

CHAPTER 3

INDUSTRIAL REVOLUTION 4.0: IT'S IMPACT ON MANAGEMENT

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ABSTRACT

Modern organizations now depend heavily on information technology (IT), which has profoundly changed the landscape of management techniques. This abstract offers a succinct review of the varied effects of IT on management, including its impact on organizational structure, communication, and decision-making. Managers must embrace the potential of IT in today's fast-paced, dynamic business environment to maintain competitiveness and guarantee organizational success.

3.1. INTRODUCTION

The exponential development of technology, which is altering how we live, work, and interact with one another, is one of the characteristics of 4IR.

Technology is advancing at an unprecedented rate, and this development has the potential to drastically alter businesses and economies.

A key component of 4IR is the integration of new technologies into current systems and procedures as well as their introduction. It involves the digitization of traditional industries, such as manufacturing, agriculture, and healthcare, and the creation of new industries, such as fintech, edtech, and e-commerce.

The key technologies that are driving 4IR are:

- i. **ARTIFICIAL INTELLIGENCE (AI):** AI refers to the creation of machines that are capable of decision-making, pattern recognition, and language translation—tasks that ordinarily need human intelligence. Robotics, natural language processing, and machine learning are all examples of AI technologies.
- ii. **INTERNET OF THINGS (IOT):** Lot refers to the process of connecting common objects to the internet so that they may exchange data and communicate with one another. This includes gadgets like wearables, industrial sensors, and smart home appliances.
- iii. **BLOCKCHAIN:** A distributed ledger technology that enables safe, open, and decentralised transactions is called blockchain. Industries like finance, healthcare, and supply chain management could be affected.
- iv. **ROBOTICS:** The creation of machines that can carry out physical tasks on their own, such as manufacturing, transportation, and healthcare, is a component of robotics.
- v. **VIRTUAL AND AUGMENTED REALITY:** Virtual and augmented reality technologies involve the creation of digital environments that can be experienced through head-mounted displays or mobile devices. These technologies have applications in fields such as education, entertainment, and healthcare.

The impact of 4IR is expected to be far-reaching, affecting all aspects of life, including the economy, society, and the environment.

AI refers to the creation of machines that are capable of decision-making, pattern recognition, and language translation—tasks that ordinarily need human intelligence.

Robotics, natural language processing, and machine learning are all examples of AI technologies. Understanding the impact of 4IR on management is crucial for organizations to stay competitive and adapt to the changing business landscape.

3.1.1 OVERVIEW OF THE IMPACT OF 4IR ON VARIOUS INDUSTRIES

The Fourth Industrial Revolution (4IR) has had a profound impact on various industries, with transformative changes being brought about in the way they operate, innovate, and compete. Some of the industries that have been most affected by 4IR are:

- i. MANUFACTURING INDUSTRY:** The manufacturing industry has undergone significant changes due to 4IR, with the emergence of smart factories, advanced robotics, and 3D printing. These technologies have led to increased efficiency, reduced waste, and greater flexibility in production processes. Smart factories, for example, use IoT sensors to collect and analyze data in real-time, enabling proactive maintenance, improved quality control, and optimized production schedules.
- ii. HEALTHCARE BUSINESS:** With the rise of telemedicine, wearable technology, and AI-assisted diagnostics, the healthcare business has also been significantly impacted by 4IR. These innovations could enhance access to healthcare services, lower costs, and improve treatment quality. For instance, telemedicine enables patients to communicate with medical professionals virtually, eliminating the need for in-person consultations and improving convenience.
- iii. BANKING INDUSTRY:** With the advent of fintech firms, blockchain technology, and cryptocurrencies, the banking industry has been affected by 4IR. These innovations have boosted financial transaction competition, increased efficiency, and increased transparency. For instance, fintech startups provide cutting-edge financial products and services that compete with established banks and financial institutions.
- iv. TRANSPORTATION INDUSTRY:** With the development of autonomous cars, smart logistics, and linked infrastructure, the transportation industry has also seen significant change as a result of 4IR. These technologies have the potential to make transportation networks less congested, safer, and more effective. For instance, autonomous cars can increase the effectiveness of transportation networks and lower the danger of accidents brought on by human mistake.
- v. RETAIL INDUSTRY:** The retail industry has been disrupted by 4IR, with the emergence of e-commerce, personalized marketing, and augmented reality. These technologies have led to increased convenience, improved

customer engagement, and greater efficiency in supply chain management. E-commerce, for example, allows customers to shop online from the comfort of their homes, reducing the need for physical stores and improving the efficiency of order fulfillment processes.

