

## Automation in HR and Payroll Systems: An Empirical Study in Poland\*

Agnieszka JUDKOWIAK, Beata ZALESKA and Krzysztof DZIADEK

Faculty of Economic Sciences, Koszalin University of Technology, Poland

Correspondence should be addressed to: Agnieszka JUDKOWIAK, [agnieszka.judkowiak@tu.koszalin.pl](mailto:agnieszka.judkowiak@tu.koszalin.pl)

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### Abstract

This article aims to analyze research on the extent to which the remuneration calculation function in the surveyed units is performed using IT tools, and to draw conclusions regarding the tendency of these units to automate operations related to remuneration calculation. The study was conducted using the indirect interview method, which involved a questionnaire. Interviews with selected employees of the human resources and payroll departments in public finance units supplemented it.

**Keywords:** remuneration, HR and payroll processes, automation of payroll calculation, specialized cadastral and payroll programs

**JEL:** K34, K2

### Introduction

In recent years, the use of Robotic Process Automation (RPA) has been steadily increasing (Schatsky, Muraskin, Iyengar, 2016). RPA is a technological solution that enables the configuration of software robots to use existing applications for data manipulation, task execution, and communication with other systems (Jędrzejka, 2019). It is designed to automate repetitive business processes by simulating human work (Fernandez & Aman, 2019). Robotization is one form of automation. In recent years, international companies providing financial and accounting services have developed bots for these purposes (Łada & Mierzejewska, 2021). The growing availability of bot development software and the relative ease of deploying bots in the cloud have contributed to the increasing application of automation in accounting, and consequently in HR and payroll (Marshall & Lambert, 2018).

RPA systems offer numerous benefits, including greater organizational flexibility and efficiency, better utilization of material and human resources, cost reduction, and enhanced operational speed. However, they also present limitations, such as the lack of standardized methods for identifying processes suitable for automation, challenges with data quality, and prerequisites for process implementation (Wewerka & Reichert, 2020).

In the literature, RPA systems are often compared with Business Process Management (BPM) and Business Process Management Systems (BPMS). Unlike RPA, BPM is a multidimensional approach aimed at improving business outcomes through continuous process optimization and digital transformation. BPMS is used to control end-to-end processes and manage interactions among humans, robots, and systems. By contrast, RPA is limited to repetitive task sequences that can be fully delegated to software robots (Ivančić et al., 2019).

One of the significant consequences of RPA implementation is the transformation of accountants' roles. RPA allows accounting professionals to focus on more strategic activities requiring human judgment and expertise,

thereby enhancing the overall efficiency and productivity of accounting departments. Consequently, the role of accountants is evolving: instead of performing technical and repetitive operations, their tasks should center on analysis, strategic planning, and decision support (Ayinla et al., 2024).

RPA is best suited for routine-based processes that do not require judgment or complex decision-making, such as settlements, data extraction, or internal performance reporting (Borowiec, 2023). Automation and robotization can also be applied to tasks such as period closing, reporting, cash management, receivables, or general ledger accounting (Le Clair, 2017; Borowiec, 2023). The potential applications of RPA in HR and payroll include (Mohamed et al., 2022):

- 1) supporting recruitment processes (e.g., application screening),
- 2) recording employees' attendance and absences,
- 3) processing payroll components,
- 4) managing vacation requests,
- 5) managing access to HR and payroll data,
- 6) administering employee benefits,
- 7) organizing e-learning training,
- 8) conducting employee evaluations,
- 9) supporting analysis and personnel decision-making.

The aim of this article is to analyze the extent to which the remuneration calculation function in the surveyed units is performed with the use of IT tools and to draw conclusions regarding their tendency to automate operations related to remuneration calculation. Previous literature indicates that the increasing opportunities for computerization in accounting are not yet fully realized (Borowiec, 2022). The research assumed the hypothesis that automating processes improves the efficiency of payroll calculation tasks.. However, their broader adoption is hindered by limited awareness of their potential, managers' reluctance to allocate funds for acquiring specialized HR and payroll systems, and insufficient investment in employee training.

## **Research method and scope of research**

The study was of a pilot nature. It aimed to identify the extent to which the remuneration calculation function in the surveyed units is carried out using IT tools (including commercial and dedicated financial and accounting software, online platforms, and electronic employee documentation systems), as well as to determine the tendency of these units to automate operations related to remuneration calculation.

