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RISK MANAGEMENT IN A HUMAN RESOURCES INFORMATION SYSTEM*

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Abstract. Employee recruitment is among the most critical processes performed in businesses. Nowadays, it is more and more frequently implemented online. Companies switch to e-recruitment, utilising information and communication technologies (ICT). This article aims to identify the risks emerging while implementing such a solution and set the risk management steps to sustain the business's long-term operation. The analysis is based on secondary as well as primary data. Multiple methods were applied: observation, questionnaire survey, semi-structured interviews, case study analysis, comparison, and synthesis. The authors' original case study was created to reduce employee turnover via a new approach to the recruitment process. Research questions and hypotheses focus on examining the relationship between the length of the employee's employment and how they were approached in the recruitment process. The main findings include identifying key potential risks jeopardising the implementation of e-recruitment. The analysis concluded that no employee recruitment step in the selected business is performed online. The practical result of this research included the creation of the business's career website. This can inform the potential applicants about the business's activities. It was created to support individual activities of the employee recruitment process. Finally, recommendations were designed for the managers of other companies. They can use these in implementing ICT solutions for the recruitment process to support long-term sustainability.

Keywords: human resources information system; information and communication technologies; ICT; human resources; HR; recruitment; risks; sustainability; case study

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1. Introduction

The applied motivational tools are analysed when assessing the loyalty of employees of individual businesses. In addition to financial motivation tools (such as salary), there are also working atmosphere and the work team, team-building activities, or parties of the employees of the given businesses. However, the first impression is judged to a minimal extent. The first impression can be understood as a springboard for the future loyalty of each employee (Varmus et al., 2022). This key element is primarily based on the applicant's first contact with the given business. Contact can be made via social networks, websites, or advertising on posters. Approaching applicants by any means is the most critical element in the recruitment process of any business.

In the current digital age, it is possible to solve most processes using ICT and information systems (Soviar et al., 2017; Snieska et al., 2020; Eom et al., 2022). It is the same with the recruitment process. However, the correct implementation of these technologies is important. Ferenc et al. (2017) reported that each implementation strategy must be based on the business's current situation. Since these situations change quickly, various risks can arise during the proposal's implementation. The purpose of this article is to identify risks related to the performance of ICT in the recruitment process. Due to the identification, it is possible to design and implement measures that minimise the negative impacts of risks. Identifying potential risks, even before the implementation of e-recruitment, allows the business to react quickly to the emergence of potential problems.

2. Review of literature

Recruiting employees is one of the most critical processes of any company. This process can be defined as searching for applicants and selecting employees for a specific job in the company (Blašková, 2003; Koubek, 2007). **Employee recruitment** aims to attract the best applicants for a given job (Armstrong et al., 2015; Joniaková, 2016). One specific employee who meets the set criteria will then be selected from the pool of possible candidates (Kisi, 2022). Recruiting can also be understood as a process consisting of two parts: (1) acquiring and (2) selecting employees. Individual aspects of recruitment are subsequently composed of several activities (Koubek, 2007).

Acquisition of employees

Several authors (Blašková, 2003; Hittmár, Parnell et al., 2021) agree that acquiring employees consists of the following activities:

- Identification of resources;
- Selection of methods of acquiring employees;
- Selection of documents required from applicants;
- Formulation and publication of a job opportunity offer;
- Preliminary selection and classification of successful applicants.

The acquisition is attracting the attention of applicants who are suitable for a given job. At the same time, they should be sufficiently motivated to become part of the given business and perform the required work duties (Holcner et al., 2021). When acquiring employees, several options relate to the internal and external environment (Hitka, 2018).

When acquiring employees from the business's internal environment, it can be, for example, advertising job offers on its intranet pages, in magazines, employee rotation, and similar methods. On the other hand, from the external environment, it is the recommendations by colleagues, the employment of direct applicants, using head hunters, and with the help of their career page or online career portals (Walas-Trebackz, 2022). It does not matter which acquisition method the business uses, but it is always necessary to present the job position honestly and

objectively to the applicants (Buckley et al., 1998). The process ends with sorting applicants into successful and unsuccessful ones (Dvořáková et al., 2012).

Selection of employees

The second activity of employee recruitment is **the selection of employees**. This is related to the previous step, which was acquiring employees. The authors define employee selection (Čihovská et al., 2007; Zhao et al., 2019; Ghani et al., 2022; Kisi, 2022) as a process during which the company makes decisions based on specific criteria for the most suitable potential employee for a specific position. Just like acquiring employees, this process also consists of other activities (Vaverčáková and Hromková, 2018):

- Detailed analysis of applicants' written documents;
- Preliminary (courtesy) interview;
- Testing the work capacity and potential of applicants;
- Selection interview;
- Summarising the results, deciding on applicants' selection, and informing them about the result.

In selecting employees, the decisive activity is **the testing of applicants**. It can be, for example, (1) intelligence tests, (2) ability tests, or (3) personality tests (Šikýř, 2012). However, there are other ways of verifying abilities (Potocnik et al., 2021), such as tests of verbal maturity, administrative tasks, control process, numerical intelligence, spatial thinking and imagination, reasoning of applicants, or physical testing.

Another important activity is **the admission interview**. The purpose of such an interview is to obtain and evaluate various information about the applicants, based on which it is possible to predict their performance in the given job (Sands et al., 2022). The final selection of the applicant means that the given applicant best meets the pre-defined criteria from the pool of all applicants. His/her knowledge and skills are sufficient to perform the given job. At the same time, the business sees the candidate's potential for maximising knowledge, which can contribute to the development of the entire business.

Risks in the recruitment process

The process of recruiting employees is also associated with **risks** that have an impact not only on the personnel department but also on the entire business. Since people are the most crucial element of any business, the failure of an individual can sometimes mean the collapse of the whole company.

The business could risk becoming non-innovative without hiring new employees from the external environment. As a result, the company would not generate new ideas or expertise, and the rate of innovation would stay the same. Other possible risks associated with the recruitment of employees can be, for example, the need for more interest of qualified applicants in a job offer, the employee not identifying with the business culture, the employee not taking a job, etc. (Sobocka-Szczapa, 2021).

