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Enhancing Business Operations Through Microlearning, BPM and RPA

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Abstract: *This paper aims to investigate the impact of emerging technologies such as microlearning, Business Process Modelling (BPM) and Robotic Process Automation on business operations. In the first part, we did a literature review and defined the key concepts underlying these technologies. Microlearning caters to the modern learner by offering short, effective learning bursts that align well with the fast pace of today's work environments. BPM accelerates the process of delivering learning content specific to microlearning modules by optimizing specific workflow. RPA contributes by automating routine tasks using bots, improving the learning experience by providing instant materials, support and feedback. In the second part, we conducted a bibliometric research with the help of VOSViewer, focusing on an analysis of the co-occurrence of keywords specific to the 3 technologies, highlighting research trends and patterns, the impact of research in terms of citation analysis, but also research gaps on a topic. A future perspective was outlined for the implementation of these technologies in business environments, analyzing their impact and presented a section with case studies, highlighting common challenges and offering possible solutions. Summarizing all this, it can be said that the synergy between these 3 technologies has obvious advantages such as increasing productivity, optimizing administrative processes, reducing costs, and improving learning experiences, but it can also pose implementation problems specific to adopting new technologies in a constantly changing environment.*

Keywords: Bibliometric Analysis, Business Development, Business Process Modeling (BPM), Microlearning, Robot Process Automation (RPA)

Introduction

The scope of the paper is to offer a forward-looking perspective on employee training and organizational efficiency in the business context of integrating modern technology in professional development. The aim is to identify what impact might have enhancing business operations using BPM (Business Process Modeling) and RPA (Robotic Process Automation). We shall briefly argue the relevance of each concept involved in the process.

Firstly, the concept of "*microlearning*", represents a method that delivers content in small, specific bursts, that aligns perfectly with the contemporary workforce's preferences and learning behaviors (Díaz Redondo et al., 2021; Leong et al., 2021; Samala et al., 2023). With just minutes at a time, microlearning efficiently perfects skills and locks down new information – an essential tool in navigating through the rush of modern work life. This learning approach caters to the need for quick, accessible learning that can be easily integrated into the daily workflow without overwhelming the learners (Nikkhoo et al., 2023).

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Secondly, the inclusion of *Business Process Modeling (BPM) and Robotic Process Automation (RPA)* is necessary as representing the technological backbone of the proposed microlearning platform in a business environment. We can picture BPM as our personal assistant, remodeling learning processes for peak performance, spotlighting key info while speeding up content delivery. This could potentially streamline the creation and distribution of microlearning modules, making the platform highly adaptive to the changing needs and objectives of the business (Li et al., 2014; Reijers, 2021).

Another key role of RPA is that the automation of repetitive tasks can be also applied for learning and development (L&D) activities, by automating the administrative and support tasks associated with training programs. This not only reduces the operational burden on L&D teams but also enhances the learning experience by providing timely support and feedback to learners, thereby increasing engagement and effectiveness (Meidan et al., 2017).

Microlearning and Business Process Modeling (BPM) represent two innovative concepts that, when combined, can bring significant benefits to the business environment Hug (2005). Tech changes in the blink of an eye, pushing us to ensure our team isn't left behind. A versatile development strategy becomes our secret weapon in this race. We will further argue the functioning and utility of integrating microlearning with BPM in the business environment (Guralnick, 2018).

When businesses blend microlearning with BPM and RPA technologies, they're really setting themselves apart. It's all about crafting top-notch skills among employees which paves the way to outshine competitors and dominate the marketplace. This synergy between learning and process optimization opens up new possibilities for the continuous growth and adaptability of organizations (Bejinaru & Iordache, 2010) in the face of the challenges of the dynamic contemporary business environment.

Literature review

Business process modeling

Business Process Modeling (BPM) is a methodology that facilitates the visual representation of an organization's processes, aiding in their comprehension, analysis, and improvement (Dumas, La Rosa, Mendling, & Reijers, 2018). It plays a critical role in identifying, redesigning, and optimizing processes to enhance efficiency and achieve organizational goals (Weske, 2019). By uncovering the trouble areas—whether it's slowdowns or doing more than needed—BPM makes everything run smoother from cutting expenses to boosting how well we serve our customers. The creation of visual diagrams, such as flowcharts and process maps, not only aids in bridging the communication gap among stakeholders but also lays the groundwork for integrating business operations with technological implementations (vom Brocke & Rosemann, 2015). Furthermore, BPM is not a one-time activity but a continuous process that requires ongoing evaluation and refinement to meet new business challenges and opportunities (Weske, 2019).

