

DIGITAL TRANSFORMATION IN BUSINESS PROCESS MANAGEMENT: THE ROLE OF EMPLOYEE ENGAGEMENT

Joanna Hernik

West Pomeranian University of Technology
Poland

ORCID 0000-0001-8895-6039

Adam Sagan

Cracov University of Economics
Poland

ORCID 0000-0002-5608-179X

Wojciech Jarecki

University of Szczecin
Poland

ORCID 0000-0002-4463-7607

Gunta Grinberga-Zalite

Latvia University of Life Sciences and
Technologies

Latvia

ORCID 0000-0002-0500-4890

Abstract: *This article explores the complex interaction between employee engagement and digital transformation within the context of Business Process Management (BPM). It intends to assess how factors such as support from supervisors, or benefits of transformation, influence the acceptance of new digital processes within organizations. In the empirical part, a survey was conducted which aimed to identify factors influencing employee engagement. Then, the study utilizes Partial Least Squares Path Modelling (PLSPM) to analyze the impact of various factors on employee engagement during digital transformation initiatives. The work highlights the critical role of effective communication in ensuring successful digital transformation, proposing that clear, consistent, and transparent messaging is essential. This study contributes to the existing literature by offering a modified model of technology acceptance, specifically tailored to modern digital transformations in BPM. It also provides insights into the dynamics of employee behaviour in response to technological changes, which is crucial for leaders and managers overseeing digital strategies. Moreover, the findings emphasize the need to consider the human-technology interface, where emotional responses, trust in digital systems, and perceived control play a significant role in shaping engagement. The study acknowledges that technology adoption is not only a rational process but also deeply rooted in human values and social context. Understanding this interplay helps organizations design digital transformation strategies that align technological innovation with human-centered approaches.*

Keywords: *employee participation, innovation management, human technology interaction, organizational change, process improvement*



INTRODUCTION

Both scientists and practitioners indicate that the low level of employee involvement in work is currently one of the most disturbing problems of the economy (Motyka, 2018). One of the areas analysing this issue is Business Process Management (BPM), which is understood as a systematic methodology aimed at enhancing the efficacy of the processes utilized by organizations to accomplish tasks, cater to customer needs, and foster value creation (Tucci, ND). The implementation and understanding of BPM exhibit significant variation across organizations, influenced by factors such as organizational size, process maturity level, technological advancement, corporate culture, and available resources. The application of BPM can range from focused interventions targeting the optimization of a single process, like onboarding a new client, to comprehensive organizational transformations necessitating the adoption of fundamentally new procedural frameworks. The effectiveness of BPM initiatives is largely depending upon an organization's ability to recognize and leverage the potential benefits of process optimization.

According to IBM (<https://www.ibm.com/topics/business-process-management>), business process management (BPM) can be categorized into three primary types: integration-centric, human-centric, and document-centric, each serving distinct operational functions within an organization. The first one, integration-centric BPM, is characterized by its focus on processes that necessitate minimal human intervention, relying instead on application programming interfaces (APIs) and mechanisms to facilitate the seamless integration of data across various systems. Examples of such systems include Human Resource Management (HRM) and Customer Relationship Management (CRM), where the automation and synchronization of data are pivotal. In contrast, human-centric BPM emphasizes the necessity for human interaction, particularly in scenarios that require approvals or decision-making (Fdez-Olivares et al. 2010). This approach enhances accountability and oversight throughout the procedural workflow. And finally document-centric BPM revolves around the management and processing of specific documents, such as contracts, which are critical to the procurement processes of companies. This type of BPM addresses the need for documents to undergo various stages of form completion and approvals, facilitating the establishment of agreements between clients and vendors through a structured and traceable process.

It seems that this division has been merged again by the ongoing digital transformation of enterprises. **Digital transformation** captures the utilization of digital technologies to either modify existing traditional and analogue processes or develop new ones, in response to changing market dynamics and customer expectations (What is digital transformation?, 2024). This transformation fundamentally redefines the management and operational methodologies of businesses, as well as the mechanisms through which value is carried to consumers. Research demonstrates that the implementation of artificial intelligence technologies in organizational contexts requires careful consideration of both technological capabilities and human factors, with performance outcomes significantly influenced by the integration of these elements (Angammana & Jayawardena, 2022). It also means a technological adoption, which causes a cultural shift that forces organizations to question existing patterns, engage in frequent experimentation, and accept some failures. The primary objective of digital transformation is to build a competitive power through the strategic implementation of

technology at scale, often aiming to enhance customer experiences and reduce operational costs. However, it should be assumed that digital transformation must simultaneously concern the processes of integration of enterprise functions (integration-centric BPM), human processes (human-centric BPM) and document-related processes (document-centric BPM). None of these areas can be ignored. Subsequently, digital transformations can apply to all processes that take place in enterprises. Each digital transformation initiative should be characterized by its goals; however, the primary goal of such actions is to enhance existing processes.

Currently, it is possible to identify digital solutions used in different areas of the enterprise, for example:

1) production companies use IoT tools to supervise and optimize manufacturing processes, improve supply chain management, and enhance product quality through real-time data collection; services companies use cloud platforms for flexible, scalable access to computing resources, data storage, and software applications, enabling remote work (Taj et al., 2023); 2) in other service sectors, like real estate, education, or healthcare, Virtual and Augmented Reality can be used to enhance the customer experience by providing immersive interactions, simulations, and visualizations; 3) AI-powered chatbots can be deployed on websites and social media platforms to provide instant customer service, and engagement; 4) cloud-based platforms, such as Google Drive or Dropbox, allow for the storage, sharing, and collaborative editing of documents, spreadsheets, and presentations, among employees. These are examples of digital solutions currently existing or being implemented in almost every enterprise. Their implementation and subsequent successful use always depend on the acceptance and commitment of employees (Murawski and Bick, 2017).

