

CHANGING COMPETITIVE BUSINESS DYNAMICS THROUGH SUSTAINABLE BIG DATA ANALYSIS

Editors:
Sukanta Kumar Baral
Richa Goel
Tilottama Singh
Erdener Kaynak
Vishal Jain

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Changing Competitive Business Dynamics Through Sustainable Big Data Analysis

Edited by

Sukanta Kumar Baral

*Department of Commerce, Faculty of Commerce &
Management,
Indira Gandhi National Tribal University (A Central
University),
Amarkantak, Madhya Pradesh, India*

Richa Goel

*Symbiosis Centre of Management Studies, Noida,
Symbiosis International Deemed University, Pune, India*

Tilottama Singh

*Uttaranchal Institute of Management,
Uttaranchal University, Dehradun, India*

Erdener Kaynak

*School of Business Administration,
Penn State University, Harrisburg,
777 W. Harrisburg Pike
Middletown, USA*

&

Vishal Jain

*Department of Computer Science and Engineering,
School of Engineering and Technology,
Sharda University, Greater Noida, India*

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(Volume 8)

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Erdener Kaynak, and Vishal Jain

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FOREWORD

Industry 4.0 is built on a foundation of Big Data Analytics (BDA). It has become a practical tool for enhancing businesses' competitive advantages through better data-driven performance. While this is happening, firms are being forced to prioritize performance that is sustainable. The evidence also shows that BDA and innovation can boost business performance, giving it a competitive edge. This book makes the claim that big data analytics capabilities (BDAC) may increase innovation capabilities (IC) and, as a result, help create a sustainable competitive advantage (SCA) when combined with a high degree of data availability (DA). It serves as a comprehensive manual for exploring numerous dimensions with the aid of theories and models in order to gain a practical understanding from several varying points of view for its potential in society. The book employs a methodologically rigorous approach while ensuring that the content is understandable to all readers.

This book provides useful insight into the intellectual and practical effort and emphasizes the importance of re-thinking while analyzing the effects. It covers important topics like Big Data for Smart Cities, Sustainable Environmental Science and Technology, the Global Energy Crisis, Digital Manufacturing Support Processes, Digital Entrepreneurship, Workers' Healthcare using Big data Repository, the Internet of Things (IoT) in the Agriculture Sector toward Urban Greening, and Recent Advances and Perspectives in the Big Data Era.

This book, I believe, will be extremely valuable for a wide range of readers, corporate executives, entrepreneurs, and other professionals and masses in all sectors who want to expand their knowledge by learning about the underlying trends and activities in this book; it is not just for academics, postgraduate students, and research associates. Big data analytics is a novel topic with the ability to revolutionize entire industries; as a result, it will have an impact on everyone in the world in the next years.

It gives me great pleasure to write this foreword because the book's editors have worked tirelessly to find excellent answers and creativity. The chapters in this book were all chosen based on peer reviews by reviewers who were quite knowledgeable about the field.

Prof. (Dr.) Mohammad Saeed
Department of Business Administration
Minot State University, Minot, ND 58707, USA

PREFACE

In the twenty-first century, digitization and the outcomes it produces hasten social change and the creation of sustainable societies. Our digital activities, judgments, and mere presence generate data, which opens up immense prospects for modifying present company procedures and practices. As a result, new theories, such as big data analytics, are desperately needed. The term “big data” refers to the process of creating increasing amounts of data in real time from several sources using modern industrial systems and advanced technology. To generate large volumes of data, modern enterprises increasingly rely on cutting-edge technology, which boosts a company's competitive advantage by extracting value from data and is based on rapidly developing digital technology research and the strengths that the information systems bring to the field. What it takes to achieve digital transformation is described in this book. An extraordinary rate of the adoption of big data analytics (BDA) is being observed in businesses in various nations looking for a competitive edge. This book's goal is to offer a conceptual framework based on resource-based theory (RBT) and dynamic capacity theory (DCT) that may be used to pinpoint the sources of competitive advantages, the interdependence of their constituent parts, and the methods for gaining competitive advantage.

The most recent results of the field's empirical study are presented in this book, along with important theoretical frameworks. In order to increase economic efficiency at the micro and macro levels, it reveals new and novel elements of big data analytics as well as how it might support industry competition. It is the perfect resource for academics, policymakers, businesspeople, organizations, and students. Big data has a variety of useful applications that are advancing both decision-making and industrial capabilities. However, for practitioners engaged in the study of stakeholders and their strategies, this book will be a valuable source of reference.

Further, this book has been organized in a reader-friendly way that makes it easy to understand the content. Important information that has been properly analyzed is underlined. The reader's access to materials in the book creates the possibility for more in-depth research. The case studies will offer a tried-and-true method for resolving typical issues in the subject area. The reader will be able to quickly grasp the chapters' major ideas and content.

Chapter I talks about the Risk Analysis of Implementing Immersive Technology in the Healthcare System

People can engage with a virtual environment in immersive situations. This technique has several medical applications. In medical applications, the use of immersive technology is still relatively new. Immersive technologies like virtual reality, augmented reality, and mixed reality have a variety of medical uses, including improving vision, treating behavioral disorders, rehabilitating patients, and developing personalized workout regimens. This chapter's goal is to evaluate the dangers of a technology-based healthcare system that is advantageous to both patients and professionals. Immersive training systems for the medical field are used to offer instruction and enhance patient care. We give a brief summary of the functional aspects of the system before doing risk analyses using Ishikawa, Fault Tree Analysis (FTA), and Causal Loop Diagram (CLD) to draw attention to three key system concerns. This chapter will also go over risk management and monitoring procedures.

Chapter II talks about the Internet of Things (IoT) in the Agriculture sector toward Urban Greening

By boosting production and efficiency, Internet of Things (IoT) technology utilization has the potential to significantly improve agriculture and farming operations. The most prevalent sub-verticals in IoT applications for agriculture and farming, according to this report, were crop management and water management. The study also found that sensor data for soil moisture was a common area of attention. The study also discovered that Wi-Fi, followed by mobile technology, was the most often employed technology in the creation of IoT applications. When compared to the farming industry, it was discovered that the agricultural sector received greater research focus. These results can serve as a reference for others in the farming sector who wish to enhance and broaden their usage of IoT in order to raise productivity. The paper also identifies key topics for further investigation, including scalability, heterogeneity, the architecture of IoT systems, data processing methodology, the size of the test site or agricultural area, and IoT security.

