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RESEARCH ARTICLE

Challenges and Opportunities in Business Process Elicitation

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ABSTRACT Context: Eliciting business processes is critical for understanding and optimizing organizational workflows. This study examines methodologies, tools, and techniques that aim to enhance the accuracy and reliability of process modeling while addressing challenges such as inconsistent data and the lack of standards for unstructured processes. Objectives: The primary goal is to identify and classify approaches and techniques used in process elicitation, categorizing them into key areas and assessing their impact on continuous improvement in organizations. Methodology: A systematic mapping was conducted to review existing literature, classifying selected studies into methodologies, modeling tools, and automation frameworks. Current trends and gaps in the field were also analyzed. Results: The study highlights the growing adoption of tools such as BPMN, collaborative approaches, and advanced technologies to address data inconsistencies. The findings emphasize the importance of integrating interdisciplinary approaches and adaptive tools to align with dynamic business environments. This work lays the groundwork for further research to enhance organizational process elicitation practices. Future work: Future research should explore the implementation of emerging technologies, such as artificial intelligence and big data analytics, to further automate process elicitation. Additionally, evaluating the effectiveness of collaborative approaches across diverse industries and analyzing the impact of tool customization in specific contexts is recommended to ensure scalability and efficiency. Ensure that your abstract reads well and is grammatically correct.

INDEX TERMS Elicitation, education, requirement technique, fit-gap analysis, business process, process management, business model.

I. INTRODUCTION

The objective of business process management is to optimize the performance of organizations to improve the efficiency and effectiveness of their operations. This is achieved by identifying areas for improvement, reducing costs and raising the quality of the products or services offered. The quality of an organization is related to its business processes, due to factors such as operational efficiency, consistency in delivery, compliance with regulations and the capacity for continuous improvement. These elements are essential to remain competitive and satisfy customers. Therefore, analyzing each process to ensure quality becomes a complex task to perform [1].

One way to measure and maintain continuous improvement in the quality of a process is through business process management (BPM), which is a systematic and standardized approach to improving the quality of business processes [2], which consists of analyzing each of the processes to apply reengineering, reducing costs and increasing process

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efficiency [3]. BPM is an organizational priority, since by defining the workflows of each business process, organizational goals and objectives are also being defined [2].

On the other hand, a low complexity must also be maintained in these flows, since the difficulty of legibility of a business process model is proportional to the complexity of the process realization, which impacts process efficiency and business agility [1].

However, despite the structure and advantages BPM offers, its implementation is not without significant challenges, one of which manifests itself when identifying an organization's business processes for BPM [4]. To identify these processes, there are traditional and collaborative approaches [5]. Traditional approaches consist of analysts meeting with participants who play a role in the process and using interviews to obtain information about the workflow. Collaborative approaches, on the other hand, are based on the use of group work tools that facilitate interaction between process participants, allowing them to gather information about the activities performed [5].

The problem to be addressed in this article is related to the challenges presented by the methods associated with the approaches for obtaining the workflows of business processes, specifically with the inconsistencies that arise in the data obtained while modelling the processes. These inconsistencies may include discrepancies in the interpretation of processes by different stakeholders, lack of critical information, errors in communication, human errors in documentation, and variations in the practical implementation of documented processes. As a result, these inconsistencies can lead to BPM models that do not accurately reflect operational reality, affecting the efficiency and effectiveness of process improvement initiatives. Business Process Model and Notation (BPMN) is a standardized modelling language used to represent processes. However, its focus is on those processes that already have a defined structure. Therefore, when eliciting processes in an organization, it may be useful to consider other tools, such as the Case Management Model and Notation (CMMN), which is more oriented toward modelling processes that are unpredictable and less structured [6]. In general terms, this can be interpreted as processes having a low level of maturity.

The objective of this article is to identify approaches, methodologies or techniques used in business process elicitation, through a general review of the literature, to contribute to the understanding of the tools and methods used to obtain information about business processes in organizations, as well as their impact on the field of process elicitation. For this purpose, we apply the systematic mapping methodology, which provides an overview of a research area through classification. In addition, we share current trends in process elicitation methodologies, intending to facilitate the creation of new methodological proposals that can optimize and accelerate the elicitation of business processes in organizations, thus supporting researchers and practitioners in this area.

In line with contemporary approaches focused on institutional sustainability and responsibility, this research also aligns with the principles of ESG goals (Environmental, Social, and Governance) [7]. The systematization and improvement of business processes through collaborative detection techniques can indirectly contribute to energy efficiency (E), the strengthening of inclusive and participatory practices (S), and increased transparency in organizational management (G). This alignment expands the potential impact of the study's results beyond their technical contribution, encompassing strategic dimensions of public value and long-term sustainability.

This paper is structured as follows: Section II presents the background information related to the Business processes. Section III An analysis of the related works is presented. Section IV presents the methodology of this investigation. Section V presents the main results, investigation gaps, and answers to the research questions posed. Section VI presents a discussion of the research. Section VII presents our proposal and Section VIII presents the limitations of this study. Finally, Section IX presents conclusions and future work.

II. BACKGROUND

Business processes or business processes are the set of interrelated activities and tasks that an organization carries out to achieve its strategic objectives. In this context, Business Process Management (BPM) is presented as a comprehensive approach that seeks to optimize and manage these processes. By implementing BPM, organizations can continuously improve their performance, adapt to market changes and increase their competitiveness. A fundamental aspect of this management is to have a deep understanding of organizational processes, which allows for the identification of improvement opportunities and ensures effective alignment with corporate goals.

A thorough understanding of organizational processes gives companies a significant competitive advantage, as it allows them to identify both their weaknesses and strengths. This understanding facilitates a thorough analysis of these processes, which in turn enables the implementation of optimizations in their work model.

A. BUSINESS PROCESS ELICITATION

Business process elicitation is a technique that allows organizations to understand, analyze and improve their processes. It is commonly applied to monitor the status of processes to optimize or automate components of workflows, using modelling languages. This makes it easier for organizations to analyze their operations and helps to increase their productivity. The objective of BPM is to carry out a reengineering process that promotes continuous improvement and raises the quality of services or products offered to customers.

To achieve quality and process improvement, various tools are used, such as forms, surveys, and participant or direct observation techniques. These elicitation strategies enable

the collection of valuable information about the internal workings of the organization and guide decision-making toward effective optimization.

However, when applying these elicitation techniques, the main challenge is related to the costs of the resources used for data collection. If problems arise in this process, the time required for analysis and information gathering is prolonged, which increases costs. In addition, if the data collected is of low quality, problems of veracity, errors and inconsistencies in the business process modelling may arise.

In this article, a systematic analysis of different studies related to business process elicitation tools and their impact on continuous improvement will be carried out. This will allow us to identify current trends and advances in process management and elicitation, as well as to evaluate how these tools contribute to the optimization and alignment of organizational processes with the strategic goals of companies.

B. ORGANIZATIONAL CHALLENGES IN BPM IMPLEMENTATION

The implementation of BPM faces challenges that can represent considerable obstacles. One of the factors to consider is organizational culture, which is critical to the effectiveness of process management. A culture that does not promote collaboration and innovation can make it difficult for employees to actively participate in identifying and improving processes.

To achieve results that contribute to the analysis of a process, it is necessary for top management to foster support for initiative and a continuous improvement mindset. This culture must be accompanied by strategies to address resistance to change, a common phenomenon in organizations, where employees may experience insecurity in the face of new technologies or methodologies. To manage this resistance, it is critical to engage employees from the beginning of the change process, ensuring that they understand the benefits and necessity of BPM implementation. Clear communication and adequate training are essential to reduce uncertainty and foster a sense of ownership in the transformation process.

C. BENEFITS OF EFFECTIVE BPM IMPLEMENTATION

An effective implementation of BPM allows organizations to delineate the flow of their processes. By defining the activities that are carried out, it is possible to create graphical models that represent these processes. This visualization facilitates the evaluation and optimization of each stage, thus promoting continuous improvement and raising the quality of the product or service delivered.

BPM also allows to systematic evaluation of the alignment of processes with the strategic objectives of an organization, ensuring that all activities contribute to the overall goals of the organization, facilitating consistency in decision-making.

In addition, this clarity in alignment allows for identifying which processes are priorities and which require adjustments or improvements. By having a holistic view of how each process relates to strategic objectives, organizations can allocate resources more effectively, optimizing the use of time, personnel and capital. This not only improves operational efficiency but also helps direct the organization's efforts toward initiatives that truly generate value and contribute to long-term success.

III. RELATED WORK

The purpose of this section is to review additional research that was not included in our initial analysis, but focuses on topics such as Business Process Management (BPM) and Digitization; Requirements Engineering and Information Systems; and Business Strategies and Innovation. Through this analysis, we seek to identify aspects that can add value to our research. In the following subsections, we will present relevant studies that were evaluated to achieve these objectives.

In this review process, 12 secondary studies were identified that analyzed topics similar to those included in the proposed study (see Table 8).

From Table 8, we can group the reviewed articles into categories according to their main contents and approaches:

A. BUSINESS PROCESS MANAGEMENT (BPM) AND DIGITIZATION

[8] explores whether techniques for generating processes in business process management (BPM) have evolved in the context of digitization or whether traditional methods are still relevant. Following a systematic literature review and interviews with experienced consultants, it is concluded that established methods, such as interviews and workshops, continue to dominate practice, despite the potential of digitization to automate these processes. The authors suggest that this reliance on traditional techniques may limit the benefits that digitization could bring to process efficiency and effectiveness. They conclude that further research is needed to develop integrated methods that combine traditional approaches with the advantages of digital tools to better address the complexities of modern business processes.

In [9] the authors analyze whether traditional business process elicitation (BPM) techniques have changed with digitization or are still relevant. Through a systematic literature review and interviews with consultants, it concludes that methods such as interviews and workshops continue to be predominant. Despite technological advances, there is a significant gap in the adoption of automated tools such as process mining, highlighting the need to modernize approaches to address the increasing complexity of inter-organizational processes in the digital era.

In [10], the article develops a conceptual framework and performs a systematic literature review on hybrid representations of business processes, which combine imperative and declarative languages and artefacts to address complexity and flexibility in process modelling. These representations seek to overcome the limitations of traditional approaches by providing a balance between comprehensibility and

flexibility. The lack of a unified terminology and a clear conceptual framework in the existing literature is highlighted, which motivates the creation of a taxonomy and a research agenda for future applications in dynamic business process management.

