Digitalization of Human Resource Management in Russia*

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Abstract

This article offers a generalized perspective on the integration of digital technologies in human resource management (HRM) practices in the Russian Federation. The authors discuss variations in businesses' resource-tied readiness and organizational readiness for digitalization of HRM, emphasize the emergence of firms that serve as "role models" to others, and highlight specific government policies that impact HRM. The study is based on an analysis of government and corporate documents, review of scholarly publications, archival sources, and media reports, and informal discussions with managers. It summarizes successful digital innovations in the selection and recruitment, training and development, and work organization, as well as in the integration of HRM into enterprise-wide information systems.

Keywords: Digitalization, human resource management, Russia
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Introduction

In the past two decades, digitalization, or the application of advanced information and communication technologies (ICT) in organizations, has been radically enhancing the capacity of human resource management (HRM) systems in their support of enterprise efficiency and, more broadly, their contribution to economic development. The fruits of ICT contributions like customized hardware and software, artificial intelligence (AI), and network solutions, however, are shaped by the national business environments. While there is no doubt about the general upward trajectory of the integration of the new technologies in HRM globally, recent studies revealed visible distinctions in this integration in emerging markets and deviations from those in developed countries (Rogovsky/Cooke 2021). These distinctions stem from the transitional nature of those economies, political and institutional constraints, mixed quality of management, and cultural dissimilarities that impact cross-border know-how transfer.

This article explores modern trends in the digitalization of HRM in the Russian Federation as one of the major emerging economies. It responds to the stream of research that explores international HRM in an era of increased political uncertainty and de-globalization (Farndale et. al. 2019; Witt 2019) and advances the ideas discussed in the International Labour Organization's (ILO) report on

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megatrends affecting the human-centered agenda in Russia (Grachev/Bobina 2021). This study further contributes to the country-level literature about modern HRM practices in Russia (Shekshnia 2007, Horwitz/Budhwar 2015, Domsch/Lidokhover 2017), whether in domestic companies (Gurkov/Zelenova 2011, Shulzhenko 2012, Gurkov/Settles 2013, Gurkov et. al. 2014, Gurkov 2016, Zavyalova/Kucherov/Tsybova 2017), multinational enterprises (MNEs) doing business in Russia (Grachev 2001, Grachev et. al. 2006, Björkman at al. 2007, Fey/Shekshnia 2008, Fey et. al. 2009, Andreeva et. al. 2014, Novitskaya/Brewster 2016, Latukha et. al. 2020) or Russian MNEs that operate in foreign markets (Budhwar et al. 2017).

Our analysis is based on a review of government and corporate documents, scholarly publications, archival sources, and media reports. We develop a strategy to navigate the relevant literature, including using selected keywords relevant to digitalization (e.g. ICT, AI) and HRM (e.g. recruitment, training) and their combinations to scan for publications in the English and in Russian languages, extracting impactful studies for screening, performing expert analyses of these impactful contributions, and summarizing successful digital innovations in the selection and recruitment, training and development, work organization, and integration of HRM into enterprise-wide information systems. We also explore critical issues of digitalizing HRM through informal interviews with twenty corporate managers in the manufacturing, financial services, and food industries in 2019-2020. While information from those discussions was not sufficient for a qualitative or quantitative analysis, it helped to shed light on the decision-makers' perceptions of the applications of advanced technologies in organizations.

We acknowledge emerging discussions about digitalization's effects on HRM in Russia (Odegov et al. 2018, Evseeva et al. 2019; Zavyalova et al. 2022) and the role of artificial intelligence (AI) in managing people in organizations (Fateeva et al. 2022). We take a cautious approach in our conclusions and consider Russian scholars' assessments of the study of the phenomenon as being "poorly conceptualized, which is evident in the different approaches to studying it and inconsistent assessment of the results. The aspects which have not yet received due attention include the factors and consequences of applying digital HRM" (Zavyalova et al. 2022: 44).

The purpose of the study defines the logic and structure of the article. In the first part, we offer an overview of the business environment in Russia that shapes firm-level technological advancements in managing people in organizations and emphasize the emergence of a cluster of firms that serve as "role models" in the digitalization of HRM. In the second part, we summarize successful digital innovations in functional areas of HRM such as selection and recruitment, training and development, and work organization, as well as in the integration of HRM into enterprise-wide information systems.

The Context for the Digitalization of HRM

Perhaps no other country's HRM practices have encountered deep transformations like Russia had in its transition from a centrally planned economy to a democracy with free markets (Aslund/Olcott 1999, Grachev 2009; Puffer/McCarthy 2011, Michailova et. al. 2013, Sachs/Pistor 2018). This was evidenced in mass privatization and businesses' desperate search for new organizational solutions, from early experiments in personnel management and in the aggressive acquisition of know-how from the West in the 1990s to the formation of the HRM profession and creation of advanced HRM systems in selected companies on par with leading MNEs in the past two decades. This evolution was accompanied by the growing interference of the state in the world of work, more visible after the adoption of the Russian Labor Code in 2002 which established the rights of employees and employers and made labor law regulations mandatory across the country. After that, the government intensified efforts to facilitate and control the use of digital technologies in the economy and, in particular, in managing people in organizations.