Chapter III talks about Embodied Immersion: Exploring the Convergence of Haptic VR and Pervasive Visual Sensors

In recent years, Virtual Reality (VR) technology has rapidly increased in importance and esteem. It offers users a virtual world in which they can form virtual habits or manage the objects in the scene with their limb movements. Users are looking for novel Human-Computer Interaction strategies as computers and information technology develop to offer a richer experience. In contrast, research on virtual scene modeling might make it easier for customers to access and have a more realistic experience. The intended article primarily focuses on the perspectives on AR and VR in the future on a global scale, taking VR strategies that depend on Scene Modelling, Statistical Analysis, and Sensor Networking and taking into consideration the research methods by examining the interactive VR technology from the perception of Visual Sensor Network (VSN), which tends to provide visual information to VR systems and also offers succinct and effective image data to aid in the creation of AR and VR. In addition, a wide range of uses tends to give the burgeoning VR business the assurance it needs to add greater value. A tried-and-true interaction mode is suggested that can significantly enhance user experiences, hence improving VR goods.

Chapter IV talks about Post-Pandemic OTT Media Hegemony in India: A Socio-Economic Perspective

As OTT media consumption spread to India after the COVID-19 pandemic, it revolutionized the entertainment market and changed how consumers watched entertainment. Customers were compelled to stay at home due to the lockdown. A paradigm shift in consumer behavior has been brought about by it. The ease of using OTT platforms for content consumption is fuelling this industry's expansion. As smartphone technology advances and internet usage rises, OTT services are benefiting the entertainment industry. The abundance of free time and thirst for entertainment during the pandemic have influenced the demand for OTT services. The study shows that during the pandemic, data usage, internet subscribers, and the proportion of internet subscribers all increased. Cheap data plans, a growing number of people using broadband, and rising smartphone sales are the major factors fueling OTT growth. It tries to evaluate the socioeconomic engagement of OTT media firms in their promotion and strategies.

Chapter V talks about the Digital Disruption Model: Redefining the Healthcare Sector with Innovation

Healthcare executives are gaining the necessary benefits for patients thanks to innovations like the combination of artificial intelligence and machine learning, advancements in virtual reality, robotic process automation, and the use of bio-sensors in mobile devices, among others. With startups introducing new business models, key disruptive innovation is occurring, and the future appears promising, with investments totaling US\$ 679 million in 2018. However, there is a dearth of literature on this phenomenon in the context of India. The current chapter aims to spark discussion within the Indian healthcare industry about disruptive and digital innovation to identify what types of disruption agents, such as technological enablers, business models, and value networks, appear to be emerging from various innovation clusters in relation to their digital transformational efforts and to assist policymakers in making informed decisions.

Chapter VI talks about a Study on Digital Transformation Empowering Human Resource Management

Businesses and employees are under pressure to adapt as a result of quick globalization and expansion of digital technology. In the business world, the phrase “digitalization” today refers to the need for organizations to adopt it if they want to stay updated. Prior studies have focused on the impact of digitalization on marketing and organizational success, including consumer preferences, buying patterns, and customer relationship management. Academic research, particularly that on HRM, tends to give less weight to how it affects internal business. Consequently, the goal of this research is to learn more about human resource management in the digital age. The goal of this study is to show how digital HRM can improve organizational effectiveness.

Chapter VII talks about an Investigation of Industry 4.0 with Client Value Added in the Business Industry

Industry 4.0, which was established in 2011, refers to a more advanced level of industrialization in which the entire process is managed by automatic or artificial intelligence-enabled machinery with very little room for human interaction. With the help of this technology, a networked channel for continuous data flow has been established between the production unit's machines and electronic retailers (E-retailers). Based on the data these retailers receive from the production unit's machines over the network, they offer services like cloud computing and other services. Data from customers, manufacturers, and workers, among others, is shared among machines *via* the internet; these machines send data *via* sensors from client machines/computer systems to service provider organizations, and these service providers analyze massive amounts of data using high-tech computer systems. The rationale behind this is to provide more customized services as well as add more value for clients; this will establish trustworthy relationships between clients and service providers, enhancing client loyalty towards the e-retailer and consumer loyalty towards the manufacturing unit at the same time.

Chapter VIII talks about the Innovations in Environment and Science: A Study on Models of Sustainable Environment across the World to Achieve SDG-9

In today's society, digitalization is an instrument, but it is also a means of survival that opens up new options, such as knowledge without time constraints through continuous education. This current study delves in to the unique ideas, practical examples, and models that have

been adopted globally as disruptive technologies of their outcomes and related problems, thus demonstrating the fundamentals of sustainability with its implementation in modern society. The study critically assesses the benefits and challenges of contemporary transformation as well as the effectiveness of these technical processes. The aspect of UN SDG-9 has also been discussed in the study that how current technologies are working towards achieving this digitalization in industries to satisfy this United Nations target.

Chapter IX talks about the Understanding of General Population toward Global Energy Crisis: A Qualitative Study

When it comes to global energy requirements, consumption, and energy sources, the last century and recent past were heavily reliant on various types of fossil fuels. These fossil fuel energy sources have long served humans, powering the Industrial Revolution in the 17th and 18th centuries. However, like other natural resources, fossil fuel supplies are rapidly declining and are anticipated to run out in the near future. The world is currently experiencing its worst energy crisis in history. In recent years, important events like the COVID-19 pandemic, the post-pandemic economic recovery, the recent Russia-Ukraine war, and harsh weather conditions caused by greenhouse gas emissions and global warming have resulted in a severe energy crunch in terms of fossil fuels. This has had a significant impact on the lives of the common populace. As a result, an attempt has been made to ascertain the general population's comprehension of numerous ideas linked to energy and its sources, problems and solutions in terms of the global energy crisis.

Chapter X talks about Changing Competitive Business Dynamics of OTT Platforms' Viewership for Transformational Digital Engagement: Post-Pandemic Entrepreneurship.

