JEMI

Weathering the Storm: Innovation-Driven Human Resource Management Practices

Edited by

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Table of Contents

Innovation-driven human resource management practices: A systematic review, integrative framework, and future research directions

Regina Lenart-Gansiniec[1] iD
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Abstract

PURPOSE: *It is increasingly emphasized that human resource management practices (HRMP), which refer to recruiting and selection, training and development, compensation and performance appraisal, are of great importance for creating innovation. However, the COVID-19 pandemic has shown that traditional HRMPs are already insufficient, which entails the need to rethink and reformulate them in the direction of more effective innovation while also allowing organizations to survive COVID-19-like crises. While there is an extensive literature on human resources management and innovation, there is still no consensus on innovation-driven HRMP. This study aims to identify and synthesize most significant and trustworthy research contributions of innovation-driven HRMP. In addition, to facilitate theory building in the field of HRMP, this article consolidates the existing knowledge into an integrative framework. This framework can be used by future researchers to identify gaps and ambiguities in the meaning of innovation-driven HRMP. **METHODOLOGY:** The article presents the results of a systematic literature review of 71 empirical research articles referring to innovation-driven HRMP from the Web of Science and Scopus databases. **FINDINGS:** The systematic literature review allowed us to identify innovation-driven HRMP, taking into account three levels of analysis: individual,*

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*group and organizational, with the latter level of analysis being dominant in previous publications. Recognition of innovation-driven HRMP, taking into account the levels in question, is included in an integrative framework, which is the theoretical basis for guiding future research. Our results confirmed the growing trend in the number of publications on the subject since 2010. Most researchers used a quantitative approach. Based on the first author's affiliation, authors from Great Britain contributed the largest number of publications. Articles are published in various journals, but mainly in those on human resources management. The research took into account a variety of organizational contexts, predominantly in dynamic and complex industries. Our findings show that the current state of research on innovation-driven HRMP confirms the need for further research in this area. Based on this, we provided thematic gaps and potential questions for future research divided into three levels of innovation-driven HRMP. **IMPLICATIONS**: Our systematic literature review allowed us to propose implications for future researchers planning to conduct research in the field of innovation-driven HRMP. **ORIGINALITY AND VALUE**: Our systematic literature review focuses on identifying innovation-driven HRMP along with determining the current state of knowledge and future research directions in this area. In addition, we developed an integrative framework that aims at organizing existing literature but also at identifying promising future research directions into innovation-driven HRMP.*
***Keywords:** human resources management, human resources management practices, innovation, innovation-driven, integrative framework, systematic literature review, thematic gaps, emerging research directions*

INTRODUCTION

Innovations are perceived as a driving force for the development and growth of the organization (Olavarrieta & Villena, 2014; Vila et al., 2014). Innovations are a key driver of creating and maintaining a competitive advantage, performance, and delivering business value over the long term (Chen et al., 2019). There is a lot of evidence that an organization can speed up the process of creating an organization, that it should mobilize its employees and take care of their well-being (Bieńkowska et al., 2022). It is emphasized that "people, not products, are an innovative company's major assets" (Gupta & Singhal, 1993, p. 41). It is not surprising that human resource management (HRM) is becoming increasingly important in innovation (Seeck & Diehl, 2017). HRM refers to "the management of work and people towards desired ends, and is a fundamental activity in any organization in which human beings are employed" (Boxall et al., 2007, p. 1).

Recently, the discussion on the importance of HRM for innovation has been intensified (Easa & Orra, 2021), emphasizing the role of human resources management practices (HRMP) understood as "recruiting a selection, training and development, performance evaluation and compensation" (Kianto et

al., 2017, p. 12). Despite the importance of HRMP for innovation, there is little research in this area (Olavarrieta & Villena, 2014). So far, considerations have focused on high-performance work practices, particularly motivating and engaging employees to create innovations, the importance of employing staff, and their mobility and composition (Ng & Dastmalchian, 2011) for creating innovation. Moreover, innovation-driven HRMP is considered a black hole (Seeck & Diehl, 2017) and one of the least explained organizational phenomena, and the need to support future research is postulated (Easa & Orra, 2021; Jotaba et al., 2022).

Apart from the above, one has to remember that although systematic reviews and meta-analyses of innovation-driven HRMP are published (Easa & Orra, 2021; Jotaba et al., 2022), they have limitations in terms of knowledge consolidation and integration. For example, Seeck and Diehl (2017) reviewed the empirical evidence on the impact of human resources management practices on innovation that was published between 1990 and 2015. However, the researchers focused on systematizing previous empirical research results, but did not propose future research directions. In turn, Koster's review (2019) concerned innovative HRM. Its limitation referred to the literature on the subject that was selected on the basis of only one database, such as the Web of Science. In addition, it was a traditional literature review that lacked accuracy and verifiability (Tranfield et al., 2003). In turn, Easa and Orra (2021) reviewed 31 empirical publications published from January 2003 to December 2018 in 18 highly rated journals with a documented history and impact on human resources management research using the following databases: Academy of Management, Sage, Wiley, Taylor and Francis, Science Direct, Oxford Academic and Emerald. The authors focused on checking how human resources management and innovation are related to each other. In turn, using bibliometric analysis, Jotaba et al. (2022) determined the current state of knowledge and research trends in HRM adopting innovative practices. At the same time, the researchers used only one Web of Science database, while the searched keywords were "innovation" and "human resources management." That narrowing resulted in omitting potentially significant publications in other databases and involving HRMP.

Therefore, an additional argument for providing further findings in the innovation-driven HRMP seems evident. The COVID-19 pandemic unleashed and intensified new and enormous challenges for management in terms of the need to go beyond traditional HRM practices (Ngoc Su et al., 2021) and redefining trends in those practices (Przytuła et al., 2020) towards more creativity, flexibility, and agility (Hamouche, 2021). Which is more "due to the COVID-19 pandemic and its destructive effects on communities and limited organizational resources, sustainable human resource management

with the long-term development of human resources from consumption to development is important and the concept of human resource management, organizational value, and organizational strategies should be reviewed with a focus on the health of employee and workplace, employees' participation, collaboration and development, flexibility, compliance with labor regulations, justice and equality" (Azizi et al., 2021, p. 7).

Overall, while reviews of research on innovation-driven HRMP are available, a complete review of previous research in this area is still insufficient. In addition, the COVID-19 pandemic intensified the need for organizations to look for new ways to maintain business continuity and create innovations based on HRMP (Bieńkowska et al., 2022). In response to the identified gaps, this literature review offers an extended and comprehensive summary of existing knowledge in the field of innovation-driven HRMP. The aim of the current research is to identify and synthesize the most significant and trustworthy research contributions of innovation-driven HRMP. "Drivers" in this article are understood as antecedents, outcomes, and other mechanisms like moderators and mediators (Dani & Gandhi, 2022). We focus on answering the following three questions:

RQ1. What are innovation-driven HRMP?
RQ2. What is the current state of research on innovation-driven HRMP?
RQ3. What are the emerging research directions on innovation-driven HRMP?

This systematic review of the literature differs from the previous ones in several respects, which at the same time contribute to the existing literature in the field of HRM and innovations. Firstly, the literature on innovation-driven HRMP was collected through the two credible databases, Web of Science and Scopus, based on comprehensive journal coverage for the business field (Kumpulainen & Seppänen, 2022). This made it possible to organize existing knowledge and identify cognitive gaps in the field of innovation-driven HRMP. Secondly, the review of the literature allowed for obtaining a deductively developed integrative framework that synthesizes and organizes existing knowledge about innovation-driven HRMP. In particular, the framework integrates the identified innovation-driven HRMP into a comprehensive approach that takes into account the link between HRMP and innovation, antecedents, mediators, moderators, and outcomes in this relationship. In addition, this framework will prove useful in identifying research directions into innovation-driven human resource management practices. Taken together, our findings provide recommendations and pathways for future

research to gain a more comprehensive understanding of innovation-oriented human resource management practices.

The remaining part of the article is organized as follows. The second section presents the theoretical background. The third section describes steps taken to perform a systematic review of the literature. Section four presents the results of our review. Section five focuses on discussing the results. The last section in this article contains final considerations and directions for future research.

THEORETICAL BACKGROUND

Innovations have been the subject of lively debate in the academic literature for several years (Chen et al., 2019; Volberda et al., 2013). Scholars have studied innovation from different perspectives, resulting in multiple definitions (Chen et al., 2019). However, despite this, there is some confusion in terms of conceptualization. In particular, there are attempts to combine innovation with creativity (Tang, 2017). In this approach, creativity is a source of innovation, which in practice means that the organization's use of the ideas and suggestions of its employees can contribute to generating new ideas or improving existing ones.

The innovation findings so far focus mainly on drivers of innovation. It is emphasized that creating innovation requires various factors. In particular, attention was paid to, inter alia, investments in research and development, government institution involvement, social capital, intra-organizational networking of employees, civic culture, interpersonal trustworthiness, control, organizational ethical code, organizational support, co-decision and risk-taking by employees, employee motivation, information and communication technologies (Kraśnicka et al., 2016). It is increasingly emphasized in the literature that drivers of innovation should be considered from the micro perspective (Weiss et al., 2022). Moreover, it is stressed that human resources management significantly contributes not only to the development of skills, motivation, commitment, employee satisfaction, compatibility of employees, organizational identification, civic behavior, organizational justice, a decrease in employee turnover, and an increase in organizational flexibility and performance, but also to creating innovations (Weiss et al., 2022).

Recent findings also point to the importance of HRMP for innovation (Ferrarini & Curzi, 2022). Generally, HRMP focus on four strategic organizational activities such as (1) recruiting and selection, (2) training and development, (3) compensation, and (4) performance appraisal (Kianto et al., 2017):

- recruitment refers to the act of finding a pool of candidates who are willing and able to be hired by an organization. Selection, on the other hand, is the process of the organization selecting the most suitable and qualified candidate from a group of candidates for a specific position;
- training refers to a systematic and planned instructional activity that promotes employee learning towards improving their knowledge, skills and competences. Development, on the other hand, is related to activities related to the provision of training or other forms of education that can contribute to stimulating, growing or realizing the potential of a given person;
- compensation refers to the remuneration given by an organization to a person in return for their work;
- performance appraisal refers to the systematic evaluation of employee performance and performance.

Despite the intensity of research on the importance of HRMP for innovation (Easa & Orra, 2021; Jotabá et al., 2022), it is still postulated to provide further findings in this regard, in particular in the context of new HRMPs, antecedents, moderators and mediators relevant to innovation-driven HRMP (Seeck & Diehl, 2017). This is important because the creation of innovations is related to various decisions made by the management staff, which in particular should be directed at the "human side of innovation management" (Weiss et al., 2022, p. 238), i.e., all activities which could stimulate employees to search for and generate ideas for improving existing or generating new products and services.

METHODOLOGY

In order to identify the current state of knowledge and future research direction, we decided to use the methodology of a systematic literature review (Tranfield et al., 2003). The choice of this methodology was dictated by the fact that it offers robust tools to be used while identifying, selecting, critically evaluating and synthesizing the existing literature in a rigorous, transparent, and repeatable way. Furthermore, a systematic literature review provides opportunities to draw robust conclusions about what is known and what is unknown in a given research area. Moreover, the transparency of the procedure allows for reducing bias and potential errors resulting from the subjectivity of researchers and it enables comprehensive, objective identification and evaluation of a variety of literature. It also allows for evolving knowledge on a given topic through the analysis, collecting and

synthesizing information, and determining research directions. In addition, a systematic literature review is recommended when researchers want to provide a framework that integrates existing knowledge in a given field. Finally, systematic literature reviews are not only recommended (Kraus et al., 2022), but also used in the latest research published in leading and significant management journals in various research areas, also related to innovation and human resources management (Belte, 2022).

Our systematic literature review consists of the following three steps: (1) formulation of research questions and development of the review protocol, (2) conducting a systematic literature review through the identification of the most significant and trustworthy research contributions of innovation-driven HRMP, assessment of their significance, analysis and synthesis, and (3) reporting of results (Kraus et al., 2022).

Search strategy

According to the methodology of a systematic literature review, it is necessary to develop clear research questions at the beginning. During their development, we focused on existing literature reviews on innovation-driven human resources management practices (Easa & Orra, 2021; Jotaba et al., 2022; Seeck & Diehl, 2017). Therefore, the purpose of our systematic literature review is to identify and synthesize the most significant and trustworthy research contributions of innovation-driven HRMP. The approach we adopted resulted from the desire to complement the findings of other researchers, not to copy them. The questions were formulated through a dialogue between the authors and recognition of the current state of knowledge in the field of HRMP. Based on this process, we proposed three research questions (Table 1).

Table 1. Research questions of a systematic literature review

Research question	Justification
RQ1. What are innovation-driven HRMP?	Determining the most common innovation-driven HRMP in the literature
RQ2. What is the current state of research on innovation-driven HRMP?	Determining the current state of knowledge on innovation-driven HRMP. Understanding of conceptual and methodological considerations. The main findings from the literature were collected using an integration framework.
RQ3. What are the emerging research directions on innovation-driven HRMP?	Establishing recommendations for future researchers in the field of innovation-driven HRMP

Selection of studies

In accordance with the systematic literature review procedure, inclusion criteria that allowed us to determine and identify all the potentially relevant publications to answer our research questions were proposed. We considered the works of Easa and Orra (2021), Jotaba et al. (2022), Seeck and Diehl (2017), and established search boundaries, search strings, and timeframes for searches. Firstly, within the scope of the search, we chose two international electronic databases, Web of Science and Scopus. The choice of those databases was dictated by their robustness, extensiveness, and convenient interface (Singh et al., 2021). Google Scholar was not used for searches. This approach resulted from the fact that "Google Scholar does not support many of the features required for systematic searches (…) Google Scholar's coverage and recall is an inadequate reason to use it as principal search system in systematic searches" (Gusenbauer & Haddaway, 2020, p. 211). Secondly, with regard to search strings, we assumed that our searches would be aimed at full-text, English-language, peer-reviewed empirical articles to confirm methodological rigor, avoid double counting of existing literature reviews, and maintain the level of internationalization. In addition, English is the academic *lingua franca* and the language in which 75-90% of publications in the field of management science are published (Rhaiem & Amara, 2021). Thirdly, in order to capture all the literature, we did not limit our search to a specific period, while the stopping point of our review is November 2022.

In order to identify the most relevant publications for our research questions, we imposed several exclusion criteria. Firstly, existing literature reviews, books, book chapters, conference proceedings, reviews, and editorial introductions were excluded. This approach results from the recommended practices used in systematic literature reviews (Klang et al., 2014). Secondly, we excluded articles that were not available in English, which resulted from the desire to create shared scholarly knowledge and existing practices in systematic literature reviews (Kraus et al., 2022). Thirdly, we limited our searches to the following category "business, economy, and management," which results from the challenges of researchers to supplement knowledge in the field of innovation-driven human resource management practices in the context of management science. Fourthly, we eliminated duplicate articles in individual databases.

Before starting the search, a search strategy was developed to identify the maximum number of relevant publications important to the research questions. Firstly, we formulated keywords related to the topic. While selecting them, the need to strike a balance between the degree of exhaustion and

precision was taken into account. Then, like Easa and Orra (2021), Jotaba et al. (2022), Seeck and Diehl (2017), we assumed that the search would cover the "terms" fields. We assumed the following search string using the "AND" and "OR" search operators:

TITLE-ABS-KEY (("innovation" AND "human resource management practices")). An initial search based on inclusion criteria and taking into account this search string resulted in 3,361 hits (Web of Science – 184; 3,177 – Scopus).

In accordance with the methodology of a systematic literature review (Tranfield et al., 2003) we imposed the adopted inclusion and exclusion criteria on the obtained initial search results. This way, we excluded 2,477 articles. Then we proceeded to evaluate the titles and abstracts of the collected articles. This step was carried out independently by two independent researchers in order to mitigate the potential effects of researcher subjectivity. After the analyses, the researchers met to compare the search results and reconcile any differences or concerns (Papaioannou et al., 2010). The goal here was to identify all possible studies that could shed light on the topic under discussion. That way, we excluded 1,765 articles that did not concern the issues of innovation-driven HRMP. We then identified duplicates, which allowed us to exclude a further 68 articles. Finally, in order to identify all possible relevant studies that were strictly related to the research topic, we read the full text of all the collected articles. On this basis, we excluded 3 concept articles and 2 articles that were not published in English. Only a thorough reading showed that they were of a theoretical nature and were published in Spanish. This resulted in 71 articles that met all the inclusion criteria. In addition, we performed a manual literature search using the Google Scholar search engine to ensure that we did not exclude any relevant articles. This step did not result in the delivery of additional articles. Figure 1 illustrates the detailed results of the subsequent selection steps.

Data extraction is designed to identify the relevant information that needs to be extracted from each article to answer research questions. At this stage, the obtained articles were distributed between two researchers. Each of them separately performed a manual analysis of the content using an extraction form taking into account the following points: authors' data, year of publication, country, journal, keywords, purpose, research methods, levels of analysis, subject areas, key findings, and recommendations. This allowed us to establish the general nature of the existing literature and to synthesize the most significant and trustworthy research contributions of innovation-driven HRMP.
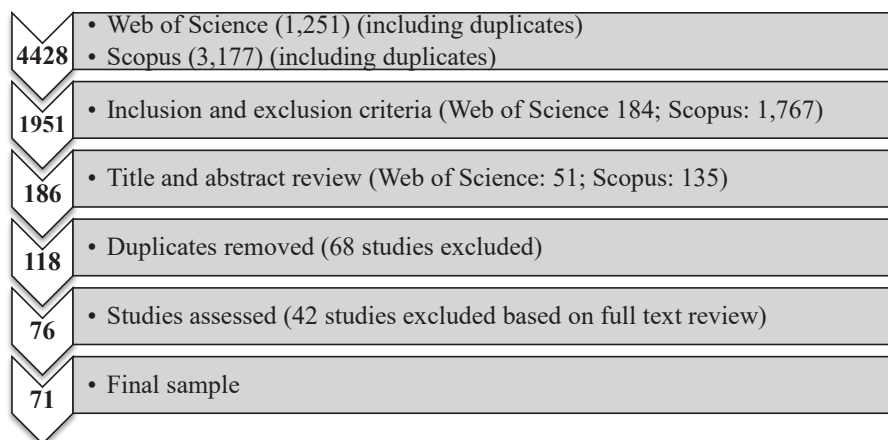
Figure 1. Literature search strategy

Data analysis

The analysis of the collected material was carried out in two ways. In order to reveal the structure and dynamics of a specific issue in the literature and to determine the frequency of occurrence of specific features in publications, one of the bibliometric techniques, i.e., frequency analysis, is used. Bibliometric techniques, like a frequency analysis, are one of the most commonly used methods of measuring the occurrence of specific features (Zupic & Čater, 2015). In order to identify recurring themes in the literature, a thematic analysis with deductive coding was carried out. The topic was understood as HRMP involving (1) recruiting and selection, (2) training and development, (3) compensation, and (4) performance appraisal (Kianto et al., 2017). With regard to deductive coding, all 71 identified publications were analyzed and grouped according to the innovation-driven HRMPs indicated in the literature. Thematic analysis is a method often used to analyze qualitative data and, due to structured approaches to data processing, it allows you to summarize key features of a large data set (Braun & Clarke, 2006; Nowell et al., 2017).

FINDINGS

This section presents the systematic review's results, which are divided into two parts. Firstly, the findings of the frequency analysis were presented particularly including the general characteristics of the selected studies (publication trend, geographic localization of authorship, place of publication,

research methods, and industry concentration). Then, the results of the theme analysis related to the current state of knowledge about innovation-driven HRMP were presented. On this basis, an integrative framework was developed, the purpose of which is to synthesize and organize existing knowledge about innovation-driven human resource management practices.

Frequency analysis

The time horizon of the research

As shown in Figure 2, the number of HRMP publications is relatively small. It is worth noting that the first publications in this field began to appear in 2010. We noticed that the number of articles in this area has been increasing since 2015. In 2021, however, we see a slight decrease in publication (10 articles). Although research on innovation-driven human resources management practices has been carried out for 12 years, the issues are still up to date. As the results show, the output is constantly growing exponentially: in 2010 – 1 publication, and 10 years later – 16 (2020). It can be considered that the analyzed area of research is at the so-called "maturing" stage, which means that researchers supplemented their knowledge with new contexts and levels of analysis, but it is still important to conduct further research in this area.
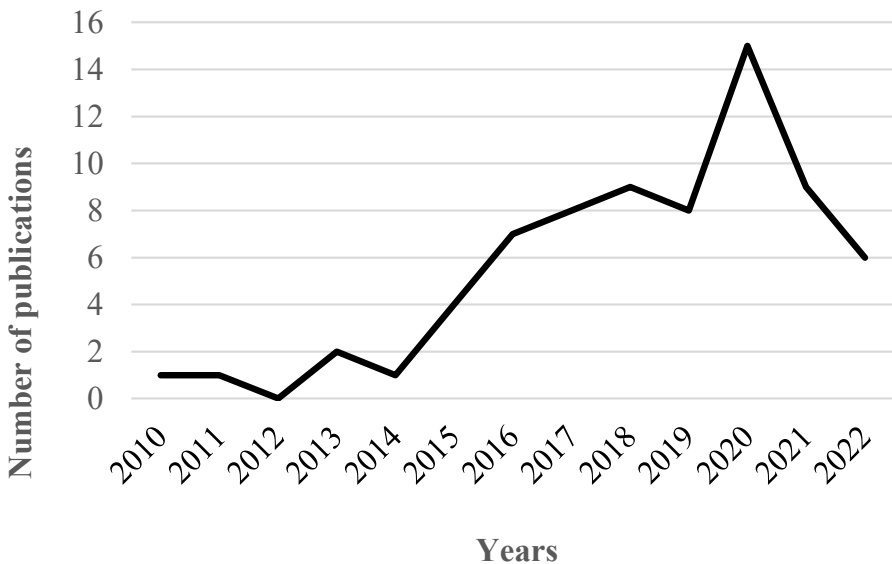
Figure 2. Publication trend

Place of publication

Our results show that the articles were published in different journals. In total, the articles were published in 55 different journals. However, only in five cases were 2 to 6 articles published. Table 2 presents a list of journals in which more than 1 article was published.

Table 2. List of journals in which more than 1 article was published

No.	Journal name	Number of articles	Publication date	Impact Factor	H-index
1.	Employee Relations: The International Journal	6	2014, 2015, 2018, 2020	2.688	57
2.	Personnel Review	3	2017	3.228	77
3.	Strategic Management Journal	3	2017, 2018, 2019	8.641	300
4.	Problems and Perspectives in Management	3	2016, 2019, 2021	b/d	23
5.	Human Resource Management, Advancing Human Resource Research and Practice	2	2016, 2019	6.235	100

Place of publication analysis shows that the vast majority of them are published in high-ranking journals. More precisely, 66.19% (47 articles) of the analyzed publications were published in leading journals placed in the following rankings: Academic Journal Quality Guide (with the highest rating of 4*, a journal of the world's elite) and the Australian Business Deans Council (with the highest rating of A*, the best or a leading journal in its field). This shows that the issues of innovation-driven HRMP are not only important but also significant in the international scientific circulation.

As a result of the analysis, the five most frequently cited articles were selected (Table 3), with the most frequently cited article on the issues of innovation-driven human resource management practices being "Knowledge-based human resource management practices, intellectual capital and innovation" (Kianto et al., 2017) published in the Journal of Business Research. The journal has an Impact Factor of 11.06 and an H-index of 217. Considering the citation measurement of this publication, it may be included in the group of seminal studies, i.e., those that are repeatedly quoted by other authors and that have some impact on the issues of innovation-driven HRMP. It is worth noting that other publications also have an impressive citation measurement.

Table 3. Five most cited articles

No.	Article title	Author/ authors	Publication year	Journal name	Citation measurement
1.	Knowledge-based human resource management practices, intellectual capital and innovation	Kianto et al.	2017	Journal of Business Research	632
2.	Promoting innovation in hospitality companies through human resource management practices	Chang et al.	2011	International Journal of Hospitality Management,	400
3.	Improving innovation performance through knowledge acquisition: the moderating role of employee retention and human resource management practices	Papa et al.	2018	Journal of Knowledge Management	330
4.	How do high performance work systems influence organizational innovation in professional service firms?	Fu et al.	2015	Employee Relations: The International Journal	237
5.	Human resource management practices and organizational innovation: An empirical study in Malaysia	Ling & Nasurdin	2010	The Journal of Applied Business Research	199

Geographic localization of authorship

The results of our review show that 214 authors come from 71 university organizations from 71 countries. Based on the first author's affiliation, authors from United Kingdom contributed the largest number of publications. There are also significant contributions from Spain and the Netherlands (Figure 3). Despite the large number of countries, 11.27% of articles were published by a single author or team from one country. On the other hand, 26.76% of the publications were written by two authors, and 61.97% from three or more countries. Our finding shows that only a fraction of research on innovation-driven human resource management practices includes research conducted by international teams (15.49%). When analyzing the regions the authors come from, taking into account their affiliations, most of them come from Europe (65.11%), then Asia (16.28%), Australia (6.98%), North America (4.65%), South America (4.65%) and Africa (2.33%).
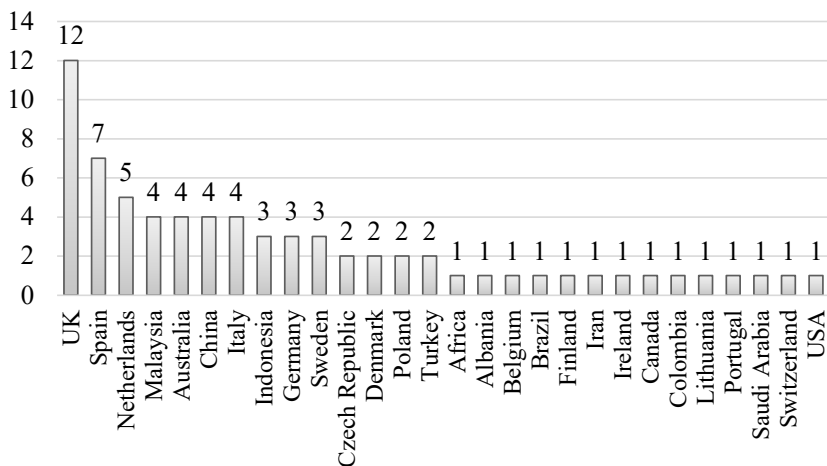
Figure 3. Geographic localization of authorship

Industry concentration

Articles in this literature review indicate that innovation-driven HRMPs are explored across industries. In general, this was empirically analyzed in several studies but limited in terms of research contexts. This issue was examined in the context of dynamic and complex industries, including manufacturing (Rajiani et al., 2016; Para-Gonzalez et al., 2018), automotive (Mazurchenko & Zelenka, 2022), start-ups (Jebali & Meschitti, 2020), IT (Mauro et al., 2020). In addition, the research was conducted in small and medium-sized enterprises (Llinas & Abad, 2020; Parwita et al., 2021; Sun & Mamman, 2022). Few studies were focused on catering (Chen et al., 2015) and hospitality (Chang et al., 2011). Interestingly, one of the articles covered the agricultural sector (Litwin, 2013).

Research methods

The researchers used a variety of methodological approaches (Table 4). The quantitative methodology was most often used (59.15%), followed by the qualitative methodology (38.03%). In relation to quantitative techniques, they involved survey questionnaires (57.75%), and in the case of qualitative techniques – single case studies (25.35%). With regard to data analysis techniques, regression analysis was used most frequently (35 publications, 49.30%). Other techniques included structural equation modeling (24 times, 33.80%) and correlation analysis (12 times, 16.90%). In addition, researchers also used a mixed methodology (2.82%). In particular, the

latter is recommended for research on innovation-driven human resource management practices (Becker & Matthews, 2005). The combination of qualitative and quantitative methods can contribute to a better understanding of the analyzed issues (Fetters & Molina-Azorin, 2017).

Table 4. Methodologies used in the analyzed articles

Method	Number of articles
Quantitative research methods	42
Survey questionnaire	41
Experiment	1
Qualitative research methods	27
Case study	18
Interviews	9
Mixed studies	2

Theme analysis

The theme analysis carried out in this literature review allowed us to identify innovation-driven HRMP on the following three levels: individual, group and organizational. The individual level includes employees, their commitment or satisfaction, and the act of giving meaning to individual activities, through innovation-driven character. At the group level, cooperation and other activities focused on the synergy effect, allowing for the creation of a new quality, are gaining importance. Finally, actions aimed at creating a common vision and ensuring strategic leadership are indicated at the organizational level. Most of the articles analyzed innovation-driven human resources management at the organizational level (61.97%, 44 publications), then at the individual level (22.54%, 16 publications). In turn, among the sample, the least attention was paid to innovation-driven HRMP at the team level (15.49%, 11 publications).

Innovation-driven HRMP: Individual level

The literature emphasizes that practices that are oriented at stimulating employees, maximizing the use of their potential and their knowledge and skills are of great importance for innovation (Castellacci et al., 2018). In particular, attention is paid to various training programs that strengthen employees' capabilities, which are important for creating organizational innovations (Lu et al., 2015). This means digital competence (Mazurchenko & Zelenka, 2022) that refers to knowledge, skills and attitudes towards the use of digital tools

and solutions by employees. For example, Mazurchenko and Zelenka (2022), analyzing organizations from the automotive industry in the Czech Republic, concluded that the widespread use of digital technologies could definitely contribute to enhancing digital competences of employees, and thus to generating the potential for innovation. Additionally, researchers find that employee retention increases the organization's ability to innovate (Papa et al., 2020). On the other hand, Ling and Nasurdin (2010) found that employee training increased the ability to create innovations. In addition, they found out that employee performance appraisal positively impacted administrative innovation, as it could serve as a guide to shaping and motivating employees to maximize their efforts towards achieving organizational goals. Contrary to expectations, the researchers concluded that the reward system had a negative impact on product innovation.

Innovation-driven HRMP: Group level

In the case of the group level, the literature indicates the importance of innovation in creating teams in the organization. Although the least explored, a stream of research focuses on the performance of multifunctional teams (Andrés et al., 2015; Deichmann & Jensen, 2018), skunkworks (Oltra et al., 2022), team dynamics (Belitski & Herzlg, 2018), their agility (Gras et al., 2020), self-management (Khanagha et al., 2021), diversity (Zouaghia et al., 2020), intergenerational teams (Říhová et al., 2019) and their importance for creating innovation. For example, Andrés et al. (2015) state that self-management teams as non-hierarchical groups of people with different and complementary experiences and knowledge are important for creating innovations. However, Oltra et al. (2022) think that skunkworks is creative and effective. Moreover, the covert activities of skunkworkers can create a new organizational context that emphasizes creativity and problem solving. In turn, Jones et al. (2021), based on research in the pharmaceutical industry, conclude that the cultural diversity of employee teams positively impacts innovation teams. To create innovations, cultural awareness of team members is important. The importance of self-managed work teams was also pointed out by Khanagha et al. (2021). They found that the stimulation of innovation by organizations required reorganization around self-managed work teams with diverse skills and knowledge with collective autonomy and responsibility for planning, managing, and performing tasks in an interdependent manner. In turn, Říhová et al. (2019), state that cross-generational creative teams increase the innovation potential of organizations. Different conclusions were reached by Zouaghia et al. (2020). After conducting their research in organizations with research and development departments in their

structures, they concluded that too much diversity of teams could reduce innovation and had a negative impact on the quality of decision-making and member involvement.

Innovation-driven HRMP: Organizational level

The literature indicates that the acquisition and employment of talented employees can contribute to the creation of an environment conducive to the creation of innovations of Hayton (2005). In the same way, several scholars argued that the selection of the right candidate for a specific position should be linked to innovation (Diaz et al., 2015). This is in line with several authors' findings that effective selection increased an organization's chance of creating innovation (Jiang et al., 2012). In addition, Nedumaran and Rani (2021) encourage the use of technology in human resources management called E-HRM to enhance more flexible HR practices more accurately and effectively, facilitate tasks, and transform communication and behavior at work and in life – ultimately contributing to create innovations. An example is provided by e-recruitment, where candidates can apply online on bulletin boards, which provide a database that allows them to search, browse and filter applications for an interview.

The literature emphasizes that compensation alone is not sufficient for innovation (Sheppeck & Militello, 2000). The system of rewards, which consists of interrelated tangible and intangible mechanisms that are a distinction or recognition for the employee for his achievements, is gaining importance. In this perspective, the reward system can be a tool to attract or retain innovative people in the organization and stimulate and encourage employees to create innovations (Sheppeck & Militello, 2000). As Smith (2018) states, based on the research conducted in a call center, the involvement of employees in the innovation process is what increases the organization's ability to shape innovation in the future.

Human resources management practices aimed at improving employee satisfaction are also of great importance, which is confirmed by the findings of Chen et al. (2015). Based on research conducted in a chain of Chinese restaurants, researchers conclude that it is important to develop an incentive system for employees, offering a competitive salary, showing employees that they are respected and appreciated, and providing rewards related to their performance. All this can translate into employee satisfaction and further innovation. Others emphasize the importance of creating innovations in employees' perceptions of the workplace. After researching telecommunication companies, Santoso and Furinto (2019) found that a friendly workplace helps to develop employees who are more tolerant to accept novelties or

failures, and more able to overcome difficulties in the pursuit of innovation. This is confirmed by the findings of Renkema et al. (2022), who state that an unfavorable working environment can be a barrier to innovation in an organization. In addition, according to Gupta and Shaw (2014), the possibility of internal promotion intensifies the creation of innovations.

Repeatedly in the literature, researchers have emphasized the importance of high-performance work practices for innovation (Murphy & Southey, 2003), which increases employees' motivation, commitment, sense of autonomy and skills. They focus on predefined human resources management policies and practices towards creating innovation (Fu et al., 2015; Rasheed et al., 2017). For example, Rajiani et al. (2016) point to green human resources management, which increases the well-being of employees and sustains the group community.

