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INDUSTRY 4.0 AND HUMAN RESOURCE MANAGEMENT IN THE HOTEL BUSINESS

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Abstract. The development of ICT and digitalization are changing the workplace and modifying the way organizations operate entirely. This tremendous progress led to the emergence of industry 4.0 and 5.0, which incorporated advanced technological means such as the Internet of things (IoT), artificial intelligence, and robotics to achieve the smart manufacturing vision. Organizations are obliged to keep up with this evolution by modifying their policies following the new market trends. In addition, advanced technology plays a vital role in the hotel business in terms of competitive advantages, service quality, customer satisfaction, and cost reduction. This article seeks to discuss changes that occur to human resources under industry 4.0, 5.0 and highlights the importance of new technology for the hotel business. The article examines several aspects of industry 4.0 and 5.0 related to human resource management and indicates the prospects of digital technology in the hotel business. This research contributes to HRM and industrial revolution literature and addresses recommendations for future studies.

Keywords: Industry 4.0; Industry 5.0; Human Resource Management; Hotel Business; Digitalization.

JEL Codes: M12; M54.

Introduction

Global development businesses are progressing to fulfill the ever-changing current and future trends. Industry 4.0 and 5.0, supported by both information and operational technology, are examples of this transformational development (Clim, 2019). Many futurists and scientists have started the investigation on Industry 5.0. They presented a variety of views for Industry 5.0. Human-robot collaboration is an emerging subject for Industry 5.0. At this point, research around the themes of Industry 5.0 is at the elementary stage. (Demir *et al.*, 2019).

The industry 4.0 phenomenon is attracting the attention of the world community and affecting all-economy aspects. A few years ago, the developed countries started preparing their organizations to receive this change and meet industry 4.0 requirements. Companies and organizations need to change their practices to keep pace with these trends and achieve a competitive advantage (Sima *et al.*, 2020).

Advanced technology has emerged through the work environment to achieve the objectives of industry 4.0. There are many technological trends such as IoT, Artificial Intelligence (AI) and robotics, big data, cloud, Virtual and Augmented reality (VR/AR), 3D printing, intelligent logistics. Industry 4.0 combines all these technological tools to achieve smart manufacturing's vision (Demir *et al.*, 2019; Ben Youssef and Zeqiri, 2020).

The sectors impacted by the evolution are not only related to the industrial aspects. Still, they will also affect the nature of employees' responsibilities, which will probably shift the employees' prospects of the human resource profession. HR departments are forced to keep up with this development by modifying their policies according to the market development criteria (Dhanpat *et al.*, 2020).

As Industry 4.0 affects the manufacturing industry, it also affects the service industry, especially the hotel sector. Hotel businesses need to provide unique services and experiences and meet customers' expectations to achieve customer satisfaction and enhance the service quality level. In this direction, Industry 4.0 is precious for the hotel business. Achieving guest satisfaction, loyalty, and enhancing service quality can all be influenced by factors such as personalized service, agility, innovative working environment, lower costs through highly customized services, and updated information on guest preferences by using big data applications, and digital advancement (Shamim *et al.*, 2017). Therefore, this article discusses some conceptual aspects of industry 4.0, 5.0,

and their impact on the nature of human resource work. It also highlights the state of hotel business under the new technological environment.

1. Overview of Industry 4.0 and HRM

The Industrial Revolutions are considered the basis of many innovations, transformations, and modernity in the world. Before the Industrial Revolution, the economy was based on agriculture, animal husbandry, merchants, and artisans. After the invention of the steamer, economic structure based on economics, mechanization, and serial production based on soil, agriculture, and muscle power have passed. The amount of production and sales increased with mechanization. The capital, which is in production, has made more production using machinery, and big companies have begun to be born. The economy has recovered, and the standards of living have begun to improve (Yıldırım and Çestepe, 2017).

