

## Impact of Industry 4.0 in Human Resource Management

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**ABSTRACT:** The opportunity of the internet in terms of eliminating the distance and the ability to instantly transfer large data influence many areas of life, and deeply affect industrial production and processes. High-tech manufacturing operations feel these changes earlier. It is inevitable for the enterprises operating with traditional technologies to be exposed to this effect in parallel with the change of environmental structure. In this study, the concept of Industry 4.0 is considered as a concept and secondly how human resources managers perceive this process from the viewpoint of human resources management of the four advanced technology companies operating in the Bursa region is investigated. An in-depth interview method was used to gather information in the study. As a result of the research, the expectation is that the Industrial 4.0 transformation of the industry will deeply affect human resources management processes due to its business environment. At each stage, it is foreseen that technology-integrated business processes will cause some of the unskilled employees to lose their jobs, while the higher qualified employees will be needed more, but it will be difficult to find these employees and keep them at work.

**KEYWORDS:** impact, industry, 4.0, human, management, resource, production, employees, business.

### Introduction

Given the rapidly changing nature of business, it is necessary to accept the fact of the need to adopt and introduce changes in the organization. Change management is becoming an essential part of the human resources as organizations need to keep up with the new, emerging era of industrial digitization. Industry era 4.0 becomes an era of robotization. In the area of human resources, it assumes the unification and automation of the processes of data collection, information analysis, evaluation, education, performance improvement and decision making. Industry 4.0 creates a number of new opportunities for organizations in the personnel field. It has an overall impact on human resource development, labor productivity growth, opportunities for creating new industries, shifting different tasks from man to machines and robots. These are tasks: routine, repetitive, dangerous or health-threatening. The combination of human potential and computer algorithms opens the way for the emergence of new industries of the future. The general transformation of the global world creates new opportunities for many countries. For example, the role of some of the constraints on the labor market, such as geographical location, underdevelopment and other similar activities, is declining.[1,2] In relation to the current need to apply changes in organizations, the article focuses on the process of implementing changes from the perspective of employees. It monitors how people perceive the change process in an organization, how communication and overall satisfaction with the outcome of changes take

place. The concept of HR 4.0 is closely linked to the so-called Industry 4.0, or to the fourth major industrial revolution.

If Industry 4.0 represents a major transformation in the way companies approach manufacturing, it is also true that this move has reduced human resource requirements, especially through automation. Similarly, the exchange of data between different systems has dramatically increased efficiency and decision-making processes related to people management.

Although the world will see even greater changes in the coming years, much of the technology needed is already in place to replace much of the current HR-related activities.

Therefore, we can say that HR 4.0 is a revolution in the area of Human Resources. In it, HR becomes more automated, focusing its activities on strategic issues and no longer on manual, bureaucratic and repetitive actions.[3,4]

This movement is seen both in the creation of tools by the IT industry and in the new demands of the government with respect to labor relations. The emergence of obligations such as eSocial, for example, has pushed HR departments to push technology into routines that were rarely done with paper documents in practice, it means that, unlike traditional HR – where the main functions of the professionals were to pay for salaries, control of work hours and basically manual and bureaucratic activities – HR 4.0 is focused on fronts such as attracting qualified talents, improved organizational climate, and other approaches that directly contribute to the company's strategic results.

HR 4.0 is essentially permeated by technology and is in line with new labor market scenarios – with special influence from the Millennial Generation, which now reaches leading positions in organizations, and the others that have followed.

In HR 4.0 there is the understanding that professionals today have other needs, and many of them receive job offers from other businesses much more frequently than they did 10 years ago. Therefore, it is necessary to work for the best experience, making the work environment more attractive, less dull – for generations that were born immersed in technology, it is extremely important that it is present in their day to day work.

With the traditional personal department leaning toward strategic people management, companies have already realized that their main asset is people. They also understood that the technology developed by them – or acquired from third parties quite easily and at reasonable prices – allows automating bureaucratic activities.