The firm-level digitalization of HRM is defined by two key sets of drivers, namely the availability of resources and the ability of organizations to innovate with those resources. In the organizational context, the former (resource-tied readiness) relates to the ICT tools and digital knowledge and skills, and the latter (organizational readiness of businesses) reflects the quality of HRM systems per se in their ability to absorb and apply resources in daily operations. We approach the context for the digitalization of HRM in Russia along these dimensions, which, in turn, will set the stage for the follow-up interpretation of successful corporate practices in the evolving Russian business environment.

(a) Resource-tied readiness for digitalization of HRM

Organizations benefit from their access to ICT resources and relevant competencies in digital technologies in the labor market. In the case of Russia, the businesses' resource-tied readiness for the digitalization of HRM is defined by (a) the level of the informatization of the society and economy (advanced hardware, software, and information networks, access to Internet and ICT services) shaped by the dual role of the government in the information sector (support and restrictions) and (b) the deficiencies and shortages in labor with ICT competencies, including those performing the HRM functions.

In the literature, the quality of ICT in Russia is assessed *somewhat optimistically*. In 2021, spending on the digital economy was estimated at 4848 bln rubles (55 bln dollars) or 3.7 percent of the GDP, including spending by organizations on the creation, dissemination, and use of digital technologies and related products; meanwhile, the spending on services was estimated at 2947 bln rubles (33.4 bln dollars) and household spendings were at 1901 bln rubles (21.6 bln

dollars) (HSE 2023: 12-13). In 2020, the ICT equipment sector was valued between 16 and 18.9 bln dollars, and ICT services sector ranged between 6.2 and 9.2 bln dollars (Statista 2023a,b).

However, comparative data attests to Russia's only moderate international positioning in terms of its ability to absorb the benefits of digitalization. The World Economic Forum ranked Russia 22nd on ICT adoption and 39th on internet usage with about 80 percent of the population being internet users (Schwab 2019). In 2021, IMD placed Russia 42nd out of 64 countries on the World Digital Competitiveness Rankings, and in particular, 48th on technology (regulatory framework, capital, technology transfer) and 47th on future readiness (adaptive attitudes, business agility, IT integration) (IMD 2021). In 2018, World Bank experts ranked Russia 41st on reaping social and economic benefits from digital transformation, 61st on the impact on government efficiency, and 75th on the impact on new forms of organizations. While they agreed that Russia has the potential "to become a global digital leader," they warned that "structural weaknesses in the digital transformation ecosystem, inadequate digital skills, restricted access to capital markets, and a lack of open innovation culture constrain Russia's ability to achieve fundamental technological breakthroughs in the near term" (World Bank 2018: xxiii).

One of the major distinctions of the ICT development in Russia is the growing regulating role of the state. On the one hand, the government prioritizes digitalization and directs significant resources into its development. On the other, it imposes significant constraints on this sector in line with political priorities, import substitution policies, and centralized controls over ICT and information security.

In the late 2010s, the Russian government placed a special emphasis on ICT that revolutionized online marketplaces, retail platforms, social media development, advanced data processing, or sped-up production processes. It has defined digitalization as a *national strategic priority* and acknowledged that inefficiencies in this sphere may lead to the loss of sovereignty and push young talented people to emigrate. Russia's Presidential Decrees set the goals of transforming half of the country's businesses into innovation-oriented enterprises (Ukaz 2018) and the National Digital Economy of the Russian Federation Program aimed at tripling resources in 2017-2024 to create high-speed telecommunication and digital infrastructure, with a primary focus on health care, education, transportation, and the defense industry, as well as supporting IT start-ups and domestic high-tech companies by offering tax preferences and promoting selective technological parks across the country as special economic zones. Furthermore, in 2019, the Presidential Decree on the development of artificial intelligence (AI) approved the relevant National Strategy and provided budget allocations for the years 2020-2030 (Ukaz 2019).

Government interventions and isolationist policies prioritize and enforce the acquisition and use of domestic digital technologies on the Russian territory, and create an institutional environment that limits access to foreign servers, networks, hardware, and software. For instance, the government is allocating 37.1 bln rubles (0.64 bln dollars) specifically to achieve Russia's technological independence from foreign software (Mospolytech 2022). It enforces the use of "made in Russia" hardware products and software packages instead of foreign ICT solutions even though it comes at a higher cost to businesses, imposes restrictions on the use of media and communication servers located outside of the Russian territory, and restricts access to the Internet via channels that are not controlled by the Federal Security Service. Examples of relevant critical cases include the attack on the Russian service Telegram which refused to surrender encryption codes to officials, fines on international companies Twitter, Facebook, and YouTube for non-compliance with content requirements, or sanctions on those using alternative satellite communication systems like SpaceX or OneWeb instead of Russian systems that operate under the government's control.

The exodus of a large group of MNEs in response to the Russian-Ukrainian conflict, whether by suspending sales (like Microsoft) or complete withdrawal (like TeamViewer) paired with international sanctions imposed on Russia's high-tech sector, visibly narrowed the country's access to international ICT know-how. In 2022, information technologies spending in Russia was down 38 percent compared to the previous year (Statista 2023b). Furthermore, in the past, there has been a known preference for Western technological products instead of investing in domestic innovations, which resulted in Russia's lagging behind global developments by at least two years (Agapov et.al. 2014). However, import substitution policies with higher demand for domestic hardware and software and generous government subsidies benefited selected domestic ICT leaders (like Croc, Lanit, Softline, and SKB Kontur).

