THE INTEGRATION OF HR INFORMATION SYSTEMS UTILIZATION IN INDUSTRIAL ENTERPRISES

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Human resource management (HRM) is of strategic importance for the management of organizations, therefore management measures in the field of HRM are of considerable importance for the performance of any organization. For the management of HR in the organization, it is important to have an information system that provides timely and reliable information necessary for decision-making. The article is focused on human resource management information systems (HRIS), which represent a significant part of corporate information systems. The main aim of the paper is to present the results of the analysis of HRIS used in industrial enterprises in Slovakia. The results of the analysis showed, that most often HRIS are only partially interconnected with other corporate IS. The results also pointed out that the used HRIS are considered mostly as useful and also demonstrated that how users evaluate the usefulness of the used HRIS is related to how they assess the integration of these systems with other corporate information systems.

KEYWORDS

Decision making, employees, human resources information system (HRIS), industrial enterprises, integration

1 INTRODUCTION

The functioning of organizations and thus industrial enterprises is increasingly influenced by new elements of information technology and digitalization. The implementation and use of information systems is therefore an important prerequisite for the effective management of industrial enterprises. From a managerial point of view, access to information managed in information systems is essential for the management of industrial enterprises. Decision-making in the field of human resources management is dependent on the availability of information necessary for decision-making. The timeliness and accuracy of these decisions depends on the relevance of the information on the basis of which these decisions are made. For decision-making, it is necessary to take into account matters related to enterprise management, such as employees, processes, etc. [Litvaj 2015]. Managers need the necessary information to make decisions or solve various problems. To obtain this information, it is necessary to identify and analyse appropriate data. Data sources or databases represent files of data organized in different ways. To facilitate the use of these data sets, various information systems are available today. Business information systems are implemented in enterprises because as such they are considered innovative and beneficial to society, thus bringing progress for all involved [Boonstra 2022]. The basic mission of these systems is to provide the authorized user with reasonably reliable data corresponding to the information needs of his work at the right time and place [Drahotsky 2003].

Different types of information systems are used due to managerial use. Classifications of individual types of information systems correspond to typical building elements of the conceptual solution of usual information systems in organizations. The structure of the information system ensures a suitable functional place in the system of managerial work in the organization. The technology digitally processes large amounts of data and is therefore time-efficient and helps increase work speed and employee efficiency [Bayraktaroglu 2019, Bondarouk 2017]. The structure of the information system reflects the specific needs and conditions of the organization. The integration of sub-systems is a significant trend in the development of managerial work in the use of information systems. Individual parts of information systems are thus interconnected and enable data sharing and cooperation of sub-systems [Keong Choong 2014]. Effective use of valuable human resources is key to ensuring the success of the organization. Organizations are increasingly using human resources information systems (HRIS), through which human resources can be used effectively. However, businesses, especially manufacturing companies, lag behind in taking advantage of modern technologies due to a number of challenges [Jadesola Ololade 2023].

HRIS have been constantly evolving and today have their place among other management information systems in organizations. Human resource information systems, formerly called personnel systems, were mostly designed and implemented for human resource management activities. It can be argued that the development of human resource information systems follows the development of human resource management [Poutanen 2010]. As HR systems developed and became more sophisticated, they gradually moved from people management software (PMS – people management software) to human resource management systems (HRMS) and to HRIS [Kent 2023]. The use of HRIS has a positive impact on the enterprise by reducing costs, improving communication and reducing the time required to complete human resource tasks [Beadles 2005, Suharti 2018]. HRIS can also be used to automate the HR department and work in a paperless office, which contributes to less use of natural resources and a greener environment [Esangbedo 2021].

The organization's information system can be made up of one integrated automated system based on ERP (Enterprise Resource Planning) or a set of several separate information systems, the so-called process systems that support individual processes or groups of processes of the organization [Zufan 2012]. HRIS is defined as an information system that is aimed at supporting HR functions and activities, as well as broader organizational processes, related to people in organizations. A more formal definition of an HRIS is a system used to collect, store, manipulate, analyse, retrieve and distribute information related to an organization's human resources to support HRM and management decisions [Kavanagh 2018]. Based on the study [Nagendra 2014], the greatest use of HRIS was its added value in the effectiveness of HR planning through skills inventory, HRIS learning needs analysis, HRIS succession planning, and HRIS labour demand and supply analyses. Organizations need to integrate HRIS functions with other business functions. It is simplistic to think of HRIS as hardware and software packages used for their implementation and to judge them based on the number of workstations, applications or users who log into the system. The most important elements are not computers, but information. The focus of any