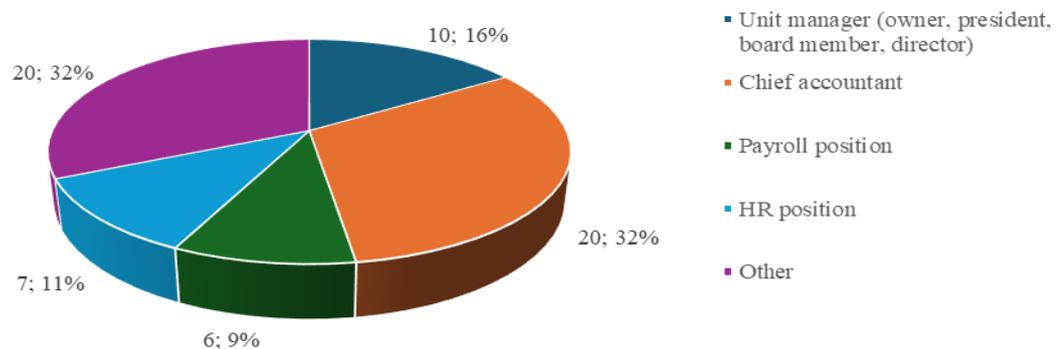
The survey was conducted using an electronic questionnaire consisting of a certificate section (7 questions) and 9 substantive questions, both single- and multiple-choice. Respondents were also able to provide open-ended responses beyond the suggested options. The questionnaire was available for completion between June and September 2024. The survey addressed the following issues:

- 1) forms of recording economic events and methods of bookkeeping,
- 2) use of HR and payroll programs,
- 3) techniques of employee documentation circulation,
- 4) methods of updating remuneration parameters related to calculation,
- 5) factors influencing the choice of specific remuneration calculation techniques.

The research method applied was an indirect interview using a questionnaire (Google Form). Invitations to participate in the study were distributed via the mailing list of the Association of Accountants in Poland (District Branch in Koszalin), the "Accounting is My Passion" professional forum, and postgraduate students of the "Human Resources and Payroll" program at the Koszalin University of Technology. Additionally, the survey was supplemented with interviews conducted with selected employees of the HR and payroll departments in public finance units. A total of 63 correctly completed questionnaires were returned.

## Research Results and Discussion

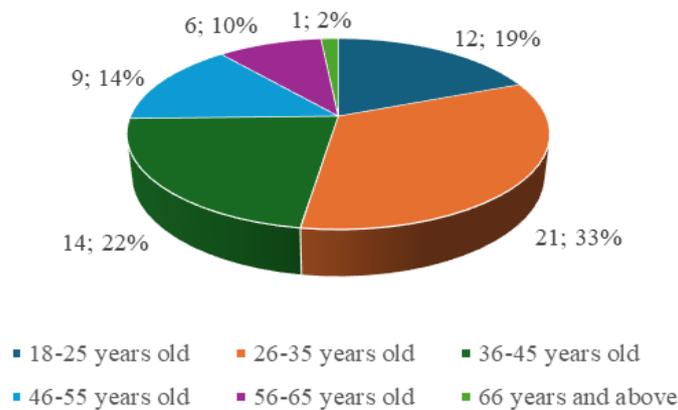
The survey was conducted among 63 respondents. Chief accountants accounted for 32% of the sample, unit managers for 16%, HR employees for 11%, and payroll employees for 9%. Additionally, 32% of respondents indicated other positions within their organizations, including salesperson, junior accountant, administrative or office worker, environmental protection officer, assistant prosecutor, civil servant, and inspector, among others. They consulted their answers with people involved in calculating salaries. Figure 1 illustrates the workplaces of the surveyed respondents. It presents both the number of responses provided and their corresponding percentage share of the total responses.



**Figure 1. Respondents' workplace**

*Source: own study based on the questionnaire.*

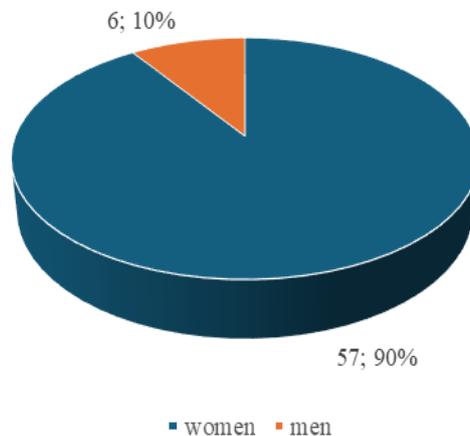
The age structure of the respondents is as follows: 33% were aged 26–35, 22% were aged 36–45, 19% were aged 18–25, 14% were aged 46–55, 10% were aged 56–65, and 2% were over 66 years old. The largest share of responses came from individuals aged 26–35 and 36–45. The smallest number of responses was recorded among respondents aged 56–65 and over 66. Overall, the age distribution indicates that the survey was completed primarily by relatively young individuals. It can be assumed that respondents from these age groups are actively engaged in improving the competences necessary for professional advancement. Given that the largest group of respondents hold positions related to salary calculation, competence development is likely to involve participation in HR and payroll training and courses. Figure 2 shows the age structure of the respondents.



**Figure 2. Respondent's age**

*Source: own study based on the questionnaire.*

The vast majority of respondents were women, who accounted for 90% of the sample, while men constituted only 10%. This distribution may result from the fact that most respondents were employed in departments related to accounting, human resources, or payroll—areas in which women have traditionally represented the majority of the workforce in Poland. c) According to data from 2018, over 60% of office workers in Poland were women, as were more than 65% of those employed in financial and insurance activities (GUS, 2018). This trend has been consistently observed in Poland's gender employment structure for many years. Figure 3 shows the gender breakdown of respondents.