While the quality of ICT gear in Russia may be assessed somewhat optimistically, the quality of labor associated with it is seen *somewhat pessimistically*. When describing the situation with human capital and comparing it to other countries, Russian experts name it as being "atypical." While they praise the high literacy and education of the Russian workforce, they also acknowledge low productivity, income and quality of life, emigration of skilled workers, and obsolete institutional environment, leaving the question of whether it is compatible with technological advancements unanswered (Gimpelson/Kapelushnikov 2011: 11-12). These assessments reflect the general situation in the Russian labor market, which is shaped by the severe demographic crisis and disadvantageous migration flows, and stem from known limitations in the educational system in generating sufficient cadre for ICT and their applications in the economy. In 2021, the share of employed in the ICT sector in total employment was lagging

far behind most European countries by 3.0 percent, like Sweden (8.0), Finland (7.4), Germany (4.9) or France (4.5) (HSE 2023: 78, 98). Russian experts admit there exists a vulnerability of the labor market, as evidenced in an insufficient supply of skilled workforce at the majority of enterprises and organizations (Andreeva et al. 2024: 22). This vulnerability is further amplified by low salaries compared to the Western standards. In 2024, Russian ITC specialists' monthly salary averaged at 151 thousand rubles (about $1,700), being slightly higher in Moscow at 200 thousand rubles ($2,270) and Saint Peterburg at 165 thousand rubles ($1,870) and lower in other regions at 135 thousand rubles ($1,530) (Kommersant 2024b).

The pessimistic assessment applies to both workers with ICT competencies able to integrate digitalization into business processes and business professionals who are capable of absorbing digitalization into the management processes and, more specifically, into the HRM practices.

The major challenges of the labor market and its ICT segment stem from a severe demographic crisis evidenced in a declining fertility rate, accompanied by a declining and aging population, and imbalanced migration flows. Russia's population is shrinking from 149 mln in 1994 to 146 mln most recently, with further decline projected by the Russian Federal State Statistics Service to 138 mln by 2046 (Rosstat 2024) or even to 130.6 per selected Western assessments (Newsweek 2024). With a life expectancy at birth being 71.34 years (2020), Russia lags behind most industrialized countries and behind China and Brazil in the BRICS group. In 2020, the Russian President admitted that the country was entering a "very difficult demographic period" and declared the demographics to be a "national strategic priority" aimed at increasing life expectancy, lowering poverty levels, and providing financial support for large families (Address 2020).

The labor market problems are exacerbated by the disadvantageous situation in terms of migration flows. Many educated workers, especially in the ICT sector, regularly express an interest in taking up higher-paying jobs abroad. According to a survey conducted by the Levada Center in 2020, 21 percent of respondents expressed their willingness to move to a different country, and for respondents under 24 years, it was above 50 percent (Levada Center 2021). According to the Russian consulting agency Garant In, in 2023, the skilled workers' demand for a permanent residency in Europe rapidly increased by 44 percent, with half of the requests coming from the ICT specialists (Kommersant 2024a). The Russian Academy of Sciences reported an outflow of scientists in 2020 at the level of 70,000, five times greater compared to 2012 (Interfax 2021). In 2022 alone, according to the Russian Ministry of Digital Development, Communications, and Mass Media, 10 percent of ICT workers left the country (Economist 2023). Given that up to 70 percent of immigrants from Russia are those with high

education (Vedomosti 2018), the state's leaders define such "export of intellect" as being "unacceptable" (RBK 2017). The outflow of skilled labor, mostly to the West, cannot be compensated for by the inflow of lower-skilled migrants, where only 13 to 17 percent, mostly from the former Soviet republics, have a higher education degree. Furthermore, in many ICT jobs, the working conditions and compensation levels also fail to compare against better opportunities in the West, and the domestic labor market is also harmed by remote work opportunities outside Russia.

In the long-term, the projections present a bleak outlook for the future composition of the labor market, the availability of talent, and hence for the potential for the successful acquisition of digital technologies. This poses unprecedented challenges for Russian businesses in finding, allocating, retaining, and using a creative and productive workforce – challenges that are compounded by the structural deficit in certain segments of the labor market, especially those related to ICT.

Russia's distinctive national priorities in the acquisition of digital technologies put additional pressure on higher education for a greater supply of competencies in new areas, such as cloud services, data analytics, e-commerce development, or online education. In response, the government seeks to support higher education institutions that offer related programs based on federal standards. Contrary to the general trend of diminishing acceptances to non-ICT free higher education by 17 percent from 2019 to 2024, the Russian government plans to increase annual budget-supported enrollment in IT-related disciplines, making IT about 1/5 of all government-sponsored admissions (Interfax 2019). It also explores new network learning options for students with credit transfers between higher education institutions toward a degree. At the same time, studying in foreign universities and a transfer of know-how to Russia becomes more problematic in light of cross-border travel restrictions, a weaking Russian currency, and the country's removal from the European Bologna system which ensures compatibility in standards and quality of higher-education qualifications. In light of this, the government has been trying to attract skilled workers from abroad, particularly from the former Soviet republics, by offering simplified naturalization procedures for Russian speakers and incentives for foreign students to study at Russian universities.

Another challenge in integrating digital technologies in personnel management stems from the limited availability and mediocre quality of HRM specialists. The number of employees in the HRM profession in Russia is estimated at about 227 thousand (Ginieva/Dolzhenko 2017). Only 9 percent of workers in personnel management have a formal HRM educational background per government classifications of higher education programs (Dolzhenko 2018). While students with this specialization graduate from 319 universities, Russian experts admit

that "domestic higher education institutions which prepare students in HRM, provide the labor market with specialists neither quality, nor quantity of which mostly do not respond to the demands of the economy" (Ibid.).