comprehensive HRIS should be on information validity, reliability and usefulness first and process automation second. Many organizations have gone through years of expensive software development only to find that the process of doing the work needed to change or added little or no value to the bottom line [Kovach 1999]. This has its basis in thinking and acting in a conventional, routine and stereotyped way, which hinders the process of observing, discovering, applying and using alternative ideas and actions, although they may provide useful and innovative solutions or activities for IS design [Methuku 2013]. However, the development of human resources information systems can also go its own way and accordingly provide development ideas for human resources management. Their framework could offer the possibility of independent and mutual development and research of both areas [Poutanen 2010]. Authors [Chakraborty 2013] characterized three types of factors that influence the selection and implementation of HRIS, namely organizational, technological and environmental. Basic organizational factors include human skills and management commitment. Also, the size of the organization, supporting organizational processes, including qualified workforce, are important factors in the successful adoption of innovations [Troshani 2011]. Technological factors are based on advances in networking, user interface, hardware, software and other aspects. The goal is to have an HRIS that meets the enterprise's requirements, is reliable and efficient [Neella 2012]. The final factor is environmental, which refers to external factors including competitive pressure, technology vendor support, and government regulations. It is government regulations that are an important factor, as they have a significant impact on the adoption of IT innovations [Alam 2016]. Based on knowledge about human resources information systems and their use, we focused on investigating how employees of industrial enterprises in Slovakia perceive their adequacy.

2 MATERIALS AND METHODS

For the purpose of determining the research framework and the scope of the areas related to the research topic of the paper, an analysis in the scientific databases WOS and SCOPUS was carried out. In the WOS (Web of Science) database, the analysis was carried out using the "Topic" search engine for three terms: HRIS, human resource management information system and Business information system. A total of 50,442 results were found. Furthermore, the following filters were used: open access left 12,335 results, filter article, left 9,098 results and filter language English left 8,558 results. The Analyse Results function was then used to identify areas that were dominant for the search terms, the results (Figure 1).

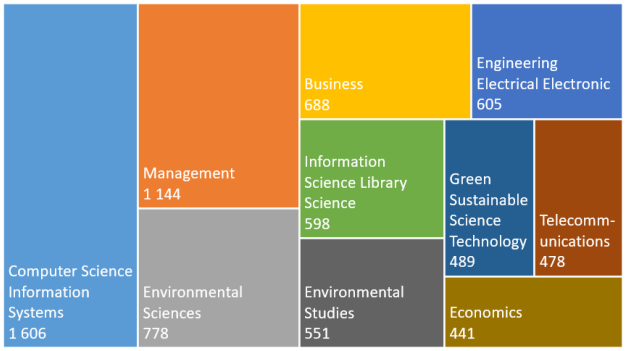

Figure 1. TreeMaps Chart for the analysed terms (own elaboration, 2023)

The results show that the top 10 areas that contain the top three search terms are Computer Science Information Systems (1606), Management (1144), Environmental Sciences (778), Business (688), Engineering Electrical Electronic (605), Information Science LibraryScience (598), Environmental Studies (551), Green Sustainable Science Technology (489), Telecommunications (478) and Economics (441). From the above, it can be seen that there are several fields dealing with HRIS and the above fact indicates the validity and relevance of the subject.

Further, we approached to bibliometric analysis using VOS viewer software. For the above analysis, an analysis was done using the SCOPUS database. Three key terms HRIS, human resource management information system and business information system were searched again. The filters, Open access, Language - English, Document type - Article were again used. A total of 15,790 possible results were left, a dataset was created from these results and analysed in the VOS viewer software. Then we selected Type of analysis - Coauthorship and we selected Unit of analysis: Country. The results can be seen in Figure 2.

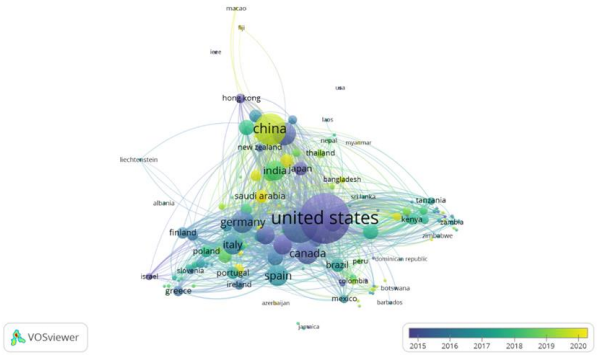

Figure 2. Coauthorship – Country for HRIS (own elaboration, 2023)

The analysis view was made in the Overlay visualization option, which allows colour-code of the analysed research by year of publication. In Figure 2 can be seen 6 main clusters and 144 items and in total there are 3181 connections. The analysis performed shows, that the United States of America, France or Australia have already addressed the issue of HRIS in 2015. On the other hand, countries like China, Saudi Arabia, Pakistan or Indonesia are addressing the above mentioned HRIS issue after 2020. To make the analysis more comprehensive, we conducted a further analysis where we looked at which keywords are closely related to HRIS. We chose the type of analysis - Co-occurrence, Unit of analysis - All keywords. The results can be seen in Figure 3.