Human resources information system

Human resources information system (HRIS) can be defined as an information system that ensures effective work in human resources (HR). Such a system's essence is providing information for the implementation of personnel processes in sufficient content, scope, quality, and time (Vrabcová, Urbanová, 2021; Staffenova, Kucharcikova, 2022). **HRIS** aims to support personnel department employees with effective HR management. (Hittmár et al., 2013). Koubek (2007) lists the four basic HRIS modules: (1) information about employees, (2) information about jobs, (3) information about personnel processes, and (4) information about the external conditions of the business in relation to the personnel department. Each of these modules is unique and contains specific information (Lambert et al., 2000):

1. The employee information module manages all information about people in the business. These are, for example, personal identification numbers, work function, the nature of the employment relationship, education and qualifications or career-related data, remuneration, employee benefits, attendance and the like;

2. The job information module provides information regarding the work activities of the given employee. This includes, for example, information about the place of work; job position characteristics; requirements for the employee who holds this job position; organisational classification and relationships within the organisational structure and the like;

3. The module of information on personnel processes describes the operations of all personnel processes of the business. This includes, for example, job analysis, planning, recruitment, evaluation, training, compensation, employee care and the like. In addition, it also provides information on labour standards, whether it is a work order, a collective agreement, records of conflicts, etc.;

4. The information module on external conditions focuses on the situation in the labour market. Information is kept on the minimum and average wages, the state and development of the population, or competition on the market and the like.

Nowadays, more and more processes, including personnel processes, are performed with the help of ICT. In such a case, we talk about the e-personalistics. **E-personalistics** can, therefore, be defined as an application of electronic personalistics which helps in the effective management of personnel processes. Hittmár (2013) lists several types of e-personalistics: e-reporting, e-attendance, e-learning, e-benefits, e-assessment, and e-recruiting. One of the most important types for supporting personnel management in a business is e-recruitment.

The essence of **e-recruitment** is that it involves recruiting employees in the online space (Sirkemaa, 2017; Gilch, Sieweke, 2021). In this case, the employees of the HR department use the online space for some recruitment process activities. For example, they post job offers on social networks (Spahrkas et al., 2021), conduct a job interview using a video call (Sands, Arnold, 2022; Wolff, Burrows, 2021), or introduce various chatbots to communicate with the applicants (Koivunen et al., 2022), etc.

Business sustainability achieved via an optimally set employee recruitment process

Views on corporate sustainability vary. Some authors look at it via an environmental and financial prism, while others look at it via a technological prism. However, this article focuses on **personnel sustainability**.

The sustainability of the business can also be described regarding HR and the processes of working with people that take place in the company. It is possible to implement a sustainable strategy by understanding the role of human resources (HR) and the correct setting of activities (Sode, Chenji, 2022). Research of 513 companies from Greece confirms that the development of human resources with a focus on strategic flexibility and innovation contributes to achieving the sustainability of the business (Kafetzopoulos, 2022). The results show that the development of human resources affects environmental dynamics, thereby supporting sustainability. Other findings point to the critical positive impact of HR practices and theories on achieving business sustainability (Dwivedi, Chaturvedi, Vashist, 2021).

Using digitisation elements in HR management reflects globalisation and a turbulent environment (Melnychenko, Lositska, Bieliaieva, 2022). This aspect also contributes to setting the personnel sustainability of the business. To achieve personnel sustainability, and thus the sustainability of human resource management (HRM), it is necessary to focus on the motivation of employees and their willingness to commit to long-term progress (Lubis, Pratama, Safrida, 2023). Only if employees and managers are convinced of the positive impact of development, understand the meaning of HRM activities, and are willing to take risks associated with implementing new solutions can the sustainability of the business be achieved. The theme of personnel sustainability is also connected with the use of HR in helping to set up socially responsible business management. As part of further research, HR policies and procedures in 46 multinational companies were analysed. The analysis resulted in

several recommendations for supporting responsible management to achieve the company's sustainability (Baek, Kim, 2021).

The gap in the current literature, addressed by the article's authors, is characterised by the interconnectedness of the areas described in this chapter. These are the areas of recruitment and selection of employees, risk management, implementation of information systems in HR, and support of business sustainability. The gap can be described as the impact of information systems and ICT tools on the efficiency of the business's employee recruitment process. This relationship ensures that the sustainability of the business, as well as the sustainability of the process of recruiting employees, are supported. When controlling the recruitment process using an ICT tool, it is necessary to identify and manage the potential risks associated with implementing the selected technical solution. For the business to be sustainable in the long term, it needs regular addition of new employees to its personnel structure. Regularly adding the required employees will be effective via applying ICT in HR.

3. Methodology

The article consists of two parts. The first part evaluates the longitudinal research conducted between September 1, 2020, and November 30, 2021. Several methods of data acquisition were used in this research. Both primary and secondary data were collected. Observation, questionnaire survey, and semi-structured interviews were used to obtain primary data. Three in-depth interviews were conducted. The first two were related to staff recruitment and took place with two branch managers. The third interview was conducted with the company manager, who presented his perspective on the analysed issue. These methods were implemented in the environment of one specific company. For the article, the company will be called ABC, because it requested anonymity (so that the results of the analyses do not give a competitive advantage to other companies in the same market). Since it is a detailed analysis of the conditions of one company, our case study was created based on the results.

On the other hand, secondary data was obtained using case studies, that is, by analysing other case studies. In this case, qualitative case studies of two businesses were evaluated. The companies were selected based on the following criteria: 1) the companies must have implemented ICT-enabled recruitment, and 2) the companies must be perceived, at least in Slovakia (preferably internationally), as solid employer brands.

The second part of the article focuses on identifying risks associated with implementing the proposed solution. A necessary step was selecting a method for risk mapping and visualisation. The critical path method (CPM) has been used as a valuable tool to assess time-related risks (Olivieri et al., 2019; Kusumadarma et al., 2020; Ramani et al., 2022). Several authors also use CPM in risk management (Nguyen et al., 2018; Mohamed et al., 2022). The method mentioned above was also used by Song et al., who used the critical path as an entry point for managing and coordinating individual project activities (2021). The results of their research show that the presented method is significantly better than the breadth-first search algorithm. The above testifies to the appropriate use of CPM for this article.