In a highly regulated environment, educational institutions in Russia are obligated to follow the state's standards in the education specialization of "personnel management" which includes competencies in "information technologies of personnel management" (Ministry of Education 2000); however, the 2021 update of the standard did not include ICT in the core ("universal") competencies (Ministry of Education 2021). In 2022, the Russian Ministry of Labor updated the professional standard for "personnel management specialist" and included competencies in specialized information systems, personnel data management, digital services, and paperless workflow, but did not address literacy in advanced digitalization (i.e. AI, social networks, platform work, IoT, etc.) or the integration of HRM functions in enterprise systems (Ministry of Labor 2022).

Overall, the resource-tied readiness for the digitalization of HRM in Russia is not high and is accompanied by complex contextual factors that facilitate or inhibit their pursuit. The challenges push companies into fierce competition over prospective new employees and increase the cost of recruiting and selecting skilled workers, notably through additional costs incurred in outsourcing personnel services or retaining aging and less productive workers to comply with government requirements.

(b) Organizational readiness for the digitalization of HRM

In the case of Russia, businesses' organizational readiness for the digitalization of HRM is defined by the responsiveness of management to the opportunities created by ICT and the ability of corporate professionals and enterprise systems to adopt those technologies. The overall assessment of the organizational readiness is *somewhat pessimistic.*

Selected empirical studies support this view. In 2019, SAP CIS and Deloitte surveyed 434 Russian enterprises and their effectiveness in digitalizing HRM. When answering about practices on a 4-point scale, 20% respondents reported using traditional paper and pencil processes (1 point); 67% reported fragmented automation like selected disconnected processes and the absence of central data storage (2 points), and 13% reported standard automation with data storage (3 points). However, none of the respondents reported a score of 4 points with AI-supported management, predictive analytics, and virtual reality in training (Vedomosti 2019). The same year, PricewaterhouseCoopers surveyed Russian private companies and revealed major obstacles to capitalizing on digitalization, such as a lack of financial resources (54% responses) and inefficient HRM, namely with a lack of relevant competencies (18%), resistive organizational culture (18%), and work overload (24%) (PwC 2019). Russian experts also

admit Russia's lagging behind the West due to a lack of necessary competencies and skills and an insufficient supply of cadre (Kolodeznikova 2023). The ability to capitalize on digitalization is low because "the current HRM practices that exist in the Russian economy do not produce the necessary level of innovation, productivity and value creation… HRM is not seen as a resource to the enterprise, it is merely a technical and administrative function. The personnel office is seen as a control function and is not utilized to develop workforce" (Gurkov et al. 2014: 384).

Pessimistic generalizations on the quality of Russian HRM highlight a number of aspects such as the state's intervention in corporate work practices, poor unemployment protection, a significant proportion of arbitrarily defined bonuses, low rate of unionization, low quality of jobs, preference for new hires who do not need training, training as being short-term oriented, compensation known for high wage differentiation and performance-based remuneration with a low baseline pay, poorly formalized assessments, and limited management attention to organizational culture (Andreeva et al. 2014; Gurkov/Zelenova 2011-2012: 76). Additionally, after the 2008 economic crisis, Russian senior managers stayed cautious in diversifying their workforce, in hiring younger and older employees, or spending funds on training and development (Gurkov/Settles 2013).

This, in turn, explains the gaps in the efficiency of the digitalization of HRM between groups of large state-run companies in key industries, groups of SMEs in the ICT segment that are attractive to younger professionals, and a large group of companies that have limited or deteriorating abilities to use new technologies in their practices. The World Bank's experts acknowledge that "Russian business, with the exception of few leading enterprises, is generally lagging in digital adoption, especially in the traditional sectors" (World Bank 2018: xxiv).

Companies' success in absorbing the benefits of digital technologies varies significantly across the key clusters of companies depending on their access to state-tied or foreign resources with "a vast mosaic in the evolution of HRM ideology, legislation, systems and practices" (Gurkov et al. 2014: 376). Hence, across the economy, firm-level personnel management practices are fragmented, ranging between selected cases that are compatible with efficient MNEs and many that are obsolete and underdeveloped.

This fragmentation is driven by the historically developed diversity of organizational forms, business philosophies, and prevailing patterns in enterprise strategies and performance that can be labeled as "traditional," "cost-minimization," and "human resources investment" models (Fey/Bjorkman 2001; Buck et al. 2003). The first is rooted in the past Communist era and is accompanied by a narrow range of technology-specific training, government-driven wage control and remuneration, direct subsidies in terms of social provisions, and high job security with hidden unemployment. The second is known for a reduction in

training spending, individual performance-based remuneration, lack of job security, and divesting of the social sphere. The third model provides a wide range of training, uses bonus and profit-sharing incentive schemes, offers medium-level job security, and distances itself from direct government subsidies. Each model displays specific organizational responses. The follow-up discussion is primarily focused on successful corporate practices that represent the human resource investment model, namely companies that integrate technological advancements into HRM to facilitate decent and sustainable work, support life-long learning and development, and work transitions through long-term investments, hence resonating with the ILO's human-centered agenda (ILO 2019).