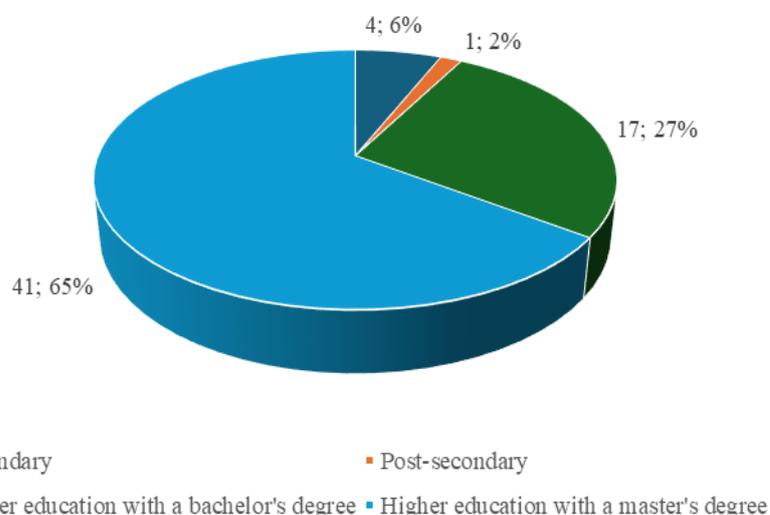
**Figure 3. Respondent's gender**

*Source: own study based on the questionnaire.*

More than 65% of respondents reported holding a master's degree, while 27% held a bachelor's degree. Secondary education was indicated by 6% of respondents, and the remaining 2% reported post-secondary education. Thus, the majority of survey participants possessed higher education qualifications.

In Poland, the number of people with higher education has been steadily increasing. According to data from the Central Statistical Office, the share of individuals with tertiary education rose from 17.1% in 2011 to 23.1% in

2021, representing an increase of six percentage points (GUS, 2022). Figure 4 presents the educational structure of the respondents.



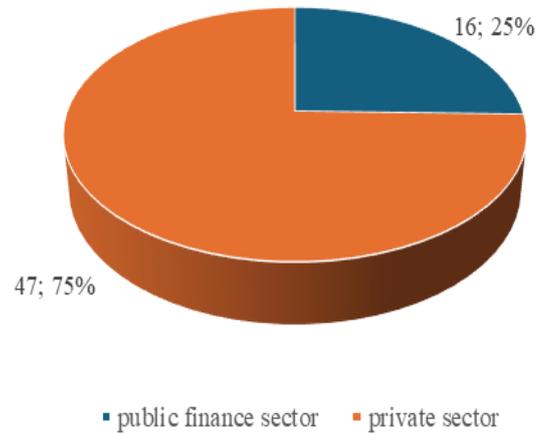
**Figure 4. Respondent's education**

*Source: own study based on the questionnaire.*

Of all respondents, 75% were employed in the public finance sector and 25% in the private sector. The public finance sector is more formalized than the private sector. Since this sector manages public funds, it is essential to ensure strict control over its financial activities, including those related to employee remuneration.

The remuneration of employees in the public finance sector is regulated by numerous legal acts, such as the Act on Local Government Employees (2008) and the Teacher's Charter Act (1982). These regulations classify employees according to specific criteria for given positions, which directly influences the value and structure of remuneration, including allowances.

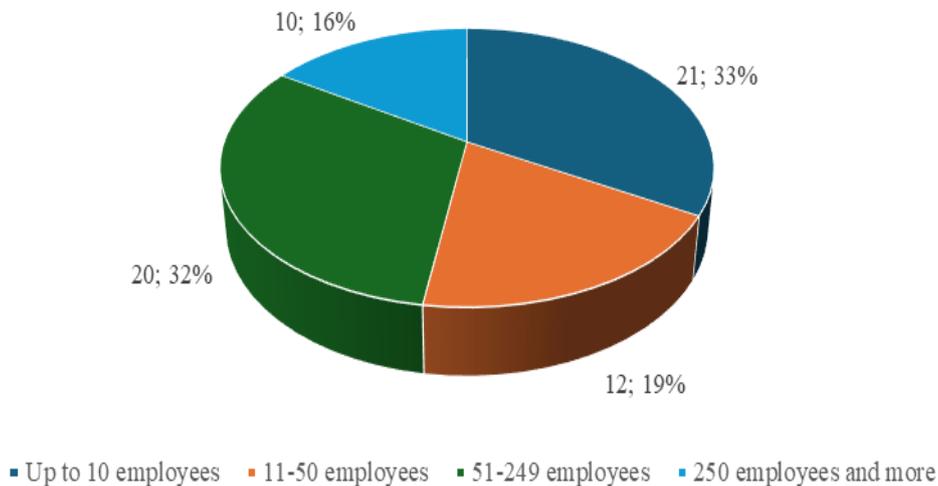
In contrast, the remuneration of private sector employees is not subject to such detailed regulations. Instead, it is governed by general provisions applicable to both sectors, such as the Labour Code (1974) and the Minimum Wage Act (2002). Figure 5 presents the distribution of respondents' workplaces by economic sector.