CPM is a project management technique used to determine the longest sequence of activities required to complete a project. It helps identify time-critical activities, meaning that any delay in these activities will directly impact the overall project schedule. The critical path method identifies potential timing risks and bottlenecks, allowing better planning and risk mitigation strategy preparation (Armstrong-Wright, 1969). Project management is considered a key element in many service and productivity projects. The results are particularly noticeable in large projects limited by the schedule (Ahmad, 2020). CPM includes the following steps:

- **Defining the project's scope:** Establishing the project's goals, tasks, and outputs. This provides a basis for determining the actions that need to be taken;
- **Identification of all project activities:** Dividing the project into individual activities that need to be performed;

- **Determining dependencies between activities:** Determining relationships between individual activities. Some actions may need to be completed before others can begin, creating dependencies;
- **Estimating the duration of activities:** Assigning a time plan for each activity based on historical data, expert opinions, or other reliable sources. It is essential to consider factors such as resource availability, dependencies and potential risks;
- **Building a network diagram:** Creating a visual representation of project activities and their dependencies using nodes (representing activities) and arrows (representing dependencies);
- **Calculating the earliest start and end times:** It is necessary to start by assigning the earliest start time of the initial activity ($t = 0$). Based on the duration of the activity, the earliest start and end times for each subsequent action are then calculated;
- **Calculating the latest start and end times:** In this case, on the contrary, it is necessary to start with the endpoint of the last activity or the entire project and work backwards, determining the latest start and end times for each activity. This helps determine flexibility within the project timeline;
- **Determining the critical path:** The critical path is the longest sequence of activities that must be performed to complete the project on time. It consists of activities with zero margin or flexibility, which means that any delay in these activities will cause a delay in the completion of the whole project;
- **Analysing the critical path:** By focusing on the critical path, potential risks and bottlenecks can be identified. Delay or disruption of any activity on the critical path poses the greatest threat to the project schedule.

By applying the critical path method in assessing the time risks associated with the implementation of the proposed solution, this article aims to provide insight into potential problem areas and help develop strategies to minimise or mitigate the negative impact of these risks.

Observation

The observation in the ABC company lasted for about a year. The authorised researcher was part of a team within the ABC company focusing on examining the performance of personnel activities, primarily recruiting new employees. The observation aimed to gain an overview of the company's employee recruitment procedures, identify possible areas for improvement and provide recommendations based on the findings. Observation and analysis of personnel activities have to focus on the hiring process in the analysed business. Therefore, the following sub-objectives were set:

- Gain a comprehensive knowledge of existing employee recruitment procedures;
- Identify strengths and weaknesses within the recruitment process;
- Evaluate the effectiveness of recruitment strategies in obtaining and selecting qualified candidates;
- Assess the level of compliance with fair employment practices and legal requirements.

The research design of this observation was predominantly qualitative, with an emphasis on direct observation of recruitment-related personnel activities. The researcher worked closely with the HR department and other relevant teams involved in the recruitment process. The following methods were used in data collection:

- **Direct observation:** The researcher actively observed and recorded recruitment activities, including applicant screening, selection, interviewing and selection procedures. This included shadowing HR staff, attending recruitment meetings, and watching various stages of the process;
- **Document analysis:** Various recruitment-related documents such as job offers, application forms, interview guides, and assessment criteria were collected and analysed to gain insight into the business's recruitment practices;
- **Interviews:** Structured interviews were conducted with key personnel involved in the recruitment process, including HR managers, recruiters, hiring managers, and selected applicants. These interviews aimed to obtain additional information, insights and feedback about the recruitment process.

The obtained data were subsequently analysed in two ways:

- **Thematic analysis:** identified and categorised vital themes and patterns related to the recruitment process;

• **Quantitative analysis:** quantitative data such as recruitment indicators (e.g., time to fill a position, applicant diversity, etc.) were also analysed to provide complementary insights and support the qualitative findings.

A vital element of the observation was the ethical aspects, such as the prior consent of the participants involved in the interviews and the anonymised identity of the participants to maintain the confidentiality of the information provided.

Questionnaire survey

The questionnaire survey aimed to supplement the study's qualitative aspect by obtaining data from a sample of employees. 128 employees of the ABC company were involved in the questionnaire survey. With the total population size (185), the error rate was 4.82% for the collected 128 answers. The questionnaire survey was designed in such a way that it was possible to:

- Obtain quantitative data to supplement qualitative findings obtained from direct observation and interviews;
- Assess the perception and experience of employees regarding personnel activities with a focus on the recruitment process;
- Measure employee satisfaction and feedback on various aspects of recruitment, such as communication, fairness and applicant experience;
- Identify potential areas for improvement and gather suggestions for improving the recruitment process.

The questionnaire was designed to obtain information related to the research objectives. At the same time, the questions were formulated to reflect various aspects of the recruitment process (including communication, fairness, and satisfaction). The questionnaire consisted of a combination of closed and open questions. Closed questions used Likert scales, multiple-choice formats, and rank ordering to facilitate quantitative data collection. Open questions allowed respondents to provide detailed explanations, suggestions, and comments. This is how quantitative data has been collected by several authors of peer-reviewed articles (Buchelt et al., 2020; Moreno-Garcia et al., 2022; Boari, Ruscone, 2015; Feijo et al., 2020).

A pilot survey was conducted with four employees to test the questionnaire's comprehensibility, validity, and reliability. Feedback from the pilot testing was used to refine the questionnaire. Respondents were given a tablet to fill out the electronic questionnaire anonymously. The collected survey data were analysed using statistical techniques appropriate to the research objectives—basic statistics such as relative and absolute frequencies were calculated to summarise responses. The collected data were analysed using appropriate statistical methods such as independence tests. Other authors frequently use these in their studies (e.g., Varmus et al., 2022).

Case study method

The companies Jysk and Lidl were selected for the case study based on the following criteria: (1) award of the best employer in Slovakia, but also abroad, (2) transparency of general information, (3) willingness to cooperate with the research team, and provision of internal documents for inspection. Data collection was performed at two levels:

- Review publicly available information, including annual reports, company websites, industry publications, and news articles. This helped to understand the history of companies, their organisational structures, and strategies, but mainly helped with an in-depth analysis of recruitment issues, whether it is communication with applicants, posting job offers, applying online channels, etc.
- Analysis of internal documents provided by selected companies and addition of information based on unstructured interviews.

The obtained data were subjected to a thematic analysis. Key themes and processes were identified, categorised and compared between Lidl and Jysk. This analysis helped reveal the similarities, differences, and unique characteristics of the recruitment process of both businesses.

Research Questions and Hypotheses

Specific research questions were defined in relation to the analysed area, which the researchers followed up on. During the application of the methods, answers were sought, and subsequently, the research hypotheses were verified during the data evaluation. The defined questions include the following ones:

- Q₁: How is the recruitment process for new applicants performed?
- Q₂: Are online platforms used in the recruitment process?
- Q₃: What are the methods of informing applicants about job offers?
- Q₄: Do applicants look for job offers on social networks?

