoffs was identified as the most challenging problem, and he opt for transparency, clear communication, and support for reskilling programs within the decision engine.

He agreed with the identified critical success factors but highlighted the importance of clear communication and leadership support. Additional critical success factors included involving frontline employees in planning and offering career progression opportunities. The scoring approach should be easy to understand and apply, with the decision engine incorporating regular employee surveys and feedback sessions.

The decision logic should be simple and actionable. For organizations beginning their BPM journey, he recommended starting with a pilot project, open communication, necessary training, and emphasizing career development opportunities, all supported by the decision engine to help employees see BPM as a tool for improvement rather than a threat to their jobs.

5.2.4. Summary of the feedback:

- **CEO's Feedback**: Emphasized the need for realistic communication and leadership commitment. Suggested the decision engine should manage expectations, include human interaction features, and leverage AI for process identification and redesign.

- **CFO's Feedback**: Highlighted the importance of financial oversight and clear financial metrics. Recommended the inclusion of financial KPIs and cost-benefit analyses within the decision engine.

- **Manager's Feedback**: Stressed the need for practical training, clear communication, and employee involvement. Suggested the engine should include regular feedback sessions and career development opportunities.

Overall, the feedback validated the decision engine's approach but also highlighted areas for improvement, such as the need for more human-centric features and financial metrics.

5.3. DISCUSSION

The empirical results and validation feedback underscore several key insights:

- **Importance of Tailored Approaches**: The decision engine's ability to provide stage-specific recommendations proved crucial for effective BPM adoption. Organizations benefit from tailored guidance that considers their current state and unique challenges.
- **Role of AI in BPM**: AI technologies, particularly large language models like GPT, offer significant potential for enhancing BPM by providing dynamic insights, automating decision-making processes, and identifying improvement areas.
- **Human-Centric Design**: Despite the advanced capabilities of AI, the importance of human factors such as leadership commitment, employee engagement, and clear communication remains paramount. The decision engine must balance AI-driven insights with human judgment and interaction.
- **Financial Metrics**: Incorporating financial performance metrics and cost-benefit analyses into the decision engine is essential for demonstrating the tangible benefits of BPM initiatives and securing executive support.
- **Practical Application**: The successful application of the decision engine at Tech Innovators Inc. highlights its practical value. The structured approach led to measurable improvements, reinforcing the engine's potential as a tool for driving BPM adoption in various organizational contexts.

5.4. DE PROTOTYPE IMPLEMENTATION ADJUSTMENTS BASED ON EXPERT SUGGESTIONS

Table 5.4.1 - DE adjustments based on feedback

Step	Action/Task	Expected Result	Expert Suggestions	Revised Expected Result
Initial Assessment	Conduct internal surveys and interviews with key stakeholders.	Clear understanding of current BPM knowledge and engagement.	CEO: Emphasize realistic communication and leadership involvement.	Enhanced understanding with realistic expectations and strong leadership commitment.
Define CSFs	Enhance employees' understanding of BPM, gather	Improved employee engagement, better alignment with customer needs,	CFO: Include financial oversight and	Improved engagement, alignment with customer needs,

	customer feedback, and foster adaptability.	and increased flexibility.	clear financial metrics.	financial clarity, and adaptability.
Develop Scoring Approach	Develop criteria and rating scales for each CSF based on literature and expert input.	Structured evaluation of BPM effectiveness.	Manager: Ensure scoring is simple and actionable.	Practical and easy-to-apply scoring system for evaluating BPM effectiveness.
Implement Decision Engine	Conduct BPM training sessions, introduce feedback mechanisms, and communicate change management plans.	Increased understanding of BPM, enhanced customer feedback integration, and higher adaptability to change.	CEO: Balance AI insights with human interaction; CFO: Ensure cost-benefit analysis; Manager: Support career development.	Improved BPM understanding, better feedback integration, cost-effective decisions, and enhanced employee growth.
Evaluation and Results	Measure improvements in employee engagement, customer satisfaction, and adaptability.	Demonstrated improvements in BPM practices and stakeholder engagement.	CFO: Include financial KPIs; Manager: Regular feedback sessions.	Comprehensive evaluation showing enhanced BPM practices, financial performance, and stakeholder engagement.

This research contributes to both academic discourse and practical applications in BPM. By developing and validating an AI-supported decision engine prototype, it offers a foundational framework for organizations to enhance their BPM efforts.

The framework can be used in any type of organization and on different stages of development, but practical application should be supported by further researches.

The integration of AI technologies and human-centric design principles ensures that BPM initiatives are effective, adaptable, and aligned with organizational goals. Future research could focus on refining the decision engine based on broader industry feedback and exploring its application in different organizational settings.