Across diverse domains, the transformative effect of technology is hard to ignore. These days in education, it's not just about what students can learn but how smoothly everything runs behind the scenes. Thanks to BPM, the educational sector is getting a major upgrade in efficiency across board—from sharpening up admin tasks to delivering better student services. By introducing BPM into educational settings, students are walking out of class with not just theory but practical skills in making businesses run smoother and more efficiently. For instance, a study by O'Leary (2020) emphasized the integration of BPM tools and methodologies within MBA

programs to foster an understanding of digital transformation in business. Thanks to the latest in BPM software, learners now have a playground for testing out business management theories on actual industry scenarios. Students today aren't just reading about business operations; they're actively reshaping them with advanced BPM tools like ARIS and Bizagi right from their desks. According to a research by Harmon and Ramos (2018), getting hands on and being involved with everyday business jobs not only clears up complex ideas about operations but also shows just how much tweaking these processes can propel an organization forward. An example includes the collaboration between universities and corporations to provide students with live projects that require BPM solutions. In a case study by Müller et al. (2019), students worked alongside professionals to redesign the supply chain processes of a manufacturing company, applying BPM principles to enhance efficiency and reduce costs. Students embarking on these joint ventures find themselves applying what was once theoretical knowledge in tangible ways, seamlessly blending study with industry application. The role of BPM education extends beyond technical skills, contributing significantly to the development of soft skills such as leadership, teamwork, and critical thinking (Baesu & Bejinaru, 2020). Engaging students in BPM projects requires them to navigate complex problem-solving scenarios, communicate effectively with team members, and lead process improvement initiatives. According to Van Looy (2021), getting hands-on with such experiences is key for prepping students to excel in the teamwork and mixed-discipline reality of contemporary businesses.

Schools are now teaching BPM, equipping young minds with critical business tools early on. Through a combination of theoretical coursework, experiential learning with BPM tools, collaborative industry projects, and a focus on both hard and soft skills development, students are better prepared to meet the challenges of today’s business world. Graduates come out of these initiatives not just more hireable but equipped with sharp tools for making workplaces run smoother and smarter.

Robotic process automation

Robotic Process Automation offers businesses a chance to automate routine operations and give human workers room for more creative endeavors, employing nifty bots to tackle diverse online chores, interacting with different applications just as humans do (clicking, typing, browsing through pages and other activities). The operational backbone of RPA is formed by software bots, which are specifically programmed to execute predefined tasks (Anagnoste et al., 2021). From fast entering loads of data to unpacking intricate business trends, these bots keep things running smoothly day and night—no rest needed, no room for slip-ups. An RPA platform is like the control center for bots, offering all the necessary tools to create, put to work, and keep an eye on them. The workflow designer is a key component of an RPA platform and is used to orchestrate the tasks without the need of coding. Its user-friendly graphics guide the user through setting up and deploy operations in no time. When examining pharmaceutical organizations Anagnoste (2018) found that the primary challenges include managing large volumes of data, encountering high rates of errors that adversely affect the company's reputation, extensive time dedicated to correcting mistakes, navigating through outdated systems, and facing a high employee turnover rate due to the monotonous nature of the tasks.

When mixing RPA with the powers of Artificial Intelligence (AI) and Machine Learning (ML), bots turn into decision-makers. They start adapting their work using insights provided by the data they crunch. Working with Natural Language Processing (NLP), RPA bots are no longer

just automated tools, they now grasp human conversations, streamlining tasks from answering client questions to analyzing stacks of papers effortlessly. Another key technology used by RPA bots is Optical Character Recognition (OCR), reading everything from pictures to hard reading text, digitizing info with ease. The integration capabilities of RPA, achieved through Application Programming Interfaces (APIs) and screen scraping, ensure that these bots can seamlessly interact with a multitude of software systems, enhancing their utility and flexibility across various operational contexts, as shown by Toma (2023) that used RPA to automate the collection and signing of university daily sheets.

The significance of RPA in operational efficiency and innovation is extensively documented in the literature. Lacity and Willcocks (2016) get into the subject as they unwrap the power of RPA to facilitate productivity like never before. Similarly, Syed et al. (2019) explores the theme and reveals that diving into RPA is more than just trendy—it's a smart move filled with benefits for those ready to lead. Aguirre and Rodriguez (2017) really broke new ground by showing us what happens when you mix RPA with AI - giving business operations a boost for the future. Moreover, the research conducted by Wanner and Janiesch (2020) shed light on the transformative role of RPA—turning up process speed and receiving positive feedback from satisfied customers. Learning is improved directly by RPA, enhancing every lesson along the way. According to Johnson et al. (2017), the use of RPA in automating feedback mechanisms allowed for more personalized and detailed feedback, contributing to better learning outcomes. With RPA tools in play, every student gets a learning journey that's personalized just for them.. A case study by Smith and Patel (2020) illustrates how RPA was used to tailor learning paths for students in an online learning platform, resulting in improved engagement and academic performance. By doing so, educational institutions can equip students with the tools necessary for personalized and effective learning, thereby fostering an environment that not only improves engagement and performance but also prepares students for a future where technological adaptability is key (Prelipcean & Bejinaru, 2018).

Another example is a study by Clark et al. (2021), which demonstrated how RPA was utilized to dynamically adjust learning materials and assessments based on student progress and feedback, resulting in improved academic performance and learner satisfaction. For every student's step forward, RPA can recommend the right resource or module they need next based on their current performance. This was illustrated in a project described by Thompson and Lee (2019), where RPA tools analyzed quiz results to recommend additional reading materials and practice exercises for students struggling with certain concepts.