B. REQUIREMENTS ENGINEERING AND INFORMATION SYSTEMS

In [11], the authors present a comprehensive review of the intersection between process mining and target modelling. They highlight the potential of process mining techniques to extract valuable information from event logs, which can serve as a basis for the development of goal-oriented models. The authors conducted a systematic literature review of 24 selected articles, and revealed that while there is a growing interest in combining process mining with goal-oriented approaches, the field lacks a coherent research trajectory. The review identifies several methodologies, such as intent mining and the use of hidden Markov models (HMMs), to understand the motivations behind process activities. In addition, it discusses the importance of aligning current practices with desired objectives and emphasizes the need for further research on performance indicators related to goal-oriented process mining. The findings suggest that integrating goals with process mining can improve the accuracy and interpretability of models and ultimately benefit stakeholders in business process management.

In [12], the article addresses challenges in requirements engineering for machine learning-based systems, exploring how to collaborate between domain experts, requirements engineers, data scientists, and developers to design intelligent data-driven applications. It focuses on the difficulties in defining, modelling, and verifying requirements due to interdisciplinary gaps and the integration of domain models and machine learning, proposing strategies to improve collaboration and overcome technical and conceptual challenges in these types of systems.

In [13], the article performs a systematic literature review, using the ''snowballing'' technique, to analyze how to elicit and specify software requirements from BPMN diagrams. It highlights that, although these models are useful for aligning requirements with business objectives, existing methods still lack automation, consistency in standards and robust approaches to address non-functional requirements and business rules. It proposes improvements to optimize this process and increase the accuracy and quality of elicited requirements.

In [14], the article performs a systematic literature review to analyze how functional and non-functional requirements are extracted from business process models represented in BPMN notation. It highlights the limited amount of existing studies, especially in non-functional requirements extraction, and points out the need for more comprehensive approaches to improve the quality and alignment of requirements with business needs. The results seek to identify gaps and propose directions for future research in this area of Requirements Engineering.

In [15], the article performs a systematic review of the literature on fit-gap analysis methods in ERP systems, identifying their advantages, limitations and possible solutions. It discusses how these methods evaluate the correspondence between business requirements and system functionalities, highlighting that they tend to be complex, dependent on human judgment and with applications limited to specific stages of implementation. The need for more flexible and effective approaches to improve their use in various business contexts is proposed.

In [16], the article proposes a BPMN-based conceptual and support model for the Fit-Gap analysis phase of ERP system implementation, offering upstream recommendations and key parameters to help consultants and clients address the gaps between business requirements and system capabilities. It focuses on mitigating common problems, such as excessive customization and inefficient resource management, to optimize decision-making and increase the likelihood of success in ERP implementation projects.

In [17], the article performs a systematic review of the literature to identify and analyze the input data required for the Fit-Gap method in ERP system implementation projects, highlighting the lack of standardization and clarity in their identification and documentation. Its objective is to improve the quality and effective use of this data to facilitate the selection and adaptation of ERP systems that are aligned with business requirements, thus optimizing the system development and deployment processes.

C. BUSINESS STRATEGIES AND INNOVATION

In [18], the article reviews the literature on the application of mass customization (MC) in business, exploring key concepts, main approaches and case studies in the production of goods and services. It discusses how to balance the efficiency of mass production with the flexibility of individual customization to meet specific customer needs, addressing operational, logistical and technological challenges, and highlighting the potential of MC to improve business competitiveness in a changing marketplace.

In [19], the study evaluates the robustness of three business models for insect production in Europe: centralized production of black soldier fly larvae for pet food, decentralized production for aquafeed and cooperative processing of maggots for human food. Through scenario analysis and stress testing, regulatory, economic and sustainability opportunities and challenges are identified, highlighting the impact of regulations on the use of side streams, insect welfare and high energy costs on the technical and economic viability of these emerging business models.

In [20], reviews rapid engineering techniques that leverage large language models (LLMs) to improve the semantic quality of business process models. Their approach addresses

key challenges such as ambiguity, incompleteness, and misinterpretation in process representations by using LLMs to support semantic enrichment.

In [21], presents ProMoAI, a generative AI framework capable of automatically generating and refining business process models from natural language descriptions. The tool incorporates advanced prompt engineering, user feedback mechanisms, and error management techniques to improve model quality and usability.

These studies demonstrate the growing potential of LLMs in enhancing process elicitation. In contrast, our proposal focuses on early-stage structural inconsistencies using rule-based logic. However, we recognize the need to evolve toward semantically enriched models, and we identify the integration of LLMs as a promising future direction for increasing robustness and alignment with human understanding.

Based on the secondary reviews provided above, we can identify in the three categories identified gaps to investigate.

1: Business process management (BPM) and digitization.

Despite technological advances, there is still a reliance on traditional methods for process elicitation and modelling, which limits the use of digital tools such as process mining. In addition, the lack of a unified conceptual framework for hybrid representations (imperative and declarative) restricts their adoption in complex environments. There is also an interoperability gap between traditional and digital approaches, which hinders the transition to more automated and efficient practices.

2. Requirements engineering and information systems.

Requirements extraction from BPMN diagrams lacks standardization, automation and robust methods for capturing non-functional requirements and business rules. In machine learning-based systems, interdisciplinary challenges make collaboration between experts, engineers and data scientists difficult. In addition, Fit-Gap analysis in ERP systems faces problems of standardization and data documentation, while goal-oriented process mining lacks clear metrics and guidelines to measure its impact.

3. Business strategies and innovation.

Sustainable business models, such as insect production, face regulatory, economic and operational challenges that limit their scalability and viability. On the other hand, the implementation of mass customization strategies lacks sufficient empirical studies that analyze their effectiveness in different sectors. There is also a lack of alignment between sustainability, advanced technologies and innovative business models, which reduces their potential to address logistical and operational challenges.

The identified gaps point to a need to update BPM education, integrating practical skills in digital tools, interdisciplinary approaches and sustainable solutions. Education must evolve to prepare future professionals in the design and management of processes that respond to the complexities and demands of modern business environments.

TABLE 1. Research questions to be applied.

Research Question	Motivation
RQ1: How many selected documents present proposals related to business process elicitation techniques?	Identifying the documents that present proposals related to business process elicitation techniques is the first step to being able to answer the following questions.
RQ2: What support technologies (software, tools) are commonly used in business process elicitation and what is their impact?	Identifying the support technologies used will provide insight into the most effective tools and how they can facilitate the elicitation of processes. This will also help organizations select the appropriate tools for their needs.
RQ3: Which methodologies for process elicitation are most common among the selected articles and what are their main characteristics?	Identifying and analyzing the most commonly used methodologies allows for an understanding of standard practices in the industry. By understanding the characteristics of a methodology, organizations can select the one that best fits their needs and thus improve the effectiveness of the documentation.
RQ4: Of the selected articles, how many focus on analyzing inconsistencies in organizations?	Understanding the various solutions and contributions from different articles allows us to gain a broader perspective on the different ways to address the management of inconsistencies in processes.

TABLE 2. Search string.

Main Concepts	Elicitation, requirement technique, eduction, business process, fit-gap analysis, process management, business model.
Groups of terms	(elicitation OR eduction OR requirement technique OR fit-gap analysis), (business process OR process management OR business model)
Search String	(elicitation OR eduction OR requirement technique OR fit-gap analysis) AND (business process OR process management OR business model)

IV. MATERIALS AND METHODS

The methodology consists of applying some steps of the Systematic Mapping technique, which allows us to identify, categorize and analyze the existing literature that is relevant to a given research topic [22]. It is a method commonly used to answer one or more research questions methodically. The stages of the adapted systematic mapping process will be described in Figure 1.

A. OBJECTIVES AND RESEARCH QUESTIONS

The purpose of this systematic mapping is to explore the existing tools and techniques that contribute to the field of business process elicitation, specifically in its initial identification. Likewise, it will be evaluated whether these current tools or techniques address the issues in the inconsistencies detected at the time of elicitation.

To gather relevant literature and discern the trends associated with the research topic, we have developed specific research questions. These questions are detailed in Table 1.

This approach will allow us to gain a more comprehensive and detailed understanding of the research topic, providing

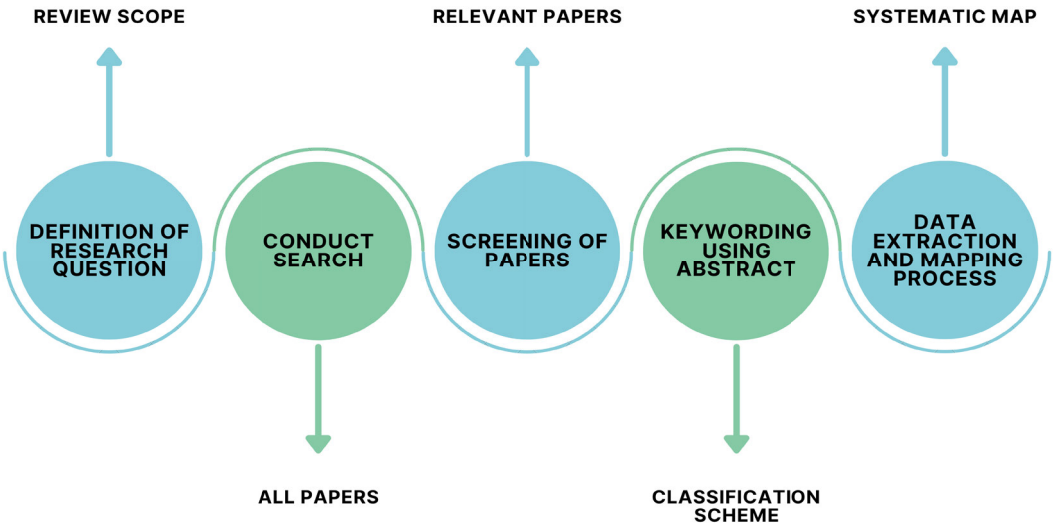

FIGURE 1. Stages of the systematic mapping process.

us with the necessary tools to address it effectively and meaningfully.

B. RESEARCH QUESTIONS TO BE APPLIED

We conducted a thorough search of data sources using search strings consisting of study-specific keywords to answer the research questions. The PICO strategy (Population, Intervention, Comparison, and Outcomes) indicated by [22] was used, and articles were searched using the search string described in Table 2.

C. DATA EXTRACTION

To carry out a comprehensive and robust data extraction search to support the present study, a strategy was implemented that involved selecting sources through digital databases of scientific publications, including Web of Science (WOS), SCOPUS, IEEE Xplore, ACM Digital Library, WILEY ONLINE LIBRARY, and ScienceDirect. The choice of these sources was based on the purpose of obtaining a wide diversity of articles related to the research topic. The use of these six sources allowed access to a considerable amount of relevant academic and scientific literature, thus contributing to enriching the knowledge base for our analysis. To optimize the accuracy of the searches, specific criteria were established, paying special attention to the analysis of document titles, abstracts, introductions, and conclusions. The decision to take advantage of this functionality, available in all the consulted databases, proved crucial, as it facilitated the identification of academic and scientific articles most relevant to the objectives of our research.