This chapter seeks to comprehend the potential factors that influenced the audience and acceptability of OTT platforms during the COVID-19 pandemic. The general public's consumption of entertainment, as well as their perception of it, has grown rapidly over the years. The demand for such services is growing all the time, resulting in high acceptance rates among the general public. The onset of the COVID-19 pandemic has favorably impacted the OTT landscape in terms of consumer viewership, content generation and distribution across OTT platforms, and customer involvement on the part of service providers. In comparison to the previous year, the subscription growth rate for OTT Service providers surged seven times around March 2020. It might be assumed that OTT platforms have inexorably become a part of the common person's life. Many factors have influenced the inclusion and expansion of this service, including Intention of Use, Accessibility, Content Quality, and Free Time, to name a few.

Chapter XI talks about Women-Driven Innovation in Industry 5.0 Post Pandemic

Women have disproportionately been affected by the COVID-19 outbreak, undoing decades of progress toward gender equality. Women-led firms have suffered badly economically, particularly in the pandemic-affected industries. The Sustainable Development Goals (SDGs) are a call to action in the United Nations 2030 Agenda to foster prosperity by addressing global challenges such as poverty and inequality (SDGs 5 and 9), with a special emphasis on catalyzing women's innovation-led entrepreneurship, resulting in economic empowerment for the world's future. Recent research has revealed the type of assistance that women-owned businesses require the most in order to recover and continue operation. These include government grants and stimulus funding, as well as private sector capital and financing, innovation assets for implementing cutting-edge technology and participating in technology-

intensive activities, programs and trainings to advance digital and entrepreneurial skills. It is critical to actively support and promote public-private initiatives that assist women entrepreneurs in adapting to new technologies, innovating, developing digital skills, and improving access to financing and financial support. In light of Industry 5.0, the goal of this research is to identify the crucial characteristics that can support innovation driven by female entrepreneurs.

Chapter XII talks about Managing Knowledge Processes and Conceptual Review for Higher Education Institutions

Higher education is the backbone of any country, determining where we stand and where we wish to go. The goal of higher education is to offer students a platform to improve their knowledge, skills, and attitude in their chosen field of study. Each course has its own set of objectives and learning outcomes that should be expected upon completion. Despite these attempts, there is a significant gap in terms of the skill set required to make a student employable. This is one of the bottlenecks in the overall teaching-learning system. Through this research chapter, the author seeks to identify systemic gaps and proposes a redesigned approach to achieving higher education's goals.

Chapter XIII talks about the Implementation of the Internet of Things (IoT) in Human Resource Management: An Overview

One of the most important technological developments in recent years is the idea of the Internet of Things (IoT). The Internet of Things, to put it simply, is a system whereby all people, organizations, and objects are connected to one another across a network segment to continuously exchange data without the need for human involvement, fully stoking business. The ease of tracking efficiency has never been greater, thanks to technology. More than ever, communication tools, wearable computing devices, trackers, and other technologies are influencing business and daily life. This chapter tries to provide a history of IoT deployment in HRM. The emergence of mobile job seekers and the use of microchips to manage personnel are just two examples of how the expansion of the Internet of Things (IoT) is expected to change the way businesses and human resources departments function.

Chapter XIV talks about Artificial Intelligence (AI): A Metamorphic Transformation in Healthcare Services

All facets of human existence are significantly influenced by artificial intelligence, and technology is supposed to enhance human welfare. Healthcare is a significant area in this regard, and artificial intelligence is accelerating development. With the help of smart gadgets, AI can deliver improved healthcare services. Using the Internet of Things (IoT) and artificial intelligence, small, portable gadgets are now improving the quality of life for people. These tools are used to diagnose and treat a variety of brain illnesses in addition to assisting in the diagnosis of diseases like Alzheimer's disease. The survey is conducted to better understand how patients and healthcare professionals (doctors and nursing staff) feel about artificial intelligence. Super specialty private hospitals in Vizag, Andhra Pradesh, and the capital region of Odisha are included in the study's scope.

Thus, the goal of this book is to provide a high-quality publication with unique insights and techniques of application for current scholars and readers. This book provides an excellent summary of how Big Data analytics transforms organizations and organizes long-term competitive innovation.

Sukanta Kumar Baral

Department of Commerce, Faculty of Commerce & Management
Indira Gandhi National Tribal University (A Central University)
Amarkantak, Madhya Pradesh, India

Richa Goel

Symbiosis Centre of Management Studies, Noida
Symbiosis International Deemed University, Pune, India

Tilottama Singh

Uttaranchal Institute of Management
Uttaranchal University, Dehradun, India

Erdener Kaynak

School of Business Administration
Penn State University, Harrisburg
777 W. Harrisburg Pike
Middletown, USA

&

Vishal Jain

Department of Computer Science and Engineering
School of Engineering and Technology
Sharda University, Greater Noida, India

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List of Contributors

Ashima Bhatnagar Bhatia	Vivekananda Institute of Professional Studies – Technical Campus, New Delhi, India
Arun Velu	Equifax, Atlanta, USA
Ashish Joshi	Graphic Era Deemed To be University, Uttarakhand, India
Ashutosh Priya	Department of Applied and Regional Economics, Mahatma Jyotiba Phule Rohilkhand University, Bareilly, Uttar Pradesh, India
Aurodeep Kamal	KIIT School of Management, KIIT University, Bhubaneswar, Odisha, India
Arpita Nayak	KIIT School of Management, KIIT University, Bhubaneswar, Odisha, India
Abhiraj Malia	KIIT School of Management, KIIT University, Bhubaneswar, Odisha, India
Biswajit Das	KIIT School of Management, KIIT University, Bhubaneswar, Odisha, India
Bhubaneswari Bisoyi	Sri Sri University, Cuttack, Odisha, India
B.C.M. Patnaik	KIIT School of Management, KIIT University, Bhubaneswar, Odisha, India
Chitra Krishnan	Symbiosis Centre for Management Studies, Noida, Symbiosis International Deemed University, Pune, India
Debendra Nath Das	Mahatma Gandhi National Council of Rural Education, Hyderabad, India
Flavio De Sao Pedro Filho	Department of Management and Economics, Federal University, Rondonia, Brazil
Hitaishi Singh	Department of Home Science (Extension Education & Communication) ANDNNMM (CSJM University) Kanpur, India
Ipseeta Satpathy	KIIT School of Management, KIIT University, Bhubaneswar, Odisha, India
Isha Pant	Department of Computer Science and Engineering, THDC Institute of Hydropower Engineering and Technology, Uttarakhand, India
Jaya Bharti	Department of Psychology ANDNNMM (CSJM University) Kanpur, India
Jasmine Mariappan	UTAS, Ibra, Oman
Kari J. Lippert	The University of South Alabama, Mobile, USA
Madhuri Yadav	Department of Commerce, Indira Gandhi National Tribal University, Madhya Pradesh, India
Mohammad Nasfikur R. Khan	The University of South Alabama, Mobile, USA
Navita Mahajan	Amity University, Uttar Pradesh, India
Neha Rastogi	Doon Business School, India