As mentioned above, for the need for a structured examination of the context, two research hypotheses were defined. The first (H₁) is related to the length of employment and the recruitment method; the specific wording is: There is a relationship between the length of employment of employees in the business and how they were approached in the recruitment process.

The second hypothesis (H₂) is related to the use of social networks and the efficiency of the job search process. The specific wording is: There is a relationship between whether employees regularly use social media to search for work and whether they consider this process effective.

4. Results

The research was focused on the field of human resources. In this area, a problem was defined in the ABC company, which consisted of the high turnover of employees. In the past, the company tried to reduce turnover by increasing employee motivation. Although the implemented solution ensured a specific decrease in the turnover rate, it was not to such an extent that it was possible to claim that the given problem was fully eliminated. Therefore, it was necessary to propose a solution that would increase the motivation of employees right from the beginning of their work for the business. The recruitment process's professionalism has the most significant impact during this period. **The recruitment process** was thus determined as a problem area of the research part.

Analysis of secondary data

Secondary data was linked to two case studies related to staff recruitment. These were explicitly chosen cases of two multinational companies, namely JYSK s. r. o. and Lidl Slovak Republic v. o. s. As recruiting employees may differ in individual countries, it is necessary to point out that these case studies focus on the territory of the Slovak Republic. This was the main reason for the deliberate selection of the mentioned companies. The JYSK company appears on the market as a retailer with Scandinavian roots, which offers its customers solutions focused on two fundamental areas of life. The company's very motto represents these areas: "Scandinavian Sleeping & Living" (Jysk website, 2023). The second company is Lidl. It is one of Slovakia's largest retail chains and abroad. Together with the Kaufland chain, they belong to the German Schwarz-Gruppe group (Lidl website, 2023).

Case study: JYSK s. r. o.

In addition to a commercial website, the company also operates a career website that is focused directly on the recruitment process (webpage – Kariéra Jysk, 2023). The domain of this website is kariera.jysk.sk in Slovakia. The main menu of the career page is divided into several sub-pages: (1) stores, (2) customer service department, (3) about the JYSK company, (4) JYSK headquarters for the Czech and Slovak Republics. This way, the company communicates with potential applicants and builds its name as a TOP employer. Job offers are also published on this page. These are available on web career portals (Profesia, 2023; Kariéra – zoznam, 2023) and social networks (LinkedIn – Jysk, 2023; Facebook – Jysk, 2023).

However, the company does not only use the online space and ICT for communication with potential applicants. A more significant part of the employee recruitment process takes place with the help of their own HRIS, which supports the management of this process. Due to this information system, some activities take place online, thus reducing the costs of their implementation. In Figure 1, employee recruitment processes in the JYSK company online can be seen (green colour).

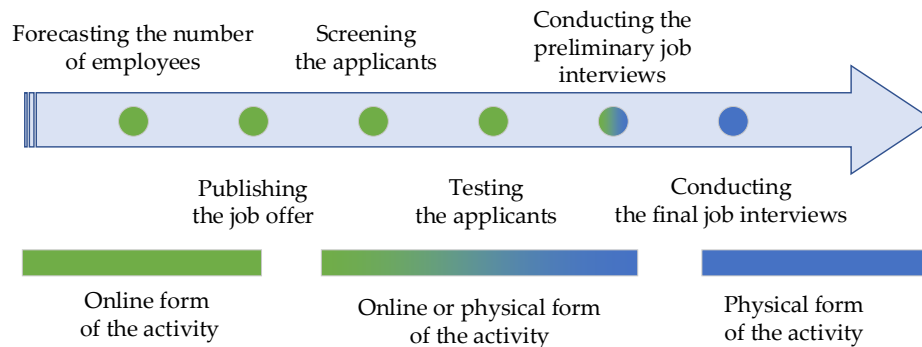


Figure 1. The use of ICT in the process of recruiting employees in the JYSK company

JYSK conducts most of its recruitment activities online using various ICTs. They contribute to the faster implementation of this process and to the improvement of the selection of employees.

Case study: Lidl Slovak Republic v. o. s.

Like the company JYSK s. r. o. also, Lidl Slovak Republic v.o.s. publishes job offers online. It also operates its career website, available to the public under the domain kariera.lidl.sk (webpage – Lidl Career, 2023). The website consists of six main parts, further divided into sub-pages. Information for potential applicants is also published here. The difference from the JYSK website is that potential applicants can create their accounts on this website. People can upload, for example, a CV to the account, a cover letter and other documents.

With the help of this page, applicants can also apply directly for a published job vacancy. Even the testing of applicants takes place directly on this page. Two types of tests are completed here: (1) cognitive tests and (2) tests of numerical intelligence. Based on the mentioned tests, the employee of the HR department decides whether to advance the applicant to the next round of recruitment or reject him/her.

The entire process of recruiting employees in Lidl Slovak Republic is shown in the following image. In this case, it concerns recruiting an employee for the job position of shop director. The individual steps of this process may differ for every recruitment; it depends on the job position for which the applicant applied.

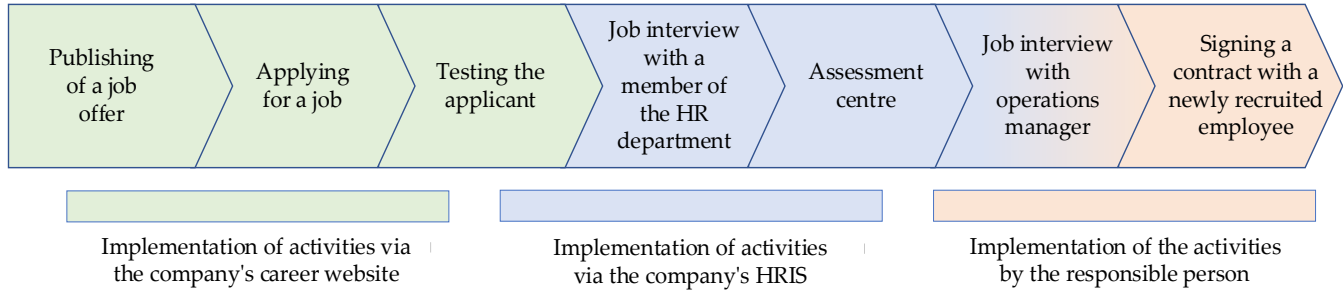


Figure 2. The use of ICT in the recruitment process in Lidl Slovak Republic v. o. s.