D. INCLUSION AND EXCLUSION CRITERIA

The articles selected from the previously described data sources were filtered according to the following inclusion and exclusion criteria.

TABLE 3. Sources for the automated search.

Electronic data sources	URL	Resources
Web of Sciences	https//www.webofscience.com	82
SCOPUS	https//www.scopus.com	224
IEEE	https://ieeexplore.ieee.org/	22
Science Direct	https://www.sciencedirect.com/	58
ACM	https://dl.acm.org/	18
Wiley	https://onlinelibrary.wiley.com/	7

1) INCLUSION CRITERIA

- Research articles in English from scientific journals and conferences.
- Articles that address business process elicitation.
- Articles published since 2014.

2) EXCLUSION CRITERIA

- Articles not in English.
- Articles published before 2014.
- Articles that do not include topics related to business process elicitation.
- Duplicate studies in different databases.
- Incomplete items.
- Articles that are not in journals or conferences.
- Articles that are not available (open access).
- Items not relevant in the search string.
- Reviews (can be used in Related Works).

E. SEARCH EXECUTION

The chosen search string was applied in the designated digital databases of scientific publications, resulting in a primary set of 411 related works (see Table 3).

The data was collected using the export functions provided by each digital library. After removing duplicate articles, the

total count was reduced to 229. The agreed-upon inclusion and exclusion criteria were then applied, and the titles, abstracts, and introductions were reviewed, resulting in 64 selected articles. Finally, a review of the articles was conducted. During this process, articles addressing topics related to process elicitation, requirements elicitation, or information capture for software development were excluded. After this selection process, 47 relevant articles were identified and retained for the research. This article filtering process is represented in Figure 2.

F. CLASSIFICATION SCHEME

The 47 selected articles were classified into three main categories: Analysis, Use of Existing Solutions, and Implementation/Proposals. Regarding the temporal dimension, the articles were categorized according to their year of publication, with the selection limited to those published from 2014 onwards. This temporal criterion allows us to focus on recent and relevant research to gain an updated perspective on the study topic.

The article type dimension categorizes the works into:

- Analysis: Refers to articles that describe analyses and comparisons of the literature on business process elicitation.
- Use of existing resources (Experiences): Refers to studies or works related to the application or use of resources, tools, methodologies, knowledge, or technologies that have already been previously developed and established for business process elicitation.
- Implementation/Proposals: Articles that address proposals or implementations focused on business process elicitation in organizations.

G. MAP CONSTRUCTION

As part of the systematic mapping focused on business process elicitation in organizations, a map has been developed that serves as a key tool to facilitate the representation and analysis of the collected data. In the following section (V-A), we present the map generated in this process, which provides a visual and organized representation of the emerging categories identified in the analyzed studies.

V. RESULTS

In this section, we detail the results obtained from the classification and analysis process of the selected studies through the review of the literature relevant to our research topic on business process elicitation, specifically related to the participation and contribution of women in this industry.

A. SYSTEMATIC MAPPING

We have created a map to effectively illustrate and analyze the studies selected in our research. In Figure 3, these studies are organized into three distinct dimensions. This representation includes articles categorized under the labels of implementation, use, and analysis.

The labels are placed on the left margin of the figure, providing a clear view of the diversity of formats and approaches in the bibliography. On the right side of the figure, the publication classifications are organized by year intervals, offering a chronological perspective and highlighting the temporal trends in the research. In the central axis, the different thematic categories of the works are displayed, allowing for a quick understanding of the research areas addressed.

This map provides us with an overview of the works related to business process elicitation. It facilitates the visualization of three crucial dimensions that we have chosen to classify by time, thematic categories, and article type, offering a valuable perspective for identifying potential patterns and evolutions in this field of study and for addressing the research questions of this article.

B. OVERALL ANALYSIS BY CHARACTERISTICS

This section presents an analysis of the findings obtained from the categorization of the 47 selected studies based on various aspects, a categorization made after analyzing the chosen studies. These studies were sourced from five academic databases: WOS, SCOPUS, IEEE, Science Direct, ACM, and Wiley.

1) CHRONOLOGICAL ANALYSIS

In recent years we have observed a drop in the number of academic publications related to business process education. This trend is also reflected in the field of study to which these works belong. This behavior is atypical because as far as we have been able to investigate the topics of business process education have not reached a level of maturity, where the main approaches and theories are already well established, thus reducing the need for new research. The chronological analysis of the selected articles shows a dynamic evolution of scientific production in business process education, reflecting global trends, methodological advances and the impact of external events. Below, in Figure 4, the behavior by period is detailed:

2014-2016: In this period, 17 publications were registered, evidencing the beginning of interest in process elicitation. The year 2015 stood out as the most productive, with 11 articles, reflecting a sustained increase in research. The main sources in this period were Scopus, with 15 publications, and WOS, with 8 publications. The observed trends show a focus on establishing methodological bases and exploring initial tools, thus laying the foundation for future advances in organizational process elicitation and modelling.

2017-2019: The analysis of scientific production between 2017 and 2019 reveals a total of 15 publications, reflecting a variable dynamic in scientific production. An increase was observed in 2017 with 8 articles, followed by a notable drop in 2018 with only 3 publications, and then experiencing a slight recovery in 2019 with 4 publications. The main sources in this period were Scopus, with 5 publications, and WOS, with 6 publications. The trends indicate a greater thematic

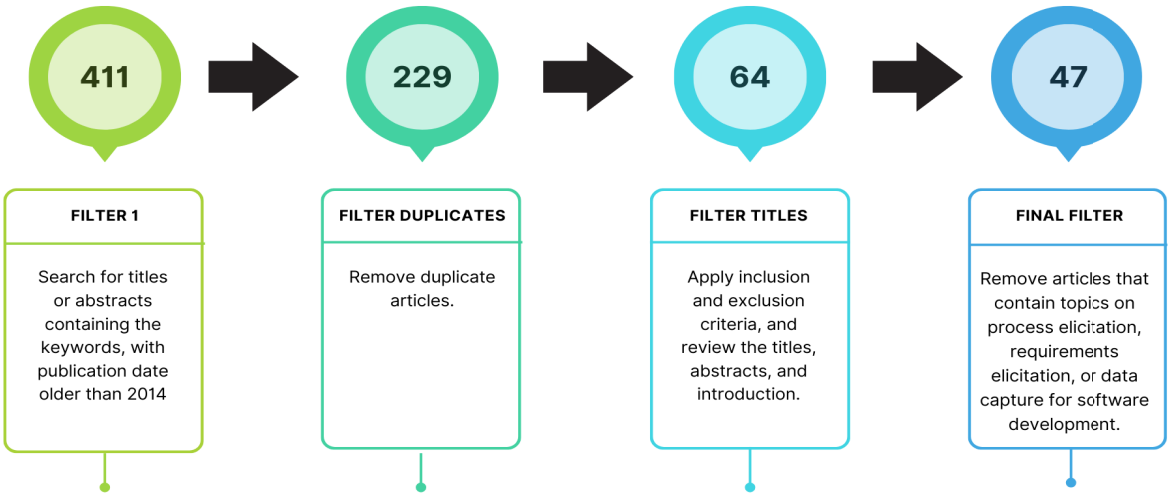

FIGURE 2. Search execution and filtering summary.

diversity, highlighting practical applications of the proposed methodologies and a growing interest in interdisciplinary collaboration, which broadened the scope and relevance of studies in process elicitation.

2020-2024: With a total of 15 publications, the period studied reveals a decrease in scientific production, with a maximum of 6 in 2020 and a minimum of 1 in 2024. Scopus and WOS were the predominant sources. Research has evolved towards the integration of advanced technologies and the adaptation of tools to specific contexts, leaving the development of new methodologies in the background.

The analysis of scientific production reveals a cyclical behavior in research activity. The period 2014-2016 stands out as the peak of activity, concentrating 36% of the total number of publications, which reflects a rapid initial growth and a marked interest in the area. Subsequently, between 2017 and 2019, a stabilization with fluctuations and lower overall activity is observed. From 2020, a progressive decline in production is evident, possibly motivated by changes in the research priorities of the subject. This behavior suggests a typical dynamic of emerging areas, which go through phases of growth, consolidation and eventual decrease in the volume of publications.

2) ANALYSIS BY ARTICLE TYPE

We have categorized the selected studies into three main types of articles, to visualize the predominant strategies in this field of study. These types of articles are:

- Analysis: Articles that provide analyses and comparisons in the literature on business process elicitation.
- Implementation: Articles that propose solutions in this field for practical applications.
- Use: Articles that propose the utilization of existing resources applied to this topic.

The examined articles were distributed as shown in Figure 5.

We have conducted a systematic mapping to identify the distribution of works. Out of the 47 selected papers, 17 (36%) conducted general analysis studies. Only 4 (9%) use existing studies for their research, and 28 (60%) propose implementations on this topic.

3) ANALYSIS BY THEMATIC CATEGORIES

To gain a comprehensive view of the related works, we have classified the contexts in which the investigations take place into the following categories: Process Modelling and Notation, Declaratory Models and Specifications, Heuristics and Simulation, Ontologies and Semantic Modelling, Process and Data Mining, Visualization and Virtualization, Elicitation and Analysis Techniques, Collaborative Tools and Methods, Requirements Engineering and Methodologies, Group Dynamics and Games, Knowledge Management and Audit. These categories are distributed as shown (Figure 6).

The previous chart clearly shows a dispersion across the different areas; however, in topics related to visualization, there are very few studies, as well as in Collaborative Tools and Methods, which allows us to generate new knowledge regarding practical solutions for business process elicitation.

C. RESPONDING TO RESEARCH QUESTION

RQ1: Of the 47 papers selected, 28 (60%) present proposals related to business process elicitation techniques. In the previous sections, a general analysis by article type was conducted, which allows us to answer this question by reviewing Figure 5. Of the 47 selected papers, 28 correspond to the generation of proposals, which we have reviewed to understand the types of proposals generated and to answer the research questions. We have classified the articles found into categories.

