



A Qualitative Study on Talent Management in Enterprises within the Industry 4.0 Process

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Article History

Received 2024-05-05

Reviewed 2024-07-01

Accepted 2024-07-04

Published 2024-07-07

Keywords

Talent

Talent Management

Industry 4.0

Manufacturing Enterprises

Human Resource Management

Abstract

Purpose- This study aims to examine the effects of Industry 4.0 on talent management. It is observed that resources are allocated and training programs are organised for the transformation of the workforce in the Industry 4.0 process.

Design/Methodology- Qualitative research approach was adopted in the study. Using purposive sampling method, 4 different industrial enterprises were analysed. Data collection process was carried out through face-to-face and online interviews.

Findings- Organizations prioritize continuous training and fringe benefits in talent management, while employee involvement in social responsibility projects and teamwork enhances internal communication. In the Industry 4.0 era, maintaining organizational balance and providing diverse opportunities to talented employees are crucial.

Practical Implications- The study suggests that implementing 28 different practices such as brand equity, collaboration, work-life balance and career opportunities to retain talent can increase awareness of the impact of Industry 4.0 on HR management. Establishing sector-based standards and models can help researchers in Turkey to implement Industry 4.0 and talent management practices.

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Introduction

Industry 4.0, from a general perspective, can be evaluated together with important developments that lead to change all over the world. Businesses, factories and the whole world in general are more affected by the general industrial developments that occur in every period with the changes in technology. In addition to focal points such as digitalisation, gig economy, digital transformation (Saadatmand, Safaie, & Dastjerdi, 2022), concepts such as Internet of Things (IoT), Big Data, Artificial Intelligence (AI), Robotics, 3D printing and Cyber-physical Systems (CPS) are among the new technologies integrated with Industry 4.0 (Anshari, Almunawar, & Razzaq, 2021; Macpherson, Werner, & Mey, 2022). As in every industrial revolution that has occurred throughout the history of the world, the impact of the last revolution, defined as Industry 4.0, is great and unique. Technological developments that constitute Industry 4.0 lead to important consequences for all sectors, disciplines and economies (Whysall, Owtram, & Brittain, 2019).

Developments within the scope of Industry 4.0 not only affect the production and manufacturing sectors, but also affect many different sectors such as health, retail, agriculture and education. In this respect, Industry 4.0 leads not only to the rapid development of technology but also to a rapid change in social and economic relations worldwide (Anshari, Almunawar, & Razzaq, 2021) and in the income, expenses and costs of enterprises. While these developments reduce labour costs, which are among the important cost items faced by enterprises, they also have positive effects on productivity, increase resource efficiency and contribute to increasing organisational competitiveness (Macpherson, Werner, & Mey, 2023). Again, with the same effect, the necessity of new specialisations and abilities is emphasised with an effect that increases the necessity of new skills and competencies in workplaces within the scope of Industry 4.0. At this point, talent management, which is an important concept for workplaces, should be taken into consideration. Talent management refers to the strategic and end-to-end processes created to identify and recruit the right talents, taking into account organisational goals, and to help these people reach the most appropriate skills. The digital transformation that has taken place has an impact on people and culture rather than technology. While technology can be purchased in one way or another, the ability to achieve a digital future depends on developing a new set of skills, closing the gap between the supply and demand for talent, and preparing the potential of the appropriate talents (Saadatmand, Safaie, & Dastjerdi, 2022). In this respect, industry 4.0 emphasises issues such as talent development, who can be the talent to be developed, which talents should be developed, who will guide talent development, what is the appropriate development speed and how the architecture to support development should be created (Anshari, Almunawar, & Razzaq, 2021). Therefore, industry 4.0-oriented developments emphasise the need for businesses to manage talent in line with the new technology, while also expressing the need for new approaches to talent sourcing practices (Conte & Siano, 2023).

In the light of this information, the aim of the study is to examine the effects of Industry 4.0 on talent management practices. In line with this purpose, answers to the following research questions were sought. These questions are;

RQ1: What are the changes that Industry 4.0 practices have brought about on talent management processes, which are an important part of human resources management?

RQ2: What contributions does the interaction between Industry 4.0 and talent management processes provide to organisations?

It is thought that the results of this research, which is designed in qualitative design, will give an idea to both businesses, human resources management experts and academicians about the impact of Industry 4.0 on talent management processes.

Conceptual Framework

Use of Industry 4.0 Technologies in Business Functions

Industry 4.0 is recognised as the latest industrial evolution in the world. However, the industry 4.0 revolution should not be considered alone as it is the last link of the world's industrial revolution. In other industrial evolutions, technology has advanced before the evolution and businesses have not had enough time to develop new rules to manage new technologies and optimise opportunities. The first of these evolutions, industry 1.0, was associated with mechanical production, followed by industry 2.0 with mass production and industry 3.0 with automated production. In contrast to these evolutions, the industry 4.0 evolution has been the only one that can be predicted in advance, as well as enabling organisations to update themselves in a planned structure (Macpherson, Werner, & Mey, 2023).