x

Neeru Sidana	Amity School of Economics (ASE) Amity University, Noida, U.P., India
Pragya Baluni	THDC Institute of Hydropower Engineering and Technology, Uttarakhand, India
Preetiraj Pattnaik	Centurion University of Technology and Management Bhubaneswar, India
Pawan Whig	Vivekananda Institute of Professional Studies - Technical Campus, , New Delhi, India
Prasanta Kumar Mohanty	Centurion University of Technology and Management Bhubaneswar, India
Robert J. Cloutier	The University of South Alabama, Mobile, USA
Rabinarayan Patnaik	Faculty of Management Sciences, Siksha 'O' Anusandhan (SOA) Deemed University, Bhubaneswar, India
Richa Goel	Symbiosis Centre for Management Studies, Noida, Symbiosis International Deemed University, Pune, India
Rajeev Ranjan	Uttaranchal University
Ravi Kumar Gupta	Department of Humanities and Management Science, Madan Mohan Malaviya University of Technology, Gorakhpur, India
Sukanta Kumar Baral	Department of Commerce, Indira Gandhi National Tribal University, Madhya Pradesh, India
S. K. Baral	Department of Commerce, Indira Gandhi National Tribal University, Madhya Pradesh, India
Supriya Lamba Sahdev	ISBR Business School, Bangalore, India
Shama Kouser	Department of Computer Science Jazan University, Saudi Arabia
Tilottama Singh	Uttaranchal Institute of Management, Uttaranchal University, Dehradun, India
Udit Maheshwari	Department of Humanities and Management Science, Madan Mohan Malaviya University of Technology, Gorakhpur, India
Yusuf Jibrin Alkali	Federal Inland Revenue Service, Nigeria

CHAPTER 1**Risk Analysis of Implementing Immersive Technology in the Healthcare System****Mohammad Nasfikur R. Khan^{1,*}, Kari J. Lippert¹ and Robert J. Cloutier¹**¹ *The University of South Alabama, Mobile, USA*

Abstract: An immersive environment allows people to interact with a virtual environment. Despite its relatively short history, immersive technology still finds applications in medicine. There are numerous medical applications of immersive technologies like virtual reality, augmented reality, and mixed reality, including the improvement of vision, treatment of behavioral disorders, rehabilitating patients, and creating customized fitness routines. The objective of this chapter is to assess the risks associated with a technology-based healthcare system that benefits both patients and professionals. In addition to delivering training and improving patient care, immersive healthcare training systems help facilitate the delivery of training. Our first step is to describe how the system functions, followed by risk analysis, such as Ishikawa, Fault Tree Analysis (FTA), and Causal Loop Diagram (CLD), to highlight the three biggest risks associated with the system. Further, this chapter will discuss the monitoring and management of risks.

Keywords: AR, CLD, FTA, FMEA, Ishikawa, Immersive technology, Risk management, VR, Virtual environment.

INTRODUCTION

Immersive technology allows for the rendering of a computer-created environment immersively. Medical sciences is among the fields in which immersive technology is most useful. Immersive technology is still in its early developmental stages in the medical field. It has already been reported that VR systems have been introduced to aid doctors and medical staff in their learning process. In addition to training and rehabilitation, immersive technologies like VR are also helpful for visually impaired people, people suffering from psychiatric disorders, and amblyopia sufferers. At the moment, there are no technology-based immersive experiences that are suitable for both patients and healthcare professionals. The focus of this chapter will be on an immersive and interactive

* **Corresponding author Mohammad Nasfikur R Khan:** The University of South Alabama, Mobile, USA; E-mail: mk2121@jagmail.southalabama.edu

digital healthcare system. A variety of devices and sensors are incorporated into this system, as well as immersive gadgets. Consequently, users can use it anytime throughout the day. This chapter also discusses several important aspects of the immersive technology-based medical system.

- Describe immersive technologies.
- Discuss how immersive technologies are used in medical sciences.
- How can immersive technologies be used in medical education?

It is possible to use this technology with a variety of devices, including immersive glasses, wrist watches, and sensors. Users can access the system according to their needs. By using this system, educators can upload content according to their preferred time. On the other hand, learners can access this content according to their needs. Furthermore, clients can seek medical providers based on their specific requirements. Clients may also trade data with them, receive comments, contact specialists, obtain surgical aid, exchange psychological information, and ultimately, access an emergency system.

The first step in understanding this system is to examine its background. In the next section, we discuss how the system operates, revealing its working process. Next, we use different risk assessment procedures to reduce the chance of failure using risk assessment techniques. This section discusses and explains the processes for handling risk and maintaining it.

BACKGROUND

Immersive Technologies

To create new experiences, immersive technology combines the physical world with a virtual or simulated one. There are two main types of immersive technologies: augmented reality (AR) and virtual reality (VR).

VR

The concept of virtual reality is a computer-generated simulation of a three-dimensional environment. VR technology allows users to experience a virtual world using a computer-based operating system and other technologies. This alternate world is simulated using different devices, which enhances the sense of realism in people. The use of VR technology has transformed the way students are trained and how teachers learn. Instead of focusing on teaching, teachers can focus on learning. Multimedia Cone of Abstraction (MCoA), a model of active learning based on Dale's Cone of Experience (CoE), occurs as learners engage in

activities within a virtual world. As a replacement for the CoE's foundation level, "Direct Purposeful Experiences" demonstrate how students can interact with and benefit from highly realistic representations. The student may be able to gain a better understanding of work or concepts if he or she receives timely feedback and can improve at their own pace. In addition, patients can directly contact medical professionals to receive fast and rapid responses. The server can also be used by medical professionals for data collection and feedback.