Microlearning

Microlearning is characterized by its delivery of content in small, manageable units, facilitating short-term focused learning activities. This approach, as Hug (2005) initially conceptualized, leverages relatively brief learning units to support skill acquisition, knowledge retention, and the achievement of specific learning objectives, making it particularly suited for ongoing professional development. As shown by Guralnick (2018), it turns out breaking down learning materials into bite-sized pieces really works with the current students. It hooks their short attention spans and makes fitting new info more easily.

Microlearning platforms are digital environments packed with tools for delivering learning content, such as a repository for storage, learning pathways, adaptive algorithms, analytics and reporting. Key references on the topic include works by Hug (2005), who

introduces microlearning as a new pedagogical challenge, and Giurgiu (2017), who discusses microlearning as an evolving eLearning trend. Regarding the field of business education, this approach has proven to be a very useful tool, as shown by Jahnke, Lee, Pham, He, and Austin (2020), that highlight microlearning's role in facilitating just-in-time learning, where learners can immediately apply concepts and skills to real-world business challenges, thereby reinforcing learning through practice.

Using BPM and RPA alongside short learning modules not only changes how we deliver lessons but also customizes them. BPM aligns development with delivery so every lesson increases in relevance and effect. In parallel, RPA is making distributing lessons or assessing learners less of a problem, according to Lacity, Willcocks & Craig (2016) during their findings which highlight benefits including efficiency and scalability. This personalization aspect, explored by Ifenthaler and Yau (2020), enhances the learning experience by ensuring that learners receive content that is most relevant to their needs and learning progress. Moreover, the scalability afforded by RPA's automation capabilities allows educational institutions and corporations to offer microlearning opportunities to a broad audience without a corresponding increase in administrative overhead.

Despite the promising integration of microlearning, BPM, and RPA, challenges such as ensuring data privacy, maintaining content quality, and overcoming technological barriers remain. The study by Schwerer and Mödritscher (2021) points out the need for more advances algorithms and investigation the long term impact on personal and professional development.

Methodology

By puting together information from three complex fields, “microlearning”, “business process modelling” and “robotic process automation”, we aim to enrich our understanding beyond current horizons and provide valuable insight. To achieve this goal, we have conducted a bibliometric analysis, a methodology that utilizes quantitative approaches to examine and assess academic literature (Vargas et al., 2022). The primary role of bibliometric analysis is to uncover research patterns and trends, such as academic productivity, the significance of contributions, and the interconnections among various academic disciplines (Ellegaard & Wallin, 2015). This type of analysis is versatile, incorporating a range of procedures like citation analysis to evaluate the influence of specific works, authors, or research fields; co-citation analysis to identify seminal works and key researchers; co-occurrence analysis to detect dominant concepts and themes through the examination of frequently occurring words in titles or abstracts; and impact analysis using metrics such as citation counts, the h-index, or journal impact factors (McAllister et al., 2022). These methods provide numerical and visual interpretations but also have limitations, such as the potential misrepresentation of research quality or the selection of inappropriate indicators, which could skew the results of the analysis (Zupic & Cater, 2015; Alayo et al., 2021).

However, the advantages of bibliometric analysis are significant in importance despite certain limitations, such as those mentioned. It facilitates extensive analysis of vast datasets from diverse sources, aiding in the discovery of publication trends and knowledge gaps, thereby guiding future research. Moreover, a suggestive visual representation of the chronological evolution of writings on a specific topic becomes extremely relevant in an in-depth research of it. Identifying a chronology of writings, authors, and journals that have conveyed information about the analyzed theme is useful in shaping the research approach. It is also cost-effective, relying on existing software and online databases. Another advantage that cannot be ignored is the time-

saving aspect, which is an essential resource in the research process. The main goal of bibliometric analysis is to assess the research impact in a specific field, over a certain period of time, or according to other criteria (Glinyanova et al., 2021; Hillmann, 2021; Agostini et al., 2020; Diez-Martin et al., 2021). Considering these benefits, we argue that bibliometric analysis is a valuable tool for providing a comprehensive review of the literature in a given field (Dhamija & Bag, 2020). We will further explore the most active research areas, prominent researchers and institutions, and the most cited articles or journals.

We applied the standard stages of bibliometric analysis using databases of works extracted from Scopus based on the key phrases “Microlearning”, “Business Process Modeling” and “Robot Process Automation”. The query codes used were as basic as follows:

TITLE-ABS-KEY (" Microlearning ")

TITLE-ABS-KEY (" Business Process Modeling ")

TITLE-ABS-KEY ("Robot process Automation")

To conduct a keyword co-occurrence analysis, steps were undertaken to load the database into the specialized software VOSviewer, followed by the selection of desired analysis criteria. For each concept, the threshold limit was incrementally adjusted in order to result an acceptable number of keywords and relevant for subsequent stages of the bibliometric analysis. This procedure is essential for achieving an efficient and focused analysis.

