Enhancing Employee Engagement: A Case Study of SmartEngage's Innovative Approach

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Abstract. *Employee engagement is vital for organizational success and productivity, yet low engagement persists as a challenge for many companies. This paper investigates the application of the SMARTENGAGE AI model in enhancing employee engagement within companies. It employs tailored questionnaires based on engagement theories and comprehensive behaviour data, supported by research and HR collaboration.*

The objective of this paper is to introduce the SMARTENGAGE model which aims to identify and enhance employee engagement, offering valuable insights through metrics analysis to improve support, engagement, and the overall work experience. The goal is to leverage AI to propose tailored questionnaires and solutions for pressing employee-related issues within companies.

This study demonstrates the potential of a digital platform that leverages AI technologies while acknowledging the importance of further exploration and validation. It focuses on reporting the process, methods, and tools used to innovate a model that overcomes traditional method pitfalls. The case study exemplifies how innovative models like SMARTENGAGE offer practical solutions to modern workplace challenges, with broader implications for various industries' data-driven strategies to improve employee engagement.

Keywords. Employee engagement, Artificial Intelligence Technology, Data Analysis, Performance metrics, Modern workplaces

1 Introduction

Employee engagement plays a pivotal role in the success of a company. Engaged employees are emotionally attached to their organization and, with great enthusiasm and motivation, strive to contribute to its success [1] [2]. Productivity and efficiency have assumed paramount importance, especially in recent years [3]. With the challenges posed by the pandemic and the subsequent financial setbacks, businesses faced even greater pressure to succeed. The safety risks brought on by the pandemic necessitated remote work for employees.

However, after one year, in the spring of 2021, when employees were asked to return to work, many did not. This event marked the continuation of an ongoing trend where workers voluntarily left their jobs, indicating that employee dissatisfaction had been brewing for some time [4]. This phenomenon is often referred to as "Quiet Quitting," affecting at least 50% of the U.S. workforce, consisting of employees with limited commitment to their duties, leading to disengagement at work [5]. While COVID restrictions were initially speculated to be the root cause of the drop in morale, it became evident that they had merely catalyzed a long-existing problem [4]. Apart from issues related to low pay and the perception of being part of the working poor, additional factors contributing to employees quitting their jobs include insufficient respect, lack of performance recognition, a toxic workplace culture, and a dearth of meaningful work [4][6]. The primary drivers of Quiet Quitting include a lack of care from the organization, limited opportunities for learning and growth, and a lack of alignment with the organization's purpose [4].

These challenges highlight the common difficulties experienced by both managers and HR departments across various organizations. While it's feasible to aggregate and address the primary issues and requirements of employees using statistical methods, managing individual employee needs presents a unique complexity. To assess employee satisfaction within the workplace, HR frequently resorts to surveys. Unfortunately, these surveys are often subject to criticism for their impersonal and excessively broad nature, which can create perceptions of ineffectiveness [7].

In essence, the goal of this paper is to introduce the SMARTENGAGE model, an AI-based platform designed to assess and enhance employee engagement. The utilization of AI for conducting team diagnostics and implementing improvements represents a significant departure from the conventional methods employed by organizations to foster and enhance effective teamwork [8]. Based on a user's response, the survey would delve into greater detail to understand why an employee feels strongly about a particular issue. Subsequently, the AI-driven system would suggest suitable solutions for HR and/or managers. Also known as e-HRM (human resource management), we opted for the use AI in HR as it leads to cost reduction, informed decisions, competitive advantages and higher profitability [7]. Studies carried out by Deloitte in 2017 showed that 56% of the measured companies already planned

to follow the trend of digitizing their HRM practices during the upcoming five years [9], an investment already paying off at established firms such as IBM who reported saving $100 million thanks to implementing AI [10].

2 Case Description

Artificial Intelligence (AI) and Machine Learning (ML) are rapidly revolutionizing various sectors in today's world. These technologies have demonstrated their potential in automating tasks, facilitating problem-solving, and enhancing efficiency. AI and ML applications are already prevalent in fields such as self-driving cars, strategic games, and chatbots like Chat-GPT [1], which can engage in human-like conversations.