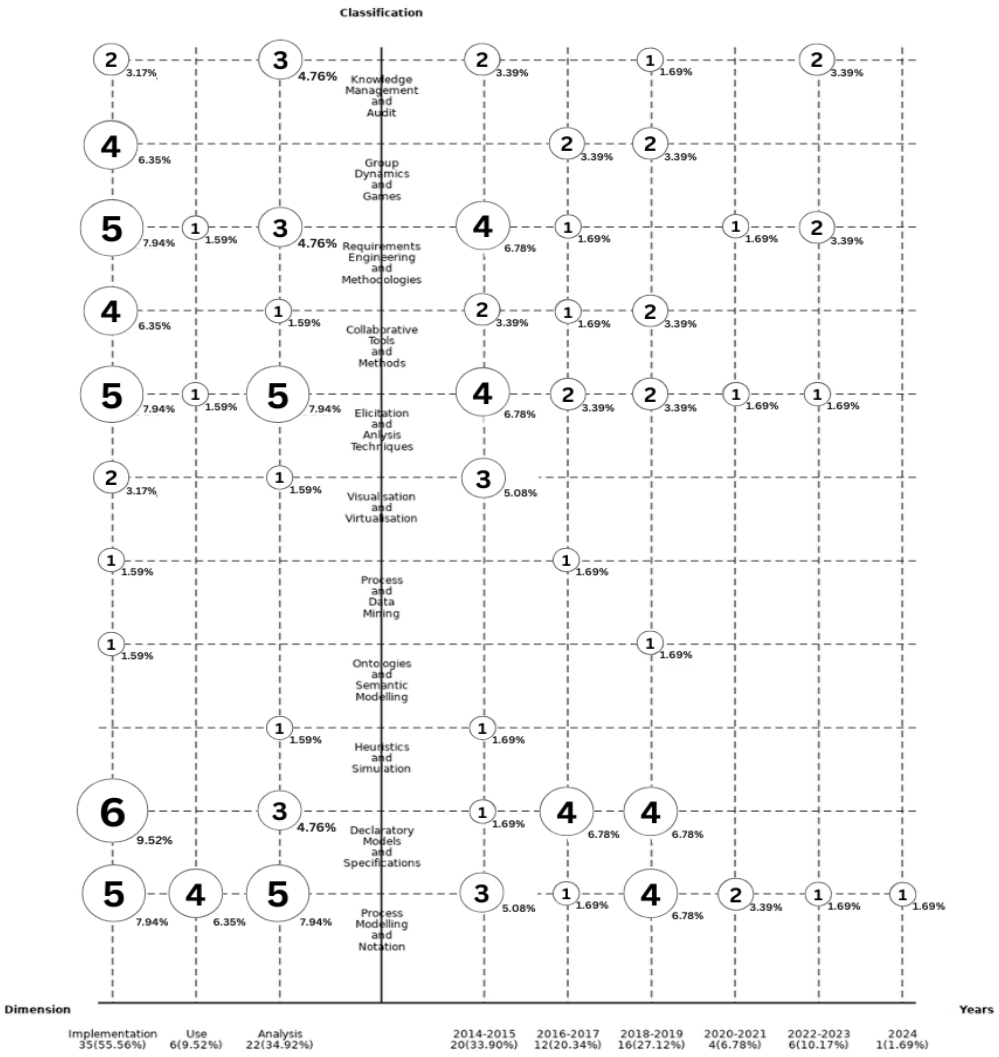

FIGURE 3. Stages of the systematic mapping process.

To conduct a complementary analysis, we classified the selected articles into 5 categories, as shown in Table 4.

As seen in Table 4, the ''Methodologies and Approaches'' category emerges as the category with the most articles. With a total of 10 documents, this category addresses practices, strategies, and techniques designed to structure and guide the elicitation process, such as hierarchical workshops and visual tools like the Business Model Canvas. These approaches represent the core of research in elicitation, as they provide a systematic framework for gathering and analyzing critical information about business processes. Their relevance lies in their ability to ensure effectiveness and accuracy in capturing requirements, reinforcing their central role in this context.

On the other hand, the ''Collaboration and Interaction'' category, with 5 documents, complements the methodologies by emphasizing the importance of active stakeholder participation. Tools such as Serious Games and information management platforms foster collaborative dynamics that enhance the quality and relevance of the information obtained during the elicitation process. Their focus on human interaction adds value by promoting a participatory environment aligned with the expectations of those involved.

The ''Modeling and Notation'' and ''Automation and Tools'' categories provide additional elements that strengthen the methodological proposals. With 8 and 5 documents, respectively, these categories offer approaches that formalize and automate the elicitation process. Tools such as BPMN and S-BPM not only standardize the documentation of processes but also enhance operational efficiency by automating repetitive tasks. These technological solutions complement the methodologies by streamlining the elicitation process, ensuring greater consistency and reducing human error.

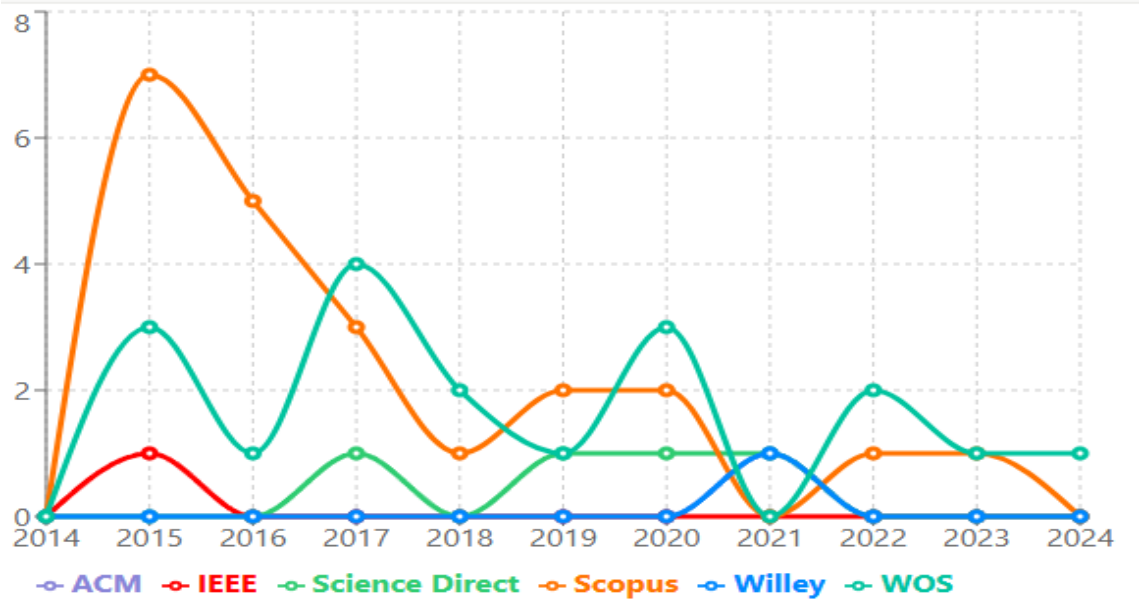

FIGURE 4. Number of publications per year.

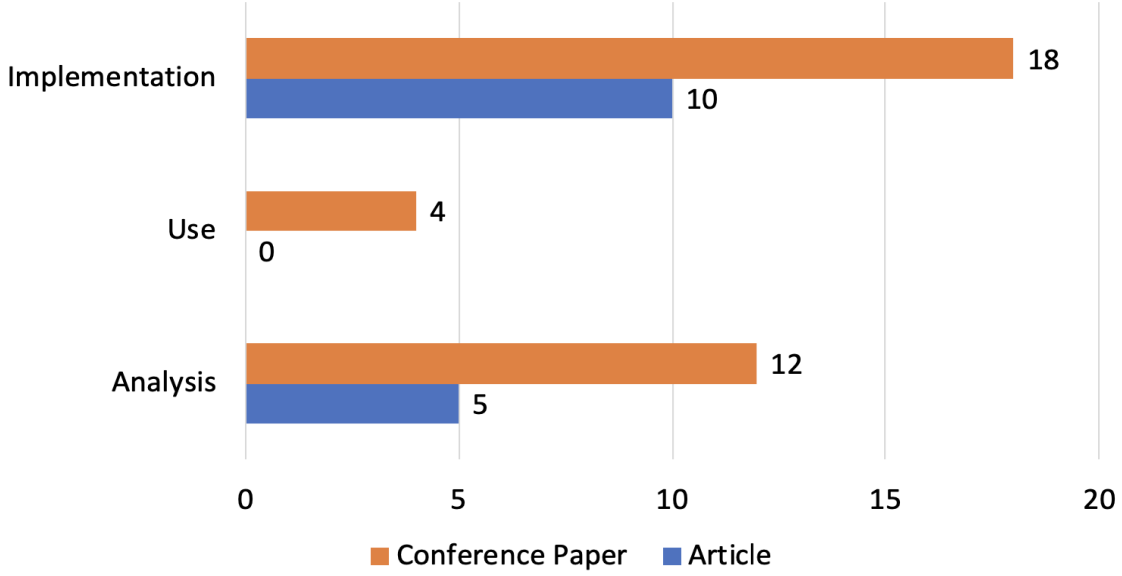

FIGURE 5. Number of publications by type.

Finally, only one article presents a proposal related to "Frameworks and Platforms." Its focus on integral technological environments, such as the ProM framework, facilitates the management and analysis of business processes, serving more as a technological support rather than a specific methodology. This type of proposal emphasizes the importance of comprehensive platforms that can integrate various tools and methodologies, providing a unified environment for the elicitation and improvement of business processes.

RQ2: What supporting technologies (software, tools) are commonly used in business process elicitation and what is their impact?

In Table 4, common technologies were identified, like: Hierarchical Elicitation Workshop, Business Model Canvas, and Balance Scorecard, which use various programs and tools in business process education. These technologies facilitate the analysis and improvement of business processes, contributing to the enhancement of productivity and efficiency in organizations. Regarding the technologies, for better clarity of their use, we have grouped them into 7 categories, as defined in Table 5.

The associated technologies listed in Table 5 are somehow linked to process education, as they support the teaching, learning, and improvement of business processes or

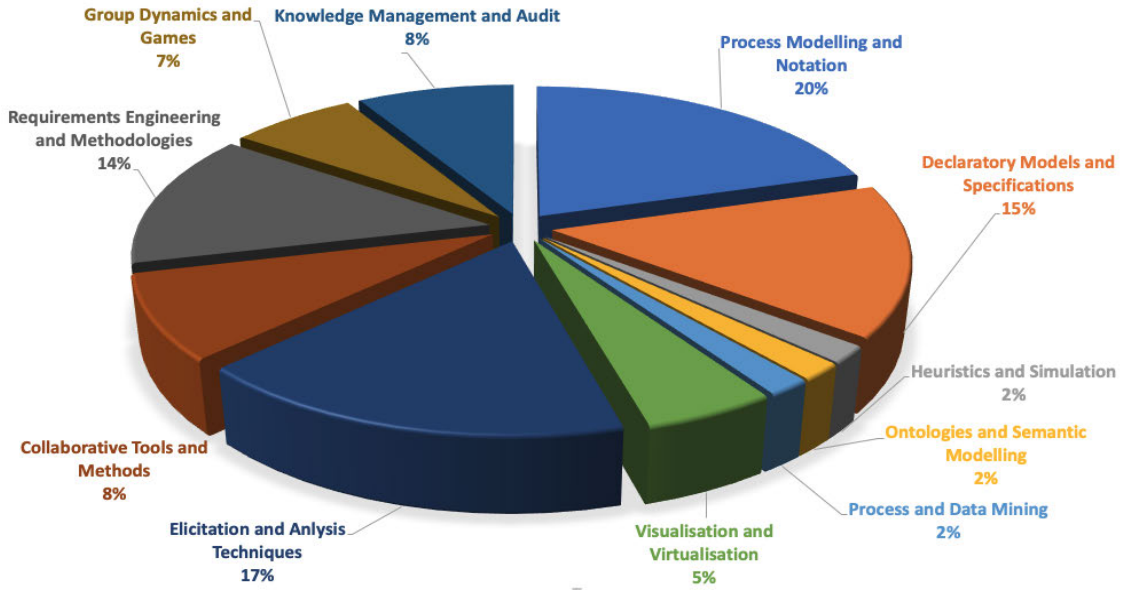

FIGURE 6. Distribution of article types.