Another point of inflection, which differentiates traditional HR from 4.0 HR, is the so-called digital transformation. Companies are now more inclined to adopt online tools, methods and services, and that trend is already reaching HR departments.[5,6]

Innovative virtual solutions and resources assist in the operations of people management, automating manual processes and optimizing strategic tasks. From the search for talent to performance management, among others, bureaucratic processes are carried out with the minimum of human intervention, which gives HR 4.0 accustomed professionals more time for a more analytical, less operational performance.

Solutions focused on the area of HR keep on appearing. These are recruitment software, employee development test platforms, satisfaction survey applications (E-NPS), internal communication tools, general management systems. And these tools are anchored by innovative technologies like Cloud Computing, Big Data, Internet of Things and even Artificial Intelligence.[7,8]

And there are many benefits of HR 4.0 for the HR departments and for the business itself.

Among these positive impacts, the following stand out:

1. process optimization;
2. error reduction and manual work;
3. reduction of costs with labor and with materials (paper, computers, etc.);
4. ease for the decision-making of managers and analysts;
5. expansion of strategic power in people management;
6. more likely to attract and retain the best talent on the market;
7. ease for HR to contribute to increased productivity;
8. possibilities of innovation in the area, etc.

One advantage that deserves to be highlighted and detailed is linked to the collaborative work of HR.

In the not-so-distant past, all HR tasks within an organization were performed by in-house teams or by 100% dedicated third parties. Industry 4.0 is now delivering technologies that include virtually every business department in processes such as recruitment and selection, performance management, benefits administration, and so on.

In HR 4.0, leaders from all walks of the hierarchy participate in the day-to-day management of people; they have tools and methods that help them collaborate with HR by inserting good practices and intelligent routines into the organizational culture. And this is quite positive, because it makes the motto of having people as priority stop being just a speech and is even more easily perceived by the employees.[9,10]

## Discussion

If marketing, sales and manufacturing are already in full digital transformation, it is also important that HR enters this new business model.

Begin by finding out the processes that are still done manually; and to reflect on how it would be possible to save time, reduce costs and optimize results with the structuring of technological tools and methods. With cloud computing democratizing technology, you no longer need to invest a lot of money in IT infrastructure. Virtually everything a HR needs in terms of technologies (software, servers, etc.) can be virtually acquired and used.

Digital technology makes investments cheaper, gives more mobility to area professionals (who can work from anywhere, at any time and using any connected device), is easy to implement and maintain, among other advantages.[11,12]

It is also crucial to help HR professionals enter this new world. You have to create the HR 4.0 mentality in them. Without this, they will be reluctant to innovate, have difficulty adapting and may even boycott initiatives.

Start by showing them the new trends in the area; if necessary, encourage the implementation of refresher courses, promote participation in lectures and events, etc. By understanding what the company's new leaning is, the area professionals themselves will come up with hints for RH 4.0 to really be implemented.

This is the face of the 4th Industrial Revolution which has been taking place since the start of the 21st century. Its transformational power comes from marrying advanced production and operations techniques with digital technologies to create connected enterprises that use data to drive intelligent actions in the physical world.

“It’s the biggest structural change of the past 250 years — a transformation of scale, scope and complexity unlike anything humankind has experienced before,”

Smart and connected technologies are being embedded in organizations, assets and even people in the case of wearable devices, taking advantage of emerging capabilities from robotics and artificial intelligence (AI) to quantum computing, additive manufacturing and the Internet of Things (IoT). Yet for companies that want to capture the true potential of Industry 4.0, technology is the means, not the end[13,14]

“All those technologies ultimately have one purpose only,” he says, “and that’s to create value.”

Combining the digital, physical and virtual worlds creates unparalleled opportunities for growth and productivity while reframing the competitive landscape with smart products and new service models. Production systems stand to become as much as 35% faster and 30% more efficient through Industry 4.0 capabilities, enabling “mass customization” — the ability to create tailored products at high speed and on a scale never before possible.

In other words, the benefits of Industry 4.0 is multidirectional, extending out to the end customer as well as deeply into manufacturing operations and across the value chain.

“It’s about creating the next generation of operational excellence,” [15,16] “with smart automation, connectivity and operational alignment, transforming the design, manufacturing and servicing of products and productions systems. What will come out of all of this are connected ecosystems. We’re seeing that already. And companies that take advantage of them will gain a competitive edge.”