AR

AR continues to be the most popular technology trend due to the availability of handheld devices that show AR. It is an interactive multi-media technology that combines virtual and real elements, enables real-time interaction, and creates three-dimensional maps. First, AR and VR are contrasted, then computer-generated models in live-action movies are discussed, and annotations and overlays on videos are shown.

To design and develop technologies that mediate human communication, it is useful to have a theory of human communication behavior. Due to the lack of appropriate technology, social acceptance, usability, money, and time, as well as a lack of knowledge of what can be achieved with AR in medical sciences, augmented reality technology has yet to gain traction even though it has been on the market since the 1980s. Additionally, traditional augmented reality applications must also combine virtual and real-world information, be interactive, and support 3D registration.

Immersive Technologies in Medical Sciences

In healthcare education, simulation training has been shown to improve knowledge acquisition and competency. VR training can help healthcare professionals teach medical students to avoid situations that could lead to poor outcomes in a patient-practitioner relationship. For medical students, VR technology has the potential to be a valuable interactive, experiential tool that can help them develop the skills needed in a real-life scenario, as well as a cost-effective approach to repeatedly practicing simulated clinical scenarios in healthcare. By using VR, students can practice without fear of making real-life mistakes, prepare for diagnosing sickness indicators, and even perform complicated procedures.

By providing a suitable training method, VR simulations eliminate the need for cadavers or animals to gain professional knowledge and create crucial practical skills in medicine. While there is still room for improvement in the haptic (touch) sense, procedural, visual, and aural senses can be trained by using this method.

Internet of Things (IoT) in the Agriculture Sector toward Urban Greening

Pawan Whig^{1,*}, Shama Kouser², Ashima Bhatnagar Bhatia³, Arun Velu⁴ and Yusuf Jibrin Alkali⁵

¹ *Vivekananda Institute of Professional Studies - Technical Campus, New Delhi, India*

² *Department of Computer Science Jazan University, Saudi Arabia*

³ *Vivekananda Institute of Professional Studies – Technical Campus, New Delhi, India*

⁴ *Equifax, Atlanta, USA*

⁵ *Federal Inland Revenue Service, Nigeria*

Abstract: The use of Internet of Things (IoT) technology has the potential to greatly improve agricultural and farming operations by increasing productivity and efficiency. This study analyzed recent developments in IoT applications in agriculture and farming and found that the most common sub-verticals were water management and crop management. Additionally, the study identified sensor data for soil moisture as a prevalent area of focus. The research also found that the most commonly used technology in the development of IoT applications was Wi-Fi, followed by mobile technology. The agricultural sector was found to receive more attention in terms of research compared to the farming sector. These findings can be used as a guide for those in the farming industry who want to improve and expand their use of IoT to increase efficiency. The study also highlighted areas for future research, such as scalability, heterogeneity, IoT system design, data processing methodologies, the size of the experimental land or farming area, and IoT security.

Keywords: Agriculture, IoT, Security, Surveys, Technology.

INTRODUCTION

The need to improve productivity in farming has become imperative due to various factors such as a rapidly increasing global population, which requires a 70% increase in food production by 2050, diminishing farming land and natural resources, and decreasing yields of key crops. The situation has been further compounded by the scarcity of resources such as fresh water and arable land and

* **Corresponding author Pawan Whig:** Vivekananda Institute of Professional Studies - Technical Campus, New Delhi, India; E-mail: pawanwhig@gmail.com

the decreasing agricultural workforce. The reduction in the number of agricultural workers has led to the use of internet connectivity solutions in farming practices. IoT technologies are aimed at addressing this issue by helping farmers ensure successful harvests, financial stability, and environmental conservation. Precision agriculture is the use of IoT technology to achieve optimal resource allocation for high crop yields and reduced costs. Fig. (1) illustrates how precision agriculture employs IoT technology to ensure optimal resource allocation results in high agricultural output and lower operational costs.

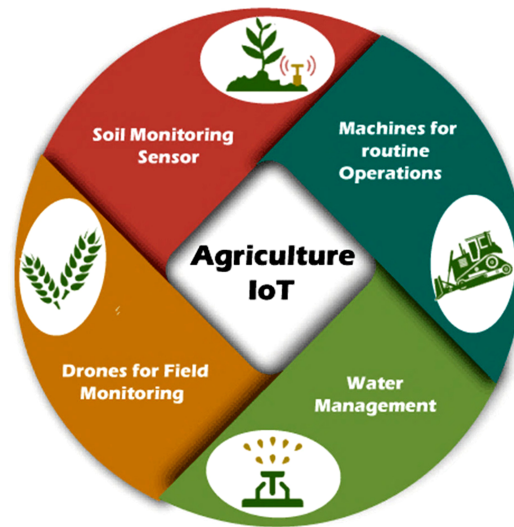


Fig. (1). IoT technologies in agriculture.

According to a BI Official estimate, there would be 75 million IoT systems in use in the agricultural industry by 2020, with a 20% annual growth rate. The best farming sector is anticipated to double in size from a little over \$5 billion in 2016 to \$15.3 billion in 2025.

The usage of fertilizer, the number of visits made by personal vehicles, and the efficient use of resources like electricity and water are just a few examples of how IoT-based precision agriculture helps gardeners and farmers reduce waste and increase productivity. IoT smart farming solutions use sensors to monitor agricultural land while managing the watering system. Farm owners can monitor the condition of their farms from any location. They can select between manual and automatic methods for carrying out the necessary actions based on the data. If the moisture level lowers, the farmer can utilize sensors to initiate irrigation. Fig. (2) illustrates the effectiveness of smart cropping.

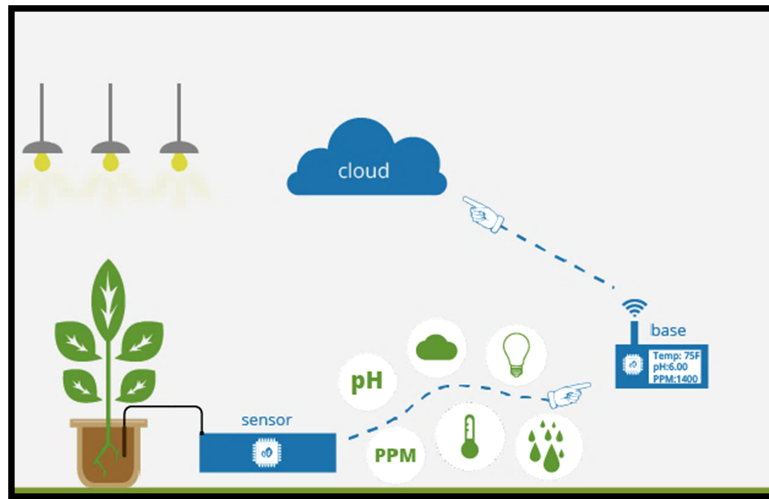


Fig. (2). Intelligent farming.

