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RPA Technology and Organizational Culture in Hospitals

ABSTRACT

This article focuses on analyzing the impact of RPA (Robotic Process Automation) technology on the organizational culture of hospitals. The authors employ a deductive method based on a critical review of the literature, complemented by elements of analysis and synthesis of existing research findings. A significant portion of the article is dedicated to the case study of the Warmian-Masurian Pulmonary Diseases Center in Olsztyn, offering a comprehensive perspective on the practical implementation of RPA. The findings indicate that changes in organizational culture are an intrinsic part of process automation, and that proper understanding and management of this aspect can significantly enhance the effectiveness of innovation adoption in healthcare institutions.

KEYWORDS: RPA technology, software robots, organizational culture, hospitals

STRESZCZENIE

Technologia RPA a kultura organizacyjna w szpitalu

Artykuł koncentruje się na analizie wpływu technologii RPA (Robotic Process Automation) na kulturę organizacyjną szpitali. Autorzy posługują się metodą dedukcji opartą na krytycznej analizie literatury, wzbogaconej o elementy analizy i syntezy istniejących wyników badań. Ważną częścią artykułu jest studium przypadku Warmińsko-Mazurskie Centrum Chorób Płuc w Olsztynie, które umożliwia kompleksowe spojrzenie na proces implementacji RPA w praktyce.

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Wnioski wskazują, że zmiana kultury organizacyjnej jest nieodłącznym elementem automatyzacji procesów, a właściwe zrozumienie i zarządzanie tym aspektem mogą znacząco poprawić skuteczność wdrożenia innowacji w placówkach ochrony zdrowia.

SŁOWA KLUCZE: technologia RPA, roboty softwarowy, kultura organizacyjna, szpitale

Introduction

In the era of automation, hospitals are increasingly adopting RPA (Robotic Process Automation) solutions to streamline business processes, manage documentation, and process patient data. These innovative tools alleviate medical staff from repetitive, tedious tasks, reduce errors, and improve the efficiency of often limited resources, such as human labor (Strzelecka, 2023). The implementation of RPA technology not only enhances productivity but also transforms organizational culture, emphasizing values such as flexibility, openness to new solutions, and inter-team collaboration. However, this transformation is not without challenges. The introduction of RPA can raise concerns among employees about losing competencies or control over key operational areas.

In Poland, there are ongoing attempts to implement business process automation technologies in the public sector, encompassing both state and local administration. Initial evaluations suggest that RPA is highly effective in automating administrative tasks. However, the public administration sector is currently at an early stage of adoption and has yet to develop scalable, systematic solutions that are easily implementable in practice. The healthcare sector, in particular, holds significant promise for process automation. Automation has been leveraged to optimize patient data management and diagnostic processes. Hospitals utilize automated systems for scheduling appointments, managing electronic medical records, and performing imaging diagnostics. These systems enhance patient care by reducing wait times and ensuring accurate diagnoses. As RPA solutions become more widespread and experience grows, healthcare institutions in Poland have the opportunity to establish robust foundations for an innovative, efficient, and patient-friendly organizational culture.

The purpose of this article is to analyze the impact of RPA on the organizational culture of hospitals. The benefits of process automation and the challenges associated with its implementation are presented. The article employs a deductive approach (Lisiński, 2016), based on a critical analysis of relevant literature. The reasoning process is enriched with elements of analysis and synthesis of existing research findings and a practical example: the case of the Pulmonary Diseases Hospital in Olsztyn. This case study provides a comprehensive perspective on the scientific problem. The authors acknowledge the

limitation of relying on a single case. However, at the current stage of RPA technology development, this is the only hospital in Poland that has comprehensively implemented software robots, with automation efforts ongoing since July 2023. The example illustrates the organizational changes resulting from RPA implementation. Understanding these mechanisms is essential for effectively introducing innovations in healthcare, particularly as technology plays an increasingly pivotal role in the daily operations of organizations. The authors are also collaborating with other healthcare units in the early phases of similar implementations, and these analyses will be continued and expanded in subsequent articles.