The case study revolves around the integration of AI and ML technologies into HR practices to enhance employee engagement and overall workplace satisfaction. The proposed approach seeks to address the pressing challenges faced by organizations in today's dynamic work environment.

Our research encompasses an exploration of alternative and competing digital platforms and solutions within the HR domain. We investigate the landscape of digital tools designed to improve employee engagement and satisfaction, comparing their features, effectiveness, and integration capabilities.

This case study provides a comprehensive overview of our project's scope, objectives, and the broader context within which we operate. It sets the stage for a detailed examination of our research methodologies, findings, and the implications of our work.

3 Methodology

In this case study, we adopted a constructive research approach guided by the Case Study Development Model from the DEMO project[2]. We complemented this with a literature review, drawing insights from academic literature and practical case analysis [11].

Additionally, our research explored the layers of a digital platform, referring to materials from the Digital Platform Enterprise Erasmus+ project and a provided case description template. These layers encompass technological, data, application, and user aspects [1] [12]. Our objective was to understand the digital platform's architecture and its impact on HR practices and employee engagement [7] [13]. This dual approach aimed to provide a comprehensive perspective on the subject matter.

3.1 Data Collection

Our data collection process was multifaceted, involving various essential activities:

To comprehensively understand the perspectives and needs of end-users and to gain insights into industry best practices and challenges faced by HR departments, we actively solicited feedback and engaged in collaborations. This multifaceted approach included:

- User Feedback -
  We actively solicited feedback from individuals in the workplace. This feedback was instrumental in shaping our research direction and understanding the real-world needs and concerns of employees.

- Collaboration with HR Professionals -
  We collaborated with HR professionals, conducting structured interviews with experts from two distinct IT companies. These interviews provided us with deep insights into industry best practices and the challenges faced by HR departments. Our interactions with these experts shed light on their approaches to employee engagement and satisfaction.

4 Results and discussion

In this section, we embark on a comprehensive exploration of SMARTENGAGE, designed to revolutionize the landscape of employee engagement within organizations. We delve into various aspects of this platform, starting with the Business view, which encompasses its core features, value propositions, and monetization strategy. After that is the Process View, delving deeper into the intricate functionalities of SMARTENGAGE that have the potential to redefine the way organizations manage and enhance employee engagement.

4.1 Business Model

The SMARTENGAGE model is designed to focus on providing an AI-powered employee experience optimization tool for medium and large companies. The core functionalities of the tool would be to assist HR managers in gathering relevant information about their employees, analyzing data, and offering actionable recommendations to enhance the overall employee experience within the organization. By leveraging advanced data analytics and AI technologies, our solution will help businesses foster a positive and productive work environment.

The Key Features and Value Propositions related to Data Gathering:

- Enable advanced analytics - utilize AI algorithms for in-depth data analysis;

- Personalized surveys - tailored surveys adapt to user responses, providing precise insights;

- Recommendation solutions - suggest personalized solutions for pressing employee-related issues;

- Predictive analytics - identify employee turnover risks and recommend proactive measures;

- Continuous improvement - adapt survey evaluations and AI responses over time to enhance accuracy.

The essential key partners are Open.AI and other tech partners, organizational psychology experts and last but not least research institutions. They bring unique expertise and resources to SMARTENGAGE. They enhance the platform's technological capabilities, ensure its alignment with psychological principles, and provide access to valuable data and research.

In terms of monetization, SMARTENGAGE would follow a subscription-based model, meaning companies would subscribe to our service and pay a recurring fee based on the number of employees and the level of access required. For larger corporations, we would offer enterprise licensing, which would allow them broader access and customization options. Our goal would be to also make our service integrable with other existing HR systems for a seamless user experience. Lastly, SMARTENGAGE would also provide data analytics packages for in-depth insights.

Further business building blocks that can be expected when developing the SMARTENGAGE software are displayed in the business model canvas, shown in Figure 1.