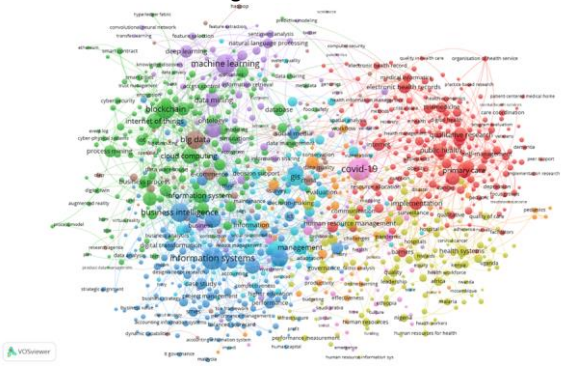

Figure 3. Co-occurrence – All keywords for HRIS (own elaboration, 2023)

From the analysis shown in Figure 3, we can see that there are 1000 items, 9 clusters and 18272 lines that are between each key expression. Of the clusters listed, the dominant cluster is Covid-19 (pink), which can be considered as a catalyst in the

development of HRIS. The other dominating cluster is blue Information systems, brown - Big data and purple - Machine learning, green - Blockchain. All of the above keyword clusters are closely related to the HRIS problematics, most of them are concepts that directly affect the development of HRIS in the corporate sphere. As the theoretical review and the analyses carried out have shown, the area of the use of information systems is a topical and constantly changing area. Due to the lack of research in this area in Slovakia, we determined the research scope and the main aim of the presented research. As the main aim of the research was to analyse the integration of corporate information systems and the usefulness of HRIS used in industrial enterprises in Slovakia. In order to fulfil the main aim of the research, three research questions (RQ) were formulated.

RQ1: Which HRIS are used in organizations in Slovakia?
RQ2: How do employees assess the integration of corporate information systems and HRIS?
RQ3: How do employees perceive the usefulness of HRIS?

Data were collected on the basis of a structured questionnaire that was constructed for this purpose. The questionnaire was completely anonymous. The three demographic questions in the questionnaire were focused on the size of the enterprise, the majority ownership of the enterprise and the job position of the respondents. In total, the questionnaire consisted of eleven questions. The following questions were focused on how the respondents applied for jobs, areas of human resources management, the way of passing on information about employee performance, the way of passing on information about changes in the organization and development opportunities, and also on which systems are used in the company for recording data on employees and how they assess their adequacy. Descriptive statistics methods were used to process and analyse the collected data.

3 RESEARCH RESULTS

The research sample is made up of employees of organizations that operate in the Slovak Republic. In total, the research sample consists of n = 288 respondents. The condition for data collection was that the respondents knew what information systems are used in the enterprise in which they are employed. The evaluation of the demographic questions from the questionnaire made it possible to analyse the structure of the respondents based on the collected data. Among the respondents, respondents working in specialist positions were most represented (34.72%), and the research sample consisted of administrative employees (31.60%), managers (12.50%) and production employees (21.18%). Table 1 shows the structure of the respondents based on the size of the enterprise in which the respondents are employed.

Table 1. Evaluation of the size of the enterprises in which the respondents work (own elaboration, 2023)

Size of the enterprise	Absolute frequency	Relative frequency [%]	Cumulative relative frequency [%]
Big enterprise	169	58.7	58.7
Medium enterprise	66	22.9	81.6
Small enterprise	35	12.2	93.8
Micro enterprise	18	06.3	100.0
∑ Total	288	100.0	-

From the results shown in Table 1 above, it is clear that the largest group of respondents are those who work in large organizations, this group consists of 169 (58.68%) employees. On the other hand, the smallest group consists of respondents who work in micro enterprises, the mentioned group consists of 18 respondents (06.25%). The second classification question focused on whether the majority owner is domestic or foreign, the results can be seen in Table 2.