The concept of Industry 4.0 has attracted the interest of producers and researchers at the same time. Implementing the Industry 4.0 concept in the production sector means the maximum use of communication technology and advanced inventions to encourage the development of production technologies. In Addition, Industry 4.0 includes more development to companies and creating a new, more effective work environment (Qin *et al.,* 2016). Collecting and analyzing data and intelligent systems leads to the simplification of work and regular communication between the entire organization and appropriate decision-making. Consequently, the advanced applications of industry 4.0, such as robotics, automation, IoT, and Artificial Intelligence (AI), are the elements that changing the workplace, modifying completely the way organizations operate, and reduce the limits between the real world and virtual reality (Sima *et al.,* 2020).

Industry 4.0 is changing the lifestyles of societies and all business life habits. Countries, communities, organizations, and employees have to keep pace with this change in order to avoid the risk of economic disappearance (Yıldırım and Çestepe, 2017).

Strategic Perspective.

The new role of HR is to be a strategic partner in order to enhance the business results. HR professionals, who can manage financial information, deal with automation and digital applications, Familiar with recent developments, and who contribute effectively with business activities will be needed more in the business market. The role of HR Specialists becomes consultative. Employees need to be proactive and involved with any implemented changes by the organization to ensure efficiency in industry 4.0 (Malik, 2019; Dhanpat *et al.,* 2020).

Embracing new technology.

Advanced technology is at the center of the current industry 4.0. The development of IT, big data, IoT, robotics, and cloud computing enable new business models, production approaches,

enhance decision-making and intelligent systems. Meanwhile, AI enables machines to acquire knowledge, perform cognitive tasks, work independently and become self-controlled agents. In addition, robotics is used in organizations for automating easy and tedious tasks. Thus, todays' jobs are more data-driven and machine-powered than in the past. As machines and robotics take over repeatable activities and the jobs people do become more creative and less routine, people require more human skills in problem-solving, analysis, communication, and design (Kergroach, 2017).

Emerging new technology and tools make it possible to redesign jobs into smaller tasks and encouraging the fragmentation of occupation into smaller parts of self-employment. Besides, online platforms joining freelancers and job seekers with companies that inviting them to offer a variety of tasks with a form of non-standard work. However, technology improves the work environment and performs routine tasks, but at the same time, there is a fear of job loss. Therefore, employees need to acquire new competences and skills in order to survive in a very dynamic work environment (Sony and Naik, 2019).

Talent Management

Technology and smartphones with different smart applications have re-invented the mode staffs engage with their companies and talent acquisition. Organizations should have investment strategies on digital tools and innovation facilities to implement new advanced technologies through different organizational functions. AI and big data enable employers to match candidates' resumes and profiles with the job description to select only the most qualified candidates and reduce much time and substantial manual efforts (Sivathanu and Pillai, 2018).

In addition, with the speed internet and advanced technology, the interview step would contain customized tests instead of general ones that enhance the prediction of future performance. Further, (4G/5G) networks improved video-based interviews and eliminated many connection challenges. Chatbots are helping in validating candidate answers instantly and minimizing interviewer bias. New employees can become productive from the first day of the work through the virtual and augmented reality that enables them to be directed with different processes, sections, and layouts across the company. Therefore, Organizations should establish their talent management systems and connect them with HR functions to be successful in the market and get the most benefits from their talented workforce (Rana, and Sharma, 2019).

HR key competencies in industry 4.0

Industry 4.0 is characterized by technology and innovation, where AI and digitization are significant factors affecting industries. Emerging a suitable employee competence roadmap is one of the most critical issues for the scientific community and managers. Studies confirmed that improving only the product is not a rational decision to have an outstanding position in the

competition, but the development of employee competence needs more attention (Hecklau *et al.,* 2017). Therefore, many of the ordinary and traditional skills will be unnecessary for modern organizations. New jobs will force the employees to acquire new skills. Lifelong learning, a mix of skills, and data analytics has become needed in the workforce market. Soft skills such as collaboration and teamwork, self-management, flexibility, and critical thinking are crucial for the employees' success (Sima *et al.,* 2020).