4.2 Process View

The main goal of SMARTENGAGE is to implement an efficient employee-tailored survey experience that detects potential disengagement and demotivation among employees. To achieve this, the following key features will play a crucial role: AI data analysis and integration development.

The data from the questionnaires submitted by employees will be collected by AI and analyzed, from which it is expected to generate valuable insights and patterns related to employee engagement levels. It will examine overall behavior and data accessible to AI, ensuring privacy by not using specific employee or company data. This approach helps in making objective decisions, free from personal relationships and subjective viewpoints.

Integration development will allow easy access for employees to access the questionnaires. Instead of having to install additional software or remember another link, SMARTENGAGE would be integrated with platforms such as Slack and Microsoft Teams. This integration ensures a user-friendly and convenient process for all employees as well as simplification of the survey experience.

The BPMN model shown in Figure 2 visualizes how SMARTENGAGE from the AI's point of view. It begins with distributing the survey, followed by selecting

survey types based on previous interactions with the user, upon which the responses would be evaluated and stored.
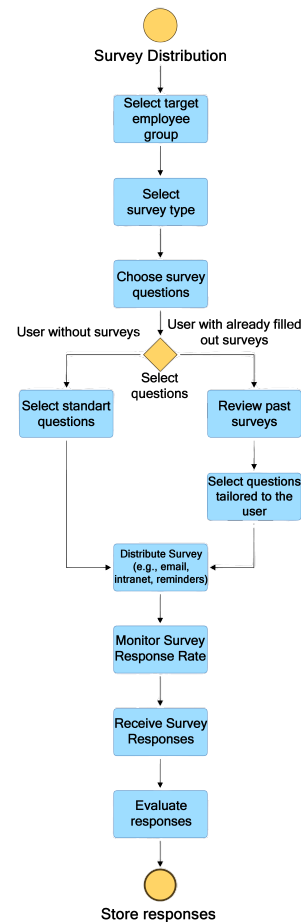

Figure 2: Business Process Model of SmartEngage AI behaviour

4.3 Interview Findings and HR Feedback

We conducted interviews with two HR experts in Sofia, Bulgaria, with the assistance of an entrepreneur and part-time lecturer at the Faculty of Mathematics and Informatics, Sofia University. These experts will be identified as Expert A, representing a renowned and large IT company, and Expert B, from a medium-sized IT firm.

The primary objective of these interviews was to extract valuable insights into each company's methodologies for managing employee engagement and satisfaction. Additionally, we sought their perspectives on the potential integration of AI-based tools in this domain.

The interviews adhered to a structured format, ensuring consistency and facilitating the comparison of responses.