Related to his first precept that Industry 4.0 is more about value creation than technology, [11,12] it’s also about people. “Manufacturing is the stage on which Industry 4.0 is playing out, but human beings are at the center.”

This is not only because human beings are affected by the outcomes and outputs of Industry 4.0, but also because they’re responsible for implementing and guiding the change. That requires top-down management support inside manufacturing companies and capacity-building throughout teams to effect the practical and cultural changes needed to see transformation through. Going Industry 4.0 is a strategic organizational endeavor.

“It’s people who have to manage the evolving environment through these new tools.

It would be impossible to do Industry 4.0 transformation all at once and [13,14] strongly advocates for a strong digital agenda setting clear, achievable goals and aspiring to incremental changes. For example, he recommends concentrating on local operations before scaling globally, getting value out of on-premises infrastructure and use cases first. With that in mind, he suggests there are essentially three progressive stages of Industry 4.0 transformation, each with its own strategic driver

## STAGE 1: Digital connectivity and sensors

Your target is pursuing operation excellence

At this first stage, the opportunities are to improve productivity, quality and efficiency and better manage risk through integration and automation, IoT solutions, AI, cloud and advanced analytics.

## STAGE 2: Digital engineering

Your target is improving growth

Once the foundation is laid, companies can then start looking for advantages farther afield, using Industry 4.0 technologies to enhance their product design and supply chains, develop smart products and cultivate

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upstream and downstream connected ecosystems. This full digital engineering process, including increasingly intelligent automation and blockchain-based smart contracts, can all come into play.

## STAGE 3: Digital operations

Your target is increasing differentiation

The final stage is when you're fully digitalized and requires using Industry 4.0 capabilities to carve out greater differentiation, which considers to be the "true competitive advantage". Differentiation isn't just about demarcating a company from rivals but can also develop whole new markets, services and business models, which is being seen today in fields involving bioinformatics, nanotechnology and quantum technologies.

So where specifically can manufacturers focus their efforts today? Small-lot manufacturing is one area with immediate potential, [15] with value driven by end-to-end integrated product data, digital worker enablement and data-driven overall equipment effectiveness (OEE) optimization.

Mass customization comes in here as well as a low-hanging opportunity. With the deployment of Industry 4.0 technologies, manufacturers can make gains by introducing degrees of product variance with high throughput and consistent quality. Closed control loops enabled by sensor-based, inline quality inspection and flexible routing, scheduling, load balancing and performance management all contribute to this, along with the extension of automation to final assembly.

The high-volume production piece is a third area deserving focus all on its own: fully automated production and maximized overall equipment effectiveness with flexibility to adapt to a given product mix.

## Riding the waves of disruption

There will be multiple waves of disruption associated with Industry 4.0, and the world is currently in the midst of just the second one. Companies that get in on the action now will be well positioned to take advantage of the future disruptions in store to 2050 and beyond. "We're talking about seismic changes here."

"We're just at the start and already industry is beginning to be reshaped beyond recognition. The most important thing for any manufacturer today is just to start."

## Results

We are living in strange and contradictory times; an age where hyper and anti-globalisation exist side by side and where the digitisation of work as marked by the fourth industrial revolution (or industry 4.0) is being envisioned in an increasingly uncertain world. Up until now people have continued to travel around the globe frequently, and countries traded with each other more than ever before. New innovations in technology have been constantly reshaping the way organisations and multinational corporations conduct their businesses. All of this has allowed us to look towards the future with a renewed sense of optimism, but there is still plenty to be concerned about.

Nation states battle with each other for trade dominance, inequality and political upheaval continue to rise, and environmental and demographic changes occur at a far more rapid pace.