In Figure 2, after passing the testing, a job interview with an employee of the HR department follows. Subsequently, another round of testing takes place, Assessment Centre (AC). This type of testing takes place in the form of role-playing games. The last step is a job interview with the company's operations manager. As can be seen, all the mentioned steps of recruiting employees are performed **strictly online**.

Analysis of primary data – ABC company

The primary data was tied to the chosen ABC company, for which the authors subsequently proposed a career website. (This company will not be explicitly named for anonymity. They have particular know-how of business activities that ensures they are unrivalled in the market.) The company in question focuses primarily on the goods inventory (hereinafter referred to as "INV") in various retail chains. The company's headquarters is in Nitra; other branches are in Banská Bystrica – Zvolen, Žilina and Rimavská Sobota. The ABC mainly employs students based on an agreement on part-time student work, which is why it ranks among small businesses. The business provides part-time work to 185 employees, mainly students, mothers on maternity leave, and working citizens. The ABC employs only 10 to 19 employees on a permanent employment contract.

Observation results

During the observation, it was possible to see that recruiting employees is approached differently in individual branches of the ABC company. While in the Banská Bystrica – Zvolen branch, the recruitment of employees is carried out primarily via the recommendation by colleagues, in the Rimavská Sobota branch, recruitment of employees takes place almost exclusively via advertisements on social networks. It is also different at the branch in Nitra. Career websites such as *profesia.sk* (2023) or *kariera.zoznam.sk* (2023) are also coming to the fore there.

The individual parts of the recruitment process are different too. While in Nitra, every employee goes through a job interview, in Banská Bystrica and Zvolen, the job interview is an exception. It is, therefore, challenging to talk about a uniform recruitment process.

Table 1 shows the individual parts of employee recruitment defined by Blašková (2003). These parts have been supplemented with information on whether the ABC company carries out the given activities and, if so, to what extent and in which branches.

Table 1. Identification of the implemented activities of the recruitment process in the business

Activity	Implementation	Form of implementation
Identification of sources of human potential	yes	Computing technology based on the forecast of employment of orders by the business's employees.
Choice of methods of recruiting employees and management staff	yes	The activity is entirely in the hands of the recruiter, and there is no directive for this activity.
Choice of documents required from applicants	no	–
Formulation and publication of a job offer	yes	The activity is entirely in the hands of the recruiter, and there is no directive for this activity.
Ongoing selection and classification of applicants' success	no	–
Evaluation of the effectiveness and feedback of the acquisition process	no	–
Detailed analysis of applicants' written documents	no	–
Preliminary courtesy call	no	–
Testing the work capacity and potential of applicants	no	–
Selection interview	partly yes	The activity is entirely in the hands of the recruiter, and there is no directive for this activity. However, the admission interview is not carried out to a large extent.
Summarising the results, deciding on the selection, and informing the applicants based on personal feeling	no	The recruiter makes the decision alone.
Evaluation of effectiveness and feedback of the selection process	no	–

The ABC company does not implement several steps in the recruitment of employees (Table 4). It is also evident that even in the parts that individual recruiters implement, they have their activities and do not follow any standard directive or template. Another conclusion is that none of the employee recruitment steps in the company are examined online.

Results of a questionnaire survey

One of the questionnaire survey questions focused on **how the respondent learned about a possible job in the ABC company**. Up to 65% of respondents answered that they learned about the job from a friend or acquaintance who works or has worked for the business. The most common method of recruiting employees is, therefore, the recommendation by a colleague. Only 35% of respondents chose the option of online recruitment. In comparison, 30% stated that they found out about the given business due to advertising on social networks, and only 5% of the respondents used a career web portal (see Figure 3).

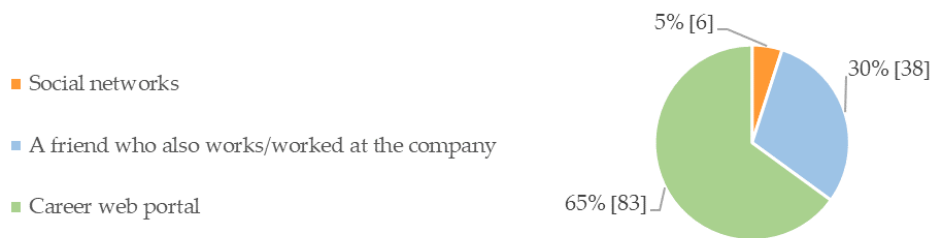


Figure 3. Methods of informing applicants about job offers in the selected business

Another question dealt with **the frequency of searching for job offers on social networks**. Only 30% of the total number of respondents who selected the social network option in the previous question were involved in this question. There were 38 respondents out of 128. Up to 87% of respondents answered positively, while 61% answered that they often seek work via social networks. 18% only look at job offers posted on social networks occasionally. And 8% of respondents are even part of groups focused on these advertisements. Only 13% of respondents do not search for job offers on social networks (see Figure 4).

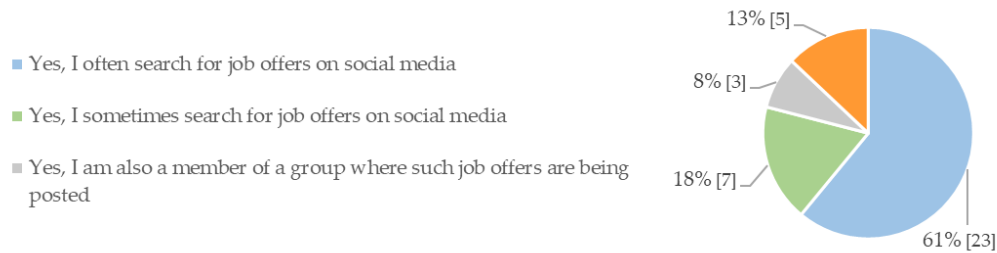


Figure 4. Searching for job offers on social networks

Based on this information, it is possible to evaluate that applicants for job offers have a habit of searching for job offers on social networks. However, since the recruitment rate of such applicants is meagre, it is possible to assume with significant probability that the ABC company needs to make more efforts for e-recruitment. Another essential piece of information emerged from the questionnaire survey: the respondents consider introducing a career website to support the recruitment of employees an excellent idea.