When an examination of the birth of the concept of Industry 4.0 is carried out, it can be said that it was first defined by the Germans at the Hannover Fair in 2011. Following this development, the concept of industry 4.0 was included in the programme as one of the ten projects for the future within the scope of the "High-Tech Strategy 2020" plan by the German government in 2012. Again, historically, the third development related to industry 4.0 is the "Made in China 2025" programme within the framework of the industrial development plan in China in 2015, and the concept of industry 4.0 has become addressed in many industrial countries for the same purpose (Şenol, Sarıoğlu, Başkaya, & Acar, 2020). The developments caused by the emergence of Industry 4.0 have supported positive developments such as the adoption of new technologies that can process large amounts of data, significant developments in points such as corporate value chain management, digitalisation of data and redesign of information flow by redesigning existing business processes (Conte & Siano, 2023). In this respect, Industry 4.0 can be expressed as a fully digitalised transformation in production processes (Anshari, Almunawar, & Razzaq, 2021). With Industry 4.0, technological developments are taking place to create real-time value streams that produce quality products and services targeting high satisfaction levels. The technological innovation that occurs with Industry 4.0 increases global competitiveness and therefore organisations can increase their competitiveness. Among the innovations caused by the development of Industry 4.0 are artificial intelligence, IoT, robotics, 3D printing and nanotechnologies (Macpherson, Werner, & Mey, 2022). In connection with this information, Industry 4.0 essentially refers to the gradual digitisation of all value chains and as a result of these developments, people, objects and systems are connected to each other through a real-time data exchange. As a result of this connection, products, machines and processes are equipped with artificial intelligence and have the opportunity to adapt to changes in the environment without being dependent on any structure. In addition, with the integration of smart objects into wider systems, it becomes easier to create production systems that are more flexible and can develop self-control mechanisms (Hecklau, Galeitzke, Flachs, & Kohl, 2016).

Impact of Industry 4.0 on Talent Management Processes

While the development of Industry 4.0 has led to the emergence of a digital age, businesses trying to fulfil the requirements of this age are looking for resources suitable for the digital age in order to gain sustainable competitive advantage, and their basic theories are talent-oriented. For this reason, businesses are implementing talent-oriented practices (Saadatmand, Safaie, & Dastjerdi, 2022). Talent is the sum of all the abilities of an individual, including competences, commitment and contribution or internal capabilities, skills, knowledge, experience, intelligence, judgement, attitude, character and impulses focused on learning and development. One of the most important resources for an organisation to achieve sustainable competitive advantage is the capabilities of its employees (Lin & Wang, 2022).

Talent management process is a human resources approach that includes practices for the recruitment, engagement and development of employees who can contribute to the growth of businesses. Talent

management ensures that the right human resources are positioned in the right organisational functions (Saadatmand, Safaie, & Dastjerdi, 2022). Talent management is associated with a series of interrelated activities to ensure that the right people are in the right position at the right time. Talent management can be defined as the cornerstone of any business and it is vital to manage talent effectively in order to become more competitive and maintain this competitive level in the industry 4.0 process (Macpherson, Werner, & Mey, 2022). Talent management is a management style that focuses on game-changing talents. New technologies and the emergence of new roles and the lack of sufficient talent to fill these areas arise at this point (Whysall, Owtram, & Brittain, 2019). In this respect, talent management is an integrated approach to attract, develop and retain employees with a high level of potential by anticipating the challenges posed by the ever-changing labour market. Following the development of Industry 4.0, human resource management has shifted from traditional methods to talent management, which is more suitable for the ever-changing business environment (Macpherson, Werner, & Mey, 2022). While the traditional practice of talent management is to fill a resource gap that occurs within the organisation by drawing from competitors, after the development of Industry 4.0, horizontal recruitment practices have not been sufficient to meet the needs and the importance of talent management has once again emerged. For this reason, the requirements of Industry 4.0 should be met with a more holistic and comprehensive talent management practice. At this point, the most important function can be expressed as identifying key talents (Whysall, Owtram, & Brittain, 2019). However, the responsibility of identifying key talents is not only the responsibility of the human resources management unit, but also the responsibility of key people including leaders, department managers and mentors operating in the organisation (Macpherson, Werner, & Mey, 2022).