Related to the keywords, there are several analysis options to consider as: Keywords Co-occurrence Network, Keywords Co-occurrence Overlay Map, and Keywords Density Map. The Keywords Co-occurrence Network facilitates the visualization of relationships among keywords within the database. The nodes in this network represent the keywords, while the links between them indicate the frequency of these words appearing together in the same works. This analysis can highlight groups or clusters of closely related keywords, suggesting subdomains of interest or emerging research trends (Shah et al., 2019). The Keywords Co-occurrence Overlay Map adds an additional layer of information to the co-occurrence network by variably coloring the nodes based on supplementary criteria, such as publication year or the impact score of the works featuring the keywords. This enables the observation of temporal evolution in research interest and the identification of domains gaining or losing popularity (Van Eck & Waltman, 2010).

Keyword co-occurrence analysis plays a crucial role in understanding the dynamics of a study field by emphasizing emerging trends and ascending topics through the identification of frequently combined keywords, facilitating thematic grouping of works and providing a clear perspective on the internal structure and relationships between various research subjects. Furthermore, the analysis can reveal existing knowledge gaps, where research could make significant contributions (Van Eck & Waltman, 2017).

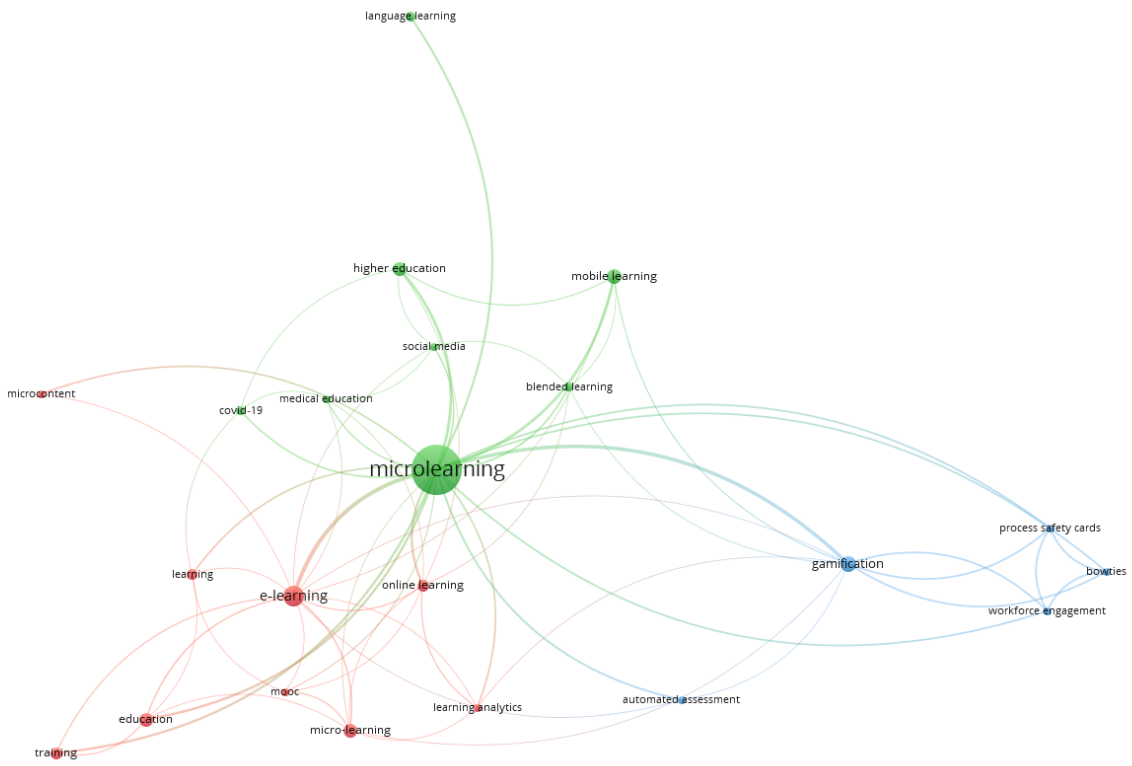

Figure 1. Co-occurrence Network for "microlearning" keyword

Source: authors' elaboration with VOSviewer.

Cluster Analysis

"Microlearning" cluster analysis

In brief, the forthcoming figure 1, which will be presented and discussed, comprises 22 keywords that are deemed representative as they fulfill the criterion of appearing (simultaneously) in the content of at least 5 works within the analyzed database, encompassing 376 articles.

As we can observe in Figure 1, adjacent to "microlearning," terms like "mobile learning," "e-learning," and "blended learning" are strongly linked, indicating a significant relationship between microlearning and these modern educational methodologies. The proximity of "mobile learning" and "e-learning" to "microlearning" reflects the trend of utilizing technology to facilitate learning in manageable increments, often through mobile and online platforms which allow for flexible and accessible education.

The association between "microlearning", "higher education" and "medical education" suggests that this approach is of interest and potentially can be applied in these formal education settings, possibly to enhance the traditional learning experience or to provide additional support and resources.

