Towards the Integration of Conversational Agents through a Social Media Platform to Enhance the Agility of BPM

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Abstract. Business Processes enable collaboration among various stakeholders, allowing different groups (people, organisations) to work together to achieve common goals. Therefore, optimising Business Process Management (BPM) is essential for organisational success in today's dynamic business environment. However, traditional BPM methods often struggle in volatile execution environments characterized by rapid change, dynamic customer demands, and evolving market trends. Innovative strategies are needed to enhance BPM practices and increase the agility of collaborative business processes. To this end, a particularly promising approach is to use Large Language Models (LLM) agents (Artificial Intelligence conversational agents). These AI conversational agents can be integrated into a social media platform to ease the stakeholders' collaboration by supporting the co-construction, design, modification, execution, and monitoring of collaborative business processes. AI conversational agents in social media platforms democratize BPM by facilitating collaborative process design and execution, streamlining interactions, and fostering seamless communication and personalized assistance, thus enhancing agility.

Keywords: Business Process Management · Social Media · Artificial Intelligence · Large Language Model · Agility.

1 Introduction

Business processes are series of actions or steps organized in a specific way to achieve a specific objective [1]. They often involve collaboration between dif-

ferent people, teams, or departments within an organisation to efficiently carry out a task or produce a specific result. They are designed to meet an entity's operational and strategic needs by transforming inputs into outputs [2]. Business processes are fundamental to promoting efficiency, quality, transparency, and adaptability within organisations, thus contributing to long-term success. They enable effective organisation and structuring of activities within the company. By breaking down operations into a series of clear, defined steps, business processes make it easier to understand how work is carried out and enable more efficient management of resources, time, and costs [2,3]. However, Business Process Management (BPM) faces challenges linked to the processes' complexity, resistance to change, collaborative coordination, technological barriers, and performance measurement [4]. Overcoming these challenges requires organisational commitment, change management skills, and the effective use of appropriate technologies and methodologies.

In an environment characterized by volatility, uncertainty, complexity, and ambiguity (VUCA), organisations have to cope with rapid and unpredictable change, decisions taken under a context of uncertainty, complex multi-faceted problems, and ambiguous situations where the meaning of events can be difficult to determine. To meet these challenges, organisations need to adopt flexible, agile, and innovative approaches.

There are many ways to approach the challenges outlined above. In the scope of this research, we focus on one possible strategy: integrating conversational agents into a social media platform dedicated to guiding and synchronizing the design and execution phases of business processes where human interaction is predominant. The aim is to enable stakeholders in the same process (characterized by repetitiveness and high human involvement) to collaborate via social media supported by social software to design and execute the process together. To this end, Artificial Intelligence (AI) modules based on Large Language Models (LLM) would be deployed to oversee the definition and implementation of the business process, analyse its objectives and expectations, and provide suggestions in the form of comments and proposals for tasks, assignments and adjustments, aimed at realizing the process best suited to the stakeholders' actual needs.

In this article, we explore the possible integration of generative AI through a social media platform dedicated to accompanying BPM. We first set the general context by briefly describing the history of business processes and highlighting the importance of managing them effectively. We will then identify the challenges faced by organisations in this field. We aim to explore the question: **how generative AI, integrated through social media, can improve the agility of BPM and collaboration in BPM?** To this end, we propose a methodology based on a social media approach to design and execute BP in an agile manner. Then, a discussion will address the main points raised, the potential challenges, and the expected impacts of our positioning. Finally, the conclusion will highlight the key points and perspectives AI-integrated BPM offers.