The successes of using these solutions in companies depend on employees at various levels, because only employees possess the cognitive abilities to set goals, make decisions, or learn from experience. Moreover, this success depends on engaged employees, who are more likely to embrace new technologies and adapt to the digital changes implemented within the company. Every change, however, can face resistance, especially when it disrupts established workflows and requires new skills. Therefore, engaged employees, who feel valued and are aligned with the organization's goals, are crucial when it comes to implementing changes. This is due to the fact that they are more likely to understand the reasons behind the digital transformation and, hence, less likely to resist it. Therefore, **the goal of the article is to define factors determining employee involvement in the digital transformation of business processes**. In relation to this goal, **4 hypotheses** have been formulated – they are given in the Methodology section.

While BPM focuses on process improvement, digital transformation aims at fundamental changes, requiring research on new process management approaches, including agile processes and infrastructure flexibility. That is why the stated hypotheses are related to the main research question: Which factors determine employee involvement in the successful digital transformation? Such a question is crucial because employees who are involved in day-to-day operations possess valuable knowledge and expertise about the processes they manage. Their insights can help identify process inefficiencies and opportunities for improvement that might not be apparent from a top-down perspective. But what is the most important, for digital transformation initiatives to be successful, they must be widely adopted across the organization. Finally, digital transformation often requires significant changes in

how processes are executed and how employees perform their jobs. Therefore employee involvement is essential for effective change management, as it helps to address concerns and resistance to change, ensuring more efficient transition.

LITERATURE REVIEW

Hajo A. Reijers, in his well-known work 'Business Process Management: The evolution of a discipline' (2021) writes, that BPM is so essential because managing processes from start to end ensures better efficiency and faster achievement of goals, therefore organizations that monitor and refine their business processes tend to outperform those that do not. Managing a business process is complex, as it often involves various departments, specialties, locations, management tiers, and other organizational divisions. Moreover, achieving effective management requires a thorough understanding of the process steps, the individuals involved, the data exchanged and processed, and the technologies used at each stage (Reijers, 2021). By optimizing and aligning these factors, an organization can enhance its product or service output, for instance, by accelerating the process, increasing efficiency, or reducing its environmental impact. The literature on BPM predominantly focuses on process models, especially the control-flow perspective, while other aspects like resources, data, time, and functions get less attention (van der Aalst, et al., 2016). This emphasis presupposes that better models will automatically lead to better processes, a notion that is questioned for several reasons, including the potential disconnect between models and reality, and the limited use of these models in actual process automation within organizations. Consequently, the argument is made for prioritizing process improvement over model perfection, suggesting that the utility and detail of process models should align with their intended purpose, such as automation or identifying redesign opportunities for efficiency gains.

Introducing changes in process management is often indicated as a key factor in market success. For example, research by Thomas (2020) shows that organizational innovation and creative outcomes stem from various challenges, including market volatility, diverse environmental factors, and competitive demands for uniqueness. Firms introducing digital integration across management, systems, and data gain a competitive edge. This approach merges various operational and technological areas, creating new opportunities, business models, and strategies. Fully integrating digital and business strategies leads to synergistic benefits, enhancing a company's adaptability, innovation, and resilience against competitive pressures.

It seems that the aspect of market competitiveness occurs very often in relation to process management. Truong, Nguyen-Duc, and Van (2023) write, that in the last decade, organizations have increasingly focused on effective management processes to stay competitive. This has led to a reliance on enterprise information systems for managing information and automating tasks. BPM plays a key role in integrating these systems into cohesive teams, enhancing operational efficiency and responsiveness to market changes. Despite BPM's recognized importance, there is a research gap in its application to digital transformation, which involves integrating digital technology into all business aspects.

BPM is an extremely important concept of business management enabling effective implementation of changes, which is emphasized by authors such as Dumas, LaRosa,

Mendling and Reijers (2015), who claim that BPM acts as a junction where diverse perspectives converge. Business managers gravitate towards BPM for its proven track record in enhancing organizational efficiency, ensuring compliance with regulations, and elevating the quality of services. Industrial engineers view BPM as a chance to apply established optimization methods from manufacturing to service-oriented organizations. Moreover, Information Technology (IT) professionals value BPM for offering a common language that facilitates communication with business stakeholders. Additionally, the advent of business process automation technology enables IT experts to deploy and manage IT systems in a manner that aligns with business leaders' vision for the company. Essentially, BPM bridges various disciplines, functioning as a crucible that blends distinct communities together. Although BPM is a complex area, it can be defined as – quoting Wil, Aalst, Hofstede, and Weske (2003), the authors of ‘Business Process Management: A Survey’

– Supporting business processes using methods, techniques, and software to design, enact, control, and analyze operational processes involving humans, organizations, applications, documents and other sources of information.

As one can see in the definition provided, the BPM connects people and technology. There is no doubt that business has been undergoing intense technological transformation in recent years. This transformation involves employing digital tools such as cloud computing, robotic process automation, workflow management software, BPM software, artificial intelligence, and low-code development platforms. These technologies aim to optimize processes, increase efficiency, and elevate customer service experiences (Verhoef et al., 2021).