RPA technology as an innovation in hospitals

The term RPA combines elements of robotics, referring to software robots (software agents) that mimic human interactions with systems, and process automation (Hallikainen et al., 2018; Syed et al., 2020; Kajrunajtys & Kajrunajtys, 2022). Robotic Process Automation is a specific form of automation aimed at transforming processes by partially or fully replacing traditional solutions with digital ones. It primarily involves redirecting repetitive and high-volume tasks performed by humans to software robots (Lacity & Willcocks, 2015; Lacity et al., 2015; Bruno et al., 2017; Fernandez & Aman, 2018; Cohen & Rozario, 2019; Kokina & Blanchette, 2019). This allows employees to be freed from tedious, routine tasks and focus on creative work (Lacity & Willcocks, 2015; Agostinelli et al., 2019; Berruti et al., 2017; Cewe et al., 2018). RPA does not involve physical robots, but software robots, whose typical tasks include migrating large volumes of data between various systems, comparing and verifying data, automating email distribution to large user bases, collecting data from different sources, updating information, and handling operations.

The concept of RPA lacks a uniform definition; therefore, for the purposes of this study, it is defined as a technology based on advanced software tools, computer hardware, and accumulated data that enables the imitation of human behavior in interactions with computer applications. It is particularly useful for repetitive tasks, encompassing entire processes or selected parts thereof. RPA fundamentally alters work organization by introducing software robots into processes, replicating human actions in performing repetitive tasks (Pypłacz, 2024).

To analyze the process of implementing Robotic Process Automation (RPA) in hospital environments, it is useful to refer to established theoretical models that describe the mechanisms of technological innovation adoption within organizations. Two of the most frequently cited approaches in the literature are the Technology Acceptance Model (TAM) (Venkatesh & Davis, 1996)

and the Diffusion of Innovation theory (DOI) (Rogers, 2003). Both models offer valuable interpretive frameworks for understanding the individual and organizational determinants of adopting new technological solutions in healthcare settings.

TAM focuses on the perception of the end user and posits that two key factors determine technology acceptance: perceived usefulness (the belief that using the technology will enhance job performance) and perceived ease of use (the degree to which a person believes that using the technology will be free of effort). In the healthcare context, this implies that medical personnel are more likely to accept RPA systems if they perceive them as practical support in their daily administrative, diagnostic, or organizational tasks, and if their implementation does not require significant adaptation efforts. TAM also captures psychological resistance to new technologies, such as fear of change, lack of digital competencies, or concerns about loss of professional autonomy.

In contrast, the Diffusion of Innovation Theory (DOI) emphasizes the process through which innovations spread within social groups and organizations. Rogers identifies five categories of adopters: innovators, early adopters, early majority, late majority, and laggards. The rate of adoption depends on several factors, including the relative advantage of the innovation over existing solutions, its compatibility with prevailing practices and values, complexity of implementation, trialability, and observability of results. When applied to hospitals, DOI helps explain why some institutions – particularly private or highly specialized facilities– are more open to implementing RPA, while others, especially those operating within rigid administrative structures, exhibit greater caution or resistance to change.

TAM and DOI should be regarded as complementary. While TAM provides tools for analyzing individual-level perceptions of technology, DOI allows this process to be situated within a broader institutional and social context. The combined use of these approaches can significantly enrich our understanding of RPA implementation in healthcare by highlighting both psychological and structural factors that influence the success or failure of technological innovation.

It is also worth noting that recent studies increasingly employ the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003), which integrates elements of TAM, DOI, and other models. UTAUT incorporates additional variables such as social influence, organizational support, performance expectancy, and facilitating conditions. In the context of hospital-based RPA adoption, such multidimensional theoretical frameworks enable a more comprehensive understanding of the complex adaptive processes occurring at both the individual and systemic levels.

As noted in the Introduction, the process of healthcare automation in Poland is at an early stage. Most institutions still rely heavily on paper-based

documentation for treatment processes and use paper-based information carriers for management, despite implementing modern IT solutions (Janik, 2024). However, the adoption of IT systems to support diagnosis, treatment, or management processes does not equate to process automation. An analysis of IT systems used in hospitals reveals that some include built-in automation mechanisms. These are typically isolated functions, often perceived by users as standard application features rather than automation tools. Examples include automatic invoice dispatch mechanisms, notification systems in ERP tools, text recognition tools, or automatic electronic document import systems, often used in accounting processes (Tokarski & Grodek, 2023).