2 Background

2.1 Definition and history of BPM

BPM is a strategic field in the business world aimed at optimising operations and improving organisational efficiency. Its introduction dates back to the 1990s [5] when companies realized the importance of understanding and controlling their business processes to remain competitive in an ever-changing market. In its early days, BPM was primarily focused on process automation, seeking to replace manual tasks with computerized workflows to gain efficiency and productivity [6]. Over time, however, BPM has evolved to encompass broader aspects, including modelling, analysis, optimisation, continuous process monitoring, and a more collaborative aspect of its lifecycle management. Multiple stages of the BPM lifecycle have been distinguished in the existing literature. The BPM lifecycle can be categorized into two main recurring phases that encompass the stages outlined in the literature [6] (see Fig. 1):

- **Design-time**: This is when processes are identified, examined, validated, and represented by business process models. The models are then supplemented with technical information in line with the objectives and goals. This is also when the BPs are redesigned and adjusted.
- **Run-time**: This is when the BPs are executed based on the prepared business process model. This is the stage at which business processes are transformed into workflows.

One of the major advances in BPM has been the introduction of structured methodologies for managing processes systematically and efficiently. Approaches such as Six Sigma, Lean Management, and Total Quality Management [7] have been integrated into BPM to improve quality, reduce waste, and increase customer satisfaction. In addition, standards such as BPMN (Business Process Model and Notation) [8] have been developed to provide a common language for modelling and graphically representing business processes, facilitating communication and collaboration between the various stakeholders.

As far as tools are concerned, BPM software has made significant progress. Initially, these tools were mainly focused on modelling and automating processes. However, with the advent of information technology, BPM tools have diversified to offer advanced functionalities such as simulation, integration with other IT systems, and performance management [9]. These tools enable organisations to monitor and analyze process execution in real-time, identifying opportunities for continuous improvement.

Traditional approaches to BPM have made important contributions to optimising business operations. However, they also present challenges and limitations, particularly in their ability to adapt to rapid change and evolving business demands. Firstly, traditional BPM approaches can be rigid and focused on pre-established processes. They often struggle to adapt to dynamic changes in the business environment, such as evolving customer needs, new regulations, or technological innovations. These approaches often rely on static models that require
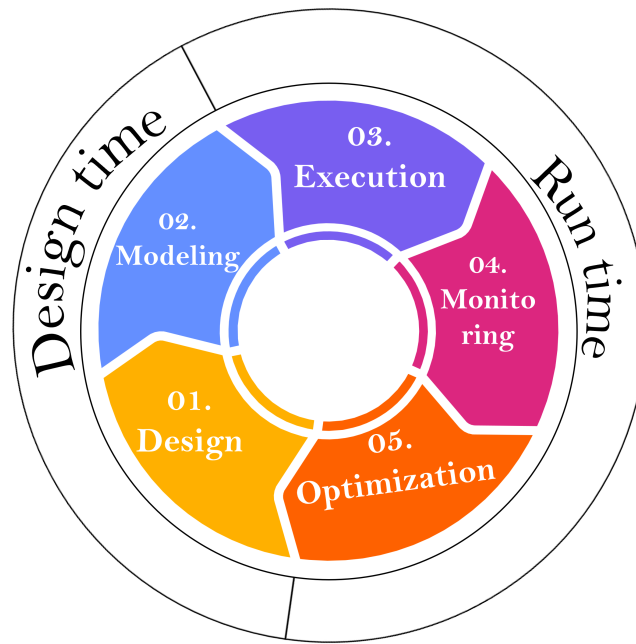
Fig. 1. BPM lifecycle

manual updates and complex validation processes to incorporate changes, which can be time-consuming and inefficient.

Secondly, traditional BPM approaches can be process-centric rather than outcome-centric [10]. They may focus more on automating and optimising existing processes without necessarily questioning their relevance or added value to the business. This can lead to long-term inefficiency, as automated processes may become obsolete or inefficient as businesses and their needs evolve.

Another major challenge of traditional BPM approaches is their lack of flexibility and adaptability [9]. They can be designed to operate in a linear, sequential fashion, making them less suited to complex, constantly evolving business environments. Organisations need agile, adaptable business processes that can respond quickly to market changes and new opportunities, which can be difficult to achieve with traditional BPM approaches.