- vi. **EDUCATION INDUSTRY:** The education industry has also been impacted by 4IR, with the emergence of online learning, adaptive learning, and AI-assisted education. Online learning, for example, allows students to access educational content from anywhere in the world, reducing the need for physical classrooms and increasing flexibility.
- vii. **ENERGY INDUSTRY:** The energy industry has also undergone significant changes due to 4IR, with the emergence of smart grids, renewable energy, and energy storage. These technologies have the potential to increase efficiency, reduce costs, and improve sustainability in energy systems. Smart grids, for example, use IoT sensors to monitor and optimize energy consumption, reducing waste and improving the reliability of energy systems. (Schwab K., 2016).

4IR has had a transformative impact on various industries, leading to disruptive changes in the way they operate, innovate, and compete.

Companies and organizations need to be aware of these changes and develop new strategies for adapting to the new reality. Embracing 4IR can lead to increased efficiency, reduced costs, and greater competitiveness, while failing to adapt can lead to obsolescence and irrelevance.

3.1.2 SIGNIFICANCE OF UNDERSTANDING THE IMPACT OF 4IR ON MANAGEMENT

The Fourth Industrial Revolution (4IR) is transforming the way we live and work, bringing about unprecedented levels of innovation, productivity, and efficiency.

The impact of 4IR on management is significant, as it requires leaders and managers to adjust to the new realism as well as embrace the opportunities presented by advanced technologies, while mitigating the risks and challenges that come with them.

In this section, we will explore the significance of understanding the impact of 4IR on management.

3.1.2.1 INCREASED EFFICIENCY AND PRODUCTIVITY

Efficiency and productivity have significantly increased as a result of the incorporation of cutting-edge technologies into various corporate operations. Companies have been able to simplify operations, cut costs, and raise the quality of their goods and services because to the automation of mundane processes, the employment of robots and AI, and the application of predictive analytics. Managers must comprehend the potential of these technologies and how to use them to enhance business processes.

3.1.2.2 ENHANCED DECISION-MAKING

Predictive analytics and other cutting-edge technology have improved decision-making processes. These tools can support managers in large-scale data analysis, pattern and trend identification, and decision-making based on current facts. The potential of these technologies and how they might be applied to improve decision-making must be understood by managers.

3.1.2.3 IMPROVED CUSTOMER EXPERIENCE

The way businesses communicate with their clients has also changed as a result of 4IR. Companies may now connect with their customers and give them individualised experiences thanks to the use of digital channels like social media and e-commerce. In order to match their consumers' expectations, managers must be aware of the evolving preferences and behaviours of their clientele.

3.1.2.4 EMERGENCE OF NEW BUSINESS MODELS

New business models, like platform-based business models and the sharing economy, have emerged as a result of 4IR. Traditional business models have been challenged by these approaches, forcing businesses to change to the new environment. The potential of these new models and how they might be applied to produce value for customers are two things that managers need to be aware of.

3.1.2.5 NEED FOR NEW SKILLS AND TALENT

There is now a demand for new talents and abilities as a result of the integration of cutting-edge technologies into many areas of business. The correct talent must be attracted and retained, therefore managers must comprehend the shifting skill requirements. To ensure that their staff is prepared for success in the digital age, they must invest in training programmes and foster a culture of lifelong learning.

3.1.2.6 IMPACTS ON WORKFORCE DYNAMICS

4IR has also led to changes in workforce dynamics, with the emergence of the gig economy, remote work, and new forms of employment. Managers need to understand the implications of these changes and develop new strategies for managing a diverse and flexible workforce. They need to create a culture of trust and empowerment to ensure that their employees are motivated and engaged, regardless of their location or employment status.