Thus, healthcare institutions inadvertently use process automation solutions, usually limited to a single application. A study conducted in late 2020 by the Polish Federation of Hospitals and the First Byte company (Robotization of Processes in Healthcare, 2022) among member hospitals revealed that 70% had invested in modern automation technologies, including AI, VR technology, and medical robotics. However, these solutions are often fragmented and experimental rather than broadly utilized. Notably, only 57% of surveyed hospital managers were familiar with RPA technology, and none reported using such solutions for process automation (Robotization of Processes in Healthcare, 2022). This indicates a relatively low awareness of modern management-supporting methods and techniques among healthcare managers, who tend to focus on medical procedures while neglecting administrative areas.

This focus on medical procedures at the expense of administrative improvements hampers the comprehensive digitization of healthcare institutions. Current efforts typically address isolated areas, lacking coordination to create an integrated system for process automation in hospitals (Szczerbak & Szczerbak, 2024). Such fragmented automation prevents institutions from reaping the full benefits of process automation. This low awareness of the need for comprehensive solutions is underscored by the fact that only 25% of hospitals employ personnel dedicated to process optimization and improvement (Robotization of Processes in Healthcare, 2022).

In the healthcare sector, process automation is most commonly applied in administrative areas, utilizing a few fundamental technologies. These include built-in mechanisms within hospital IT systems and, rarely, dedicated solutions or RPA-class tools. In clinical research, certain AI-based solutions are employed, though they are not fully integrated with data collection systems (Skoczylas, 2023). Greater integration between IT systems and artificial intelligence/machine learning solutions is needed, enabling real-time data acquisition and analysis to support medical process diagnosis and evaluation. Currently, healthcare automation includes: electronic medical records, data management with funding institutions, and tools supporting diagnosis and treatment.

Case study – process automation at the Warmian--Masurian Pulmonary Diseases Center

The authors conducted a detailed case study at the Warmian-Masurian Pulmonary Disease Center in Olsztyn between July and December 2025. The aim of the analysis included the assessment of the effects of process automation after one year of implementing software robot scenarios. The empirical research was based on a case study approach, utilizing both quantitative data (analysis of records and system data) and qualitative data (semi-structured interviews). A total of 12 interviews were conducted with representatives of various professional groups within the hospital: 4 with administrative staff, 3 with middle management personnel, 3 with medical staff (physicians and nurses), and 2 with members of the technical team responsible for the RPA implementation. The respondents were selected purposively to capture diverse organizational and operational perspectives. All interviews were recorded, transcribed, and analyzed using qualitative content analysis. The coding process was iterative and involved thematic categorization based on predefined research areas (e.g., role transformation, adaptation to technology, and team communication), while also allowing for emergent codes that arose during the review of the material. To enhance the credibility of the interpretation, data triangulation was applied: interview data were compared with internal hospital documents (e.g., implementation schedules, training materials) and with quantitative indicators of implementation outcomes (e.g., process completion times before and after RPA deployment). This triangulated approach enabled the alignment of participants' declarative responses with actual operational changes observed within the organization.

To complement the qualitative analysis of organizational culture change resulting from the implementation of Robotic Process Automation (RPA), Table 1 below summarizes the key indicators examined in the case study. These were selected to capture both structural and behavioral dimensions of organizational transformation, including shifts in decision-making, role redefinition, interdepartmental collaboration, attitudes toward automation, and evolving competency needs.

Table 1. Indicators examined in the case study

Area of organizational culture	**Examined indicator**	**Data source**	**Observed changes**
Organizational structure	Scope of decision--making delegation, decentralization	Interviews, document analysis	Partial decentralization
Professional roles	Scope of employee tasks, tasks taken over by RPA	Interviews, process analysis	Reduction of routine tasks
Communication and collaboration	Frequency of inter-departmental collaboration	Interviews, participant observation	Increased coordination between departments
Attitudes toward technology	Level of acceptance and fear of automation	Interviews	Mixed – from enthusiasm to mistrust
Competencies	Level of digital skills, need for training	Interviews, HR data	Growing demand for digital skills training
Organizational values	Orientation toward efficiency vs. relationality	Interviews, narrative analysis	Shift toward efficiency and innovation

Source: developed by the authors.