**Figure 5. Respondents' workplace by economic sector**

*Source: own study based on the questionnaire.*

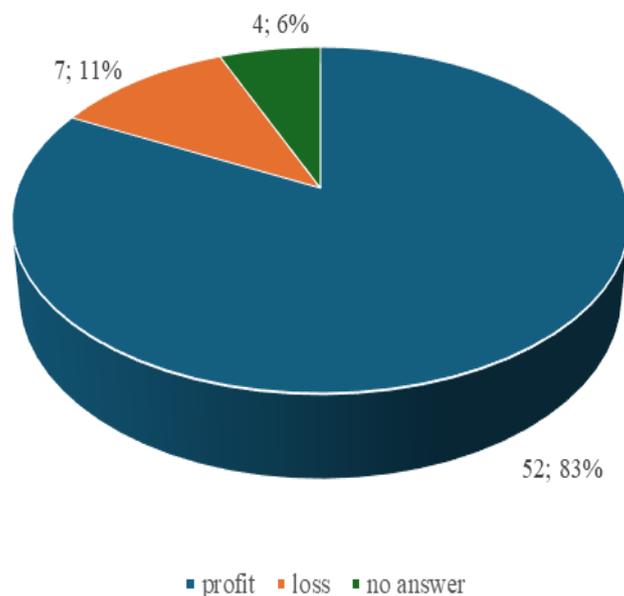
A total of 33% of respondents were employed in units with up to 10 employees, while 16% worked in units employing 11–50 people. Units with 51–249 employees accounted for 32% of respondents, and 16% were employed in units with more than 250 employees. Thus, the majority of respondents were employed in medium and large units, as measured by the number of full-time equivalent positions. Figure 6 presents the level of employment in the respondents' workplaces.



**Figure 6. Level of employment at the respondent's workplace**

*Source: own study based on the questionnaire.*

The responses indicate that 83% of participants were employed in units that generated a positive financial result in the previous year (2023), measured as the difference between revenues and costs. In contrast, 11% reported a loss, while 6% did not provide information on the financial outcome of their unit in 2023. These findings suggest that the majority of units employing the respondents were profitable. Figure 7 presents the financial result of the entities employing the respondents.



**Figure 7. Financial result of the entity in which the respondent is employed**

*Source: own study based on the questionnaire.*

Of all the units employing the respondents, 75% maintained full accounting books. In these entities, business operations affecting assets and financial results were subject to detailed records. Consequently, all activities related to the calculation and settlement of remuneration were also recorded in accounting accounts. Simplified tax records with income tax settled under general principles were used in 8% of units, while another 8% applied a flat tax system. In addition, 9% of surveyed entities used a tax card as the form of business settlement.

Regardless of the method of accounting, all entities employing staff are required to maintain appropriate HR and payroll documentation. Such documentation covers a wide range of information—from employees' personal data and employment conditions to records of working time and remuneration.

Documents related to the establishment of employment include employment contracts or other civil law contracts, personal questionnaires, employment certificates from previous employers, and records of preliminary medical examinations (Frączek et al., 2019; Nałęcz, 2023; Lenart, 2023). Documents generated during employment include records of working time (attendance lists, work cards), leave applications and holiday records, training documentation, and employee declarations (e.g., no criminal record, family relations).

Payroll documentation consists of payroll lists, records of salaries paid and deductions, tax returns, social security contribution records, and documents related to the calculation of bonuses, awards, and other additional benefits. Termination-related documentation includes employment certificates, termination agreements, and records concerning severance payments or other entitlements due upon leaving employment. It should be emphasized that employee documentation is strictly regulated by law, for example, through the Regulation on Employee Documentation (2018). Figure 8 presents the forms of recording economic events in the units where the respondents were employed.



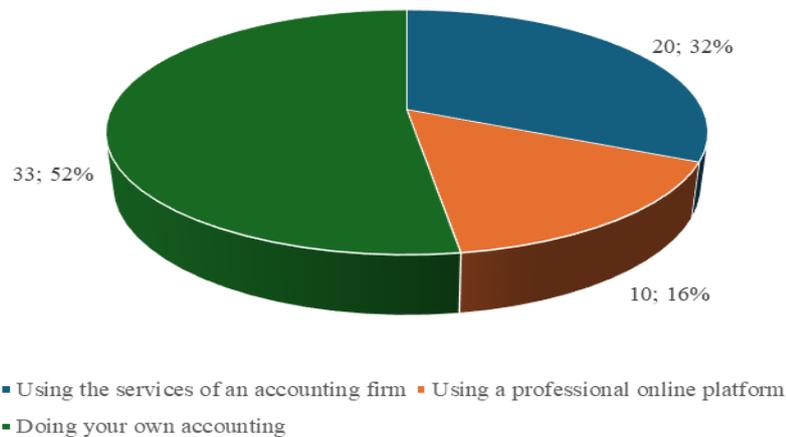
**Figure 8. Forms of recording economic events in respondents' units**