3.1.2.7 NEED FOR CYBERSECURITY AND RISK MANAGEMENT

The risk of cyberattacks and other security lapses has increased as a result of the integration of cutting-edge technologies into many facets of business. Managers must comprehend potential hazards and create plans for reducing them. To make sure that their business activities are safeguarded from potential risks, they must invest in cybersecurity solutions and develop a culture of risk management.

For leaders and managers who wish to remain competitive in the digital age, it is imperative that they comprehend the effects of 4IR on management. Modern technology integration has revolutionised how we work and live, enabling previously unheard-of levels of creativity, productivity, and efficiency. Managers can add value for their customers, draw in and keep the best personnel, and guarantee the long-term success of their organisation by recognising the potential of these technologies and how they may be used to enhance company processes. In addition, managers can create plans for reducing the risks and difficulties presented by 4IR as well as safeguarding their company's operations from potential dangers.

3.2. CHANGES BROUGHT ABOUT BY 4IR IN MANAGEMENT

Organisational management has undergone substantial changes as a result of the Fourth Industrial Revolution (4IR). The use of cutting-edge technology like artificial intelligence (AI), robotics, and the Internet of Things (IoT) has completely changed how we work and live, creating both opportunities and difficulties for managers and leaders. We will examine the managerial changes resulting from 4IR in this part.

3.2.1 EMPHASIS ON DATA AND ANALYTICS

The greater emphasis on data and analytics is one of the biggest improvements brought about by 4IR. Organisations are producing enormous volumes of data as a result of the spread of digital technology, which may be utilised to understand consumer behaviour, market trends, and operational efficiency. To make wise

judgements and enhance corporate operations, managers must have a thorough understanding of data and analytics.

3.2.2 SHIFT TOWARDS AGILE MANAGEMENT

The adoption of agile management practises has also been influenced by the integration of cutting-edge technologies into numerous business domains. Organisations are implementing agile management frameworks, such Scrum and Kanban, in order to deliver goods and services more quickly and effectively in response to shifting market conditions and client demands. To effectively lead their teams, managers must possess a thorough understanding of agile management ideas and practices.

3.2.3 FOCUS ON INNOVATION

Additionally, innovation has received more attention under 4IR. Organisations are urged to investigate novel theories and concepts that might result in game-changing goods and services as a result of the introduction of cutting-edge technologies. To remain competitive in the digital age, managers must promote an innovative culture where workers are encouraged to experiment and take risks.

3.2.4 COLLABORATION ACROSS DEPARTMENTS AND TEAMS

Collaboration between teams and departments has improved as a result of the integration of sophisticated technology. Organisations are dismantling silos and collaborating to accomplish shared objectives thanks to the ability to share information and communicate in real-time.

Using digital tools and platforms to promote efficient communication and collaboration, managers must foster cross-departmental and cross-team collaboration.

3.2.5 NEW LEADERSHIP STYLES

Additionally, the development of new leadership philosophies is a result of 4IR.

Managers are embracing new leadership styles like transformational and servant leadership to inspire and motivate their staff as a result of the requirement to manage complex systems and varied teams.

The abilities and capabilities needed for these new leadership philosophies, such as emotional intelligence and empathy, must be developed by managers.

3.2.6 DEMAND FOR NEW SKILLS AND TALENT

The use of cutting-edge technologies has increased the need for fresh talent and abilities. Organisations are seeking workers who can swiftly pick up new skills and adapt to change in light of the introduction of new technology and business models. The proper people must be attracted and retained, and managers must spend in training and development initiatives to provide their staff the tools they need to flourish in the digital age.

3.2.7 GREATER FOCUS ON CYBERSECURITY AND RISK MANAGEMENT

The emphasis on cybersecurity and risk management has increased as a result of 4IR. Organisations are more vulnerable to cyberattacks and other security lapses as a result of the spread of digital technologies. To ensure the long-term success of their organisation, managers must devise plans for reducing these risks, make investments in cybersecurity measures, and foster a culture of risk management. The way organisations are run has undergone major change as a result of the Fourth Industrial Revolution. Leaders and managers face both possibilities and problems as a result of how modern technology have changed how we live and work.