Statistical evaluation of the analysed relationships

The conducted Chi-square test aimed to examine two hypotheses regarding the relationship between different variables in the recruitment process. The results showed that the first hypothesis H1 was confirmed, according to which there is a relationship between the length of employment of employees in the company and how they are approached in the recruitment process (Table 2). The test result is $X^2 = 7.273$, with a P-value of 0.026. All respondents involved in the questionnaire survey (n = 128) were included in evaluating the subject hypothesis.

Table 2. Chi-square test results

	Hypothesis H ₁	Hypothesis H ₂
Test statistic:	$X^2 = 7.273$	$X^2 = 18.153$
Critical value @ 5%:	C = 5.991	C = 21.026
Significant*	yes	no
P-value:	0.026	0.111
* $X^2 > C = \text{yes}; X^2 < C = \text{no}$		

The findings show that how the employee was approached during the recruitment process has a statistically significant effect on the length of employment in the ABC company. This means that the length of their tenure in the company is related to how the employees were addressed. But it also shows that this aspect affects the sustainable setting of the recruitment process. When setting the company's sustainability in relation to employees and their loyalty, it is necessary to emphasise the recruitment method.

Subsequently, a pivot table was also created, where the specific frequencies of the individual options, which the respondents marked for the questions, are listed (Table 3). The option with the highest frequency of marking: "A friend who also works/worked at the company" is highlighted in orange. It is possible to state that the respondents use the referral program the most, while it is one of the most expensive forms of employee

recruitment. It is also possible to state that, even though the ABC company uses a career website, its benefit can only be identified in relation to 5% of hired employees (green colour in Table 3).

Table 3. Chi-square test results

	1-3 months		Over 3 months		Together	
	Freq.	[%]	Freq.	[%]	Freq.	[%]
Social networks	19	22	19	45	38	30
A friend who also works/worked at the company	62	72	21	50	83	65
Career web portal	5	6	2	5	7	5
Total sum	86	67	42	33	128	100

On the other hand, the second hypothesis H₂, which examined whether there is a relationship between the respondents' regular use of social media when looking for a job and their perception of the effectiveness of this process, **was not confirmed** (Table 2). Those respondents who were approached via social networks in the recruitment process (n = 38) were included in the evaluation of the second hypothesis.

The study found no significant relationship between the respondents' regular use of social media in their job search and their perception of the effectiveness of this process. The assumption that individuals who frequently use social media for job search tend to perceive the process as more effective than those who do not rely on social media for job search activities was not confirmed. This finding does not support the potential benefits of incorporating social media platforms into the recruitment process. Businesses should combine these platforms with a career website to attract and engage potential candidates effectively.

5. Recommendations and discussion

Based on the research (specifically, primary data analysis), creating a career website supporting **the recruitment process** management at ABC company was recommended. This and similar methods of streamlining the staff recruitment process are also supported by Mhamdi et al. (2022). The secondary data analysis also confirms the importance of using different ICTs in recruitment. The example of the JYSK company confirms that the selection of employees is more effective with such technologies. From a long-term point of view, effective recruitment of suitable applicants impacts the support of sustainable business. Fluctuation is reduced, employees share their ideas and thoughts, bringing value to the company, etc.

Based on the findings from the analysis of primary data (the current situation of the company ABC) and secondary data (examples of best practices), recommendations for the creation of the website were created. The website should primarily communicate with potential job applicants in the business, i.e., creating a mutual relationship. Top management should also support this (Liu, Chua, Hu, 2021). The proposal is for the website to be split into two parts. In the first part, it would be about publicly available pages. These include *Home, About Us, Work, Q&A, Login, Blog*. All these sub-pages should deal with informing site visitors about the company, job offers, subject of activity, and the like. This will likely attract potential applicants with the skills and abilities necessary to fill open positions, contributing to a sustainable recruitment process.

The second part of the website should be the pages that are not visible to the public. These are sites where the recruitment process would take place directly. The applicant reaches them via email, which he/she receives automatically after sending a job application to the company. These pages include *Welcome to Us, CV, Test, and Video questionnaire*. All these non-public pages should support the individual steps of the recruitment process, whether it is collecting documents, testing applicants, or a job interview. At the same time, it is suggested that a chatbot is available on all pages, in which it is recommended to install artificial intelligence. Due to this solution,

communication with site visitors will be simplified and more effective. It is artificial intelligence that can answer almost all questions and thus reduce the burden on recruitment staff, which leads to the support of the company's sustainability.

As part of a project solution, such as **implementing a website to support the staff recruitment process**, it would be necessary to define sub-phases. Within them, it is also essential to identify individual activities that must be performed to achieve the project's goal, like how the steps were placed in the analysis of the Lidl example (Figure 2). Individual phases, as well as activities, are shown in Figure 5.