As demonstrated, Polish hospitals utilize automation solutions in a limited and often unconscious manner, relying on isolated functions embedded in their IT systems. However, there is significant potential for fully leveraging technologies such as RPA. An exemplary case of comprehensive robotic automation is the Warmian-Masurian Pulmonary Diseases Center in Olsztyn. This institution implemented RPA-class solutions to automate management, auxiliary, and core processes. It became the first healthcare facility in Poland to establish a process automation strategy. The RPA solution enabled the automation of processes such as hospital performance monitoring, managerial analyses, information exchange with National Health Fund (NFZ) systems, support for medical procedures, monitoring critical patient parameters, and data analysis for clinical research purposes. According to the adopted IT strategy, RPA technology was initially introduced as a pilot solution. The outcomes provided a basis for planning further actions and subsequent implementations.

Choosing an RPA implementation model

The growing interest in RPA technology in the business world has led to the development of implementation models tailored to diverse organizational needs. Two primary approaches stand out: establishing internal Centers of Excellence (CoE) and outsourcing technology and support from external providers (Marciniak & Stanisławski, 2021a; 2021b; Willcocks et al., 2015; Aguirre & Rodriguez, 2017; Hallikainen et al., 2018). The first approach, utilized by both large and small organizations, focuses on building in-house competencies and standardizing processes. In contrast, outsourcing allows for the quick adoption of ready-made solutions without the need to create internal resources. Regardless of the chosen model, RPA enables the automation of many repetitive business processes, influencing organizational operations and necessitating management and organizational changes.

Healthcare institutions should carefully analyze various strategies before choosing an RPA implementation model. A key advantage of this technology is the ability to realize benefits without heavily involving IT departments (Pypłacz, 2024; Sobczak, 2019), which is especially important in hospitals facing a shortage of specialists. The first decision criterion is whether the implementation will rely on internal staff or external consultants. Unfortunately, Polish hospitals typically lack in-house experts, and hiring external specialists – such as software robot trainers – can be challenging due to their limited availability. While training in-house consultants is an alternative, this process takes approximately a year, significantly prolonging implementation and potentially discouraging further efforts.

A consultant-driven model allows for a quick start to the automation process and the realization of initial benefits but is more costly and creates dependency on external providers. This approach does not build the internal competencies required for independent process development and improvement in the future. Thus, a hybrid strategy, combining the use of external experts with in-house personnel training, may prove to be the optimal solution.

An example of this approach is the Warmian-Masurian Pulmonary Diseases Center, which employed a hybrid strategy in collaboration with the Institute of Public Affairs at the Jagiellonian University. Students completing internships under the supervision of university staff developed software robots. After their internships, they were employed by the hospital as robot trainers. This approach allowed the hospital to implement automation scenarios from the outset while simultaneously preparing an in-house team for ongoing development and optimization of the solutions. Given the lack of experience in implementing robotic process automation in healthcare, the approach chosen by the Warmian-Masurian Pulmonary Diseases Center appears to be the most optimal. It minimizes the risks associated with excessive financial investment and the implementation

of untested technologies. This method also facilitates overcoming human resistance, as observed during the hospital's implementation process.

Selection of processes suitable for automation

The healthcare sector in Poland requires significant managerial reforms, as current practices often resemble basic administration rather than effective management. Institutions lack clearly defined processes, procedural standards, and performance metrics, while managerial control often remains merely declared without practical tools or implemented oversight mechanisms. It is therefore essential to introduce process management and automation (RPA), which would optimize processes, improve resource utilization, and enable more effective data management.

The first step is the proper selection of processes for automation. However, this selection process faces barriers, including employee resistance stemming from fears of job loss or difficulties in adapting to new technologies. Effective communication plays a pivotal role in overcoming these challenges by explaining the principles of RPA operation and emphasizing that robots primarily take over repetitive, monotonous tasks, leaving employees to focus on those that require creativity and expert knowledge. It is also important to provide information about process management and automation potential, helping employees understand the purpose of the changes. This approach was successfully implemented at the Warmian-Masurian Pulmonary Diseases Center, where open communication and training facilitated employee acceptance of new solutions and active participation in the transformation process.