The development of virtual work leads to increasing the extent of working in a virtual and digital environment. Platforms virtual collaboration requires a high level of communication and cooperation to provide an efficient environment within more heterogeneous and dynamic teams. Moreover, strategic tasks with more specific responsibilities need more and new dimensions of leadership thinking and competences. Future management styles will need to be transformed from power-driven to value-driven to meet the diverse workforce in education, cultural background, and geographical location. A few years ago, all these abilities were considered additional skills, but now it is necessary to say that they have become mandatory, and workers will be forced to adapt and acquire these skills. (Rajnai and Kocsis, 2017; Flores *et al.,* 2020; Cimini *et al.,* 2021).

Information Security

Data protection is one of the things or challenges facing human resources. The human resources department has a database for workers that contain a lot of information and personal data such as sickness records and evaluation materials. Data exchanging through the cloud and mobile devices lead to more information security risks. In addition, Industry 4.0 connects the IoT and digital technologies and relevant physical, including additive, analytics business, high-speed computing, robotics, cognitive technologies, advanced materials, and augmented reality to integrate and digitize business operations (Wyrwicka and Mrugalska, 2017). Thus, this condition needs to address appropriate security systems and practices to protect the information, devices and communication systems, users' accounts, and business data (Clim, 2019).

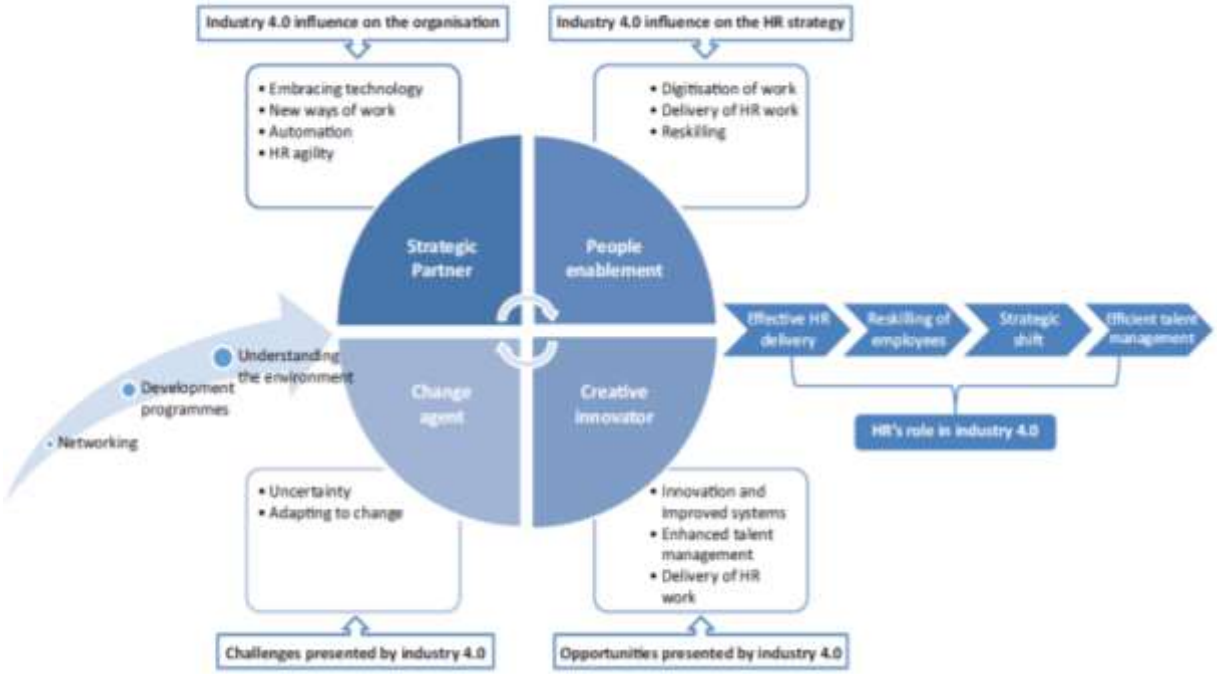
As industry 4.0 is combing information technology (IT) and operational technology (OT), implementing a solid integrated strategic cyber-security system is a substantial asset to organization value chains. It is late for organizations to think about addressing cyber risks after the strategic process. Cyber protection should be implemented with strategic planning, design, setup, and operation. Companies should mitigate incident effects through rapidly restoring processes and system backup. Setting up an attack plan, understanding exactly which procedures are should be implemented during any security attack, and employees should be trained well on the organization's cyber-security procedures (Waslo *et al.,* 2017).