While the effectiveness in digitalizing HRM in Russia is mixed, companies that deliver strong results serve as "role models" to others and emerge as "centers of knowledge" that disseminate the best practices and successful ICT solutions, even under the challenging political and socio-economic conditions discussed above. The profile of such a "role model" combines the prioritized strategic role of HRM in the execution of a business model with a "human resource investment" orientation, the integration of HRM processes into the enterprise-wide system (paperless, enterprise systems, cloud-based solutions), the aggressive application of new digital and online tools in the selection, recruitment, training, and development of employees, and an emphasis on the long-term development of human resources.

Limited empirical data support a positive connection between a "human resource investment" model and companies' international competitiveness (Fey et al. 2000; Fey et al. 2009). For example, a survey of the top 41 internationally competitive Russian companies emphasizes employees' involvement in decision-making, delegation of authority, advanced communication and networking, senior HRM managers' involvement in strategy-making, comprehensive training programs, and effective ties with external stakeholders including educational institutions (Zavyalova et al. 2017). Furthermore, these successful companies acknowledge the advantages of integrating artificial intelligence into HRM practices. According to a survey of companies conducted by the Russian recruitment platform HeadHunter, 33% of respondents expect AI to make a major change in human resources by 2050 (Fateeva et al. 2022). This would include the integration of platforms like "GigaChat," the Russian-made alternative to ChatGPT in light of the Russian government's ban on the latter platform. Another recent empirical study of 449 firms in 16 sectors of the Russian economy revealed the benefits of digitalization in having a younger workforce, greater flexibility in attracting and managing a skilled workforce, and applying innovative approaches in HRM (Zavyalova et al. 2022). At the same time, this study displays challenges associated with digitalization, and successful companies in the survey acknowledged a higher level of employee turnover which may not only reflect greater flexibility but also reveal deficiencies in management.

Furthermore, some scholars have shown that there is not a direct correlation between the level of digitalization and short-term gains in business performance, which in part may be explained by a "human resource investment" model's long-term orientation and expectations (Zavyalova et al. 2022: 48-49).

Among companies with successful digitalization practices, MNEs form a separate group usually affiliated with the third model ("human resource investment"). While studies that compare foreign subsidiaries and genuine Russian companies in HRM are rare (Gurkov 2016), selected surveys show distinctions in their policies. For example, almost 100 percent of top multinationals reported detailed job descriptions and assessment procedures compared to only 40 percent of Russian firms; MNEs prefer expatriates to be in charge of their Russian operations and place greater emphasis on training and development, accompanied by sending employees to business schools to upgrade their practical skills (ibid.: 380). However, in terms of their HRM policies, multinational firms in Russia operate under multiple institutional constraints. They must comply with regulations that establish caps on the percentage of expatriates to be employed by MNEs in selected industries (like banking). The Russian law also imposes geographic restrictions on FDI (closed cities, land plots in border areas) and in the spheres of economic activities which are considered of strategic importance for national security or those relevant to agricultural land transactions or mass media. Furthermore, low inward FDI, political sanctions imposed by Western countries in response to the conflict in Ukraine, and the preferential treatment of locals over international competitors in the domestic market result in foreign investors fleeing Russia. For example, well-known and branded multinational firms such as Shell, Honda, IKEA, SAP, Dell, HP, Heineken, McDonald's, or Siemens exited the market, and other MNEs like ABInBev, Bosch, Coca-Cola, Samsung or Toyota scaled back or suspended their operations.

Nevertheless, select MNEs continue to perform in the Russian markets, primarily in retail (Auchan, Leroy Merlin, Metro Group, Alibaba), air transportation (Emirates Airlines, Turkish Airlines), communication (AT&T, Verizon), or tobacco (Japan Tobacco International) industries. They apply localization strategies, respond to selective tax breaks or government incentives, and capitalize on the establishment of special economic zones and simplified contractual procedures. In competing with domestic Russian companies, these firms have an advantage in HRM efficiency due to their access to global innovative resources, their ability to transfer organizational advancements across borders to their Russian subsidiaries, and their reliance on information platforms not easily accessible by locals. However, those subsidiaries concede to restrictions imposed by the Russian government in the use of servers, networks, storage of information, etc., as discussed earlier.

Overall, there is a visible gap in organizational readiness between the industry leaders, innovative startups, and MNEs' subsidiaries who generate innovative solutions, on the one hand, and many traditional organizations who are not able or willing to absorb the advantages in digitalization due to a lack of or poor access to the state or to information resources and due to insufficient competencies of their HRM cadre, on the other. While the fragmentation of HRM patterns, insufficient availability of relevant competencies, and cultural barriers explain pessimistic projections about resource-tied and organizational readiness in Russia, the emergence of "role models" firms attest to the potential for the digitalization of HRM.

Digital Innovations in HRM

Firm-level digitalization of HRM in Russia depends on the composite impact of external factors discussed above, and success in absorbing the benefits of ITC varies significantly among business clusters. In the following section, we explore how successful local firms and MNEs' subsidiaries in Russia respond to the new technological opportunities with their *positive* experiences at two levels: (a) specific HRM functional areas such as selection and recruitment, training and development, and work organization, and (b) integration of digital HRM innovations into enterprise-wide management systems and competitive business models.