While traditional BPM approaches have brought significant benefits to businesses, they also present significant limitations. To overcome these challenges, companies need to adopt more agile and collaborative approaches to BPM, integrating tools and methodologies that foster innovation, flexibility and stakeholder involvement at all levels of the organisation and collaboration.

2.2   Agile BPM

Agile BPM represents a paradigm shift in the field of process management, emphasizing flexibility, collaboration, and iterative development to meet the evolving needs of modern organisations. Agile BPM is "an approach to BPM that emphasizes flexibility, collaboration, and continuous improvement" [11]. It prioritizes rapid delivery of value and continuous improvement through short, iterative process design, implementation, and evaluation cycles. By breaking down complex processes into manageable chunks, Agile BPM enables organisations to respond quickly to changing market dynamics, customer preferences, and regulatory requirements. Through close collaboration between business users, process analysts, and IT professionals, Agile BPM fosters a culture of transparency, empowerment, and accountability, driving greater alignment between business objectives and process execution [12].

The transition from traditional BPM to Agile BPM emphasizes adaptability and collaboration, while Social BPM further enhances organisational workflows by integrating social technologies and principles.

2.3   Social BPM

Social BPM has emerged as a dynamic and innovative approach to enhancing organisational workflows and collaboration dynamics by integrating social technologies and principles. It "is an approach to BPM that incorporates social media and collaboration technologies into the design, execution, and monitoring of BPs to facilitate stakeholder engagement" [11]. At its core, Social BPM combines traditional BPM methodologies with social computing tools and platforms to facilitate more transparent, flexible, and efficient business processes. It can have two aspects: on the one hand, Social BPM can be seen as a platform for collaborative BPM and, on the other hand, it represents an attempt to solve the problems that arise when implementing and adopting traditional BPM [13]. By leveraging social media platforms, collaborative tools, and crowd-based decision-making mechanisms, Social BPM enables organisations to harness the collective intelligence of their workforce, foster greater communication and knowledge sharing, and facilitate collaborative problem-solving. Through real-time interactions and feedback loops, stakeholders across different departments and hierarchical levels can contribute insights, ideas, and feedback, leading to more informed decision-making and improved process outcomes. Moreover, Social BPM fosters a culture of continuous improvement and adaptability, allowing organisations to respond swiftly to changing market conditions, customer demands, and competitive pressures.

Transitioning from the innovative realm of Social BPM, which enhances organisational workflows through social technologies, to the dynamic field of artificial intelligence, recent advancements, particularly with Large Language Models (LLM), could revolutionize various industries, offering new avenues for improving operational efficiency and collaboration.

2.4   Conversational agents

AI has recently seen a major turning point with the introduction of LLMs, including architectures such as GPT (Generative Pre-trained Transformer) [14]. LLMs have opened up new perspectives in many fields, revolutionizing how we interact with machines and process information. Their vast and varied benefits are enabling more natural and accurate text generation, facilitating machine translation to a level never achieved before, and offering powerful tools for analysing complex data. Thanks to their ability to understand and generate human language, they can be adapted to many tasks without requiring specific training for each application, considerably reducing the cost and time needed to develop high-performance AI systems. LLMs can accomplish "three text-related BPM tasks: mining imperative process models from textual descriptions, mining declarative process models from textual descriptions, and assessing the suitability of process tasks for RPA from textual descriptions" [15].

Advances are also significant in the domain of conversational agents, often powered by these LLMs. These agents, or chatbots, have become ubiquitous in our daily lives, whether for customer service, virtual assistance or even social interactions. Their effectiveness is based on their ability to understand and generate natural language and to adapt to user preferences and needs. To achieve this, they rely on machine learning techniques, such as deep learning, to assimilate conversational data and improve their ability to respond in a contextual and relevant way.