Authors such as Davis (1989), Venkatesh and Davis (2000), Marler and Dulebohn (2005), Lok (2015) or Tamilmani (2021), try to explain, how users come to accept and use a technology, and indicate two main factors: 1) perceived usefulness, which refers to the degree to which a person believes that using a particular technology will enhance his or her job performance. In other words, when a technology is perceived as useful, an employee is more likely to accept and use it; 2) perceived ease of use, which refers to the degree to which a person believes that using a particular technology will be free of effort. So, if a technology is perceived as easy to use, it is more likely to be accepted and used by employees. This Technology Acceptance Model (TAM) stems from the Theory of Reasoned Action, described by Fishbein and Ajzen (1975), and assumes that users are rational and make systematic use of the information available to them when forming their judgment about technology acceptance. Nowadays this basic 2-factors approach has many extensions, encircling different types of users, organization, technology, task types, time of performance, and different locations. One of the advanced models is Unified Theory of Acceptance and Use of Technology (UTAUT), developed by Venkatesh, Morris, Davis, and Davis in 2003. UTAUT integrates elements from other models, including TAM, proposing that four key constructs - Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions - are the primary determinants of usage intention and behaviour (Venkatesh & Davis, 2000). This model also has its variants and extensions (Bouvier, Hwang & Hwang, 2024; Tamilmani et al., 2021).

One of the core concepts in this article is engagement, which can be understood as an aspect of the relationship between an employee and the organization or work performed, as

well as identification with work (Jarecki and Młokosiewicz, 2017). By engagement, according to Kenneth and Walter (2020), we mean the energy and thoughts that an employee puts into his or her work. Engagement is essential because when people are engaged in their work, they take steps to ensure that actions performed are effective in achieving goals. Moreover, engaged and satisfied employees demonstrate extra-role behaviours that go beyond the duties and requirements of employment (Veseli and Çetin, 2024.) According to the mentioned authors, the work engagement profile refers to four elements:

- 1) The feeling of meaningfulness – an employee has the chance to work towards a significant goal.
- 2) The feeling of autonomy – an employee has the ability to choose tasks that resonate with his skills and to carry them out in a manner he finds suitable.
- 3) The feeling of competence – an employee can effectively execute the tasks he has selected.
- 4) The feeling of advancement – an employee has a feeling that he makes progress towards achieving task objectives (Kenneth and Walter, 2020).

When the factors mentioned above are in place, then work becomes an important source of satisfaction and fulfilment. In many ways, the four intrinsic rewards—sense of meaningfulness, sense of choice, sense of competence, and sense of progress—serve as psychological marks indicating how well the job is working for both an employee and his company. All of this is important because engaged employees perform better, experience less burnout, and stay in organizations longer (Stein et al., 2021). Contemporary research in organizational performance demonstrates that employee engagement serves as a critical mediator between management practices and organizational outcomes, with studies showing substantial improvements in performance metrics when engagement-focused strategies are implemented (Vovk & Vovk, 2024) From this perspective it should be noted that a lot depends on leaders because they are the ones who inspire and motivate their employees to exceed expected levels of performance (Maj, 2023).

From the point of view of running a business, digitizing processes entails transitioning from manual to digital operations. This conversion leverages digital solutions to modernize traditional task execution methods, including document filing, invoice processing, and inventory management. Verhoef et al. write, that there are three key external drivers forcing the need for digital transformation. First one is the Internet supported by various technologies such as smartphones, Web 2.0, SEO, cloud computing, online payment systems, and cryptocurrencies. Second is the widespread availability of big data and the introduction of cutting-edge digital technologies like artificial intelligence, blockchain, or the Internet of Things, enabling the use of this data. Thirdly, replacing more expensive human labour with robots, virtual agents, and AI. For these factors in business activity arises the need of digital resources, the need of organizational structure change, and the need for specific goals and metrics. If we assume that we have a knowledge-based economy, this fact itself causes a shift in emphasis, because knowledge-based economy has led to transformations in the nature of work, the workplace, and the workforce from simple tasks to tasks based on specialized know-how (Kanur, 2021).

Digital technologies also significantly influence consumer behaviour, granting them constant access to information and the ability to communicate. Therefore, according to Vial (2019), businesses must now anticipate changes in market expectations to maintain a strategic

edge, rather than merely reacting to them. Thus it is worth of noticing that digital changes cover not only companies' internal processes, but also external operations and their offer, which is a direct result of the changing expectations of consumers (Etienne Fabian et al., 2023).

The relationship between humans and technology is dynamic and multifaceted, shaped by both innovation and the evolving needs of society. Technology serves as an extension of human capabilities, enhancing communication, productivity, decision-making, and access to information (van Beinum, 2024). While technological advancements can lead to increased efficiency and new opportunities, they also raise challenges related to adaptation, trust, ethical use, and social impact. Ultimately, the success of any technological innovation depends not only on its functionality but also on its alignment with human values, behaviors, and expectations, making the human-technology relationship a central consideration in design and implementation processes (Bouvier et al., 2024; Hasyim & Bakri, 2024; Siderska et al., 2023).

METHODS

In the empirical part, a survey was conducted which included both quantitative and qualitative questions. The survey aimed to identify factors influencing employee engagement in the digital transformation of Business Process Management. The questions concerned, among others, issues such as: changes related to modern technologies, self-knowledge about changes and commitment, difficulties associated with digital transformation, the role of direct superiors, adequacy of communication, opinions about training, and suggestions for increasing engagement in digital initiatives.

Responses were obtained from 154 people, but from this group, 11 people indicated that they did not see any digital changes at work - so the analysis mostly concerns the answers of 143 respondents. Men constituted 43.5% of the surveyed sample, while women constituted 56.5%. The sample is characterized by a very diverse age structure because the respondents came from very different age groups, including people younger than 25 and older than 55. The sample is also diverse in terms of education, although the largest part are respondents with master's degree.

For empirical part 4 hypotheses have been formulated:

H1: Employee engagement in digital transformation is dependent on the support of direct superiors.

H2: Employee engagement is influenced by the perception that their contributions are significant to the process

H3: Employee involvement is dependent on the benefits stemming from transformation for themselves or for the entire company.