TABLE 4. Articles by categories.

Categories	Definition	Examples	Papers
Methodologies and Approaches	Sets of practices, techniques, or strategies used to structure and guide the elicitation process.	Hierarchical Elicitation Workshop Business Model Canvas Balance Scorecard	[23] [24] [25] [26] [27] [28] [29] [30] [31] [32]
Modeling and Notation	Technologies and tools used to model, visualize, and document business processes through standardized diagrams or notations.	BPMN i* SPEM Secure Tropos	[25] [33] [34] [35] [36] [37] [38] [39]
Automation and Tools	Technologies that automate repetitive or complex tasks within business process modelling and elicitation.	ISEASy S-BPM KAOS4SOA BPMS	[40] [41] [42] [43] [44]
Frameworks and Platforms	Technological infrastructures that provide comprehensive environments for modelling, analyzing, and managing business processes.	ProM framework	[45]
Collaboration and Interaction	Methods and tools that promote the active and effective participation of stakeholders in the elicitation process.	Information Management Platforms Serious Games	[46] [47] [48] [49]

organizational systems by offering tools and methodologies that facilitate the understanding, modelling, and optimization of these processes.

The impact of these support technologies is significant, as they allow organizations to conduct thorough analyses of their operations, leading to continuous improvement and higher quality of the services or products offered to customers.

These technologies facilitate the capture, modelling, and analysis of business processes, improving accuracy and reducing errors in process representation. They also promote collaboration among stakeholders, increasing efficiency and alignment with the strategic objectives of organizations.

RQ3: What methodologies for process elicitation are most common among the selected articles and what are their main characteristics?

Table 6 presents a summary of the identified methodologies, detailing their main characteristics and associated references. These methodologies are organized from the most common to the least used, to provide an overview of their practical application and contribution to the field of process elicitation.

The presented methodologies are evidence of the diversity of approaches and characteristics of the methodologies employed in process elicitation. These methodologies stand out for their ability to address key challenges in process elicitation, such as active stakeholder participation, data-driven optimization, and early identification of critical requirements like security.

RQ4: Of the selected articles, how many focus on analyzing inconsistencies in organizations?

Of the 28 articles reviewed, 4 articles focus directly on the analysis of inconsistencies in organizations, which

TABLE 5. Technologies and their categories.

Category	Definition	Associated Technologies
Process Modeling and Representation.	Technologies for designing, representing, and visualizing business processes in a structured way.	SPEM, BPMN 2.0, ArchiMate, BPMN, i*, BPMN Collaboration Diagrams, AS Algorithms, BPMN-based Process Architecture.
Elicitation and Requirements Management.	Tools for identifying, gathering, and documenting stakeholders' requirements.	HEW, BPMN, Tangible Tabletop Interfaces, Serious Games, Mural, Post-It Notes, Checklist.
Automatization and Process Optimization.	Solutions that automate processes to improve efficiency, reduce errors, and increase adaptability.	SAP ERP, SAP MBQ, ProM Framework, Apromore, BPMS, UML, Secure Tropos, Hybrid Process Skeletons, Privacy patterns.
Process Analysis and Improvement.	Technologies that facilitate process evaluation, simulation, and improvement through metrics and prediction.	Design based on scientific methodology, Kaos4SOA, Model Checking, MTL, Business Model Canvas, Balanced Scorecard.
Collaboration and Knowledge Management.	Platforms that promote collaboration and manage knowledge efficiently.	EA Information Management, MediaWiki, Mural, Post-It Notes.
Security and Privacy Processes.	Technologies that ensure security and privacy in the development and implementation of processes.	BPMN 2.0, ArchiMate, Secure Tropos, Hybrid Process Skeletons, Privacy patterns.
Inclusion and Stakeholders' Participation.	Tools that promote the participation of non-technical users in process design and validation.	3D virtual world, S-BPM, physical cards, image recognition, S-BPM tools.

TABLE 6. Technologies and their categories.

Methodology	Main characteristics	References
Collaborative and participatory elicitation	Approaches that involve stakeholders through workshops (like HEW) or participatory techniques such as serious games and simulations. They allow for better communication, consolidation of knowledge, and the generation of more comprehensive and understandable models.	[33], [24], [41], [28]
Predictive modelling and optimization	Use of tools such as machine learning and process mining to generate predictions about resources and outcomes. These methodologies optimize assignments and processes in real time using specialized algorithms.	[23], [45], [42]
Elicitation of security requirements	Techniques like SREBP that identify security objectives from process models. They provide an early analysis to ensure asset security and the alignment of processes with technological objectives.	[34], [30], [31]
Goal and rule based modelling	Approach based on the identification of strategic objectives and their integration into process models through structured representations like the Business Model Canvas. They align business goals with operational processes to ensure coherence.	[25], [50], [43]
Techniques based on BPMN and ontologies	They use BPMN to structure processes and generate domain ontologies that define semantic relationships. They help capture needs from strategic to operational levels consistently.	[36], [51], [39]
Visual and design methodologies	They use visual and design tools like Design Thinking to foster creativity and innovation. They provide structures to represent complex processes in tangible and virtual interfaces.	[46], [26], [49]
Regulatory compliance	Methods aimed at extracting process models from regulatory documents. They represent regulatory rules in graphical views or temporal patterns, allowing alignment with regulations in sectors such as e-government.	[32], [40]
Privacy and trust	They incorporate privacy patterns and trust frameworks into business processes. They integrate user concerns into process models through privacy objectives translated into technical requirements.	[35], [38]
Automation and e-health analysis	Automatic modelling and analysis for e-health systems focused on capturing clinical process requirements and improving efficiency in rapidly changing contexts.	[44]

can be due to a lack of alignment between objectives and processes, non-traceable decisions in evolving architectures, trust concerns in collaborative processes, or regulatory mismatches in business processes. In Table 7, the inconsistencies and their proposed solutions are specified.

TABLE 7. Articles focused on the analysis of inconsistencies in organizations.

Ref.	Description	Proposed Solution
[43]	This article analyzes how inconsistencies between goal models and derived business processes can lead to implementations that do not align with actual business objectives.	Introduce an approach based on extended goal models (Kaos4SOA) to derive coherent processes that meet temporal and logical constraints.
[39]	Examine how architectural decisions can generate inconsistencies in processes as they evolve. It highlights the importance of maintaining systematic traceability during process development.	It proposes the "Process Edification" technique to capture and manage decision information, ensuring that inconsistencies are identified and mitigated.
[35]	It addresses the inconsistencies in collaborative processes arising from users' subjective concerns about trust and security.	Develops a user-centred analysis and modelling framework to refine reliability requirements and ensure alignment with expectations.
[32]	Investigate how inconsistencies between business processes and regulations can impact organizations' compliance with legal standards.	It presents a method to extract process models from regulatory documents and represent them graphically to minimize regulatory inconsistencies.

Of the 4 articles that address inconsistencies in organizations, they focus on the alignment of objectives and processes, traceability of decisions, trust in collaborative processes, and regulatory compliance. The proposed solutions are extended models, traceability techniques, and regulatory methods, highlighting their importance in optimizing processes and ensuring organizational coherence.

VI. DISCUSSION

Throughout the systematic review process and literature analysis, significant gaps were identified in the area of business process elicitation in organizations, which are described below:

Lack of standardization in process elicitation techniques: Although there are various methodologies for business process elicitation, a clear consensus has not been reached on which is the most effective in different organizational contexts. The lack of a unified standard generates inconsistencies in the results, which negatively impacts the effectiveness of the implementations.

Unstructured processes lack studies: Most current research focuses on well-defined and structured processes. However, many organizations face unpredictable or flexible processes, which require more dynamic approaches, such as the use of CMMN (Case Management Model and Notation). Research on the application of these tools is still limited.

Limited research on collaborative process elicitation: Although collaborative approaches to process elicitation are mentioned in the literature, few empirical studies explore their effectiveness compared to traditional methods. It is necessary to delve deeper into how collaboration among process stakeholders can improve the accuracy and efficiency in workflow modelling.

Challenges in managing the quality of elicited data: Inconsistencies and errors in the data collected during process elicitation continue to be a recurring problem. More research is needed on how to mitigate these problems, whether through the use of advanced technologies or the implementation of better practices in data collection.

Insufficiency of technological tools adapted to process elicitation: Although there has been progress in the development of support technologies for elicitation, such as BPMN modelling tools, they still present limitations when facing complex or emerging processes. There is a need to explore new technologies or adapt existing ones to more effectively support different types of processes.

Insufficient evaluation of the effectiveness of methodologies: Few standardized metrics allow for an objective assessment of the effectiveness of different elicitation methodologies. It is essential to develop clear criteria to measure the impact of the applied techniques and tools, especially in terms of efficiency, accuracy, and scalability.

These gaps offer valuable opportunities for future research that could significantly improve the field of business process elicitation, promoting advances in the standardization of methodologies, the development of more robust tools, and the optimization of collaboration in complex organizational environments.

One of the key tools for improving processes is having a model that allows for a detailed and explicit analysis of the activities that make up each process. In this sense, the BPMN modelling language presents itself as a powerful option, as it allows for the representation of the workflow through activities, events, and specific roles within the process.

Although this description seems simple, the real difficulty lies in identifying the roles, activities, and events that make up a process. It is often assumed that the process owners are familiar with all the roles, participants, and events involved. However, when processes are complex and span multiple areas, collecting and organizing this information becomes a task prone to errors. These errors can generate inconsistencies when creating modelling diagrams, which affects the utility of the model.