6. CONCLUSIONS AND FUTURE WORKS

In this final chapter, we synthesize the work done in this research, highlight the recommendations made, discuss the limitations encountered, and suggest possible directions for further research.

6.1. SYNTHESIS OF THE WORK DONE WITH HIGHLIGHT TO THE RECOMMENDATIONS MADE

This thesis explored the integration of AI-supported decision engines into Business Process Management (BPM) to enhance BPM adoption and implementation. The primary contributions of this research are:

Literature Review: A comprehensive literature review identified Critical Success Factors (CSFs) crucial for BPM implementation and examined the role of AI, particularly Large Language Models (LLMs) like GPT, in BPM.

Development of a Decision Engine Prototype: Using some of the components of Design Science Research Methodology, we developed a decision engine prototype tailored to different stages of BPM adoption. The engine was designed to guide organizations through awareness, adoption, project execution, and productization stages, providing stage-specific recommendations.

Empirical Study: The prototype was tested through a simulated case study of Tech Innovators Inc., demonstrating its practical application and effectiveness in improving BPM practices.

Expert Validation: Interviews with industry experts validated the approach and provided critical feedback for improvement. The recommendations from experts included managing expectations, incorporating financial metrics, ensuring clear communication, and balancing AI-driven insights with human judgment.

6.1.1. Key Recommendations:

Realistic Communication: Clearly communicate the benefits and limitations of BPM to avoid overhyping and to build a solid foundation.

Leadership Commitment: Ensure strong and empathetic leadership to drive BPM initiatives.

Financial Metrics: Integrate financial performance metrics to demonstrate ROI and secure executive support.

Human Interaction: Balance AI insights with human-centric features to build trust and facilitate engagement.

Training and Education: Conduct practical training and workshops to enhance employee understanding.

6.2. Limitations of the Work Done

Several limitations were encountered during this research:

Lack of Real-World Company Access: The inability to access a real-world company limited the scope of empirical validation. The simulated case study provided valuable insights but lacked the complexity of real-world implementation.

Scope of Expert Interviews: While expert feedback was crucial, the sample size was small. A broader range of industry perspectives could provide more comprehensive validation.

Prototype Testing: The decision engine prototype was tested in a controlled environment. Real-world testing might reveal additional challenges and areas for refinement.

6.3. Further Work Possible to Do

Future research could address the limitations and expand on the findings of this thesis:

Real-World Implementation: Conduct case studies with real-world companies to validate and refine the decision engine prototype in diverse organizational settings.

Broader Expert Feedback: Engage with a larger and more diverse group of industry experts to obtain comprehensive validation and insights.

Advanced AI Integration: Explore the integration of more advanced AI techniques, such as reinforcement learning and hybrid AI models, to enhance the decision engine's capabilities.

Longitudinal Studies: Conduct longitudinal studies to assess the long-term impact of AI-supported decision engines on BPM adoption and performance.

Customization for Different Industries: Develop industry-specific versions of the decision engine to address unique challenges and requirements in sectors such as healthcare, finance, and manufacturing.

By addressing the limitations and pursuing further research, we can continue to advance the field and support organizations in achieving greater operational efficiency and market responsiveness.

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APPENDIX A - ETHICS COMMITTEE REPORT

This is to certify that
Project No.: **INFSYS2024-7-133775**
Project Title: **Critical success factors in BPM implementation: Creating AI supported decision engine for the business.**
Principal Researcher: **VIctor Lipov**

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 7/13/2024.