Another significant barrier is the availability of data in digital form. Robotic information processing requires standardized formats, consistent data models, and integrated IT systems. In healthcare institutions, the diversity and fragmentation of data – for example, diagnostic data in PDF format and laboratory data in databases – hinder automation efforts. To address this challenge, it is necessary to first organize informational resources and ensure uniform data formats.

Only after overcoming these social and technological barriers can automation processes be effectively implemented. A holistic and well-considered approach not only enhances the operational efficiency of healthcare institutions but also contributes to improved patient care quality.

A characteristic feature of healthcare institutions is their relatively high skepticism towards implementing technological solutions, driven by a desire to ensure patient safety. Consequently, robotic solutions are often faced with significant resistance and distrust from employees in their initial phases. The simplest method for overcoming this resistance appears to lie in solutions leaders

interested in automating work processes may offer. Creating customized solutions enables other employees to familiarize themselves with the technology, observe its benefits, and eventually adopt it. Furthermore, observing the operation of implemented solutions facilitates the generation of ideas for using technology to optimize processes.

Organizational culture in hospitals in the era of RPA implementation

The implementation of RPA technology in hospitals impacts not only operational efficiency but also organizational culture, redefining employee roles, collaboration methods, and the values guiding the institution. Automating repetitive administrative tasks, such as patient data registration, document processing, and report generation, enables staff to focus on tasks that require specialized knowledge, engagement, and patient interaction. Consequently, daily work becomes more creative and fulfilling, and employees feel that their competencies are valued and used more effectively.

A key factor for the success of this process is proper preparation and communication regarding the change. Explaining the purpose of the changes, highlighting the benefits, and providing education about new technologies help alleviate fears about job security and the challenges of adapting to innovation. Institutions that foster a culture of openness, innovation, and tolerance for mistakes, are better equipped to learn from initial failures, treating them as a natural part of the improvement process. Software robots become collaborators, while employees analyze inefficiencies, suggest corrections, and actively participate in developing new scenarios, thus feeling like co-creators of the implemented solutions.

At the Warmian-Masurian Pulmonary Diseases Center, the situation evolved throughout the RPA implementation process. Initially, staff were skeptical. However, the lack of knowledge about RPA was addressed through open communication, training, phased implementation of solutions, and active involvement of management. As a result, employees began engaging in the automation process, understanding that robots would take over tedious, routine tasks, allowing them to focus on activities that improve the quality of medical care. A phased, localized automation approach – centered on small, motivated teams – enabled the institution to achieve results quickly and cost-effectively. This approach also facilitated the development of a group of RPA ambassadors who encouraged other staff members to participate in the transformation process and demonstrated the benefits of implementing software robots for specific tasks. Reaching a critical mass of implemented solutions allowed for a shift in processes were automated. In the examined hospital, this milestone

was reached after deploying approximately 50 localized automation scenarios across organizational units. Subsequent stages involved the development of systemic solutions, including the integration of localized solutions into "super robots" capable of executing multiple scenarios, and a technological shift from workstation-specific solutions to centrally managed systems, or "robot farms". Achieving this level not only led to a significant improvement in work quality but also simplified the management of implemented solutions and accelerated the creation of new, more advanced automation systems with broader scopes and higher automation levels.

Although Robotic Process Automation (RPA) brings significant benefits in terms of operational efficiency, it is important to recognize that its implementation may also lead to unintended consequences from both organizational and social perspectives. One of the key risks is the dehumanization of the work environment, understood as a reduction in interpersonal interaction and the transformation of certain tasks into purely procedural exchanges with automated systems. This phenomenon can weaken the sense of purpose among medical personnel, especially in the context of patient care, where empathy and communication are essential (Wangmo et al., 2019). Another important consideration is the potential for competency shifts, which require staff to adapt to new roles. Automation may reduce the demand for certain routine skills while simultaneously increasing the importance of digital, analytical, and managerial competencies (Al Kuwaiti, 2023). Without adequate training and strategic change management, such shifts carry the risk of marginalizing segments of the workforce. It is therefore crucial to maintain a balance between technological efficiency and the humanistic values that are fundamental to the mission of healthcare institutions. At the same time, the implementation of RPA requires a new leadership model based on inspiring, supporting, and encouraging proactive exploration of new opportunities. Leaders must be able to manage uncertainty and create an environment conducive to experimentation.