The interview process followed a straightforward sequence, including an introduction, a series of general questions, discussions on improvement strategies, exploration of current challenges faced by HR profes-
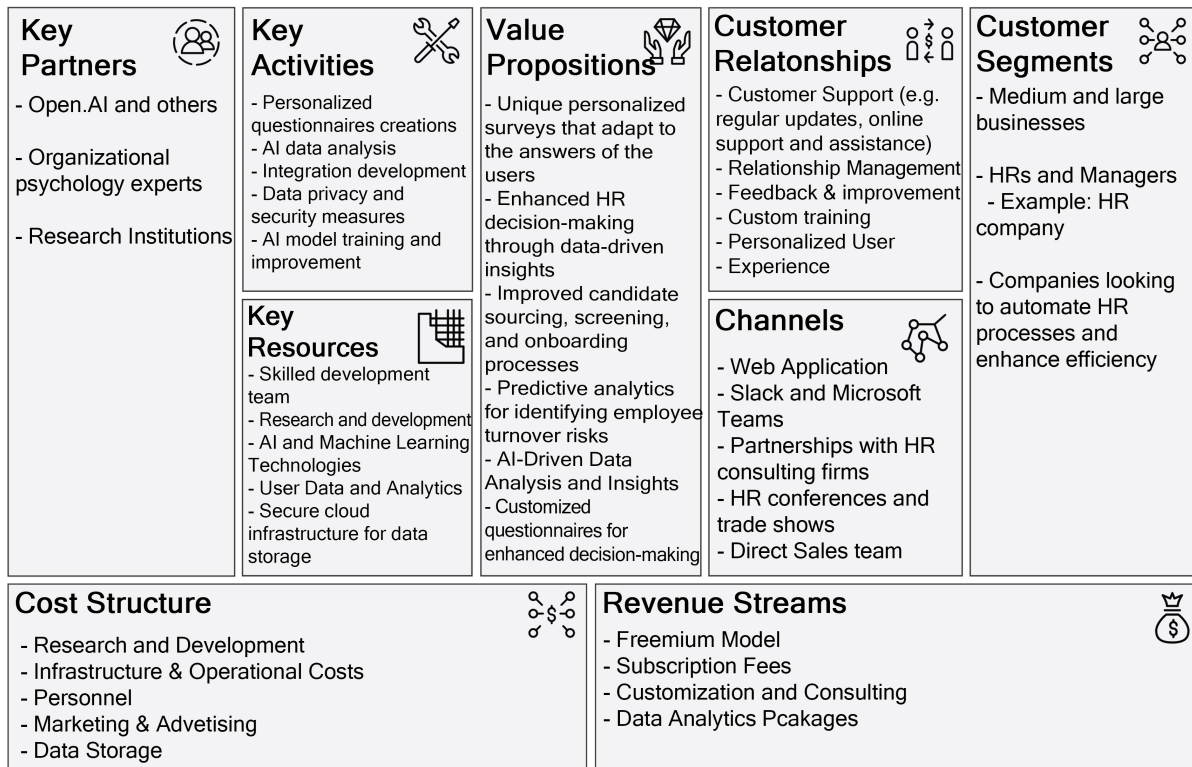
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Figure 1: Business Model Canvas

sionals, examination of existing AI-based tools, considerations on pricing for a tool like SMARTENGAGE's model, follow-up recommendations, comments related to data analysis, and a concluding discussion.

Our interactions with HR specialists yielded a rich tapestry of findings and recommendations. The professionals generously shared their expertise, and lauded the initiative while offering invaluable suggestions.

One key insight emerged: the importance of **augmenting our questionnaires**. HR specialists recommended incorporating a broader array of questions, specifically simpler ones. These additional queries would enable a more comprehensive examination of employee sentiments, including their reactions to promotions and emotional states. Furthermore, this expanded questioning would facilitate the nuanced analysis of text responses.

The next feature that was proposed by HR was the option for respondents to **answer questions anonymously**. This approach would enable HR teams to glean insights from both macro and micro perspectives, examining aggregate responses while preserving the individual's privacy.

A core theme that surfaced was the importance of **long-term planning**. The SMARTENGAGE model should encompass features that allow organizations to strategize for extended periods. This includes the capability to predict trends, analyze promotion and salary statistics, monitor employee mood fluctuations, and ensure sustained engagement.

Our discussions also underscored the need for a

user-friendly and **informal design**. The model should be intuitive, encouraging candid feedback from employees. Such an approach aligns with contemporary HR practices, where open communication is valued.

A pertinent question that arose during our conversations was the **integration of AI within existing HR tools**[14]. Many organizations employ platforms like SAP's Boltrics, prompting us to explore the extent of AI utilization within these systems. This inquiry opens avenues for future research on enhancing AI integration within HR solutions.

4.4 Implementation of AI Technologies

The increasing trend of using AI for automation purposes is increasingly finding usage in the HRM department. Some of the advantages brought forth by these developments not only include saving costs in terms of costs or finances [14] but also during the recruitment process. Studies have shown that AI in HR is capable of making better decisions and reducing human bias when selecting potential new employees [15]. In addition, research has shown that AI can contribute to optimizing human resources and increasing employee productivity.

In the case of SMARTENGAGE, the main purpose of AI would be **data gathering**. The tool would collect data from various sources, such as surveys, performance reviews, employee feedback, and HR records, based on which it would build a comprehensive understanding of the workforce. Further assistance would

be provided for **advanced analytics**, whereby it would analyze the collected data based on which it would recognize patterns, trends, and areas of improvement in employee experience. Based on the previous features, HR managers would receive tailored suggestions and strategies to address specific challenges to enhance the overall work environment.