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, 7/13/2024

NOVA IMS Ethics Committee
ethicscommittee@novaims.unl.pt

APPENDIX B – DECISION ENGINE PROTOTYPE

	Stage of BPM adoption	Focus points and suggestions relevant for the stage	Potential problems at the respective stage	CSFs to address and methods to use	Proposed Scoring approach	Measurment criteria	Scale	Data sources	Example of insight and recommendations	Decision logic
Stage #1	**Awareness and Understanding of BPM** **Description:** Organizations at this stage have begun to recognize the importance of BPM. Process improvement is typically ad hoc, reactive, and unstructured. Organization recognizes BPM as a potential value-add and begins to understand its principles and benefits **Identification:** If BPM is a new concept or if there is limited understanding of process management principles organization-wide, it's likely at this stage. **Moving Forward:** Introduce formal BPM training and establish a sense of urgency for process improvement.	**Focus:** Education on BPM importance and its impact on performance. **Education and Communication:** Conduct workshops and training sessions to educate stakeholders about the benefits and principles of BPM. **Visible Executive Support**: Secure and showcase executive endorsement to highlight the importance of BPM within the organization. **Case Studies and Success Stories:** Share case studies of successful BPM implementations to illustrate potential gains and encourage buy-in.	**Miscommunication**: If not effectively communicated, BPM can be seen as a buzzword rather than a valuable methodology, leading to skepticism. **Insufficient Executive Support**: Without strong leadership endorsement, BPM efforts may not be taken seriously or prioritized. **Overwhelm with Information:** An abundance of case studies and information can lead to confusion about where to start or unrealistic expectations.	**Empowerment of Employees:** Offer training and workshops to improve employees' understanding of BPM and its benefits, and create a suggestion system that enables them to contribute ideas. **Customer Focus:** Implement a feedback loop with customers to understand their needs and expectations, and integrate this feedback into process improvement plans. **Openness to Changes:** Encourage a culture that values adaptability through regular communication about the benefits of change and recognition of teams that embrace and lead successful change initiatives.	**Employee Empowerment:** Scoring could be based on employee training initiatives, the presence of a suggestions program, and the level of autonomy employees have in their roles. **Customer Focus:** Measure the extent to which customer feedback influences process changes and the alignment of processes to customer needs. **Openness to Change:** Assess the organization's history and readiness for change, the existence of change management strategies, and flexibility in current processes.	Number of BPM-related training sessions held. Employee participation rate in BPM training and workshops. Existence and utilization of customer feedback mechanisms in processes. Number of process improvements driven by customer feedback. Existence and utilization of customer feedback mechanisms in processes. Number of process improvements driven by customer feedback.	Scale: 1 (No involvement) to 5 (Full involvement and empowerment in BPM activities). 1 (Not integrated) to 5 (Fully integrated and driving BPM initiatives). 1 (Resistant to any change) to 5 (Actively embraces change).	Internal suggestion systems, HR records. Customer service feedback, process documentation. Change logs, project management tools.	Actionable Insight: Employees are not suggesting process improvements, indicating a lack of empowerment. Recommendation: Develop and implement an idea management system to capture employee suggestions. Hold regular workshops and training sessions to educate employees on BPM principles. Encourage managers to foster a culture that values input from all team members.	If the average score for employee empowerment is below 3, the decision engine recommends prioritizing employee engagement initiatives. If customer focus is rated high but change openness is low, suggest strategies for more responsive process improvements based on customer feedback.
Stage #2	**Desire to Adopt BPM** **Description:** The organization acknowledges the need for BPM and is motivated to start adopting BPM practices. There might be some informal process improvements, but no organized effort yet. The organization decides to commit to BPM practices and starts to build internal desire for change and process improvement. **Identification:** If there is enthusiasm about BPM and discussions about its potential benefits are occurring, but no structured approach has been taken, this indicates stage 2. **Moving Forward:** Develop a clear vision and strategy for BPM and start engaging stakeholders to support BPM initiatives.	**Focus:** Building internal buy-in and preparing the organization for change. **Culture and Change Management:** Foster a culture receptive to change by involving employees in the BPM discussion early on. Address resistance proactively. **Stakeholder Engagement:** Identify and engage key stakeholders to create a coalition that desires BPM adoption, ensuring their needs and concerns are addressed.	**Cultural Resistance:** Even with awareness, there can be inherent resistance to change within the organization's culture that is hard to overcome. **Misalignment of Expectations:** Stakeholders may have different expectations from BPM, leading to conflicts or disillusionment if not managed well.	**Involvement and Full Support of Top Management:** Ensure that top management not only endorses but is also actively involved in BPM initiatives by leading project kick-offs and regularly reviewing progress. **Project Champion:** Appoint a respected leader within the organization to act as a BPM champion who will advocate for and drive BPM efforts. **Business Drivers (a Sense of Urgency):** Identify and communicate the business imperatives that necessitate BPM, such as market pressure or efficiency gains, to create a sense of urgency for change.	**Top Management Involvement:** Score based on visible support from leadership, allocation of resources for BPM, and communication about the importance of BPM from top management. **Project Champion Presence:** Evaluate the appointment of project champions for BPM initiatives and the authority and resources given to them. **Sense of Urgency/Business Drivers:** Determine whether there's a clear understanding across the organization of the need for BPM, driven by competitive pressure, efficiency goals, or other business imperatives.	