However, the success of conversational agents largely depends on the quality and diversity of the data they are trained on. Their ability to master what is learned and interact in a relevant way with users is directly linked to the variety of interactions they have had and the quality of their training. In addition, they must be able to detect and adapt to subtle nuances in human language and communication, which represents a significant challenge given the complexity and diversity of human behaviour. By broadening our AI perspective, particularly about LLMs and conversational agents, we can further explore integrating these technologies into business processes, highlighting their diverse applications for improving operational efficiency and fostering collaboration in contexts such as social media.

3   Generative AI integrated Business Process Management

To enhance agility in Business Process Management, social media could effectively facilitate collaboration and task execution. Traditionally, BPM has involved rigid systems and pre-established workflows. However, introducing social media could help to transcend these limitations, bringing with it the capacity for better human interaction. The term "social media" refers to online platforms enabling users to create, share, and exchange content in various forms, including text, images, videos, and other multimedia formats [16]. The term

"social network" is often used instead of social media. But, the social network is a part of social media [17], since it represents the list of contacts of a social media user. The key characteristics of social media platforms are the ability to share content and interact with others through reactions like likes, comments, and shares. These platforms are primarily designed for content dissemination and interaction around that content. These platforms make it possible to create and cultivate social relationships by facilitating the exchange of information. By incorporating social media into business processes, organisations can achieve greater agility through improved communication, enhanced collaboration, and efficient task management. This will ultimately lead to better overall performance and adaptability in a rapidly changing business landscape.

When using generative AI in business processes to enhance agility, conversational agents could stand out as versatile tools for facilitating collaboration and task execution. Conversational agents are computer programs that simulate human conversation via text or voice interfaces. Their functionality goes far beyond the simple automation of repetitive tasks, as they can interact contextually with users, understand their intentions, and respond appropriately to their needs. Conversational agents could play a crucial role in social media. These computer programs open up new possibilities in BPM. Integrating conversational agents into social media offers considerable potential for improving the efficiency of business processes by enabling smoother communication and facilitating access to relevant information. Integrating generative AI, and more specifically conversational agents, into BPM would represent a significant step forward in using cutting-edge technologies to improve efficiency and organisational agility.

3.1   Desired features

We aim to develop a social media tailored to our needs, characterized by the following features:

- **Profiles**: Users can create profiles showcasing their skills, experience, and roles within the company, fostering better professional acquaintance among colleagues.
- **Groups (Circles)**: Users can form or join groups dedicated to specific projects, work teams, or departments, providing a platform for information sharing, collaborative tasks, and project coordination.
- **Posts**: Users can create posts to share updates, announcements, and important information related to projects and processes. Team members can be tagged to ensure they reach the right audience.
- **Notifications**: Users will be notified about new posts, comments, task assignments, deadlines, and other important updates. They may receive automated reminders for upcoming deadlines, meetings, and tasks to ensure users stay on track.
- **Reactions**: Enable reactions such as likes, thumbs up, or other emojis on posts and comments. This provides a quick and easy way for users to show agreement or acknowledgement.

– **Comments**: Allow users to comment on posts, provide feedback, ask questions, or add additional information. This fosters interactive discussions and collaborative problem-solving.
– **Document and File Sharing**: The platform facilitates secure sharing of professional documents such as presentations, spreadsheets, and reports, streamlining project collaboration.
– **Professional Messaging**: Besides public messaging, users can access private messaging for confidential discussions or direct professional exchanges.

3.2   Conversational agents characterization

Building on these features, the use of conversational agents could offer a range of potential applications for business processes, serving various and complementary roles as we can see in Figure 2:

– **Co-construction and design**: Conversational agents might assist users in designing and co-constructing business processes. They could provide personalized recommendations and advice throughout the design phase, making the process more efficient and tailored to specific needs. This might involve suggesting best practices and offering alternatives based on real-time feedback and user preferences.
– **Monitoring and analysis**: By collecting data on process performance, conversational agents could provide advanced analysis to identify trends, inefficiencies, and optimisation opportunities. They might analyze workflow patterns, user interactions, and operational metrics to uncover areas for improvement. Agents could collaborate by sharing data and insights with each other, creating a more holistic analysis and improving the overall accuracy of their recommendations.
– **Supervision and modification**: During the execution of business processes, conversational agents could play a crucial role in real-time monitoring operations. They could detect anomalies, such as deviations from the expected workflow or performance issues, and suggest immediate adjustments to ensure smooth and efficient operation. This proactive approach would enable businesses to address problems before they escalate, reducing downtime and maintaining productivity.
– **Execution and support**: Conversational agents could accompany users throughout the execution of business processes, providing detailed instructions and real-time support. They might answer questions, clarify steps, and offer guidance to ensure users understand their tasks and remain engaged. This collaborative aspect emphasizes the interaction between users and agents, ensuring users receive timely assistance and feedback.

3.3   Proposal

Now that we have established a clear vision of the functionalities we desire for our social media platform and the anticipated behaviour of our conversational
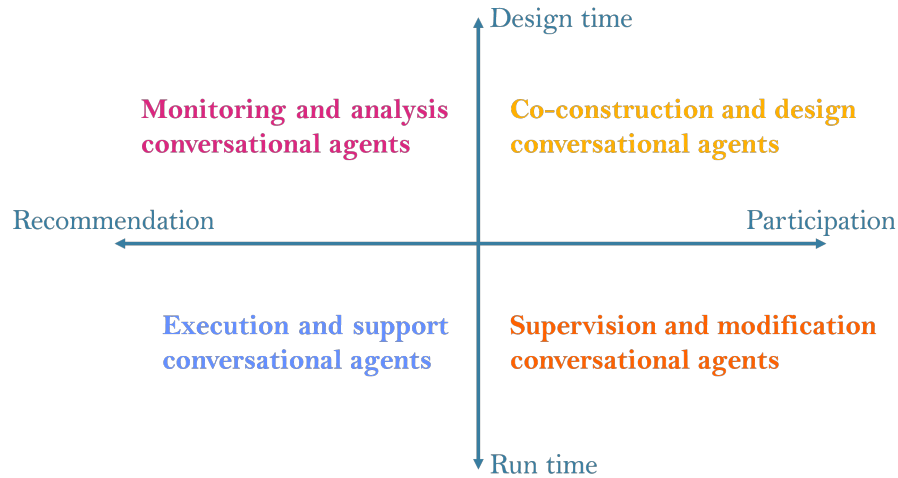
Design time

Monitoring and analysis conversational agents

Co-construction and design conversational agents

Recommendation   Participation

Execution and support conversational agents

Supervision and modification conversational agents

Run time

Fig. 2. Different types of conversational agents and their roles characterized.

agents, we can transition to envisioning how these elements will manifest in real-world scenarios and how they will be characterized (Figure 2). Specifically, let us delve into how a user seeks to embark on a project or activity that will ultimately give rise to a business process (Figure 3).

- **Post associated with an objective**: In the social media platform, corresponding to our collaborative circle in Figure 3, the user writes a post describing a new project, its objectives and the tasks required to complete it. The group working on the project is notified and can focus on communicating the next steps and specific requirements. A conversational agent specialized in project design (yellow in Figure 3) steps in to help structure the objectives, tasks and resources required, asking pertinent questions, suggesting best practices and adding the necessary players if they haven't already been added into the loop.
- **Creation of a project group**: Group members working on the project are potentially already notified and can immediately access the dedicated group on the social media platform. The project initiator can then start coordinating activities within the group, using task management tools to assign responsibilities and set deadlines.
- **Administration member notification**: Besides notifying group members working on the project, the social media platform sends notifications to relevant administration members, such as department heads or directors, to inform them of the project's launch and keep them abreast of its progress. This ensures visibility.
- **Assign tasks and monitor progress**: Project group members use integrated task management tools to allocate responsibilities and track progress.

Notifications are automatically generated to inform members of updates, new tasks, and milestones that have been reached. A supervisory conversational agent (orange in Figure 3) monitors the team's activities and progress. Meanwhile, an execution and support conversational agent accompanies users throughout the execution of the process (blue in Figure 3). It detects any delays or problems and alerts the employee in charge of the project to make adjustments if necessary.