H4: A lack of information about changes diminishes the level of involvement.

The above hypotheses were tested using PLSPM (the partial least squares path modelling). Model estimation was done in WarpPLS using PLS regression as outer model analysis algorithm. PLS methodology is especially fruitful in a case of small sample sizes and non-normality assumptions for ordinal indicators. Based on minimum significant path coefficient in a model ($b=0.15$), significance level of 0.05 and power of 0.8 the minimum estimated sample size equals between 275 (inverse square root method) and 262 (Gamma exponential method). This sample size would be optimal. The actual sample size was 154 that

obtained too low power ($1-\beta = 0.63$), therefore, the results should be analysed with appropriate caution. As an outcome of the analysis, the stated hypotheses were verified, and a structural model showing the importance of factors determining employee engagement was created.

RESULTS

The nature of changes

In our study, 77.9% of respondents confirmed that digital changes are taking place in their companies, with 59.9% saying that they personally implement changes in their workplace. Only 7% answered that they did not see such changes, and 14% were not sure. It is significant that digital transformation mainly concerns processes, in particular document circulation, access to data, meetings and online communication. The least changes concern the devices themselves. The Fig.1 shows the nature of the changes according to the three areas: processes, technology and devices.

A culture that supports change

As mentioned, digital changes should be accompanied by a culture focused on innovation, and it seems that such a culture exists in some companies, as 29.4% of respondents stated that they often submit proposals for changes in the functioning of the company, and 13.5% stated that all submitted ideas were implemented. However, it is difficult to assume that this is the situation in most companies, because 44.8% said that they rarely suggest changes, and 25.9% said that they never report them. So about 30% of companies have a change-friendly culture.

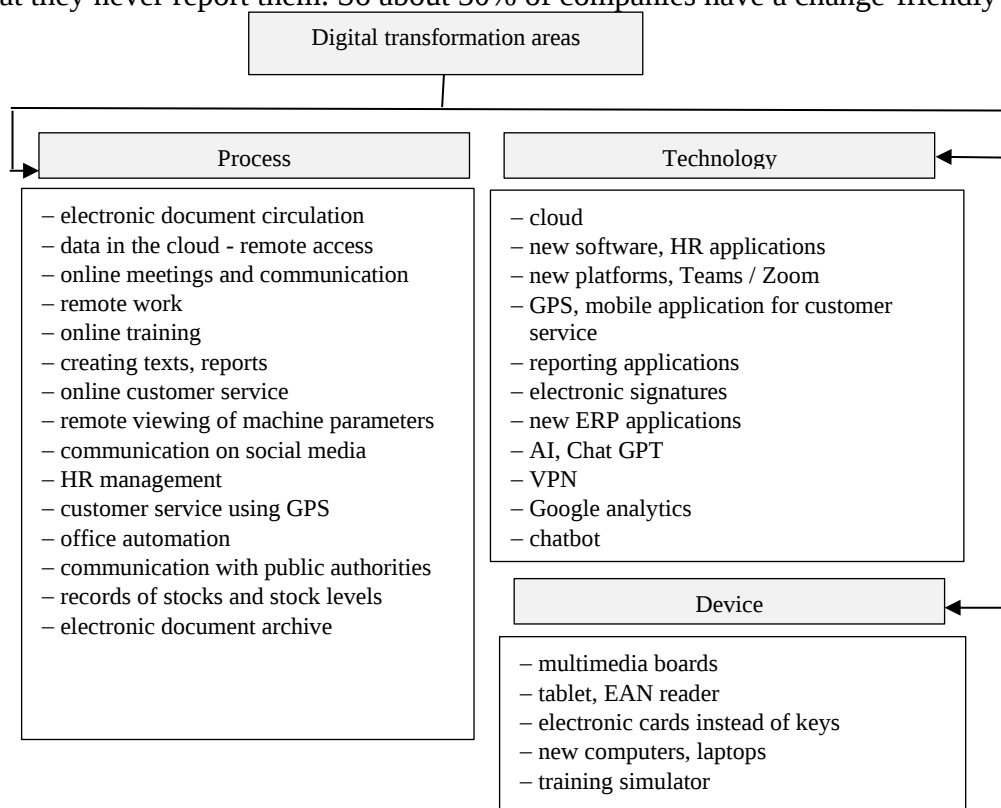


Figure 1. Character of changes. [Source: own work]

Engagement in digital transformation

Employee engagement determines the success of digital transformation, so the level of such engagement was asked. Only 16.8% of respondents rated their commitment as high. Most indications concerned average engagement (26.6%), and 11.2% rated their involvement as very low. In total, almost 35% of respondents indicated no or low involvement. Figure 2 refers to this issue.

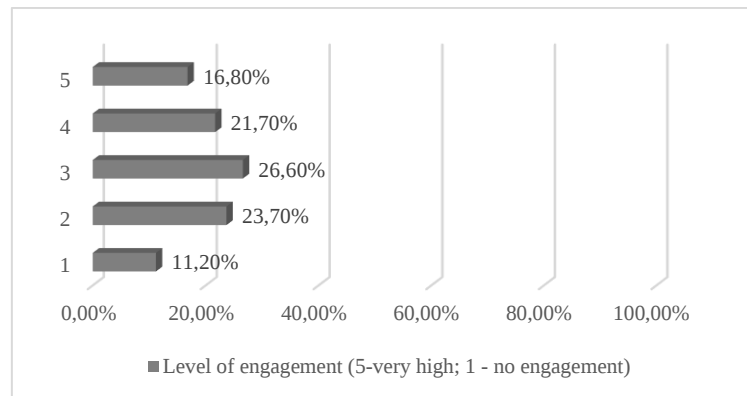


Figure 2. Engagement of employees. [Source: Own work]

Engagement determinants

A large group of respondents make their commitment dependent on factors such as: financial allowance (46.6%), the possibility of remote work (45%), or a shorter working day (32.1%). Training is also an important factor - 35% of responses indicated that training should be better adapted to the needs of employees, and 31% that generally there should be more training. It turns out that information about the benefits of implementing digital changes is important as well - benefits for the company (27.1%) and benefits for employees (23.6%) were indicated.