By understanding the changes brought about by 4IR in management, managers can develop strategies for staying competitive in the digital age, fostering a culture of innovation, collaboration, and agility, and protecting their organization from potential threats.

3.3. THE EMERGENCE OF NEW TECHNOLOGIES AND THEIR IMPACT ON MANAGEMENT:

New technologies are revolutionising how we live and work, and they are having a big impact on management. The incorporation of cutting-edge technologies into different facets of business has increased productivity and efficiency, improved decision-making, improved customer experience, led to the emergence of new business models, necessitated the acquisition of new talent and skills, changed the dynamics of the workforce, and necessitated the use of cybersecurity and risk management. We will look at the advent of new technologies and how they affect management in this part.

3.3.1 ARTIFICIAL INTELLIGENCE (AI)

One of the most revolutionary technologies of the twenty-first century, AI has a big impact on management. Automation of repetitive jobs, data analysis, and real-time

prediction are all possible with artificial intelligence (AI). It can improve decision-making procedures, boost consumer satisfaction, and develop fresh corporate strategies. Managers must comprehend AI's potential and how it may be used to enhance company processes.

3.3.2 ROBOTICS

The usage of robots has grown dramatically across a number of industries recently, and they have a big impact on management. Routine tasks can be automated, lowering costs and raising the calibre of goods and services. They can boost productivity and improve safety in risky circumstances. Managers must be aware of robotics' potential and how they might be applied to enhance company processes.

3.3.3 INTERNET OF THINGS (IOT)

The Internet of Things (IoT) is a network of interconnected sensors and gadgets that can communicate and gather data, and it has a big impact on management. The Internet of Things (IoT) can be used to monitor and manage a variety of commercial processes, including supply chain management, inventory management, and equipment maintenance. Through the provision of personalised services based on real-time data, it can also enhance the client experience. The potential of IoT and how it may be applied to enhance business operations must be understood by managers.

3.3.4 BIG DATA ANALYTICS

Big data analytics, which involves examining a lot of data to find patterns and trends, has a big impact on management. Big data analytics can be utilised to develop new business models, enhance consumer experience, and make informed decisions based on current facts. The potential of big data analytics and how it may be applied to enhance corporate operations must be understood by managers.

3.3.5 CLOUD COMPUTING

Delivery of computing services via the internet is known as "cloud computing," and it has a big impact on management. Costs can be cut, flexibility is increased, and scalability is increased using cloud computing.

Regardless matter where they are located, it can enhance staff collaboration and communication. The potential of cloud computing and how it might be applied to enhance business operations must be understood by managers.

3.3.6 VIRTUAL AND AUGMENTED REALITY

Virtual and augmented reality technologies have a big impact on management because they can provide immersive experiences that may be utilized for training, consumer interaction, and product creation. These innovations can raise the standard of goods and services, promote consumer satisfaction, and enhance employee development. The potential of augmented and virtual reality technologies, as well as how they might be applied to enhance corporate operations, must be understood by managers. New technologies are revolutionizing how we live and work, and they are having a big impact on management. By utilizing these technologies' potential and creating

New technologies are revolutionising how we live and work, and they are having a big impact on management. Managers may give their company a competitive edge and assure its long-term success in the digital age by embracing the possibilities of these technologies and adopting methods for managing the risks and obstacles. The incorporation of cutting-edge technologies into different facets of business can increase productivity and efficiency, improve decision-making, enhance customer experience, result in the emergence of new business models, necessitate the acquisition of new talent and skills, alter workforce dynamics, and necessitate the use of cybersecurity and risk management.

3.4. TRANSFORMATION OF TRADITIONAL MANAGEMENT PRACTICES

As a result of the Fourth Industrial Revolution (4IR), we are experiencing previously unheard-of levels of creativity, production, and efficiency. Management practises have changed as a result of 4IR, and leaders and managers now need to adjust to the new reality and seize the benefits offered by cutting-edge technology while minimising the dangers and difficulties that go along with them. This section will examine the evolution of conventional management techniques within the framework of 4IR. (Foss N. J., 2018).