Industry 4.0 has led to significant changes in both the labour market and human resource-oriented activities. In Industry 4.0, the characteristics of work have become digitalised, flexible and globalised (Lin & Wang, 2022). This new perspective brought by Industry 4.0 requires the development of new digital skills that will change the way people work and where they work (Santoso, Sitorus, Batunanggar, Krisanti, & Alamsyah, 2021). At this point, the critical skills of the labour force in the industry 4.0 process can be listed as follows (Al Amiri & Abu Shawali, 2021);

1. Being prepared for uncertainties with the development of new leadership skills and explaining the risks and uncertainties encountered to the workforce, ensuring the integration of analytical thinking with human resource management skills by combining operational management with technology,
2. Manage the integration of technology into the workforce,
3. Improving the employee experience,
4. Creating an agile and personalised organisational culture,
5. To develop new measurement methods focussing on human capital,
6. Realising diversity and inclusion

With the impact of the change and transformation process created by Industry 4.0 on the business world, human resources management and talent management processes have been significantly affected as well as all business functions. The change effects of Industry 4.0 on talent management can be analysed under four different headings. These are;

Digital Talent Acquisition and Development: The innovations brought by digitalisation and the effects of the industry 4.0 process have forced businesses to make updates in terms of needs such as knowledge, skills and abilities. At this point, businesses turn to employees with digital talent (Gilch & Sieweke, 2021). Applications

such as big data, artificial intelligence and machine learning, which are available to businesses in the Industry 4.0 process, have made it easier to identify talent anywhere in the world. This development has further increased the importance of digital talent management (Stander, Rothmann, Popov, & Sun, 2022). From a general point of view, digital talent can be defined as an individual who has various digital abilities, competencies and skills, either innate or acquired later, and who works productively and is responsible for their work. Businesses have to compete in order to have digital talents (Khaira, Triyonggo, & Sukmawati, 2023). Organisations have the opportunity to gain significant competitive advantage through digital talent management practices and the development of these capabilities. Bughin et al. (2018) emphasise that the full use of digital talent management tools has increased the company's profit margins by an average of 350 basis points and that this figure can be further increased in industries based on high-skilled, high-salaried talent.

Flexible Workforce Management: Workforce flexibility is an organisational flexibility obtained from the practices within the scope of human resources management. Practices such as overtime, flexible working times, teamwork or outsourcing of employees, which are provided by labour flexibility, support the enterprise to achieve a more flexible structure. A business with labour flexibility can be faster and more agile, while being more competitive and more stable in uncertain labour markets (Avcı, Şahin, & Terzioğlu, 2020). Practices related to the flexibility of the workforce contribute to the survival of the business in uncertain environments. With flexible workforce management, gains such as gaining competitive advantage, ensuring business sustainability, adapting to changing environments and increasing the ability to respond to consumer needs are achieved. With a flexible workforce management, businesses can adapt to environmental changes quickly and effectively and play an important key role in ensuring sustainable competitive advantage (Sabuhari, Sudiro, Irawanto, & Rahayu, 2020). In this respect, the flexibility of human resources can be useful in achieving significant gains in the process of adapting to new developments, practices and changes brought by Industry 4.0.

Data-Driven Talent Planning: Big data, which constitutes one of the important points of Industry 4.0, has revealed innovative practices and communication strategies in human resources management. Thanks to big data, human resources analytics are created and a system where employees can be more closely recognised and evaluated can be created. With data-based methods, candidate selection, employee mood, emotion analysis and attrition predictions can be made easily. Data-based talent planning in human resources management plays an important role in solving internal communication problems, increasing the speed of workflow and improving information sharing among employees. By creating more transparent plans with data-driven applications that use big data, more information about employees' skills, attitudes, weaknesses and future performances can be accessed (Conte & Siano, 2023).

Workforce Automation and Artificial Intelligence: Artificial intelligence and automation applications, which are among the important applications in the Industry 4.0 process and contribute to the enterprise to gain various advantages, allow the workforce to be subjected to a digital evaluation. With digital talent management applications, employee evaluation applications can become faster and more practical and accurate and clear results can be obtained. With artificial intelligence applications, individuals in the enterprise can be coded and categorised based on skills and abilities. At the same time, automatic digitalisation of employee criteria is also provided. In this way, data such as required qualifications, personal characteristics, technical and professional knowledge and experience characteristics can be used and talent can be redefined in this way (Wiblen & Marler, 2021). Considering that the main goal of Industry 4.0 is to create an interconnected structure with big data, the selection of the most qualified personnel for the business in the business environment will make significant contributions to the sustainable competitive advantage of the business. With artificial intelligence applications, efficient and more accurate choices can be made with much better relationships between businesses and job applicants. Thanks to Industry 4.0 applications, employees with the knowledge, skills and abilities appropriate

to the strategy of the enterprise can be identified faster, with less cost and better process management (Samarasinghe & Medis, 2020).

With a general evaluation, it can be said that talent management is the basic building block of any organisation. This basic building block plays an important role in the competitiveness of the business with the effect of industry 4.0. With the coordination of Industry 4.0 and talent management, businesses can access talents suitable for their strategies and manage talents more easily. In order to find suitable talents for business environments that are in constant change with Industry 4.0, talent management practices in the focus of Industry 4.0 can contribute to the development of businesses (Macpherson, Werner, & Mey, 2022).