To avoid these inconsistencies, collaboration among the participants in the process is usually sought through a joint elicitation exercise. This collaboration allows for the identification and clarification of the different stages of the workflow. However, carrying out this exercise efficiently remains a challenge, especially when the processes are large or involve multiple stakeholders.

Therefore, in the following section, we present the design of a software solution to facilitate collaboration among the participants in the process, allowing them to respond to surveys with specific questions related to their roles and activities within the workflow. The questions are based on a research model that helps accurately identify positions, roles, and activities, as well as the interactions between them.

VII. PROPOSAL

Our proposal involves the development of a collaborative system for business process elicitation, designed to detect and manage inconsistencies in the information provided by multiple participants, while also offering mechanisms to resolve them where feasible. In this context, we define data inconsistency as the lack of coherence in the descriptions of a workflow gathered from different actors within the organization. These inconsistencies are grouped into two main categories: role inconsistencies and workflow inconsistencies. Role inconsistencies occur when there is a discrepancy between the role a participant assigns to themselves and the roles attributed to them by others. This includes: (i) undeclared roles, where a participant fails to mention a role assigned by peers; and (ii) unrecognized roles, where a participant claims a role that is not acknowledged by others. Such differences introduce ambiguity in determining individual responsibilities within the process. Workflow inconsistencies, on the other hand, arise when participants describe the sequence of tasks and collaborations differently. These include: (i) a successor not acknowledging their predecessor; (ii) a predecessor failing to mention their successor; and (iii) asymmetric declarations of parallel collaboration. These inconsistencies indicate fragmented or conflicting understandings of the process structure. The proposed system addresses these challenges by comparing individual responses and identifying conflicts where agreement is lacking. By detecting such inconsistencies early in the elicitation phase, the system supports iterative clarification and convergence toward a shared, validated process model. This solution seeks to enhance the accuracy and reliability of business process elicitation, ensuring that the resulting models more faithfully reflect organizational realities. These validated models serve as a robust foundation for decision-making, process optimization, and continuous improvement initiatives. The implementation of specialized software for business process elicitation is expected to be an improvement in the data collection and analysis phases, compared to traditional approaches. Manual processes, such as interviews and paper surveys, are prone to errors, inefficiency, and difficulties in data management, especially in large-scale projects. With our proposal, we hope that these tasks will be carried out while optimizing the accuracy of the collected results. The automated generation of process models is a key advantage; in this sense, our proposal converts the collected data into process diagrams, such as BPMN or, in this case, directly into flowcharts with adapted Petri nets, which provide a clear visual representation of the activities and flows within the organization. This automated process not only accelerates the creation of models but also improves the understanding of processes and facilitates communication among stakeholders by providing a baseline model of the flow being analyzed. This proposal consists of the development of a collaborative system for the elicitation of business processes.

A scheme consisting of three stages has been designed. Figure 7 shows our path in the present research:

- Phase 1 - Solution design and prototyping: This phase aims to define and design a solution that optimizes process elicitation, culminating in an initial functional prototype. The phase begins with a detailed analysis of the current context, clearly identifying the limitations of traditional methods. Based on this analysis, key objectives are established, such as the automatic detection of data inconsistencies and the automation of process model generation. Next, a conceptual design is developed to visually and structurally represent the proposed solution. Based on this foundation, iterative prototypes are created, integrating essential functionalities to assess the system's feasibility and utility from the early stages of the project.
- Phase 2 - Validation and refinement: During this phase, the objective is to obtain feedback from key stakeholders to adjust and improve the proposal. The prototypes and initial concepts will be presented to strategic users, who will provide feedback on the usability, functionalities, and scope of the system. This feedback will be collected and analyzed to identify areas for improvement and possible adjustments. Subsequently, the design will be iterated based on the feedback received, ensuring that the solution aligns more precisely with the identified needs. As a result, a refined proposal will be obtained that reflects greater precision and is fully aligned with the stakeholders' expectations.
- Phase 3 - Preparation and presentation of the proposal: Finally, the aim is to formalize the proposal. To this end, a document will be drafted that includes a detailed introduction to the problem, the system's objectives, the proposed methodology, and the expected benefits, highlighting its impact on improving organizational processes. Likewise, a visual presentation will be prepared to summarize the key aspects of the proposal, questions raised will be addressed, and final adjustments will be made based on the feedback received. As a result, a complete proposal document, a successful formal

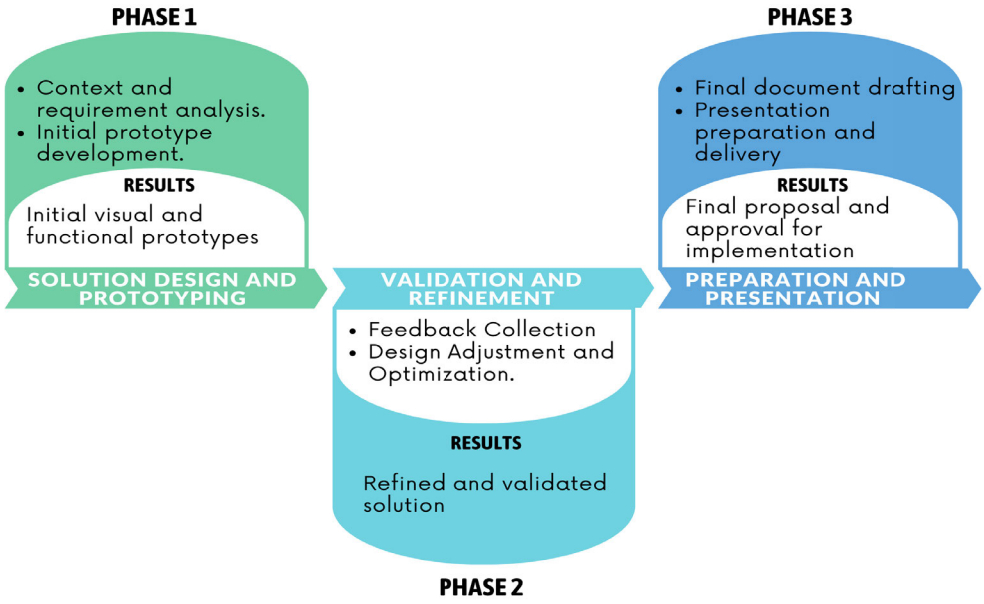

FIGURE 7. Phases of proposal creation.

presentation, and final approval will be obtained to initiate the implementation of the system.

A. SYSTEM INTERFACE AND FUNCTIONALITY

Following the definition of the proposed solution, this section details the key system interfaces, providing a clear understanding of how users interact with the solution. These views have been designed to optimize process elicitation by facilitating the detection of inconsistencies and automating process model generation.

1) Main system view:
The main system view (home) serves as the primary interface for analysts, allowing them to visualize registered companies and organizations. Each company is created in the system when a process is registered, ensuring proper association. This interface provides an overview of the status of processes within organizations and includes a search bar for efficient company retrieval, enhancing navigation, and usability (see figure. 8).
2) Company details view:
This interface enables analysts to examine the processes associated with a specific company. Each registered process is displayed with its current status (“completed” or “in progress”), offering a clear perspective on processes where workflows have been successfully identified. This view aids in monitoring and managing ongoing and completed processes (see figure. 9).
3) Business process details view:
This view provides detailed information about a specific business process. It displays the stakeholders involved, the individual who provided the process information, the resolution status of each participant concerning the elicitation survey, and the overall survey status. If no inconsistencies are detected, the system automatically generates a graphical model of the elicited workflow, enhancing process comprehension (see figure. 10).
If the process presents a problem of inconsistency at the time of elicitation, it looks like this (see figure. 11)
4) Survey with inconsistencies view:
This interface allows analysts to examine surveys that contain inconsistencies in one or more responses after the elicitation process is completed. Its purpose is to provide tools for correcting these inconsistencies through additional survey iterations with targeted questions, enabling the progressive refinement of process models (see figure. 12).
5) Process creation view:
This view facilitates the system’s primary functionality: creating instances for process elicitation. The analyst can associate an existing company or create a new one, add workflow participants, and define necessary parameters for proper process configuration. Additionally, the interface presents a standardized set of questions to guide the elicitation of business processes (see figure. 13).

The described views are aligned with the objectives of the proposed solution. They enable efficient data inconsistency detection, facilitate the effective management of registered processes, and optimize the automation of process model generation. By incorporating these features, the system

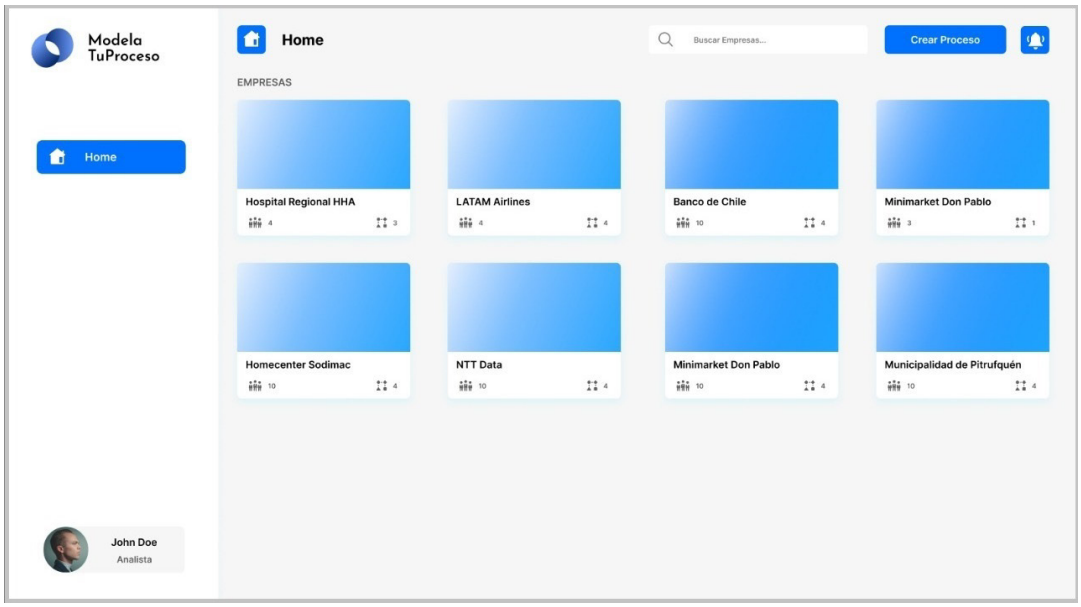

FIGURE 8. The main system view.