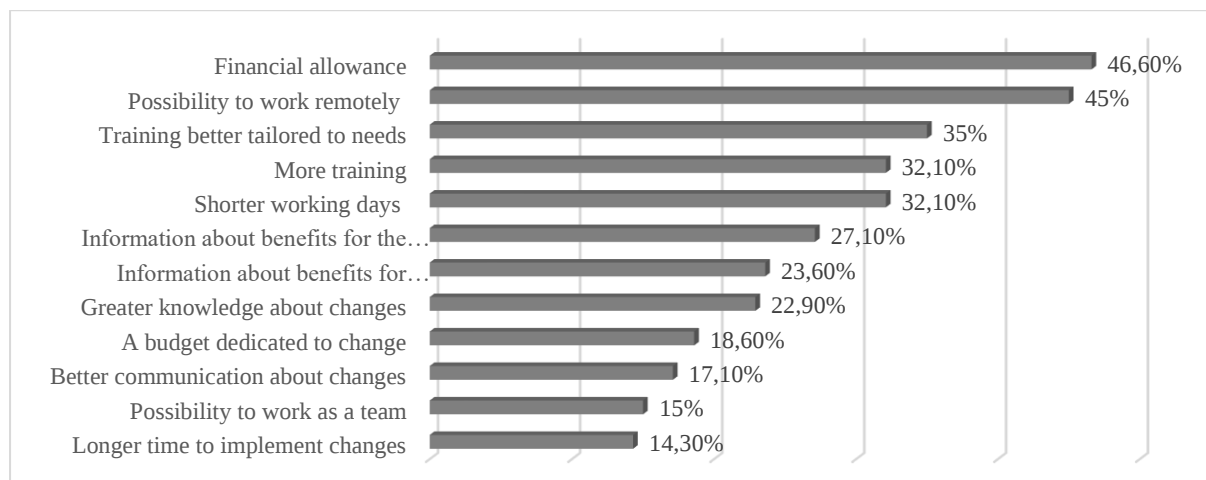


Figure 3. Incentives of engagement. [Source: own work]

Usefulness of training

Among respondents, 62.3% received training in digital transformation; this number indicates that employees are currently undergoing a lot of training and learning new things. However, 28% of this group claim that the training was insufficient. Moreover, 15.4% replied that they had not received any training but needed it. In turn, 21.7% said they did not need training at the moment.

Respondents who completed the training were asked about their assessment. The issue of usefulness of training at work was rated the best - on a scale of 1-5, this feature received an average score of 3.63. The lowest scores were given to the distribution of training over time (3.22) and the support of employees after training (3.05). However, it should be noted that all aspects of the training were rated below 4, i.e. less than good. This means that a lot of training is created but it does not meet expectations.

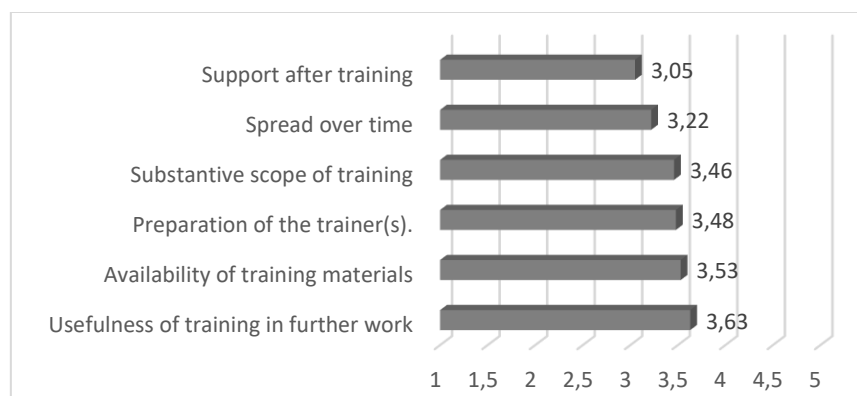


Figure 4. Evaluation of training. [Source: own work]

Verification of hypotheses

The hypotheses posed in this paper refer to: support of direct superiors (H1), the belief that employee participation is significant (H2), benefits of transformation for the entire company, (H3), and the role of information in building engagement (H4). The variables corresponding to the hypotheses were coded and then a structural model was built, using PLSPM path modelling. The advantage of WarpPLS is an ability to identify a non-linear relationship between variables, so it can be used to analyse factors that have direct impact on employee engagement.

The structural part of model with path parameters, p-values, and effect sizes (ES) is depicted in Figure 5.

The analysis shows that the model fit is acceptable. Average path coefficient (APC) = 0.247, $p < 0.001$, average R-squared (ARS) = 0.198, $p = 0.003$, average adjusted R-squared (AARS) = 0.191, $p = 0.004$, average full collinearity VIF (AFVIF) = 1.585, Tenenhaus goodness of fit index (GoF) = 0.445, Simpson's paradox ratio (SPR) = 1.000 (acceptable if ≥ 0.7), R-squared contribution ratio (RSCR)=1.000 (acceptable if ≥ 0.9), statistical suppression ratio (SSR) = 1.000 (acceptable if ≥ 0.7) and nonlinear bivariate causality direction ratio (NLBCDR) = 1.00 (acceptable if ≥ 0.7).