Table 2. Majority owner of the enterprise in which the respondents work (own elaboration, 2023)

Majority owner of the enterprise	Absolute frequency	Relative frequency [%]	Cumulative relative frequency [%]
Foreign enterprise	188	65.3	100.0
Domestic enterprise	96	33.3	34.7
I don't know (no answer)	4	01.4	01.4
∑ Total	288	100.0	-

Table 2 contains the results that showed that up to 65.28% (188) of respondents work in an enterprise whose majority owner is a foreign owner. On the other hand, only 33.33% (96) of the respondents said that they work in an enterprise whose majority is domestic owner, and only 4 respondents (01.39%) said that they could not answer the question. After analysing the demographic questions, we proceeded to evaluate the research questions.

RQ1: Which HRIS are used in organizations in Slovakia?

At the beginning of the analyses, the authors of the article focused on how information from selected areas of human resources management is conveyed. Responses to questions on how information related to selected areas of human resource management is processed and communicated were processed using descriptive statistics. The results of the evaluation of the respondents' answers are shown in Figure 4 and Figure 5. Figure 4 shows the respondents' answers regarding the transfer of information in the selected areas of HRM in relative frequency.

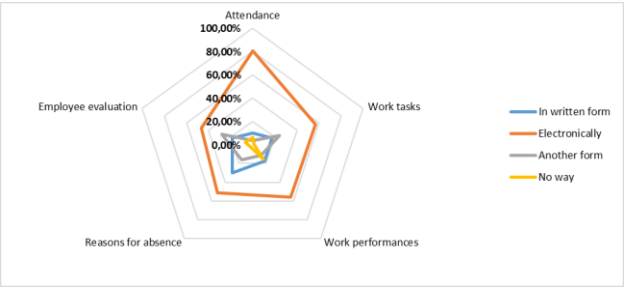

Figure 4. The way how HRM information on employee performance is processed (own elaboration, 2023)

The findings shown in Figure 4 indicate that data relating to attendance records are the most frequently transmitted and processed electronically. The least electronic use is for staff appraisals. The written form is most frequently used for recording reasons for absence, which is probably due to the

fact that various confirmations, such as doctor's visit confirmations, are issued in paper form. Other than the electronic or paper form of transmission of information, the most used form of transmission of information is the staff appraisal. The authors of the paper observed the highest frequency of non-information when monitoring the performance of employees. Figure 5 shows the respondents' answers regarding the transfer of information in the further selected HRM areas in relative frequencies.

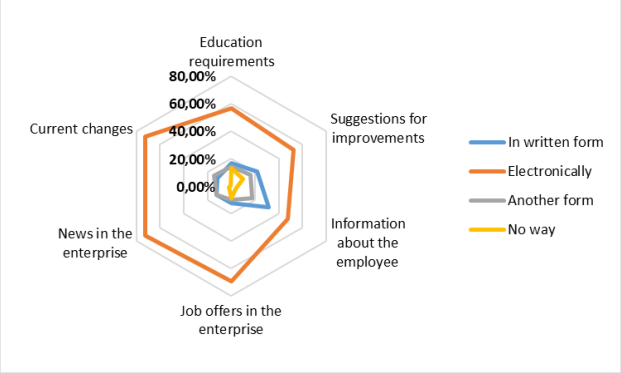

Figure 5. The way how HRM information on changes and development opportunities in the organization is processed and communicated (own elaboration, 2023)

As can be seen from the answers of the respondents processed in Figure 5, the most frequently transmitted information is electronically related to the latest news in the company and current changes or work-related issues in the company. In paper form, information about the employee such as change of marital status, birth of a child or graduation, etc. is most frequently transmitted.

When evaluating the first research question, we subsequently focused on the analysis of which system the enterprise uses to record employee data. Respondents could choose from several options, or they could indicate own answer. Table 3 shows the results displayed in absolute and relative frequency.

Table 3. Use of HRIS in enterprises in Slovakia (own elaboration, 2023)

Option	Absolute frequency	Relative frequency [%]
Own information system	131	40.06
SAP	68	20.80
MS Excel	64	19.57
Humanet	11	03.36
Workday	7	02.14
Redmine	3	00.92
Jira	2	00.61
None	8	02.45
Other	29	08.87
No answer	4	01.22
∑ Total	327	100.00

The most numerous answer in Table 3 was the own information system with 131 answers (40.06%). The least numerous answer was the answer of Jira 2 respondents (00.61%) and Redmine 3 respondents (00.92%). The answer other was given by 29 respondents (08.87%), these answers included: Oracle, Egje, RON portal, Human, eHuman, RON, SOFTIP, Softip HR, Enterprise. The results showed that although the condition for filling out the questionnaire was that the respondents knew what information systems were used in the company in which they were employed, 4 respondents could not indicate which specific system it was. The analysis also showed that different (multiple) HRIS are used in the management of personnel activities in organizations.