Literature Review

When the literature on Industry 4.0 and talent management is examined, it is determined that the points for the adaptation of human resources management practices to technological developments within the scope of Industry 4.0 are emphasised, especially considering the recent developments. In this context, information on previously published studies on this subject is shared in the rest of the study.

Heklau et al. (2016) prepared a study to examine human resources management for enterprises in the industry 4.0 period with a holistic perspective. Emphasising that Industry 4.0, digitalisation and automation have transformed production processes, the study states that technology management and leadership styles should be taken into consideration in addition to factors such as workforce planning, talent development and collaborative work culture. The study also emphasises the importance of continuous training and talent development strategies for the workforce to adapt to changing skill sets, and points out that realising human-technology optimisation and ensuring occupational safety is a strategic necessity. In conclusion, a suggestion is made that in order for businesses to be successful in the Industry 4.0 era, they should act with a holistic perspective instead of traditional human resources management approaches.

In their study, Whysall et al. (2019) aimed to examine the effects of the radical changes brought about by Industry 4.0 in business environments on strategic human resource management. For this purpose, in-depth interviews were conducted with HR managers and senior leaders in engineering leadership organisations. The findings suggest that the pace of technological change in Industry 4.0 has created a significant gap between the existing capabilities of employees and the rapidly evolving requirements of their roles, and that new and more effective talent development approaches need to be considered. In particular, the study emphasises that while recognising that different talent management practices are interrelated and interdependent, the influence of forces in broader talent systems should not be ignored. As a result, theory and practice need to be developed to understand the impact of industry 4.0 on contemporary talent management practices and to help individuals and organisations adapt to this change.

The study prepared by Anshari et al. (2021) examines the effects of industry 4.0 on unemployment and aims to identify future talent management practices. In the study, four main characteristics of business environments are evaluated using talent mapping. Through Education 4.0, it is emphasised that the perspectives of educators should be utilised to develop the skills required for industry 4.0. It is emphasised that technology has strengths and weaknesses in the talent development process and it is stated that education 4.0 should pursue new opportunities by combining labour and machines. The model proposed within the scope of the study is expected to provide a transformation involving learning by creating a new plan for industry 4.0 and to contribute to the development of talents and skills in the industry 4.0 period with the intensive use of online learning.

In the study conducted by Sivarethinamohan et al. (2021) on the development of Industry 5.0, the accelerating effect of the COVID-19 pandemic on the transition from industry 4.0 to industry 5.0 was mentioned. The study emphasised that the change requires companies and HR leaders to develop new strategies in areas such as

workforce organisation, recruitment, development and performance management. The study reveals that factors such as employer brand, organisational culture and talent competition come together to form an effective talent management strategy. The study also emphasises that specific talent strategies for IT professionals are important for shaping the future workforce and help companies create a comprehensive talent management strategy. The study concludes that digitalisation and technology will encourage new ways of working while driving workplace strategies in the future and support the transformation of indispensable talent for organisations.

The study by Macpherson et al. (2022) investigates the technological and operational changes of Industry 4.0 in the South African automotive industry and the effects of these changes on human resource management. The research aims to identify emerging job categories and the competencies associated with these categories. The findings emphasise that despite the increasing automation in operational processes in the automotive industry's process of adapting to Industry 4.0, it faces challenges related to human resources and the necessity of hybrid competency sets for new job categories. Accordingly, employees' skills need to be continuously realigned and talent management strategies need to be restructured. The results of this study underline the need for the automotive industry to fully embrace Industry 4.0 technologies and the importance of attracting, developing and retaining talented employees through a collaborative approach.

Saadatmand et al. (2022) examines the impact of digital transformation on talent management processes and the impact of digitised process management on organisational performance. Based on a sample of managers and experts working in the Iranian mobile telecommunications industry, the data were obtained through a quantitative approach. The findings suggest that talent management through digitalised process management can improve organisational performance. This study highlights the importance of digitalising talent management processes for companies to succeed and gain competitive advantage in the era of digitalisation. It can also improve the competitiveness of companies in the sector by providing information about the future of this process in the mobile telecommunications industry.

Furthermore, study by Conte and Siano (2023) is to examine the impact of Industry 4.0 on HR and talent management processes. An exploratory web research conducted through literature analysis and a structured questionnaire was used. The findings show limited use of Industry 4.0 technologies and big data analytics in HR and labour market relations. Challenges such as sectoral differences in the adoption of Industry 4.0 technologies in organisations in Italy and short-term perspective and lack of skills hindering the development of HR analytics were identified. The limitations of the research are a single country sample and an exploratory research design. However, the study provides strategic insights for the adoption of big data analytics for internal and recruitment communications. In conclusion, the study is a valuable resource for digital communication managers and can provide insights for other organisations in Europe.