(a) Digital innovations in the functional areas

Selection and recruitment

The supply-demand gap in ICT competencies in the Russian labor market and the effects of the demographic crisis manifested in a decline in the number of secondary school students and a drop in the number of students in higher education pose new challenges in finding, allocating, retaining, and utilizing creative and productive workforce, especially related to new technologies. The majority of local firms are known for lower risks in technology acquisition when trailing the West, and for lower compensation and less attractive working conditions for employees in the digital sector. However, in response to the challenges, the "role model" firms successfully integrate digital tools into the selection and recruitment process and build cooperative relations with higher education institutions for direct access to ICT talent.

While most of the advanced digital tools in selection and recruitment are not widespread yet, the trend in Russia "is gradually changing from an experimental approach to a focused one" (Evseeva et al. 2019: 152). In the past few years, innovations have included the application of AI-powered screening calls and voice bots (Sberbank, Megapolis Group), HR robots (X5 Retail Group,

Pepsico, Raiffeisen Bank, Coca-Cola HBC Russia), crowdsourced recruitment (Rosatom, Soglasie insurance), messaging apps (Megafon, Sberbank, Metalloinvest, Gazprom Neft), and access to social networks (Mail.ru). In their search for the best candidates, these firms use AI-powered automated screening calls and video interviews with face and voice recognition and gain an advantage in finding, screening, and selecting job candidates. They experiment with automated searching and preliminary assessments of candidates, video interview recordings, and security checks and bidding, and may use outsourced or in-house-developed mobile applications.

In a HeadHunter platform's survey of Russian companies, 63% of respondents predict that by the year 2050, recruitment will be performed by HR robots (Fateeva et al. 2022). HR robot recruiters equipped with voice recognition connect HR agencies with employers and draw on a corpus of billions of words and combinations. Such robots interact with humans, recognize certain emotions, and can simultaneously interview hundreds of candidates. For example, the AI-based online recruiting platform Robot Vera, developed by the Russian software company Stafori, was equipped with voice recognition software, used more than 13 bln words and combinations, and was ten times faster than humans, helping employers to reduce recruitment costs by 50 percent.

Crowdsourcing is another powerful tool that allows companies to obtain information and opinions submitted by large groups of people from multiple locations via the Internet and smartphone apps. For example, the Russian-made Witology proprietary platform provides "syntellectual" crowdsourcing solutions and permits users' access to hundreds of universities in numerous cities in Russia to observe candidates' behaviors and abilities to solve complex problems.

Pressured by unfavorable demographics, in the search for ICT talent, top Russian companies (MegaFon) and subsidiaries of multinational firms (Huawei) aggressively build partnerships with higher educational institutions. These firms emphasize the value of long-term cooperation with universities in their search for talented candidates able to create new digital products. They establish digital labs, encourage ICT-tied modifications and advancements in university courses, and offer grants and internships to the best students at their corporate facilities. In building such partnerships, some companies move even further and create business-university-government alliances to acquire digital talent.

Training and development

In Russian organizations' total expenses on digital technologies, the share of training and development is very low at only 0.6 percent (HSE 2023: 15). However, companies' interest in those technologies is changing rapidly. Training was also claimed as a critical factor in the success of multinational companies operating in the Russian market (Bjorkman et. al. 2007: 13).

Successful Russian companies in the "human resource investment" group that have high levels of organizational readiness apply various tools and techniques that range from chatbots and webinars to advanced "learning experience" and "learning management" platforms. The market for learning management systems offers collaboration tools, communication features, real-time content-sharing, and course delivery, where businesses use free applications (Moodle) or modules (WebTutor, GetCourse), cloud-based solutions (Teachbase) and plugins for WordPress (Memberlux), or create learning portals on available ordinary websites. Projections about further integration of digital tools specifically within the application of AI in corporate training are highly optimistic, with 47% of respondents in the HeadHunter recruiting platform's survey expecting that training will be performed by AI by 2050 (Fateeva et al. 2022).

However, the digitalization of training is accompanied not only by benefits (quality and automation of learning, flexibility and cost-effectiveness, speed and accessibility of training and evaluation) but also displays challenges such as job cuts and the emergence of unclaimed professions, risk in leaking personal data, employees' resistance to digital innovations, or weak senior management control over the organizational processes (Kolodeznikova 2023). The 2020-2021 empirical survey of companies that use digital training, mostly in large cities, revealed respondents' relatively low satisfaction at only 50%, with similarly pessimistic outlooks on their concerns about technical difficulties (55%), lack of motivation (47%), noncompliance with standards (38%), and problems in absorbing information via digital channels (35%) in training and development (Sobol 2021).

International experts acknowledge that in Russian companies, employee performance depends on skills, capabilities, and motivation (Fey et. al. 2000) and employee development may be of even greater significance in Russia than in the West (Fey/Bjorkman 2001). While managers typically complain about a deficit of skilled labor, in many cases they are not ready to invest in the necessary training and development or hiring of young workers (Gimpelson 2010). With a shortage of competent candidates in the labor market, like in digital technologies, many managers name retention as a critical problem and directly link hiring to training and development.

The evaluation of the effectiveness of training activities also varies among different groups of businesses. On the one hand, the top companies create in-house programs, outsource to professional centers, support personalized learning with mentoring, or encourage AI-tied adaptive learning as complementing digitalized evaluations. On the other hand, many SMEs in traditional industries typically ignore training innovations because of their relatively short-term strategic orientation and lack of resources to invest in lifelong learning. Despite their intention to follow effective training practices, many domestic companies often perceive

training evaluations as "a useless procedure not creating value for the organization" (Kucherov/Manokhina 2017: 139).