– **Feedback and cross-functional collaboration**: Project group members can seek feedback or advice from colleagues outside the group, including relevant members of management. They can do this by specifically mentioning these people in their publications, which triggers notifications for these stakeholders and allows the stakeholder access to the group. A conversational agent provides support by answering team members' questions and helping them to overcome obstacles. A monitoring conversational agent (pink in Figure 3) collects data on project activities, such as the number of tasks completed, deadlines met and team members' commitment levels, and analyzes team members' feelings. It analyzes this data to identify trends, strengths and areas for improvement, providing valuable insights for optimising project management.

– **Finalize and share results**: Once the project is complete, the results can be shared with the whole company, including administration members, by publishing a summary on the social media platform. This ensures transparency and effective communication at all levels of the organisation. Depending on the project, some may have access to feedback.
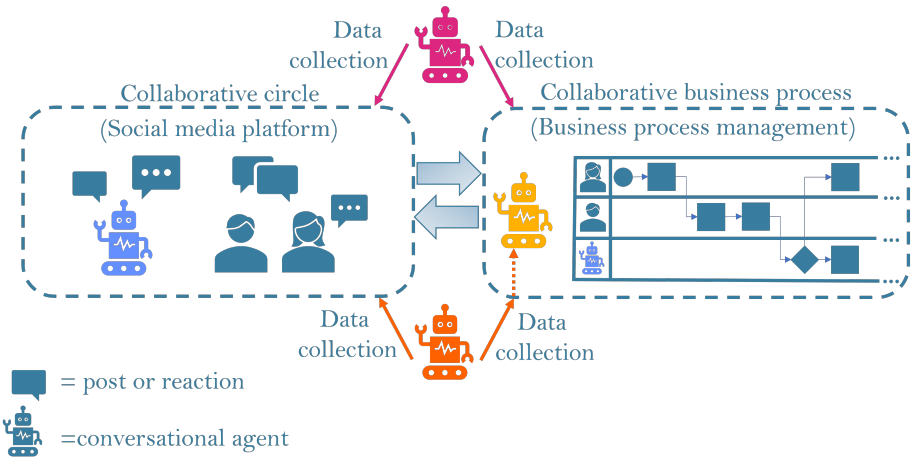

Fig. 3. Proposal summary.

4   Discussion

4.1   Reflecting on impact

Integrating generative AI through social media into BPM offers significant potential for improving operational efficiency, collaboration, and agility. By enabling smoother communication and more effective stakeholder collaboration, these technologies can lead to more flexible, adaptive, and results-focused business processes.

This evolution potentially directly impacts organisational culture, fostering a more open, collaborative and results-oriented approach. Business processes may no longer be seen as rigid sequences of tasks but as opportunities for innovation and continuous improvement, where everyone's contribution is valued. Everyone will be encouraged to share their ideas, collaborate with their peers and experiment with new approaches, thus stimulating innovation and creativity within the organisation.

Moreover, integrating AI through social media into BPM also promotes better decision-making. By providing users with relevant information and contextual suggestions, conversational agents contribute to more informed, data-driven decision-making, which could lead to more positive outcomes for the organisation.

4.2   Discussion of potential challenges

Integrating generative AI through social media into BPM offers significant potential benefits but presents several challenges that warrant careful consideration. Firstly, data privacy and security are paramount concerns, especially regarding collecting and utilising user data within a social context. Safeguarding sensitive information and ensuring compliance with privacy regulations are essential aspects that require robust mechanisms to address them. Secondly, the reliability and accuracy of information provided by conversational agents pose significant challenges, particularly in intricate scenarios demanding contextual understanding. Ensuring that these agents deliver dependable and precise guidance is crucial for their effective utilization in business processes. Another critical challenge is fostering the successful adoption of these new technologies within organisations. This necessitates comprehensive employee training initiatives and effective change management strategies to mitigate potential resistance and ensure widespread acceptance and utilization. Furthermore, the design and deployment of these systems must prioritize inclusivity by accommodating users' diverse needs. Tailoring the user experience to cater to various demographics and ensuring accessibility for all stakeholders are essential considerations for maximizing the effectiveness and acceptance of AI-integrated BPM solutions.