Montero Guerra and Danvila-Del Valle (2024) also examined how organisational changes such as new organisational culture, new leadership and new business models brought about by digital transformation affect talent management, which is seen as one of the biggest challenges faced by companies in the digital transformation process. Using a quantitative methodology, 314 companies were surveyed and the results of talent management in the digital transformation process were analysed. The study shows that digital transformation is not just about digitalisation and that talent management is a key element that facilitates or hinders the achievement of high levels of digital maturity. The findings show that digital transformation affects talent attraction, talent retention and talent management in general and that digital transformation does not depend on digitalisation, but instead talent management plays a critical role in achieving digital maturity. The originality of this study lies in examining the impact of the changes brought about by digital transformation on talent management.

Methodology and Sample of the Study

The sample of the study was determined using purposive sampling method. Purposive sampling, which is a qualitative research method, is a sampling method in which researchers select a sample for a specific purpose or goal. Researchers select participants or units that will provide the best answers to the purpose of the research and the research questions. This method is used to ensure that the sample has a certain quality or characteristic. Purposive sampling can sometimes be used in combination with other sampling techniques. For example, a researcher may first select a random sample and then purposively select participants from this sample according to certain criteria (Patton, 2015).

In order for the Industry 4.0 concept to be a new concept and for the study to be an example for other enterprises, 10 different enterprises that carry out industrial activities in Turkey and declare that they have done the necessary work in the field of industry 4.0 were contacted. However, only 4 of these 10 enterprises agreed to participate in the research. The data of the research were obtained by face-to-face interviews and online semi-structured interviews by taking notes by the researcher. Semi-structured interview method was used as the interview method. Thus, the possibility that the employee could reflect his/her personal views was also taken into consideration.

Each of the 4 enterprises within the scope of the research was visited separately (Enterprise A, Enterprise B, Enterprise C and Enterprise D) and all processes of the enterprises were examined on-site. In addition, the existing industry 4.0 investments, technological investments and inter-departmental relations of the enterprises were also observed and examined on-site. The issues created as a result of the researches, including the analyses of the current positions of the enterprises, were sent to the participants again and the final version of the data analyses obtained from the research was finalised with the feedback received. In this way, both misunderstandings were prevented and information about the issues that the participants forgot to convey during the interview was also obtained.

In this context, a total of five people from four enterprises who wanted to participate in the research were interviewed. All information such as the titles of the employees responsible for the Industry 4.0 process or human resources management, how many years they have been working in the enterprise, where and how long the interview was conducted are shown in Table 1.

Table 1. Participants of the Study

Business	Person Interviewed	Duration of Employment in the Research Organisation	Location of the interview	Duration of Interview	Business Sector Researched
A	Factory Manager	15 Years	In the Fabric	2 hours and 30 minutes	Cement
B	HR Manager	11 Years	Online	1 hour and 15 minutes	Tyre Manufacturing
C	HR Manager	16 Years	Online	1 hour and 30 minutes	Ready-to-Wear Clothing
D	HR Manager	15 Years	Online	1 hour and 30 minutes	Transport Vehicles

Results

Talent Management in Businesses

Enterprise A uses industry 4.0 processes in most areas, including human resources management over time. However, there is no intensive technology and digitalisation until the packaging stage of the product, especially after the raw material is taken to the production line. The main reason for this is that the product produced does not require a technology-intensive process. On the other hand, in human resources systems, starting from the stage of finding employees; components of industry 4.0 processes are used in most human resources systems such as career planning, training and development, performance evaluation.

The company aims to increase its annual production amount by 35-40% in the next 2-3 years. In line with this strategic goal, the company aims to increase the number of employees in addition to automation and production capacity increase, and thinks that only in this way can the demands be met. Considering that manpower is more effective in baking, warehousing and shipment stages, the enterprise attaches importance to labour power, but also attaches importance to advanced technology. Therefore, the enterprise prepares training programmes such as productivity improvement and technological innovations for its employees.

The human resources specialist and the factory manager who have been working in the enterprise for a long time stated that the skills and competences have changed a lot in the industry 4.0 process. They emphasised that while muscle power was effective in most of the processes in the cement sector, especially until 10 years ago, different skills have gained importance today. In particular, it was mentioned that industry 4.0 components such as software, hardware, cyber security, transformation of big data into information are extremely important. It has been emphasised that the importance of the skills of all employees acquired to the enterprise in order to increase market share and gain competitive advantage by integrating these components into organisational processes is an undeniable fact. In particular, it is important to reveal and develop the existing talents of white-collar employees for the continuity of the organisation.

Enterprise A bases the continuous employment of talented employees in the organisation on a mutual win-win strategy. Enterprise A, which is already preferred by talented people because it is a pioneer in its sector, is located within the borders of Ankara instead of being located in a province where economic conditions are difficult such as Istanbul or holiday regions. In addition, it is stated that the social life opportunities (shopping, concerts, theatre, etc.) of Ankara province are more than the Central Anatolian provinces, which is effective in keeping talented employees in the enterprise.