RQ2: How do employees assess the integration of corporate information systems and HRIS?

The second research question was focused on the integration (compatibility) of individual corporate information systems and the used HRIS. In Table 4 we can see the answers of the respondents.

Table 4. Integration of HRIS and enterprise information systems (own elaboration, 2023)

Size of the enterprise	Absolute frequency	Relative frequency [%]
Fully interconnected, all data is generated automatically	90	31.25
Partially interconnected, some data needs to be re-entered or searched	131	45.49
All systems work independently, and it is always necessary to re-enter everything in each system	15	05.21
I do not know	52	18.05
Other answer	0	00.00
∑ Total	288	100.00

It is clear from Table 4 that, according to the respondents, HRIS are partially connected with other corporate information systems, some data need to be re-entered or searched. This answer was given by 131 (45.49%) respondents. The least indicated option (15 respondents) was the option that all systems work independently, and it is always necessary to re-enter everything in each system. It follows from the above that HRIS are mostly sufficiently integrated and connected with other corporate information systems.

In the further processing of the research data, we focused on whether, according to the respondents, it would be appropriate or desirable to change the HRIS used for recording employee data. The responses of the respondents are shown in Table 5.

Table 5. Recommendation for changing the information system used about employees (own elaboration, 2023)

Size of the enterprise	Absolute frequency	Relative frequency [%]
No, the system/systems we use are completely satisfactory	93	32.29
Partially, some systems/apps work, others need improvement	130	45.14
Used systems require better connectivity	18	06.25
Completely, the systems used are inadequate	10	03.47
I do not know	37	12.85
∑ Total	288	100.00

As can be seen in Table 5, the largest number of respondents answered that they would partially recommend changing the HR information system used, for the reason that some used

applications would need to be improved. Partial change of the used systems would be recommended by 130 (45.14%) respondents. A smaller number, 93 (32.29%) respondents, would not recommend replacing the used HRI system or systems, because they consider it or them to be fully satisfactory. According to 18 (6.25%) respondents, the used systems would require better connectivity. 10 (3.47%) respondents consider the used systems to be completely unsatisfactory.

RQ3: How do employees perceive the usefulness of HRIS?

When evaluating the third research question, we focused on whether, in their opinion, the HR information systems used in the enterprise are useful. The results are shown in Table 6.

Table 6. Perceived usefulness of the information systems used (own elaboration, 2023)

Size of the enterprise	Absolute frequency	Relative frequency [%]
They completely facilitate administrative tasks	119	41.32
They are partially useful	141	48.96
They don't make the work any easier	4	01.39
I do not know	24	08.33
∑ Total	288	100.00

According to Table 6, 141 (48.96%) of respondents' asses that the information systems used partially facilitate work. According to a lower number of respondents, 119 (41.32%) completely facilitate administrative activities. The smallest part of respondents 4 (1.39%) considers information systems useless because they do not facilitate their work in any way. In the further analysis of the obtained data, we focused on whether the consideration of the used information systems as useful is related to the degree to which enterprise information systems are integrated. The results are shown in Table 7.

Table 7. Connectivity and usefulness of the information systems used (own elaboration, 2023)

Option	They completely facilitate administrative tasks	Partially	They don't make the work any easier	I do not know	∑ Total
Fully linked, all data is generated automatically	60	28	0	2	90
Partially linked, some data needs to be re-entered or searched	45	82	3	2	132
All systems work independently, and it is always necessary to re-enter everything in each system	3	9	2	1	15
I do not know	11	22	0	19	52
∑ Total	119	141	5	24	289

Cross Table 7 contains an assessment of the usefulness of information systems used by employees in relation to the degree of their integration. The processed data are divided according to whether the respondents evaluated whether the information systems used in the enterprise are unified (integrated) or whether it is necessary to re-enter some data repeatedly (duplicate) and how they evaluated the usefulness of the systems used. The results show that how the respondents perceive the usefulness of the used information systems is related to the extent to which the used systems are integrated. In addition, 82 respondents stated that they consider the information systems used to be partially useful and also stated that the corporate information systems used are partially interconnected because some data needs to be re-entered or searched. Of the respondents who said that the used systems completely facilitate administrative tasks, up to 60 said that the company's information systems are completely interconnected, and all data is generated automatically. Furthermore, 45 respondents who stated that the used systems completely facilitate administrative tasks also stated that these systems are only partially interconnected. A smaller part, 28 respondents, said that despite the fact that corporate information systems are completely interconnected, they consider them only partially useful.