*Source: own study based on the questionnaire.*

Among the surveyed entities, 52% conducted accounting independently. In practice, this meant employing staff in accounting departments and using financial and accounting software to record business operations. Accounting office services were used by 32% of entities, while 16% relied on professional online platforms. Consequently, entities that did not maintain their own accounting records (32%) also lacked internal procedures for calculating employee remuneration. Currently, some organizations choose to use online accounting platforms operating within ERP models (16% of surveyed units). These systems, based on cloud computing technology, are accessible online without the need for installation on a local computer. Their advantages over traditional accounting programs include:

- 1) Facilitated reporting of tax and financial statements online (e.g., JPK\_V7, VAT-EU returns, annual PIT/CIT returns, e-financial statements JPK\_SF, and submissions to the Social Insurance Institution),
- 2) Lower costs compared to traditional accounting programs,
- 3) Better adaptation of bookkeeping to the specific needs of an entity,
- 4) Continuous updates reflecting changes in legislation,
- 5) Quick access to information about the financial condition of the entity,
- 6) Availability of standardized accounting schemes and integration of HR and payroll modules, which automate employee settlement processes while simultaneously recording labor costs.

However, in large entities generating a high volume of diverse documents, online platforms may prove insufficient. They are primarily recommended for small and medium-sized enterprises (Business Insider, 2019). Figure 9 shows the method of bookkeeping in the units employing the respondents.

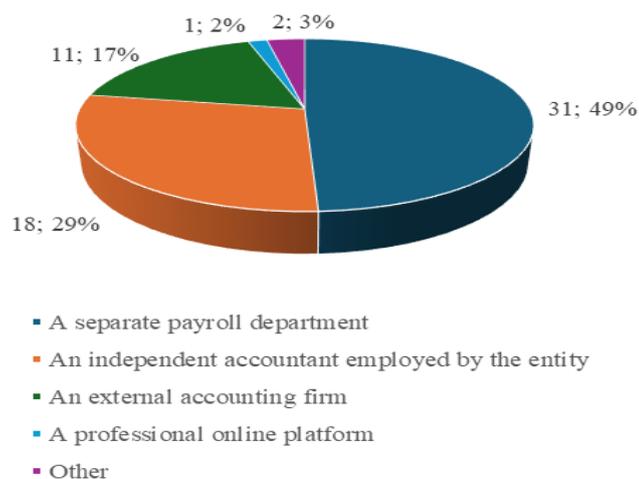


**Figure 9. Bookkeeping in respondents' units**

*Source: own study based on the questionnaire.*

49% of respondents indicated that their units have a separate payroll department in the organizational structure. This outcome is largely explained by the fact that most respondents were employed in medium and large entities. A greater number of employees requires handling a higher volume of HR and payroll operations, which is why dedicated HR and payroll departments are most often established in medium and large organizations that maintain their own accounting records.

Smaller entities typically choose to employ an independent accountant, who manages the accounting records on behalf of the head of the unit and also provides HR and payroll services. Such a solution was indicated by 29% of respondents. In addition, 17% reported that payroll calculation in their companies was outsourced to an external accounting office, 2% indicated the use of a professional online platform, and 3% stated that payroll was handled by the chief accountant. These findings imply that in 17% of the surveyed entities there were no formalized procedures related to payroll calculation. Figure 10 presents the organization of payroll calculation in the units employing the respondents.



**Figure 10. Organization of payroll calculation in respondents' units**

*Source: own study based on the questionnaire.*

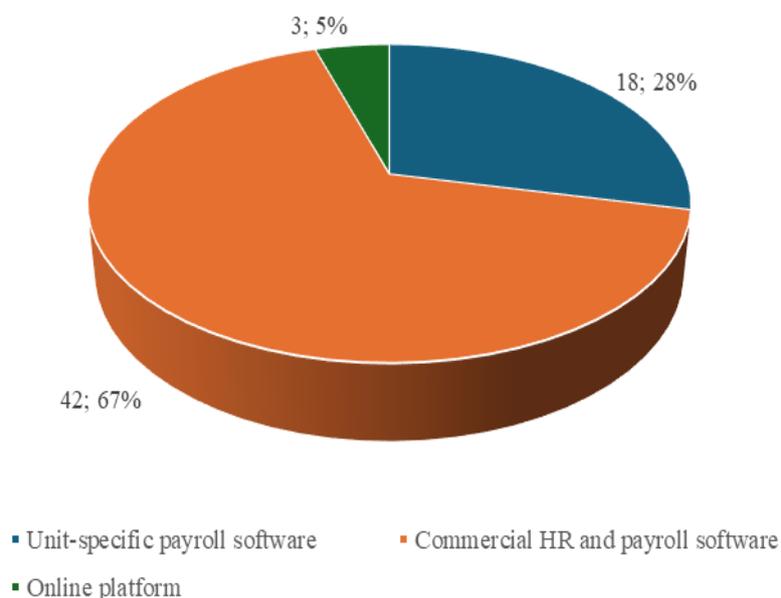
The results show that entities which do not use the services of accounting offices but keep their own accounting records—and thus calculate salaries internally—rely on different types of payroll software. Specifically, 67% of such entities use dedicated payroll programs, 28% use commercial HR and payroll systems available on the market, and 5% use professional online platforms.