Working Environment

The process of digitizing the work environment is increasing very rapidly, which has led to the impact of the penetration of information and communication technologies (ICTs) in all aspects of work and life. The digital environment, Cyber-Physical Systems (CPS), and virtual and augmented reality are facilitating connecting the physical world with the virtual world. In addition, the number of new generations involving in the workplace market is increasing and affecting the work environment. For example, Gen Y and Gen Z (born after 2000) have developed in the era of the internet, smartphones, and social media; they prefer working anytime–anywhere in cafes or corners that provide working spaces and working facilities. Thus, large companies changed their office design to be more attractive and inspiring to work (Rana and Sharma, 2019).

The new technology, cloud applications, and tablet devices enabled more cooperation between employees by working on one file simultaneously and from anywhere. Meanwhile, social media has become inside organizations to bring employees closer, connect groups, and improve human relationships through the organization (Lazarou *et al.*, 2019). Figure 1 shows the entire human resource management model in Industry 4.0.

Fig. 1: A holistic model for HR 4.0 (Dhanpat et al., 2020)



2. Moving on Industry 5.0

While Industry 4.0 focused on creating intelligent organizations through new technology and facilitating the production process. Industry 5.0 is more concerned with cooperation between systems and people and the social, legal, and ethical considerations created through this

cooperation. Industry 5.0 is estimated to be characterized by integrating humans and intelligent systems to create a new working model for producing new value-added services (Clim, 2019).

Besides, McDonnell (2018) laying out a vision for the work environment through Industry 5.0 in which humans interact with AI and robots to improve the processes and activities. Modern technology connected with operating systems will provide managers with valuable advice through digital dialogues, helping them make innovative decisions and optimize production. AR and VR will support an effective control process through envisioning and modeling. Consequently, managers will be allowed to tour and get real-time information about the operation through AR glasses (Demir *et al.,* 2019).

Cobotics is one of the features of intelligent working systems. The term Cobotics refers to using work points as a workstation between humans and robots in a specific job. Hence, cobots are robots designed for cooperation with workers inside the workplace. The creation of these cobotic systems and robots requires a good understanding of the possible behaviors and the issues resulting from this cooperation that will affect the entire work system (Bednar and Welch, 2019). These changes will present new problems and challenges for businesses, requiring greater attention on interactions among stakeholders and interactions between stakeholders and intelligent, interconnected systems. Cobotics cannot be considered only as a technological issue. Therefore, Implementing and sharing these robots need a comprehensive socio-technical approach in which many aspects should be studied, extending beyond cybernetic and technological considerations (Özdemir and Hekim, 2018).

3. The state of Hotel Business

In the hotel business, competition is very high, and guest expectations are increasing. Hotel companies should meet and exceed these expectations to achieve customer satisfaction and enhance the service quality level. In this direction, Industry 4.0 is precious for the hotel business for achieving guest satisfaction, loyalty, and enhancing service quality can all be influenced by factors such as personalized service, agility, efficient supply chain management, innovative working environment, lower costs through highly customized services, updated information on guest preferences by using big data applications, and digital advancement (Tatiana, 2019; Shamim *et al.,* 2017).

Innovations, intelligent devices, and IoT are used in many hotel departments to increase efficiency and improve the guest experience. Automation robots replace human resources and chatbots to enable customers on the online sites, face recognition, and sensors for a more secure

environment. Cleaning the guest rooms is easily performed by cleaning robots (Ben Youssef and Zeqiri, 2020).