The literature shows that performance appraisal is considered to be one of the most important HR practices in the context of innovation (Andreeva et al., 2017). This potential results from the fact that feedback provided to employees can encourage them to certain behaviors, intensify the willingness to share knowledge and increase their internal motivation to search for, generate and deliver innovative ideas. In addition, it is indicated that performance-oriented feedback positively affects employees' job satisfaction, thus increasing their involvement in creating innovation (Kampkötter, 2016). In this view, when employees receive feedback, they will feel obligated to reciprocate by providing new information and ideas that may be relevant to creating innovations. However, the mere design and application of performance appraisal may not always generate innovation. This potential is only possible when employee performance evaluation is developmental and focused on discovering new ways of doing things. This can help employees manage mistakes and see them as an opportunity to learn, share knowledge, and generate new ideas without fear of being penalized if the desired results are not achieved (Bednall et al., 2014). In addition, performance appraisals must be understandable and unambiguous, which comes down to their compliance and stability in relation to all employees.

Lastly, many researchers also point out that management is important not only for the adoption of innovative practices, but also for improving the efficiency and results achieved by employees (Fu et al., 2015; Sun & Mamman, 2022). Research conducted by Jebali and Meschitti (2020) in Tunisian start-ups showed that it was important for management to provide a work environment that supports innovation in organizations. Finally, management should strive to strengthen the relationship between employees (Meacham et al., 2017).

Despite the importance of leadership, some researchers like Contreras et al. (2017) conclude that leadership alone is insufficient to promote employees to innovative behavior at work. The absorptive capacity and involvement of employees in work are important, which directly impact innovative behavior at work and further the creation of innovations. In addition, the organizational climate has a moderating effect on the creation of innovations. However, the role of management is to encourage employees to be innovative at work. Automation of business processes in the field of human resources and information management are becoming important factors in the effectiveness of the organization and the initiation of innovative processes. This was pointed out by Bilevičienė et al. (2015). Additionally, researchers find that employee retention increases the organization's ability to innovate (Papa et al., 2020).

Antecedents of innovation-driven HRMP

Antecedents refer to factors preceding and triggering a specific action. Earlier research indicated many antecedents of innovation-driven HRMP. They can be divided into external and internal.

External antecedents refer to the conditions in which organizations operate, such as the labor market, environmental dynamism, and institutional isomorphism. The labor market related to labor supply and demand is important in the context of recruiting employees in accordance with the needs of the organization. In the case of low labor supply, the organization may have difficulties in acquiring talents or employees with innovative capabilities. With regard to innovation-driven HRMP, environmental dynamism gains in importance, which refers to the pace and unpredictability of changes in the organization's environment (Kim & Ployhart, 2014). This intensifies the need to recruit employees with unique, distinctive skills, but also to increase their autonomy and involvement in the organization's affairs. Institutional isomorphism refers to the mechanisms that allow an organization to gain legitimacy in terms of funding obtained from institutional bodies. They may take the form of coercion or incentive. For example, in order to obtain funds for innovation, an organization is obliged to meet certain conditions referring to e.g. specific social practices or employment status.

With regard to internal antecedents, previous research identified organization characteristics, industry affiliation, employee turnover, organizational strategy, unions, and consulting firms. It was pointed out in the literature that one of the antecedents was the size and type of organizations. A greater need for innovation-driven human resource management practices may be noticed by organizations with foreign capital, capital companies,

and industries that operate in strategic uncertainty and technological change. This also applies to organizations operating in knowledge intensive industries, those that cooperate with various groups of stakeholders and competitive environment. Moreover, the adoption of new technologies by the organization is gaining importance for innovation-driven HRMP (Neirotti & Paolucci, 2013). The literature indicates that employee turnover may become the cause of innovation-driven HRMP. That way, organizations will strive to mitigate the effects of employee turnover, but also to mitigate the possible dissatisfaction of their employees and prevent further turnover. In addition, a flexible, decentralized, informal, highly integrated organizational structure intensifies the HRMP towards innovation (Laursen & Mahnke, 2001). Workgroups, delegation of responsibility, and integration of functions are important here. Organizational strategy is also important for innovation-driven HRMP. The literature emphasizes that the use of knowledge-based and innovative strategies is an important antecedent. Additionally, unions can be antecedents of HRMP. They aim at improving the working conditions of employees, their participation opportunities, and improving their competences. Some research shows that unions are related to innovation (Berton et al., 2021). In this perspective, stable employment conditions may make employees more willing to search for and generate new ideas or solutions. And finally, the organization's use of external advice from consulting companies may be an antecedent of innovation-driven HRMP.

Mediators of innovation-driven HRMP

Mediators refer to factors that can facilitate or hinder the creation of innovations using driven human resources management practices. A systematic literature review identified fourteen mediators that related to individual ambidexterity, innovative work, employee creativity, organizational citizenship behavior, innovation capability, supportive work environment, adaptive capability, creativity organizational climate, organizational culture, organizational learning, knowledge management capacity, absorptive capacity, human and social capital, and organizational learning capability.

Individual ambidexterity

Individual ambidexterity refers to the simultaneous exploration and exploitation of resources and knowledge. Creating innovations using the knowledge and skills of employees can be enhanced by the simultaneous exploitation and exploration of knowledge. In this approach, it is possible to use the existing

knowledge and search for new approaches in order to meet the client's needs and respond to the challenges of the environment (Malik et al., 2017).

Innovative work behavior

Innovative work behavior is defined in the literature as a set of employee behaviors that are oriented towards identifying problems or opportunities, searching, generating ideas, promoting them, and popularizing, financing, and developing implementation plans (Yuan & Woodman, 2010). At the same time, innovative work behavior also requires specific strengthening actions; hence, the literature mentions mediators of innovation-driven HRMP in that context (Sanz-Valle & Jiménez-Jiménez, 2018). All this encourages employees to take innovative actions, which can contribute to the creation of innovations. In addition, the importance of middle managers' innovative behavior is emphasized (Chen et al., 2018).

Employee creativity

Employee creativity refers to personal characteristics related to creating new and useful ideas and analyzing problems (Zhou & Shalley, 2004). According to findings by Jiang et al. (2012), employee creativity mediates the relationship between HRMP and innovation. In this view, when employees perceive that the organization values them, they reciprocate and provide for the implementation of new products, services, organizational processes, and procedures. Moreover, creativity of employees can strengthen the importance of HRMP for innovation.

Organizational citizenship behavior

Organizational citizenship behavior (OCB) refers to "individual behavior that is discretionary, not directly or explicitly recognized by the formal reward system, and that in the aggregate promotes the effective functioning of the organization" (Organ, 1988, p. 4). Generally, OCBs help employees cope with uncertainty, environmental change and scarcity of resources, which consequently allows the organization to increase its ability to adapt to changes in its environment. Moreover, OCB allows an organization to increase its potential for collaboration, which benefits innovation (Naqshbandi et al., 2016).

Innovation capability

Innovation capability refers to the "ability to continuously transform knowledge and ideas into new products, processes, and systems for the

benefit of the firm and its stakeholders" (Lerro, Linzalone & Schiuma, 2009, p. 11). The literature indicates that building innovation capability is related to the organizational context, in particular, feedback provided to employees by the management and the development of employee competencies (Ma Prieto & Perez-Santana, 2014). In this sense, the implementation of effective HRMP can contribute to the development of employees' competences, their motivation, which drives the formation of innovation capability and ultimately leads to the creation of innovations (Farooq et al., 2016).

Work environment

There is general agreement in the literature on the importance of the work environment as an important factor conducive to creating innovation (Ma Prieto & Pérez-Santana, 2014). The work environment refers to employees' perception of organizational support in the development of employee initiatives and innovative behaviors. It is also noted that HRMPs are conducive to the perception of the work environment by employees, which may further affect their abilities, motivation, and generally their performance (Janssen, 2000). In particular, a supportive work environment is gaining in importance, which stimulates the innovative behavior of employees and, consequently, the creation of innovations (Hunter & Cushenbery, 2011).

Adaptive capability

Adaptive capability refers to abilities, which enables the organization to solve problems, respond to customer needs, and identify opportunities in its environment (Wei & Lau, 2010). Adaptive capability encourages the organization to reconfigure resources to take advantage of emerging opportunities and to deal with challenges more effectively. An organization should be able to adapt to new situations by drawing on and developing the skills of its employees. What's more, adaptive capability is a kind of motivator to look for new ways to stand out from the competition and respond to customer needs by providing or improving products or services (Wiwoho et al., 2020).

Creativity organizational climate

Generally, organizational climate refers to "individual cognitive representations of the organizational setting" (Scott & Bruce, 1994, p. 581). The creativity organizational climate is stimulated and promoted by HRMP, which boils down to employees becoming emotionally involved in work, initiating and making decisions, looking for new ideas and willingly taking on

new challenges (Heffernan et al., 2016). Overall, the creativity organizational climate has the potential to support innovation and can act as a mediator between HRMP and innovation. This is because the innovation process in organizations needs to be managed, which requires a climate that will enable employees to innovate.

Organizational culture

Organizational culture refers to values and beliefs that define the very behavior of organization members (O'Reilly & Chatman, 1996). In this perspective, organizations that consider human capital as the most important determinant of innovation are more likely to initiate innovation-driven human resource management practices (Lepak et al., 2007). An organizational culture focused on innovation can encourage risk-taking, employee participation, creativity, and shared responsibility.

Organizational learning

In the literature, organizational learning is defined as a process that includes knowledge acquisition, assimilation, exploration, and exploitation (March, 1991). The literature emphasizes that organizational learning contributes to innovation, but it can be supported by HRMP (Raj & Srivastava, 2013). In particular, practices that increase employee engagement and motivation to share knowledge are essential for organizational learning. In addition, organizations should use incentive systems that will encourage employees to take risks, be flexible, build teamwork, and create, develop, and use knowledge.

Knowledge management capacity

Knowledge management capacity refers to an organizational mechanism of continuous and purposeful acquisition, creation, sharing and application of knowledge in organizations (Von Krogh et al., 2001). As pointed out by Than et al. (2022), it is important for the potential to acquire, share and apply knowledge for innovation-driven HRMP. In this perspective, organizations show a greater ability to develop new insights and opportunities, respond to change, and develop creative ideas and innovations. This is because unique and valuable knowledge (Özbağ et al., 2013) allows organizations to modify the existing one, thus increasing the ability to create innovations.

Absorptive capacity

Absorptive capacity refers to the organization's potential to recognize, identify, assimilate, incorporate and use new knowledge for innovation (Cohen & Levinthal, 1990). The literature indicates that this ability can facilitate the creation of innovations using driven human resources management (Chang et al., 2012). In this approach, employees with specialist knowledge can more effectively search for information in the organization's environment, which increases the organization's potential and the creation of innovation.

Human and social capital

The literature points out that both the knowledge, skills and experience of an employee (human capital) and collective knowledge embedded in relations between employees (social capital) may prove useful in gaining access by the organization to information about new technologies, generating new ideas and creating innovation (Donate et al., 2016). In particular, job design, empowerment, teamwork and incentives intensify the formation of human and social capital, which increases the ability to create innovations.

Organizational learning capability

Organizational learning capability refers to "the capability of an organization to process knowledge – in other words, to create, acquire, transfer, and integrate knowledge, and to modify its behavior to reflect the new cognitive situation, with a view to improving its performance" (Jerez-Gómez et al., 2005, p. 2). HRMP can be important for innovation with the mediating effect of organizational learning capability (Lai & Kwang, 2014). In this perspective, HRMP gains importance as the development of employees' learning skills, remuneration systems that motivate employees to experiment, generate new ideas, inter-team cooperation, and share knowledge (Lepak et al., 2007). All this can contribute to the mobilization of employees to learn, which increases the possibility of shaping knowledge-based resources necessary for creating innovations.

Moderators of innovation-driven HRMP

Moderators refer to factors that influence the direction and/or strength of the relationship between HRMP and innovation. Previous research highlighted several moderators, including environmental dynamism, firm ownership, compensation and benefits, employee creativity, work–family facilitation, and work climate. In this view, Martínez-Sánchez et al. (2011) indicated

that environmental dynamism intensified the creation of innovations using HRMP. The dynamics refer to the pace and unpredictability of changes in the organization's environment, which requires the organization to look for ways to adapt to them. In addition, it increases the need for employee autonomy as well as the development of their skills. Another moderator is attributed to firm ownership (Liu et al., 2017), where privately owned enterprises use a combination of various HRMP to create innovation more often than state-owned enterprises. Other moderators refer to compensation and benefits (Diaz-Fernandez et al., 2017), and they may affect the correlation between HRMP and innovation. In addition to remuneration for work, opportunities for additional financial support or additional fringe benefits, gain importance for innovation. Employee creativity was indicated as a moderator by Liu et al. (2016). Such skills contribute to the recombination of knowledge possessed by the organization, which will allow it to be revised, supplemented and applied to create innovations. Another moderator refers to work–family facilitation (Chen et al., 2018). Lack of work–family conflict may contribute to generating a positive working environment, but also a sense of security in terms of resources, which may intensify the creation of innovations. Research has also shown that work–family conflict limits the innovativeness of employees (Luo et al., 2016), which may lead to a decrease in the quality of their work and reduce the intensity of innovative behavior. The last moderator identified in the systematic literature review refers to work climate (Chen et al., 2018) characterized by trust, collaboration, justice, equality, security and permission to take risks. Thanks to the above, employees will feel involved in the operation of the organization, as well as feeling safe in it and knowing they are responsible for its success.

Innovation-driven HRMP outcomes

The systematic literature review allowed for identifying several outcomes of innovation-driven human resource management practices, which in turn allows for recognising changes that occur in the organization in connection with adopting such practices. According to the literature, HRMPs contribute primarily to organizational performance, but also to technological development, business growth, productivity, and profitability (Schloemer-Jarvis et al., 2022). In addition, according to other researchers, innovation-driven human resource management practices may be important for shaping organizational innovation capability (Engelsberger et al., 2021), introducing changes, supporting strategic decision-making in organizations (Sheehan et al., 2016), building a competitive advantage, or developing the ability to respond to changing customer needs (Falahat et al., 2020).

A synthesis of 71 articles identified in the systematic literature review revealed the innovation-driven HRMP, antecedents, mediators, moderators, and outcomes. Based on the obtained results, an integrative framework was proposed to identify gaps and ambiguities in innovation-driven HRMP (Figure 4).
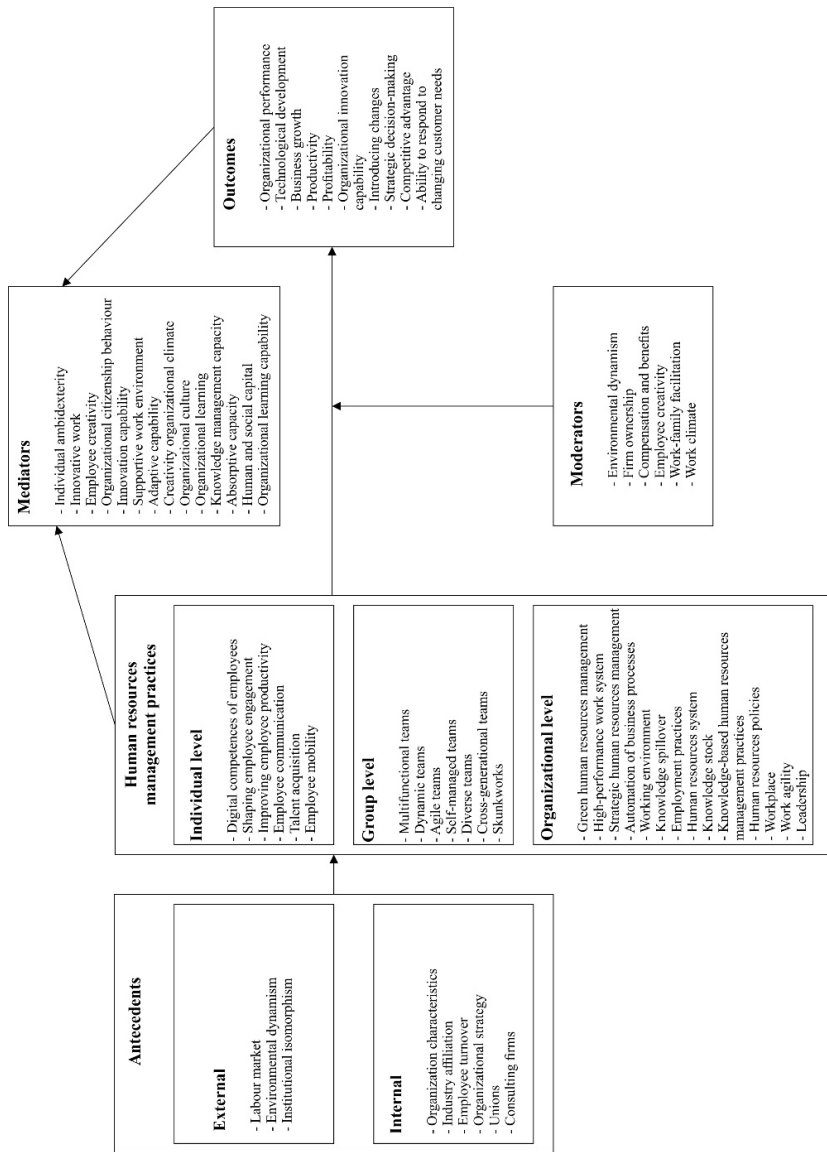
Figure 4. Integrative framework

The framework can also be used too. This framework takes into account the multi-level, innovation-driven approach. HRMP consists of an individual, group, and organizational level. This allows you to understand which of the individual HRMPs are relevant to innovation. Secondly, the framework provides insight into what factors can lead to an innovation-driven HRMP. Both external and internal antecedents are included here. This means that the organization's launch of specific antecedents may be caused by the external conditions in which the organization operates. Internal practices, processes, techniques, and governance structures are also important. Thirdly, the integrative framework includes both factors determining the importance of HRMP for innovation (moderators) and factors mediating this relationship (mediators). Fourth, the framework takes into account the outcomes related to the results or the consequences of the organization's use of HRMP that stimulate the organization to create innovations. These integrative frameworks show that innovation-driven HRMP is a complex process that depends on many factors that act as antecedents, mediating and modifying variables. The combination of these factors allows you to understand complexity of innovation-driven HRMP and their effects.

FUTURE RESEARCH DIRECTION

As the results of the systematic literature review show, there is a large variety of findings in the field of innovation-driven HRMP. However, despite the research intensity in this area, it is still a postulated direction for further research. A systematic review of the literature revealed several gaps that could be suggested as future research directions. In order to present them, the integrative framework was again used, which included challenges for future research on innovation-driven HRMP (Figure 5).

For a more complete understanding of the innovation-driven HRMP, several research gaps were identified through a systematic literature review, providing potential paths for future researchers to conduct their own research (Table 5).
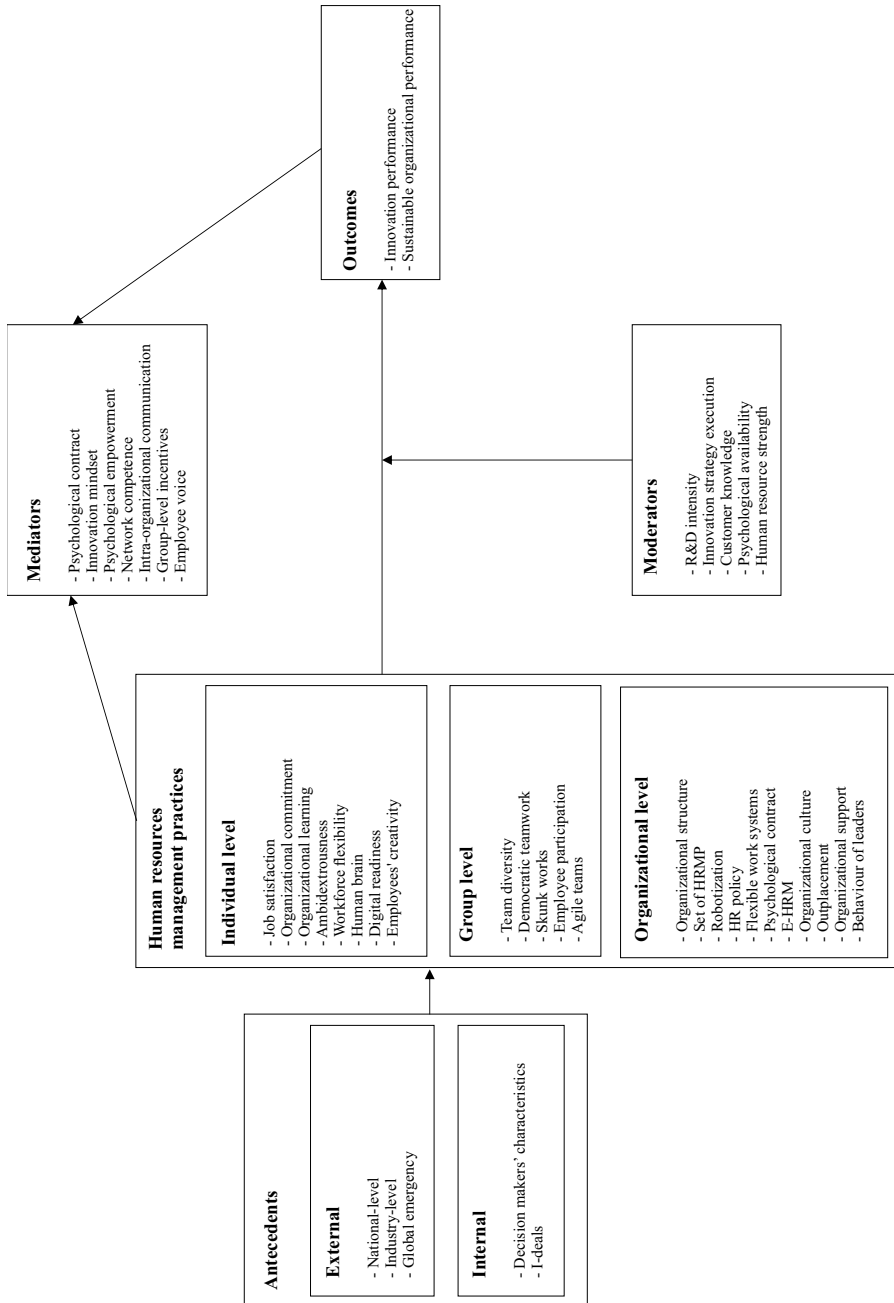
Figure 5. Model of future research direction

Table 5. Thematic gaps and potential questions for future research

Main topic	Cognitive/research gaps	Potential questions for future research
Antecedents of innovation-driven HRMP		
External	1. Understanding the national-level factors for creating innovation	RQ1. What is the importance of national-level factors for creating innovation?
	2. Understanding the industry-level factors for creating innovation	RQ2. What is the importance of industry-level factors for creating innovation?
	3. Understanding the global emergency for creating innovation	RQ3. What is the importance of global emergency for creating innovation?
Internal	1. Understanding the decision makers' characteristics for creating innovation	RQ1. What is the importance of decision makers' characteristics for creating innovation?
	2. Understanding the proactively voicing or negotiating idiosyncratic deals (i-deals) for creating innovation	RQ2. What is the importance of proactively voicing or negotiating idiosyncratic deals (i-deals) for creating innovation?
Innovation-driven HRMP		
Individual level	1. Understanding the importance of job satisfaction for creating innovation	RQ1. What is the importance of job satisfaction for creating innovations?
	2. Understanding the importance of organizational commitment for creating innovation	RQ2. What is the importance of organizational commitment for creating innovations?
	3. Understanding the importance of organizational learning for creating innovation	RQ3. What is the importance of organizational learning for creating innovations?
	4. The importance of ambidextrousness in human resources management at the individual level	RQ4. How does the ambidextrousness of human resources management at the individual level affect the creation of innovations?
	5. The importance of workforce flexibility for innovation	RQ5. What is the importance of workforce flexibility for innovation?
	6. Understanding the importance of employees in creating innovation, taking into account neuroscience and research on the human brain	RQ6. What is the importance of employees for creating innovations taking into account neuroscience and human brain research?
	7. The importance of digital readiness of employees for creating innovations	RQ7. What is the importance of employee digital readiness for innovation?
	8. The importance of employees' creativity for creating innovations	RQ8. What is the importance of employees' creativity for creating innovations?

Main topic	Cognitive/research gaps	Potential questions for future research
Team level	1. The importance of team diversity for creating innovation	RQ1. What is the importance of diverse teams for innovation?
	2. Studying the impact of democratic teamwork on creating innovations	RQ2. How does democratic teamwork drive innovation?
	3. The importance of teamwork for creating innovations	RQ3. What is the importance of teamwork for creating innovations?
	4. The importance of skunk works for creating innovation	RQ4. What is the importance of skunk works for creating innovation?
	5. The importance of employee participation for creating innovations	RQ5. What is the importance of employee participation for creating innovation?
	6. The importance of agile teams for creating innovations	RQ6. What is the importance of agile teams for innovation?
Organizational level	1. The importance of the organizational structure for creating innovations	RQ1. What is the importance of the organizational structure for creating innovations?
	2. The importance of a set of human resources management practices for creating innovation	RQ2. What is the importance of a set of human resources management practices for creating innovation?
	3. The importance of robotization for creating innovations	RQ3. What is the importance of robotization for creating innovations?
	4. Understanding HR policy for creating innovation	RQ4. How can HR policy influence the creation of innovations?
	5. The importance of flexible work systems for creating innovations	RQ5. What is the importance of flexible work systems for creating innovation?
	6. The importance of the fulfilment of the psychological contract for creating innovations	RQ6. What is the importance of the fulfilment of the psychological contract for creating innovations?
	7. Understanding the importance of e-human resources management for creating innovations	RQ7. How can e-human resources management contribute to creating innovations?
	8. The importance of organizational culture for creating innovations	RQ8. What is the importance of organizational culture for creating innovations?
	9. Understanding the importance of outplacement for creating innovation	RQ9. What is the importance of outplacement for creating innovations?
	10. The importance of organizational support for creating innovations	RQ10. What is the importance of organizational support for creating innovations?
	11. Understanding the behavior of leaders for innovative behavior of employees	RQ11. What actions should leaders take to strengthen innovative behavior among employees?

Main topic	Cognitive/research gaps	Potential questions for future research
Mediators of innovation-driven HRMP	1. The importance of the psychological contract in the relationship between HRMP and innovation	RQ1. Is the relation between HRMP and innovation mediated by the psychological contract?
	2. The importance of an innovation mindset in the relationship between HRMP and innovation	RQ2. Is the relation between HRMP and innovation mediated by the innovation?
	3. The importance of psychological empowerment in the relationship between HRMP and innovation	RQ3. Is the relation between HRMP and innovation mediated by the psychological empowerment?
	4. The importance of network competence in the relationship between HRMP and innovation	RQ4. Is the relation between HRMP and innovation mediated by the network competence?
	5. The importance of intra-organizational communication in the relationship between HRMP and innovation	RQ5. Is the relation between HRMP and innovation mediated by the intra-organizational communication?
	6. The importance of group-level incentives in the relationship between HRMP and innovation	RQ6. Is the relation between HRMP and innovation mediated by the group-level incentives?
	7. The importance of employee voice in the relationship between HRMP and innovation	RQ7. Is the relation between HRMP and innovation mediated by the employee voice ?
Moderators of innovation-driven HRMP	1. Explore the interactive effects of R&D intensity on HRMP and innovation	RQ1. Does R&D intensity moderate the relationship between HRMP and innovation?
	2. Explore the interactive effects of innovation strategy execution by top-management on HRMP and innovation	RQ2. Does innovation strategy execution by top-management moderate the relationship between HRMP and innovation?
	3. Explore the interactive effects of customer knowledge on HRMP and innovation	RQ3. Does customer knowledge moderate the relationship between mental health and job performance?
	4. Explore the interactive effects of psychological availability on HRMP and innovation	RQ4. Does psychological availability moderate the relationship between HRMP and innovation?
	5. Explore the interactive human resource strength intensity on HRMP and innovation	RQ5. Does human resource strength moderate the relationship between HRMP and innovation?

Main topic	Cognitive/research gaps	Potential questions for future research
Innovation-driven human resource management practices outcomes	1. The importance of innovation-driven HRMP for innovation performance 2. The importance of innovation-driven HRMP for sustainable organizational performance	RQ1. What is the significance of innovation-driven HRMP for innovation performance? RQ2. What is the importance of innovation-driven HRMP for sustainable organizational performance?

Apart from the thematic gaps in Table 5, the systematic literature review helped us find out that most research on innovation-driven HRMP was quantitative. Of course, those studies make it possible to determine cause-and-effect relationships between human resources innovation practices and innovation. However, quantitative research methods have their limitations, because they do not allow us to recognize the meaning of social phenomena, explain what social reality is like, and how people interpret their actions and others. The use of quantitative research methods is important to establish reliability and validity, but researchers are encouraged to use qualitative methods. They enable comprehensive and in-depth descriptions and analyses of causes, course, conditions, as well as results of the occurrence or functioning of innovation-driven HRMP in specific conditions and context.

In addition, we also recommend conducting research on innovation-driven HRMP using mixed methods. They allow for comprehensive discoveries, increased confidence in the results, accuracy of conclusions, and a more in-depth understanding of phenomena, methodological diversity, heterogeneity, and multiple levels of analysis (Johnson & Onwuegbuzie, 2004) in order to accelerate innovation-driven research human resource management practices.

CONCLUSIONS AND LIMITATIONS

For the last twelve years, there has been an increase in the number of publications devoted to innovation-driven HRMP. As a result, the existing literature in this field is diverse, but still limited. Therefore, research is needed to identify and synthesize all existing research inputs, streams and future research direction on innovation-driven HRMP using transparent and repeatable procedures.

This article makes two contributions to the literature in the management science context. Firstly, by addressing the challenges (Easa & Orra, 2021; Jotaba et al., 2022; Seeck & Diehl, 2017), we ensure identification of findings from previous literature and address the present situation of innovation-

driven human resource management. As a result, we reviewed the current literature and provided an in-depth and up-to-date synthesis, taking into account various sub-areas. To identify the state of the knowledge in this area, we conducted a systematic literature review based on a sample of 71 English-language, full-text and peer-reviewed scientific papers obtained from the Web of Science and Scopus databases through a rigorous and iterative data collection process. We synthesized the literature taking into account the following issues: research time horizon, place of publication, research methods, geographic localization of authorship, the levels of analysis and subject areas, and future research directions proposed by the extant literature. We focused our search on innovation-driven HRMP, the current state of research and future research directions on innovation-driven HRMP. Therefore, we hope that this article can serve as a road map for future researchers interested in conducting research in this area.

Secondly, as a part of the synthesis of all the existing inputs and research streams we identified, we proposed an integrative framework, which includes antecedents, innovation-driven HRMP, moderators, mediators, and outcomes. This framework not only organizes the existing literature, but also enables future researchers not only to understand innovation-driven HRMP, but also to deepen its underlying mechanisms and conditions. In addition, those frameworks allowed us to draw attention to emerging areas that were overlooked by previous research and are recommended in the literature due to existing theoretical and empirical inconsistencies. Hence, they can be the basis for undertaking further, new research efforts and a significant contribution to the development and comprehensive understanding of innovation-driven HRMP.

In addition, a systematic literature review provided valuable insights and guidance for management practitioners. In particular, we point to specific HRMP that are important for creating innovation. Taken together, our findings provide recommendations and pathways for future research to gain a more comprehensive understanding of innovation-oriented HRMP. It should be emphasized that the vast majority of research analyzing innovation-driven HRMP leads to the conclusion that the human factor is the most important in the organization. It is up to employees to generate new ideas or improve existing ones. However, the mere fact of employment or timeliness of remuneration may not be sufficient for innovation. Various practices are necessary to increase the motivation and involvement of employees, but also to encourage them to seek new knowledge, share it and use it. Participatory policies are also important. Employees are interested in passing on new ideas. Moreover, creating innovation may also require encouraging employees to experiment, take risky actions and collaborate with both

colleagues and various stakeholders. In addition, the reviewed literature also shows that organizations should take care of work–life balance, which is also of great importance for the motivation of employees and their search for new opportunities to create innovations.

Our systematic literature review, like any other, has several limitations. Firstly, we limited our searches to two international databases, such as the Web of Science and Scopus. This could result in the omission of potentially important publications that are not only available in digital form. Therefore, future research is encouraged to use complementary strategies. Secondly, we focused only on English-language, peer-reviewed, full-text articles and excluded unpublished studies, journals, books, book chapters, conference monographs, and abstracts written in other languages (including Polish) that might be relevant. Thirdly, the keywords we adopted may have resulted in the omission of potentially relevant literature. Finally, the findings in those articles come from different countries, so they are difficult to apply to every cultural context. Therefore, future research may empirically test the delivered integrative framework in different cultural contexts.

In this issue, we have endeavored to shed new light upon the above conceptual and empirical challenges by bringing together interdisciplinary, high-quality approaches to innovation-driven human resource management practices. The issue comprises four academic papers.

The first of the articles, titled "Sustainable human resource management practices in organizational performance: The mediating impacts of knowledge management and work engagement" by Abu-Mahfouz et al. (2023), focuses on establishing the mediating role of knowledge management and work engagement and the impact of sustainable management practices human resources on the performance of the organization. After conducting quantitative research using a sample of 500 academics, the authors used structural equation modeling to confirm that sustainable human resource management practices, knowledge management, and work engagement are related to organizational performance. The authors also found that knowledge management and work engagement mediated between human resource management practices and organizational performance. They also found that employee collaboration was essential in optimizing organizational performance, employee engagement in sustainable human resource management practices, and knowledge management.

The second article is "Predictors of fairness assessment for social media screening in employee selection" by Balcerak, Woźniak, and Zbuchea (2023). Based on quantitative research results, an analysis of the factors perceived by potential job candidates regarding the fairness of reviewing accounts on two Facebook and LinkedIn portals. Having interviewed 147 adults, the authors

found that Facebook perceived selection fairness was rated significantly lower than LinkedIn accounts and that perceptions of privacy intrusion during selection were higher for Facebook account review. Those findings are the first of their kind, especially with the use of the cybervetting scale, which made it possible to determine that activities focused on creating one's own image on the Internet were conducive to greater acceptance by candidates of selection based on data from social media.