Frequency and consistency of communication from top management regarding BPM. Investment in BPM initiatives (budget, resources). Identification and activity level of BPM champions or process owners. Impact assessment of project champions on BPM projects (progress, success stories). Documentation and communication of business imperatives driving BPM adoption. Response time to critical process-related issues or market changes.	1 (No support) to 5 (Highly visible and committed support). 1 (No champion) to 5 (Strong, effective champion promoting BPM). 1 (No drivers identified) to 5 (Clear drivers identified and communicated with urgency).	Meeting minutes, executive communications. Project documentation, stakeholder surveys. Strategic plans, internal communications.	Actionable Insight: Top management involvement in BPM initiatives is minimal. Recommendation: Schedule regular BPM briefings for top management to report on progress and value. Appoint a senior executive as a BPM sponsor to increase visibility and commitment. Create a BPM steering committee including top management to oversee initiatives.	If top management support scores less than 3, trigger a recommendation for executive workshops on BPM value. If a project champion is not identified or scores low, recommend establishing a clear champion role with defined responsibilities and authority.
Stage #3	BPM Projects **Description:** The organization has initiated specific BPM projects, focusing on improving particular processes. These are often pilot projects that serve as proof of concept.Specific BPM projects are initiated, often as pilots or initial efforts to apply BPM principles to particular business processes. **Identification:** If there are one or more BPM projects underway with dedicated resources and goals, the organization is in this stage. **Moving Forward:** Analyze the outcomes of these projects to refine the BPM approach and prepare for broader implementation.	**Focus:** Gaining experience in BPM and demonstrating early wins. Select Pilot Projects: Choose initial BPM projects carefully, targeting high-impact areas where quick wins are achievable. **Project Management Best Practices:** Utilize structured methodologies and robust project management practices to ensure the success of BPM projects. **Monitoring and Measurement:** Implement KPIs to measure the performance of BPM projects, using the data to drive decision-making and continuous improvement.	**Selection of Incorrect Projects:** Choosing the wrong projects for initial BPM efforts can result in a lack of visible success and diminished credibility. **Project Management Issues:** Without strong project management, BPM projects may face delays, budget overruns, or scope creep. **Inadequate Measurement:** Poorly defined KPIs or a lack of measurement tools can lead to ineffective monitoring and the inability to demonstrate value.	**Clearly Defined Objectives and Plan:** Develop a formal project charter for each BPM project that outlines its objectives, scope, expected benefits, and timeline. **Professional Guidance of External Consultants:** Engage with consultants who have a proven track record in BPM to provide expertise and an external perspective. **People Who Are Willing and Motivated to Change:** Select project team members who are open to change and have demonstrated adaptability, involve them in decision-making to keep them motivated.	**Project Communication:** Score the clarity and frequency of communication about BPM project goals, progress, and outcomes. **External Consultants' Guidance:** Rate the extent and effectiveness of external consultancy use, including the transfer of knowledge and practices to internal teams. **Change Willingness:** Measure the organization's readiness for change specific to BPM projects, including staff engagement and participation.	Clarity and dissemination of project goals and milestones across the organization. Number of documented and communicated BPM project plans. Consultant engagement score based on project outcomes and feedback. ROI from consultant-led initiatives versus internally led. Pre and post-training assessment scores on BPM readiness. Employee turnover rates in departments undergoing BPM projects.	1 (Very unclear) to 5 (Extremely clear and well understood by all stakeholders). 1 (Not involved/no contribution) to 5 (Significant involvement/contribution). 1 (High resistance) to 5 (Eager willingness and motivation to change).	Project charters, communication records. Consultant performance evaluations, project outcome analyses. Engagement surveys, participation records in BPM initiatives.	Actionable Insight: Project objectives and plans are not well-communicated across the organization. Recommendation: Utilize a centralized communication platform to disseminate BPM project updates. Include clear communication plans in all BPM project charters. Establish regular all-hands meetings to discuss BPM projects and invite feedback.	When scores for project communication and clarity are low, the logic emphasizes improving project charters and communication plans. If motivation to change is high but guidance from consultants is low, the logic suggests a review of consultant selection criteria and engagement effectiveness.

APPENDIX C - EXPERT QUESTIONNAIRE

1. In your experience, what are the key elements to focus on during the BPM adoption?
2. How would you describe the most effective methods to introduce BPM concepts to the organization?
3. What role do you see for leadership in BPM adoption?
4. Do you expect any challenges during implementation of BPM? How can they be mitigated?
5. What are the most critical success factors for BPM adoption that you believe should be prioritized?
6. If you can apply a decision engine model for BPM, what features do you think would help you the most? What to avoid and how to structure better?
7. How do you view the potential role of AI in BPM, especially in identifying and redesigning business processes?
8. From your perspective, what types of data sources can be used for the decision engine? Would external inputs like customer feedback add value?
9. Should a BPM tool balance data-driven insights with human judgment? Or be purely technical?

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