The presence of terms such as "social media" and "gamification" in the vicinity of "microlearning" implies an intersection with more interactive and engagement-focused methods of learning, that could indicate a research interest in how game-like activities and social platforms can be incorporated into microlearning to increase motivation and participation. Also, the

connection to "COVID-19" might reveal a recent focus, potentially related to the pandemic's impact on education and the subsequent increase in demand for innovative and remote learning solutions, including microlearning strategies to address the challenges of distance learning and keeping learners engaged outside of the traditional classroom.

"Business Process Modeling" cluster analysis

The VOSviewer protocol is similar for "business process modeling" concept and comprises a total of 7957 keywords for the standard threshold of 5 which generates a total of 485 keywords on the co-occurrence map that makes it impossible to be deciphered. Thus, we raised the threshold to 20 occurrences and obtained a set of 74 keywords that is more relevant and efficient to analyze.

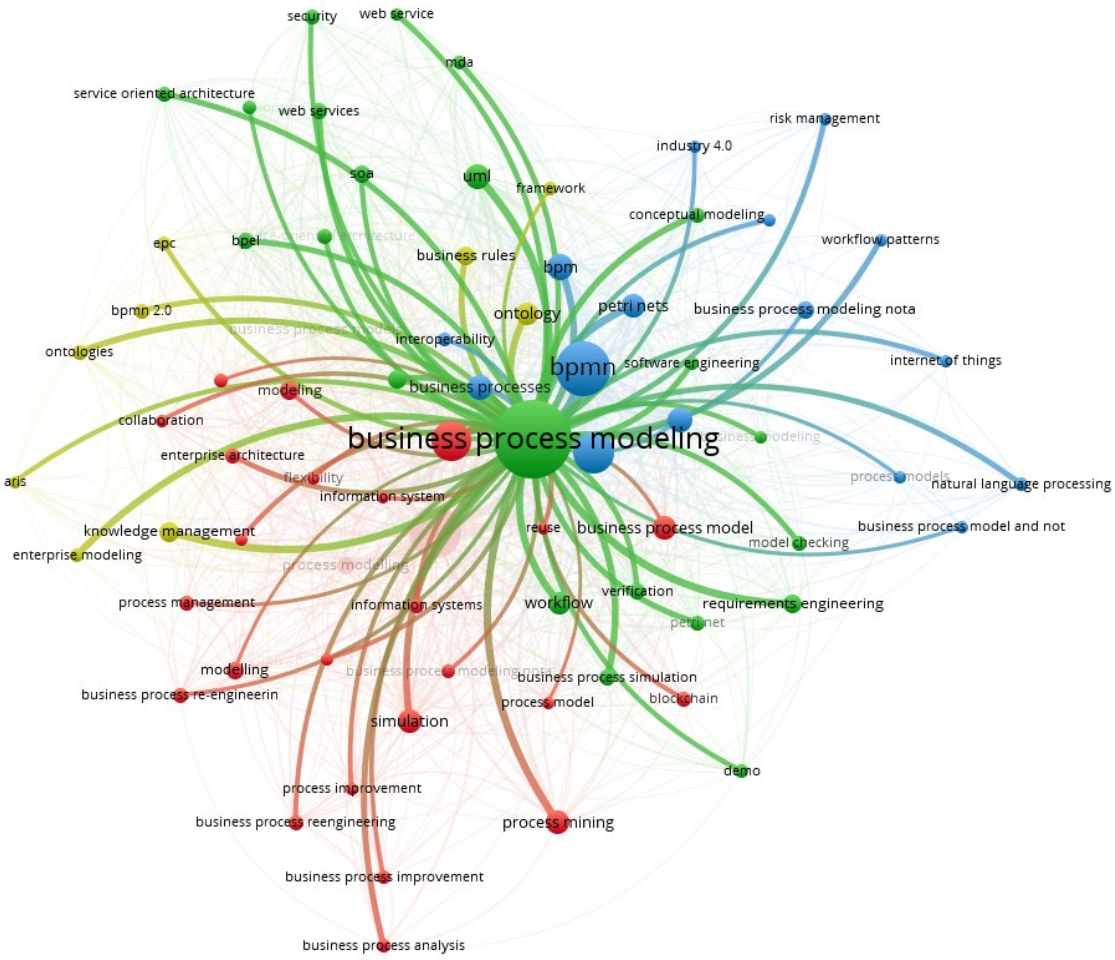

Figure 2. Co-occurrence Network for "Business Process Modeling" keyword

Source: authors' elaboration with VOSviewer.

In Figure 2, the central and most prominent cluster is anchored by the term "business process modeling," suggesting it is a primary focus of the research field and frequently associated with other key terms. Terms such as "business process management" (BPM), "process mining," and "simulation" are prominently connected to the central term, indicating that these are well-established and significant sub-areas in the domain of business process modeling. The strong

connections between "business process modeling" and "process mining" might indicate a trend in literature that emphasizes the importance of extracting process-related information from event logs to improve business processes. The connection between "business process modeling" and terms like "ontology," "enterprise architecture," and "knowledge management" suggests an interdisciplinary approach, where business process modeling integrates concepts from these related fields to enhance the comprehensiveness and utility of the models. The presence of terms such as "BPMN" (Business Process Model and Notation), "workflow," and "information systems" reflects the technical aspects of the field, pointing towards the practical application of business process models in designing and managing workflows within information systems.