The third article is "Overcoming the pitfalls in employee performance evaluation: An application of ratings mode of the Analytic Hierarchy Process" by Islam and Periaiah (2023). Researchers focus on determining the possibilities of using the Ratings mode of the Analytic Hierarchy Process to evaluate employee performance. The suggested tool includes five criteria: service, quality, finance, time, and teamwork. The authors' findings show that each of those criteria is important for evaluating employee performance. In addition, the following three important sub-criteria were distinguished when evaluating employees: harmonious work, skills, and punctuality.

The issue closes with the article "The influence of e-trust on a job performance model based on employees' dynamic capabilities during a crisis caused by a Black Swan event" by Tworek et al. (2023). The article attempts to recognize the importance of e-trust for enhancing the impact of employees' dynamic abilities on work efficiency. Quantitative research conducted among 1,200 organizations based in Poland, Italy and the United States found that the level of e-trust was related to the dynamic abilities of employees, which is important for work efficiency. In addition, research recognizes that e-trust is an essential element of e-leadership in the context of crisis situations, such as the COVID-19 pandemic.

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Abstrakt

CEL: *Coraz częściej podkreśla się, że duże znaczenie dla tworzenia innowacji mają praktyki zarządzania zasobami ludzkimi (HRMP), które odnoszą się do rekrutacji i selekcji, szkolenia i podnoszenia kompetencji, wynagrodzenia oraz oceny. Jednak pandemia COVID-19 pokazała, że tradycyjne HRMP już są niewystarczające, co pociąga za sobą potrzebę ich ponownego przemyślenia i przeformułowania w kierunku bardziej skutecznych dla tworzenia innowacji, ale także pozwalającym organizacjom przetrwać kryzysy na skalę COVID-19. Chociaż istnieje obszerna literatura w zakresie zarządzania zasobami ludzkimi i innowacji, nadal nie ma zgody co do praktyk zarządzania zasobami ludzkimi napędzających innowacje. Niniejsze badanie ma na celu identyfikację oraz syntezę najbardziej znaczące i godne zaufania wkłady w badania praktyk zarządzania zasobami ludzkimi napędzających innowacje. Dodatkowo, aby ułatwić budowanie teorii w zakresie HRMP niniejszy artykuł konsoliduje istniejący stan wiedzy w ramy integracyjne. Ramy te mogą być wykorzystywane przez przyszłych badaczy do identyfikacji luk i niejasności w rozumieniu praktyk zarządzania zasobami ludzkimi napędzających innowacje.* ***METODYKA:*** *Artykuł prezentuje wyniki systematycznego przeglądu literatury 71 empirycznych artykułowych. Literatura przedmiotu została wyłoniona w oparciu o przeszukiwania zagranicznych baz danych, takich jak: Scopus i Web of Science.* ***WYNIKI:*** *Przeprowadzony przez nas systematyczny przegląd literatury pozwolił na identyfikację praktyk zarządzania zasobami ludzkimi napędzających innowacje z uwzględnieniem trzech poziomów analizy: indywidualnym, grupowym oraz organizacyjnym, przy czym ten ostatni poziom analizy*

jest dominujący w dotychczasowych publikacjach. Rozpoznane praktyki zarządzania zasobami ludzkimi napędzające innowacje z uwzględnieniem poziomów ujęliśmy w integracyjne ramy, które stanowią podstawę teoretyczną do kierowania przyszłymi badaniami. Nasze wyniki potwierdziły rosnący trend liczby publikacji w prezentowanej tematyce począwszy od 2010 r. Większość badaczy wykorzystywała podejście ilościowe. Na podstawie afiliacji pierwszego autora, najwięcej publikacji dostarczyli autorzy z Wielkiej Brytanii. Artykuły są publikowane w różnych czasopismach, przeważnie jednak o tematyce zarządzania zasobami ludzkimi. Badania uwzględniały różnorodne konteksty organizacyjne, przeważnie w dynamicznych i złożonych branżach. Nasze ustalenia potwierdzają, że obecny stan badań nad praktykami zarządzania zasobami ludzkimi napędzającymi innowacje wskazują na konieczność prowadzenia dalszych badań w tym zakresie. W oparciu o to dostarczyliśmy luki poznawcze oraz potencjalne przyszłe pytania badacze z podziałem na trzy poziomy praktyk zarządzania zasobami ludzkimi napędzające innowacje. IMPLIKACJE: Przeprowadzony przez nas systematyczny przegląd literatury pozwolił na zaproponowanie implikacji dla przyszłych badaczy planujących prowadzenie badań w zakresie praktyk zarządzania zasobami ludzkimi napędzających innowacje. ORYGINALNOŚĆ I WARTOŚĆ: Nasz systematyczny przegląd literatury koncentruje się na identyfikacji praktyk zarządzania zasobami ludzkimi napędzających innowacje, ustaleniu obecnego stanu wiedzy oraz przyszłych kierunków badań w tym zakresie. Dodatkowo opracowaliśmy ramy integracyjne, których celem jest uporządkowanie istniejącej literatury, ale także zidentyfikowanie obiecujących przyszłych kierunków badań nad praktykami zarządzania zasobami ludzkimi napędzającymi innowacje.
Słowa kluczowe: zarządzanie zasobami ludzkimi, praktyki zarządzania zasobami ludzkimi, innowacje, napędzanie innowacji, ramy integracyjne, systematyczny przegląd literatury, luki tematyczne, wyłaniające się kierunki badań

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Conflicts of interest

The authors declare no conflict of interest.

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Sustainable human resource management practices in organizational performance: The mediating impacts of knowledge management and work engagement

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Abstract

PURPOSE: *Modern business and global organizations are regularly presented with challenges caused by unpredictable competitive environments. Human resource management (HRM) practices give sustainable opportunities for employees to use their abilities and express their enthusiasm to obtain skills and knowledge and to apply them at the workplace with a view to achieving engaged individuals and increasing organizational performance. This article presents a recent study outcome to examine (i) the mediating role of knowledge management and work engagement and (ii) the effect of sustainable HRM practices on organizational performance.* **METHODOLOGY:** *500 self-reported questionnaires were distributed to Jordanian university lecturers (research population) for data collection. The study data were assessed with structural equation modeling (SEM) using IBM-SPSS-AMOS 25.0.*

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FINDINGS: Two pivotal outcomes were identified: (i) sustainable HRM practices, knowledge management, and work engagement were positively associated with organizational performance; (ii) knowledge management and work engagement played a mediating role in the sustainable HRM practice-organizational performance correlation. **IMPLICATIONS:** *Overall, employee cooperation proved essential to optimize organizational performance, specifically during their engagement in sustainable HRM practices and knowledge management. Finally, the research proposed several practical recommendations and interventions on sustainable HRM for future research.* **ORIGINALITY AND VALUE:** *The research has provided proof of five variable relationships contained in the model. Firstly, organizational performance increased with sustainable HRM practices through knowledge management. Secondly, organizational performance increased with sustainable HRM practices through work engagement. Thirdly, work engagement increased with sustainable HRM through knowledge management. Fourthly, organizational performance increased with knowledge management through work engagement. Fifthly, organizational performance increased with sustainable HRM through knowledge management and work engagement.*

Keywords: *sustainable HRM practices, organizational performance, knowledge management, work engagement, Ability-Motivation-Opportunity (AMO) theory*

INTRODUCTION

Organizations from various industries have faced complex tendencies and challenges like high-performance expectations, demographic changes, and globalization (El-Kot & Leat, 2008; Chandrakumara & Sparrow, 2004). Those difficulties have created a dire need to manage human resources (HR) to survive in the market and to accomplish competitive advantage. Those developments called for adequately managing human resources in assorted areas, including work engagement (Aboramadan, Albashiti, Alharazin, & Abed Dahleez, 2020; Chew, 2004), knowledge management (Gope, Elia, & Passiante, 2018; Minbaeva, 2005; Mohanapriya & Sasikala, 2015; Monteiro & Pais, 2014), and organizational performance (Chew, 2004; Wall & Wood, 2005; Al-Qudah et al., 2014; Abu-Mahfouz, 2019).

HRM practices have become a well-known field of investigation for practitioners and researchers because of the huge impact on innovative performance and organizational performance (Abu-Mahfouz, 2019; Al-Bahussin & Elgaraihy, 2013; Hashemi & Dehghanian, 2017; Jiang, Wang, & Zhao, 2012; Laursen, 2002). However, the sustainable HRM phenomenon highlights the importance of HR practices on organizational results (Ehnert, Parsa, Roper, Wagner, & Muller-Camen, 2016).

As a necessary and novel means of people management beyond strategic HRM, sustainable HRM (Kramar, 2014) has induced HR capacity re-

orientation and towards organizational sustainability (Ehnert, 2009; De Prins et al., 2014). In other words, sustainable HRM denotes an innovative notion in its preliminary stage that strives to associate sustainability with HRM. Realistically, organizations prioritized employees as a long-term asset rather than a mere financial cost through sustainable HRM practices to effectively execute sustainability initiatives (Ehnert et al., 2016).

The experience of developed nations featured the imperative role of higher education institutions (HEIs) in societal and economic developments (Fullwood & Rowley, 2017; Lilles & Rõigas, 2017). The research literature has shown that the performance of educational institutions depends fundamentally on the quality of HR (Amin, Wan Ismail, Abdul Rasid, & Selemani, 2014), knowledge management (Sahibzada, Jianfeng, Latif, & Sahibzada, 2020), and work engagement (Gupta, Acharya, & Gupta, 2015). In that capacity, HEIs need to retain, develop, and recruit employees. University staff who are well trained, motivated, and skilled are bound to be committed to their research work and training that contribute to the development of nations (Lew, 2009).

HEIs are viewed as knowledge-intensive institutions, not just on account of their huge contribution to knowledge creation and development, but additionally, their engagement in knowledge dispersion through research, learning, and teaching (Fullwood & Rowley, 2017).

Thus, researchers have progressively accentuated the requirement for effective implementation of knowledge management initiatives in HEIs during the past few years (Al-Husseini & Elbeltagi, 2016; Ramjeawon & Rowley, 2017; Al-Kurdi, El-Haddadeh, & Eldabi, 2020; Quarchioni, Paternostro, & Trovarelli, 2020).

Given the importance of promoting academic pursuits, a few HEIs are gaining from HRM and achieving high performance (Amin et al., 2014), advancing positive collaboration (Wall & Wood, 2005), encouraging work engagement (Hughes & Rog, 2008; Aboramadan et al., 2020), and implementing many cycles of knowledge management (Brewer & Brewer, 2010; Sahibzada et al., 2020).

Albeit a few researchers have approached the aspects of HRM practices in HEIs (such as Huxley & Hall, 1996; Chen, Wang, & Yang, 2009; Lew, 2009; Khasawneh, 2011; Amin et al., 2014; Aboramadan et al., 2020), the research regarding work engagement in HEIs is exceptionally restricted (Aboramadan et al., 2020), as is research on knowledge management (Brewer & Brewer, 2010; Sahibzada et al., 2020), and organizational performance (Amin et al., 2014; Sahibzada et al., 2020).

Jordanian universities have a problem with a lack of clarity of their vision for independence, which has affected their efficiency and performance (Economic and Social Council, 2017).

Despite reform endeavors to accomplish high-quality education, many HEIs in Jordan are still struggling to achieve excellent performance in their annual evaluation on the basis of certain key performance indices (Alshatnawi & Abd Ghani, 2018). Among the challenges that have contributed to hindering job performance and competitiveness of universities around the world, especially in Jordanian universities, was the growing demand for a place to study (Economic and Social Council, 2017). Universities in Jordan were unable to accommodate the demand due to limitations in facilities or/and employee capacity (Khasawneh, 2011; Badran, 2014; Alawin et al., 2016).

While institutions are seeing knowledge management as a basic achievement factor in the present dynamic environment (Yeh, 2005; Ju, Lin, Lin, & Kuo, 2006), knowledge management activities in HEIs in Jordan are however inadequate (Alshatnawi & Abd Ghani, 2018). The improvement of employee work engagement is one of the vital stages to improve sustainable HRM (Xu, Zhang, Yang, & Wu, 2020). From this perspective, engagement needs to be tested further in Jordanian HEIs because it is expected to contribute to the growth of the institution, job performance, and new knowledge (Dhir & Shukla, 2019).

In summary, the recent research will not be exhaustive enough without testing the relevance between sustainable HRM practices and organizational performance in Jordanian universities. Furthermore, the study sought to determine the mediating influence of knowledge management and work engagement on the link between sustainable HRM practices and organizational performance in universities. In addition, the study also purports to determine the mediating influence of knowledge management on the link between sustainable HRM practices and work engagement. Universities need to realize how sustainable HRM practices, knowledge management, and work engagement affect organizational performance. The bonds between sustainable HRM practices, knowledge management, work engagement, and organizational performance have not been previously studied. The study destines to examine the ensuing relationships with the use of AMO theory to fill the knowledge gaps that, in turn, will facilitate the proffering of the solution to the impending problem.

THEORETICAL BACKGROUND

AMO theory

Scholars have broadly followed the AMO theory to investigate the effect of HRM practices on employee and organizational performance (Shin & Konrad, 2014; Obeidat, Mitchell, & Bray, 2016; Zhang & Morris, 2014; Jerónimo, De Lacerda, & Henriques, 2020). The AMO theory claims that the practices affect individuals into accomplishing organizational aims through their skills, knowledge, and abilities; motivation; and opportunity (AMO) that influence the employee and organizational performance (Lepak et al., 2006; Appelbaum et al., 2000) and accomplishment of organizational objectives (Buller & McEvoy, 2016).

Sustainable HRM practices have been utilized to allude to HRM activities that improved positive environmental results, green HRM results, and positive human and social results. Green HRM is considered in the assessment of sustainable HRM (Kramar, 2014). Sustainable HRM is instrumental in enhancing green performance through individual staff and has direct and indirect consequences on the workforce and the organization (Paillé, Chen, Boiral, & Jin, 2014).

Thus, in AMO theory, sustainable HRM contains 1) ability-enhancing practices such as green training (Jerónimo, De Lacerda, & Henriques, 2020; Renwick, Redman, & Maguire, 2013), development, selection, and green knowledge management (Renwick et al., 2013); 2) motivation-enhancing practices, e.g., pay and reward systems and green benefits (Renwick et al., 2013), and incentives for green performance (Renwick et al., 2013; Jerónimo et al., 2020); and 3) opportunity-enhancing practices, e.g., employee' exchange knowledge (Jerónimo et al., 2020), employee involvement, engagement, groups for solving a problem, and encouraging individuals to generate suggestions for enhancements (Renwick et al., 2013).

In AMO theory, sustainable HRM may enhance the abilities, skills, and knowledge of individuals to reach an undeniable level. It can enhance the opportunity for them to share, disseminate, and transfer knowledge among employees. Ishak, Eze, and Ling (2010) proposed that firms that developed and extensively applied knowledge management would be able to achieve consistently high performance; consequently, reinforcing the organizations' ability to develop its sustainability further.

When employees were exposed to a high level of knowledge management, they would consistently experience a high level of engagement. Employee and organizational performance were among the results of work engagement because engaged individuals were more productive, more

creative, and were more able to exceed everyone's expectations (Bakker & Demerouti, 2007). Those qualities impacted work performance in a manner that fortified an organizations' ability to enhance its sustainability (Macey & Schneider, 2008). According to the AMO theory, HRM practices give sustainable opportunities for individuals to use their abilities and express their enthusiasm to acquire the necessary skills and knowledge and apply them in the workplace. The ultimate goals are to create engaged employees and increase organizational performance.

Sustainable HRM practices

Innovative organizations should implement sustainability to establish optimization approaches (Manzoor, Wei, Bányai, Nurunnabi, & Abdul Subhan, 2019). Sustainable HRM is defined as the adaption of HRM strategies and practices that enables the achievement of financial, social, and ecological goals, with an impact inside and outside of the organization and over a long-term time horizon, while controlling for unintended side effects and negative feedback (Ehnert et al., 2016, p.90). The term 'sustainable HRM practice' provides a two-fold connection between sustainability and HRM practices. Overall, HRM practices catalyze sustainability for long-term organizational performance (Manzoor et al., 2019).

The frequently referred to dimensions of sustainable HRM practices were selection (Manzoor et al., 2019), training (Macini, Alves, Cezarino, Liboni, & Caldana, 2020; Manzoor et al., 2019), development (Glot, 2006; Zaugg, Blum, & Thom, 2001), employee participation (Baum et al., 2016; Manzoor et al., 2019), and compensation and rewards (Macini et al., 2020; Zaugg et al., 2001). Thus, those dimensions are considered in the research. The selection is described as a procedure that involves the possibility of work, resulting in the partition of two classes, namely, individuals who are offered the job and those who are not (Yoder, 1942). Training and development allude to irreplaceable vital instruments for successful individuals and organizational execution—the organization provides substantial funding for training and development with the certainty that it will give them an upper hand in the realm of business (Weil & Woodall, 2005; Birdi et al., 2008). Employee participation is characterized as an employee's involvement in problem solving and reaching a decision through a loyal and motivated workforce, who work together in teams to apply discretionary effort and share common experiences. Such endeavors enable the organization to accomplish its objectives and upgrade individuals' results (Gürbüz, 2009). Finally, compensation and rewards are described as aggregate monetary and non-money related prizes for individuals as a side-effect of their performance (Lim & Ling, 2012).

Work engagement

In the education sector, work engagement enables the creation of guidelines for a task-shared objective, preparedness to spend effort, and the productive attitudes including flexibility, the satisfaction to perform tasks that increase a team's thought action level and, hence, lead to high performance and capability to address work challenges (Dubbelt, Rispens, & Demerouti, 2016). For HEIs, the work engagement in an academic workforce encourages more research publications and achievements (Christensen, Dyrstad, & Innstrand, 2018).

In a recent study, work engagement is considered as a "multi-dimensional latent motivational construct" as coined by Alfes, Shantz, Truss, and Soane (2013, p. 2610) and defined by Schaufeli et al. (2002, p. 74) as "a positive, fulfilling, work-related state of mind" that is portrayed by vigor, dedication, and absorption. Vigor includes high levels of energy and mental resilience while working; dedication alludes to being strongly involved in one's work and experiencing a sense of enthusiasm, significance, and challenge, and absorption alludes to being completely concentrated and engrossed in one's work (Schaufeli et al., 2002, pp. 74–75).

Organizational performance

As a definitive and dependent construct across various disciplines, organizational performance implies the degree to which organizations successfully attain their goals (Zhang, Wan, & Jia, 2008). The measurement methods that are employed to assess organizational performance in multiple examinations differed substantially (Kirby, 2005). So, organizational performance is a multi-dimensional concept and complex. In this research, the organizational performance is defined as the outcomes of different educational interconnected processes that occur during its daily operations (Hussein, Mohamad, Noordin, & Ishak, 2014). For Jordanian HEIs, the organizational performance is represented by several dimensions, for instance, student quality, faculty resources, development target and characteristics, teaching activities, research results, and teaching quality (Chen et al., 2009).

HRM practices influence the behaviors of employees toward achieving organizational objectives. Thus, HRM practices can enhance organizational performance (Aguta & Balcioglu, 2015; Al-Tit, 2016; Chahal, Jyoti, & Rani, 2016; Otoo, 2019). As a big part of what we think we realize nowadays, will be out of date in a couple of years (Newman, 2011), previous HRM practices are now inadequate. Consequently, people and organizations are required to behave as persistent and adaptable students who are prepared to travel new

roads as conditions dictate (Newman, 2011); fortifying the organizations' capacity to enhance its sustainability in the long term. Such organizations perceive employees as a long-term investment instead of solely a financial cost with sustainable HRM practices (Ehnert et al., 2016).

Knowledge management

In the education sector, knowledge management can be characterized as a device that gives clues to staff and managers of educational institutions in the arising universe of knowledge management to address the difficulty of the knowledge period. Knowledge management assists educational institutions with understanding the beauty and merits of knowledge creation and sharing as a method for upgrading the learning and teaching process (Alshatnawi & Abd Ghani, 2018).

Like other productive institutions, the job of knowledge-based assets in HEIs is fundamental since HEIs are the focal point of intangible activities: professors are storehouses of knowledge and transfer it to students (Veltri & Silvestri, 2015). Nonetheless, in this era of competition, the job of HEIs should not be restricted to spreading knowledge only, but appreciating it (Feng, Chen, Wang, & Chiang, 2012; Ramírez & Gordillo, 2014; Secundo et al., 2015), and creating it (Lee & Choi, 2003) as well.

In recent research, four components of knowledge management had been considered. Knowledge creation characterizes as an organization creating new knowledge through the interaction and conversion between its explicit and tacit knowledge. Understanding the reciprocal relevance between those two sorts of knowledge would be the way to understanding the knowledge-creating process. The conversion of explicit and tacit knowledge is a social practice among people and isn't bound to a solitary individual (Nonaka & Takeuchi, 1995). Knowledge acquisition (tacitly possessed by human specialists) depicts knowledge-engineering for explicit decision-making processes (Gaines, 2013). Knowledge sharing portrays as a bunch of behaviors that help the exchange of acquired knowledge. An organization can be viewed as a social community creating, transferring, and sharing tacit and explicit knowledge (Li, 2006). Knowledge transfer is a systematic strategy employed to determine, gather, and exchange implicit knowledge for conversion into explicit information to be accessed and utilized by employees or organizations instead of designated groups or individuals (Graham et al., 2006).

HYPOTHESES DEVELOPMENT

Many past studies have broken up the connection between HRM practices and work engagement (Aboramadan et al., 2020; Aybas & Acar, 2017; Sani & Ibrahim, 2005). Those that have examined the relationship between sustainable HRM practices and work engagement are extremely restricted (Jerónimo et al., 2020). HRM practices can increase performance, learning, and innovation; reemphasizing the significance of work engagement as a triumphant variable of the institution (Shuck, Rocco, & Albornoz, 2011). In synopsis, thinking about the above explanation, it is hypothesized that:

H_1: Sustainable HRM practices have a significant and positive effect on work engagement.

Based on multiple studies, work engagement was associated with work and company performance (Bakker & Bal, 2010; Bhatti, Hussain, & Al Doghan, 2018; Gutermann, Lehmann-Willenbrock, Boer, Born, & Voelpel, 2017; Bailey, Madden, Alfes, & Fletcher, 2017; Junça-Silva, Caetano, & Lopes, 2017; Rofcanin, Heras, & Bakker, 2017; Schneider, Yost, Kropp, Kind, & Lam, 2018) as highly-engaged employees have undeniable degrees of energy regarded organizational tasks to be satisfying, positive, emotionally motivating, and rewarding (Bakker, Schaufeli, Leiter, & Taris, 2008). Work engagement is considered one of the important variables for improving performance (Demerouti & Bakker, 2011). Mirroring the above clarification, it is hypothesized that:

H_2: Work engagement has a significant and positive effect on organizational performance.

Much research demonstrated that HRM practices positively impacted organizational performance (Aguta & Balcioglu, 2015; Al-Tit, 2016; Chahal, Jyoti, & Rani, 2016; Otoo, 2019). For example, Delaney and Huselid (1996) asserted that HRM practices induce high company performance by influencing employee skills and motivation, and work structure. Specifically, when individuals believed that their work is meaningful and significant, they are more able to start activities that add to organizations' sustainability objectives (Jerónimo et al., 2020). Consequently, the following hypothesis is established in the research under review:

H_3: Sustainable HRM practices have a significant and positive effect on organizational performance.

Essentially, HRM and knowledge management reflected both direct and indirect connections with intangible resources: strategic organizational assets (Geiger & Schreyögg, 2012). The HRM denoted competent people management within an organization to catalyze knowledge-sharing, interactions, and organizational objective attainment (Al-Tit & Hunitie, 2015; Fong, Ooi, Tan, Lee, & Chong, 2011). Knowledge management is about developing, capturing, sharing, organizing, exploiting, and applying knowledge resources inside the organization to acquire productivity and sustain the competitive advantage, where employees played focal roles (Inkinen, Kianto, & Vanhala, 2015; Omotayo, 2015).

HRM and knowledge management are two individually focused concepts and most scholars recommended it as being critical for knowledge management execution to accomplish business success (Mohanapriya & Sasikala, 2015; Monteiro & Pais, 2014). Specifically, HRM upholds individuals in managing and creating knowledge through the sharing of experiences, opinions, and ideas (Theriou & Chatzoglou, 2008; Monavvarian & Khamda, 2010). Additionally, knowledge management can also be deciphered as an HRM type by employing information technology as a supporting tool in human collaborations and interactions (Yahya & Goh, 2002).

Different studies demonstrated that HRM practices positively impacted knowledge management (Theriou & Chatzoglou, 2008; Al-Bahussin & Elgaraihy, 2013; Gope et al., 2018). Regarding sustainable HRM practices, the 'knowledge as substance' notion is substituted by 'knowledge as participation.' Knowledge is spread, developed, and applied inside dynamic working connections between the individuals of a sustainable HRM-practicing community (De Prins et al., 2014). Thus, the sustainability-HRM link can be leveraged with the incorporation of strategic provisions for human capital development in terms of knowledge-oriented competencies and the cultural infrastructure which upholds knowledge creation and sharing, learning, networking, and communication, and social development (Glot, 2006). Reflecting the above clarification, it is theorized that:

H_4: Sustainable HRM practices have a significant and positive effect on knowledge management.

The influence of knowledge management on work engagement has transformed into a warmed research point. Past results revealed that knowledge management fundamentally affected work engagement (Rožman, Shmeleva, & Tominc, 2019; Hanif, Waheed, & Ahmad, 2020; Qureshi, Awan, & Perveen, 2020). The best main outcome of a great level of engagement is an enhancement in well-being (Figurska, 2015). As "engaged employees

are physically, cognitively, and emotionally connected with their work roles, they feel full of energy, are dedicated to reaching their work-related goals, and are often fully immersed in their work" (Bakker, 2011, p. 268). So, those organizations that carrying out the primary acts of knowledge management can see the positive effects in terms of the level of engagement of their individual workers (Hughes & Rog, 2008). As a result, a significant degree of individuals' engagement carries advantages to themselves and to the organization where they work (Figurska, 2015). One advantage is the retention of older workers who are completely engaged to impart knowledge, thus creating flexible capacity (Newman, 2011). In the light of findings from previous studies, it is hypothesized that:

H_5: Knowledge management has a significant and positive effect on work engagement.

A firm that is knowledge-based will obtain a bunch of distinguishing capabilities that improve the opportunities for competitive expansion and endurance (Claycomb, Dröge, & Germain, 2001). Additionally, organizations that have the capability to apply knowledge can likewise essentially reduce expenses and accomplish better performance results (Claycomb et al., 2001; Pauleen, Corbitt, & Yoong, 2007). Yeh, Lai and Ho (2006) led the research to discover the impact of knowledge management dynamics, prompting better organizational capacity in implementing, developing, and maintaining suitable practices that would enable firms to select, organize, find, transfer, and disseminate significant information for better performance (Demerouti & Bakker, 2011). Research has shown that knowledge management positively affected organizational performance (Al-Bahussin & Elgaraihy, 2013; Kinyua, 2015; Kılıç & Uludağ, 2021). Thus, knowledge management enhances the quality of decision-making and increases organizational performance sustainability (Mosconi & Roy, 2013). Hence, the recent research proposes the following hypothesis:

H_6: Knowledge management has a significant and positive effect on organizational performance.

Knowledge management was found to be the mediator that provided a beneficial outcome to the organization and the organization's individuals (Al-Bahussin & Elgaraihy, 2013; Iqbal & Malik, 2019; Kılıç & Uludağ, 2021). Some investigations exhibited that knowledge management had a mediator role linking HRM practices and organizational performance (Al-Tit, 2016; Gope et al., 2018). Research had tracked down a positive relevance between

knowledge management and work engagement (Hanif et al., 2020; Qureshi et al., 2020). Work engagement was found to be the mediator that kept a positive behavior among an organization's individuals (Karatepe, 2013; Luu, 2019; Aboramadan et al., 2020; Sani & Ibrahim, 2020). Some studies showed that work engagement had a mediator role linking HRM practices and organizational performance (Ahmad, Hashmi, Ali, & Faheem, 2021; Pombo & Gomes, 2018). Consequently, the following hypotheses have been proposed in recent research:

H_7: Knowledge management mediates the effects of sustainable HRM practices on organizational performance.

H_8: Work engagement mediates the effects of sustainable HRM practices on organizational performance.

H_9: Knowledge management mediates the effects of sustainable HRM practices on work engagement.

H_{10}: Work engagement mediates the effects of knowledge management on organizational performance.

METHODOLOGY

Pretest and pilot testing of the instruments

The study tools were expert reviewed for face, content, and criterion validity. A pilot study was subsequently performed with the dissemination of 109 self-reported questionnaires for arbitrarily-selected respondents for data gathering purposes (Mahfouz, 2019; Mahfouz, Awang, & Muda, 2019; Mahfouz, Awang, Muda, & Bahkia, 2020; Mahfouz, Bahkia, & Alias, 2021; Mahfouz, Halim, Bahkia, & Alias, 2022a, 2022b, 2022c).

Method of sampling and data collection

Simple random sampling was employed to select 500 respondents from the sampling frame of general Jordanian public university lecturers. The questionnaires were emailed to the chosen individuals to be addressed at their convenience. If necessary, the researcher made phone calls to remind respondents to complete the questionnaire. Eventually, a total of 301 completed and usable questionnaires were gathered. The response rate was 60.2%. Albeit Arabic being the official language in Jordan, the instrument was circulated in English as it is the most ordinarily used language in Jordanian universities.

Of the 301 respondents, 63.12% were males and 36.88% were females. An aggregate of 82% of the respondents held an academic position, while 18% held administrative and academic positions simultaneously. An aggregate of 16% of the respondents had 1–5 years of academic experience, 22% had 6–10 years, and 62% had more than 10 years. The average age of the respondents was 47.5 years old (see Table 1).

Table 1. Profile of respondents

Category		Frequency	Percentage %
Gender	Male	190	63.12
	Female	111	36.88
	Total	301	100.00
Position	Academic position	247	82
	Administrative and academic positions	54	18
	Total	301	100.0
Academic experience	1-5 years	48	16
	6-10 years	66	22
	More than 10 years	187	62
	Total	301	100.0
Age	Less than 30 years	7	2.33
	31-40	41	13.62
	41-50	168	55.82
	51-60	56	18.6
	More than 60 years	29	9.63
	Total	301	100.0

Measurement of construct

A total of 18 sustainable HRM practice items were adapted from Zhang et al. (2008) and Al Damoe, Hamid, and Sharif (2017). A total of 25 knowledge management items were adapted from Li Sa, Choon-Yin, Chai and Aik Joo (2020), Hult, Ketchen, and Slater (2004), Choi, Lee, and Yoo (2010), and Reagans and McEvily (2003). A total of 17 work engagement items were adapted from Schaufeli, Bakker, and Salanova (2006). Organizational performance was evaluated (as subjective performance) with 35 items adapted from (Chen et al., 2009). This study used a five-point Likert scale ranging from (1) strongly disagree to (5) strongly agree.

RESULTS

The Confirmatory Factor Analysis (CFA)

Parceling technique

The research used the parceling model for the second-order constructs, namely, sustainable HRM practices, knowledge management, work engagement, and organizational performance. The CFA result is shown in Table 2 where every inclusive fit index exceeds their threshold value, i.e., CFI > 0.90, TLI > 0.90, RMSEA < 0.08, and ChiSq/df (< 3.0) (Hair, Black, Babin, & Anderson, 2014). Accordingly, the measurement model of sustainable HRM practices, knowledge management, work engagement, and organizational performance was viewed as statistically adequate.

Table 2. Inclusive fit of the second order constructs via a parceling model of the CFA

Measurement model	CFI	TLI	RMSEA	ChiSq/df	p-value
Su-HRMP	0.975	0.971	0.049	1.868	0.000
KM	0.942	0.936	0.054	2.067	0.000
WE	0.954	0.946	0.056	2.137	0.000
OP	0.950	0.945	0.052	1.803	0.000

Note: Sustainable HRM Practices (Su-HRMP), Knowledge Management (KM), Work Engagement (WE), Organizational Performance (OP).

The items for the second-order constructs exceed their threshold value (above 0.60), indicating good measurement validity. All values of average variance extracted (AVE) and composite reliability (CR) were found to surpass their edge estimations of 0.5 and 0.6, respectively, which reaffirm convergent validity for a sustainable HRM practices construct, knowledge management construct, work engagement, and organizational performance construct as summarized in Table 3.