It cannot be said that skilled labourers work in Enterprise A due to financial opportunities and do not want to transfer to another enterprise. Because employer and employee unions are active in almost all enterprises operating in the sector and producing cement. This limits the lower and upper limits of wage systems. In other words, even if a talented labourer wants to transfer to another cement factory, he/she can receive 5-10% more than the monthly earnings he/she receives from Enterprise A.

While determining the talented employees of Enterprise A, it is important to observe the employee, his/her willingness to improve himself/herself, communication skills, performance, work discipline, follow-up of his/her work, and the innovations that these employees provide to the enterprise. According to Enterprise A, which is ahead of the other employees in all these aspects, privileges such as extra wages, leave, lodging rights or education opportunities from Koç and Boğaziçi Universities are provided to ensure the continuity of the talented employee in the organisation or to increase his/her career in the axis of career planning and for the full development of his/her skills. However, while making all these improvements for talented employees, care is taken not to disturb the internal balance.

Enterprise B primarily thinks that Industry 4.0 has challenging effects as well as positive effects on labour dynamics, and that the need for people has started to decrease with the development of technology. On the other hand, it was stated that digital transformation has made contributions especially in terms of faster and more systematic management of recruitment and selection processes. Since the end-to-end digitalisation of recruitment processes within the enterprise is an important issue in terms of time and cost both on the company side and on the candidate side, the enterprise that includes digitalisation in its processes has gained the advantage of focusing on strategic rather than operational tasks.

At the stage of finding and selecting the employees who are considered to be talented, the company attaches importance to digitalisation and uses career portals such as linkedin and kariyer.net. Apart from social platforms, the company also receives consultancy support according to the position and the position to be selected. Here, the candidate's ability as well as his/her adaptation to the organisational culture is also important for the business. In order to select talented employees, structured interviews are applied to the candidate by experts. According to the requirements of the inventory and the position, the candidate is subjected to a foreign language test. Finally, a reference check is carried out and if the candidate is found suitable, the company makes a job offer to the candidate.

Enterprise B emphasised that 3 skills will be more important than other skills in the future in the long term strategies on the axis of industry 4.0. These 3 skills are "digital rationality and citizenship, software use and development, understanding digital systems". In order to attract these talents, the company has preferred to move to a more agile organisational structure by creating development plans and stretching hierarchical structures. It has also provided opportunities for new working models. In all these processes, it uses international software such as SAP ERP (Systems, Applications, and Products in Data Processing - Enterprise Resource Planning) and Oracle for the execution of different functions of human resources.

With regard to talent management, Enterprise B stated that it is difficult to find talented employees, but it is more difficult to keep talent within the organisation. Since the need for human labour is gradually decreasing with the rapid changes in technology, human resources management thinks that the labour force will start to be employed in different fields. In this respect, people who want to work in different sectors and new business areas are expected to have a higher level of education and new skills. This will also bring with it the need to renew the qualifications of the labour force. According to human resources management; firstly, individuals who have lost their jobs due to technological transformation should participate in new training programmes in order to acquire these skills; after the trainings, it is necessary to give importance to in-organisational trainings that will enable employees to continuously acquire new skills. Human resources management stated that another important method of keeping talents within the organisation is to make more accurate data analyses with the help of artificial intelligence.

Data analysis applications are also considered important for the increase in remote and hybrid working models, especially with the pandemic process, and for the identification and development of talented employees who attach importance to work-private life balance. According to human resources management; digitalisation of all human resources processes not only helps in identifying talented employees but also helps in time management. While teleworking models provide benefits in terms of ensuring the balance between private life and work life, it has also caused some problems for companies in terms of transferring the company culture to new employees. Enterprise B has had to develop different methods for organisation employees to come together and socialise together.

Enterprise C is an enterprise that uses Industry 4.0 in every possible area. Industry 4.0 is used effectively in human resources. The reduction of 1 step from the hierarchical steps from the employee level of the enterprise

to the general manager level actually shows us a new structuring in the industry 4.0 process. Reducing the decision-making process with digital software once again shows the importance of time in today's businesses.

In addition to in-depth specialisation in the industry 4.0 process, the enterprise needs skilled employees in other subjects. It has been stated that the producer should make a very good production but should be able to use new technologies effectively as well as production. These two factors actually complement each other in today's industry 4.0 enterprises. During the industry 4.0 process in the enterprise, there have been increases in the qualifications of the jobs in terms of human resources. For example, while in the past, personnel record books were kept manually, today the enterprise provides training with augmented reality (VR) glasses. In other words, skills have always existed since the day the business started its operations. However, with Industry 4.0, the skills have been updated and transformed into suitable for today's conditions. In addition to digital trainings and online learning methods replacing the face-to-face trainings of human resources in the past, issues such as big data analysis, design, innovation and creativity have been given great importance in the field of human resources.