"Robotic Process Automation" cluster analysis

Finally, the upcoming Figure 3, representing the RPA co-occurrence analysis includes 55 keywords identified as representative, out of 2105. The 55 keywords meet the criteria of concurrently appearing in the content of at least 5 works within the examined database, which consists of 940 articles.

The term "intelligent automation" occupies a central position. This signifies its core relevance and frequent co-occurrence with other terms in the literature. In proximity we can see significant terms like "machine learning," "robotic process automation," and "natural language processing, indicating a strong association between intelligent automation and these fields, suggesting that advancements in machine learning and natural language processing are likely influencing the development of intelligent automation technologies.

The term "machine learning" is also closely associated with "deep learning," "neural networks," and "computer vision," reflecting the contribution of these technologies to the progress of intelligent automation. Such connections may imply a trend in the research community towards leveraging deep learning algorithms and neural networks to enhance the capabilities of computer vision systems within the scope of automation. In addition, "robotic process automation" links to "robotics" and "intelligent systems," highlighting the application of robotics in automating structured business processes. This might represent the operational aspect of intelligent automation, where RPA is employed to streamline and improve the efficiency of workflows.

The visualization also shows a connection to broader industrial and technological trends. Terms like "Industry 4.0", "digital transformation," and "internet of things" (IoT) underscore the integration of intelligent automation within the larger context of digital and industrial advancements, reflecting a multidisciplinary approach that combines automation, data exchange, and manufacturing technologies (Bejinaru & Balan, 2020).

Robotic Process Automation (RPA) is increasingly intersecting with emergent concepts such as IoT, blockchain, digital twins, and Industry 5.0, (that can be observed in yellow color) heralding transformative research and application avenues. The integration of RPA with IoT facilitates the automation of both digital and physical tasks, enhancing efficiency and enabling predictive maintenance (Nalgozhina et al., 2023). Coupling RPA with blockchain technology promises secure, automated transactions and smart contract execution, ensuring data integrity and streamlined processes (Moreira et al., 2023). Moreover, RPA's role in Industry 5.0 underscores its capacity to support personalized production and foster human-robot collaboration, aligning automated processes with human ingenuity and customization demands (Dewasiri et al., 2023; Pypłacz & Žukovskis, 2023).