Agriculture is one of several industries that have been negatively impacted by the Industrial Internet of Things (IoT) to date. By the end of 2018, the connected agriculture market had a value of USD 1.8 billion and was continually expanding. It is projected to reach USD 4.3 billion by 2023 with a CAGR of 19.3%.

IoT technology is used to create automated machinery, networked gadgets, autonomous vehicles, and smart wearables. The IoT has, nevertheless, had the most impact on agriculture. 1.9 trillion people will live in the world by the year 2050, according to latest statistics. And in order to feed this vast population, the agriculture industry is compelled to use the Internet of Things. Among the difficulties are those caused by climate change and extreme weather. The late 20th century saw the introduction of mechanical advancements like tractors and harvesters into agriculture operations all across the world. And because of the consistently rising demand for food, the agriculture industry largely depends on fresh ideas.

Agricultural productivity has increased at a lesser cost thanks to the Industrial IoT. IoT-powered smart solutions will become more prevalent in agriculture operations during the coming years. In fact, according to a few recent reports, the agriculture sector would have an IoT device installation growth rate of 20% CAGR. And by 2024, there will be 225 million connected agricultural devices, up from 13 million in 2014.

A vendor of IoT solutions and business owners in rural or underdeveloped areas had difficulty implementing their solutions since there was a lack of a consistent

CHAPTER 3

Embodied Immersion: Exploring the Convergence of Haptic VR and Pervasive Visual Sensors

Isha Pant^{1,*}, Ashish Joshi² and Pragya Baluni³

¹ Department of Computer Science and Engineering, THDC Institute of Hydropower Engineering and Technology, Uttarakhand, India

² Graphic Era Deemed To be University, Uttarakhand, India

³ THDC Institute of Hydropower Engineering and Technology, Uttarakhand, India

Abstract: Virtual Reality (VR) technology has exponentially gained significance in recent years, providing end users with a virtual world in which users can develop virtual habits or manipulate the items in the virtual scene using their limb movements. As computers and information technology advance, users are searching for innovative types of Human-Computer Interaction techniques to provide a richer experience. In contrast, virtual scene modeling research can help consumers have a more realistic experience and ease of access. This chapter will largely concentrate on the perspectives on Augmented Reality (AR) and VR in the future on a global scale, taking VR strategies that rely on Scene Modeling, Statistical Analysis and Sensor Networking and taking into consideration the research techniques by examining the interactive VR technology from the perception of Visual Sensor Network (VSN), which tends to offer visual information to VR systems, also leading to concise and effectual image data to aid in the creation of a digital model. Simultaneously, a diverse set of applications tends to give the booming VR industry the confidence to append more value.

Keywords: Human-computer interaction, Sensors, Scene modeling, Virtual reality, Visual visualization.

BACKGROUND AND DRIVING FORCES

The origin of virtual and augmented reality technology can be traced back to 1838, when Charles Wheatstone invented the stereoscope, which superimposed an image over each of the user's eyes, culminating in a distant 3D image. Virtual Reality addresses the intricacies and pragmatism of realism and is demonstrated by virtual humans who glance, move, and act like real humans. It has the ability to be used in dynamic ways with far-reaching impacts across many research domains. Virtual reality technology is critical to the realization of telesensation. It

* **Corresponding author Isha Pant:** Department of Computer Science and Engineering, THDC Institute of Hydropower Engineering and Technology, Uttarakhand, India; E-mail: ishapant324@gmail.com

features an intuitive simulated reality in which viewers can explore, walk around, and engage with virtual items (Chatzopou-los *et al.*, 2017). Virtual worlds, like the real world, show us a stereo vision image, relying on our vantage point.

We are constantly bombarded with screens. It is almost hard to get away from them. Virtual reality enables people to wear goggles or headgear in order to fully delve into the virtual world. While overlaying graphics on a tablet or smartphone is a more popular application of augmented reality than projecting visuals onto clear screens (Costa and Peixoto, 2021). Nobody had ever considered AR experiences or implementations on a smartphone before. This unforeseen utilization of mobile augmented reality validated the global consumer adoption of augmented reality. Within the last three decades, the Internet revolutions have had a profound impact on the growth and integration of new technologies, particularly e-collaboration. Human-Computer Interaction (HCI) analysis, like other fields of study, has become popular lately. In reality, interaction design is a multidisciplinary field that includes computers, pictures, cognitive sciences, psychology, and other fields. Wireless sensor networks (WSN) have received great interest in the academic field in recent years. WSN is made up of numerous small devices known as nodes, which include sensing, refining, communication, and power distribution systems. Distributed networks help identify the physical setting and collect crucial data, which are then aggregated using wireless transmissions. Because of the growing demand for innovation, VSN combined with tiny cameras has rapidly become a major research area. The VSN may sample visual images in addition to the fundamental operations of the conventional WSN. This implies that VSN not only strengthens fundamental applications like conventional tracking and environmental monitoring, but it also expands into new domains. Furthermore, as a base, VSN has aided in the development and use of numerous technological innovations. In virtual reality, for example, programmers may use the VSN to get more precise parameters and visual information to construct a more sensible scene model or directly produce the impact of remote access scenarios with the aid of the remote VSN. Virtual scene creation indeed holds significant importance in the realm of VR goods. It serves as the foundation for immersive experiences in various applications, including gaming, entertainment, education, training, design, and more. This is why virtual scene creation is a major priority for VR goods. Leveraging a large-scale visual sensor system in the actual world is a big task that may be prohibitively expensive for the majority of academics intrigued by constructing and exploring sensor networks. Furthermore, most privacy laws prohibit the vigilance of individuals in public settings for research purposes. Aside from legal constraints and economic considerations, the use of realistic digital realities in network analysis includes significantly greater fluidity during the testing and evaluation cycle, thus speeding up the schematic design. For the purpose of visual

sensor network algorithm validation, the virtual environment provides handy ground data. Because experiments in the virtual environment are fully reproducible, we can easily alter the methods and settings and quickly assess their effect. In the simulated environment, the harsh real-time restrictions of the actual world may be readily eased (Baker, 2017). These technological advances are still floundering in the commercial world due to the elevated production costs and the intricacies of AR/VR devices, but early advent has come. So, how near are we to mainstream adoption?