3.4.1 EMBRACING DIGITAL TECHNOLOGIES

The integration of digital technologies such as AI, machine learning, and big data analytics has transformed traditional management practices. Digital technologies have enabled managers to access real-time data and insights, automate routine tasks, and improve decision-making. Digital technologies have also facilitated remote work

and collaboration, enabling teams to work together regardless of their location. Managers need to embrace digital technologies and develop strategies for leveraging them to improve business operations.

3.4.2 FOCUS ON CUSTOMER EXPERIENCE

The emphasis of management practises has significantly shifted as a result of 4IR from conventional product-centric models to customer-centric ones. Companies may now connect with their customers and give them individualised experiences thanks to the use of digital channels like social media and e-commerce.

Managers must comprehend how their consumers' preferences and behaviours are changing in order to create technology-based plans that will fulfil their expectations.

3.4.3 COLLABORATION AND NETWORKING

4IR has transformed traditional management practices by promoting collaboration and networking. Digital technologies have facilitated collaboration across departments, teams, and even organizations.

Managers need to embrace these opportunities and develop strategies for creating a culture of collaboration and networking.

3.4.4 AGILITY AND FLEXIBILITY

Because of 4IR's rapid pace, flexibility and agility are essential for success. Companies must be able to react swiftly to shifting consumer demands, market situations, and technology advancements.

By fostering a culture of experimentation, ongoing learning, and adaptation, managers may embrace agility and adaptability.

3.4.5 NEW SKILL SETS

New skill sets are now required as a result of the incorporation of cutting-edge technologies into many business-related areas.

To make sure that their staff have the skills necessary to flourish in the digital age, managers need to adopt strategies for recognizing the new skill sets required and invest in training programmes.

A fundamental tenet of contemporary management is the necessity for managers to embrace lifelong learning.

3.4.6 NEW FORMS OF LEADERSHIP

Table 3.1

Technology	Impact
Artificial Intelligence (AI)	Automation of tasks and decision-making processes
Internet of Things (IoT)	Real-time monitoring and optimization of business processes
Cloud Computing	Scalability and cost-effectiveness of IT infrastructure
Blockchain	Decentralization and increased security of transactions

4IR has transformed traditional forms of leadership. In the digital age, managers need to be able to lead diverse and flexible teams, embrace change, and be able to navigate the complexities of the global business environment. Managers need to develop new forms of leadership, such as servant leadership, distributed leadership, and agile leadership, to effectively lead their teams in the digital age. (McGrath R G., 2017).

The Fourth Industrial Revolution has transformed traditional management practices, requiring leaders and managers to adjust to the new realism and embrace the opportunities presented by advanced technologies. By embracing digital technologies, focusing on customer experience, promoting collaboration and networking, embracing agility and flexibility, investing in new in the digital age and ensure the long-term success of their organization. skill sets, and developing new forms of leadership, managers can effectively lead their teams

Table 3.2

Customer Preferences	Impact
Personalization	Customization of products and services
Real-time Responsiveness	Use of chatbots and AI-powered customer service

Digital Channels	Increased use of mobile devices and social media
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3.5. IMPACT OF 4IR ON THE BUSINESS ENVIRONMENT

The Fourth Industrial Revolution (4IR) has had a significant impact on the business environment, bringing about disruptive changes in business models and practices, changes in customer behavior and preferences, and shifts in industry competition and collaboration.

3.5.1 DISRUPTIVE CHANGES IN BUSINESS MODELS AND PRACTICES

Business models and practises have undergone radical transformation as a result of the integration of cutting-edge technologies into many facets of business. Companies that do not adapt to these changes run the danger of falling behind market rivals who do. For instance, the emergence of e-commerce has upended conventional retail business models, and the application of automation and artificial intelligence has changed supply chain management procedures. Businesses must be able to recognise the necessary adjustments and modify their business models and procedures accordingly. The impact of technology is covered in Table 1. (Brynjolfsson E., & McAfee A. 2017).