All constructs were based on formative measurement model with one indicator. As both independent and dependent latent variables were measured using 5-point Likert scales, the common method variance was estimated using Harman method. The first principal component in Harman method explains 41.37% of total variance and do not exceed 50%.

The results indicate that statistically significant relationships exist between: CAC-PTE, PTE-EE, CAC-PCI, PCI-EE, SDS-EE and TRA-PCP. In turn, no significant relationships were found between: CAC-PTO, PTO-EE and PCP-EE.

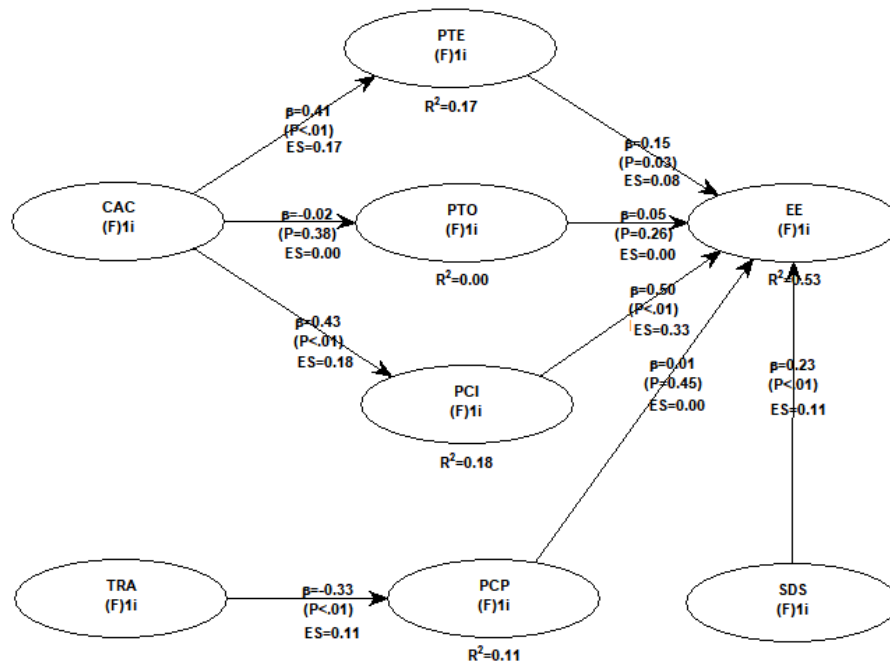


Figure 5. Estimated model parameters. [Source: Own work]

Legend:

- (F) - formative indicators; 1i - number of items (one item)
- (G) CAC – communication about change
- PTE – perceived transformation benefits for employee
- PTO - perceived transformation benefits for organisation
- PCI – perceived contributions importance
- EE – employee engagement
- TRA - training in transformation
- PCP - perceived contributions performance
- SDS – support of direct superiors

Analysing the obtained results of the model estimation we may draw the following conclusions:

Referring to H1: Employee engagement (EE) in digital transformation is significantly dependent on the support of direct superiors (SDS; $\beta=0.23$, $p<0.1$). However, the effect size is rather small ($ES=0.11$). In other words, while there is evidence that employee engagement in digital transformation depends on the support of direct superiors, the strength of this dependency is low. This means that even though the support from direct superiors influences

employee engagement in digital transformation, it does so to a limited extent, and probably depends on other factors as well.

The vast majority of respondents have some kind of superior, only 9.2% said they have no boss. The former, assessing the role of their superiors, often said that they knew what to do when implementing changes and did not contact their direct superiors (31.2%). Often, the superior directly participates in introducing changes (22.7%), but also quite often the boss only gives orders and controls their implementation, but does not take part in the changes himself (18.4%). Interestingly, some respondents said that they knew more about the changes being introduced than their direct boss (8.4%).

Referring to H2: Employee engagement (EE) is strongly influenced by the belief that their contributions are significant (PCI) and this is the strongest relationship found in our study ($\beta=0.5$, $p<0.1$, $ES=0.00$). The results indicate that employees' engagement in the process is significantly boosted when they see their work as important to the success of the digital transformation. Moreover, there is also a statistically significant relationship between communication about transformation (CAC) and perception of contributions (PCI; $\beta=0.43$, $p<0.1$, $ES=0.18$). This means that both factors, i.e. communication about transformation and perception of contributions, significantly influence employee engagement.

Referring to H3: The hypothesis that employee involvement (EE) depends on the benefits stemming from transformation for the entire company (PTO) was not confirmed ($\beta=0.05$, $p=0.26$, $ES=0.00$). This suggests that there is no significant dependency of employee involvement in digital transformation on the perceived benefits of the transformation, either for the employees themselves (PTE) or for the entire company (PTO). Moreover, it seems that this result is negatively influenced by another factor – CAC ($\beta= -0.02$, $p=0.38$, $ES=0.00$). Therefore, it may turn out that poor communication about the transformation blocks the impact of the benefits on employee engagement.

The surveyed respondents stated that digital changes usually cover 10-50% of their tasks. The assessment of understanding the transformation goals shows that the majority understands the goals of digital transformation well - 77.5%. Only 7% of respondents indicate that the understanding of causes and goals is low or insufficient.

Referring to H4: The sum of indirect (mediation) effect for the relationship between communication about change (CAC) and level of employee engagement (EE) is significant ($b = 0.275$, $p=0.00$) with small effect size ($ES = 0.143$). It indicates that lack of information about changes diminishes the level of employee engagement, but the relations are significantly explained by perceived transformation benefits for employee (PTE) and organization (PTO) and perceived contributions importance (PCI).