Table 3. The AVE and CR for the Sustainable HRM Practices, Knowledge Management, Work Engagement, and Organizational Performance Constructs

	Number of items	AVE	CR
Sustainable HRM Practices	**18**	**0.55**	**0.83**
Selection (Zhang et al., 2008)	4	0.71	0.91
Training and Development (Al Damoe et al., 2017)	7	0.60	0.91
Employee Participation (Zhang et al., 2008)	4	0.69	0.90
Compensation and Rewards (Al Damoe et al., 2017)	3	0.73	0.89
Knowledge Management	**25**	**0.64**	**0.88**
Knowledge Creation (Li Sa et al., 2020)	12	0.501	0.92
Knowledge Acquisition (Hult et al., 2004)	5	0.55	0.86
Knowledge Sharing (Choi et al., 2010)	3	0.73	0.89
Knowledge Transfer (Reagans & McEvily, 2003)	5	0.60	0.88
Work Engagement (Schaufeli et al., 2006)	**17**	**0.63**	**0.83**
Vigor	6	0.51	0.86
Dedication	5	0.55	0.86
Absorption	6	0.53	0.87
Organizational Performance (Chen et al., 2009)	**35**	**0.59**	**0.90**
Student Quality	3	0.72	0.88
Faculty Resources	6	0.51	0.86
Development Target and Characteristics	4	0.71	0.91
Teaching Activities	6	0.55	0.88
Research Results	9	0.56	0.87
Teaching Quality	7	0.61	0.91

Pooled CFA

The CFA technique was then applied on the simplified pooled first-order constructs. As shown in Figure 1, all fitness indexes meet the cut-off standards and, hence, the assessment of the measurement model of all latent constructs accomplishes the requirements of construct validity. The factor loading for all items is above 0.60, which meets the requirements for factor uni-dimensionality.
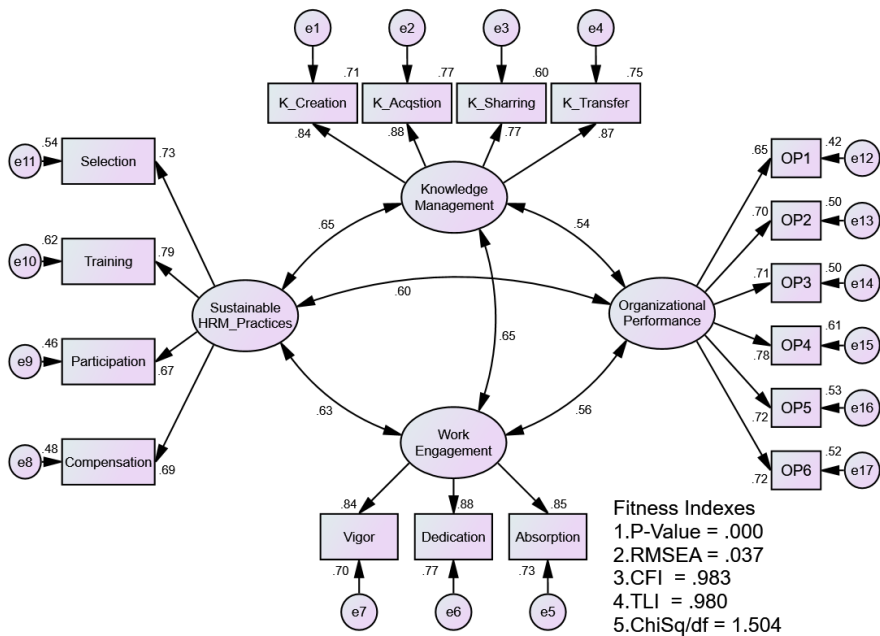
Figure 1. The Pooled CFA Results.

Source: IBM-SPSS-AMOS 25.0.

As shown in Table 4, all values of AVE and CR surpass their edge estimations. The research reaffirmed adequate convergent validity and CR for all latent constructs based on these values.

Table 4. AVE and CR

Variables	Factor loading	AVE	CR
Sustainable HRM Practices (α = 0.899)		**0.52**	**0.81**
Selection	0.73		
Training	0.79		
Participation	0.67		
Compensation	0.69		
Knowledge Management (α = 0.880)		**0.71**	**0.91**
K_Creation	0.84		
K_ Acquisition	0.88		
K_Sharing	0.77		

Variables	Factor loading	AVE	CR
K_Transfer	0.87		
Work Engagement (α = 0.852)		**0.73**	**0.89**
Vigor	0.84		
Dedication	0.88		
Absorption	0.85		
Organizational Performance (α = 0.955)		**0.51**	**0.86**
OP1 (Student Quality)	0.65		
OP2 (Faculty Resources)	0.70		
OP3 (Development Target and Characteristics)	0.71		
OP4 (Teaching Activities)	0.78		
OP5 (Research Results)	0.72		
OP6 (Teaching Quality)	0.72		

The outcomes of the data analysis indicated that the constructs possessed internal consistency as their reliability measurement, based on Cronbach's alpha (α) value, ranged from 0.852 to 0.955. Besides, the bivariate Pearson correlations among latent variables were under 0.85, thus portraying the model to be unaffected by multi-collinearity issues following Lei & Wu (2007). The model's discriminant validity index is summarized in Table 5, where the correlation among constructs is less than the square root of AVEs according to Awang, SH., & Zainudin (2018).

Table 5. Discriminate validity index summary

	Su-HRMP	KM	WE	OP
Su-HRMP	**0.72**			
KM	0.65	**0.84**		
WE	0.63	0.65	**0.85**	
OP	0.60	0.54	0.58	**0.71**

The skewness values were within the range of between -0.809 and 0.053, whereas the kurtosis values were between -0.420 and 1.309. Those values indicated that all data were normally distributed, hence meeting the assumption for utilizing parametric statistical analyses (Hair et al., 2014).

The common method bias may have possible significant effects on the results of the study. Thus, the current study conducted Harman's single-factor test to limit all the study items to one measure. Resultantly, 43.43% of the variance was represented by one construct. The variance was below

Harmans' single factor test cut-off point of 50%, indicating the absence of common method bias (Tehseen, Ramayah, & Sajilan, 2017).

The SEM

The SEM, through analysis of moment structures (AMOS) 25.0, accessed the path relationships among the study constructs in line with Anderson and Gerbing (1988). Figure 2 shows the SEM graphic output.
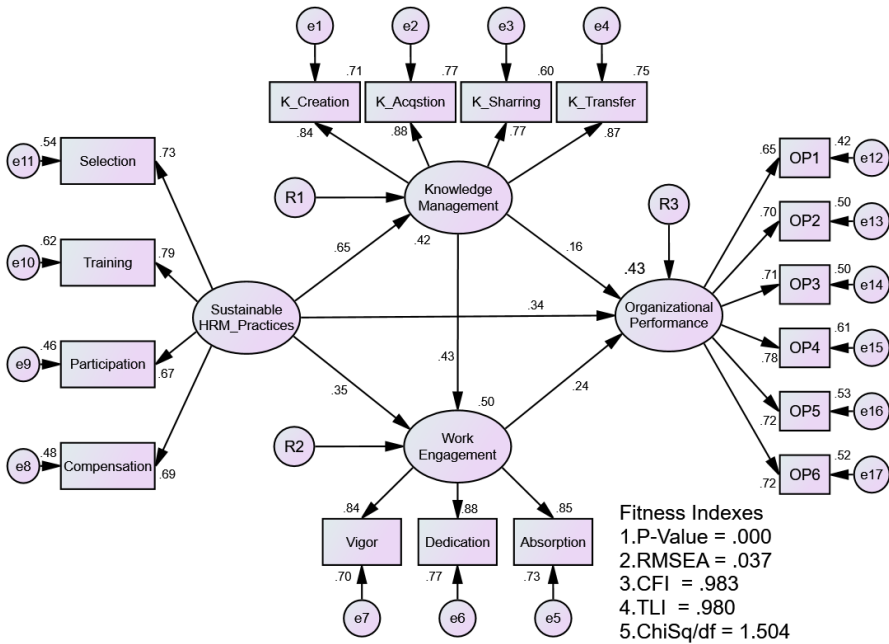
Figure 2. The Standardized Regression Path Coefficient in the Model.
Source: IBM-SPSS-AMOS 25.0.

Figure 2 shows the regression coefficients of the multiple-determinant model. The results examined that sustainable HRM practices have caused a 42 percent variance in knowledge management of university employees. Secondly, the two constructs, sustainable HRM practices and knowledge management, have caused a 50 percent change in work engagement of university employees. Finally, sustainable HRM practices, knowledge management, and work engagement have caused a 43 percent change in the organizational performance of Jordanian universities.

The regression path coefficients were derived from SEM (see Table 6). Notably, H_1 was supported as the sustainable HRM practices impact on work engagement was proved to be positive and significant (β = 0.521, p = 0.001). The work engagement impact on organizational performance was positive and significant (β = 0.183, p = 0.002) consequently supporting H_2. The sustainable HRM practices effect on organizational performance proved positive and significant (β = 0.380, p = 0.001) therefore supporting H_3. Besides, the sustainable HRM practices impact on knowledge management was positive and significant (β = 0.936, p = 0.001) therefore supporting H_4. Additionally, the knowledge management effect on the work engagement proved positive and significant (β = 0.438, p = 0.001) therefore supporting H_5. Lastly, the knowledge management impact on organizational performance was positive and significant (β=0.123, P=0.038), therefore supporting H_6.

Table 6: The regression path coefficient and its significance

			Std Beta	Estimate	SE	CR	p-value	Result
WE	←	Su-HRMP	0.35	0.521	0.107	40.881	***	significant
OP	←	WE	0.24	0.183	0.058	30.172	0.002	significant
OP	←	Su-HRMP	0.34	0.380	0.094	40.040	***	significant
KM	←	Su-HRMP	0.65	0.936	0.096	90.770	***	significant
WE	←	KM	0.43	0.438	0.070	60.294	***	significant
OP	←	KM	0.16	0.123	0.059	20.073	0.038	significant

Mediation tests

Knowledge management has mediating effects on the relationship between sustainable HRM practices and organizational performance. Sustainable HRM practices positively affected organizational performance using knowledge management and supported hypothesis 7. Work engagement has a mediating effect on the relationship between sustainable HRM practices and organizational performance. Sustainable HRM practices positively affected organizational performance using work engagement and supported hypothesis 8. Knowledge management has mediating effects on the relationship between sustainable HRM practices and work engagement. Sustainable HRM practices positively affected work engagement using knowledge management and supported hypothesis 9. Work engagement has a mediating effect on the relationship between knowledge management and organizational performance. Knowledge management positively

affected organizational performance using work engagement and supported hypothesis 10 (refer to Table 7).

Furthermore, knowledge management and work engagement had a mediating effect on the relationship between sustainable HRM practices and organizational performance. Sustainable HRM practices had a positive effect on organizational performance using knowledge management and work engagement (H_9 and H_{10}). Hypotheses 7, 8, 9, and 10 were all supported. Summarily, all research hypotheses were supported by the data.

Table 7. Testing the mediators

H	Path	Direct effect	Indirect effect	Total effect	Results on mediation	Mediation type
H_7	Su-HRMP→KM→OP	0.34	0.104	0.44	Sig.	Partial
H_8	Su-HRMP→WE→OP	0.34	0.084	0.42	Sig.	Partial
H_9	Su-HRMP→KM→WE	0.35	0.28	0.63	Sig.	Partial
H_{10}	KM→WE→OP	0.16	0.103	0.26	Sig.	Partial

The mediation test implications were affirmed through bootstrapping by selecting n = 5000 bootstrap sample. The bootstrapping results are displayed in Table 8.

We included all the possible indirect effects that were present in the model. H_7, H_8, H_9, and H_{10} were all supported in our data. Therefore, we found that knowledge management (KM) has a significant mediating effect between sustainable HRM practices (Su-HRMP) and organizational performance (OP) (H7). Work engagement (WE) has a significant mediating effect on the relationship between sustainable HRM practices (Su-HRMP) and organizational performance (OP) (H_8). Knowledge management (KM) has a significant mediating effect on the relationship between sustainable HRM practices (Su-HRMP) and work engagement (WE) (H_9). Work engagement (WE) has a significant mediating effect on the relationship between knowledge management (KM) and organizational performance (OP) (H_{10}). Finally, we found that knowledge management and work engagement have a significant mediating effect on the relationship between sustainable HRM practices and organizational performance. Summarily, all the proposed study hypotheses involving the direct and mediation effects of the model constructs were supported by the research data.

Table 8. Bootstrap estimates of the mediating effects of Knowledge Management and Work Engagement

H		Direct effect		Indirect effect		Results on med.	Type of med.
		Bootstr value	p-value	Bootstr Value	p-value		
H_7	Su-HRMP➜KM➜OP	0.34	0.001	0.104	0.039	Sig.	Partial
H_8	Su-HRMP➜WE➜OP	0.34	0.001	0.084	0.041	Sig.	Partial
H_9	Su-HRMP➜KM➜WE	0.35	0.001	0.28	0.002	Sig.	Partial
H_{10}	KM➜WE➜OP	0.16	0.038	0.103	0.022	Sig.	Partial

Note: Probability value (p-value), Bootstrapping Value (Bootstr value), Results on mediation (Results on med.), Type of mediation (Type of med.), Significant (Sig.).

DISCUSSION AND CONCLUSION

The research has made several important contributions to knowledge concerning an empirical examination of a conceptual model linking sustainable HRM practices, knowledge management, work engagement, and organizational performance. It has provided proof of five variable relationships contained in the model. Firstly, organizational performance increased with sustainable HRM practices through knowledge management. Secondly, organizational performance increased with sustainable HRM practices through work engagement. Thirdly, work engagement increased with sustainable HRM through knowledge management. Fourthly, organizational performance increased with knowledge management through work engagement. Fifthly, organizational performance increased with sustainable HRM through knowledge management and work engagement.

It could be inferred that sustainable HRM practices are an important factor in increasing the efficiency of universities in Jordan, where the research was conducted. Although universities typically constitute a large number of employees with standard wages, complete and accurate employee performance assessments were not conducted for high organizational performance, thus increasing organizational performance and maintaining it at high levels may pose some challenges insofar as employee productivity is concerned. In examining the study model in Figure 2, knowledge management substantially affected work engagement, while sustainable HRM practices significantly influenced knowledge management, work engagement, and organizational performance. Additionally, the highest organizational performance impact originated from sustainable HRM practices. The outcomes would have been affected by sample attributes where most (62.0%) employees constituted an average of 47.5 years old with over 10

years of working experience and tertiary (including postgraduate) education. The fundamental role of sustainable HRM practices for high organizational performance was assumed as the study respondents were predominantly mature and highly educated adults with adequate working experience.

The research has proven the positive and significant effect of sustainable HRM practices on organizational performance through knowledge management. That finding was in line with the results of previous research by Al-Tit (2016) involving manufacturing firms in Jordan, and another by Gope et al. (2018), who surveyed employees of IT companies in India. The research has also proven the positive and significant effect of sustainable HRM practices on organizational performance through work engagement. That finding was in line with the results of previous research by Ahmad et al. (2021), who surveyed employees of SMEs in Pakistan, and by Pombo and Gomes (2018) whose survey spanned several industry sectors, ranging from energy and water to transport, communication, and finance and businesses in Portugal, Norway, and Denmark.

The result of the recent study indicated how sustainable HRM practices could enhance work engagement and knowledge management. As espoused by Al-Bahussin and Elgaraihy (2013), Gope et al. (2018), and Theriou and Chatzoglou (2008), HRM practices were found to affect knowledge management. Consistent with the findings of Hanif et al. (2020) and Qureshi et al. (2020), knowledge management was found to affect work engagement. The first gap explored in the recent research was the mediating role of knowledge management on the relationship between sustainable HRM practices and work engagement. The result of using SEM to scrutinize the gap revealed that sustainable HRM practices, directly and indirectly, influence work engagement through knowledge management. The direct effect of sustainable HRM practices on work engagement $(\beta = 0.35)$ was stronger than its indirect effect through knowledge management ($\beta = 0.28$). That could be explained by the fact that most respondents (62.0%) were academic staff of Jordanian universities who were already accustomed with knowledge management, having had more than 10 years of experience and were highly educated, including owning a postgraduate qualification.

The research result indicated how knowledge management could improve and increase organizational performance. It positively affected and increased the level of work engagement, as Hanif et al. (2020) and Qureshi et al. (2020) had proven, and work engagement had an effect on organizational performance; consistent with the research findings of Bakker and Bal (2010), Bhatti et al. (2018), Dubbelt et al. (2016); Gutermann et al. (2017), Junça-Silva et al. (2017) and Rofcanin et al. (2017). For example, a study conducted by Dubbelt et al. (2016), found that academic females spent more time on

activities associated with performance during days when they felt more engaged. The second research gap addressed was the mediating role of work engagement on the relationship between knowledge management and organizational performance. The direct effect of knowledge management on organizational performance (β = 0.16) was found to be stronger than its indirect effect through work engagement (β = 0.10). Hence knowledge management was significantly instrumental in improving organizational performance. The academic staff of the universities produced knowledge, which was applied at their university to improve its performance. The staff may transfer their experience to future generations, who may further enhance university performance.

The result of the recent study was consistent with the findings from previous research (Gope et al., 2018; Theriou & Chatzoglou, 2008) in that HRM practices positively affect knowledge management. In fact, it had the effect that was shown to be the largest. According to the literature, the effect increased the efficiency of knowledge acquisition (Soliman & Spooner, 2000; Gope et al., 2018); knowledge sharing (Currie & Kerrin, 2003; Soliman & Spooner, 2000; Gope et al., 2018); knowledge transfer (Minbaeva, 2005; Tuan, 2011); absorption, using, and re-using employees' knowledge (Soliman & Spooner, 2000); and the processes of generating, distributing, developing, and retaining knowledge (Gope et al., 2018). Knowledge creation and application initiated organizational innovation (Johannessen, Olsen, & Olaisen, 1999), so did knowledge integration and vision (Johannessen et al., 1999). Hence, overall, organizational innovation was supported by knowledge management, following Al-Bahussin and Elgaraihy (2013) and Alfawaire and Atan (2021), and HRM practices (Al-Bahussin & Elgaraihy, 2013; Jiang et al., 2012; Laursen, 2002).

HRM practices were found to impact the knowledge creation process (Soliman & Spooner, 2000; Oltra, 2005; Osterloh, 2005) at the core of knowledge management (Lee & Choi, 2003). Knowledge creation is an impulse in the quest for more sustainability in organizational operations (López-Torres et al., 2019). Universities that belong to the service sector should have the capability to innovate as a result of sustainable HR practices, as hinted by Wikhamn (2019).

Sustainable HRM practices foster a workplace dialogue, which can also increase knowledge and skills in an organization (Manzoor et al., 2019). As a result, sustainable HRM practices can improve the implementation of knowledge management. From that perspective, knowledge management offers an alternative impulse in the quest for more long-term sustainability (Martins, Rampasso, Anholon, Quelhas, & Leal Filho, 2019) in organizational

operations (López-Torres et al., 2019) and organizational performance (Kordab, Raudeliūnienė, & Meidutė-Kavaliauskienė, 2020).

Efficient and effective knowledge management in organizations improves work engagement. Engaged employees should be able to easily access and exploit generated knowledge and uncover new ones (Hanif et al., 2020; Qureshi et al., 2020). Work engagement is being considered as an end result or an effect of HRM practices (Aboramadan et al., 2020; Karatepe, 2013; Saks, 2006; Sani & Ibrahim, 2005). Thus, knowledge management is vital in determining work engagement. The improvement in employee work engagement can enhance by way of sustainable HRM (Xu et al., 2020).

Moreover, knowledge management affected organizational performance (Al-Bahussin & Elgaraihy, 2013; Kinyua, 2015). It improved followers' engagement as well as organizational performance. It boosted organization and work engagement by initiating discussions on task-related issues and improved the acquisition and sharing of knowledge (Gope et al., 2018; Soliman & Spooner, 2000). Work engagement additionally has a significant effect on organizational performance (Demerouti & Bakker, 2011) presumably because personnel with positive attitudes at their workplace can promote organizational success (Gruman & Saks, 2011; Al Mehrzi & Singh, 2016). Recent research has proven that work engagement mediated the relationship between knowledge management and organizational performance.

The research results indicated the importance of sustainable HRM practices as a direct antecedent of organizational performance. In addition, the perception of knowledge management and work engagement also exerted a direct effect on organizational performance. Thus, employees' perception of appropriate HRM practices could support the implementation of knowledge management processes. Hence, they would be more inclined to engage in their work and participate in improving organizational performance. This generalization coincides with AMO theory (Appelbaum et al., 2000; Lepak et al., 2006; Jerónimo et al., 2020) that reinforced how sustainable HRM practices could make more noteworthy degrees of knowledge and engagement and they, thus, would create an environment that boosts organizational performance. Along those lines, individuals who saw appropriate sustainable HRM practices in their organization would be greater prepared to implement knowledge management and would be better engaged in their work. This feeling of engagement would influence organizational performance.

Nevertheless, the research result showed the mediating effect of employees' perception of knowledge management and work engagement that reinforced the direct relationship between sustainable HRM practices and organizational performance. It confirmed that, beyond HRM practices, knowledge management, and work engagement, organizations could

weave a set of interactions that further favored their performance. Hence sustainable HRM practices were important for generating further organizational performance.

MANAGERIAL IMPLICATIONS

The aim of the research was to derive some guidelines for universities on how they could capitalize on sustainable HRM to improve their organizational performance coupled with knowledge management and work engagement. It was empirically proven that sustainable HRM practices affected organizational performance through knowledge management followed by work engagement. The research has made substantial contributions to existing theories by way of a logical model; constructs, their domains, measurement instrument, and relationships. These are potential means for developing practical applications such as a university planning and control model that is based on index measures of constructs.

Sustainable HRM practices proved influential to optimizing organizational performance with essential implications in creating, acquiring, sharing, and transferring organizational knowledge. As knowledge management influences work engagement effectiveness and catalyzes organizational performance, universities should utilize sustainable HRM practices for high organizational attainment and a productive working environment. In Lew (2009), employees significantly improved university ratings in key areas: faculty academic reputation, research quality, empirical contributions to society, academic program and graduate quality, and leadership training. As knowledge-producers, employees would generate reputable knowledge in a conducive, working environment.

Sustainable HRM practices are highly necessary to maintain the pertinence of HR roles. The term sustainability implies 'durable' or 'longer,' where current actions induce positive implications. Notwithstanding, few companies could be fully bound to sustainable HRM potentiality (Manzoor et al., 2019). Following recent investigations on the impact of sustainable HRM practices on organizational performance through knowledge management and work engagement using SEM, sustainable HRM practices proved significant for sustainable organizational success with a focus on the significance of knowledge and variables associated with the rise of the information age. Rapid knowledge processing and novel information generation implied the need to train competent workers as employee experiences reflect intangible university properties. Thus, universities aim to transfer such experiences to future generations through effective storage in line with the current

study area. Recent research has proven that knowledge grew as a result of sustainable HRM practices at universities. Knowledge management positively affected work engagement and organizational performance. Sustainable HRM practices elevate work engagement levels with personal development, while their implementation could induce employee well-being as academic research indicated enthusiastic workers to be productive. The ultimate aim of universities is to become more efficient and effective through performance improvement. To boost their performance, universities should implement sustainable HRM practices and adapt to the conditions that create knowledgeable as well as engaged employees.

LIMITATIONS AND FUTURE RESEARCH

Even though this study gives a few theoretical and practical consequences, a few limitations highlight several opportunities for future contributions to this stream of research. The first is the high subjectivity of respondents' judgments (especially in the area of organizational performance). The second is the simplified measurement of latent constructs through selected dimensions (items) only. The third is the lack of assessment of the representativeness of the research results.

Replication and expansion of the current research could provide a better comprehension and generalizability of its conclusions. Future research may test the relevance between sustainable HRM practices, knowledge management, work engagement, and organizational performance in various countries, cultures as recommended by Al-Bahussin and Elgaraihy (2013), and organizational creativities according to Jiang et al. (2012) and Shin, Jeong, and Bae (2016) that could augment the theoretical model. Future research may opt for a longitudinal design rather than the cross-sectional design employed to avoid confining data collection to a single point in time. Moreover, in order to capture organizational performance fully and comprehensively, objective organizational performance is recommended for future research.

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Abstrakt

CEL: Współczesny biznes i globalne organizacje regularnie stają przed wyzwaniami wynikającymi z nieprzewidywalnego otoczenia konkurencyjnego. Praktyki zarządzania zasobami ludzkimi (ZZL) dają pracownikom trwałe możliwości wykorzystywania swoich zdolności i wyrażania entuzjazmu do zdobywania umiejętności i wiedzy oraz stosowania ich w miejscu pracy w celu wzrostu zaangażowania jednostek i zwiększenia wydajności organizacji. Ten artykuł przedstawia najnowsze wyniki badań, których celem jest zbadanie (i) pośredniczącej roli zarządzania wiedzą i zaangażowania w pracę oraz (ii) wpływu praktyk zrównoważonego zarządzania zasobami ludzkimi na wyniki organizacji. METODYKA: 500 kwestionariuszy zostało rozesłanych do jordańskich wykładowców uniwersyteckich (populacja badawcza) w celu zebrania danych. Dane z badania oceniono za pomocą modelowania równań strukturalnych (SEM) przy użyciu IBM-SPSS-AMOS 25.0. WYNIKI: Zidentyfikowano dwa kluczowe wyniki: (i) zrównoważone praktyki zarządzania zasobami ludzkimi, zarządzanie wiedzą i zaangażowanie w pracę były pozytywnie powiązane z wynikami organizacji; (ii) zarządzanie wiedzą i zaangażowanie w pracę odegrały rolę pośrednika w trwałej korelacji pomiędzy praktyką ZZL a wynikami organizacji. IMPLIKACJE: Ogólnie rzecz biorąc, współpraca pracowników okazała się niezbędna do optymalizacji wydajności organizacji, szczególnie podczas ich zaangażowania w zrównoważone praktyki HRM i zarządzanie wiedzą. Na koniec w badaniu zaproponowano kilka praktycznych zaleceń i interwencji dotyczących zrównoważonego zarządzania zasobami ludzkimi, które można wykorzystać w przyszłych badaniach. ORYGINALNOŚĆ I WARTOŚĆ: Badanie dostarczyło dowodów na pięć zmiennych relacji zawartych w modelu. Po pierwsze, wydajność organizacyjna wzrosła dzięki zrównoważonym praktykom ZZL poprzez zarządzanie wiedzą. Po drugie, wydajność organizacyjna wzrosła dzięki zrównoważonym praktykom ZZL poprzez zaangażowanie w pracę. Po trzecie, zaangażowanie w pracę wzrosło dzięki zrównoważonemu zarządzaniu zasobami ludzkimi poprzez zarządzanie wiedzą. Po czwarte, wydajność organizacyjna wzrosła wraz z zarządzaniem wiedzą poprzez zaangażowanie w pracę. Po piąte, wydajność organizacyjna wzrosła dzięki zrównoważonemu zarządzaniu zasobami ludzkimi dzięki zarządzaniu wiedzą i zaangażowaniu w pracę.

Słowa kluczowe: praktyki zrównoważonego zarządzania zasobami ludzkimi, wydajność organizacji, zarządzanie wiedzą, zaangażowanie w pracę, teoria AMO

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Conflicts of interest

The authors declare no conflict of interest.

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Predictors of fairness assessment for social media screening in employee selection

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Abstract

PURPOSE: *The purpose of this paper is to analyze the factors that determine the response of potential candidates to the screening of private (represented by Facebook) and professional (LinkedIn) social networking sites (SNS) for personnel selection purposes, and in particular to examine how SNS screening in the personnel selection process is perceived by innovative candidates.* **METHODOLOGY:** *The empirical data were obtained through an e-questionnaire survey among c. 150 young Polish Internet users in 2021. Multiple linear regression with backward elimination was used to determine the predictors of perceived justice of Facebook and LinkedIn screening in the selection process.* **FINDINGS:** *The results confirmed previous scientific findings that the perceived justice of Facebook cybervetting is significantly lower than for LinkedIn and the privacy invasiveness of Facebook screening was rated significantly higher than for LinkedIn. The results of linear regression with backward elimination indicated that among the assumed factors influencing the perceived justice of Facebook and LinkedIn screening in the selection process (i.e., privacy invasiveness, personal innovativeness, self-image management, risk aversion, ability to control a social networking site's information, above average performance self-assessment, a general concern for internet privacy, and – in the case of LinkedIn – having an account on LinkedIn) the perceived privacy invasiveness is the best predictor of perceived justice of both private (Facebook), and professional (LinkedIn) social networking site screening for personnel selection purposes. Also, the candidate's*

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self-image management affects the perceived justice of both types of social media used as selection tools, whereas personal innovativeness increases the acceptance of private social media (Facebook) scanning for this purpose. **IMPLICATIONS***: This study contributes to the body of knowledge regarding the perceived justice of ICT-based selection tools, and of social networking site screening for personnel selection purposes in particular. It expands the knowledge about the applicability of social networking site content analysis of Polish users, especially of innovative candidates. The paper also provides some practical recommendations to help organizations apply social media content analysis in a way that minimizes potential candidates' perception of privacy invasiveness and increases their fairness perception.* **ORIGINALITY AND VALUE:*** It is the first application of a cybervetting scale on a Polish sample that is advantageous in terms of comparability of data from different countries. We found that activities focused on creating one's online image foster a higher acceptance of cybervetting that can diminish predictive validity of this type of selection practices.* **Keywords:*** social networking sites, ICT-based selection tools, employee selection, fairness assessment, cybervetting*

INTRODUCTION

Proper staffing is a key HR task that enables the organization to function. Increasing turbulence in organizations' environments, as well as the increasing importance of employees' knowledge and their ability to interact with people from different backgrounds, requires HR not to overlook any rich sources of information that can be useful to predict how a given person will behave in various situations at work. The emergence of new sources from which information can be obtained to enable such predictions, i.e., containing manifestations of behavior of potential candidates, results in attempts by HR to use this information for staffing purposes. Social media – with their ever-wider groups of people and social interactions – are another such source of information that HR cannot bypass.

According to the latest Digital Global Overview report (Kemp, 2022) there were 27.2 million (70% of the total population) social media users in Poland in January 2022. Between 2021 and 2022, this number increased by 5% (1.3 million). Facebook had 17.65 million users, Instagram had 10.70 million, TikTok had 7.70 million, and LinkedIn had 4.60 million users in Poland in early 2022. This widespread use of social media paves the way for using it for HR purposes, especially for gathering information for employee selection processes.

The use of ICT-based techniques has revolutionized not only business, but also HR operations. In response to the new needs of organizations and the environment in which they operate today, which is turbulent not only economically and technologically but also in terms of social values, changes

in Human Resources Management (HRM) tools are emerging. A significant proportion of them use ICT-based solutions and new types of data, which ICT help to create. Naturally, questions arise about the utility of the new methods for organizations that operate in this innovation-intensive environment.

One such new HRM method is the analysis of information from social networking sites (SNS) in the recruitment and selection processes of job candidates. Despite its widespread use by organizations, we know little about its actual usefulness and the reaction of candidates to this type of behavior by recruiters, and scientific research has yielded divergent results. Notably, there is no data to assess which candidates react most negatively to the use of social media screening, in particular whether the use of these methods discourages innovative candidates from applying.

The purpose of this article is to identify factors that promote a positive response from potential candidates to the use of social media information analysis as a selection method, which is often referred to in the literature as cybervetting (Cook et al., 2020; Gruzd et al., 2020), and in particular to see if the use of cybervetting for evaluating innovative candidates elicits negative reactions from them. Based on the data obtained by means of an electronic questionnaire from c.150 young Polish Internet users, it was confirmed that the acceptance for SNS screening for professional content (LinkedIn) is higher than for private content (Facebook). Then it was examined whether factors affecting the perceived justice (the proxy for the acceptance, typically used in recruitment studies – see Anderson et al., 2010) of SNS screening include those that indirectly promote organizational entrepreneurship. Based on a literature review, we hypothesize that the perceived justice of SNS screening (cybervetting) can be predicted by privacy invasiveness, personal innovativeness, self-image management, risk aversion, ability to control SNS information, above average performance self-assessment, a general concern for internet privacy, and – in the case of LinkedIn – having an account on LinkedIn.

The results of linear regression with backward elimination demonstrated that a candidate's perceived privacy invasiveness and self-image management influence the perceived justice for both types of SNSs used as selection tools. However, personal innovativeness increases acceptance for screening private SNSs for this purpose (Facebook). The results of the study expand the scientific knowledge on the applicability of professional-type social media content analysis on innovative candidates, and provide some practical recommendations to help organizations apply social media content analysis without discouraging potential candidates.

LITERATURE REVIEW

Social media and their types

The growth of social media and its widespread use by potential employees has led to interest in the possibility of using the social media content as a source of information in employee selection processes. Social media is usually defined as an IT application that creates a space with user-driven content, and the role of the owner of the application that enables access to this content is only to provide opportunities for users to interact with each other, according to the rules for creating this content. For example, A.M. Kaplan and M. Haenlein define social media as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0 and that allow the creation and exchange of User Generated Content" (Kaplan & Haenlein, 2010, p. 61). These applications include social networking sites (SNSs), which aim to create a shared social space where not only interactions occur with the use of extensive capabilities and a variety of expressive tools, but also a sense of social connection is achieved. Their growth in the 21st century has resulted in combining user-constructed profiles with the ability to communicate with others through various types of messages. This enables users to be pseudo-permanently in touch with friends and maintain social ties of various kinds. From the perspective of social media users, they enhance their real-world social relationships, and serve not only as a means to exchange information (Levinson, 2010; Richey et al., 2018; Gonzalez et al., 2019).

However, not all SNSs are private and egocentric. Some are oriented toward creating bonds between people (acquaintances) and raising one's own self-esteem from place of position and by receiving praise (Levinson, 2010, p. 32). Other SNSs (e.g., LinkedIn) focus on professional matters and knowledge sharing, and thus serve to establish professional relationships and discuss professional problems (Levinson, 2010). However, the line between private and professional SNSs is becoming increasingly blurred today (Richey et al., 2018, p. 426). There is a growing number of SNSs' users who treat their online activity as a self-promotional tool, not only in the sense of promoting their contribution to the network, but also in terms of representing themselves to potential job markets (Richey et al., 2018; Jacobson & Gruda, 2020).

Social media (SM) can be divided into three main types: Entertainment networks (a cluster of SM that have to do with general entertainment, such as games, sports, cinema, travel, and so on), Profiling Networks (a cluster of SM that offer functions promoting skills, goals, personal journals, etc.) and Social Networks (a cluster of SM with primary utility of connecting and sharing information) (Koukaras et al., 2020). From the perspective of the current study,

the most important division separates SNSs into two types: (a) communities of people who share some type of professional interests (e.g., LinkedIn); and (b) "egological" ones, the purpose of which is building relations among groups of peoples (e.g., Facebook). This division is the one most commonly used in research on the use of SNSs in HR practices (Aguado et al., 2016; Roth et al., 2016; Cook et al., 2020; Roulin et al., 2021). Both types of SNSs "allow individuals: (a) to build a public or semi-public profile within a well-defined system, (b) to articulate a list of users with whom they have a connection and, finally, (c) to see and cross their connections list with others made by different individuals belonging to the same system" (Gonzalez et al., 2019, p. 707). It should be clearly emphasized that from the perspective of their users, these two types of SNSs (i.e., professional and private) have different functions and different rules for the disclosure of personal facts. Both types of networks allow users to use the privacy settings to ensure which of their online activities will not be revealed to others, and individuals may maintain public/private self-disclosure. However, the admiration- and entertainment-oriented private-type networks are characterized by a stronger tendency to reveal private information, while the professional-type network users focus on establishing their positions as professionals worthy of cooperation (which also includes employment).