4 DISCUSSION

Information about employees may be required by various interested parties such as HR, managers, other employees as well as government institutions and inspection bodies. The information can be used for strategic decision-making, identification of problems associated with discrimination in hiring employees, evaluation of training programs, or daily operations such as helping managers monitor time and attendance of employees [Zafar 2013]. The findings of the already conducted study demonstrated that the perceived usefulness and quality of applications contained in HRIS has a significant positive relationship with the extent to which employees use them and the satisfaction of their users. The use of HRIS applications and the satisfaction of HRIS users are related to how successfully HRIS is implemented in the organization [Srivastava 2021]. The results presented in the research showed that the perception of the used information systems as useful is related to the extent to which they are integrated with other corporate information systems.

The individual use of information technology devices and applications is similarly rooted in the possibilities offered to us, our ability and motivation as users to realize their potential, to use it in an appropriate way, and to be aware of the possible consequences of such use – positive and negative [Seetharaman 2019]. The results of the presented research showed that a significant part of the respondents are satisfied with the used systems. This result can be achieved by the fact that they are really satisfied with the systems in use, but they can also be influenced by a natural resistance to change. The implementation of information systems often brings significant changes in the work processes of the employees involved. This means that employees have to let go of what they know and start doing their work in a completely different way than they are used to [Boonstra 2022]. The main advantage of introducing HRIS is competitiveness, increasing the efficiency of HR activities and line management, raising the organization to a higher level from the point of view of generating documents related to HR and the ability to evaluate HR activities related to the strategic plans of the organization [Moussa 2014].

The digitization of organizational environments, especially in large organizations, has been driven by a combination of the opportunities offered by technology and the ability of organizations to absorb and exploit this potential while meeting the diverse and constant demands for transformation from within and outside the organization [Seetharaman 2019]. The introduction of digital technologies into HR management will help to make the purposeful activity of the HR department and company management more efficient [Vrabcova 2021]. Digitization of HR management makes it possible not only to use available archival documentation from time to time, but especially in everyday work to quickly find and use the necessary information and to reduce the time traditionally used for preparing reports [Sotnikova 2021]. For the information systems to be useful as a supported tool for business management, it is necessary that they enable the efficient retrieval of information [Prajova 2021]. However, in order to fully utilize the potential of digitization, it is necessary to ensure that the corporate information systems used are integrated to such an extent that there is no need for duplicate data entry or retrieval. In that case, employees consider data entry and retrieval as well as the information systems themselves to be useless and burdensome. It is useful if corporate information systems are tailored to the current needs of organizations. This will enable better management of the redundant data problems that many organizations struggle with. Employees in these organizations then find themselves overloaded by large amounts of data [Martinkovic 2020].

Among the disadvantages of HRIS and their implementation, we can include initial investment costs and user training costs, especially with regard to smaller organizations, which often do not have sufficient resources for such solutions [Buzkan 2016]. The security of the HRIS used is also a very important area. The organization must ensure that the data contained in the HRIS is well secured, as it may contain information about social security, payroll data, performance history, medical history, and so on. Confidential information can be disclosed intentionally by someone such as a disgruntled employee or inadvertently by an employee who has not been properly trained in the use of the HRIS [Miciak 2019]. Also, information can be changed or damaged. Each of these threats can affect the organization and lead to harmful consequences such as lawsuits or bankruptcy [Peltier 2005]. Thus, organizations face significant security and privacy challenges for HRIS records in terms of authorizing specific users to access HRIS records and data files; development of passwords and special codes that will allow users to access different parts of the database; authorizing access to employee profiles for specific business purposes; informing about principles in the field of security and protection of private information; granting employees the right to access their personal records [Gomez-Mejia 2010]. The perception of the threat of digital disruption is gaining importance and companies perceive it as a significant external risk. It represents a new trend related to the increasing uncertainty related to digital disruption. As some authors state, companies perceive the need to protect information systems and data within the network as the highest priority [Senova 2020].