VR has been demonstrating several promising and impactful use cases across various industries, ranging from real estate to tourism. Even though augmented reality technology is somewhat less established than virtual reality due to constraints, lack of standardization, and increased costs, it is already being used in sectors such as manufacturing, logistics, and healthcare. Augmented reality perceptions are usually accomplished *via* headsets such as Vuzix, ODG, Meta, and HoloLens. Indeed, the indications suggest that VR technology is poised to reshape industrial and commercial marketplaces in significant ways. The coronavirus pandemic has boosted the adoption of hybrid reality perceptions, which combine in-person and digital aspects. Brands, marketers, and consumers are interested in XR technologies because they have ushered in the next era of human connection. Advancements like XR and motion capture have opened up a whole new world for visual story telling that links individuals to their surroundings and tend to make a labeled experience feel more rooted, genuine, beneficial, and interactive. Nevertheless, there is still much progress to be made before all these technologies can be widely embraced (Azuma, 2001).

Perception and Reality

With the extended reality (XR) regime already in full swing, it is easy to foresee a future where the outline between the real and virtual worlds will become much more muddled than they are now. Everything that pertains to our view of things is the result of our senses. Subsequently, in essence, everyone's reality is distinct. Taking this a step further, it stands to reason that if you occupied your senses with additional computer-generated or simulated information, your experience of reality would alter, resulting in the emergence of a new, virtual one (Doerner *et al.*, 2022). Any interference with humans' natural sense of reality might be seen as "mediating" reality. Thus, different types of "mediating" realities existed long before the contemporary computer. To understand the notion and virtue of virtual reality, it is important to fully identify the notion of perception. Perception is the route through which man gathers and analyzes information about his surroundings. Perception involves both the senses and the brain. External senses and interior senses are the two kinds of senses. The exterior senses detect events

Post-Pandemic OTT Media Hegemony in India: A Socio-Economic Perspective

Madhuri Yadav^{1,*} and Sukanta Kumar Baral¹

¹ Department of Commerce, Indira Gandhi National Tribal University, Madhya Pradesh, India

Abstract: Following the COVID-19 pandemic, OTT media consumption made its way to India, revolutionizing the entertainment industry and altering how consumers consumed entertainment. The lockdown has forced consumers to stay home. It has brought about a paradigm shift in consumer behavior. The convenience of consuming content on OTT platforms is driving the growth of this sector. The entertainment sector is doing well with OTT services thanks to the rise in smartphone technical changes and rising internet usage. Due to the abundance of spare time and appetite for entertainment during the pandemic, OTT demand has been greatly influenced. India is a booming market, surpassing Australia, Germany, and South Korea and will become the sixth-largest market in 2024 with a CAGR of 28.6%, as per the PricewaterhouseCoopers report (PwC) published in August 2022. The OTT market continues to increase with growing demand in India. The data were collected from secondary sources. The research reveals that throughout the pandemic, both data usage and subscribers to the internet increased. The main drivers of OTT growth are cheap data plans, broadband penetration, and increasing smartphone sales. It aims to assess how OTT media companies are engaged in their promotion and strategy plans from a socio-economic perspective. The study shows that Hotstar has the highest market share, with 41%, followed by Eros Now at 24%. The findings show that the lockdown has brought socio-economic changes in the consumption patterns of consumers.

Keywords: COVID-19, Entertainment, Internet users, OTT media, Post-pandemic, Revenue market, Socio-economic.

INTRODUCTION

Media has played a crucial role in shaping lives, views, and opinions. With the introduction of technology, the media and its forms have evolved. One such media platform is OTT. OTT stands for over-the-top; the name is given since OTT devices go over the cable box, unlike TVs, in an attempt to provide access to

* Corresponding author Madhuri Yadav: Department of Commerce, Indira Gandhi National Tribal University, Madhya Pradesh, India; E-mail: yadavmadhuri444@gmail.com

video content to its end users. The customers can avail the streaming content directly over the web. The term is generally used to describe platforms for VOD programming; it refers to streaming audio, texting, and internet-based phone calling options. There are certain exceptions, but “OTT services” are generally monetized through paid subscriptions (Gomathi and Christy, 2021). Simply put, OTT is a medium by which TV and film content is provided on the internet, *i.e.*, individual experience based on and offered directly to viewers in a more personalized manner. In 2008, it was seen that Reliance Entertainment launched BigFlix as its first OTT platform to capture the viewers in the market. However, OTT started flourishing in India in 2013 after the launch of Zee TV and Sony Liv. Since Disney Hotstar was launched in 2015, it has become the most popular OTT platform. Similarly, Netflix came into the Indian market in 2016. With the emergence of OTT, the entire process of media churning (particularly entertainment) has changed as now the users are not required to wait to watch a show like a traditional TV system. They can subscribe to any OTT platform, select the genre they like, and watch their chosen content. Simply put, entertainment is enjoying oneself, usually with close friends and family. In the modern world, one of the most important sectors is entertainment, including the sub-fields of theatre, dance, film, literary publishing, music, fine arts, opera, dance, television, and radio. “Over-the-Top (OTT) entertainment, as this technology came to be known, is burgeoning into a multi-billion-dollar industry in India, cannibalizing smoothly into the established bastion of traditional television, cinema theatres, radio, and other traditional forms of entertainment” (MICA, 2021). The consumer has shifted from traditional TV to OTT platforms due to three factors: technological flexibility, customer-centric, and user behavior (Patnaik *et al.*, 2022). The study focuses on the emergence of customer behavior in the pandemic era in a specific industry, namely OTT or over-the-top services. It is a part of the entertainment sector, which is very big. Notably, the pandemic-induced lockdown fuelled the demand for OTT.