4.3   Illustrative use case

The following example serves as a fictional use case crafted to illustrate the concept's envisioned potential and practical applications in real-world scenarios.

A company decides to respond to an invitation to tender for a software development project. Here is how they could use the proposed integration of generative AI through social media in BPM.

The company's team uses the dedicated internal social media platform to collaborate on the proposal's design. A team member creates a group in a dedicated channel on which they will post content for the project launch. Team members share their ideas in comments, discuss tender requirements and develop a detailed plan to meet the customer's needs. They also use conversational agents to get recommendations on necessary tasks and proposal structure. These suggest best practices for effectively meeting tender requirements when they are called upon, and when they have additions to make to what will have been said.

During the proposal writing process, a conversational agent monitors the progress of the various tasks. It detects any gaps or inconsistencies in the proposal and suggests real-time adjustments to ensure its quality and relevance. Team members receive instant notifications when a suggestion is made, enabling them to make informed decisions quickly. They can ask the conversational agent questions if they need clarification on tender requirements or proposal structure. The conversational agent provides fast, accurate answers, avoiding delays and errors in the response process. It also provides ongoing support throughout the process, guiding team members through critical steps and providing advice to maximize the proposal's impact.

Once the proposal has been submitted, the conversational agent continues to monitor feedback and comments from team members and interactions with the customer. It gathers data on the proposal's performance, identifies strengths and weaknesses, and offers recommendations for improving future bid responses. This enables the company to learn and adapt continuously, optimising its processes and strengthening its ability to win future tenders. Plus, it allows them to collaborate in a better way.

This method allows the company to collaborate effectively, optimise the tender response process, and improve the quality of its proposals, giving it a competitive edge in the marketplace.

5   Conclusion

In this article, we examined the integration of generative AI through social media in BPM. We first defined business processes and highlighted their importance to organisational success. Next, we explored the challenges organisations face in managing these processes and the limitations of traditional BPM approaches.

We then proposed an innovative approach using social media and conversational agents to improve efficiency, flexibility, and collaboration in BPM. This approach could deliver tangible benefits, such as fluid communication, informed decision-making, and improved customer experience while fostering an organisational culture focused on innovation and collaboration.

Effective business process management is essential for organisations' competitiveness and sustainability in a constantly changing business environment.

Integrating generative AI through social media offers a unique opportunity to improve this management by harnessing the power of social collaboration and intelligent data analysis.

The future of AI integration in BPM through social media is promising. It offers several interesting prospects: Ongoing advances in AI, particularly in natural language processing and machine learning technologies, pave the way for new functionalities and applications for conversational agents in business process management. As organisations continue to recognize the potential benefits of integrating AI into BPM, we can expect widespread adoption of these technologies. This will require appropriate awareness, training and support to ensure a smooth transition. Plus, integrating generative AI through social media could lead to an evolution in management practices, emphasising collaboration, agility and data-driven decision-making. This could lead to significant cultural changes within organisations. Also, by encouraging collaboration and innovation, integrating AI into BPM could stimulate new ideas and approaches to business process management. This could lead to continuous improvements and new opportunities for organisations to remain competitive on the marketplace.

In conclusion, the integration of generative AI through social media into business process management represents a significant evolution in the way organisations approach the management of their operations. This approach offers multiple benefits, from operational efficiency to improved customer experience, while fostering a dynamic, innovation-driven organisational culture. To realize the full potential of this approach, organisations must continue to invest in the research, development and responsible adoption of these technologies. By anticipating trends and adapting proactively, organisations can position themselves advantageously for success in an ever-changing business environment.

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