5 CONCLUSION

The future is a challenge for any enterprise that needs to success and continue to prosper. The management of the enterprise must not only accept this challenge, but also cope with it in their interest. Being interested in the future means taking care of the future information security of individuals as well as collectives. Changes in the operating conditions of enterprises create new demands for managerial work and thus create new needs for information and information systems necessary for the performance of managerial work. Information technologies significantly influence the development of management. The use of an integrated management system, which is supported by an integrated information system, is important for the effective management of organizations. The results of the presented research showed that in the analysed organizations, personnel information systems are only partially interconnected with other business systems. From the point of view of sustainability, it is important that when implementing information systems in the sub-area of business management, it is taken into account how the introduced system is compatible with other systems. The results also showed that the integration of information systems in an enterprise is related to the extent to which users find them useful, which may influence the willingness to use them.

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REFERENCES

[Alam 2016] Alam, M. G. R., et al. Critical Factors Influencing Decision to Adopt Human Resource Information System (HRIS) in Hospitals, PLoS ONE, vol. 11, no. 8, p. e0160366, Aug. 2016, doi: 10.1371/journal.pone.0160366.

[Bayraktaroglu 2019] Bayraktaroglu, S., et al. Application of Expanded Technology Acceptance Model for Enhancing the HRIS Usage in SMEs, IJAMT, vol. 18, no. 1, Jan. 2019, doi: 10.5590/IJAMT.2019.18.1.04.

[Beadles 2005] Beadles, N., et al. The impact of human resource information systems: An exploratory study in the public sector, Communications of the IIMA, vol. 5, no. 4, pp. 39-46, 2005.

[Bondarouk 2017] Bondarouk, T., et al. Electronic HRM: four decades of research on adoption and consequences, The International Journal of Human Resource Management, vol. 28, no. 1, pp. 98–131, Jan. 2017, doi: 10.1080/09585192.2016.1245672.

[Boonstra 2022] Boonstra, A., et al. Information system conflicts: causes and types, IJISPM, vol. 3, no. 4, pp. 5–20, Feb. 2022, doi: 10.12821/ijispm030401.

[Buzkan 2016] Buzkan, H. The Role of Human Resource Information System (HRIS) in Organizations: A Review of Literature, AJIS, vol. 5, no. 1, pp. 133-138. Mar. 2016, doi: 10.5901/ajis.2016.v5n1p133.

[Chakraborty 2013] Chakraborty, A. R., et al. Adoption of Human Resource Information System: A Theoretical Analysis, Procedia - Social and Behavioral Sciences, vol. 75, pp. 473–478, Apr. 2013, doi: 10.1016/j.sbspro.2013.04.051.

[Drahotský 2003] Drahotsky, J., et al. Logistika. Procesy a jejich rizeni. 1st ed. Brno, Czech Republic: Computer Press. 2003. ISBN 80-7226-521-0.

[Esangbedo 2021] Esangbedo, M. O., et al. Evaluation of human resource information systems using grey ordinal pairwise comparison MCDM methods, Expert Systems with Applications, vol. 182, p. 115151, Nov. 2021, doi: 10.1016/j.eswa.2021.115151.

[Gomez-Mejia 2010] Gomez-Mejia, L. R., et al. Managing Human Resources; Pearson/Prentice Hall, 2010.

[Jadesola Ololade 2023] Jadesola Ololade, A., et al. Bolstering the role of human resource information system on employees' behavioural outcomes of selected manufacturing firms in Nigeria, Heliyon, vol. 9, no. 1, p. e12785, Jan. 2023, doi: 10.1016/j.heliyon.2022.e12785.

[Kavanagh 2018] Kavanagh, M. J., et al. Human Resource Information Systems. Fourth Edition. Los Angeles USA: SAGE. 2018. ISBN 9781506351452.

[Kent 223] Kent, S., et al. Towards an understanding of the relationship between institutional theory, affective events theory, negative discrete emotions, and the development of feral systems when using human resource information systems, Computers in Human Behavior Reports, vol. 9, p. 100264, Mar. 2023, doi: 10.1016/j.chbr.2022.100264.

[Keong Choong 2014] Keong Choong, K. The fundamentals of performance measurement systems: A systematic approach to theory and a research agenda, International Journal of Productivity and Performance Management, vol. 63, no. 7, pp. 879–922, Sep. 2014, doi: 10.1108/IJPPM-01-2013-0015.

[Kovach 1999] Kovach, K. A., et al. Human Resource Information Systems (HRIS): Providing Business with Rapid Data Access, Information Exchange and Strategic Advantage, Public Personnel Management, vol. 28, no. 2, pp. 275–282, Jun. 1999, doi: 10.1177/009102609902800208.