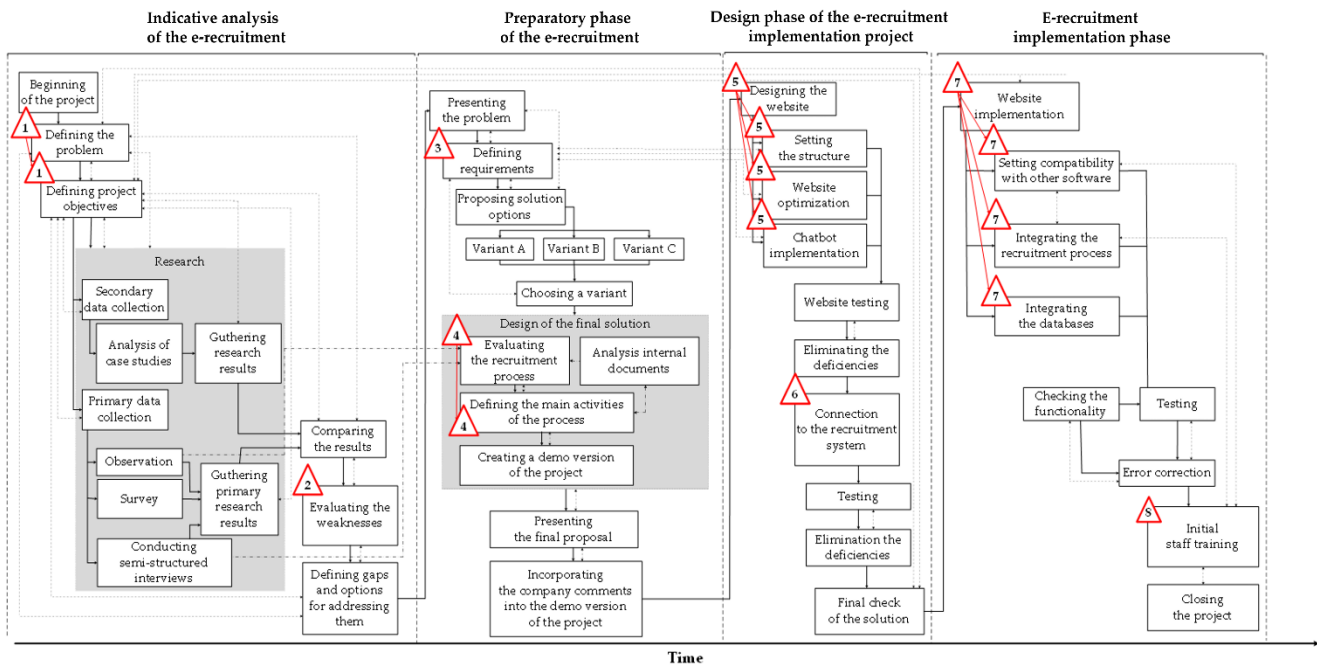


Figure 5. The process of implementing the proposed solution and identifying possible risks

As shown in Figure 5, certain risks (indicated by red triangles) are associated with implementing such a project in the company. These can occur in several phases of implementation, such as:

- Defining the problem and goals of the project;
- Evaluation of the weaknesses of the staff recruitment process;
- Defining the requirements of the solution by the company;
- Evaluation and definition of the main activities of the recruitment process;
- Creation of a website;
- Connection with the system for recruiting employees;
- Implementation of the website;
- Initial training of company employees.

One of the most significant risks is **non-compliance with the project schedule** (Acebes et al., 2022). As a result, financial costs for the entire project may increase. Risks must be identified and managed (Buganova et al., 2023). As part of management-related activities, risks can be measured using several methods and indices (Jia, Li, 2022). The necessity of risk management is highlighted by Trzeciak (2021).

To minimise the identified risk, it is necessary **to clearly define the project's critical path** (Li et al., 2022). The critical path consists of activities that are bottlenecks in implementing the website to support the selected

company’s employee recruitment process. These implementation steps are risky, and if they are not completed by the set date, the total time of project implementation will be extended.

To identify the critical path, it is first necessary to define the individual activities that will be carried out during the implementation of the project. Table 4 shows the chronologically arranged activities. Individual activities are also assigned their duration and previous activities (predecessors) or subsequent activities (successors).

Table 4. Defining the activities of the recruitment process via the website

ID	Activity	Duration	Predecessor	Successor
A	Determination of the solved problem and the goal of the project	2	-	B, C
B	Collection of secondary data	20	A	D
C	Collection of primary data	40	A	D, I
D	Comparison of collected data and definition of bottlenecks	10	B, C	E, G
E	Presentation of the problem to the representative of the company	1	D	F
F	Definition of solution criteria by the company	2	E	J
G	Creation and submission of three variants of solving the company’s problem	2	D	H
H	Choice of solutions to the problem by the company	2	G	I
I	Evaluation of the recruitment process	1	H, C	J
J	Creating a demo version of the website	20	F, I	K
K	Presentation of the final proposal of the solution	1	J	L
L	Incorporation of company comments into the demo version	5	K	M
M	Creating a website	60	L	N, P
N	Website testing	10	M	O
O	Elimination of shortcomings	5	N	S
P	Linking the website with the system for recruiting employees	20	M	Q
Q	Testing the connection between the website and the employee recruitment system	10	P	R
R	Elimination of shortcomings	5	Q	S
S	Final check of the solution	10	O, R	T, V
T	Compatibility setting with other software and ISs	10	S	U
U	Integration of the recruitment process	10	T	W
V	Database integration	15	S	W
W	Website testing	5	U, V	X
X	Initial training of employees	3	W	-

Based on the succession of individual activities of the recruitment process, the project’s time distribution plan is also evident. For clarity, the individual activities were plotted in a project network, captured in Figure 6.

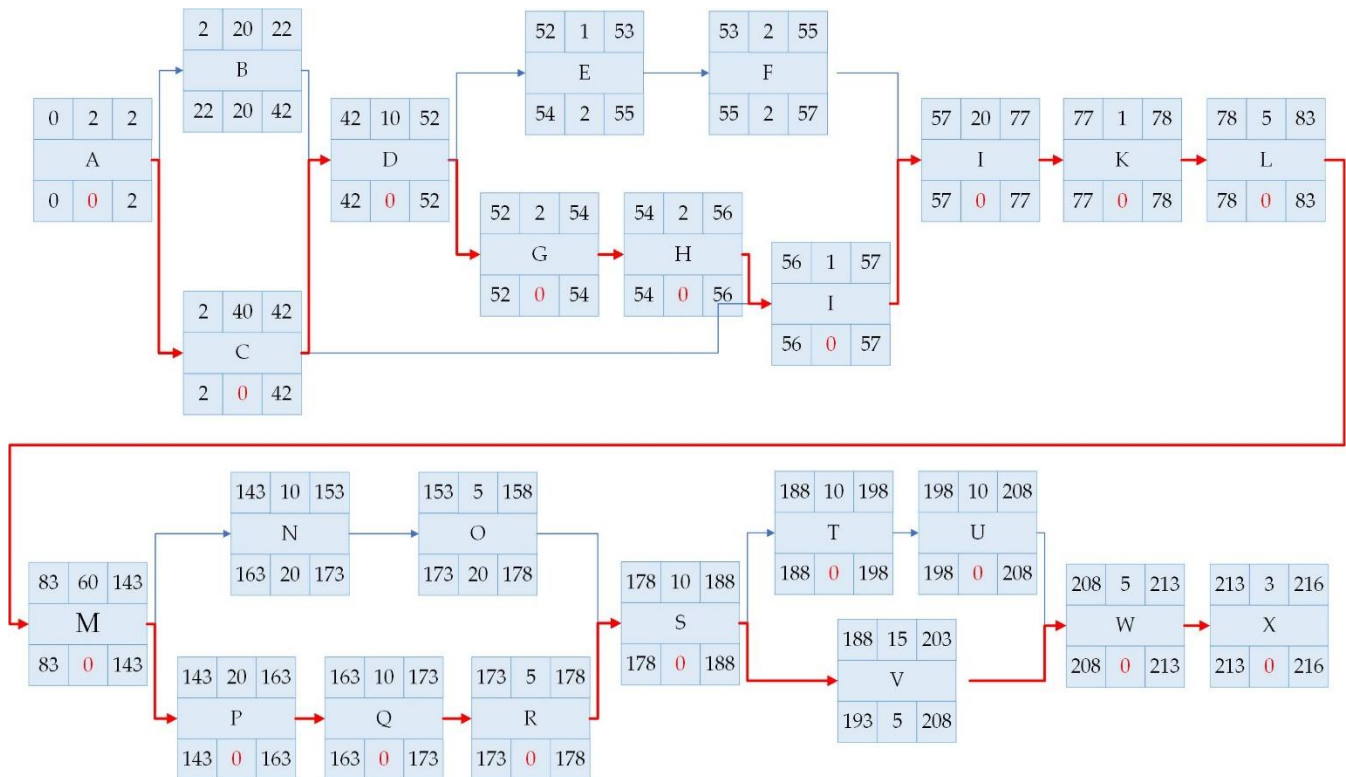


Figure 6. Project network showing the critical path of the implementation of the design solution