The relationship between CAC and PCI is negative ($\beta= -0.02$), and between CAC and PTE and PCI is positive ($\beta=0.41$ and 0.43). The statistical significance of the mediation effect ($p=0.00$) suggests that the process through which communication about change affects employee engagement is reliable and not due to random chance. The beta coefficient ($\beta = 0.275$) quantifies the change in employee engagement for each one-unit change in communication about change, considering the mediating effects.

When asked how employees evaluate the way of communicating about digital transformation, the answers were quite varied – as it is shown in Fig. 6, it was definitely good in 11.2% of cases, and definitely bad in 7%. It seems that the way of communication in

companies is imperfect and is often not conducive to change, as ratings from 'average' to 'poor communication' accounted for a total of 57% of the ratings.

It is significant that only 11.2% of respondents rate communication about digital changes as very good. Negative assessments of communication definitely outweigh what Fig. 6 refers to.

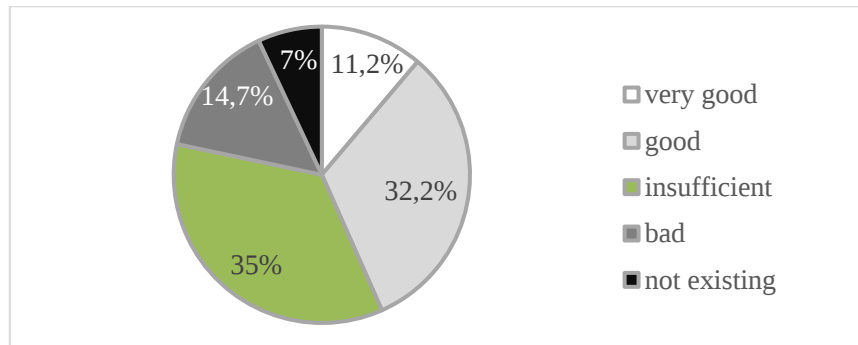


Figure 6. Assessment of communication related to digital transformation. [Source: Own work]

It is worth to notice, that non-linear relationships between PTE-EE, PCI-EE and SDS-EE exist, as well as between CAC-PTE, and CAC-PCI. The lower score of transformation benefits, perceived contributions performance and support of direct superiors tend to diminish or stabilize the employee engagement (EE) and the larger effect of engagement is observable at high score of PTE, PCI and SDS variables. Additionally, a negative effect of the TRA factor (training in transformation) on PCP (perceived performance) was also found ($\beta = -0.33$, $p < 0.01$, $ES = 0.11$). Therefore, it appears that employee performance is reduced by training.

DISCUSSION

The conducted study on digital transformation within Business Process Management (BPM) contributes to the existing literature by providing empirical evidence on the relationship between employee engagement and digital transformation. It can be stated that some findings are consistent with established theories, but others offer new insights.

When discussing the results in the context of the Technology Acceptance Models, it is evident that factors such as perceived usefulness and perceived ease of use (core to TAM) play a role in digital transformation acceptance. Thus, our results support the foundational principles of TAM, showing that employees' perceptions of the usefulness impact their engagement levels. This aligns with the work of Davis (1989), who first proposed these as key determinants of technology acceptance.

However, our findings extend beyond these basic factors by highlighting, for example, the importance of direct superior support, significance of employee contributions, and effective communication, aligning more closely with extensions of TAM. However, the UTAUT includes performance expectancy, effort expectancy, social influence, and facilitating conditions as determinants of technology use and acceptance, which factors do not fully match our model. We discover several new elements that have not been highlighted before: great importance of communication about digital transformation, which is the role of

the direct supervisor, who should communicate the task to employees. It is also worth noting that self-assessment of competences is important and influences the employee's approach to work (Tomczak et al., 2023). The common element, however, is importance of the tasks performed emerged. Also our research proves that employees are more engaged when they are convinced that their tasks are important. But, our results do not refer only to classic technology acceptance models, but also to the basic criteria that make employees engaged at work, discussed by Kenneth and Walter (2020). It turns out that employees still need a sense of meaning in their tasks, or a sense of autonomy.

In our case, the study diverges from the existing literature by demonstrating that perceived benefits for the employee or the organization do not directly correlate with higher engagement levels. This is important to some extent, but ultimately it does not affect engagement, so it can be assumed that the impact of these factors is short-term. This is a novel finding, as it contradicts the assumption within TAM2 and TAM3 that perceived benefits (an extension of perceived usefulness) are directly related to acceptance and use. This indicates a potential area for further research, suggesting that in the context of digital transformation, other factors may overshadow the perceived benefits.

Our research and analysis focusses on the aspect that BPM is a key area of business management enabling effective implementation of changes, as discussed by Dumas, LaRosa, Mendling and Reijers. Without a doubt, elements such as Facilitating Conditions or Effort Expectancy are important for the acceptance of modern technologies. However, behind these elements lies the need for effective communication and closeness with the superior - that was mentioned earlier - as well as the possibility of obtaining certain benefits, for example related to a different organization of the working day and the use of remote work. Therefore, we believe that our model, shown in Fig. 7, can complement the missing elements developed so far.