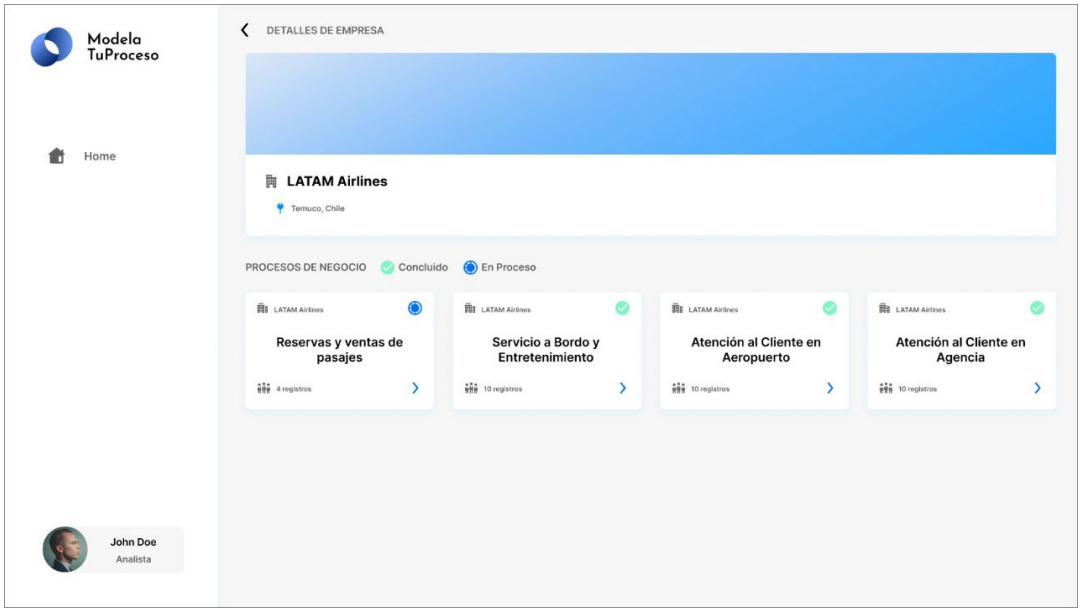

FIGURE 9. Business processes of a company.

becomes a key tool for improving process elicitation in various organizational settings.

While the current system relies on a set of rule-based logical comparisons to identify inconsistencies in structured data, mainly mismatches in roles and task sequences, this approach has limitations in capturing semantic inconsistencies, such as variations in terminology, communicative intent, or interpretation between different actors. Such divergences, even if they do not manifest themselves as explicit contradictions, can lead to a fragmented or misaligned understanding of the process.

As a line of future improvement, it is proposed to explore the integration of large-scale language models (LLM) to support the semantic analysis of the responses provided by participants. These models offer advanced capabilities for interpreting context, resolving ambiguities and detecting subtle discrepancies in meaning, making them particularly suitable tools for collaborative process education environments. Incorporating such technologies could significantly improve the system's ability to identify and reconcile semantic mismatches, thereby increasing the accuracy and robustness of process modelling.

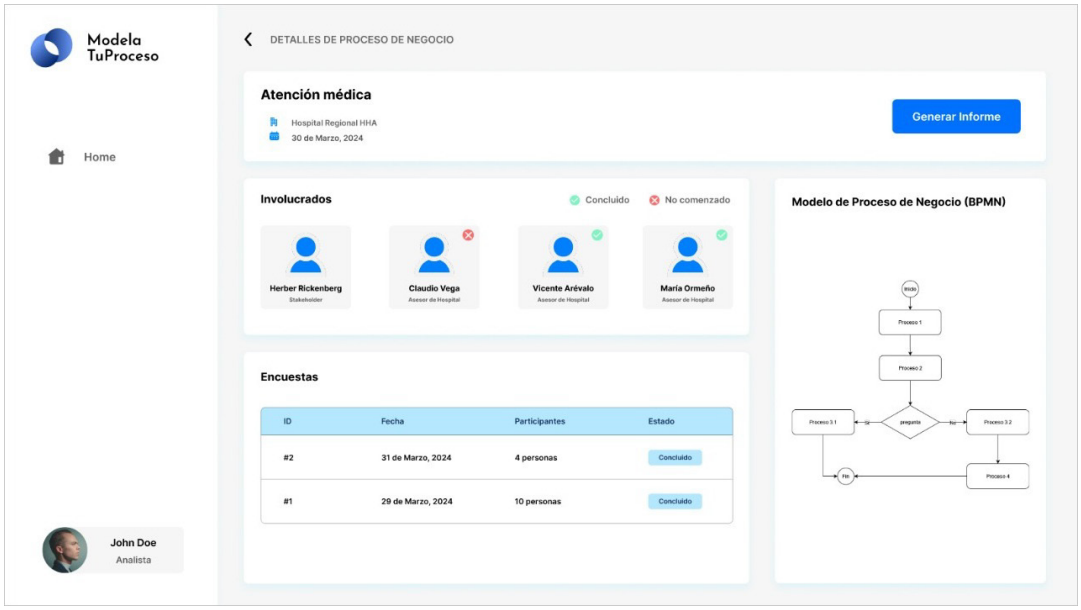

FIGURE 10. Detail of a business process.

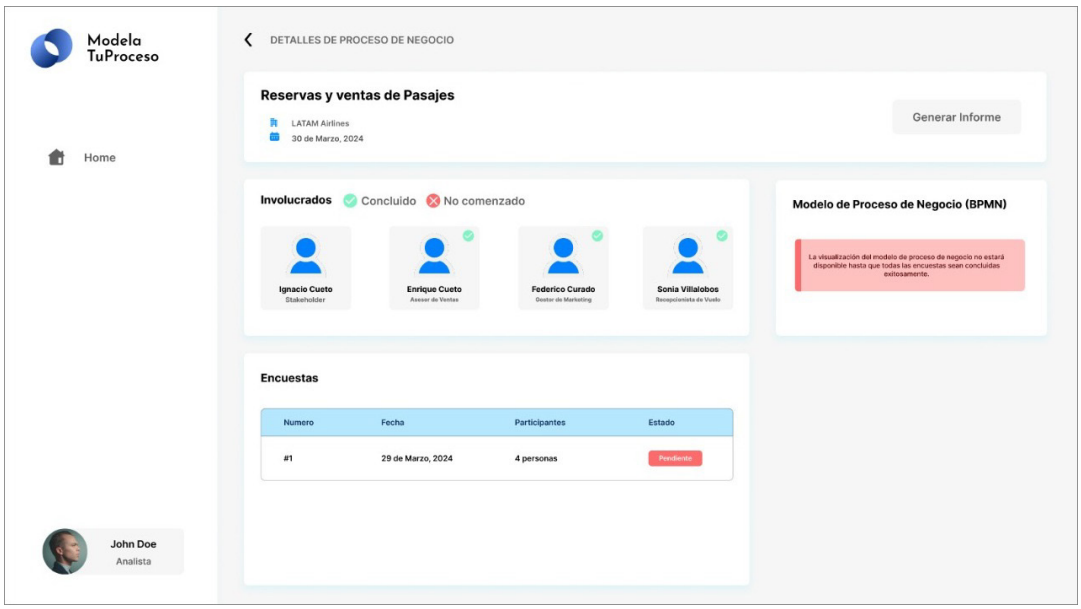

FIGURE 11. Another Business Process Detail.

VIII. LIMITATIONS OF STUDY

This study has certain limitations that must be considered when interpreting the results and proposals. These limitations are related to the reliance on secondary sources, the focus on structured processes, and technological and methodological barriers. They are described in detail below:

A. DEPENDENCE ON SECONDARY SOURCES

This study relies heavily on a systematic review of existing literature, which implies that conclusions depend on the quality and comprehensiveness of the sources reviewed. The lack of its own empirical data limits the ability to validate the propositions directly in real organizational settings. This dependence may restrict the generalizability of the results to more diverse or specific contexts.

B. LACK OF FOCUS ON UNSTRUCTURED PROCESSES

Most of the tools and methodologies analyzed are designed for well-defined and structured processes. This leaves aside unstructured or highly dynamic processes, which are common in many contemporary organizations. The absence of an in-depth analysis of tools such as the Case Management

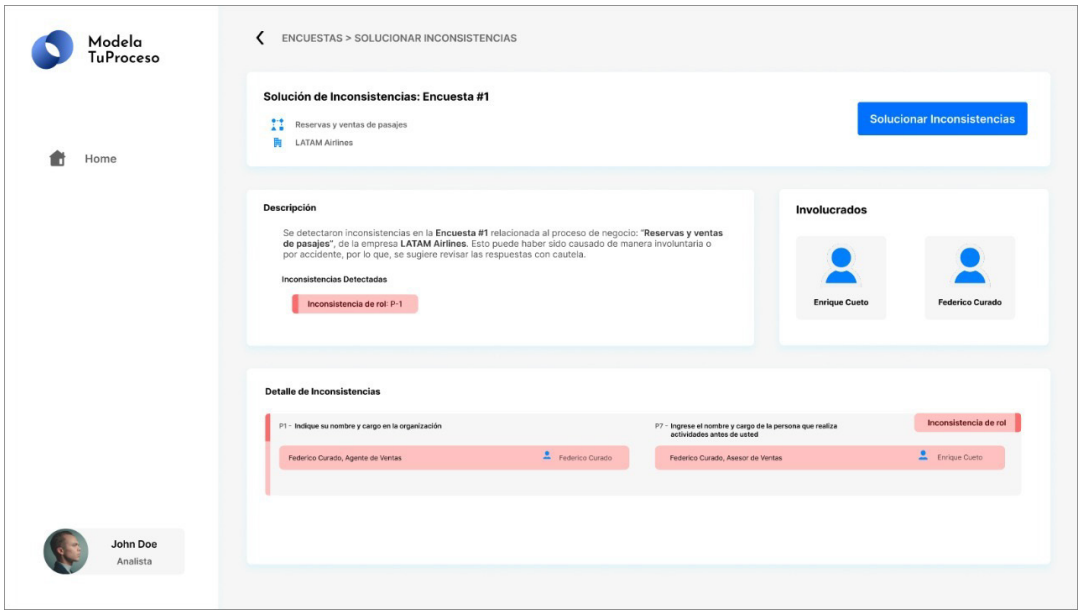

FIGURE 12. Inconsistencies.