Dedicated payroll programs are designed to address the specific requirements of employing and remunerating particular occupational groups, where salary calculation is not standardized and is often based on special legal regulations. This applies, for example, to teachers in primary, secondary, and higher education, state administrative employees, doctors, nurses, and uniformed services personnel.

For many years, companies such as Insert, Comarch, and Symfonia have operated on the Polish market, offering both dedicated HR and payroll solutions and universal commercial programs. These systems provide a high degree of automation, reducing the risk of errors in salary calculations (Entrepreneur, 2024). Updates regularly provided by software developers ensure compliance with changes in legislation. In some cases, updates are implemented directly by users.

Many programs also include electronic HR document circulation, eliminating the need for paper documentation, shortening information flow times, and ensuring greater control over the accuracy of employee records. In addition, they facilitate the registration and planning of working time through the definition of individual schedules. Such programs allow for issuing various types of employment contracts, generating payrolls and salary slips, recording sick leave, and more. Most are integrated with the Płatnik and e-Declarations systems, which streamline settlements with the Social Insurance Institution and tax offices regarding social security and personal income tax.

Overall, the HR and payroll software market offers a wide range of solutions that can be tailored to the size of an entity, the number of employees, and the specific nature of its business. Figure 11 presents the types of payroll calculation programs used in the surveyed entities.



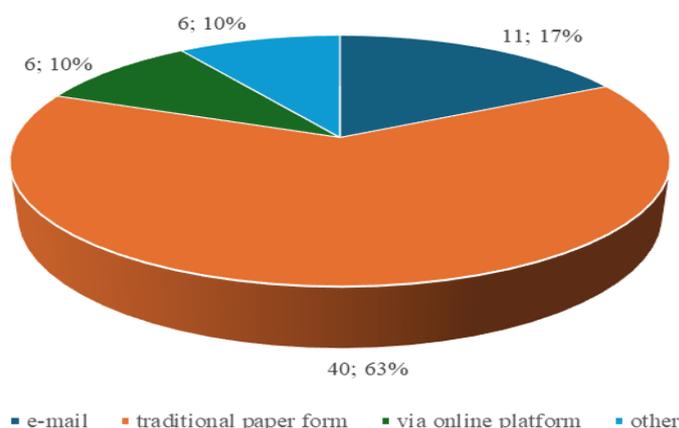
**Figure 11. Payroll calculation programs in respondents' units**

*Source: own study based on the questionnaire.*

Respondents were asked how the circulation of employee documentation is organized in their workplace, using the example of a leave request. A total of 63% indicated a traditional paper form, 10% an e-mail, 17% an online platform, and another 10% reported other methods, such as an electronic document management system, an HR system, an ERP program module, or a mixed electronic–paper system, depending on the employee’s choice.

Despite the fact that many units reported using HR and payroll programs, most of them did not implement electronic HR documentation. Only a small number of surveyed entities used ERP systems with a modular structure, where individual modules are responsible for specific organizational functions (e.g., procurement, finance, accounting, HR and payroll). The HR and payroll module allows users to review HR data and submit leave requests online. For example, the Streamsoft Prestige ERP mobile application enables selected ERP functionalities to be accessed via a smartphone.

Some surveyed units also relied on electronic document workflow systems for circulating employee documentation. These systems support the creation, monitoring, and storage of documents in electronic form (Jagiełło, 2024). They allow documents to be scanned, indexed, and archived, thereby increasing both accessibility and security. In entities where respondents reported using mixed systems (paper and electronic documentation), it is likely that an electronic document circulation system has been partially implemented, covering selected unit functions. During the transition period, employees may submit applications either in paper or electronic form. Figure 12 presents the workflow of employee documentation in the units where respondents were employed.