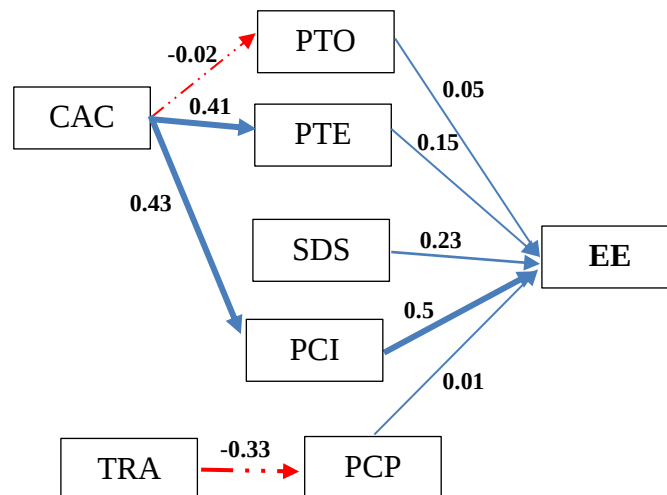


Figure 7. CECIS Model of successful digital transformation determinants from the perspective of employee engagement (dashed line - negative impact). [Source: Own work]

Legend:

- CAC – communication about change
- PTE – perceived transformation benefits for employee
- PTO - perceived transformation benefits for organisation

PCI – perceived contributions importance
 EE – employee engagement
 TRA - training in transformation
 PCP - perceived contributions performance
 SDS – support of direct superiors

Unlike solely relying on technology acceptance models, our CECIS model integrates broader organizational behaviour and change management principles, offering a many-sided view of digital transformation processes. The acronym of CECIS takes its shape from the key factors that influence engagement:

C – communication / about transformation
 E – employee / benefits to employee
 CI – contributions / importance of contributions
 S – superiors / role of superiors

Our findings, first of all, underscore the crucial role of the significance of recognizing employee contributions, then the direct superior support, the importance of effective communication and the mixed impact of perceived benefits. These elements resonate with and expand upon theories presented in the literature review, particularly in highlighting the importance of human-centric factors in the success of digital transformation initiatives.

Finally, the results show respondents' surprising opinions about training - 62.3% of participants reported receiving digital transformation training, so most respondents had already undergone some training. However, the evaluation of various aspects of training is far below 'good' which likely explains the negative impact of training on employee engagement.

As already mentioned, the findings of the study highlight several key areas of digital transformation in Business Process Management, focusing on aspects such as the nature of changes in processes, determinants of engagement, and the perceived usefulness of training. These aspects relate to the hypotheses posited in our research.

The research confirms that employee engagement in digital transformation depends on the support from direct superiors (H1), albeit the effect size indicates that while support is significant, its impact is limited, suggesting the influence of other factors as well. The study finds a strong influence of the perception that employee contributions are significant on their engagement (H2). This supports the idea that recognizing employees' contributions significantly boosts their involvement in digital transformation efforts.

Contrary to expectations, the hypothesis that employee involvement depends on the perceived benefits for themselves, or the company was not confirmed (H3), although employees indicated that their engagement could increase if they received additional pay or were able to have flexible working days. This indicates a complex relationship between perceived benefits and engagement that might be influenced by other factors such as communication effectiveness, and this requires further research. The results indicate that lack of information about changes diminishes employee engagement, underlining the importance of effective communication in digital transformation initiatives (H4). This also indicates the need for transparent and open communication when the company is undergoing transformation. This complexity is connected to the level of digital maturity of the company, which means that sometimes companies implement ad hoc activities and sometimes these are systemic ones, and then the behaviour of employees will differ (Karekla et al., 2021).

CONCLUSIONS

The goal of this study was to identify factors critical to employee involvement in the successful process of digital transformation. The study results indicate that employee engagement in digital transformation is a multifaceted issue influenced by several key factors: support from direct superiors, the perceived significance of employee contributions, effective communication, and the perceived benefits of transformation. The findings reveal also that while direct superior support is essential, its effect is relatively modest, suggesting the presence of other influential factors that require further research. The strong impact of recognizing employee contributions underscores the importance of fostering a work environment where employees feel valued and understand the importance of their work in the broader context of digital transformation.

The lack of confirmation of the perceived benefits hypothesis suggests that employee engagement is not motivated directly by benefits alone, which indicates a complex dynamic between individual motivations and organizational goals. The significant role of communication in influencing employee engagement highlights the necessity for clear, consistent, and transparent information sharing about the goals, processes, and expected outcomes of digital transformation initiatives.

The importance of effective communication and adequate information about changes, highlighted by our findings, offers a perspective that is not explicitly included in TAM or UTAUT. This suggests that for digital transformation initiatives, change management strategies including clear, transparent communication are as critical as the technological aspects themselves.

The research faced limitations due to the smaller than optimal sample size, potentially affecting the power and generalizability of the findings. Additionally, reliance on self-reported measures creates the potential for response bias, possibly skewing results. These limitations suggest that the conclusions drawn should be interpreted with caution and considered indicative rather than definitive.

IMPLICATIONS FOR RESEARCH, APPLICATION, OR POLICY

The findings of this study have significant implications for future theory, research, application, and policy in the realm of digital transformation. Future research could explore in greater depth the dynamics of direct superior support and its interaction with other factors to enhance employee engagement. Investigating the long-term effects of training on employee engagement and performance, and identifying additional motivational factors beyond the perceived benefits, could provide deeper insights into the complexities of fostering employee engagement in digital transformation contexts. The study concerned the inhabitants of Poland; in the future, comparisons could be made between different nationality groups, as well as between generations.

This research also indicates a gap in current theoretical models like TAM and UTAUT, which could be addressed by integrating change management strategies that emphasize clear, transparent communication.

From an application perspective, organizations should prioritize fostering a supportive environment, recognizing employee contributions, and ensuring effective communication to enhance employee engagement during digital transformations. This approach can help mitigate the negative impacts of suboptimal training, as identified in the study and can lead to more comprehensive and effective strategies for managing digital transformation in organizations.

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All correspondence should be addressed to

Joanna Hernik
 Faculty of Economics, The West Pomeranian University of Technology in Szczecin, Poland
 Zolnierska street 47
 71-210 Szczecin
jhernik@zut.edu.pl

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