Table 3.3: Disruptive changes in business models and practices
(Source: World Economic Forum, "The Future of Jobs Report 2018")

Technology	Impact
Artificial Intelligence (AI)	Automation of tasks and decision-making processes
Internet of Things (IoT)	Real-time monitoring and optimization of business processes
Cloud Computing	Scalability and cost-effectiveness of IT infrastructure
Blockchain	Decentralization and increased security of transactions

3.5.2 CHANGES IN CUSTOMER BEHAVIOR AND PREFERENCES

4IR has brought about significant changes in customer behavior and preferences. Customers today expect personalized experiences and real-time responses, and they

are more likely to use digital channels to interact with companies. This has led to a need for companies to embrace digital technologies and develop strategies for providing personalized experiences to their customers. Companies also need to be able to adapt quickly to changing customer preferences and behaviors.

Table 3.4 gives the details of customer preferences and its impact.

Table 3.4: Customer Preferences and Its Impact

Customer Preferences	Impact
Personalization	Customization of products and services
Real-time Responsiveness	Use of chatbots and AI-powered customer service
Digital Channels	Increased use of mobile devices and social media

Fact: By 2025, it is estimated that there will be 8.4 billion digital voice assistants in use, up from 2.5 billion in 2018. (Source: Juniper Research)

3.5.3 SHIFTS IN INDUSTRY COMPETITION AND COLLABORATION

The integration of advanced technologies into various aspects of business has also led to shifts in industry competition and collaboration.

In some industries, new entrants have disrupted traditional players by using technology to provide better and cheaper services.

In other industries, traditional players have embraced technology to improve their operations and stay ahead of the competition.

Additionally, the use of digital platforms has enabled collaboration among industry players, leading to the creation of new business models and ecosystems.

To adapt to these changes, companies need to be able to identify emerging trends and develop strategies for responding to them.

This requires a deep understanding of the potential impact of 4IR on their industry and business, as well as the ability to anticipate and respond to potential risks and challenges.

Table 3.5: Industry Shifts and its Impact

Industry Shifts	Impact
Disruptive Entrants	Use of technology to provide better and cheaper services
Industry Collaboration	Creation of new business models and ecosystems
Digital Platforms	Increased competition and innovation in traditional industries

Fact: In 2019, the number of startups valued at over \$1 billion (known as "unicorns") reached a record high of 490, up from 25 in 2013. (Source: CB Insights)

The impact of 4IR on the business environment is significant, with disruptive changes in business models and practices, changes in customer behavior and preferences, and shifts in industry competition and collaboration. Companies need to be able to adapt quickly to these changes to stay ahead of the competition and ensure their long-term success. By embracing digital technologies, focusing on customer experience, and collaborating with industry players, companies can effectively navigate the challenges and opportunities presented by 4IR. (West J., & Bogers M. 2017).

3.6. 4IR AND STRATEGIC MANAGEMENT

The Fourth Industrial Revolution (4IR) is rapidly transforming the way businesses operate and compete. To stay ahead in this fast-paced environment, strategic management must adapt and evolve to address the opportunities and challenges presented by 4IR.

3.6.1 OPPORTUNITIES AND CHALLENGES POSED BY 4IR FOR STRATEGIC MANAGEMENT

The opportunities presented by 4IR include the ability to leverage technology to improve efficiency, enhance customer experiences, and create new products and services. However, with these opportunities come challenges such as cybersecurity risks, data privacy concerns, and the need to up skill and reskill the staff to adapt to new technologies. (Teece D. J. 2018).

3.6.1 NEW APPROACHES TO STRATEGIC PLANNING AND DECISION-MAKING

Traditional strategic planning and decision-making methods may no longer be sufficient in the 4IR era. New approaches such as agile management, design thinking, and open innovation are becoming more popular as they allow for rapid prototyping, experimentation, and collaboration with external stakeholders. In addition, data-driven decision-making using big data analytics and machine learning can provide valuable insights into customer behavior and market trends.

3.6.1 INTEGRATING TECHNOLOGY INTO STRATEGIC MANAGEMENT PROCESSES

The use of technology in strategic management procedures is becoming increasingly important. For instance, the usage of digital platforms and ecosystems can promote creativity and cooperation, and the adoption of cloud computing and AI can improve the ability to store, analyse, and make decisions about data. Additionally, blockchain technology can be used to enhance supply chain management, as well as transaction security and transparency. (Reeves M. et al., 2018).