Limitations and future research directions

Although this study contributes to the ongoing discussion on the impact of Robotic Process Automation (RPA) on the organizational culture of hospitals, it is subject to several limitations. First, the limited number of analyzed healthcare institutions and the use of a single case study restrict the generalizability of the findings. The research focuses on one public hospital in Poland, providing valuable insights into the local context, but not accounting for the organizational and cultural diversity of other facilities, including comparisons with private institutions. In the future, the analysis will be extended to include a broader range of cases – both domestic and international – as well as institutions at

various stages of RPA implementation. Such an approach will allow for verification of the consistency of observed phenomena in a wider context.

Second, although the study addresses general aspects of cultural change, it does not provide a detailed analysis of the psychological and ethical implications of automation in the workplace. Future research should explore issues such as tensions and concerns related to the dehumanization of care, the reduction of interpersonal interactions, and the shifting of competencies within medical teams. These aspects are closely tied to the job satisfaction and performance of healthcare personnel and warrant further in-depth investigation.

While both qualitative and quantitative data were employed, this study does not include the patient perspective or a systematic evaluation of the impact of RPA on employee satisfaction across different professional groups. In the forthcoming phases, it would be valuable to incorporate survey-based research, attitude measurement scales, and broader comparative analyses between roles and functions within the organization.

Conclusions

The implementation of RPA (Robotic Process Automation) technology significantly transforms the organizational culture of hospitals, affecting how staff operate, their relationships, values, and overall approach to process management. The adoption of robotic process automation follows the same principles as other organizational changes. It generates barriers, may introduce errors in organizational functioning, and requires specific costs. In healthcare institutions, process automation should be treated as implementation of innovations. Consequently, process automation has become an essential component of modern healthcare management improvement. Among the changes identified at the Warmian-Masurian Pulmonary Diseases Center in Olsztyn, which gradually reshape the hospital's organizational culture, the following are noteworthy:

- Redefinition of roles and responsibilities: RPA takes over repetitive and time-consuming tasks, allowing employees to focus on more demanding activities, such as patient care or strategic decision-making. This shifts the perception of work by assigning greater value to creative and empathetic tasks, enriching the organizational culture with elements of innovation and collaboration.
- Changing attitudes towards technology: initial resistance to change driven by concerns about job security or procedural complexity can be replaced by acceptance and trust if the implementation process is well-managed. This fosters an organizational culture that values development and adaptation to a changing environment.

- Improved communication and collaboration: by eliminating errors and accelerating flow of information, automation enhances coordination between medical and administrative teams. This improves relationships across departments and strengthens a culture of accountability for achieving organizational goals.
- Increased efficiency and employee satisfaction: RPA relieves staff from monotonous and tedious tasks, reducing work-related stress and increasing job satisfaction. Employees who can dedicate more time to tasks requiring their expertise are more motivated and engaged, positively influencing the work atmosphere and fostering a performance-oriented organizational culture.
- Promotion of innovative values: the introduction of RPA in hospitals underscores the importance of efficiently managing resources such as time, money, and data. This promotes the development of an organizational culture focused on continuous improvement and the pursuit of new solutions.
- Leadership support: transforming organizational culture requires active involvement from senior management, who act as ambassadors of change and guide the organization through the process.

The findings of the study confirm that the implementation of RPA technology in a hospital setting affects not only operational aspects but also deeper structures of organizational culture, such as professional roles, core values, and patterns of collaboration. The study's limitations include the fact that it only offers a partial comparative perspective and a narrow research scope, as it focuses on a single public hospital. Future research should consider expanding the analysis to include private healthcare facilities as well as international comparative studies. Additionally, it is recommended to further explore the ethical and psychosocial dimensions of automation in healthcare.

In summary, the implementation of RPA not only streamlines hospital operations at the operational level but also drives significant changes in organizational culture. Automation strengthens innovation, enhances collaboration and communication, and increases employee satisfaction creating a more modern, flexible, and change-oriented work environment. Hospitals that effectively manage this process can serve as exemplary institutions successfully integrating technology with a human-centered approach to healthcare.

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