The hotel business needs to recognize guest preferences, locations, and behaviors to provide personalized services. Most of the room's functions can be controlled by the guest's smartphone or from a provided tablet. Computing resources over time could keep records of customers' comfort preferences and room setting such as lights, temperature, TV channels, and music, and make up the room for their next visit automatically. In addition, in-room monitoring methods can be used to determine if a room is occupied or vacant, allowing housekeeping duties to be scheduled accordingly. Applications of AR and VR have provided chances for hotel businesses and guests to navigate certain places such as interior hotel designs, room amenities, and facilities, and let guests interact and share opinions and information with others in online networks. These services will make the customer experience more personalized and unique, and the hotel operation; more effective. (Car *et al.,* 2019; Ben Youssef and Zeqiri, 2020).

The key to success in an uncertain and unpredictable economy like Industry 4.0 is learning, training, and innovative capabilities. The significant parts of all these challenges depend on employees and the firm's capabilities. Hotel companies should develop approaches and strategies based on what they expect from their staff. Effective management practices can help to build dynamic skills and create successful learning and innovation. In all these challenges and rapidly changing working environments, hotel businesses should create their roadmap based on their customers' needs and wants (Sari, 2018).

In the current literature, the majority of the studies on Industry 4.0 were conducted on industrial firms. However, the issues like mass customization of services, supply chain efficiency, IoT, digital development, smart work environment are also facing the service sector. Studies investigating service sectors are few and with a general perspective (Shamim *et al.,* 2017).

Conclusion

Digitalization and automation are affecting all economic sectors. Advanced technology provides many opportunities for organizations and many challenges at the same time. This study aims to discuss some conceptual aspects of industry 4.0, 5.0 and their impact on the nature of human resources. It also highlights the state of hotel business under the new technological environment. Industry 4.0 presents many opportunities to the hotel business to enhance the level of service and improve the work environment. The human resources department faces significant challenges to keep pace with the continuous changes in the work environment. Thus, organizations need to develop their policies in line with the general economic trends. In future research, studies

should provide more attention to service sectors. The findings explored some theoretical models which need to be validated by several quantitative studies, and appropriate measures need to be developed. This study indicated various aspects and directions of industry 4.0 and 5.0, such as cooperating with robots, redesign job models, and employee adaptability. All the issues addressed need a wide range of research.

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ИНДУСТРИЯ 4.0 И УПРАВЛЕНИЕ ЧЕЛОВЕЧЕСКИМИ РЕСУРСАМИ В ГОСТИНИЧНОМ БИЗНЕСЕ

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Аннотация. Развитие ИКТ и цифровизация меняют рабочие места и полностью меняют методы работы организаций. Этот огромный прогресс привел к появлению индустрии 4.0 и 5.0, которые включили передовые технологические средства, такие как Интернет вещей (IoT), искусственный интеллект и робототехника, для достижения концепции интеллектуального производства. Организации обязаны идти в ногу с этой эволюцией, изменяя свою политику в соответствии с новыми тенденциями рынка. Кроме того, передовые технологии играют жизненно важную роль в гостиничном бизнесе с точки зрения конкурентных преимуществ, качества обслуживания, удовлетворенности клиентов и снижения затрат. Эта статья посвящена обсуждению изменений, которые происходят с человеческими ресурсами в рамках индустрии 4.0, 5.0, и подчеркивает важность новых технологий для гостиничного бизнеса. В статье рассматриваются некоторые аспекты индустрии 4.0 и 5.0, связанные с управлением человеческими ресурсами, и указываются перспективы цифровых технологий в гостиничном бизнесе. Это исследование вносит вклад в литературу по УЧР и промышленной революции и содержит рекомендации для будущих исследований.

Ключевые слова: индустрия 4.0; индустрия 5.0; управление человеческими ресурсами; гостиничный бизнес; цифровизация.

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