Social media and their recruitment use

Both types of SNSs contain information that can be useful in the employee selection process (Chauhan et al., 2013; Roth et al., 2016; Zacny et al., 2020) and studies – both academic and industry reports – show that recruiters often use SNSs of both types in the selection process. Given the widespread use of Facebook by potential employees, the Huffington Post reported back in 2012 that "37% of current employers are using social media to find information on potential employees. Of that group, 65 percent use Facebook as their primary tool (Curran et al., 2014, p. 444)". To this day, Facebook is the most widely used SNS. It is not surprising that, according to surveys conducted in the USA and Europe, up to 85% of managers or organizations have used LinkedIn and 78% have used Facebook for selection purposes (Cook et al., 2020, p. 383).

In Poland, the scale of this utilization may be somewhat reduced, as the spread of social networks in Poland was delayed in comparison, and the SNS user base has slightly different demographic characteristics than that of Western countries (Woźniak, 2013). According to 2021 data of Polish industry research, Facebook is used mainly by people over the age of 35 and there are about 18 million Polish accounts. LinkedIn is used by 4.1 million people, also extensively by senior executives, and the main user base is aged between

25–44 years, with 50% of users being in this age range (Social Media in Poland, 2021). In 2010, industry surveys showed that recruiters were declaring the use of SNS screening in the recruitment process (Woźniak, 2013), and limited studies demonstrated a fairly widespread use of such media in specific companies. According to 2018 data from a survey conducted by Lee Hecht Harrison DBM Poland, 97% of Polish recruiters use social media for work-related purposes. Up to 77% of headhunters and 35% of internal recruiters do it every day (Latus, 2018). Similar results are presented in other industry reports, showing that the larger the company, the more often recruiters use social media for recruitment purposes, and that recruiters are more likely to check candidates' social media before an interview than after – 56% vs. 36% (Błaszczak, 2018).

Many researchers are skeptical about the predictive value of using Facebook as a data source in employee selection processes (Van Iddekinge et al., 2016; Zhang et al., 2020; Roulin et al., 2021). Opinions on data extracted from LinkedIn are sometimes more favorable (Cook et al., 2020; Roulin et al., 2021). For example, Roulin and Levashina (2019) found that hiring recommendations based on LinkedIn assessments were positively associated with several career success indicators. However, there are also studies questioning the value of information obtained by screening LinkedIn accounts (Cubrich et al., 2021).

Negative fairness assessment as an obstacle to the use of ICT-based selection tools

The use of non-traditional, ICT-based selection tools encounters obstacles related not only to their accuracy, and therefore the possibility of collecting information that predicts well the success of the position being filled, but also to the side-consequences that the use of new tools can bring to the organization. Early research on the application of ICT in selection has already shown that applicant reactions to personnel selection methods can be negative if novel technologies are used (e.g., Blacksmith et al., 2016) and, consequently, some applicants might self-select out of the application process because they experience negative feelings toward technologically advanced selection procedures. It is not surprising that applicant reactions toward specific selection and preselection tools have generated much research over the past decades (Anderson et al., 2010) pointing to the importance of fairness and justice in selection processes (Stone et al., 2013), both in studies of traditional (Anderson et al., 2010) and new selection methods (McCarthy et al., 2017; Woods et al., 2020), also in Poland (Balcerak & Woźniak, 2021; Woźniak, 2019).

Research on SNS screening in the selection process is still scarce (Roth et al., 2016; McCarthy et al., 2017; Woods et al., 2020) and their findings often diverge. Some indicate the negative effects of social media screening on candidate responses (Aguado et al., 2016), while some state that the effects can be positive, particularly in cases of professional SNSs (Cook et al., 2020; Roulin et al., 2021). It is also shown that the opinions of candidates may differ from country to country (Gruzd et al., 2020), or be indirectly and situationally affected. For instance, a company's image improvements, may favor positive fairness assessment of the selection processes based on SNS screening (Folger et al., 2022).

Quite unanimously, studies show negative reactions from potential candidates to private SNS screening (Bohnert & Ross, 2010; Aguado et al., 2016; Baglione et al., 2020; Roulin et al., 2021), although it is sometimes emphasized that social media competencies, such as the ability to restrict access to profile information, mitigate this negative reaction (Suen, 2018; Baglione et al., 2020). Since the start of this research, differences between private and professional SNSs have also been highlighted, both in terms of the scale of their use by HR (Nikolaou, 2014) and candidates' reactions to this use. It is generally believed that job applicants have more favorable reactions toward the use of information posted on LinkedIn compared to other social media platforms such as Facebook (Stoughton, 2016; Stoughton et al., 2015; Aguado et al., 2016; Roulin et al., 2021). Some studies have shown that candidates' attitudes toward social media screening in the selection process can differ geographically. For example, Gruzd et al. (2020, p. 1) found that after researching respondents from India, they are "significantly more comfortable" with this method than those living in the United States. Therefore, it is important not to neglect research on the determinants of responses to SNS screening (both private and professional) in Poland.

Gaps in the literature

There are also a number of additional needs in the field of research into candidates responses to ICT-based selection tools. There is a lack of knowledge about the reasons for the differentiation of candidates' reactions to SNS screening (Roth et al. 2016; McCarthy et al., 2017; Baglione et al., 2020). Cook et al. (2020, p. 384) note that existing research on attitudes toward cybervetting usually is based on measures "borrowed from attitudes toward traditional selection methods."

Hence, the purpose of the current study is to analyze the factors that determine the positive response of candidates to private and professional SNS screening, and in particular to examine whether selection based on such

data fosters negative reactions of potential candidates characterized by high personal innovativeness and other features indicating their entrepreneurial traits. This partially answers the call for further research, stated in the Journal of Management, on how candidates' individual traits differentiate their responses to cybervetting (Roth et al., 2016, p. 273, 289).

Even a cursory review of the scattered detailed knowledge identifies a number of variables that should foster a less negative attitude toward cybervetting. If candidates believe they are highly competent professionally, they should expect success when applying, as research shows that successful candidates will positively evaluate the use of SNS screening during the recruitment process (Gardner & Dunkin, 2019).

The ability to secure private information on one's own social media profile is also important here. Suen's (2018) study found that potential candidates, who were able to restrict access to information on their profiles, rated SNS screening for selection purposes higher than those who were not. It is to be expected, therefore, that both a potential job candidate's perception of their professional competence as high, and a good ability to manage own SNS profiles, should foster a more favorable assessment of cybervetting.

In addition, it is worth noting that potential candidates are increasingly aware that SNS content analysis is becoming an employee selection tool. Consequently, for the purpose of creating their image as a professional and increasing their chances of obtaining employment, they no longer use only their profile on the professional SNSs, but also create a separate profile on the private SNSs (e.g., on Facebook), or remove certain information from it (Suen 2018, p. 398), generally taking care to "create positive professional impressions" (Richey et al., 2018, p. 426) to increase their chances of obtaining suitable employment. Hence, it is to be expected that those who put care into creating their professional image on social media will be positive about SNS screening as a selection practice.

Older research indicates that people with high computer skills (i.e., general, not social media related), particularly IT students, are less anxious when interacting with computers (Beckers & Schmidt, 2003; Potosky & Bobko, 1998), react more positively to using ICT tools in employee selections (Wiechmann & Ryan, 2003; Zacny et al., 2019), and have more favorable reactions to the selecting organizations (Bauer et al., 2006). It is also assumed – and confirmed by some studies – that a younger age, which is an indirect indicator of computer competence (or at least a sense of agency in this area), promotes a positive response to cybervetting (Roth et al., 2016). However, there is no shortage of research showing that IT knowledge (e.g., being an IT student – Zacny et al., 2019) does not significantly affect attitudes toward organizations' use of ICT-based tools during selection (Langer et al., 2018).

One may also think that a general IT knowledge makes the opportunities presented by given ICT-based procedures visible, and so it will reinforce psychological inclinations related to attitudes concerning privacy protection (Langer et al., 2018) or entrepreneurship traits.

From the perspective of the purpose of the study, which is to verify how SNS screening in the personnel selection process is perceived by innovative candidates and in what ways organizations can increase the strength of positive responses to these tools in candidates with traits associated with entrepreneurial inclinations, it is important to consider the role of personal innovativeness in building a response to SNS screening. Personal innovativeness is understood as "the willingness of an individual to try out any new information technology" (Agarwal & Prasad, 1998, p. 206). Research shows the influence of personal innovativeness on information technology acceptance (Slade et al., 2015; Ahmad, 2018) and SNS acceptance (Wijesundara & Xixiang, 2018; Kim et al., 2019). This specific type of innovation should also foster a positive attitude toward cybervetting, as it involves the use of new technologies in the personal area (Mochi et al., 2017; Parasuraman & Colby, 2015).

In turn, negative reactions to SNS screening should be fostered by risk aversion and a sense of privacy risk. Previous research has shown that the perception of privacy risks is one of the reasons why SNS screening is treated with reluctance by candidates (Roth et al., 2016, p. 288; McCarthy et al., 2017, p. 1705; Zacny et al., 2019).

As highlighted above, an important factor influencing attitudes toward cybervetting is the use of one's online profile to create a professional image. This aspect has not been studied directly to date, but was postulated by Gruzd et al. (2020). However, the authors of that study used as an indicator for this factor not the scale associated with managing one's self-image through social media activities, but the number of accounts one has on such portals, and the results of their study did not support such an operationalized hypothesis.

We hypothesize that predictors of perceived justice of screening Facebook and LinkedIn in the personnel selection process includes privacy invasiveness, personal innovativeness, self-image management, risk aversion, ability to control SNS information, above average performance self-assessment, and a general concern for internet privacy, and – in the case of LinkedIn - having an account on LinkedIn.

METHOD

Respondents' characteristics

Data were collected in June 2021 using snowball methodology by one of the authors' MA students, who agreed to extend the survey used for her thesis (Szczygieł, 2021) and agreed for further use of the data in the authors' research. The research sample consists of 147 adults, of whom 61.3% were 18–25 years old, 27% were 26–36 years old, and 11.7% were over 36 years old. The participants can be treated as young professionals, or on the way to be, as 49.3% of them were students or had a bachelor's degree, 38.7% had a master's degree, and only 12.0% had received at most a secondary education. Only 26.7% of our respondents were not actually working – being fulltime students, while 36.7% had been employed for up to 4 years, 27.3% employed for 5–14 years, and 9.3% had a longer work history.

It should be clearly noted that the scale of Facebook and LinkedIn use among the respondents varies, although it seems to be in line with data that comes from earlier Polish incidental sample surveys (e.g., "almost 80% of respondents have their own profile on social network site... [but] 28% of respondents admitted having their own virtual professional profile", Zdonek et al., 2015, p. 225) and the trend toward increasing levels of social media use over time. In our sample, 99% of respondents had an account on Facebook and 33% declared that it was mostly public (although the answer "public" was chosen twice as often as "primary public"). Only 38% of respondents had an account on LinkedIn, and 13% intended to set up a LinkedIn account soon. The percentage of those who declared that their profiles were public was 75%, and the answer "public" was selected twice as often as "primary public." This breakdown of social network use is consistent with the claim about the prevalence of Facebook among Polish Internet users and their significantly lower use of LinkedIn. It also means that it is useful to study the implications of having a LinkedIn account for attitudes toward cybervetting, while it is not possible to study that based on the data available for Facebook account ownership.

Measures

Perceived justice and **privacy invasiveness** were measured on the scales developed by Cook et al (2020). Representative items included: "It is fair for a potential employer to make a hiring decision based on the information they acquired from my Facebook/LinkedIn profile" and "I believe that screening my Facebook/LinkedIn profile is an effective tool for an employer

to use in the hiring process" (perceived justice), "I would be concerned if I knew a potential employer might access my Facebook/LinkedIn profile" and "I would feel uncomfortable if I learned that a potential employer had viewed my Facebook/LinkedIn profile without my knowledge" (privacy invasiveness). Participants responded on a seven-point Likert-type scale (from 1– strongly disagree to 7 – strongly agree). Cronbach's α for perceived justice =0.686; for privacy invasiveness =0.874.

Self-image management was measured by an ad hoc constructed three items scale: 1. Before adding a post or photo on social profiles, I wonder how other people will react to it. 2. Have you ever wondered if your future employer is looking for information about you on the Internet? 3. Do you think you care about your image on the Internet? Participants responded on a seven-point Likert-type scale (from 1 – strongly disagree to 7 – strongly agree). Cronbach's α=0.663.

Above average performance self-assessment was a dichotomous variable indicating whether the respondent assessed his/her work performance as "rather higher than average", "higher than average," or "definitely higher than average."

Ability to control SNS information. Three items, two of them adopted from Suen (2018), were used to measure this construct: "I know how to use the privacy settings in my social media accounts," "I know which information on my social media accounts may provoke a negative impression on potential recruiters," "I have quite a lot of knowledge about the latest solutions related to ensuring privacy on the Internet". Participants responded on a five-point Likert-type scale (from 1 – strongly disagree to 5 – strongly agree). Cronbach's α =0.677.

Risk aversion was measured using three items derived from Disatnik and Steinhart (2015): "I would rather be safe than sorry," "I want to be sure before I try things that are new or unfamiliar to me," "I avoid risky things." Participants responded on a five-point Likert-type scale (from 1 – strongly disagree to 5 – strongly agree). Cronbach's α =0. 858.

A general concern for internet privacy was measured using four items derived from Schumann, von Wangenheim and Groene (2014): "In general, I am concerned about my privacy when using the Internet," "I am concerned that information I submit on the Internet could be misused," "I am concerned that a person can find private information about me on the Internet," "I am concerned about submitting information on the Internet, because they could be used in a way that I cannot foresee." Participants responded on a five-point Likert-type scale (from 1 – strongly disagree to 5 – strongly agree). Cronbach's α =0. 914.

Personal innovativeness was measured on the scale developed by Agarwal and Prasad (1998). This scale consists of four items: "I like to experiment with new information technologies," "Among my peers I am usually the first to try out new information technologies," "If I heard about a new information technology I would look for ways to experiment with it," "In general, I am hesitant to try out new information technologies (reversed)". Cronbach's α =0. 821.

LinkedIn user – was a dichotomous variable indicating whether the respondent has or is intending to create an account on LinkedIn soon.

IBM SPSS Statistic software (ver. 27) was used to conduct all statistical analyses. The criterion for statistical significance was set at 5%.

RESULTS

Table 1 presents the mean, standard deviations, and correlations among the variables used in this study.

Table 1. Mean, standard deviations, and correlations

	Variable	Mean	SD	Correlations[†]									
				1	2	3	4	5	6	7	8	9	10
1	Perceived justice (Facebook)	2.94	1.30	1									
2	Privacy invasiveness (Facebook)	4.42	1.84	-0.467**	1								
3	Perceived justice (LinkedIn)	4.16	1.67	0.349**	-0.072	1							
4	Privacy invasiveness (LinkedIn)	3.16	1.81	-0.117	0.437**	-0.625**	1						
5	Self-image management	4.90	0.95	0.165*	0.034	0.207*	-0.103	1					
6	Personal innovativeness	2.76	0.98	0.048	0.057	0.046	0.089	-0.222**	1				
7	Risk aversion	3.44	1.14	0.002	0.276**	-0.049	0.224**	0.266**	-0.342**	1			
8	Ability to control SNS information	3.63	0.89	0.110	0.200*	0.109	0.064	0.120	0.210*	0.224**	1		
9	Above average performance self-assessment	0.44	0.50	0.033	-0.153	0.209*	-0.216**	0.006	0.061	-0.122	0.156	1	
10	General concern for internet privacy	3.06	1.14	-0.099	0.376**	-0.078	0.270**	0.273**	-0.012	0.339**	0.173*	-0.027	1
11	LinkedIn user	0.51	0.50	0.036	-0.023	0.508**	-0.354**	-0.065	0.220**	-0.239**	0.032	0.339**	-0.004

Notes: ** - correlations significant at the 0.01 level, * - correlations significant at the 0.05 level.
Source: data from research.

Firstly, we assessed if there are expected differences in perceived justice and privacy invasiveness ratings between Facebook and LinkedIn screening for personnel selection purposes. The perceived justice of Facebook was rated significantly lower than LinkedIn's, with Cohen's d=0.71, $t_{(146)}$ =-8.57, p<0.001 whereas the privacy invasiveness of Facebook was rated significantly higher than LinkedIn's with Cohen's d=0.65, $t_{(146)}$= 7.90, p<0.001.

To identify the predictors of perceived justice of Facebook screening (the first analysis) and LinkedIn (the second analysis) in the personnel selection process, two multiple regressions with backward elimination were conducted.

In both models, residuals are normally distributed. In the Facebook analysis the Shapiro-Wilk statistic = 0.99 (p = 0.384), in the LinkedIn analysis the Shapiro-Wilk statistic = 0.99 (p = 0.402). The homoscedasticity assumption was examined by analysing the scatterplots of standardized predicted values against the standardized residuals (Figure 1). As Figure 1 shows, the residuals are randomly scattered and therefore the assumption of homoscedasticity was met.
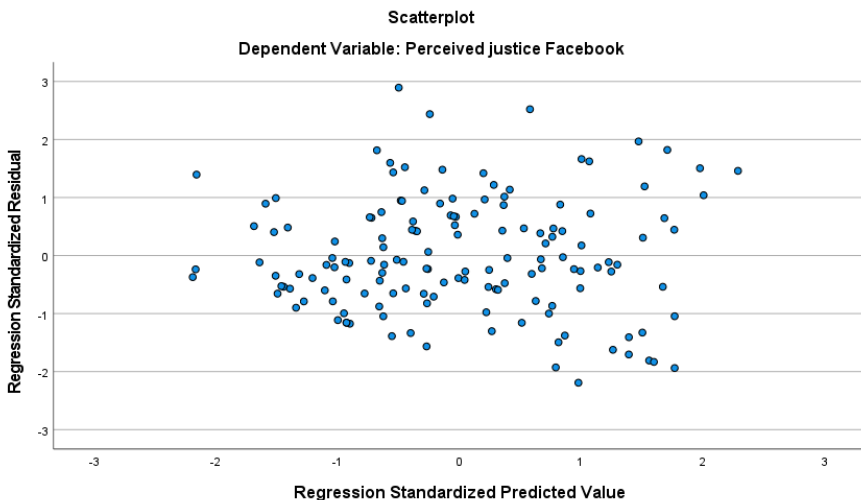
a

Figure 1. Scatterplots of homoscedasticity tests for perceived justice of a) Facebook, b) LinkedIn
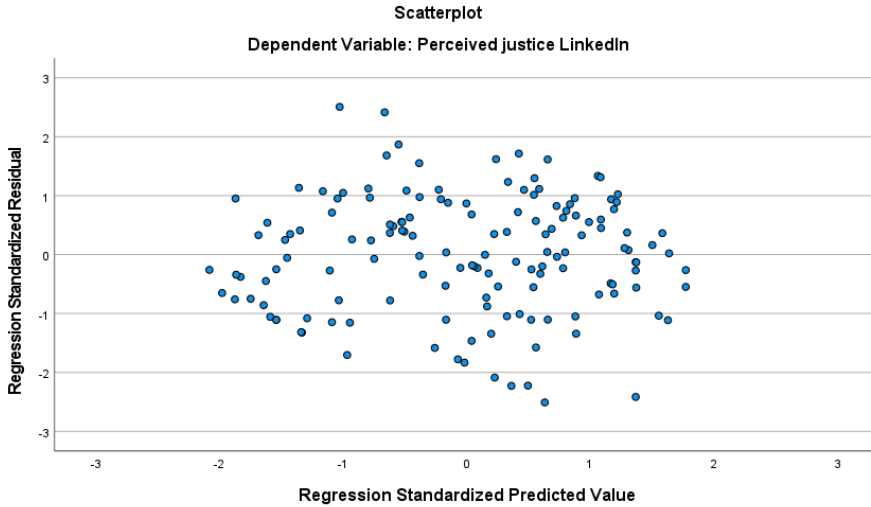
b

Figure 1. Scatterplots of homoscedasticity tests for perceived justice of a) Facebook, b) LinkedIn (cont.)

The first regression analysis indicates that the perceived justice of Facebook screening in the selection process is influenced mostly by perceived privacy invasiveness (negative coefficient), personal innovativeness and self-image management. The final model also includes risk aversion, although this predictor is not significant at the .05 level (Table 2). The model was statistically significant $F_{(4, 142)}=14.094$, $p<0.001$ and accounts for 26.4% of the variance in the perceived justice of Facebook screening in the selection process (R Square =0.284, Adjusted R-Square =0.264).

The squared multiple semi-partial correlation coefficients indicate that privacy invasiveness uniquely accounts for 24.90% of the variation of the perceived justice of Facebook screening, whereas personal innovativeness accounts for 2.46%, and self-image management 2.89%.

As the second regression analysis revealed, privacy invasiveness, self-image management, and risk aversion also influenced the perceived justice of LinkedIn screening in the selection process (Table 2). The last predictor in the model is being a LinkedIn user. The model was statistically significant $F_{(3, 142)}=39.513$, $p<0.001$ and accounts for 51.3% of the variance in the perceived justice of LinkedIn screening in the selection process (R Square =0.527, Adjusted R-Square =0.513).

Table 2. The final linear regression models

Dependent variable: Perceived justice of screening B		Unstandardized		Stand. Beta	t	Sig. Zero-order	Correlations			Collinearity Statistics	
		B	Std. Error				Partial	Semi-partial	Tolerance	VIF	
Facebook	(Constant)	2.137	0.686		3.114	0.002					
	Personal innovativeness	0.229	0.103	0.171	2.214	0.028	0.0048	0.183	0.157	0.841	1.189
	Self-image management	0.246	0.102	0.179	2.399	0.018	0.165	0.197	0.170	0.910	1.099
	Privacy invasiveness	-0.374	0.053	-0.527	-7.031	<0.001	-0.467	-0.508	-0.499	0.898	1.114
	Risk aversion	0.181	0.093	0.158	1.946	0.054	0.002	0.161	0.138	0.763	1.311
LinkedIn	(Constant)	3.160	0.616		5.134	<0.001					
	Privacy invasiveness	-0.466	0.059	-0.505	-7.946	<0.001	-0.625	-0.555	-0.459	0.826	1.211
	Self-image management	0.262	0.107	0.149	2.448	0.016	0.207	0.201	0.141	0.898	1.113
	Risk aversion	0.164	0.092	0.112	1.781	0.077	-0.049	0.148	0.103	0.846	1.182
	LinkedIn user	1.219	0.209	0.366	5.827	<0.001	0.508	0.439	0.336	0.845	1.184

Source: data from research.

The squared multiple semi-partial correlation coefficients indicate that privacy invasiveness uniquely accounts for 21.07% of the variation of the perceived justice of LinkedIn screening, whereas being a LinkedIn user accounts for 11.29%, and self-image management for 1.99%.

In both analyses, the variance inflation factors (VIF) for all predictors indicates acceptable levels of collinearity (Studenmund, 2001). The Durbin-Watson statistic in the first analysis is 2.146, and in the second is 1.947, which indicates that there is no correlation between residuals. Cook's distance maximum values are 0.064 in the Facebook analysis and 0.087 in the LinkedIn analysis, indicating no problems with significant outliers.

DISCUSSION

SNS screening, especially professional ones, is already a well-established method of gathering information for employee selection, and data from industry reports and academic studies show that recruiters often reach for information from both professional and private sites. However, research data shows that candidates' reactions to cybervetting are unfavorable, which, regardless of the risks associated with the inaccurate use of this data to predict the competence of potential employees, carries the risk of negatively

affecting the company's image, as well as the risk of some good candidates abandoning their applications.

The results of this research confirm previous scientific findings that the perceived justice of Facebook cybervetting is significantly lower than for LinkedIn cybervetting (Cohen's d=0.71), so Polish respondents were similar in that regard to those from other Western countries (Aguado et al., 2016; Cook et al., 2020), but different from Indian respondents (Gruzd et al., 2020). Similarly, it was found that the privacy invasiveness of Facebook screening was rated significantly higher than LinkedIn's (with Cohen's d=0.65), which can be considered expected (Roth et al., 2016; McCarthy et al., 2017), but – to the authors' knowledge – has only recently been studied directly (Cook et al., 2020).

Lack of privacy invasiveness is the best predictor of perceived justice of SNS screening. It uniquely accounts for 24.90% and 21.07% of the variation of the perceived justice of Facebook/LinkedIn screening, respectively, which is in line with other studies that have shown that privacy invasiveness is an important factor affecting justice perception, both for traditional screening methods (Bauer et al., 2006; Anderson et al., 2010; McCarthy et al., 2017), IT-based methods (Bauer et al., 2006; Woods et al., 2020; Balcerak & Wozniak 2021), as well as SNS-data-based methods such as cybervetting (Roth et al., 2016; Van Iddekinge et al., 2016; Cook et al., 2020).

Both models also include self-image management, although this factor uniquely accounts only for 2.89% of the variation of the perceived justice of Facebook screening and for 1.99% of the variation of the perceived justice of LinkedIn screening. This suggests that both types of SNSs are sometimes used by users to create their own professional brand, which naturally increases the acceptance of SNS screening in the selection process. If the practice of creating one's own brand on social media or consciously managing it becomes widespread, the predictive value of SNS content for success at work is expected to decline. Furthermore, we should not expect that more information would be included on Facebook than on LinkedIn, suggesting the limited added value that information from Facebook can bring relative to that gathered on LinkedIn.

The final linear regression model predicting factors influencing acceptance of Facebook screening also included personal innovativeness that uniquely accounts for 2.46% of the variation. This factor was excluded from the model predicting the perceived justice of LinkedIn screening. Innovative candidates are more open to screening private social media, which does not change the fact that the main barrier to accepting this selection method is perceived privacy invasiveness. Indirectly, this opinion is supported by the fact that above average performance self-assessment was also excluded from

both models, as it suggests that it is specific attitudes toward technology or social media privacy, rather than general psychological traits (unrelated to social media) that influence candidates' opinions.

As already highlighted, since nearly all respondents had a Facebook account, having an account on Facebook was not taken into account for the regression analysis conducted when seeking significant predictors of the perceived justice of Facebook screening. The linear regression analysis to predict the perceived justice of LinkedIn screening yielded a model that included LinkedIn profile ownership. This predictor uniquely accounts for only 11.29% of the variation. This means that setting up a professional social media account does not guarantee acceptance for social media screening.

While privacy invasiveness proved to be the best predictor of the perceived justice of social media screening, both models excluded a general concern for internet privacy. Acceptance of social media screening is thus diminished by the knowledge that the account will be analyzed by a "potential employer," but this does not go hand in hand with a more general concern for privacy. Those who feel a high concern for Internet privacy may be more careful about selecting the information they share. Privacy invasiveness concerns the discomfort and perceived disrespect associated with a potential employer viewing private information, even if it involves objectively secure content.

CONCLUSIONS

The purpose of the current study was to see how the use of two types of cybervetting was perceived by Polish users, and in particular whether it leads to a negative reaction in innovative candidates. Based on data obtained through an e-questionnaire from 150 young Internet users, we confirmed that acceptance of professional SNSs (LinkedIn) content screening is higher than private SNSs (Facebook), and that the sense of invasion of privacy has a strong impact on the perceived justice of SNS screening. We found that activities focused on creating one's online image foster a higher acceptance of cybervetting.

Through multiple linear regression with backward elimination, we checked whether among the factors determining perceived justice are those that indirectly promote organizational entrepreneurship. For the two types of SNSs, the following predictors of perceived justice of SNS screening were taken into account: privacy invasiveness, personal innovativeness, self-image management, risk aversion, ability to control SNS information, above average performance self-assessment, general concern for internet privacy, and – in the case of LinkedIn – having an account on LinkedIn. The results

of linear regression with backward elimination showed that the perceived justice of social media screening is primarily influenced by perceived privacy invasiveness. This is a negative influence. The main predictor in the obtained model, privacy invasiveness, uniquely accounts, respectively, for 24.90% and 21.07% of the variation of perceived justice of Facebook/LinkedIn screening. Acceptance of both types of SNS screening is positively influenced by self-image management, while personal innovativeness increases the acceptance of scanning private SNSs for this purpose (Facebook). In the case of LinkedIn screening, having a LinkedIn profile is also a predictor, which is understandable since one of the reasons for setting up an account on LinkedIn is to increase potential job opportunities.

From the perspective of the current study's objective, it can be concluded that the use of Facebook cybervetting is less dangerous for companies in relation to innovative candidates, as personal innovativeness was found to be a significant predictor of perceived justice of Facebook screening. As privacy invasiveness is a major predictor of respondents' opinions toward cybervetting, it can be said that the use of cybervetting on innovative candidates is better received by them than by other candidates.

The first practical postulate arising from the study is the need for measures to reduce the sense of potential privacy invasiveness when SNS screening is disclosed. Studies have already confirmed that increasing potential candidates' knowledge of the scope of SNS screening, as well as the strength of the impact of screening conclusions on selection decisions, can reduce privacy invasiveness concerns as long as the organization conducts some additional activities to familiarize candidates with the selection procedure (McCarthy et al., 2017a, Truxillo et al., 2018). This approach is consistent with the general thesis already confirmed for Polish candidates that experience with a particular selection method promotes greater acceptance of that method (Balcerak & Woźniak, 2020ab; Woźniak, 2019). It is worth noting, however, that this postulate does not apply to passive candidates.

The second important conclusion of the study is related to a factor not yet studied in the area of responses to cybervetting, namely, self-image management. Our study showed that the practice of creating one's own image on social media, or consciously managing it, is so widespread (mean 4.95 on a seven-point scale in our study) that one should expect a decrease in the predictive power of this selection method. In other words, information obtained through candidates' SNS screening will not contribute to an accurate prediction of their achievements and attitudes at work – at least when the subject of the analysis is the content rather than the form. Only some past studies have indicated that such activities should be expected, but even then they were expected on LinkedIn (professional type portals) rather than on

Facebook. Our data suggest that self-image management fosters acceptance of cybervetting for both types of SNSs, so that a mutual reinforcement of the two practices is to be expected. This means that the more frequently candidates expect cybervetting to be used in employee selection processes, the more often they will implement self-image management activities. Consequently, this suggests a decline in the predictive value of the information contained in these networks, which forces organizations to use a different way of analyzing SNS content, that is, one that analyzes not only information but the forms of relationships that these networks create. These two distinct uses of social media data – one oriented toward content and the other on the form of established relations (Gandomi & Haider, 2015; McCarthy et al., 2017; Woźniak, 2020) – are characterized by a different sensitivity to truthfulness, where the latter way is independent of it. It is to be expected that the informal use of social media as a source of content-driven information analysis will increasingly lead recruiters astray. This means that the predictive accuracy of SNS data geared toward unformalized analysis of social network content will decline. Thus, it can be concluded that this will favor the use of more formalized, analytical methods based on artificial intelligence.

Such a trend would be favorable from the perspective of the predictive validity of selection practices, as it would promote more objective analysis of SNS content, but it may carry with it further threats to candidates' positive attitude toward selection due to reluctance toward AI use (Mirowska, 2020; Zacny et al., 2019). This would necessitate hiding information about the use of AI in selection processes or introducing other measures to improve candidate perceptions with AI-driven selection practices, such as increasing the positive ratio through pre-selection activities (McCarthy et al., 2017a, Truxillo et al., 2018), or through broader explanations of how the tools work in practice, in the form of feedback right after selection, along with broader feedback to support their understanding and use in further career planning (Konradt et al., 2017). The necessity of such practices concerning recruitment also stems indirectly from the fact that they can foster a reduced sense of privacy invasiveness, which, for those surveyed here, is the strongest predictor of perceived justice of cybervetting.

At the same time, it may be thought that the positive impact of self-image management on the perceived justice of SNS screening also suggests some other practical measures that may make it easier for potential candidates to reconcile with cybervetting, namely – prior disclosure of the scope and consequences of SNS screening in the selection process. This will allow potential candidates to trigger self-image management activities, and so – while it may indirectly lower the accuracy of inferences about competencies from SNS content –make it easier to accept such screening. In the face of this

tension – between actions conducive to obtaining a positive response and provoking a decline in the informational value of posted content – it is to be expected that only the use of formalized analyses, based not so much on freely interpreted content by the recruiter, but on algorithms that examine underlying structures, can be an effective predictive cybervetting tool.

The results of the study described here expand the scientific knowledge about the applicability of SNS content analysis of Polish users, especially of innovative candidates, and allow us to make some practical recommendations to make it easier for organizations to apply SNS content analysis without discouraging candidates from applying. These results also respond to the demand that research on response to new selection tools, and cybervetting in particular, should be based on standardized measurement scales to enable methodologically valid comparison of their results and foster knowledge accumulation (McCarthy et al., 2017; Cook et al., 2020).

It should be noted that our study has a number of limitations that suggest treating the results as preliminary. They also yield findings that are inconsistent with previous findings on users from other countries, suggesting the need for further research. As the study sample was collected using snowball sampling, not only were the respondents relatively young and at the beginning of their careers, but they were also overwhelmingly female, which supports a stronger perception of the privacy risks associated with cybervetting (Gruzd et al., 2020). It was relatively rare – though in line with the overall percentage among adult Poles – for respondents to have a profile on LinkedIn, which fostered an opinion about it that was not grounded in their own experience (but was based on transferring their expectations characteristic of Facebook, where most respondents had their own profiles). The sample is relatively small and generalizations are risky, not only because of the number of respondents, but also because of the non-probability sampling. So the result should be treated as a preliminary one, and there may be a need for a similar study based on a much bigger and representative sample.