The human resources manager of the enterprise stated that it is difficult to identify talented people today and to ensure their continuity within the enterprise. The main reason for this is the expectations of talented people. Considering that the primary reason why people work is to earn a salary, talented people may demand high salaries in terms of the added value they provide to the enterprises. However, giving high salaries by acting privileged from other employees may harm organisational integrity. This may be a reason for talented employees whose talents have not yet come to light to leave the organisation. With this perception, the company evaluates all its employees as talented and applies continuous trainings for the emergence and development of talents. While these trainings contribute to the individual development of the employees; at the same time, they create a positive effect on the whole organisation.

In addition to the trainings, middle and top managers coach other employees and transfer their experiences to them. This coaching system also enables talented employees to participate in the management of the organisation. In addition, as a result of mutual exchange of ideas, career plans of talented employees can be determined by human resources management. One of the most important factors in talent management in the company where flexible career plans are applied is to identify the talents correctly and it is aimed that the employee should not only focus on a higher position, but also to see other higher tasks suitable for him.

The company offers additional opportunities such as leave and holiday opportunities and foreign travel opportunities to talented employees with high performance in order to establish a balance between work and personal life. While these additional opportunities contribute positively to the motivation of the employees; celebrating successes, ensuring open communication within the organisation, giving importance to employee health and welfare are other motivational sources for talented employees to stay in the organisation.

Business D; As the enterprise has managed to use the Industry 4.0 process mostly in every field, it has accelerated the decision-making processes as well as saving time by using the Industry 4.0 process in the decision-making process. In human resources systems, it uses the Industry 4.0 process effectively starting from the stage of finding and selecting employees.

The company initially experienced difficulties in the digitalisation of processes and intensive use of automation systems. The main reason for these difficulties is that especially x and y generation employees are not as familiar with digitalisation as z generation. In order to eliminate this deficiency, the enterprise has organised trainings for all employees with new training modules such as digitalisation, digital literacy and technology today. The human resources management, which has a solid infrastructure in the enterprise, considers all employees in the enterprise as talented employees and argues that the important thing is to bring talents to light. Therefore, it does not want to lose any labourer. One of the main reasons for this is that it spends a lot of effort for both

training and individual development of all employees from the orientation process they started to work until today.

Although the human resources management considers all employees as skilled employees, it has stated that there are employees who make them feel that they are different from each other. Although human resources processes within the enterprise are managed through digital platforms, human resources managers themselves identify employees who have different working principles from other employees such as work discipline, communication skills, self-management skills. Instead of sitting at a desk, these managers try to get to know the employees better and discover them by visiting them at work, during break times and even during the day. In this way, they listen to what they expect from the organisation, what they need for high performance, what they need to increase their skills and competencies from the employee and the first manager of the employee. This method shows us that the company is sensitive to the needs of the employees. In the next stage; they reveal the talents of the employee with the help of software systems used in human resources.

The company carries out experience enhancement activities to increase the satisfaction and loyalty of the employees by focusing on improving their individual and work experience. It is evaluated that elements such as modern working tools, ergonomic working environments, opportunities to provide work-life balance contribute positively to the employee experience. In addition, the company receives suggestions such as projects, campaigns and social responsibility activities from employees via digital platforms and face-to-face at certain intervals. If there is a project or social responsibility work that will be welcomed by the senior management, the employee who makes a proposal is included in the project/responsibility working team and ensures that the project/campaign he/she proposes is implemented. It is thought that this method increases the motivation and organisational commitment of the employee.

Despite all these positive approaches of the organisation, if the talented person wants to leave the organisation, the organisation starts to investigate the reasons for this. According to human resources, the reasons for this are generally family reasons, the obligation to be close to the parents and to take care of them, low wages or the availability of a better paid job. Counter-offers are made to the employee whose problem is detected; if he/she needs to take care of his/her family, additional leave is given if he/she needs to be with them. In terms of salary, improvements can be made to a degree that will not shake the balance within the organisation or career opportunities can be offered. However, if the employee still does not accept all these improvements, then the company tries to get open sincere feedback from the employee in question. The aim here is to take additional measures before it turns into a crisis if there is an element that negatively affects the organisational climate.

Table 2. Practices for Talented People in Research Organisations

BUSINESS Practices for the continuity of talented people within the organisation	
A	<ul style="list-style-type: none"> • High brand value. • Location selection of the business. • Due to unionisation in the sector, there are upper and lower limits for monthly earnings in other competing enterprises in the same sector. • Wage increase, • Additional leave entitlement, • Career opportunities, • Training and Development Opportunities, • Overseas Travel Opportunity, • Increasing Other Fringe Benefits