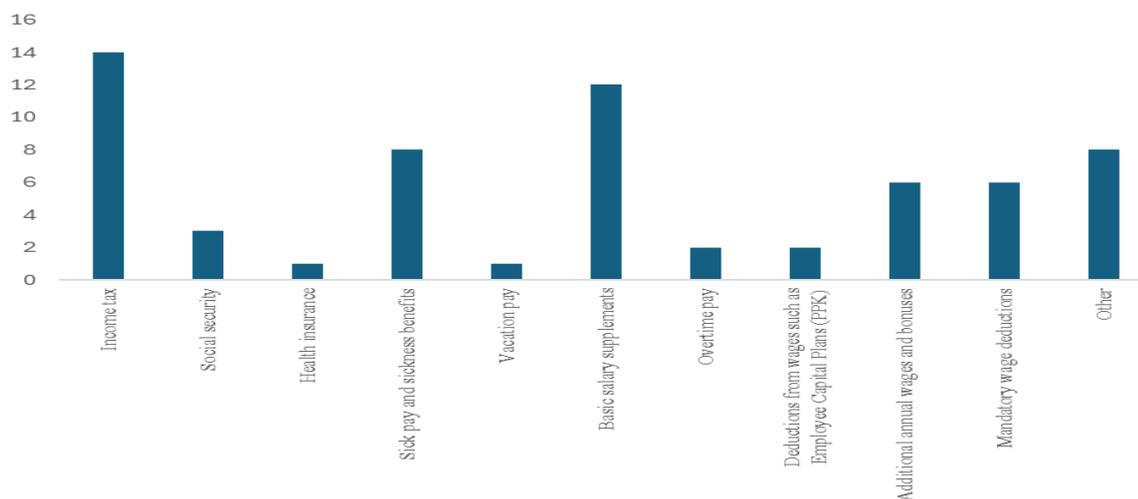
**Figure 12. Employee documentation workflow in respondents’ units**

*Source: own study based on the questionnaire.*

According to respondents, the most frequently updated elements of remuneration included: parameters related to income tax calculation (in the first year of the Polish Deal, the tax calculation method changed several times), salary supplements, sickness pay and sickness benefits, additional annual remuneration and awards, as well as mandatory wage deductions.

In practice, HR staff most often enter data related to employees’ working time (e.g., vacation leave, sick leave, childcare leave, business trips, employee allowances, overtime) into the HR system, which are then exported to the payroll program. Within the payroll system, parameters necessary for salary calculation are updated, such as income tax rates, social security and health insurance contributions, salary supplements, and mandatory deductions. Updates are required when legal regulations change, when new components are added to gross remuneration (e.g., functional allowances, seniority allowances, allowances for hazardous working conditions), when deductions change (e.g., provident fund loans, court-ordered deductions), when employees exceed the first income tax threshold, or when social security contributions must be recalculated after exceeding the base limit.

Once updates are implemented, payrolls for individual employees are automatically generated. Payroll systems also include decree generation modules, allowing accounting schemes defined in the system to be applied automatically for payroll posting. Nevertheless, respondents emphasized the necessity of random checks of payroll accuracy in order to verify whether all relevant data were correctly entered and transferred from other systems or modules. Figure 13 presents the elements of remuneration that require frequent updating in HR and payroll programs.

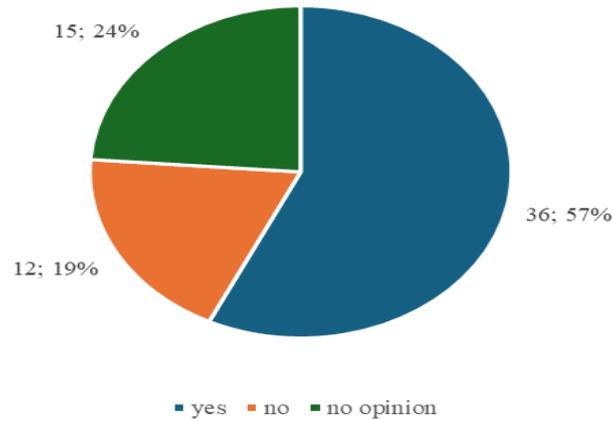


**Figure 13. Elements of remuneration requiring frequent updates in HR and payroll programs**

*Source: own study based on the questionnaire.*

In response to the question “Are you in favor of automating the payroll calculation procedure?”, 57% of respondents answered “yes,” 24% had no opinion, and 19% responded “no.” Interpreting these results, it can be assumed that individuals directly involved in payroll calculation or those using online platforms were more likely to support automation. In contrast, respondents not professionally engaged in HR and payroll tasks tended not to perceive such a need.

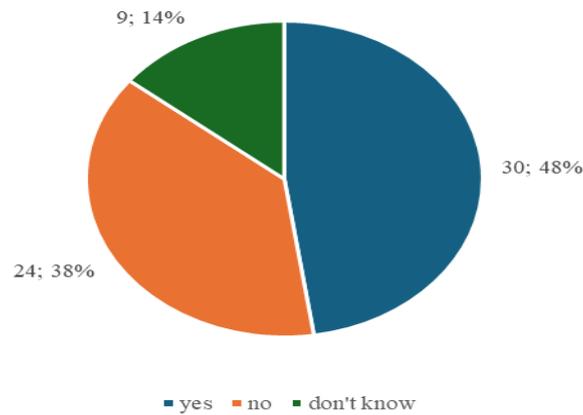
Payroll automation is closely linked to cloud-based systems and the digitalization of HR and payroll activities. These solutions typically rely on an employee platform, into which staff enter data on working time (e.g., overtime, vacation, and other absences). The data are then transferred from the employee platform and HR module to the payroll module, where salaries are calculated and employees can generate salary information. Storing payroll-related data in the cloud eliminates paper documentation, centralizes HR and payroll information, enables online submission of applications, and minimizes errors in salary calculation. Figure 14 presents respondents’ opinions on the automation of payroll calculation procedures.