Respondents were also not put in a situation of applying for a job, which may, but does not have to (Jacobson & Gruzd, 2020), change the way they perceive selection tools based on social media. But above all – the study explored opinions formulated in response to a questionnaire, not the actual reaction when learning of an event concerning a person as a candidate for a particular workplace. This limitation of the whole fairness research paradigm has been pointed out by us before (Balcerak & Woźniak, 2020b) and the current study is not free of it.

An important limitation, which also indicates the direction of future research, is to study the responses of candidates not against the description of a certain type of company activity (as in our case – collecting information

on social networks), but situate such activity in the context of the practices of other companies. The first data obtained in this way show that the type of cybervetting (juxtaposed with the candidate's personality profile) influences such responses (Bowen et al., 2021), however, it is difficult to say to what extent the policies concerning SNS profile access are actually practiced by companies. This line of research seems promising because, as already highlighted in other research, the practice of cybervetting in employee selection has evolved from "whether companies use social media content to vet job applicants" to "to what extent companies use social media content to vet job applicants" (Bowen et al., 2021, p. 6). With the creation of norms in this area and clear standards, the strength of negative reactions to these practices is expected to decrease.

To recap, our study was the first attempt to measure attitudes toward cybervetting using the cybervetting scale proposed by Cook et al. (2020) on Polish users, which promotes comparability of data from different countries and poses questions leading to the accumulation of scientific knowledge in this area. At the same time, we demonstrated that cybervetting as a practice can be used by organizations seeking innovative candidates, and that the need for changes in the current practice of using cybervetting by organizations should be expected. For the first time in Poland, we strongly formulated a thesis that is also still absent in the world literature, namely, that regardless of the practical recommendations made here to promote a sense of fairness in candidates subjected to cybervetting by organizations, we should expect recruiters to move away from informal cybervetting in the near future.

Acknowledgments

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Abstrakt

__CEL:__ Celem tej pracy jest analiza czynników wpływających na odbiór przez potencjalnych kandydatów przeglądu w trakcie procesu selekcji zawartości ich prywatnych (reprezentowanych przez Facebook) i profesjonalnych (LinkedIn) portali społecznościowych, a w szczególności zbadanie jak ta praktyka jest odbierana przez innowacyjnych kandydatów. __METODYKA__: Dane zostały pozyskane drogą e-kwestionariusza ankiety w 2021 roku. W celu ustalenia predyktorów postrzeganej uczciwości przeglądu kont na Facebooku i LinkedInie w ramach selekcji kandydatów do pracy zastosowano wielokrotną analizę regresji z eliminacją wsteczną. __WYNIKI:__ Wyniki badań potwierdziły, że postrzegana uczciwość selekcji w oparciu o dane z mediów społecznościowych (cybervetting) kandydatów do pracy na podstawie przeglądu konta Facebook jest oceniana istotnie niżej niż w przypadku konta LinkedIn, natomiast postrzeganie naruszenie prywatności w trakcie selekcji w oparciu o dane z mediów społecznościowych jest istotnie wyższe w przypadku przeglądu konta Facebook. Wielokrotna analiza regresji z eliminacją wsteczną wykazała, że spośród przewidywanych predyktorów postrzeganej uczciwości przeglądu kont portali społecznościowych w trakcie selekcji kandydatów do pracy (poczucie naruszenia prywatności, osobista innowacyjność, zarządzanie własnym wizerunkiem w sieci, awersja do ryzyka, umiejętność kontrolowania informacji na portalu społecznościowym, ponadprzeciętna samoocena jakości pracy, ogólna troska o prywatność w internecie oraz – w przypadku LinkedIn – posiadanie konta na tym portalu) najlepszym predyktorem zarówno w przypadku prywatnych (Facebook), jak i profesjonalnych (LinkedIn) portali społecznościowych jest poczucie naruszenia prywatności. Innym istotnym predyktorem postrzeganej uczciwości przeglądu obu tych typów portali społecznościowych jest zarządzanie własnym wizerunkiem w sieci, natomiast osobista innowacyjność zwiększa akceptację skanowania w procesie selekcji portali prywatnych (Facebook). __IMPLIKACJE__: Niniejsze badanie przyczynia się do poszerzenia wiedzy na temat postrzeganej sprawiedliwości narzędzi selekcji opartych na technologiach informacyjno-komunikacyjnych, a w szczególności przeglądu kont portali społecznościowych w trakcie selekcji kandydatów do pracy. Poszerza wiedzę na temat możliwości zastosowania analizy treści serwisów społecznościowych w przypadku polskich, zwłaszcza innowacyjnych, kandydatów. Artykuł zawiera również kilka praktycznych zaleceń, które mają pomóc organizacjom w przypadku stosowania analizy treści portali społecznościowych w trakcie selekcji kandydatów, by minimalizować u nich poczucie naruszenia prywatności i tym samym zwiększać postrzeganie uczciwości tego działania. __ORYGINALNOŚĆ I WARTOŚĆ__: Jest to pierwsze zastosowanie cybervetting scale na polskiej próbie, co jest korzystne ze względu na możliwość porównania danych z różnych krajów. Stwierdziliśmy, że działania skoncentrowane na kreowaniu własnego wizerunku w sieci sprzyjają większej akceptacji selekcji w oparciu o dane z mediów społecznościowych (cybervetting), co może zmniejszać trafność predykcyjną tego typu praktyk selekcyjnych.
__Słowa kluczowe:__ portale społecznościowe, narzędzia selekcji oparte na technologiach informacyjno-telekomunikacyjnych, selekcja pracowników, ocena sprawiedliwości, selekcja bazująca na mediach społecznościowych

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Conflicts of interest

The authors declare no conflict of interest.

Citation (APA Style)

Overcoming the pitfalls in employee performance evaluation: An application of ratings mode of the Analytic Hierarchy Process

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Abstract

PURPOSE: *Employee performance evaluation is a common exercise conducted in many organizations. Employees need to know the feedback on their performance from the management. Often the results of performance evaluation exercises are used for promotion, confirmation in service and awarding of bonuses for employees. However, the performance evaluation exercise often meets with criticism due to the presence of subjective factors and, specifically, the way in which these factors are handled. The purpose of the present paper is to show how the Ratings mode of the Analytic Hierarchy Process (AHP) can be applied to evaluate employee performance using objective as well as subjective criteria.* **METHODOLOGY:** *The whole AHP exercise for the present employee performance evaluation has been shown through a case study on CLSB, a company in Kuala Lumpur, Malaysia. Four senior managers and the Managing Director of the company were involved in all phases of the present evaluation exercise, including elicitation of the criteria, sub-criteria and assigning weights to them. The AHP data were analyzed using software called AHP Calc version 24.12.13 developed by Klaus D. Goepel and available online. In particular, the Ratings mode of AHP was used to evaluate employees' performance at CLSB.* **FINDINGS:** *Five criteria, namely Services, Quality, Financial, Timing, and Teamwork, are found to be important for the evaluation of employee performance at CLSB. Each of these criteria has sub-criteria. Harmonious work, Skills, and Punctuality are found to be the three most important sub-criteria for the present evaluation exercise. The outcome of the evaluation exercise provides an ordered set of ranks of 20 employees working in the company. Apart from the application of AHP for performance evaluation, an ordered set of detailed rubrics for all the criteria have been developed. The rubrics*

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provide precise guidelines to the evaluators at the time of evaluating employees' performance. **IMPLICATIONS***: An evaluation scheme that is scientific and systematic, such as the present one, will minimize criticism levied against the performance evaluation exercise. Once the employees are aware of the criteria and sub-criteria set along with the associated weighting scheme and the evaluation process itself, they will be motivated to perform their tasks and discharge their duties accordingly. Hence, employee job satisfaction and productivity are expected to increase. This will bolster not only the employees' morale but also the organization's overall performance.* **ORIGINALITY AND VALUE***: In the literature, many schemes are available to evaluate employees' performance. But often, these methods are criticized as they either take all the criteria of evaluation as equally important or they lack the capability to strike a balance between objective and subjective factors. The main contribution of the present work is to show how AHP can alleviate the above drawbacks of the existing methods. The present research work has developed a performance evaluation method, which is simple and straightforward, and the detailed steps have been elaborated on how the method can actually be applied to measure the performance of employees. The method can be applied to measure employees' performance of other companies with the necessary modification of the criteria set and assigning appropriate weights to them.*

Keywords: *employee performance, employee performance evaluation, reward, training need, AHP Ratings*

INTRODUCTION

Effective performance evaluation (also known as performance appraisal) of employees is a fundamental issue on which an organization pays careful attention to ensure its survival, as it plays an important role in leading the organization (Grant & Maxwell, 2018). Derebew et al. (2021) contend that before providing incentives or promoting employees, their performance should be evaluated in a fair manner. To provide managers with useful information and sustain competitiveness, organizations should measure all aspects of employee functions. Traditional performance measures are often solely based on the financial dimension, but as a result of stiff competition from the industry, organizations need to adopt different approaches to evaluate employee performance. An integrated or multi-dimensional employee performance evaluation system is a major innovation in human resource management. However, employee performance evaluation can remain ineffective if it is not linked to the organization's goals. Employee performance measurement systems also vary according to organizational structure.

Lansbury (1988, p. 46) defined employee performance evaluation as "the process of identifying, evaluating, and developing the work performance of the employees in the organization so that organizational goal

and objectives are effectively achieved while, at the same time, benefiting employees in term of recognition, receiving feedback and offering career guidance." Unfortunately, performance appraisals are not at the top of the list of "favourite things to do" for managers. Common challenges in using performance appraisal tools are managers not being trained to conduct performance appraisals effectively and failure to tie performance appraisal expectations to desired business results.

Performance appraisal is important for both administrative (e.g., promotion, reward, assignment of tasks) and development (e.g., assessing employee training needs, identifying employees' strengths and weaknesses) purposes (Bruce, 2013). Performance appraisals help employees measure their performance and identify further training that they need to improve their performance (Halawi & Hayday, 2018). Performance appraisal reports should be available to all staff. Many companies use work performance to outline their employees' expected performance standards and goals, as well as skills improvement. Tudor and Petre (2022) underscore the importance of drawing the relationship between staff motivation and their performance. The authors conclude that this relationship is vital to improve organizational culture and employee engagement.

By reviewing performance, the management may also discuss weaknesses or problems and identify solutions together with the employees. In conducting a performance review, a manager should:

- ask the employees to rate themselves;
- provide a written performance review to the employees;
- conduct a review meeting after the written performance review;
- note, document, and file any employees' comments.

Management needs to incorporate performance appraisal into their business operations. The criteria chosen to measure performance should relate directly to the core activities of the organization. Some of the common criteria used for performance evaluations are unit sales, profit per item, product quality, customer service, the time required to complete tasks, customer referrals, and punctuality (Na-Nan et al., 2018). Performance needs to be measured in areas that will influence the success of the business. Further, the evaluator should highlight the areas requiring further improvements.

Performance appraisals have been the subject of considerable research, yet there are limited studies on performance appraisal practices. Choice of performance measures has been the focus of Accounting and Economics researchers (Bol, 2008). Levy and Williams (2004) emphasized on psychometric properties of appraisal instruments.

An ineffective appraisal system can cause many problems in an organization. Somerick (1993) highlighted problems such as decreased employee productivity, a decline in employees' enthusiasm, low morale, and a decrease in support for the organization that may occur if the appraisal system is ineffective. Although the importance of performance appraisal within organizations has long been recognized, in recent years, it has also become central to political and policy debates as well. In the United States, for example, the issue of whether and how teachers' performance should be measured and rewards tied to their teaching effectiveness have become contentious political debates (Peretz & Fried, 2011).

The objectives of the present research, within the context of the present case study, are the following:

- identify the relevant set of criteria and sub-criteria for performance appraisal;
- determine the criteria and sub-criteria priorities by taking inputs from the key senior managers using Analytic Hierarchy Process (AHP) questionnaires;
- evaluate employee performance using the Ratings mode of the Analytic Hierarchy Process;
- propose the application of the AHP to overcome the common pitfalls in employee performance evaluation exercises.

The whole exercise was carried on a consulting firm named CLSB in Kuala Lumpur, Malaysia. The novelty of the present work is to show how the Ratings mode of the AHP can be applied to overcome the pitfalls of employees' performance evaluation exercises. The AHP application is believed to be simple yet comprehensive and the performance rating of the employees it generates is the outcome of a systematic analysis of both qualitative and quantitative factors.

LITERATURE REVIEW

Employees' performance

One of the most important resources that an organization possesses is its people. When employees perform well collectively, the whole organization moves forward. Research has shown that human resource (HR) practices influence employee attitudes and hence their performance. Conteh and Yuan (2022) investigated the relationship between High Performance Work System (HPWS) and Employee Service Performance (ESP) through

organizational support (OS). The results show that the above relationship is positive and OS partially mediates between HPWS and ESP. One crucial challenge managers are facing today is how they can elicit maximum performance from their employees (Joe et al., 2020; Karadas & Karatepe, 2019). Therefore, managers need to find the right motivators and adopt the right HR practices (Rossi, 2012).

Ali et al. (2019) show that the physical working environment of an organization has a positive correlation with employees' performance. Though their case study research involved universities, the findings are believed to be equally applicable to other types of organizations. Ali et al. (2019) find that room temperature, relative humidity, and illumination level are important in providing a conducive physical working environment. The same observation was made by Sullivan et al. (2013), who concluded that office design, room thermal condition, indoor air quality, lighting and noise level have an impact on employees' performance. Further, a study conducted by Ajala (2012) reveals that employees' productivity may go down to even 40% if the physical environment in which they are working is distracting.

Employees' organizational citizenship behavior and creative performance are related to ethical leadership practiced in organizations (Ahmad et al., 2019). The importance of ethical leadership in organizations is increasing, especially when large-scale corporate scandals are being surfaced (Mo & Shi, 2015). Studies have been conducted to draw linkages between ethical leadership and employee wellbeing (Chughtai et al., 2015), performance (Walumbwa et al., 2011), safety performance (Khan et al., 2018), job satisfaction (Yozgar & Mesekiran, 2016), and innovative work behavior (Yidong & Xinxin, 2013). Ahmad et al. (2019) conclude that ethical leaders are those who walk their talk and, in turn, elicit good performance from their employees.

Employees' performance evaluation

Employee performance evaluation is an important tool that an organization uses. Hassanpour et al. (2022) developed and tested an employee performance evaluation model for Isfahan Municipality Corporation, Iran. Their performance evaluation model was the outcome of a mixed-method research. Adler et al. (2016) noted that the goal of an organization's performance evaluation system is to achieve high performance by enabling managers to increase employees' level of productivity. However, an ineffective performance evaluation system may become counterproductive due to the dissatisfaction of employees (Na-Nan et al., 2018; Razzaq et al., 2016). Murphy (2020) stated that most of the existing performance evaluation systems are flawed, and even some researchers recommended not using

them. But Hassanpour et al. (2022) cautioned that the absence of any performance evaluation tool might trigger employees to use their political behavior to influence their supervisors. Consequently, employees may shift their focus to relationship building with those who can influence their scores rather than improving their professional practices. Therefore, the primary question is how can you develop a performance evaluation system that can be used objectively with minimal criticism and that will help organizations fulfill their performance goals?

By discovering the challenges of subjective performance evaluation, Arnold (2021) contends that employees' reduced perception of evaluation fairness may eventually decrease their performance. Hence, Arnold (2021) cautioned evaluators on using subjective factors in employee performance evaluation. But it is also noted that not all dimensions of employees' performance can be covered by objective measures. Therefore, along with objective measures, subjective performance evaluation should be used as it allows taking employees' performance in some uncovered dimensions (Grabner et al., 2020).

De Clercq et al. (2020) find that employees may opt to resort to self-protective silence against their abusive supervisors just to avoid their negative performance rating. This silent demeanor may remain temporary, but in the long run, either employees will resign or sharply react to their abusive supervisors, especially if they engage in rude interactions, denigrating remarks and debasing ridicule. This kind of dysfunctional leadership may bring serious problems for an organization (Peltokorpi, 2019). De Clercq et al. (2020) further find that self-protecting silent behavior, usually found in high-power distance, collectivistic countries, is most common among employees with neurotic dispositions.

Does centrality bias in subjective performance evaluation influence employees' willingness to exert work effort and their retaliation intention? Mursita and Nahartyo (2022) found that centrality bias has a negative relationship with willingness to exert work effort and a positive relationship with retaliation intention. They recommended organizations have reliable evaluation mechanisms that can help inculcate a positive work attitude.

Umphress and Bingham (2011, p. 622) defined unethical pro-organizational behavior (UPB) as "actions that are intended to promote the effective functioning of the organization but violate ethical norms, values or standards of proper employee conduct." Reports of organizational malpractices and employees' unethical behavior have been reported in the literature (Moore & Gino, 2015). By means of a hierarchical linear model, in the Chinese context, Zhan and Liu (2022) investigated the effect of UPB on

employee performance evaluation and found that UPB is positively related to performance evaluation rated by supervisors.

Employees' creativity is another important factor for the success of an organization as creative work is usually regarded as a differentiator and a source of competitive advantage (Anderson et al., 2014; IBM, 2010). A number of studies have found that employee performance evaluation and their creativity are negatively related. However, Speckbacher (2021) has contrasted this with his empirical findings and found that the relationship is the opposite. He argued that organizational settings, culture and management practices have a direct influence on creativity and employee performance evaluation. He writes (p. 6): "Performance evaluations and incentives can support creativity and innovation if they are transparent about what kind of creativity is desired and how such creativity is measured and rewarded."

Mansor et al. (2012) consider that an employee performance management system is a building block of human capital management. Nobari et al. (2021) developed a performance evaluation scheme for employees working in the National Library and Archives of Iran by integrating Soft System Methodology (SSM) with Importance Performance Analysis (IPA).

The present paper shows how the AHP can be applied to measure employee performance by combining subjective factors with objective ones and finally providing an overall evaluation score for all the employees. Note that AHP is a multi-criteria decision-making method that was developed by Saaty (1980). The method has been widely applied to make decisions in various areas of Management, Environmental Science, Transportation, Technology Management and so on (Sipahi & Timor, 2010). It is also a popular method for performance evaluation in varieties of contexts (Anjomshoae et al., 2019; Elgazzar & Ismail, 2021; Ic et al., 2021; Shi et al., 2021). The main reasons behind the popularity of AHP are its simplicity, mathematical rigor, and ability to deal with both objective as well as subjective criteria.

RESEARCH METHOD

Decision scenario

This research evaluates performance and selects the best employees for CLSB. CLSB is a consulting company that provides solutions to its clients on environment-related issues. Every year the company evaluates the performance of its employees for two reasons: firstly, to identify the employees who are performing well (these employees can be rewarded for their superior performance) and secondly, to identify the employees who are

not performing at the expected level and hence can be further trained to improve their skills. The main challenge the evaluators face in the evaluation process is developing an overall score by combining performances on both objective and subjective criteria.

There are many tools available to evaluate employee performance, such as ranking, paired comparison, forced distribution, confidential report, essay evaluation, critical incident, checklist, and graphic rating scale, to mention a few. Detailed information on each tool was explained to the top management of CLSB. The Managing Director of the company preferred the ranking and paired comparison method due to its intuitive appeal. The concept of AHP and its application in performance appraisal was also presented to the top management and senior managers. Through this presentation, the researchers were able to get feedback from the management and senior managers and ascertain their concerns regarding the performance appraisal process.

Identification of criteria and sub-criteria

A one-day workshop was conducted with relevant employees to explain the proposed performance appraisal system using the Ratings mode of the AHP method. We used the group decision-making method to determine relevant criteria and sub-criteria and to establish the AHP hierarchy. Four senior managers and the Managing Director were chosen to develop the complete tool for employee performance evaluation using AHP. These people were chosen by virtue of their positions, and their inputs were deemed essential to develop the tool. The demographical information of the five expert participants is provided in Table 1.

Table 1. Demographical information of the five expert participants

Position	Gender	Age (years)	Education level	Years of service
Managing Director	Male	53	Doctorate	18
Senior Manager	Male	41	Bachelor	8
Senior Manager	Male	34	Bachelor	5
Senior Manager	Male	35	Bachelor	7
Senior Manager	Female	42	Bachelor	9

The hierarchy of criteria and sub-criteria of the evaluation process is presented in Figure 1. Note that all the criteria and sub-criteria were generated by the team of the four senior managers of CLSB in consultations with their Managing Director. The team decided on a different number of sub-criteria for each main criterion depending on their relevance to the scope of employee

responsibilities except for C6 where there are no sub-criteria as the main criterion alone is sufficient to measure the corresponding performance.
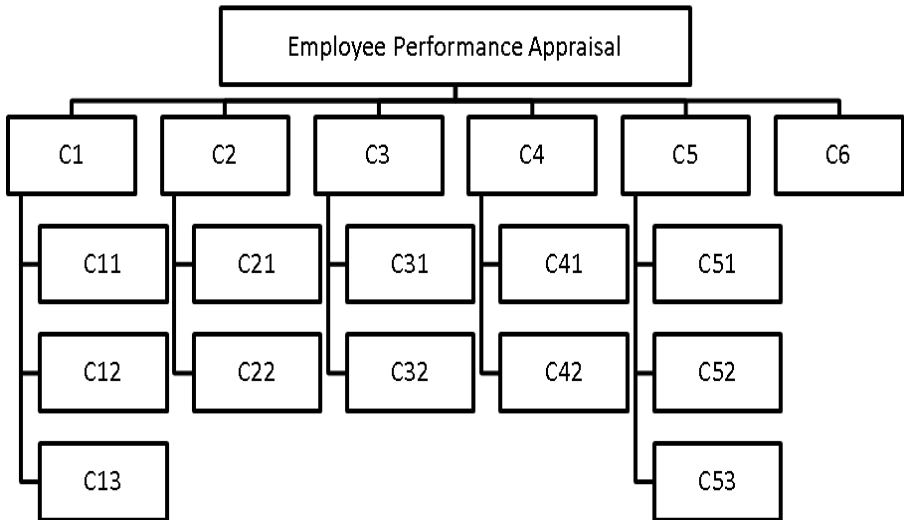
Figure 1. The hierarchy of the criteria and sub-criteria
of the evaluation process

The list of criteria and sub-criteria and their meaning have been presented in Table 2.

Table 2. Criteria and sub-criteria of the performance appraisal process

Criteria	Sub-criteria	Meaning
Services (C1)	Work Completion (C11)	Completes the work as per work schedule without any delay/error. Housekeeping after completion of work.
	Commitment (C12)	Supports unscheduled work requests or an urgent request from a customer. Response time for critical operations supports required.
	Multitasking (C13)	Able to support other departments during urgency. Able to perform work beyond the specified job description. Able to arrange resources to deliver critical work.

Criteria	Sub-criteria	Meaning
Quality (C2)	Skills (C21)	Minimal supervision. Development of a new test method. Ability to learn new test methods. Laboratory/field skills in sampling and testing. New skill acquired. Equipment/chemical handling skills. Overall performance on precision and bias.
	Compliance with ISO 17025 (C22)	Conformity to ISO 17025 laboratory quality management system during internal/ external audit. Response time to carry out corrective and preventive action on Non-Conformity Records (NCR).
Financial (C3)	Budget (C31)	Ability to control expenses within the stipulated budget.
	Sales Target (C32)	Able to support the accounting/sales department to achieve weekly and monthly targets.
Timing (C4)	Punctuality (C41)	Punctuality to work.
	Attendance (C42)	Attendance to monthly company meetings and other internal meetings.
Teamwork/ Cooperation (C5)	Training & Development (C51)	Provide adequate training and resources to develop subordinates.
	Leisure (C52)	Commitment and support for company trips, annual dinners, fitness activities and birthday celebrations.
	Harmonious work (C53)	Maintaining harmonious and healthy work relationships with co-workers and all departments. Promote a positive and effective work environment.
Environment, Health & Safety (EHS) (C6)		Incidents frequency rate per year. Customer feedback on EHS issues. Usage of proper Personal Protective Equipment (PPE) during sampling/ testing. Commitment and contribution to EHS.

Determination of the priorities of the decision criteria and sub-criteria

An AHP questionnaire was developed to determine the priorities of the evaluation criteria. Questionnaires were distributed to the four senior managers and the Managing Director of the company. There was a briefing session on how to complete the questionnaire based on pairwise comparisons. After completion, questionnaires were collected and analyzed using the AHP

analysis tool – AHP Calc version 24.12.13 developed by Klaus D. Goepel and available online (http://bpmsg.com). This AHP analysis tool calculates the weights of the decision criteria by the relative measurement of AHP, i.e., by constructing the pairwise comparison matrix for all the criteria and computing the normalized principal right eigenvector of the matrix (Saaty & De Paola, 2017). This vector gives the priorities of the criteria. It then divides the criteria into sub-criteria and calculates the weights of these sub-criteria in the same manner. Following this, it then multiplies these priorities by the priorities of the parent criteria.

The intensity of decision criteria and sub-criteria

As per the Ratings mode of the AHP method, each sub-criterion was divided into five intensities (Excellent (E), Good (G), Average (A), Satisfactory (S), and Poor (P)). In the present work, the priorities of the intensities are reproduced from Islam and Rasad (2006) and shown in Table 3.

Table 3. The local weights of intensities

	E	G	A	S	P	Weights
E	1	3	5	6	8	0.501
G		1	3	5	6	0.262
A			1	3	5	0.133
S				1	3	0.067
P					1	0.036
CR=0.06						

Source: Islam and Rasad 2006.

These priorities were multiplied by the priority of the parent sub-criterion. Note that the weightage of the intensities could be different for different criteria. That is, the difference between Excellent and Good could vary from criterion to criterion. But in the present case study, common weights were considered for the intensities for all the criteria.

If p_i, i = 1, 2, …, m is the weight of the ith main criterion, q_{ij}, i= 1, 2, …, m, j = 1, 2, …, n is the weight of the jth sub-criterion of the ith main criterion, then the global weight r_{kg} of the kth intensity, k = 1, 2, …,5 with respect to the sub-criterion

$$r_{kg} = p_i \times q_{ij} \times r_k \quad …. \tag{1}$$

where r_k is the local weight of the kth intensity.

The same AHP Calc Version 24.12.13 was used to determine the weightage of each sub-criterion. However, this AHP tool required a minimum of three sub-criteria to perform the analysis. Therefore, sub-criteria C2, C3, and C4 were calculated manually using an Excel template.

Performance evaluation of the employees

The employee performance evaluation was carried out based on the intensity of each criterion (refer to Appendix 1) and submitted to the superior/ manager to evaluate the performance of each employee. The evaluator was briefed on each evaluation criterion. The global priorities of the intensities (as calculated using equation (1)) for an employee were added. Finally, the overall weight of each employee was calculated using the Ratings mode of the AHP. The process was repeated for all the employees and ranked them all.

DATA ANALYSIS

In this section, AHP application results on employee performance appraisal are presented. At CLSB, the present decision-making process to select the best-performing employees is based on personal judgment. Decisions are normally made based on past experience and peer recommendations. As a first step of the present AHP application process, a group decision-making method was used to identify the potential criteria and sub-criteria. A list of criteria was obtained and sorted according to importance by voting. The management initially decided to choose six criteria, as previously summarised in Table 2. However, after some discussion, the top management removed criterion C6 related to Environment, Health, and Safety (EHS). The company is moving towards ISO 14001, which specifically pertains to the Environmental Management System. Their new target is to achieve 'zero defects' per year and no EHS issues and complaints from customers. Therefore, this criterion is not relevant to the evaluation process. Figure 2 presents the final hierarchy of the criteria and sub-criteria of the proposed employee performance evaluation process.
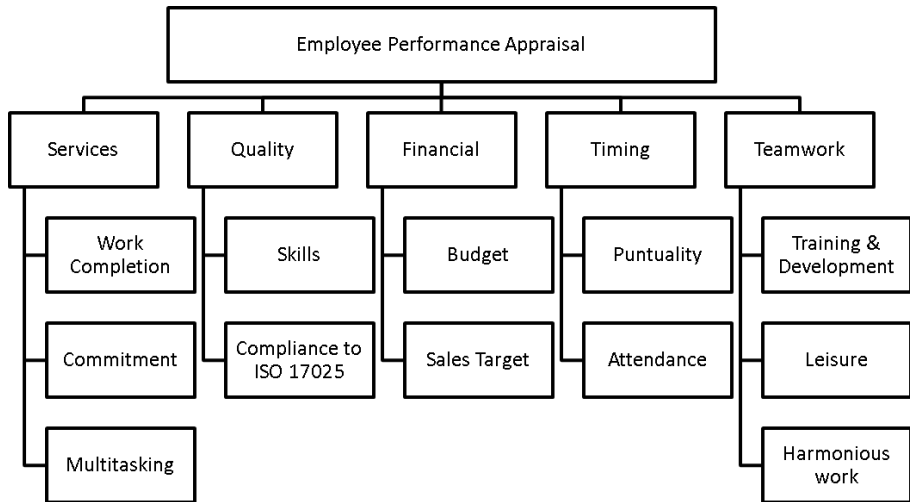
Figure 2. The hierarchy of the criteria and sub-criteria
of the evaluation process

As mentioned before, AHP questionnaires were used to calculate the weight for each criterion by a panel of five respondents (four senior managers and the Managing Director). Questionnaires were initially distributed to the respondents to complete after a short briefing on AHP. In order to check how the demographical background of the experts influenced the weights of the criteria, a separate set of weights assigned by each expert was calculated, and these are provided in Table 4.

Table 4. Weights of the five main criteria for individual participants

Criteria	Managing Director	Senior Manager 1	Senior Manager 2	Senior Manager 3	Senior Manager 4
Services	0.25	0.17	0.39	0.24	0.05
Quality	0.20	0.16	0.41	0.16	0.06
Financial	0.06	0.28	0.03	0.14	0.25
Timing	0.03	0.20	0.09	0.24	0.30
Teamwork	0.46	0.20	0.08	0.22	0.34

It is noted that the Managing Director has favored Teamwork as the most important criterion for employee performance evaluation. The same view is held by the Senior Manager 4. According to the Senior Manager 1 and 3, all the criteria are almost equally important. But Senior Manager 2 considers

that the two most important criteria for employee performance evaluation are Quality and Services. But, in this work, the Geometric Mean method (Saaty & Peniwati, 2008) was used to combine the group judgements.

In calculating the weights by AHP Calc version 24.12.13, we found a consistency ratio (CR) of 14.9%, which shows that respondents were not consistent in their pairwise comparisons. Perhaps they are new to AHP questionnaires. Therefore, we chose the interview method to complete the AHP questionnaires, from which we managed to achieve a consistency ratio of CR: 0.6%, which was deemed to be acceptable. In the interview process, the participants had the opportunity to review their previously articulated judgements.

The calculated weights of the criteria and sub-criteria are summarised in Table 5. The rank of the criteria and sub-criteria were also determined and communicated to the employees. An Excel-based AHP software screenshot for the calculation of weights is shown in Figure 3.

Table 5. Criteria and sub-criteria weights

Criteria	Weight	Rank	Sub-criteria		Weight	Overall Weight	%	Rank
Services	0.221	2	Work Completion	C_{11}	0.304	0.067	6.72	8
			Commitment	C_{12}	0.434	0.096	9.59	4
			Multitasking	C_{13}	0.262	0.058	5.79	11
Quality	0.206	3	Skills	C_{21}	0.679	0.140	13.98	2
			Compliance with ISO 17025	C_{22}	0.321	0.066	6.62	9
Financial	0.140	5	Budget	C_{31}	0.498	0.070	6.97	7
			Sales Target	C_{32}	0.502	0.070	7.03	6
Timing	0.160	4	Punctuality	C_{41}	0.629	0.101	10.06	3
			Attendance	C_{42}	0.371	0.059	5.94	10
Teamwork/ Cooperation	0.273	1	Training & Development	C_{51}	0.307	0.084	8.38	5
			Leisure	C_{52}	0.135	0.037	3.69	12
			Harmonious work	C_{53}	0.558	0.152	15.23	1
Total	1.000				5.000	1.000	100	

From the data analysis, the teamwork/cooperation criterion scored highest, with a weightage of 0.273, followed by services (0.221) and quality (0.206). Meanwhile, financial contribution possesses the lowest rank, with a weightage of 0.140. This was in contrast with the Managing Director's expectation, as he ranked quality and services higher. The other four senior managers rated teamwork equally important to quality and services. After the discussion, the team agreed on the overall weightage of the sub-criteria. The next task was to rate each employee without bias or favor. With the help of the human resource manager, rubrics for each intensity were created,

which facilitated the performance evaluation process for each individual employee (Refer to Appendix 2).

The last step was to pick one employee and measure his/her performance with respect to all the criteria. Table 6 provides the rating for each employee with respect to each sub-criterion. Table 7 provides the overall synthesized data and overall score for each employee. The overall ranking of the employees is presented in Table 8, which shows the Ideal score of each employee with respect to the best-performing employee. From the global weight (score), employee SG scored the highest (0.3630), followed by PO (0.3601), SF (0.3481), VI (0.3436) and the lowest score is for UT (0.1530). The Managing Director requested not to reveal the actual names of the employees in this paper to maintain confidentiality.

From the analysis, employee SG scored Excellent for commitment, skills, punctuality, attendance, and training and development. This enabled him/her to obtain a high score, and he/she was subsequently rewarded as the best employee. This finding is in contrast with the existing traditional approach adopted in the company for selecting the best employees. The best employee, according to the perception of the Managing Director based on the traditional approach, is DK. However, employee DK only scored rank 5 in this AHP exercise. Nevertheless, the Managing Director agreed with the findings from the AHP method as he regarded it as more systematic, scientific and covered many aspects of the evaluation process. Discussions with senior managers showed that persons ranked 1 – 4 did not report directly to the Managing Director, and he was often unaware of their actual contribution or performance. Therefore, using the traditional method for performance appraisal could lead to bias, which may lead to low morale among otherwise high-performing employees.

Employee UT, who obtained the lowest score, only managed to get an average rating for many criteria. This is possible as this employee joined the company recently and is yet to acquire the necessary skills and knowledge to perform the job. The human resource manager has already identified the weakness of the low-performing employees. This group of employees will be paid more attention, and further training will be provided to help develop their potential.