Work organization

The approaches to work organization in Russia have been evolving during the transition to the market economy. In the Soviet era, government agencies enforced country-wide organizational standards with a centralized dissemination of the best practices in work organization. After the dissolution of the Soviet Union in the 1990s, the source of the new initiatives shifted from central authorities to businesses. However, engineering-based solutions, with their focus on productivity and efficiency, dominated, often at the expense of the soft components of work organization (job enlargement, job enrichment, etc.). According to Horie, work organization at Russian industrial enterprises depends heavily on standardized job designs and it will take some time for them to move on from their inherited obsolete work organization patterns (Horie 2014).

Most recently, a combination of digitalization opportunities and the impact of the pandemic on the world of work triggered a major shift in work organization when work in different industries was transferred online and remotely on a massive scale (Kuzminov 2020). In 2021, this led to revisions of the Labor Code to give more flexibility to employers and employees in making remote work arrangements.

As a result, many businesses improved their inter- and intra-organizational communications and moved toward a wider usage of cloud services, corporate internet and intranet channels, group calls, and messaging. According to a poll conducted by Rabota.ru, a quarter of employees started working from home during the pandemic, with about half returning to the office in 2021 and another 15 percent working in a mixed format, leaving just 8 percent still working remotely (Moscow Times 2021). Statista (2022) estimated one fifth of Moscow and St. Petersburg residents working exclusively remotely, and a further 16 percent using a hybrid work mode. Furthermore, in inter-firm communications, 45 percent of companies surveyed by Statista (2021) preferred traditional video communication systems like Microsoft Skype or Zoom, with other mediums including Cisco Webex, MS Teams, and Google Hangouts. However, with the government's restrictions on dependencies on foreign companies or following selected Western providers' decisions to limit Russian users' access due to sanctions (for example, Zoom distributors restricted sales of the online conference services for state institutions and state-owned companies in Russia and CIS), there is a visible shift in reference to lower-cost Russian-made alternatives for remote communication like Webinar Meetings or Vinteo.

(b) Search for integrated HRM systems and solutions

The most sophisticated digitalization of firm-level HRM in Russia is evidenced in the leading companies' search for and creation of enterprise-wide systems that integrate ICT solutions in corporate performance, including personnel management or comprehensive software packages that allow users monitor multiple functions in real-time decision-making. The implementation of these systems depends on the ability of companies and their HRM personnel to use the advanced technologies in daily operations and consolidate automation, self-service, change of management software, paperless work, and data storage and distribution, thus aligning HRM information and HR analytics with other components of the enterprise management system.

Companies in the "human resource investment" group, whether industry leaders or MNEs' subsidiaries, use digital HRM platforms to organize, streamline, and aggregate multiple activities in an organization. They also synthesize personnel management subfunctions including but not limited to workflows and approvals, digital employee records, payroll, time tracking, and assessment, and integrate the HRM module into enterprise-wide corporate information systems. Such companies apply either Russian-made software products or rely on advanced Western integrated platforms adapted for use in Russia. In the past decade, the top firms preferred foreign cloud-based platforms that establish a single source of HR data across an enterprise and optimize HR and business operations such as SAP SuccessFactors Human Experience Management Suite (Germany) or Oracle Cloud Human Capital Management (USA). Likewise, software packages such as SAP's Integrated Employee Self-Service and Manager Self-Service provide decision-makers with centralized and streamlined document management and access to archival data, standardized reporting, improved time tracking, development planning, administration of benefits, and payroll processing. The users acknowledge the efficient automation of HRM processes, including planning, selection, development, evaluation, compensation, and benefits, and confirm that they have achieved significant cost savings and a simplified workflow.

Domestic industry leaders (Sber, Gazprom, Polyus, Rostelecom, Metalloinvest) and multinationals' subsidiaries in Russia (ABInBev, Heineken, Auchan, Decathlon) effectively used advanced SAP applications and reported positive results in major restructuring projects, integration of electronic documents and signatures, effective mobile solutions, and encrypted electronic recruitment and training with the main production information system. In selected cases, firms reported a ten-times increase in the effectiveness of HRM processes and two-times decrease in associated risks (CNews 2017). Some firms further integrated their SAP-based enterprise-wide platform with external social networks and messaging apps, and subsequently reported improved communication and interactions among business units.

Internationally recognized enterprise platforms and software, however, have limitations due to the difficulties in tailoring them to the Russian business and legal contexts, and in providing adequate translation and interface. The licenses and access are expensive, and many traditional firms and SMEs simply cannot afford the cost of those technologies. Furthermore, international sanctions, especially in the high-tech sector, limited Russian firms' access to relevant integrated products and services, and in selected cases, credible service providers exited the Russian market in response to the conflict in Ukraine. For example, in April 2022, SAP decided to end its software support and halted its sales in Russia, shutting down its cloud operations and giving non-sanctioned companies the choice to have their data deleted or migrate to data centers outside of the country.

In response, Russian firms sought substitutes for the SAP software and explored domestic products like Comindware Business Application Platform, DeloPro, or EPROMIS Business Suite, which were included in the state register of software products. However, a transition of such enterprise systems is very difficult, costly, and time-consuming due to the complexity of the software, hardware adjustments, and security complications, along with a greater need for relevant competencies.