**Figure 14. Automation of payroll procedures according to respondents' opinions**

*Source: own study based on the questionnaire.*

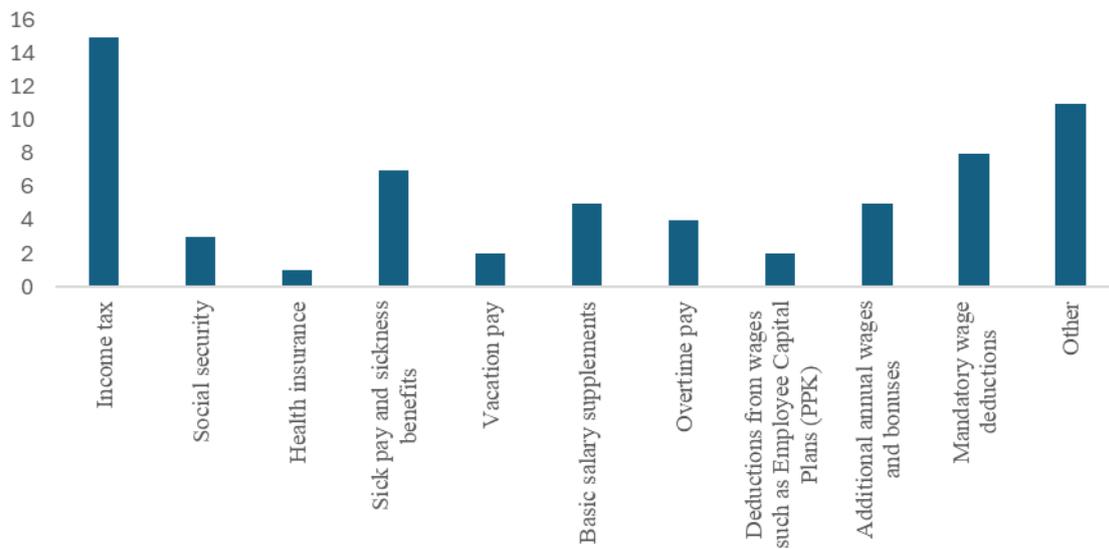
In response, 48% of respondents confirmed that actions aimed at automating payroll calculation were undertaken in their units, while 38% reported that no such actions were being implemented. The remaining 14% stated that they were not aware of whether such initiatives had been introduced. Figure 15 presents responses to the question of whether actions have been undertaken to introduce payroll automation in the respondents' workplaces.



**Figure 15. Actions related to the introduction of payroll automation in respondents' workplaces**

*Source: own study based on the questionnaire.*

Figure 16 presents respondents' opinions on the reasons for continuing to use traditional methods of payroll calculation (outside online systems).



**Figure 16. Reasons for using traditional methods of payroll calculation, according to respondents**

*Source: own study based on the questionnaire.*

In response to the question concerning the reasons for using traditional methods of payroll calculation outside online systems, respondents most frequently indicated the following factors: high costs of purchasing and updating software, lack of awareness of technological possibilities in performing HR and payroll tasks, reluctance of management to invest in modern software, insufficient training in software use, fears of staff dismissals following payroll automation, and limited employee competence in operating advanced systems. Additional responses included: “I don’t know,” “the program makes simple mistakes,” and “a machine cannot replace a human.”

## Conclusion

The surveyed group of respondents was dominated by traditional document circulation (63%), while the most frequently used IT tool was a commercial HR and payroll program (67%). A total of 57% of respondents supported the automation of remuneration calculation, although only 48% indicated that their entities were actually undertaking steps to automate this process.

According to the respondents, the main reason for continuing to use traditional methods of payroll calculation was the high cost of purchasing and updating software (37%). Other important factors included a lack of awareness of the potential of modern technologies, management’s reluctance to invest in new systems, and insufficient training in the use of advanced tools. Although respondents recognized the need for greater automation of HR and payroll work, several barriers hindered its full implementation. Therefore, the research hypothesis formulated in the introduction was confirmed.

An interpretation of the survey results suggests that most respondents lack sufficient knowledge about payroll automation. Many reported being unfamiliar with how online platforms (cloud computing) function or what benefits they may provide for both units and HR/payroll employees. High implementation costs—such as investment in more advanced computer hardware—were perceived as the primary barrier to transitioning from traditional payroll programs to automated solutions.

Particularly concerning are respondents’ observations regarding management’s reluctance to invest in new technologies and the lack of employee training on their application. Such limitations do not support organizational development and may reduce competitiveness in the market. It is also noteworthy that some respondents

associated payroll automation with potential staff layoffs, which contributed to their unwillingness to adopt new technologies in HR and payroll departments.

## Declaration Of Authors

The authors report no conflict of interest.

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