AHP Analytic Hierarchy Process (EVM multiple inputs)

K. D. Goepel Version 12.08.2013 http://bpmsg.com

Only input data in the light green fields and worksheets!

n= 5	Number of criteria (3 to 10)	Scale: 1		Linear
N= 5	Number of Participants (1 to 20)	α: 0.1	Consensus:	64.3%
p= 0	selected Participant (0=consol.)	2 7	Consolidated	

Objective Employee Performance Evaluation

Author Nagendran

EVM check: 7.17858E-09

Table		Criterion	Comment	Weights	Rk
	1	Services		22.1%	2
	2	Quality		20.6%	3
	3	Financial		14.0%	5
	4	Timing		16.0%	4
	5	Teamwork		27.3%	1
	6				
	7				
	8				
	9		for 9&10 unprotect the input sheets and expand the		
	10		question section ("+" in row 66)		

Result	Eigenvalue			lambda:	5.029
	Consistency Ratio	0.37	GCI: 0.02	CR:	0.6%

Matrix		Services 1	Quality 2	Financial 3	Timing 4	Teamwork 5	0 6	0 7	0 8	0 9	0 10	normalized principal Eigenvector
Services	1	-	1 1/4	1 2/7	1 3/7	5/6	-	-	-	-	-	22.09%
Quality	2	4/5	-	1 1/2	1 4/7	5/7	-	-	-	-	-	20.65%
Financial	3	7/9	2/3	-	3/4	1/2	-	-	-	-	-	13.95%
Timing	4	5/7	5/8	1 1/3	-	2/3	-	-	-	-	-	15.98%
Teamwork	5	1 1/5	1 2/5	2 1/9	1 5/9	-	-	-	-	-	-	27.33%
0	6	-	-	-	-	-	-	-	-	-	-	0.00%
0	7	-	-	-	-	-	-	-	-	-	-	0.00%
0	8	-	-	-	-	-	-	-	-	-	-	0.00%
0	9	-	-	-	-	-	-	-	-	-	-	0.00%
0	10	-	-	-	-	-	-	-	-	-	-	0.00%

Figure 3. Excel-based AHP software screenshot for computation of weights of the main criteria

Table 6. Rating for each employee

No	Name	C₁₁	C₁₂	C₁₃	C₂₁	C₂₂	C₃₁	C₃₂	C₄₁	C₄₂	C₅₁	C₅₂	C₅₃
		C₁			**C₂**		**C₃**		**C₄**		**C₅**		
1	NR	G	E	G	G	A	G	E	E	E	A	A	A
2	SY	A	G	G	E	S	S	A	E	E	A	E	G
3	DK	E	E	E	G	A	S	G	G	G	G	E	G
4	DY	G	G	G	A	S	E	G	E	E	A	G	G
5	WH	G	G	G	G	A	E	G	A	A	A	G	G
6	GW	G	G	G	A	A	E	G	E	E	A	E	G
7	KA	S	G	G	A	A	A	A	E	E	E	G	A
8	MD	A	A	A	A	A	P	A	G	E	G	G	G
9	PO	G	E	A	E	G	A	G	E	E	E	G	G
10	VI	E	A	A	G	G	A	A	E	E	E	E	E
11	AS	S	A	A	S	S	A	G	E	E	E	E	G
12	SU	A	A	A	S	S	A	G	G	G	E	G	G
13	NF	G	G	G	G	G	S	G	G	E	G	G	G
14	NA	A	A	E	E	G	P	G	P	S	E	E	G
15	SF	E	E	E	E	E	G	G	G	S	E	A	A
16	SG	G	E	G	E	G	S	G	E	E	E	G	G
17	UT	A	A	A	A	A	S	G	A	A	G	G	A
18	HZ	G	G	G	G	A	A	G	E	E	E	A	G
19	KH	A	A	G	A	A	S	G	G	G	G	G	A
20	MU	G	A	A	G	G	S	G	S	G	E	G	G

Table 7. Synthesis of the individual scores and overall score of each employee

No		C₁₁	C₁₂	C₁₃	C₂₁	C₂₂	C₃₁	C₃₂	C₄₁	C₄₂	C₅₁	C₅₂	C₅₃	Score
		C₁			**C₂**		**C₃**		**C₄**		**C₅**			
	Weight →	**0.067**	**0.096**	**0.058**	**0.140**	**0.066**	**0.070**	**0.070**	**0.101**	**0.059**	**0.084**	**0.037**	**0.152**	
1	NR	0.262	0.501	0.262	0.262	0.133	0.262	0.501	0.501	0.501	0.133	0.133	0.133	**0.2962**
2	SY	0.133	0.262	0.262	0.501	0.067	0.067	0.133	0.501	0.501	0.133	0.501	0.262	**0.2874**
3	DK	0.501	0.501	0.501	0.262	0.133	0.067	0.262	0.262	0.262	0.262	0.501	0.262	**0.3015**
4	DY	0.262	0.262	0.262	0.133	0.067	0.501	0.262	0.501	0.501	0.133	0.262	0.262	**0.2751**
5	WH	0.262	0.262	0.262	0.262	0.133	0.501	0.262	0.133	0.133	0.133	0.262	0.262	**0.2387**
6	GW	0.262	0.262	0.262	0.133	0.133	0.501	0.262	0.501	0.501	0.133	0.501	0.262	**0.2883**
7	KA	0.067	0.262	0.262	0.133	0.133	0.133	0.133	0.501	0.501	0.501	0.262	0.133	**0.2429**
8	MD	0.133	0.133	0.133	0.133	0.133	0.036	0.133	0.262	0.501	0.262	0.262	0.262	**0.1963**

No		C_1			C_2		C_3		C_4		C_5			Score
		C_{11}	C_{12}	C_{13}	C_{21}	C_{22}	C_{31}	C_{32}	C_{41}	C_{42}	C_{51}	C_{52}	C_{53}	
	Weight →	0.067	0.096	0.058	0.140	0.066	0.070	0.070	0.101	0.059	0.084	0.037	0.152	
9	PO	0.262	0.501	0.133	0.501	0.262	0.133	0.262	0.501	0.501	0.501	0.262	0.262	**0.3601**
10	VI	0.501	0.133	0.133	0.262	0.262	0.133	0.133	0.501	0.501	0.501	0.501	0.501	**0.3436**
11	AS	0.067	0.133	0.133	0.067	0.067	0.133	0.262	0.501	0.501	0.501	0.501	0.262	**0.2470**
12	SU	0.133	0.133	0.133	0.067	0.067	0.133	0.262	0.262	0.262	0.501	0.262	0.262	**0.2044**
13	NF	0.262	0.262	0.262	0.262	0.262	0.067	0.262	0.262	0.501	0.262	0.262	0.262	**0.2626**
14	NA	0.133	0.133	0.501	0.501	0.262	0.036	0.262	0.036	0.067	0.501	0.501	0.262	**0.2670**
15	SF	0.501	0.501	0.501	0.501	0.501	0.262	0.262	0.262	0.067	0.501	0.133	0.133	**0.3481**
16	SG	0.262	0.501	0.262	0.501	0.262	0.067	0.262	0.501	0.501	0.501	0.262	0.262	**0.3630**
17	UT	0.133	0.133	0.133	0.133	0.133	0.067	0.262	0.133	0.133	0.262	0.262	0.133	**0.1530**
18	HZ	0.262	0.262	0.262	0.262	0.133	0.133	0.262	0.501	0.501	0.501	0.133	0.262	**0.2980**
19	KH	0.133	0.133	0.262	0.133	0.133	0.067	0.262	0.262	0.262	0.262	0.262	0.133	**0.1811**
20	MU	0.262	0.133	0.133	0.262	0.262	0.067	0.262	0.067	0.262	0.501	0.262	0.262	**0.2290**

Table 8. Ranking for each employee

Name	Overall score	Ideal score	Rank
SG	0.3630	1.0000	1
PO	0.3601	0.9920	2
SF	0.3481	0.9589	3
VI	0.3436	0.9465	4
DK	0.3015	0.8306	5
HZ	0.2980	0.8209	6
NR	0.2962	0.8159	7
GW	0.2883	0.7942	8
SY	0.2874	0.7917	9
DY	0.2751	0.7578	10
NA	0.2670	0.7355	11
NF	0.2626	0.7234	12
AS	0.2470	0.6804	13
KA	0.2429	0.6691	14
WH	0.2387	0.6575	15
MU	0.2290	0.6308	16
SU	0.2044	0.5630	17
MD	0.1963	0.5407	18
KH	0.1811	0.4988	19
UT	0.1530	0.4215	20

CONCLUSIONS

Evaluating employees' performance is an important function for every organization. Often, performance evaluation results are used for a year-end bonus, promotion, confirmation in service, salary increments, and identifying employee training needs. Hence, a systematic and effective performance evaluation system is deemed necessary for every organization. A simple and effective appraisal system that emphasizes the continuous development of human capital will increase the organization's productivity and contribute to better organizational performance. The details of the whole assessment method being used, including the criterion and sub-criterion as well as the weight of each criterion, need to be communicated to the employees at the beginning of the year/assessment calendar. The poor-performing employees need to be identified, and further coaching and training need to be provided to the respective employees so that they can perform better in the future. Managers need to be trained on how to carry out assessments objectively without personal bias or influences. The high-ranking employees also need to be rewarded adequately.

Previously, at CLSB, the employee performance evaluation exercise was complicated when managers had their own ways of evaluating performance, and the process was not standardized throughout the organization. A number of bias factors were inherent in the system, and employees who scored low used to feel that the entire system was flawed. But the present AHP application was successfully used to evaluate employee performance and to rank all the employees at CLSB. After identifying the criteria and sub-criteria, weights were assigned to them in a systematic way following a scientific procedure. In addition to this, the performance of each employee was evaluated using the rubrics solely developed for the present evaluation exercise. This addresses the achievement of the main aim of the present research. The major contribution of the study is developing a complete tool (criteria, sub-criteria, weighting scheme and rubrics) for employee performance evaluation. This tool will alleviate many of the pitfalls that surround the performance evaluation exercise.

However, over time, weaknesses may occur in every system. Therefore, the decision criteria and evaluation mechanism should be closely monitored. Feedback from employees needs to be collected to identify any potential weaknesses in the system. The employee performance system should be continuously reviewed and enhanced to meet organizational objectives. It is also important to note that the criteria and sub-criteria weights may vary over time, in particular, more so when the goal of the organization changes. Therefore, the present ranks of the employees may change if the criteria

and sub-criteria weights change. Therefore, a detailed Sensitivity Analysis can be carried out to observe the ranks at the differential weighting scheme for the criteria and sub-criteria. The main limitation of the study is that the tool is developed only for CLSB. Therefore, before applying the tool to other organizations, necessary modifications should be made.

Acknowledgments

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Appendix 1. Employee Performance Evaluation Form

Name: Department:

Date:

No	Criteria	Subcriteria	Meaning	Poor	Satisfactory	Average	Good	Excellent
1	Services	Work Completion	Completes the work as per the work schedule without any delay/ error. Housekeeping after completion of work.					
		Commitment	Supports unscheduled work requests or urgent requests from customers. Response time for critical operations supports required.					
		Multitasking	Able to support other departments during urgency. Able to perform work beyond the specified job description. Able to arrange resources to deliver critical work.					
2	Quality	Skills	Minimal supervision. Development of a new test method. Ability to learn new test methods. Laboratory/ field skills in sampling and testing. New skill acquired. Equipment/ chemical handling skills. Overall performance on precision and bias.					
		Compliance with ISO 17025	Conformity to ISO 17025 laboratory quality management system during internal/ external audit. Response time to carry out corrective and preventive action on Non-Conformity Records (NCR).					
3	Financial	Budget	Ability to control expenses within the stipulated budget.					
		Sales Target	Able to support the accounting/ sales department to achieve weekly and monthly targets.					
4	Timing	Punctuality	Punctuality to work.					
		Attendance	Attendance to monthly company meetings and other internal meetings.					
5	Teamwork/ Cooperation	Training & Development	Provide adequate training and resources to develop subordinates.					
		Leisure	Commitment and support for company trips, annual dinners, fitness activities and birthday celebrations					
		Harmonious work	Maintaining harmonious and healthy work relationships with co-workers and all departments. Promote a positive and effective work environment.					

Evaluated by   Reviewed by

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Appendix 2. Rubrics for each sub-criterion of an employee performance evaluation exercise

Subcriteria	Intensity	Level of performance
Work completion (C11)	Poor (P)	Work completion with delay and error more than ten times a month. Repeat the same mistake more than five times in a month. 100% bad record in error file for all months.
	Satisfactory (S)	Work completion with delay and error more than seven times a month. Repeat the same mistake more than three times in a month. Bad record in error file for all months.
	Average (A)	Work completion with delay and error more than five times a month. Repeat the same mistake two times in a month. Bad record in error file for all months.
	Good (G)	Work completion without delay and error. Not repeat the same mistake in a month. No bad record in the error file for all months.
	Excellent (E)	Work completion is perfect, and no delays and errors in any job. Not repeat the same mistake in a month. No bad record in the error file for all months.
Commitment (C12)	Poor (P)	Only focus on own daily routine. Does not give importance to extra work or urgent work first. No work for overtime to complete the job on time. Not trying to learn in other jobs. Does not follow an unscheduled job, for example, throwing rubbish, removing dead animals and insects from the office or inside, and repairing some problem at the office.
	Satisfactory (S)	Only focus on own daily routine. Does not give importance to extra work or urgent work first. No work for overtime to complete the job on time. Try to follow an unscheduled job, for example, throwing rubbish, removing animals and dead insects from the office or inside, or repairing some problem at the office.
	Average (A)	Good in own job and try to learn to different work. Can complete own or different urgent job on time. Follow the work schedule. Mostly follow an unscheduled job, for example, throwing rubbish or repairing a problem at the office after HR gives instructions.
	Good (G)	Always can complete own job and also can do a different urgent job on time. Follow the work rotation. Always follow an unscheduled job, for example, throw rubbish, remove animals and dead insects from the office or inside, or repair some problem at the office after HR gives instructions.
	Excellent (E)	perfection in own job and different jobs, and able to complete the urgent job on time without error. Perfection to follow own job and complete on time. The entire time follows an unscheduled job, for example, throwing rubbish, removing animals and dead insects from the office or inside, and repairing some problem at the office without HR giving instructions to do that repair work.

Subcriteria	Intensity	Level of performance
Multitasking (C13)	Poor (P)	Always giving reason to ignore to learn new work. Does not take responsibility for learning or knowing extra work. Always routine the same work. Simply ignore attending training.
	Satisfactory (S)	Try to learn new work, but 80% fail when testing. Does not take responsibility for learning or knowing extra work. Always routine the same work. 50% attend training and try to follow the training skills.
	Average (A)	Try to learn new work, but 40% fail when testing. Interest in extra work learning. Always routine the same work. 80% attend training and apply new skills in their daily routine.
	Good (G)	Always alert and solve an extra work problem. Interest in extra work learning. Always routine the same work. 80% attend training and apply new skills in their daily routine.
	Excellent (E)	Easily can find the solution and solve in different department job, for example, communicate and clear customer doubt. Interest in extra work learning. Always routine the same work. 100% attend training and apply new skills in their daily routine.
Skills (C21)	Poor (P)	No interest in learning or studying about the job. Not able to learn for new work. Minimal education and interest in own and different jobs. Minimal knowledge and experience in own job. Not able to explain about own job and deal with customers.
	Satisfactory (S)	No interest in learning or studying about the job. Try to learn or study for a new job. Less education and interest in own and different job. Less knowledge and experience in own job. Try to explain about own job but not perfect and deal with customers.
	Average (A)	Interest in learning or studying about the job. Have education and interest in own and different job. Have knowledge and experience in own job. Able to explain about own job and deal with customers.
	Good (G)	Good in learning or studying the job. Have education and interest in own and different job. Have knowledge and experience in own job. Able to explain about own job and deal with customers.
	Excellent (E)	High knowledge and experience in one department. Able to complete all work without error. Have education and interest in own and different job. Have knowledge and experience in own job. Perfect explanation about the job to customers.

Subcriteria	Intensity	Level of performance
Compliance with ISO 17025 (C22)	Poor (P)	No perfect answer and no good response. Does not complete the work on time. Does not follow the correct format or instruction. Last minutes preparation for audit. Absent on an important day.
	Satisfactory (S)	Try to give a perfect answer and a good response but fail. Completed the work on time but not in the correct way. Does not follow the correct format or instruction. Last minutes preparation for audit.
	Average (A)	Sometimes give a perfect answer and a good response. Completed the work on time. Follow the correct format and instructions. Early preparation for audit.
	Good (G)	Frequently give a perfect answer and a good response. Completed the work on time and with no delay. Follow the correct format or instructions. Early preparation for audit.
	Excellent (E)	Always give a perfect answer and a good response. Completed the work on time and with no delay. Follow the correct format or instructions. Early preparation for audit. Keep perfect records for auditing.
Budget (C31)	Poor (P)	Does not try to use recycled paper. Not responsible for taking care of equipment when testing at lab or job. Have a record for breaking the equipment more than ten times a year and a big loss for the company. Does not save electricity and always requests stationery. Does not inform and wait for other staff to send the equipment to the service centre.
	Satisfactory (S)	Try to repair the equipment or some problem at the office by own self. Save electricity and water. Have a record for breaking the equipment ten times a year and a big loss for the company. Less request the paper clips. Inform and wait for other staff to send the equipment to the service centre.
	Average (A)	Alert and careful when handling the equipment at the lab and side jobs. Save electricity and water. Have a record for breaking the equipment five times a year and less loss for the company. Able to save electricity or extra work at the office. Inform and try sending the equipment to the service centre.
	Good (G)	Alert and careful when handling the equipment at the lab and side jobs. Save electricity and water. Have a record for breaking the equipment three times a year and less loss for the company. Able to save electricity or extra work at the office Inform and send the equipment for services at the service centre by own self.
	Excellent (E)	Perfect skills in handling the equipment at the lab and side job. Always save electricity and water. No record of breaking equipment. Able to save electricity electric or extra work at the office Inform and send the equipment for services at the service centre by own self.

Subcriteria	Intensity	Level of performance
Sales target (C32)	Poor (P)	Contribution to company monthly sales of less than RM 5,000
	Satisfactory (S)	Contribution to company monthly sales of less than RM 10,000
	Average (A)	Contribution to company monthly sales of less than RM 20,000
	Good (G)	Contribution to company monthly sales of less than RM 30,000
	Excellent (E)	Contribution to company monthly sales above RM 30,000
Punctuality (C41)	Poor (P)	Late in more than 15 times a month of 30 minutes without notice. Late in and not informed management more than 15 times a month. Early out without information to the management and no proof. Late in but early out 15 times a month.
	Satisfactory (S)	Late in more than ten times a month of 30 minutes without notice. Late in and not informed the management more than ten times a month. Early out without inform to management and no proof more than ten times. Late in but early out more than ten times a month.
	Average (A)	Late in more than five times a month of 30 minutes without notice. Late in and not informed to the management more than five times a month. Early out without inform to management and no proof more than five times. Late in but early out more than five times a month.
	Good (G)	Late in less than five times a month of 30 minutes without notice. Late in and not informed to the management less than five times a month. Early out without inform to management and no proof less than five times. Late in but early out less than five times a month.
	Excellent (E)	No record for late in and early out.
Attendance (C42)	Poor (P)	No record of attendance at monthly company meetings and internal meetings.
	Satisfactory (S)	Less record of attendance at monthly company meetings and internal meetings.
	Average (A)	Average record of attendance at monthly company meetings and internal meetings.
	Good (G)	Good record of attendance at monthly company meetings and internal meetings.
	Excellent (E)	The perfect record of attending monthly company meetings and internal meetings.
Training & Development (C51)	Poor (P)	Does not attend training and has no improvement.
	Satisfactory (S)	Less attention to training and no improvement.
	Average (A)	Less attention on training and less improvement.
	Good (G)	Good attention to training and good improvement.
	Excellent (E)	Best attention and best improvement.
Leisure (C52)	Poor (P)	Zero per cent attendance and no attention to outdoor company activity.
	Satisfactory (S)	30% attend and involve in outdoor company activities.
	Average (A)	50% attend and involve in outdoor company activities.
	Good (G)	80% attends and plan for new outdoor activity all the time.
	Excellent (E)	100% attends and involves in all the company's outdoor activities.

Subcriteria	Intensity	Level of performance
Harmonious work (C53)	Poor (P)	Not involved in group discussion. 10% involvement in teamwork.
	Satisfactory (S)	Minor involvement in group discussion. 40% involvement in teamwork.
	Average (A)	Good communication in group discussions. 60% good involvement in teamwork.
	Good (G)	Good communication in group discussions and getting new ideas. 80% good involvement in teamwork.
	Excellent (E)	Good communication in group discussions and getting new ideas. 100% good involvement in teamwork.

Abstrakt

CEL: Ocena wyników pracowników jest powszechnym zadaniem przeprowadzanym w wielu organizacjach. Pracownicy muszą znać informacje zwrotne od kierownictwa na temat ich wyników. Często wyniki ocen pracowniczych są wykorzystywane do awansów, potwierdzania stażu i przyznawania premii dla pracowników. Jednak ocena wyników często spotyka się z krytyką ze względu na obecność czynników subiektywnych, a zwłaszcza sposób, w jaki te czynniki są traktowane. Celem niniejszego artykułu jest pokazanie, w jaki sposób tryb Oceny Procesu Hierarchii Analitycznej (AHP) może być zastosowany do oceny wydajności pracowników przy użyciu zarówno obiektywnych, jak i subiektywnych kryteriów. METODYKA: AHP dla obecnej oceny wydajności pracowników zostało pokazane na przykładzie CLSB, firmy z Kuala Lumpur w Malezji. Czterech kierowników wyższego szczebla i dyrektor zarządzający firmy byli zaangażowani we wszystkie etapy niniejszej oceny, w tym w określenie kryteriów, podkryteriów i przypisanie im wag. Dane AHP analizowano za pomocą oprogramowania o nazwie AHP Calc wersja 24.12.13 opracowanego przez Klausa D. Goepela i dostępnego online. W szczególności do oceny wyników pracowników w CLSB wykorzystano tryb ocen AHP. WYNIKI: Pięć kryteriów, a mianowicie usługi, jakość, finanse, czas i praca zespołowa, zostało uznanych za ważne dla oceny wyników pracowników w CLSB. Każde z tych kryteriów ma kryteria podrzędne. Harmonijna praca, Umiejętności i Punktualność to trzy najważniejsze kryteria podrzędne niniejszej oceny. Wynikiem ćwiczenia ewaluacyjnego jest uporządkowany zestaw rankingów 20 pracowników zatrudnionych w firmie. Oprócz zastosowania AHP do oceny osiągnięć opracowano uporządkowany zestaw szczegółowych rubryk dla wszystkich kryteriów. Rubryki dostarczają ewaluatorom precyzyjnych wskazówek w momencie oceny wyników pracowników. IMPLIKACJE: Program ewaluacji, który jest naukowy i systematyczny, taki jak obecny, zminimalizuje krytykę nałożoną na ocenę wyników. Kiedy pracownicy będą świadomi ustalonych kryteriów i podkryteriów wraz z powiązanym schematem ważenia i samego procesu oceny, będą zmotywowani do wykonywania swoich zadań i odpowiedniego wykonywania swoich obowiązków. W związku z tym oczekuje się, że zadowolenie z pracy i produktywność pracowników wzrosną. Poprawi to nie tylko morale pracowników, ale także ogólną wydajność organizacji. ORYGINALNOŚĆ I WARTOŚĆ: W literaturze dostępnych jest wiele schematów oceny wyników pracowników. Często jednak metody te spotykają się z krytyką, ponieważ albo traktują wszystkie kryteria oceny jako równie ważne, albo nie po-

trafią znaleźć równowagi między czynnikami obiektywnymi i subiektywnymi. Głównym wkładem niniejszej pracy jest pokazanie, w jaki sposób AHP może złagodzić powyższe wady istniejących metod. W niniejszej pracy badawczej opracowano metodę oceny wydajności, która jest prosta i jednoznaczna, a szczegółowe kroki zostały opracowane, w jaki sposób metoda może być faktycznie zastosowana do pomiaru wydajności pracowników. Metodę można zastosować do pomiaru wydajności pracowników innych firm po niezbędnej modyfikacji ustalonych kryteriów i nadaniu im odpowiednich wag.
Słowa kluczowe: *wydajność pracowników, ocena wyników pracowników, nagroda, potrzeba szkolenia, AHP.*

Biographical notes

Rafikul Islam obtained his Ph.D. in Operations Research from the Indian Institute of Technology, Kharagpur (1996). Presently he is working as a Professor at the Department of Business Administration, International Islamic University Malaysia. He is a recipient of the Best Researcher Award at the faculty level and the Quality Research Award at the university level. Dr. Islam has published over 100 articles in internationally referred journals, and 18 students completed their PhDs under his supervision. He has also authored nine books. His research areas include Multiple Criteria Decision Making, Operations and Quality Management.

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Conflicts of interest

The authors declare no conflict of interest.

Citation (APA Style)

The influence of e-trust on a job performance model based on employees' dynamic capabilities during a crisis caused by a Black Swan event

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Abstract

PURPOSE: *In a crisis such as the COVID-19 pandemic, employees play a key role in the ability to survive and achieve both sufficient and outstanding performance in the organization. Therefore, both the characteristics of people in the organization and the possibility of influencing the improvement of their performance at work, have become the focus of attention of scientists and practitioners. In this context, the purpose of this article is to analyze the role of e-trust in strengthening the influence of employees' dynamic capabilities on the job performance of employees among organizations operating under the conditions of the COVID-19 pandemic.* **METHODOLOGY:** *An empirical study was performed based on the Employees' Dynamic Capabilities model. In order to verify the potential relations, empirical studies were conducted in 1200 organizations located in Poland, Italy and USA. The companies were selected on the basis of the purposive manner. The structured questionnaire was prepared and the CAWI (Computer-Assisted Web Interview) method was used in this research. The reliability of the scales used in the survey was tested and afterwards a multigroup path analysis was performed using IBM SPSS AMOS. The model was verified, confirming the presumed relationships between the variables.* **FINDINGS:** *It has been*

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proven that the higher the level of e-trust is, the stronger the influence of EDC is on job performance of organizations operating under a crisis caused by a Black Swan event mediated by P-J fit, work motivation, job satisfaction and work engagement. **IMPLICATIONS:** This study contributes to the current knowledge of management, in particular human resource management. In the theoretical area, the relationships between the factors influencing job performance in the difficult conditions of the crisis caused by the Black Swan event were described. On the other hand, from a practical point of view, indications on how to shape leadership behavior during remote work, with particular emphasis on the e-trust aspect, seem to be important. **ORIGINALITY AND VALUE:** This research enriches the considerations regarding the existing Employees' Dynamic Capabilities model. The role of the e-trust factor, which is an important part of e-leadership, in the context of the impact on this model was indicated and discussed. The conclusions are a solid step in the development of knowledge about managing employees during remote work, which not only became a solution for the time of the crisis, but was also permanently introduced to the current work organization.
Keywords: management, e-trust, employee dynamic capabilities, person – job fit, motivation, satisfaction, work engagement, job performance.

INTRODUCTION

The crisis caused by the COVID-19 pandemic has introduced many changes in the perception and operation of the contemporary world (Bufquin et al., 2021; Han et al., 2022; Kosieradzka et al., 2022). These changes can be observed in virtually all areas, including political, social and economic ones. As a consequence, it became necessary to introduce a new approach to organization management, including human resource management (Charoensukmongkol & Pandey, 2022). The spread of the virus, which is particularly dangerous for individuals with existing diseases (Bangwal et al., 2022), actually has a direct effect on the physical and mental health of all people (Yu et al., 2021). That is why it was crucial from the business point of view, on the one hand, to ensure the safety of customers, but on the other, to make sure that the health and performance of employees were not endangered (Bangwal et al., 2022). Since, despite the efforts of many countries, it is not possible to find an effective cure for the disease caused by the SARS-CoV-2 virus, a number of other measures have been introduced to mitigate the negative effects of the pandemic's spread. One of them that ensured social distancing and reduced contamination migration was the introduction of remote work (Shen, 2021; Tan et al., 2022). The organization of remote work is associated with many challenges, and success depends on the implementation of the technology-organization-environment (TOE) framework (Ng et al., 2022). The employee must prepare a workplace at

home, learn about IT tools supporting online work, transfer work-related activities to virtual reality, and find a way to navigate this space (Bontrager et al., 2021). Considering the multiplicity of problems that may arise in this process, support from management seems to be necessary. Therefore, the transfer of interpersonal contacts to the digital environment drew attention to e-trust, a part of e–leadership (Kulshreshtha & Sharma, 2021). Previous research showed how the lack of good solutions in the area of e–trust can affect the overall activity. Among the most frequently mentioned problems there are indicated are: miscommunication, poor motivation, lack of recognition, inadequate use of IT tools, inappropriate process and security management (Van Wart et al., 2019).

Despite the fact that the tools that allow one to work from home are not a novelty, as well as a concept of remote work (Ng et al., 2022), the scale of this phenomenon, which appeared with the onset of the pandemic, brought the issue of the online workforce performance into the spotlight. However, research in this area does not seem to be unequivocal. First of all, there are discrepancies in the perception of the impact of the pandemic on performance. On the one hand, researchers believe that the spread of coronavirus has a negative impact on performance – due to job insecurity, stress, work–life balance disorders, difficulties in adapting to the new reality, inability to use IT tools (Demirović Bajrami et al., 2021; Tu et al., 2021). On the other hand, it was shown that switching to remote work resulted in better job satisfaction, the possibility of recruiting specialists from all over the world and flexible adjustment of working hours, which had a positive impact on performance (Graves & Karabayeva, 2020; Narayanamurthy & Tortorella, 2021). Secondly, the influence of e-trust on performance does not seem to be unambiguous. According to certain reports, e-trust as a part of e-leadership has little influence on virtual teams' performance in the public sector (Elyousfi et al., 2021). On the other hand, it is claimed that focusing on this aspect will allow to achieve performance beyond expectations (Roman et al., 2019). The above considerations lead to the conclusion that we are dealing with a research gap, therefore, it is advisable to conduct research in this area.

It is already established that organizations operating under such critical conditions need to rely on their dynamic capabilities (Bieńkowska & Tworek, 2020), especially those connected to their employees. Bieńkowska and Tworek (2020) indicated that employees' dynamic capabilities (EDC) have the ability to positively influence the job performance of employees through numerous mediators connected to work-related attitudes. It seems that e-trust may have a crucial role in strengthening such a relation. Therefore, the aim of the conducted research is to analyze the role of e-trust in strengthening the influence of employees' dynamic capabilities on the job performance

of employees among organizations operating under the conditions of the COVID-19 pandemic. Such aim will be accomplished by a literature review and empirical studies, conducted to verify the proposed hypothesis.

LITERATURE REVIEW

Job performance model based on employees' dynamic capabilities during a crisis

Job performance, as a key element for the long-term survival of an organization, is often the focus of researchers' attention (Ángeles López-Cabarcos et al., 2022; Han et al., 2022). This is due to the proven relationship between job performance and organizational performance, and the construct connected with organizational outcomes such as financial performance, product market performance and shareholder return, and therefore requires synergistic involvement of the entire organization (Bieńkowska et al., 2021b; Ramezan et al., 2013; Richard et al., 2009).

With this in mind, Bieńkowska & Tworek (2020) developed a job performance model based on employees' dynamic capabilities. Within this model, the starting point is employees' dynamic capabilities, which are treated as a new construct that has grown up in the area of organizations' dynamic capabilities and has captured the interest of academics and practitioners (Al Wali et al., 2022; Joather Al Wali et al., 2020). According to Bieńkowska & Tworek (2020), employees' dynamic capabilities are considered as a multidimensional notion, which takes into account the employee ability to be sensitive to changes in the environment, to adapt to changes in the environment, to proactively solve problems arising in the workplace (if they occur) and include innovations in the workplace, but also the ability for continuous personal development and learning. In research based on the sample of 550 employees from Poland and USA, the authors discovered the influence of employees' dynamic capabilities on job performance with two mediation dependencies. The first mediator was person–job fit, i.e., matching the characteristics of the employee and the job description. The second was the group of mediators: job motivation (perceived as an internal motivation, which is considered as an employee's sense of willingness in performing job related tasks efficiently), job satisfaction (the level in which an employee is happy with the job) and job engagement (the level in which an employee voluntarily adjusts to the duties performed) (Bieńkowska & Tworek, 2020; Edwards, 1991; Hackman & Oldham, 1974; Schaufeli & Bakker, 2003).

The model described above was developed and verified before the critical changes in the functioning of organizations caused by the Covid-19 pandemic. There is no doubt that during this crisis, known as a Black Swan event, perception of phenomena has changed (Henseler et al., 2022). On the one hand, there are several reports that during the spread of coronavirus job performance decreased. This is due to a number of negative factors affecting the activity of the employee. First of all, the need for social isolation forced the cessation of informal contacts, and this hindered development and learning (Chaker et al., 2021). Secondly, it could be observed that stress increased among employees. This is due to layoffs in certain sectors of the economy, a more demanding working environment, and unethical solutions implemented by organizations that tried to survive in difficult conditions (Tu et al., 2021; Wong et al., 2021). Thirdly, emotional exhaustion was noticed. It appeared as a consequence of fear for one's own and relatives' health, job insecurity, as well customer incivility behavior, and this all had a negative impact on job performance (Shin et al., 2021). On the other hand, it was observed that in developed economies, 20-25% of workers did not lose their performance when switching to remote jobs (Lund et al., 2021). There is also evidence from Hong Kong that during the waves of infection, online work remained at the same level of effectiveness (Vyas & Butakhieo, 2021). Finally, Ng et al. (2022) proved that remote work is positively related to job performance and has no significant relationship with emotional exhaustion.