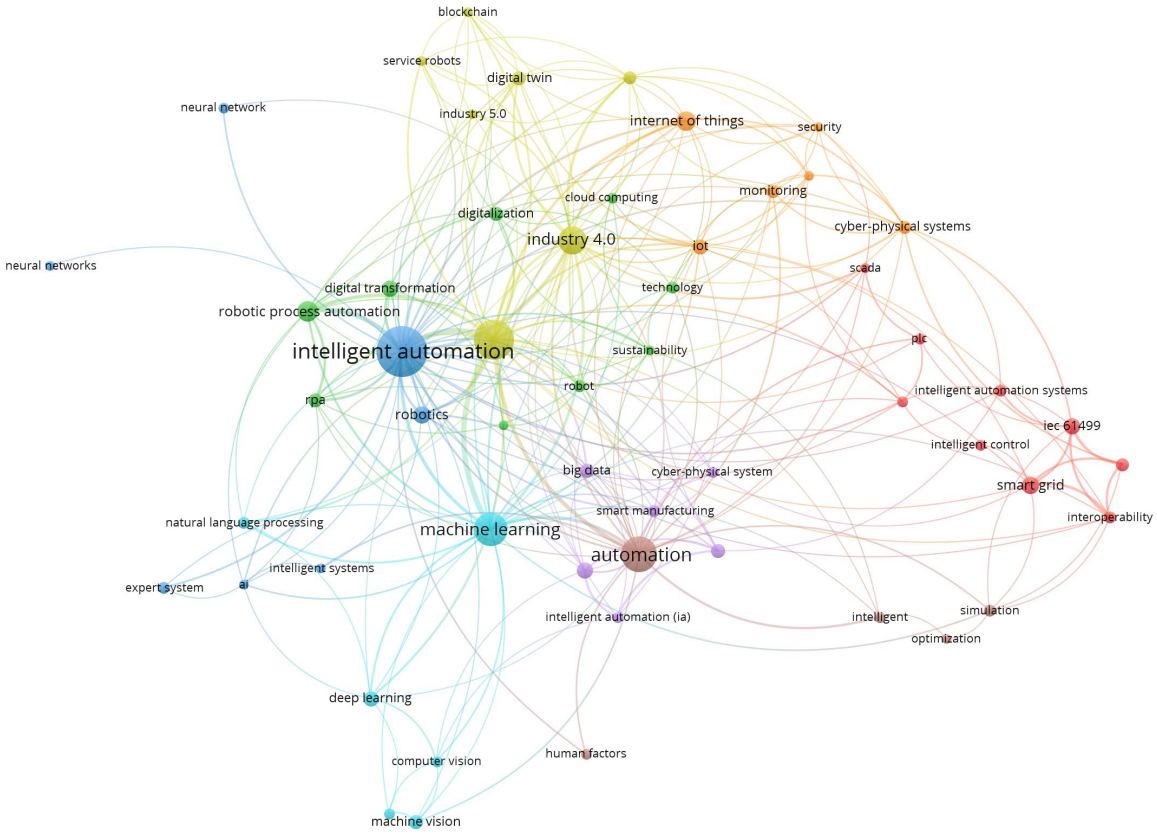

Figure 3. Co-occurrence Network for "Robot Process Automation" keyword

Source: authors' elaboration with VOSviewer.

Case studies

Businesses are increasingly integrating innovative technologies such as microlearning, BPM, and RPA to improve corporate training and operational efficiency. This type of implementation has shown clear benefits such as increased employee engagement, productivity gains and cost reductions. However, fully realizing these benefits requires addressing the challenges of technology integration, change management and scalability, as the case studies described below illustrate both the successful application of these technologies and the obstacles encountered, providing valuable lessons for other organizations.

JPMorgan Chase & Co. utilized RPA within its BPM framework to automate routine tasks, thereby enhancing efficiency and allowing employees to focus on more strategic activities. Beside the advantages, fitting cutting-edge technology into all areas of business highlighted that employees need extensive learning programs and efforts in management change. Similarly, AT&T's implementation of microlearning to support continuous employee development demonstrates the approach's effectiveness in enhancing job performance and engagement but in the same time faced challenges such as the selection of relevant content and the integration with the existing technology.

Siemens AG, the tech giant in electronics and electrical engineering, has led the way with BPM and RPA to boost how fast and flexible it operates. The company initiated a comprehensive digital transformation program aimed at automating complex business processes across various

departments, from procurement to human resources (Lacity & Willcocks, 2016). Siemens was able to automate repetitive tasks, reduce manual effort and improve process speed, leading to significant cost savings and increased process transparency, but in the same time the company faced challenges in aligning its IT infrastructure with the new digital tools and in managing organizational change, underlying the importance of investing in employee training and communication strategies to facilitate adaptation was crucial for the company.

Deloitte, a global consulting firm, has also enhanced its workforce's skills and knowledge with the help of microlearning. Recognizing the need for a flexible and efficient learning solution for its consultants, who often work in time-sensitive and knowledge-intensive environments, Deloitte developed a microlearning-based platform that delivers targeted, just-in-time training modules (Baer, 2020). With every twist and turn a project takes, consultants who can adjust swiftly set new standards for success and client satisfaction. Deloitte encountered difficulties trying to keep their learning content relevant, while also making sure it fit the wide array of needs across its worldwide team.

The above case studies reveal that mixing microlearning with BPM and RPA can seriously improve efficiency while keeping everyone learning and agile at work. They also state that adopting new tools isn't just plug-and-play. It demands active engagement in learning along with smartly navigating shifts as they come. The experiences of Siemens AG and Deloitte, along with those from JPMorgan Chase & Co. and AT&T, offer valuable insights and a roadmap for organizations seeking to leverage these technologies for operational and educational advancements, while also stressing the necessity of strategic planning to address the challenges of technology adoption and implementation..

Common challenges

The integration of technologies such as microlearning, BPM and RPA in business operations obviously presents a series of transformative advantages for organizations in improving the efficiency and performance of employees but however, these implementations are not without challenges, which will be discussed in the following section and we offer practical solutions to solve them.

***Technological Compatibility and Integration*:** A primary challenge businesses face when integrating BPM, RPA, and microlearning is ensuring technological compatibility among existing IT infrastructure and the new technologies (van der Aalst, 2013). The different nature of existing systems and new digital tools can hinder seamless integration, thus impacting the effectiveness of business processes, but a strategic approach that involves conducting a comprehensive IT infrastructure review and adopting middleware solutions that act as bridges between different systems would be a solution. Additionally, opting for technologies that offer API integration capabilities can facilitate smoother interoperability between these platforms.

***Change Management and Employee Resistance*:** Implementing new technologies can often disrupt established workflows and require employees to adapt to new ways of working. This change may be met with resistance, driven by fear of redundancy or the challenges of learning new systems (Osmundsen, Iden, & Bygstad, 2018), meaning that effective change management strategies are critical in addressing this challenge. This can be resolved by a clear communication regarding the benefits and rationale behind the integration of technology, involving employees in the transition process and providing comprehensive training and support. Building a team of

change advocates in the company can make the shift to new tech smoother, as they offer support and spread enthusiasm among their peers.

***Scalability and Maintenance*:** As organizations expand, the solutions initially implemented may not efficiently scale to meet increased demands, resulting in performance issues or bottlenecks. Furthermore, the ongoing maintenance of BPM, RPA, and microlearning platforms can strain resources (Lacity & Willcocks, 2016). Kicking things off with scalability in mind, taking things step by step and regularly schedule maintenance and updates, coupled with continuous monitoring of system performance, can prevent potential issues from escalating.