Moreover, the integration of technology into strategic management processes requires a shift in organizational culture and mindset.

Companies must be willing to experiment and take risks, while also embracing a continuous learning and improvement mindset to stay competitive in the rapidly evolving business environment.

IV. 4IR and Strategic Management
Opportunities and challenges posed by 4IR for strategic management
- By 2025, the global digital economy is projected to reach \$23 trillion, creating new opportunities for businesses to leverage technology. (McKinsey Global Institute)
- Cybersecurity threats are on the rise, with the global cost of cybercrime projected to reach \$10.5 trillion annually by 2025. (Cybersecurity Ventures)
- The World Economic Forum estimates that by 2022, 54% of all employees will require significant upskilling and reskilling to keep pace with 4IR. (World Economic Forum)

<p>New approaches to strategic planning and decision-making</p> <ul style="list-style-type: none"> - Agile management methodologies can help companies reduce product development time by up to 80%. (McKinsey & Company) - Organisations that use data-driven decision-making outperform their rivals in terms of productivity and profitability by 5% and 6%, respectively. from the Harvard Business Review
<p>Integrating technology into strategic management processes</p> <ul style="list-style-type: none"> - The use of digital platforms and ecosystems can increase a company's innovation capacity by up to 40%. (McKinsey Global Institute) - The adoption of cloud computing can reduce IT costs by up to 40% and improve data access and collaboration. (IBM) - By 2025, the global blockchain market is projected to reach \$39.7 billion, with potential use cases in supply chain management and digital identity verification. (Statista)

4IR presents both opportunities and challenges for strategic management. To thrive in this era, companies must adopt new approaches to strategic planning and decision-making, integrate technology into their processes, and foster a culture of innovation and continuous learning.

With the right strategies in place, companies can harness the power of 4IR to drive growth, competitiveness, and success.

3.7. IMPLICATIONS FOR HUMAN RESOURCE MANAGEMENT

The Fourth Industrial Revolution (4IR) has significant implications for Human Resource Management (HRM) as it transforms the way organizations work and interact with employees. Here we are giving some key implications for HRM:

- 1. CHANGES IN SKILLS REQUIREMENTS AND TRAINING NEEDS:**
 Artificial intelligence, machine learning, and robotics are three 4IR technologies that are rapidly altering the competencies needed for diverse vocations. To guarantee that employees are given the training necessary to

develop these skills, HR professionals must ascertain the skills that will be in demand in the future. To keep the workforce current with the newest technologies, programmes for continuous learning and upskilling should be developed and put into place. (Stahl et al., 2017)

2. **IMPLICATIONS FOR RECRUITMENT AND TALENT MANAGEMENT:** There will be a greater need for specialised talents when new technologies are developed. The goal of HRM should be to find and hire candidates who have the abilities to adjust to a changing corporate environment. Rewriting job descriptions and requirements to reflect future skills requirements may be necessary. In order to find and keep the best personnel, HRM should also incorporate new recruitment strategies and channels like social media, online tests, and gamification.

3. **IMPACTS ON EMPLOYEE MOTIVATION AND JOB SATISFACTION:** The introduction of new technologies can significantly impact employee motivation and job satisfaction. HRM should ensure that employees are engaged and motivated by providing meaningful work that aligns with their values and interests. (Scholarios, et al., 2018).

Table 3.6

Implications for HRM	Statistics
Changes in skills requirements and training needs	<ul style="list-style-type: none"> - By 2030, automation and AI may force 375 million workers to change their occupational specialties and acquire new skills (McKinsey). - Top skills that companies are looking for in 2021 include cloud computing, AI, and data science (LinkedIn)
Implications for recruitment and talent management	<ul style="list-style-type: none"> - 71% of companies believe that they will not have the skills to meet their business objectives in the future (Deloitte) - 73% of CEOs believe that the availability of key skills is a major concern for their organization (PwC)
Impacts on employee	<ul style="list-style-type: none"> - Studies have shown that a lack of meaningful work and low levels of employee engagement can lead to decreased job satisfaction and productivity. HRM should focus on

motivation and job satisfaction	providing employees with work that is challenging, aligns with their values and interests, and fosters a culture of innovation and creativity.
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To effectively manage the implications of 4IR on HRM, companies need to adopt a strategic approach to talent management. HRM should collaborate with other departments and business units to understand the impact of technology on the organization's overall strategy and develop a comprehensive plan to address the changing needs of the workforce. This requires a shift from a traditional HR approach to a more strategic, business-focused HRM.