The total timeframe for implementing the recruitment website is provisionally estimated at 216 days, i.e., approximately 7 months. Figure 6 shows **the critical path of the process** (highlighted in red). The critical path consists of activities where the time margin is zero. Each activity is assigned an earliest date (start = top left and end = top right), the latest permissible date (start = both bottom left and end = bottom right), a time margin (bottom centre) and, of course, the duration of the activity (top centre). An explanatory view can be seen in the bottom right corner of the figure. The critical path shows the possible occurrence and magnitude of the time risk of the project’s implementation phase. When implementing it, it is necessary to keep the set deadlines of the activities that are part of the critical path as a priority so as not to prolong the whole project and, therefore, not increase the implementation costs.

Suppose the enterprise wants to avoid the risk of failing to meet the project schedule while implementing the proposed solution. In that case, meeting all the deadlines of the activities that make up the project’s critical path is necessary. Care must be taken during these activities to adhere to the time limit (Goman, 2021). Any time slippage will be reflected in the overall duration of the project and thus, for example, in an increase in the total cost associated with the implementation of the solution (Zou, Zhang, & Zhang, 2021; Catalao, Cruz, & Sarmiento, 2021). If, during the implementation of the proposed solution, the business wants to avoid the risk of non-compliance with the project schedule, it is necessary to comply with all the dates of the activities that make up the project’s critical path. In these activities, it is essential to pay attention to the observance of the time limit (Goman, 2021). Any time slippage will be reflected in the project’s total duration and, thus, in the increase of the total costs associated with implementing the solution (Zou, Zhang, Zhang, 2021; Catalao, Cruz, Sarmiento, 2021).

Conclusions

As can already be seen from the analysis of the theoretical starting points, the main goal of employee recruitment is to attract the best applicants for the given job. It is necessary to do it in a way that will be effective for the company. Recruitment can also be understood as a process consisting of two sub-processes: recruitment and selection of employees. When planning and preparing recruitment, it is necessary to focus on both sub-processes separately and regarding their immediate connection.

Many authors also deal with the issue of risk identification and management. The analysis showed that there are several risks associated with the process of recruiting employees. These can have an impact not only on the personnel department but also on the entire company. Therefore, managers must address the risks associated with the recruitment process. Then, new and current employees will be able to generate new ideas, the acquisition of expertise will be supported, and the rate of innovation may increase.

Overall, ICT support for staff recruitment can be included under HRIS. HRIS aims to support personnel department employees by effectively managing human resources. The use of ICTs also affects the sustainability of business. This can be achieved if employees and managers understand the meaning of HRM activities and are willing to take risks associated with implementing new solutions.

The article described the analysis of cases from practice at two selected companies (JYSK s. r. o.; Lidl Slovak Republic v. o. s.). This was the phase of the secondary data analysis. Based on the primary data analysis, an authors' case study was subsequently created, which was carried out in one selected Slovak company (ABC company). The purpose of creating this study was to point out the fact that the recruitment of employees significantly affects the subsequent motivation of employees (motivation to achieve high work performance, incentive to stay in the company, motivation to submit new ideas, etc.).

The main findings led to the design of a solution: to create a career website that provides information for the public and potential job seekers. The website also supports the management of the recruitment process, as several employee recruitment activities are carried out exclusively by this method. The second part of the article identified potential risks associated with implementing the proposed solution in the selected enterprise. Above all, the need for clearly defined project schedules and adherence to time limits is emphasised.

A limitation of this article is the focus on one selected company in the case of primary analysis. Within this company, the field of human resources is dealt with, explicitly recruiting employees. Two examples of best practices from Slovakia were chosen as part of the secondary data analysis. Their number can be expanded, as well as the market in which the analysed companies operate (not only Slovakia). Only the critical path method was used when identifying risks, representing a limitation in a specific aspect.

In the future, risk analysis can be expanded via other methods such as Pareto analysis of risk areas, BIA analysis of the proposed solution, or risk matrix for determining the importance and impact of the risk on the company. In the future, it is also possible to expand the research to several other companies and, due to this, develop recommendations in the form of a model solution to the issue of e-recruitment. It is also recommended that future research focus more deeply on the specific factors and mechanisms underlying the confirmed relationship between social media applications and perceived effectiveness in the recruitment process. In addition, conducting qualitative studies to capture individuals' experiences and perspectives regarding using social media in the job search can provide valuable insights into the underlying reasons for this relationship.

In their future projects, the authors of this article will focus on other Slovak companies, where they will apply the same methodological procedure. It will be small and medium-sized companies since large companies implement

e-recruitment themselves. They have entire IT departments (corresponding activities will be provided in-house). We will compare the new results with the previous ones to identify similarities or differences in this area within Slovakia. These will be beneficial for creating further recommendations. We encourage foreign authors to focus on SMEs in their environment so that they can compare results across countries.

The originality and **novelty** of the results presented in this article are linked to the emphasis on the necessity of identifying and managing risks associated with implementing ICT in HR. Business managers must focus on detecting threats as early as possible while planning to use any ICT tool in personnel management. In a narrower sense, the novelty can be seen in the crucial online support of the recruitment process. These technologies support the overall innovativeness of businesses and their approach to employee recruitment. The results presented and the recommendations defined have implications for firms aiming to optimise their recruitment strategies. While employees may be fine with their recruiting experience, businesses should recognise the importance of social media as a valuable tool for reaching and engaging job seekers. By effectively using social media platforms, companies can strengthen their recruitment efforts and reach a wider pool of candidates actively using these channels for job search.

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