Conclusions

In this article, we analyzed the digitalization of HRM in Russia in a broader economic and political context. We summarized the drivers that shape the potential for the successful acquisition of new technologies in business organizations and highlighted challenges and the best practices in digital innovations. Our study revealed the factors that determine businesses' resource-tied readiness and organizational readiness in successful applications of digital technologies in HRM. We discussed advanced organizational practices in selection and recruitment, training and development, work organization, and the integration of digital HRM with corporate-wide systems at successful Russian companies and MNEs' subsidiaries operating in the Russian market.

Based on the analysis of archival sources and informal interviews with managers in Russia, we came to the following important conclusions. First, a country's business environment (economic, political, social, cultural) in a historical perspective shapes the ways in which businesses in Russia have been integrating digital technologies in HRM practices. Second, the Russian government moderates digitalization practices, facilitates or inhibits the application of digital technologies by providing relevant support and resources, and simultaneously imposes politically charged regulations, standards, and restrictions. Third, distinctive HRM patterns, effective or ineffective, co-exist in Russia, and the role of the cluster that is consistent with the "human resource investment" agenda

has been growing. The best companies that belong to this group serve as "role models" to others in the digitalization of HRM. Fourth, in the search for ways and tools to manage people in organizations effectively, "role model" companies not only use digital solutions in selected functional areas, but also shift their attention towards integrated HRM systems, hence delivering synergies in management and strengthening their competitiveness.

Our assessment of the perspectives of digitalization of HRM practices is somewhat pessimistic. In the 2020s, businesses in Russia experienced major shocks due to the pandemic, demographic crisis, Western sanctions imposed in response to the conflict in Ukraine, and an exodus of many major MNEs from the Russian market. This results in the reconfiguration of supply chains and limits Russia's access to advanced HRM know-how (e.g. exit of the best international HRM consulting firms like Hayes) and digital resources and licenses (e.g. exit of Microsoft, SAP). Furthermore, new risks to the digitalization of HRM may stem from the relocation of the state's financial and human resources to conflict-tied activities, hence diminishing support to and funding of long-term HRM development and talent advancements.

These changes, challenges, and uncertainties position Russia at a crossroads in the digitalization of HRM if the gap between advanced HRM practices in industrialized countries and those in Russia will continue to grow, due to obstacles and government restrictions in the access to technological resources, shrinking prospective opportunities in the labor market, especially in ICT segment, and barriers for cross-border organizational and technological know-how transfer. This, in turn, may limit the scope of firms with a "human resource investment" agenda in Russia and make approaches developed in other parts of the world more difficult to apply in the Russian context.

This article contributes to several streams of scholarly literature. First, by placing the digitalization of HRM in a broader economic and socio-political context, it adds to the mainstream international business studies and, more precisely, studies of the emerging markets. Second, our examination of the modern technologies' effects in Russia adds to country-centered international HRM studies. Third, assuming that theoretical aspects of ICT-HRM integration are still at the developmental stage and their application to country cases has been rare, our research on practical firm-level changes offers new insights for a theoretical generalization of "HR digitalization technologies" or "e-HRM" (Bondarouk/Fisher 2020; Bondarouk et al. 2017; Marler/Fisher 2013; Parry 2011).

The findings herein have practical implications. They educate decision-makers in their search for productive solutions in the complex Russian business environment. In particular, when integrating digital technologies in HRM, managers need to understand the complexity of this context and distinctions of the state-tied resources and restrictive government policies, admit that selected

companies in Russia have an advantage in this integration and learn from their best practices, address challenges in finding talent by utilizing digital solutions and partnering with educational institutions in selection and recruitment, capitalize on enterprise and cloud-based platforms and advanced software products in training, and develop and build enterprise-wide systems with a HRM component.

The limitations of this study are linked to the bounded availability of corporate information on HRM practices in the Russian Federation and to the developmental nature of relevant international HRM theories. While we acknowledged the emergence of selected surveys and empirical studies about the digitalization of HRM in Russian literature, many do not offer sufficient evidence that permits country-level generalizations. Furthermore, the Russian business environment is known for managers' unwillingness to reveal weaknesses and inefficiencies in incorporating practices. This was evidenced in our informal interviews with 20 managers in the manufacturing, financial services, and food industries in 2019-2020. While we collected valuable information in those interviews, the data was deemed insufficient for rigorous qualitative or quantitative analysis, and those findings were used primarily as expert assessments and insights in summarizing the trends in the digitalization of HRM.

The results of our study help draw directions for future research which include but are not limited to the alignment of theoretical generalizations of digital technologies' effects in HRM and country-tied studies of practical ICT solutions in business and the exploration of causal links between digital technologies and their effects in the labor market and HRM, that will include quantitative research designs, hypotheses testing, and the application of statistical analysis. Furthermore, in the follow-up research, a summary of the results of empirical studies (main focus, empirical strategy, main results) may contribute to the discussion. Finally, an extension of this study may offer productive comparisons of national practices and the transfer of best practices across borders, hence enriching international HRM as a discipline.

Overall, in this article, we offered a discussion about modern trends in digitalizing HRM in the Russian Federation and highlighted the distinctions in relevant practices (specific government policies that impact HRM, fragmentation of HRM approaches, emergence of firms that serve as "role models" to others). Considering the variations in businesses' resource-tied readiness and organizational readiness, we positioned the digitalization of HRM in Russia as being at a crossroads.

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