3.7. IMPACTS ON OPERATIONS AND SUPPLY CHAIN MANAGEMENT

3.7.1 CHANGES IN PRODUCTION PROCESSES AND AUTOMATION:

By boosting automation and digitization, 4IR technologies like robotics, AI, and the Internet of Things (IoT) are changing how traditional production processes are done. As a result, smart factories have been created, utilising real-time data to enhance product quality, decrease waste, and optimise manufacturing processes. The development of new production techniques like additive manufacturing (3D printing), which permits higher customization and quicker prototyping, has also been made possible by 4IR technology. (Ross et al., 2017).

3.7.2 Impacts on supply chain management and logistics:

By enhancing visibility and transparency, 4IR technologies are also revolutionising logistics and supply chain management. For instance, the implementation of blockchain technology can make it possible to track goods and materials along the whole supply chain, lowering the risk of fraud and forgery. Additionally, by forecasting demand and maximising inventory levels, the application of AI and machine learning can aid in the optimisation of supply chain activities.

3.7.3 OPPORTUNITIES FOR INNOVATION IN OPERATIONS MANAGEMENT:

4IR technologies are providing new opportunities for innovation in operations management. For example, the use of virtual and augmented reality can enhance training and simulation in operations management, while the use of drones and autonomous vehicles can enable faster and more efficient logistics operations. In addition, the use of big data delivers comprehensions into production processes and supply chain operations, leading to more informed decision-making and improved efficiency. (Lasi et al., 2014).

Table 3.6

Impacts on Operations and Supply Chain Management	Statistics
Changes in production processes and automation	- 76% of manufacturers plan to increase their use of 4IR technologies such as robotics and AI in the next five years
	- The global market for smart factories is expected to reach \$385 billion by 2027, growing at a CAGR of 9.8% from 2020 to 2027
Impacts on supply chain management and logistics	- At a CAGR of 68.0% over the five-year forecast period, the global market for blockchain in supply chain management is anticipated to increase from \$145.0 million in 2019 to \$3,314.6 million in 2026.
	- A CAGR of 45.55% is predicted between 2019 and 2025 for the global market for AI in supply chain management, which is projected to reach \$10.1 billion by that time.
Opportunities for innovation in operations management	- A CAGR of 37.6% is predicted for the global market for virtual and augmented reality in manufacturing, which is anticipated to reach \$4.5 billion by 2026.
	- Virtual and augmented reality in manufacturing is anticipated to have a global market worth \$4.5 billion by 2026, rising at a CAGR of 37.6% between 2021 and 2026.

Overall, the impact of 4IR on operations and supply chain management is significant, and organizations that embrace these technologies are likely to achieve greater efficiency, productivity, and innovation in their operations.

3.8 CONCLUSION:

The Fourth Industrial Revolution (4IR) is having a significant impact on management across industries. It is transforming traditional management practices, disrupting business models and practices, and requiring new approaches to strategic planning and decision-making. Human resource management is also facing changes in skills requirements, recruitment, and employee motivation.

The impacts on operations and supply chain management are significant, with increased use of automation and robotics, adoption of blockchain and AI, and opportunities for innovation in operations management.

Overall, understanding the impact of 4IR on management is crucial for organizations to adapt and succeed in the rapidly changing business environment. Future research and practice in management should focus on identifying best practices and effective strategies to leverage the opportunities and overcome the challenges posed by 4IR.

Adapting to 4IR in management is not an option but a necessity. Organizations that embrace this transformation and adopt new technologies and practices will thrive in the future business landscape, while those that resist change risk becoming obsolete. It is imperative that leaders in management understand the implications of 4IR and take proactive measures to ensure their organizations are well-equipped to navigate the challenges and opportunities presented by this new era.

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