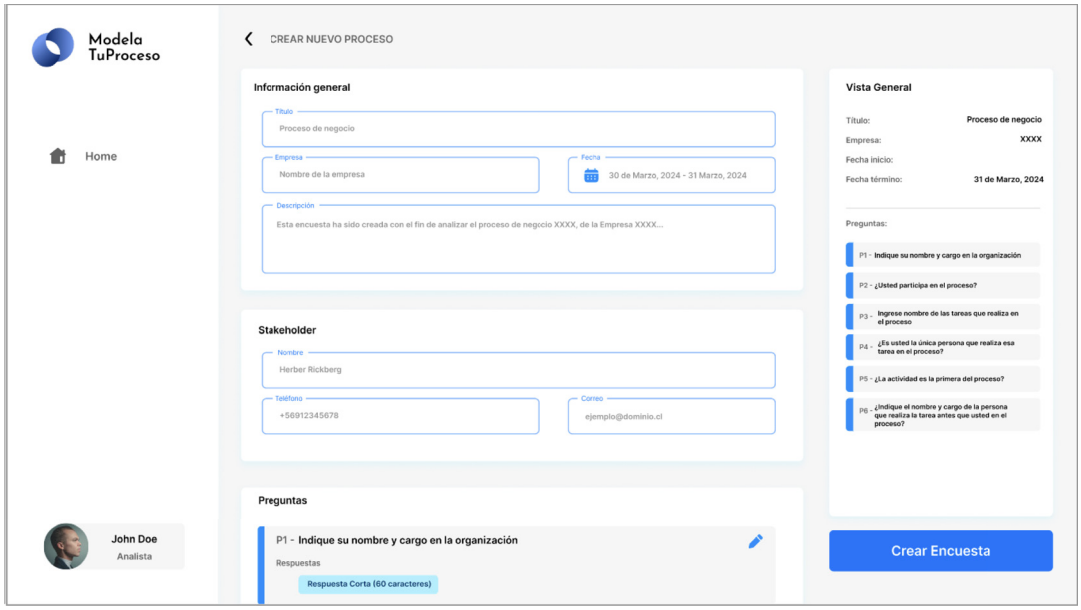

FIGURE 13. Standardized set of questions.

Model and Notation (CMMN), which is better suited to these scenarios, represents a major limitation in the applicability of the findings.

C. TECHNOLOGICAL AND METHODOLOGICAL LIMITATIONS

Although advanced technological tools such as BPMN and hybrid models are being addressed, they still face significant challenges in their practical implementation. Limitations include interoperability issues, lack of standardization in hybrid approaches, and the lack of integration of emerging technologies such as artificial intelligence and process mining into real-world scenarios. This hinders the adoption of innovative solutions and the optimization of organizational processes.

These limitations underline the need for future research that complements current findings with empirical studies, specific approaches to unstructured processes, and technological developments that strengthen the practical application of the analyzed methodologies.

TABLE 8. Selected articles summary.

Ref.	Approach	Area of study	Problem
[8]	The article combines a systematic literature review and interviews to analyze the theoretical requirements and current practices in BPM process elicitation.	Business process management, exploring the effectiveness of traditional process elicitation techniques.	Whether the techniques for process elicitation in BPM have evolved with digitization or whether the established methods are still adequate for current practices.
[11]	The article uses a systematic review to explore the intersection between process mining and target modelling, analyzing 24 articles selected after searches in four relevant engines.	The study analyses the integration between process mining and target modelling, highlighting its growing interest but the paucity of research on the subject. It classifies the literature into goal modelling, intentional mining and performance indicators.	The paper addresses the lack of consistent research that combines process mining with goal-oriented approaches, identifying opportunities in goal extraction and requirements engineering to improve business processes.
[9]	Compliance patterns are analyzed, identifying gaps between theory and practical requirements, especially in data-oriented compliance restrictions.	The study covers business process compliance in sectors such as banking, e-commerce and healthcare, focusing on patterns related to data and regulatory requirements.	The paper highlights the gap between business process literature and actual regulatory requirements, underlining the lack of focus on data-driven compliance and the need for standards that reflect practical needs.
[10]	The research develops a conceptual framework and reviews the literature on hybrid process representations that combine imperative and declarative languages to optimize their modelling.	Business Process Management (BPM), specifically in the field of hybrid representations that integrate different modelling paradigms (imperative and declarative).	The lack of unified terminology and a clear conceptual framework for hybrid representations makes it difficult to understand, categorize and apply them in business processes.
[12]	It explores the challenges of requirements engineering in machine learning systems, focusing on interdisciplinary collaboration to develop data-driven applications.	Requirements engineering applied to machine learning systems, with a focus on interdisciplinary collaboration for the development of data-driven intelligence systems.	It analyzes the difficulties in defining, modelling and verifying requirements in complex machine learning systems, highlighting the interdisciplinary gaps and the challenges of integrating domain models and machine learning.
[15]	Analyze Fit-Gap analysis methods in enterprise resource planning (ERP) systems, identifying their advantages, limitations and possible solutions.	Enterprise Resource Planning (ERP) systems, specifically in the gap analysis methodology to assess the correspondence between business requirements and ERP systems functionalities.	The research addresses the limitations of current gap analysis methods, which are often complex, dependent on human judgment and difficult to apply at different stages of implementation, proposing more flexible and effective approaches.
[13]	The literature is systematically reviewed by snowballing to analyze and improve the elicitation of software requirements from BPMN models.	Requirements engineering in the context of business process models, specifically the use of BPMN diagrams for eliciting and specifying functional and non-functional requirements.	The study highlights the need to improve requirements elicitation from BPMN diagrams, pointing out the lack of automation, standards and approaches for non-functional requirements and business rules.
[19]	Evaluates the robustness of three business models for insect production in Europe, analyzing scenarios and stress tests, with emphasis on regulatory, economic and sustainability challenges.	Insect production for animal and human food in Europe, including markets for pet food, aquaculture and insect-based food for human consumption.	Analyzes regulatory uncertainties, insect welfare, sustainability and high energy costs that impact the technical and economic viability of business models in the sector.

TABLE 8. *(Continued.)* **Selected articles summary.**

[16]	A BPMN-based model is proposed for Fit-Gap analysis in ERP systems, helping to address gaps between business requirements and system capabilities.	Implementation of ERP systems, specifically in the Fit-Gap analysis phase, which evaluates the discrepancies between business requirements and ERP system capabilities.	The article addresses gap management in ERP projects, highlighting the need to reduce excessive customization, improve decisions and optimize resources in Fit-Gap analysis.
[17]	The article reviews the literature to analyze the data needed in the Fit-Gap method, seeking to improve its quality and use in the selection of ERP systems.	Implementation of ERP systems, focusing on Fit-Gap analysis to assess the alignment between business requirements and system capabilities.	It addresses the lack of clarity and standardization in the identification and documentation of input data for Fit-Gap analysis, which hinders the effective selection and adaptation of ERP systems to the specific needs of companies.
[18]	The application of Mass Customization (MC) in business, analyzing key concepts, main approaches and practical cases of implementation in the production of goods and services.	Mass customization strategies in marketing, manufacturing and business management, with applications in both tangible goods and intangible services sectors.	The article discusses how to balance the efficiency of mass production with the flexibility of customization, highlighting operational, logistical and technological challenges.
[14]	The article reviews the literature to classify studies on functional and non-functional requirements extraction from BPMN models, identifying gaps and areas for future research.	Requirements Engineering, specifically in the extraction of software requirements (functional and non-functional) from business process models using the standard BPMN notation.	The article highlights the scarcity of studies on non-functional requirements extraction from BPMN models, which hinders the development of systems aligned with business needs.

IX. CONCLUSION

The elicitation of organizational processes stands out as a crucial approach to identifying, analyzing, and improving business processes in organizations. This approach not only facilitates the alignment of processes with strategic objectives but also allows for the identification of inefficiencies and the proposal of solutions that directly impact productivity and competitiveness. In the current business context, where adaptation to change is key, process elicitation becomes a strategic tool to address complex problems and ensure organizational sustainability.

Despite the advances in process management methodologies, problems related to the lack of standardization in elicitation techniques persist. This lack generates inconsistent results among different organizations and sectors, making the uniform implementation of best practices difficult. For example, the varied use of tools like BPMN or conceptual models can lead to disparate interpretations of processes, negatively impacting communication and collaborative design. Therefore, it is essential to develop standardized methodological guidelines that promote consistency in the application of process elicitation.

Collaborative approaches in process elicitation represent an opportunity to improve the accuracy and relevance of the generated models. The active inclusion of stakeholders, such as employees, managers, and customers, allows for capturing diverse perspectives and enriching the understanding of processes in their real context. However, the literature shows that this approach is not sufficiently explored or adopted in practice, often due to time constraints, resource limitations, or resistance to change. Promoting structured collaborative methodologies could strengthen the quality of process models and ensure that the proposed solutions are more applicable and sustainable.

Although advanced technological tools, such as BPMN and other modelling frameworks, exist, they still face significant challenges when addressing unstructured or dynamic processes. Many tools are designed for predictable and standardized scenarios, which limits their ability to handle situations where processes change rapidly or involve multiple external variables. For example, the representation of creative or innovative processes requires more adaptive technologies that can better capture the uncertainty and flexibility inherent in these scenarios. This highlights the need to develop more robust technologies integrated with artificial intelligence and machine learning.

The elicitation of organizational processes still has ample room for innovation and improvement. Future research should focus on developing new methodologies that include clear metrics to evaluate the effectiveness of the techniques used. Moreover, integrating advanced technologies such as process mining, scenario simulation, and predictive

analysis could significantly transform this field. Another key area of research would be to explore how to adapt elicitation methodologies to specific contexts, such as small organizations, startups, or sectors with limited resources, to ensure that their benefits are accessible and effective in a wide variety of environments.

The proposal to use automated tools for data collection and model generation represents a significant advancement in the optimization of traditional methods. These tools not only improve the accuracy of the results but also allow for greater scalability, which is especially important in organizational environments that are constantly changing. The ability to adapt to these changes is a key aspect of the proposed solution.

From an applied perspective, the findings of this study contribute not only to the technical improvement of business process detection and structuring, but also extend into key areas associated with ESG goals (Environmental, Social, and Governance). Firstly, the standardization and digitalization of processes facilitate the identification of redundancies, optimization of workflows, and reduction of unnecessary resource usage, thereby enhancing operational efficiency and minimizing environmental impact (Environmental dimension). Secondly, involving multiple stakeholders in the detection process fosters a more participatory and inclusive organizational culture, where diverse perspectives are acknowledged and incorporated—reinforcing the Social dimension. Finally, the use of automated tools for modeling and documenting processes improves traceability, accountability, and internal auditing capabilities, which are essential features of sound institutional governance. These contributions position the proposed solution not only as a response to operational needs, but also as a technological enabler aligned with strategic sustainability goals, thus generating cross-cutting value for organizations committed to ethical, transparent, and responsible management.

One of the current limitations of this work is that the proposed system remains at a conceptual and prototype stage, without empirical validation or user testing. Future work will include case studies and experiments with real stakeholders to assess the effectiveness, usability, and scalability of the approach in real organizational contexts.

APPENDIX A

See Table 8

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