4.5 Overview of the SMARTENGAGE platform

Figure 3 depicts the SMARTENGAGE system in the form of a UML Use Case diagram, displaying how people and other applications can interact with it. The application would generally take four types of actors into account: the system administrators, the managers and/or HR, employees and the software that the application is integrated into, e.g., Slack or MS Teams Authentication.

Low-level users interacting with the system, such as employees, would only need to login and respond to engagement questionnaires. The log in process would be handled by integrated software such as MS Teams.

System administrators would have the responsibility of managing the system, meaning setting the roles of other users, creating engagement questionnaires, processing answers given by employees, etc.

Persons in superior positions such as managers or HR representatives would similarly to the system administrator have the option to view and export statistics, create questionnaires, process the answers given by employees and access the data from the questionnaires.

The SMARTENGAGE homepage will be exclusively accessible to HR professionals, managers, and additional technical support administrators. Upon logging in, users will have a personalized profile page featuring a calendar showcasing all scheduled surveys, the most recent exports of survey data, and a list of their latest questionnaire creations. Additionally, a convenient side panel will provide navigational links to access detailed views of the calendar, survey statistics, AI-generated reports of survey results, settings, and other relevant pages.

The other employees within the organization will access the questionnaires exclusively through applications like Slack and Microsoft Teams, providing them with the ability to respond to scheduled questions. The accessibility and functionality of these questionnaires within these applications will be determined by thread-specific settings, including options for anonymous responses, result visibility, and other related actions.

4.6 Discussion of challenges and future work

Through qualitative research and interviews, we uncovered potential security challenges associated with implementing AI in HR, aligning with findings from various articles and publications.

To begin with, we found that building trust in AI-driven HR systems is a critical challenge [10] [16]. Many employees are sceptical about AI's ability to handle HR processes fairly and effectively, leading to resistance to adopting such systems.

Employees expressed concerns about the privacy and protection of their data when interacting with AI, let alone AI-driven HR tools. They are worried about sensitive information, such as performance evaluations or personal feedback, being accessible to unauthorized individuals [17].

Interviewees raised questions about the ethical use of AI in HR [18]. They were concerned about potential bias in AI algorithms, leading to unfair treatment or decisions based on gender, race, or other factors. Ensuring fairness and transparency in AI processes was a significant concern.

Another thing the HR professionals emphasized was the importance of robust data security measures [19]. They expressed worries about data breaches, unauthorized access, or hacking attempts, especially when AI systems handle sensitive employee information.

Last but not least, the employees and HR specialists highlighted the need for comprehensive training and awareness programs [15]. Ensuring that both employees and HR staff understand how AI systems work and the security measures in place is essential to address concerns.

All of these identified concerns underscore the paramount importance of implementing the highest levels of security and data protection measures in AI-driven HR systems, emphasizing this as a critical direction for future work.

5 Conclusion

In conclusion, this paper has presented SMARTENGAGE, an innovative AI-powered platform designed to address the critical issue of employee engagement within organizations. Rather than relying on generic questionnaires, SMARTENGAGE utilizes tailored surveys and artificial intelligence to comprehensively assess and improve employee engagement. It empowers organizations to proactively identify areas for enhancement, ultimately leading to increased productivity and improved work experiences.

This research underscores the potential of AI-driven solutions in addressing contemporary workplace challenges. While the study has shown promising results, there is a need for further exploration and validation in this evolving field.