The challenges and discrepancies discussed above made it necessary to verify a job performance model based on employees' dynamic capabilities during a crisis. The starting point for the considerations was the assumption that in times of rapid changes, uncertainty and the need to quickly adapt to external requirements, employees' dynamic capabilities will be a chance for the survival and even development of the organization (Bieńkowska & Tworek, 2020; Cullen et al., 2014). In research conducted in 115 organizations operating in Italy during the introduction of full restrictions related to the spread of the Covid-19 pandemic, Bieńkowska et al. (2021a) proved a positive relationship between employees' dynamic capabilities and job performance. Moreover, the authors noted that during a Black swan event, job satisfaction and job motivation are no longer significant mediators. What is also very interesting, it turned out that the mediating strength of job engagement increased. Furthermore, the person–job fit remained a significant mediator (Bieńkowska et al., 2021a). Bearing in mind the above changes, it seems that further research should be carried out on the job performance model based on employees' dynamic capabilities during a crisis.

Definition and characteristics of e-trust

Trust is a key element, often cited by scientists as a fundamental aspect of any social interaction. This is because shared trust has direct social, ethical, as well as economic consequences in its causative effect. Trust makes joint ventures a reality (Arrow, 1974; Gambetta, 1988). The idea of trust can be characterized as trust in the credibility and integrity of the exchange partner (Morgan & Hunt, 1994). This idea is developed by arguing that it results from the fact that trust is the starting point for deriving rules of correct behavior or methods of effective action by reducing complexity and uncertainty in a given social system (Luhmann, 1979). Trust is the binder of all international relations and economic exchanges; and also takes the form of a catalyst to create the ground for the first steps in conflict resolution (Deutsch, 1958).

Due to the dynamic development of technology, the term trust finds itself as a new research object in the space of considering new technologies. In the digital age, the term trust takes on a new meaning and, as scientists note, trust is a necessary aspect of the digital economy (Tapscott et al., 2000). The development of technology and broadly understood digitization is what drives a revolution in the industrial world. These dynamics shaped the reconstruction of the concept of leadership, which, as a result of the development of information technologies, has been referred to as e-leadership (Mohammad, 2009; Van Wart et al., 2019).

The significance and dynamics of IT development has been particularly intensified due to the COVID-19 pandemic. In a very short time the way in which a society of different cultures performs their professional and private duties has changed. The necessity to isolate and change the functioning of society as a causative effect have become a catalyst for changes in the way people perform their duties, and thus this change contributed to the development of methods and technologies for communication and information exchange. It is also noted that trust has been recognized as a key issue in digital media and technologies (Shin & Biocca, 2018).

Corritore et al. (2003) define the term e-trust as a certain attitude of complete trust in an online situation where there is a risk that someone's weakness will not be exploited. The phenomenon of e-trust appears on a multitude of levels, becoming a fairly common phenomenon in specific events, such as e-trust in business ethics, e-commerce or systems management. E-trust takes place in environments where there are no direct and physical contacts, where moral and social pressures may be perceived differently as a result. In this process, interactions are carried out by digital devices (Corritore et al., 2003).

The absolutely unexpected COVID-19 pandemic forced employees to work virtually. The term 'virtual team' has developed to reveal aspects related to the performance of their activities and aspects of leadership of such a team. Leaders of such teams have been faced with a new challenge of how to exercise leadership in a new form. Researchers conducted studies where they identified key aspects of how existing knowledge can lead to new insights for newly transferred e-leaders (Chamakiotis et al., 2021). The e-leadership theory explores workplace leadership that is implemented using technology that has an impact on potential interactions and electronic communication networks (Putriastuti & Stasi, 2019). The three-dimensional model of digital trust in the workplace was proposed. Researchers focused on employees' perceptions of technology, people and processes in the workplace, the authors presented three factors that are fundamental to answer the question of what influences the digital trust of employees in the workplace (Launer et al., 2022).

Nowadays, the formula of work that takes place in the digital world is oriented towards achieving the same goals as before the inclusion of employees into the digital world. The only difference is that the concept of information management, supported by technology, is used on a larger scale. Transferring work to binary thresholds creates new challenges not only in the aspects of leadership and team management, but also ethical aspects related to the implementation of new technologies in the work environment (Paska, 2021). The technology must therefore be the result of appropriate validations to remain reliable. And this, in turn, comes down to the idea that the reliability of technology is a key aspect of the reliability of modern organizations (Bieńkowska et al., 2020b).

Due to the contemporary dimension of the functioning of the world, technology not only shapes people's work culture, but also stimulates their social relations. The new technology brings not only a more effective recipe for solving problems, more optimal ways of conducting business processes, but also shapes a new pattern of social relations based on physical methods of information exchange. When operating in a digital environment, people are exposed to binary relationships in which, as in traditional contacts, a new element of trust emerges, identified as e-trust. This e-trust, as well as trust outside the digital environment, is quite a rich concept conditioned by many different elements of the entire system. The development of technology, which during the pandemic took a special development, reduced in a fairly short unit of time the duties of many professions to be performed in front of a computer, tablet or telephone screen. This included various social strata, regardless of education or age, and meant that the first effects of work encountered many difficulties, revealing an extremely important aspect of

trust in this new e-environment. Thus, the phenomenon of e-trust appears, which is identified as the attitude of people towards a digital entity. Different attempts to understand e-trust and how e-trust can be promoted, researchers conceptualize e-trust differently because of the different forms it can take and the different levels at which it can occur.

The role of e-trust during a crisis caused by a Black Swan event

Since the initial outbreak of COVID-19 along its evolvement to a pandemic, researchers have been examining its characteristics against the definition of Black Swan (Wind et al., 2020) (Shilo & Collins-Kreiner, 2022). Although virus infection itself is not novel to human society, with even precedented large-scale effects such as the deadly 'Spanish flu' around 1918 (Trilla et al., 2008) and the H1N1 pandemic from 2009 to 2010 (Neumann et al., 2009), COVID-19 which has wiped human society since 2019 is having an unimaginable scale on the global stage. It caught the whole of humanity off guard. The lack of knowledge and preparedness saw a swift escalation of the event from a regional disease to epidemic and then to an extraordinary global pandemic crisis. Regular economic rules were disturbed by city lockdowns or people guarantees. The aviation industry was damaged greatly followed by unemployment, shrinking transportation capacity and unpredicted traveling experiences (Dube et al., 2021). On the fronts of politics, science or social services, COVID-19 has been bringing challenges to traditional statistical correlational analysis and shaking people's psychological safety. It is assumed that public opinion is likely to transit from pessimistic to unsure (Hutmacher et al., 2022). All these correspond with the attributes of a Black Swan event, and thus led us to treat COVID-19 as such an event, by which we might be able to refer to experiences and proven, effective strategies in coping with it.

E-trust is one of the 6-competence e-leadership models proposed and is allegedly one of the most important attributes in the model (Roman et al., 2019). To understand the role of e-trust under a Black Swan event such as COVID-19, we ought to refer to some early research on the subject of trust and crisis management. Trust has been much discussed in the literature, especially on the subjects of management and teamwork, with e-trust being proposed to be the most important element for continued success of an organization (Avolio & Kahai, 2003; Malhotra et al., 2007). Trust can lead to cooperative behaviors on various levels of crisis management. On the contrary, lack of trust is often seen as the culprit of the deepening of a crisis (Mainwaring, 2006). Győrffy (2018), in his study among European Union countries found that trust level is positively correlated to crisis management process efficiency (Győrffy, 2018). Research that has a virtual

setup revealed as well that members expect e-leaders to sustain the same level of support via ICT tools, which substantiates the argument that e-trust between a leader and a virtual team has no different a nature than traditional trust (Toleikienė et al., 2020). E-leaders who successfully establish e-trust are perceived as being honest, consistent and fair (Avolio & Kahai, 2003). Being able to create such a sense of honesty, consistency and fairness is proven to be essential and achievable by skilled e-leaders (Roman et al., 2019). In return, e-leadership is an essential tool when the majority of productivity work had to take place in a remote manner during COVID-19 (Dwianto et al., 2021). During the COVID-19 crisis, leaders have been leaning towards building a relationship with members through rich media such as discussion forums and instant messaging, which is strengthened by the plain media such as file sharing and presentation. Such effort could positively effect members' work efficiency if there is strong trust between the leader and members (Roman et al., 2019). There can be found research that also endorsed the role of e-trust and postulated that building trust is the most fundamental factor that underpins other leadership responsibilities during the COVID-19 crisis (Wang et al., 2022).

The role of e-trust in strengthening the EDC-JP model

Employees' Dynamic Capabilities (EDC) originated from the general Dynamic Capabilities (DC) concept which was thoroughly studied (Ambrosini & Bowman, 2009; Teece et al., 2001; Zahra et al., 2006) and outlined as "the firm's ability to integrate, build, and reconfigure internal and external competencies to address a rapidly changing environment" (Teece et al., 1997, p.516). Bieńkowska and Tworek (2020) defined it as "the ability to integrate, build and reconfigure employees' competencies to address a rapidly changing environment that directly influences the performance of tasks in the workplace" (Bieńkowska & Tworek, 2020).

It denotes not only adaptability and problem solving, but also long-term work process improvements. It is an essential ability that underpins organizations' capacity to deal with varying and turbulent environment (Pulakos et al., 2000). This well corresponds to the Black Swan COVID-19 situation as was elaborated in the previous chapter. COVID-19 entailed a great degree of uncertainty and an extremely dynamic environment with a growing pace of changes. In such a situation, employees are tasked with problems which are characterized as unstructured and require continuous learning (Bieńkowska & Tworek, 2020).

The situation of a high level of uncertainty and the need to work remotely, highlighted the importance of the e-trust issue. Numerous reports indicate

the key role of trust in international alliances (Grosse, 2002), as well as in the work of virtual teams (Child, 2001), Interestingly, it even turns out that trust plays a much greater role among virtual teams than those working in a traditional way (Cascio & Shurygailo, 2003). Moreover, it was noted that there is a dependency between the characteristics of an employee and the trust they have in a leader when working remotely (Flavián et al., 2022). The characteristics of the employee, in turn, are aspects that may be manifested, among others, by EDC (Bieńkowska et al., 2020). On the other hand, the role of the e-leader is undoubted in the context of person–job (P-J) fit. Starting from the importance of the influence of the supervisor on the assessment of the newcomer's P-J fit (Dufour et al., 2022) to making sure that an atmosphere of trust is provided by creating certainty that the employees will perform their tasks reliably, which is one of the positive consequences of P-J fit (Lilian, 2014).

The growing body of literature in this area has led to the conclusion that, after the situation in which the world found itself through the Black Swan COVID-19 crisis, organizations cannot be managed the way they were traditionally (Allen et al., 2015). Hierarchical management works much worse in managing employees working remotely, so it is necessary, among others, to change the approach to building trust (de Vries et al., 2019). Managers should not focus on organizing fragmented tasks, but on building an environment that will neutralize the negative effects of working in an uncertain environment and using IT tools that not all employees use with ease and pleasure (Stokols et al., 2009). Numerous researchers have investigated that the P-J fit affects multiple attitudinal and behavioral outcomes, such as job motivation, job satisfaction, job engagement (Bieńkowska et al., 2020; Kaur & Kang, 2021; O'Reilly et al., 1991). It was noted that team trust is based on the belief that other members will perform well the tasks entrusted to them (which is a consequence of P-J fit), and this in turn translates into job motivation. In this case, the role of an e-leader is to build trust in the team, including e-trust (Zaccaro & Bader, 2003). In addition, modern managers, through a whole range of activities supporting e-trust, such as promoting joint efforts, creating a positive atmosphere for remote work, improving knowledge management or supporting the implementation of joint projects, and improving online communication of challenges, affect not only motivation, but also job satisfaction and job engagement (Lilian, 2014). Therefore, it seems that e-trust may strengthen the positive influence of a P-J fit, job motivation, job satisfaction and work engagement in job performance.

A Black Swan COVID-19 crisis made e-leadership inevitable due to forced teleworking as a measure against the spread of the virus (Dwianto et al., 2021). E-trust in such a context led to a drastic transformation of leadership tasks to instruct employees how to utilize ICT tools and to gather and share

information, monitor and review task division and motivate members through ICT tools (Toleikienė et al., 2020), all using their dynamic capabilities. In addition, working from home is often a complaint by employees as it can prolong working hours and add mental stress, therefore negatively impacting the work–life balance, which may be somehow mitigated by such dynamic capabilities (Toleikienė et al., 2020). The situation expediated ICT tool integration and leadership transformation so that newly emerged e-leaders can successfully manage a crisis and utilize the dynamic capabilities of their employees (Bufquin et al., 2021), because of their ability to strenghten positive influences and mitigate negative ones. Leaders who intend to build trust through ICTs start as early as the project initiating and planning stage, so to create an amicable dynamic which can better orient tasks and responsibilities (Wang et al., 2022) and enable proper use of EDC. In certain situations, such as short-term project virtual teams, even though e-trust is relatively transient and dependent upon the project lifespan, e-trust is still proven to be an essential success factor throughout the project development. It can sustain the team to go through a change of responsibilities and unexpected circumstances enabling EDC (Malhotra et al., 2007), and motivate the team to excel in performance (Avolio & Kahai, 2003). From the employees' perspective, having trust for their leaders creates a sense of belonging and security, a booster for high performance. Therefore, the following hypothesis can be formulated and presented in Figure 1:

H1. The higher the level of e-trust is, the stronger the influence of EDC is on job performance of organizations operating under a crisis caused by a Black Swan event through P-J fit, work motivation, job satisfaction, and work engagement.
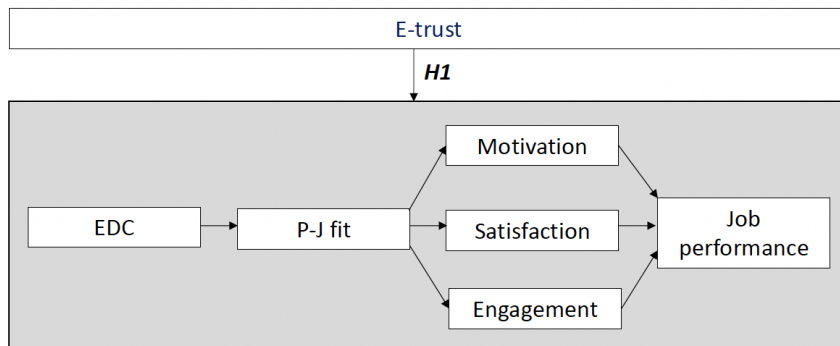

Figure 1. Theoretical model

METHODOLOGY

The role of e-trust in moderating the EDC-JP model was verified during empirical research, after being embedded with the extensive literature review and shown by hypothesis H1. The research was conducted as a part of project no 2020/37/B/HS4/00130 titled "Development of the Job Performance model based on Employees' Dynamic Capabilities for various phases of a crisis in an organization" funded by the National Science Centre in Poland.

Research methods and sample

The research was divided into the pilot research and the main research. The pilot research was conducted among 25 managers, who acted as competent judges. The quality of the questionnaire was tested during this phase of research. The input from the pilot research allowed to avoid common method bias and improve the questionnaire used in the main part of the study, and rewrite several questions, which were not fully understood.

The main part of the research was conducted during an active wave of the COVID-19 pandemic (characterized by rising number of active cases, various restrictions required by most countries – including social distancing, travel limitations, remote work) among 1197 organizations operating in Poland, Italy and USA in the first quarter of 2021. The wave of the COVID-19 pandemic (caused by a new strain of the virus) is considered in the study as the example of a Black Swan event, which caused a crisis in many organizations operating in various countries in the world. Moreover, those organizations were operating in various stages of such crisis, as the study was performed almost 1.5 years after the beginning of the pandemic. The study was conducted using the computer-assisted web interview using the purposive panel of high-level managers working in organizations, employing more than 10 people. Because of the aim of the study, the sample was purposefully selected and limited by geographical aspects (only Poland, Italy and USA were considered – countries severely hit by the COVID-19 pandemic, with implemented restrictions enabling crisis within organizations). In each organization, only one survey was conducted, and it was filled in by a person from a higher level of management. Despite the fact that the selection of organizations for the sample was not representative, it is possible to formulate conclusions because of the diversity of the organizations included in the sample chosen for the study. Organizations were divided into two groups, depending on the level of e-trust (see Table 1). The model itself was verified only among organizations, which declared that they operated during an active wave of COVID-19, which is an example of a Black Swan event. The KMO was calculated for all variables

included in the study and the results remained above 0.8 in every case, which means that the sample was sufficiently big to perform the intended analysis.

Table 1. Research sample characteristic

	Poland	**USA**	**Italy**
Total	428	543	235
Including:	Higher level of e-trust	Lower level of e-trust	Total
	670	527	1197

Variables overview and measurement scales verification

To allow verification of hypotheses, the following variables were used: e-trust, EDC, P-J fit, work motivation, job satisfaction, work engagement, job performance (Table 2).

Table 2. Summary of the items and the corresponding variables

Variable	Item
E-trust *E-trust	Within the virtual environment, the leader is able to create a sense of trust.
	The leader uses virtual communications in a manner that supports honesty, consistency, follow-through, fairness, and general integrity.
Employee dynamic capabilities *EDC	Employees quickly notice and successfully recognize in the environment (both inside and outside of the organization) opportunities and threats (including early warning signals) that can affect the work they do
	Employees adapt effectively to the opportunities and threats appearing in the environment (both inside and outside the organization)
	Employees undertake preventive actions that will enable them to carry out the tasks entrusted to them despite changes in the environment
	Employees quickly notice and successfully recognize problems appearing at the workplace
	Employees quickly solve problems appearing
	Employees do it on their own or seek support (within the scope of knowledge and information) that allow them to perform assigned tasks
	Employees generate innovative ideas and original solutions to problems
	Employees constantly develop their competences and raise my qualifications
Person – job fit *PJfit	Employees knowledge, skills and abilities fully "match" or fit the requirements of the job
	Employees fell that their goals and needs are met in this job
	Employees can use their talent, skills and competencies in this job

Variable	Item
Motivation *Motiva	Employees feel motivated to work
	Employees are willing and ready to carry out the tasks entrusted to them at the level of a satisfying organization
	Employees are willing and ready to allocate extra effort allowing exceed the requirements posed in front of them
Satisfaction *Satisf	Generally speaking, Employees are very happy with the work
	Basically, Employees really like the type of work they do in this organization
	Employees rarely think about resigning from work
Work engagement *WrkEng	Employees are enthusiastic about their job
	At this job, employees feel bursting with energy
	Employees are immersed in their work
Job Performance *JobPerf	Employees always complete the duties specified in their job description
	Employees always meet all the formal performance requirements of their job
	Employees complete their tasks efficiently
	Employees are always able to overcome obstacles to complete their tasks
	Employees are rarely absent from my work
	Employees avoid absenteeism at work without a legitimate reason
	Employees make few mistakes at work

- E-Trust: a variable assessed on a 5-point Likert scale (1: I strongly disagree to 5: I strongly agree) using 2 items based on a leader's ability to create a sense of trust and supportive communication (Roman et al., 2019).
- Employee dynamic capabilities: a variable assessed on a 5-point Likert scale (1: I strongly disagree to 5: I strongly agree) using 6 items concerning: sensitivity to changes in the environment, ability to adapt to changes in the environment, ability to solve problems in the workplace (including innovation in the workplace), as well as the ability of continuous personal development (Bieńkowska & Tworek, 2020).
- P-J fit: a variable assessed on a 5-point Likert scale (1: I strongly disagree to 5: I strongly agree) using 3 items concerning the match between employees' knowledge, skills, abilities (including talent) and requirements of the job (Brkich et al., 2002).
- Work motivation: a variable assessed on a 5-point Likert scale (1: I strongly disagree to 5: I strongly agree) using 3 items concerning willingness and readiness to carry out the entrusted tasks, including the allocation of an extra effort to it (Hackman & Oldham, 1975).
- Job satisfaction: a variable assessed on a 5-point Likert scale (1: I strongly disagree to 5: I strongly agree) using 3 items concerning

the employees' attitude towards their job (including happiness and intention to resign from work).

- Work engagement: a variable assessed on a 5-point Likert scale (1: I strongly disagree to 5: I strongly agree) using 3 items concerning the employees' attitude towards their job (including their enthusiasm, the level of immersion into the job) (Jung et al., 2021).
- Job Performance: a variable assessed on a 5-point Likert scale (1: I strongly disagree to 5: I strongly agree) using 7 items based on the task proficiency, task meticulousness and work discipline.

As a first step of the study, which required a multigroup path analysis based on the obtained data, the measurement scales were assessed. The assessment was made in IBM SPSS using Cronbach's α and the results are given in Table 3.

Table 3. Variables overview

Variable	Items	Alpha-Cronbach
Satisfaction (Satisf)	3	0.630
Motivation (Motiv)	3	0.714
Work engagement (WrkEng)	3	0.714
Job performance (JobPerf)	4	0.753
Person – job fit (PJfit)	3	0.685
EDC (EDC)	8	0.843

This approach seems to be sufficient because the scales used have been previously validated. Cronbach's α should remain above 0.7 (which seems to be the case for almost all variables). Moreover, the systematic method variance was controlled to ensure no common method bias. Based on the performed assessment, it should be noted that almost all measurement scales are well-fitted, reliable, and coherent. Besides that, the discriminant validity was also tested to ensure that the latent variables that represent different theoretical concepts are statistically different and the results (all HTMT < 0.68) confirm that the chosen variables may be used for path analysis.

Path analysis results

The set of criteria concerning measurement scales and the sample, which need to be met to perform the multigroup path analysis, were analyzed and it was determined that the sample and measurement scales can be used for path analysis. Based on such analysis, it was decided to move forward with the model verification using path analysis, as it was more important to

analyze to the full extent the differences among the effects within the model than verify moderation using a continues moderator. That is why a multigroup path analysis was performed using IBM SPSS AMOS, which remained more valuable for the authors than linear regression analysis with moderators, which could have been performed in IBM SPSS.

The multigroup path analysis was performed through dividing the sample into two groups of organizations, those which declared the lower level of e-trust (below median), and those which declared the higher level of e-trust (above median). Based on the obtained data, the statistically significant and well-fitted model was obtained, and the full assessment of the model was performed. It should be noted that the fit of the model was measured at first and assessed with CFI (which determines the goodness of the fit of the model and sufficient values are above 0.7) and RMSEA (which determines the badness of the fit of the model and sufficient values are below 0.2). The unconstrained model obtained from the multigroup path analysis was statistically significant and well-fitted at Chi2 (91) = 953,663; p = 0.001; CFI = 0.783; RMSEA = 0.183 and it was better fitted than the constrained model (which is important from the point of view of moderation).

The detailed results are given in Tables 4-7. Table 4 and 5 contain regression coefficients calculated for organizations characterized by a higher level of e-trust (Table 4) and a lower level of e-trust (Table 5), showing an estimate for each relation, standard error (S.E.), t-value critical ratio (C.R.) and probability (p).

Table 4. Regression coefficients for organizations with a higher level of e-trust

			Estimate	S.E.	C.R.	P
PJfit	<---	EDC	0.579	0.034	17.005	***
Motiv	<---	PJfit	0.534	0.038	14.230	***
Satisf	<---	PJfit	0.600	0.042	14.380	***
WrkEng	<---	PJfit	0.524	0.041	12.629	***
JobPerf	<---	Motiv	0.205	0.043	3.776	***
JobPerf	<---	Satisf	0.100	0.040	2.514	0.012

Table 5. Regression coefficients for organizations with a lower level of e-trust

			Estimate	S.E.	C.R.	P
PJfit	<---	EDC	0.552	0.039	14.095	***
Motiv	<---	PJfit	0.505	0.045	11.169	***
Satisf	<---	PJfit	0.452	0.041	10.893	***
WrkEng	<---	PJfit	0.459	0.045	10.126	***

			Estimate	S.E.	C.R.	P
JobPerf	<---	Motiv	0.162	0.042	4.848	***
JobPerf	<---	Satisf	0.100	0.047	2.147	0.032

Table 6 and 7 contain total effects occurring within the model calculated for organizations characterized by a higher level of e-trust (Table 6) and a lower level of e-trust (Table 7).

Table 6. Total (including indirect) effects for organizations with a higher level of e-trust

	EDC	PJfit	WrkEng	Satisf	Motiv
PJfit	0.579	0.000	0.000	0.000	0.000
WrkEng	0.303 (0.303)	0.524	0.000	0.000	0.000
Satisf	0.348 (0.348)	0.600	0.000	0.000	0.000
Motiv	0.309 (0.309_	0.534	0.000	0.000	0.000
JobPerf	0.138 (0.138)	0.239 (0.239)	0.177	0.100	0.205

Table 7. Total (including indirect in brackets) effects for organizations with a lower level of e-trust

	EDC	PJfit	WrkEng	Satisf	Motiv
PJfit	0.552	0.000	0.000	0.000	0.000
WrkEng	0.253 (0.253)	0.459	0.000	0.000	0.000
Satisf	0.249 (0.249)	0.452	0.000	0.000	0.000
Motiv	0.279 (0.279)	0.505	0.000	0.000	0.000
JobPerf	0.105 (0.105)	0.190 (0.190)	0.089	0.100	0.162

The obtained results confirm that the EDC-JP model is correctly determining the mechanism of EDC influence on job performance in the given sample. Moreover, the obtained model was well-fitted and statistically significant, which shows that there is a statistically significant difference between the strength of a relation occurring within the model for organizations characterized by a higher and a lower level of e-trust. Hence, such results

confirm that e-trust is indeed a moderator of the EDC-JP model and it has the ability to strengthen the relations occurring within it. Such a strengthening effect is quite visible, as the total effect of EDC influence on job performance is 30% stronger in the case of organizations with a higher level of e-trust. The effects are stronger for such organizations in case of all relations within the model. It is worth noting that the highest difference (almost doubled) occurs in case of work engagement (for a higher level of e-trust, the total effect = 0.177, and for a lower level of e-trust the total effect = 0.089). Such findings were additionally verified using IBM SPSS Macro Process (by Hayes), determining that e-trust is indeed a moderator of the relations appearing in the model. Therefore, the obtained results allow to accept the proposed hypothesis stating that the higher the level of e-trust is, the stronger the influence of EDC is on job performance of organizations operating under a crisis caused by a Black Swan event mediated by P-J fit, work motivation, job satisfaction and work engagement (Figure 1).

DISCUSSION AND CONCLUSION

The role of employees in shaping performance seems to be an important issue in modern organizational management, especially in times of crisis caused by a Black Swan event. The results of the conducted research allowed us to state that e-trust, as an essential part of e-leadership, plays an important role in influencing all dependencies between the variables in an employees' dynamic capabilities model based on job performance. E-trust influences the dependencies in the model, strengthening the relationship between them.

The results of the research carried out allow us to confirm the reports from the currently existing literature analysis. First of all, it was shown that e-trust strengthens the relationship between employees' dynamic capabilities and P-J fit, which is consistent with the conclusions of Lilian (2014), but also Dufour et al. (2022), who in their studies indicate the important role of trust in the leader as a reinforcing factor between the characteristics of the employees and their adaptation to work, manifested, inter alia, in the perfect performance of the tasks entrusted to them. Child (2001) emphasizes that these conclusions are especially important for remote work. Secondly, it was shown that e-trust strengthens the relationship between P-J fit and (a) work motivation (b) job satisfaction (c) work engagement, which is also emphasized by the works of Zaccaro and Bader (2003) or Lillian (2014), in which the influence of actions taken by leaders aimed at strengthening e-trust on the relationship between P-J fit and work related attitudes is shown. Finally, it was proved that e-trust strengthens the relation between (a) work motivation

(b) job satisfaction (c) work engagement and job performance, which is also supported by Malvey and Hamby (2004) stressing that, from the employees' perspective, having trust for their leaders creates work-related attitudes which are a booster for high performance. In the above context, the effect of e-trust on a job performance model based on employees' dynamic capabilities during a crisis caused by a Black Swan event should be considered validated.

The main aim of the conducted research was to analyze the role of e-trust in strengthening the influence of employees' dynamic capabilities on the job performance of employees among organizations operating under the conditions of the COVID-19 pandemic. Such aim was fulfilled by a literature review and empirical research. The literature review was a basis for the formulation of the main hypothesis, which was then verified based on an empirical study performed among more than 1100 organizations from Poland, Italy and USA. Bieńkowska and Tworek (2020) indicated earlier that employees' dynamic capabilities (EDC) have the ability to positively influence the job performance of employees through numerous mediators connected to work-related attitudes. This study has proven that e-trust has a crucial role in strengthening such a relation. The conducted research made it possible to verify the impact of e-trust on the job performance model based on EDC during a crisis caused by a Black Swan event (COVID-19 pandemic). In particular, it has been proven that a) e-trust is strengthening the relation between EDC and P-J fit; b) e-trust is strengthening the relation between P-J fit and (a) work motivation (b) job satisfaction (c) work engagement; e-trust is strengthening the relation between (a) work motivation (b) job satisfaction (c) work engagement and job performance. Based on the above considerations, it turned out that the higher the level of e-trust is, the stronger the influence of EDC is on job performance of organizations operating under a crisis caused by a Black Swan event. Therefore, the research gap, which emerged from the literature analysis, has been filled.

The developed addition to the initial model also has a practical significance, in addition to knowledge contribution in the fields of both organizational management and human resources management. The research attempts to determine the dependence of factors influencing job performance, which translates into organizational performance. This aspect is particularly important for ensuring the continuity of the organization's operation, as well as its growth and development. The studies were conducted during the waves of the COVID-19 pandemic, but it seems that the conclusions resulting from them can support the organization's activities, not only during situations caused by this particular crisis. After gaining experience and diagnosing the benefits of remote work, it can be highly probable that it will be implemented into the routine work of an organization. Therefore,

the conducted empirical research may also be used in further activities of the organization. Managers received guidelines on how to influence employee behavior in order to shape the outcomes desired from the organization's point of view. The importance of building e-trust in virtual teams as a key part of e-leadership was indicated. Therefore, the management should focus on the use of tools and strengthening of behaviors that build an atmosphere conducive to a sense of trust between the participants of the organization while working remotely.

The established aim of the paper has been successfully fulfilled. Nevertheless, the discussed results have certain limitations. First of all, although the research sample appears to be significant – 1,200 organizations were tested – they were selected in a purposive manner. Secondly, the research was geographically restricted and conducted in Poland, Italy and USA. Thirdly, research was conducted during the second wave of the pandemic, and the conditions for changes in a pandemic situation may differ. Finally, only e-trust, treated as a component of e-leadership, was considered. However, it seems that, contrary to the above limitations, the conducted research contributes to the knowledge of organizational management and human resource management.

Those considerations also seem to be a solid starting point for future research. First of all, it seems advisable to expand the sample of organizations, as well as to check the analyzed dependencies in other countries, including those with different economic and social characteristics. Secondly, in further research on the job performance model based on employees' dynamic capabilities, it is worth considering other elements of the e-leadership model (e-communications skills, e-social skills, e-team building skills, e-change management skills, e-technological skills). Finally, it is worth considering conducting the same-constructed research due to the turbulent reality around the world.

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Abstrakt

CEL: *W kryzysie, jakim niewątpliwie jest pandemia COVID-19, pracownicy odgrywają kluczową rolę w zapewnieniu ciągłości działania oraz osiąganiu zarówno zadowalających, jak i ponadprzeciętnych wyników organizacji. W związku z tym zarówno charakterystyki uczestników organizacji, jak i możliwość wpływania na poprawę ich efektywności w pracy, znalazły się w centrum uwagi naukowców i praktyków. Mając na uwadze powyższe, celem artykułu jest analiza roli e-zaufania we wzmacnianiu wpływu dynamicznych zdolności pracowników na wydajność pracy wśród organizacji działających w warunkach pandemii COVID-19.* ***METODYKA:*** *Badania empiryczne przeprowadzono w oparciu o model dynamicznych zdolności pracowników. Aby zweryfikować potencjalne zależności przeprowadzono badania empiryczne w 1200 organizacjach zlokalizowanych w Polsce, Włoszech i USA. Organizacje zostały wybrane w sposób celowy. Przygotowano ustrukturyzowany kwestionariusz ankiety, a w badaniu wykorzystano metodę CAWI (Computer-Assisted Web Interview). Zbadano rzetelność skal użytych w ankiecie, a następnie przeprowadzono wielogrupową analizę ścieżek przy użyciu IBM SPSS AMOS. Model został zweryfikowany, potwierdzając domniemane zależności między zmiennymi.* ***WYNIKI:*** *Udowodniono, że im wyższy poziom e-zaufania, tym silniejszy jest wpływ dynamicznych zdolności pracowników na wydajność pracy w organizacjach działających w warunkach kryzysu spowodowanego zdarzeniem typu czarny łabędź, z uwzględnieniem mediacyjnego efektu dopasowania osoby do pracy, motywacji do pracy, satysfakcji z pracy i zaangażowania w pracę.* ***IMPLIKACJE:*** *Opracowanie stanowi wkład do aktualnej wiedzy z zakresu zarządzania, a w szczególności zarządzania zasobami ludzkimi. W kontekście teoretycznym opisano zależności między czynnikami wpływającymi na wydajność pracy w trudnych warunkach kryzysu wywołanego wydarzeniem typu czarny łabędź. Z praktycznego punktu widzenia istotne wydają się natomiast wskazówki w jaki sposób kształtować zachowania przywódcze podczas pracy zdalnej, ze szczególnym uwzględnieniem aspektu e-zaufania.* ***ORYGINALNOŚĆ I WARTOŚĆ:*** *Badania wzbogacają rozważania dotyczące istniejącego modelu dynamicznych zdolności pracowników. Wskazano i omówiono rolę czynnika jakim jest e-zaufanie, który jest istotnym elementem e-przywództwa, w kontekście wpływu na ten model. Wnioski stanowią podwaliny do rozwoju wiedzy na temat zarządzania pracownikami podczas pracy zdalnej, która nie tylko była rozwiązaniem na czas kryzysu, ale została również na stałe wprowadzona do obecnej organizacji pracy.*

Słowa kluczowe: *zarządzanie, e-zaufanie, dynamiczne zdolności pracownika, dopasowanie osoby do pracy, motywacja do pracy, satysfakcja z pracy, zaangażowanie w pracę, wydajność pracy.*

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Conflicts of interest

The authors declare no conflict of interest.

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Table of Contents