B	<ul style="list-style-type: none"> • Selecting the right employee with SAP ERP software. • Analysing the data on talent correctly. • Increasing social activities within the organisation. • Cooperation and teamwork. • Continuous training practices to increase employee skills and to acquire new skills. • Technological infrastructure and tools.
C	<ul style="list-style-type: none"> • Continuous training for the emergence and development of talents. • Coaching of talented managers by middle and top managers. • Ensuring the participation of talented employees in business management. • Flexible career planning, • Additional opportunities such as leave and holiday opportunities, foreign travel opportunities are provided. • Celebrating achievements, ensuring open communication within the organisation and giving importance to employee health and welfare.
D	<ul style="list-style-type: none"> • Developing personal and work experience, • Providing modern working tools and ergonomic working environments, • Opportunities to achieve work-life balance, • To be sensitive to the needs of employees • Providing opportunities for participation in social responsibility projects, • Career opportunities, • Additional leave and wage increase at a rate that does not shake the internal balance,

When Table 2 is examined, today's industry 4.0 organisations are trying to adapt to the rapidly changing world much more easily. It is vitally important to adapt to the ever-changing production systems as soon as possible in order for the organisation not to fall behind in the competition. In addition to adaptation, another important issue in this competitive environment is the recruitment and continuity of talented employees. While organisations generally exhibit special approaches towards talented employees, they also attach importance to the continuity of talents.

Discussion

The research conducted across leading enterprises in the cement, tyre manufacturing, ready-to-wear clothing, and transportation vehicle manufacturing sectors highlights the varied yet interlinked nature of the Industry 4.0 process. Despite the differences in innovative areas within each sector, digital transformation remains a common thread, where mechanical objects are increasingly interconnected via sensors, driving efficiency and productivity.

“Enterprise A” in the cement sector attributes its high brand value as a primary factor in attracting talented employees. Additionally, its location in a district of Ankara offers economic advantages such as lower rent and transportation costs compared to larger cities like Istanbul, benefiting both the business and its employees. The presence of trade unions within the enterprise is positively perceived, although wage increases due to union activities are constrained. To maintain balance and appeal to talented workers, the company offers additional leave, career opportunities, and continuous education.

“Enterprise B” leverages digital tools like SAP-ERP to monitor and enhance employee skills, emphasizing the retention and continuous development of talented employees. The company fosters intra-organizational cooperation and teamwork through regular training practices aimed at skill enhancement and acquisition.

“Enterprise C” focuses on continuous training for all employees to uncover and develop their talents. It values leadership in talent management, encouraging talented employees to participate in management and career planning. Additionally, the company prioritizes organizational unity, communication, employee health, and welfare, alongside providing fringe benefits that do not disrupt internal balance.

“Enterprise D” aligns with the other enterprises by emphasizing training to improve individual and work experience. The company offers modern, ergonomic working environments and encourages participation in social responsibility projects, highlighting the importance of leadership and collaborative work environments. Fringe benefits for talented employees are provided in a balanced manner similar to the other enterprises.

Common practices across these enterprises include offering fringe benefits, developing talents through continuous training, and fostering collaborative practices and social responsibility activities. These findings align with the results of Heklau et al. (2016) and Anshari et al. (2021), emphasizing the significance of continuous training and talent development strategies in talent management. Additionally, the focus on leadership in talent management, particularly in Enterprise C, corroborates the findings of Sivarethinamohan et al. (2021), which underscore the importance of leaders in workforce organization, recruitment, development, performance management, and talent management. Moreover, the encouragement of social responsibility activities, teamwork, and improved communication within the organization, as observed in the study, parallels the research by Conte and Siano (2023) on the impact of Industry 4.0 on human resources and talent management processes.

Conclusion

The study predicts that Industry 4.0 will bring about radical changes in business life and the workforce. The practices identified for ensuring the continuity of talented employees within organizations contribute to the existing literature by highlighting the impact of Industry 4.0 on human resources management and raising awareness.

For researchers and practitioners aiming to implement Industry 4.0 processes and talent management practices in Turkey, establishing sector-based standards and developing models can serve as valuable reference points. Further sector-based research on talent management and its association with Industry 4.0 processes can provide deeper insights into talent development and the future of talented employees. Additionally, examining the Industry 4.0 process across other organizational departments can reveal the changes and transformations in talents driven by this technological revolution. By addressing these areas, organizations can better navigate the Industry 4.0 landscape, ensuring that they remain competitive and capable of attracting and retaining talented employees in an increasingly digital and interconnected world.

This study's limitations include its focus on a specific set of leading enterprises in Turkey, which may not fully represent the broader industry spectrum. Additionally, the research primarily considers the perspectives of managers, potentially overlooking insights from other employee levels. Future research should expand to include a more diverse range of industries and employee perspectives to enhance the generalizability of the findings. Furthermore, developing sector-specific standards and models for talent management within the Industry 4.0 framework could provide valuable benchmarks for organizations. Increased sector-based research on the intersection of talent management and Industry 4.0 processes, alongside investigations into how these processes affect various organizational departments, will contribute to a more comprehensive understanding and implementation of effective talent management strategies in the digital age.

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflict of interest.

Data Availability Statement: The data that support the findings of this study are available from the corresponding author, [SA], upon reasonable request.

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