Looking forward, our long-term vision is for SMARTENGAGE to become the standard in HR and team management for medium to large companies, similar to widely adopted tools like Microsoft Teams
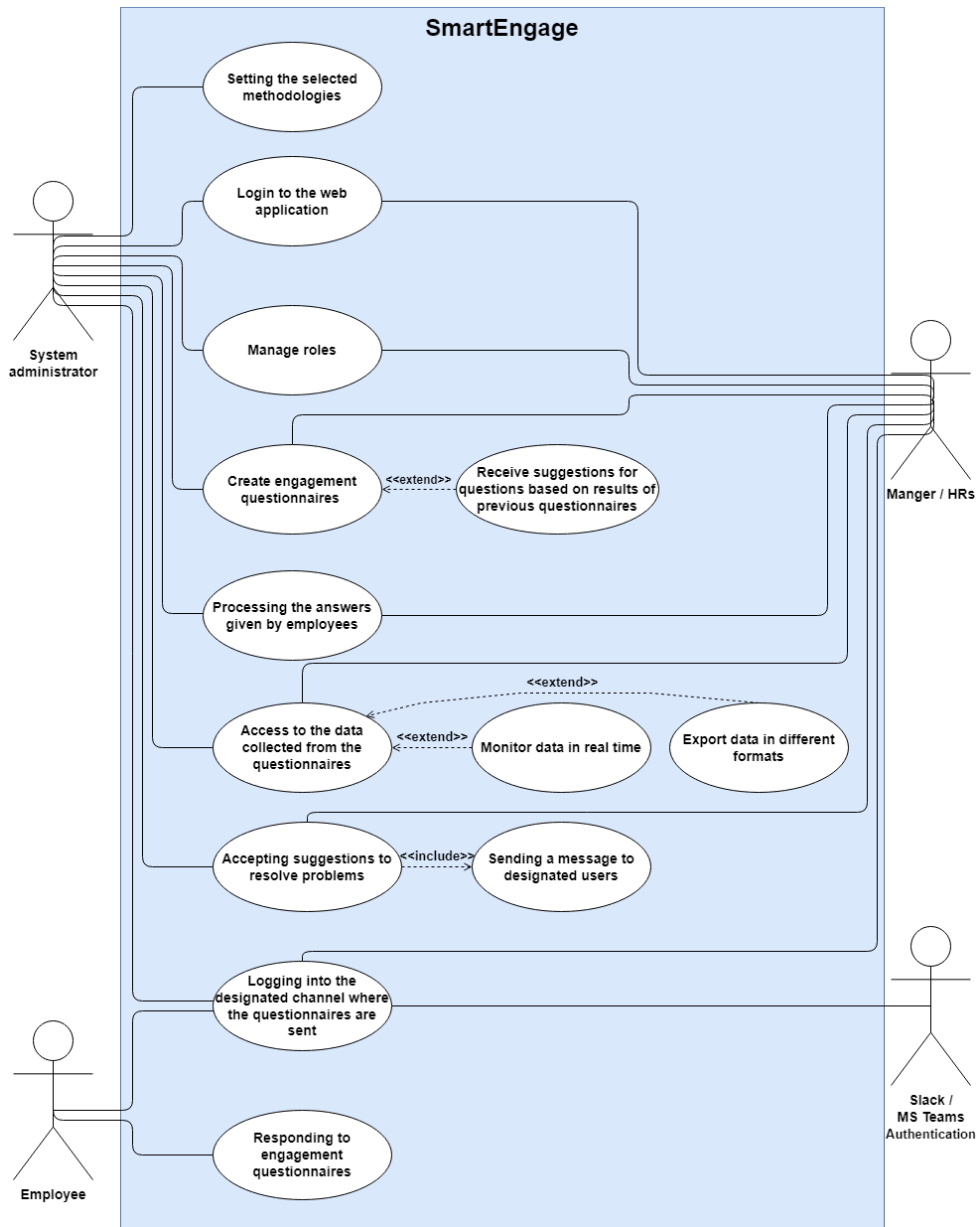
Figure 3: Use Case diagram for SMARTENGAGE

and Slack for communication. We aspire to revolutionize support and enhance critical aspects such as work ethics, and team dynamics, and combat issues like Quiet Quitting.

As part of future work, we intend to engage in discussions with companies to gather feedback on the SMARTENGAGE platform and proceed with its implementation. This research sets the stage for a new era in employee engagement, where AI-driven solutions offer personalized support and contribute to more engaging and fulfilling work environments.

Acknowledgments

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