***Content Relevance and Engagement in Microlearning*:** Maintaining the relevance, engagement, and tailoring of microlearning content to the needs of a diverse workforce is a significant challenge (Baer, 2020). Outdated or generic content can lead to disengagement and diminish the effectiveness of learning initiatives. This can be solved by adopting a dynamic strategy for clear and personalizing content, leveraging analytics reports to understand employee learning behaviors and preferences as a crucial part in crafting targeted and relevant content, soliciting in the same time feedback on microlearning modules.

Future research

Future studies combining Business Process Modeling (BPM), Robotic Process Automation (RPA), and microlearning should aim to investigate the effects of emerging technologies, tackling not only the potential benefits but the challenges they present too, such as the following:

- *Enhancing Integration with AI and ML*: Investigating how artificial intelligence (AI) and machine learning (ML) can optimize BPM, RPA, and microlearning, focusing on adaptive systems, efficiency improvements, and personalized learning experiences (Cao et al., 2024).
- *Blockchain for Security and Transparency*: Examining blockchain's role in ensuring secure, transparent BPM and RPA implementations, and its potential to revolutionize process and transaction logging (Akram et al., 2024).
- *IoT for Real-time Data Integration*: Exploring how the Internet of Things (IoT) can enhance data collection and analysis, thereby improving decision-making and automating processes based on real-time insights (Hussain, 2024).
- *AR and VR in Microlearning*: Assessing the impact of Augmented Reality (AR) and Virtual Reality (VR) on creating immersive learning experiences that enhance engagement and knowledge retention (Aldoseri et al., 2024; Bratianu et al., 2023).
- *Ethical and Social Implications*: Evaluating the broader implications of automating business processes on employment, privacy, and ethical considerations, particularly in the context of AI (Al Naqbi, Bahroun, & Ahmed, 2024).
- *Effectiveness of Microlearning*: Investigating the long-term impact of microlearning on employee performance, knowledge retention, and its sustainability as a corporate training strategy (Kohnke et al., 2024).
- *Adoption in SMEs*: Examining the unique challenges and opportunities presented by BPM, RPA, and microlearning integration in small and medium-sized enterprises (SMEs), with a focus on innovation and competitiveness (Kakade, 2024).

Exploring these areas will enable future research to provide greater insights into the emerging technologies and the combined use of BPM, RPA, and microlearning, helping

organizations understand how to leverage these innovations to improve operational efficiency, create more engaging learning environments, and maintain a competitive edge.

Conclusions

Reviewing each of the approached concepts we can formulate that the synergy between microlearning, BPM, and RPA as outlined in the paper offers a multifaceted approach to enhancing business operations, suggesting that a microlearning platform not only provides precise and effective learning experiences but also utilizes cutting-edge technologies to refine both learning processes and administrative tasks, a strategy suited especially in a business environment that prioritizes agility, efficiency, and ongoing learning.

Incorporating "Business Process Modeling" into educational curricula is seen as an innovative strategy to enhance students' business skills because it integrates theoretical knowledge with hands-on applications of BPM tools, collaboration with the industry, and a focus on developing both technical and interpersonal skills.Our bibliometric analysis positions "business process modeling" as a focal point in research, intricately connected with BPM, process mining, and simulation. This underscores its vital role and the growing trend towards utilizing data analysis to refine processes, coupled with a multidisciplinary strategy that augments the utility and application of models in designing workflows across information systems.

Regarding Robotic Process Automation (RPA), it is transforming business task automation by incorporating advanced technologies such as AI, machine learning (ML), natural language processing (NLP), and optical character recognition (OCR). These technologies enables the automation of complex tasks that require decision-making, significantly boosting operational efficiency, enhancing customer satisfaction, and tailoring educational experiences. The bibliometric analysis centered on "intelligent automation" and associated technologies such as "machine learning" and "natural language processing" emphasizes its pivotal role in integration with AI advancements, suggesting a research direction focused on enhancing automation capabilities with sophisticated algorithms. These developments are applicable in areas from improving computer vision to optimizing business processes, fitting within the larger context of digital and industrial revolutions like Industry 4.0.

The integration of microlearning enhanced by BPM and RPA introduces a transformative approach to business education by offering highly personalized, efficient, and timely learning solutions that meet the needs of today's professionals, thus reshaping the corporate training and professional development landscape. The bibliometric analysis has shown a strong correlation between microlearning and modern educational approaches such as mobile learning, e-learning, and blended learning. This trend leverages technology for accessible, step-by-step learning. Its application in higher and medical education shows its potential to enhance traditional educational methods, while its link to social media, gamification, and COVID-19 highlights its role in innovative, remote learning solutions responding to changing educational demands.

In summary, this approach offers a compelling vision for using technology to cultivate a culture of learning and continuous improvement, making it both relevant and significant amid the challenges of the modern business environment.

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