[Litvaj 2015] Litvaj, I., et al. Decision - Making, and Their Relation to The Knowledge Management, Use of Knowledge Management in Decision - Making, Procedia Economics and Finance, vol. 23, pp. 467–472, 2015, doi: 10.1016/S2212-5671(15)00547-X.

[Martinkovič 2020] Martinkovic, M., et al. Development of enterprise information systems. Conference: Prumyslove inzenyrstvi (Conference: Industrial Engineering), pp. 154-162, 2020. doi: 10.24132/PI.2020.09693.154-162.

[Methuku 2013] Methuku, H., et al. A Study on Developing the Role of Human Resource Information Systems for Good Leadership, AJIBM, vol. 03, no. 05, pp. 497–506, 2013, doi: 10.4236/ajibm.2013.35057.

[Mičiak 2019] Miciak, M. The efficiency of investment in human capital in IT enterprises, Transportation Research Procedia, vol. 40, pp. 1134–1140, 2019, doi: 10.1016/j.trpro.2019.07.158.

[Moussa 2014] Moussa, M. A Review of Human Resource Information Systems (HRISs) in Organizations, SIU Journal of Management, vol. 4, no. 1, pp. 1–34, June 2014.

[Nagendra 2014] Nagendra, A. et al. Human Resource Information Systems (HRIS) in HR Planning and Development in Mid to Large Sized Organizations, Procedia - Social and Behavioral Sciences, vol. 133, pp. 61–67, May 2014, doi: 10.1016/j.sbspro.2014.04.169.

[Neella 2012] Neella, A., et al. Technological Advancements and Its Influence on Transformation of HRIS, International Conference on Managing Human Resources at the Workplace, December 14-15, 2012; SDMIMD, Mysore, 2012.

[Peltier 2005] Peltier, T. R. Information Security Risk Analysis, Second Edition; CRC Press, 2005.

[Poutanen 2010] Poutanen, H. et al. The Many Sides of Human Resource Information Systems: International Journal of Technology and Human Interaction, vol. 6, no. 4, pp. 1–13, Oct. 2010, doi: 10.4018/jthi.2010100101.

[Prajová 2021] Prajova, V. et al. The Benefits of Information Systems in the Management of Industrial Enterprises: MM Science Journal, 2021, pp. s. 4743-4748. Oct. 2021, doi: 10.17973/MMSJ.2021_10_2021022

[Seetharaman 2019] Seetharaman, P., et al. Information Systems Debates, Applications and Impacts. New York, NY: Routledge, 2019.

[Seňová 2020] Senova, A., et al. Eurointegration tendencies in implementation of 'Industry 4.0' in European companies, Management: Journal of Contemporary Management Issues, vol. 25, no. 2, pp. 251–261, Dec. 2020, doi: 10.30924/mjcmi.25.2.14.

[Sotnikova 2021] Sotnikova, Y., et al. DIGITAL TECHNOLOGIES IN HR MANAGEMENT, Management Theory and Studies for Rural Business and Infrastructure Development, vol. 42, no. 4, pp. 527–535, Jan. 2021, doi: 10.15544/mts.2020.54.

[Srivastava 2021] Srivastava, S., et al. Human Resource Information System Use, Satisfaction, and Success:, International Journal of Enterprise Information Systems, vol. 17, no. 1, pp. 106–124, Jan. 2021, doi: 10.4018/IJEIS.2021010106.

[Suharti 2018] Suharti, L., et al. The implementation of human resources information system and it's benefit for organizations, DIJB, vol. 1, no. 1, p. 1, Mar. 2018, doi: 10.14710/dijb.1.1.2018.1-7.

[Troshani 2011] Troshani, C., et al. Exploring the public sector adoption of HRIS, Industrial Management & Data Systems, vol. 111, no. 3, pp. 470–488, Mar. 2011, doi: 10.1108/02635571111118314.

[Vrabcová 2021] Vrabcova, P., et al. Use of human resources information system in agricultural companies in the Czech Republic, Agric. Econ. - Czech, vol. 67, no. 5, pp. 173–180, May 2021, doi: 10.17221/452/2020-AGRICECON.

[Zafar 2013] Zafar, H. Human resource information systems: Information security concerns for organizations, Human Resource Management Review, vol. 23, no. 1, pp. 105–113, Mar. 2013, doi: 10.1016/j.hrmr.2012.06.010.

[Zufan 2012] Zufan, J. Informacni systemy v modernim personalnim rizeni (Information systems in modern personnel management). Prague: Wolters Kluwer Czech Republic, 2012. ISBN 978-80-7357-955-5.

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