All of this illustrates the increasing volatility of the times we are living in. In this regard, having a constructive debate about the 'future of work' and the impact that automation technology (e.g. artificial intelligence, robotics etc.) will have on jobs, skills and wages becomes even more difficult due to the growing uncertainty and complexity. How will industry 4.0 impact the world now and what implications will this have for HR management? How can HR stay relevant – and useful – during these unprecedented times? There's no doubt about it – the impact of industry 4.0 is going to be massive. Large organisations will adopt



new technologies in the near future that will completely reconfigure the way we work. For example, automation will replace many of the traditional factory jobs, as repetitive work becomes fully digitised. Technologies like augmented and virtual reality will enable organisations to deliver training using simulations to make employees more effective in their jobs. In addition to the implementation of tools and technologies such as automation, robotics, artificial intelligence, virtual reality, big data analytics, cloud computing and the internet of things (IOTs), the structure of jobs is already changing. Instead of in-house staff, more firms are relying on specialised contract or remote workers (the so-called ‘gig economy’).

In future we can expect to see fewer full-time jobs, as more people work flexibly or undertake ‘portfolio careers’. There will be more frequent job changes and a constant need for workers to acquire new skills as part of their lifelong learning.[16]

These are just a few examples of the many changes industry 4.0 is already bringing. Organisations must now embrace these changes and work to capitalise on the opportunities it creates for them, their employees and their stakeholders.

So, what can HR do to prepare and how can it stay relevant in these uncertain times?

## 1. Get employees on side

The most important task for HR will be to change internal perceptions and shift the attitudes of employees about the impact that automation and digitisation will have on their jobs. Clear communication is essential here to bring them on board. The more open employees will be to this change, the easier it will be for the HR to implement it.

## 2. Become a ‘contingent champion’

We have often heard of HR being a strategic partner to organisations but besides being a strategic partner, HR will also need to become a contingent champion. This means that the HR policies and practices will need to be more agile, adaptable and flexible to prepare for any contingencies that employees and the organisation may encounter both internally and externally. Whether it’s transitioning from physical to remote work, or training employees to operate machines in a virtual environment – it’s essential to be prepared. HR needs to build agility and resilience to thrive in an environment of constant change.

## 3. Invest in training

One of the most critical areas for HR will be to constantly make sure that it devotes resources (e.g. capital, time, technology) to re-skilling and upskilling employees to prepare them for new tasks, roles and jobs. For example, HR will need to deliver online training using new technologies (like virtual reality or artificial intelligence) to impart new cognitive and technical skills, such as, complex problem-solving, analytical thinking, emotional intelligence, innovation, system analysis, technology installation and so on. Additionally, they may also partner with universities to provide digital education opportunities as part of their career development programmes. As new tools, technologies and systems are constantly adopted by organisations, HR will also need to constantly train and retrain the workforce.

## 4. Deliver ongoing support

HR’s role in providing continued ongoing support, psychological and mental wellbeing and a positive employee experience will be critical in managing the disruptions that industry 4.0 will bring.

For many organisations, this will mean addressing HR grievances, providing individual support and delivering a seamless experience by breaking departmental barriers. Team collaboration tools like WhatsApp For Business or Workplace From Facebook could offer HR the opportunity to support employees in a more personal way, in real time[14]

**5. Adjust to new regulations quickly**

With all of this new technology will come increased regulation, some of which may pertain to the use of technology or data, and some to employee rights, for example. As these new regulations get introduced, updated or changed, the HR will quickly need to assess their implications for the workforce and will have to adopt and adjust to them in a timely manner.

**Conclusions**

Overall, it's clear that industry 4.0 will bring unparalleled opportunities for HR but it will also create major challenges and significant disruptions. Internally, HR will need to transform the working landscape, building a strong network and community. Externally, the challenge will be to quickly adjust to regulatory changes and the new business environment, ensuring that they remain contingent champions. Industry 4.0 is the central theme of the literature analyzed and is accomplished through the development of employment, qualifications, skills and learning frameworks. The results reveal that most papers are conceptual, with quantitative studies still lacking. Developed countries have a leading role in terms of research production, while Asia is far behind. Clustering reveals four dominant themes (educational changes, employment scenario, work infrastructure resources and work meaning and proposal). The first refers to labor changes around working conditions, the work environment and new skills which are required. The second main theme concerns the potentially unstable shift in the labor market has toward a high-level context.[16]

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