OTT in India and COVID-19 Pandemic

The COVID-19 pandemic outbreak confined people to their respective homes. Everything was impacted, from schools and colleges to theatres and offices. The world subsequently shifted to the internet. People solely relied on these OTT platforms for entertainment. The pandemic has changed how audiences consume media because OTT platforms offer convenience, productivity, and low cost. The OTT market continues to increase with growing demand in India (MICA, 2021). According to IBEF, the pandemic-induced lockdown fuelled the growth of these platforms even more, and people consumed entertainment themselves staying at their respective homes. Further, the subscription video on demand will significantly generate revenue, rising at a CAGR of 30.7% (Jain, 2021). The

pandemic impacted consumer behavior globally, and digital media assumed greater significance in keeping the public informed and entertained within the four walls of their homes. It can be observed that from the start, OTT platforms have flourished and grown in popularity; during the pandemic, it gained more popularity because of sudden changes in the consumption pattern of consumers (Patnaik *et al.*, 2022).

As per the PWC report, India is one of the 10 largest markets of OTT platforms in terms of revenue, where mobile internet users would double from 406 million to 805 million in 2022. Furthermore, demand for consumer-generated content, declining internet costs, and portability demand drive the OTT video business. The secret to the Indian OTT market is a greater emphasis on locally produced content. Additionally, India has shown all the possibilities to surpass South Korea, Germany, and Australia in total video revenue and would be the 6th-largest market in 2024. The PWC report revealed that OTT, a video platform, has been growing in and beyond the four walls due to the penetration of smartphones and smart TVs. The main source of revenue will be subscription VOD, which would grow at a CAGR of 30.7 percent, from US \$ 708 million in 2019 to US \$ 27 million in 2024. In 2020, after the COVID-19 outbreak, the total OTT revenue more than doubled when public entertainment was absent, and people were forced to spend additional time at home. Despite a slowdown in growth rates, the market will still develop at a remarkable CAGR of 14.1% to reach INR 21,032 crore in 2026. Subscription services, which accounted for 90.5% of revenue in 2021 and are projected to account for 95% of revenue in 2026, are responsible for fueling this rapid growth.

Literature Review

Sundaravel, E. and Elangovan, N. (2020) explored the emergence, benefits, and way forward for VOD streaming in India. They also introduced “OTT” varied services, growth drivers, technical knowledge, target audience features, content censorship, and anticipated future developments within the industry. The emergence of “OTT” has adversely affected the penetration of cable TV in India. Additionally, smartphones are the most widely used devices for watching OTT video content in India.

Fitzgerald, S. (2019) stated that Amazon and Netflix are engaged in a war in India, which will eventually cause the growth of the OTT market. Most of the users have been using YouTube as a free media library for video programming. The three forms of OTT apps in the Indian marketplace include communicate services, software ecosystems, and video and audio content material. Various regional content creation channels have accelerated the OTT sector and media

The Digital Disruption Model: Redefining the Healthcare Sector with Innovation

Preetiraj Pattnaik¹, Rabinarayan Patnaik^{2,*} and Prasanta Kumar Mohanty¹

¹ Centurion University of Technology and Management Bhubaneswar, India

² Faculty of Management Sciences, Siksha 'O' Anusandhan (SOA) Deemed University, Bhubaneswar, India

Abstract: With innovations and developments in virtual reality as well as artificial intelligence, machine learning, robotic process automation, the use of biosensors in mobile technologies *etc.*, healthcare executives are seizing the required benefits for patients. The introduction of new business models by start-ups is causing considerable disruptive innovation, and with investments totaling US\$ 679 million in 2018, the future appears bright. However, there is very little literature available on this phenomenon. This study focuses on instigating the discussion in the healthcare sector of India on the field of digital and disruptive innovation to spot what sort of agents of disruption can help policymakers make informed decisions. The scope of the study includes understanding the usage of this disruption, typically by the startups operating in the field of healthcare and so on. Further investigation found ventures from these companies in a digital context can be examined using the criteria of value for cost towards health services, the presence of a robust and sustainable business model, and a platform for customer-centric solutions. The approach was to see patterns that could show incumbents in the industry relying more on sustainable innovation and creating enough space to allow spectacular usage in the future with due changes in their traditional setups.

Keywords: AGG, Apps, DFR, DHR, Digital india, Digital transformation, Disruptive innovation, FODCAP, Healthcare sector, Health-tech start-ups, JTBD, Low-end disruptions, MM, New-market disruption, Organizational culture, Profit formula, Resources, RPR framework, SAR, Sustainable innovation.

* Corresponding author Rabinarayan Patnaik: Faculty of Management Sciences, Siksha 'O' Anusandhan (SOA) Deemed University, Bhubaneswar, India; E-mail: patnaik.rabinarayan@gmail.com

INTRODUCTION

Disruptive innovation combined with digital transformation talk about the complete restructuring of an industry, including its business models, due to the advent of digital technologies and the transformation of products, services, and processes. It is hoped that the healthcare sector will be as disruptive as other industries through the adoption of digital transformation. Even though new technology is constantly introduced, this change has yet to materialize. The reason this happens is because established businesses focus on developing better products and services through sustainable innovation for those customers who are the most demanding and profitable ones. As a result, the needs of some segments are either exceeded or unmet. When a smaller new entrant is able to cater to the needs of the segments that were overlooked by the incumbents earlier and is able to gain a strong market share over the course of time by providing good enough functionality, preferably at a lower price, then it proves to be disruptive. Given the low-profit margin provided by these ignored segments, the incumbents (who prefer going after more profitable and demanding segments) tend to ignore the entrant and do not fight it aggressively. The entrant then slowly moves up the segments, providing the performance that the customers in the profitable segments require while maintaining the competitive advantage that drove their earlier success. The major challenges faced by these Indian healthcare operators can be the next game changer for them, typically because of ever-increasing demands for specialized treatments. However, the infrastructure necessities in this process have been a great challenge and will remain one of the most potential limitations if not addressed sufficiently as well as timely. The optimism in bringing down these limitations to a greater extent can be because of the application of digital tools and interfaces in creating an efficient system accessible to patients from all types of segments and spectrums.

UNDERSTANDING DISRUPTION

Now, coming to answer one key strategic question, which is how the healthcare sector in India can respond to the digital changes to ensure sustainability? In order to answer this question, we need to know in detail about the theories of disruption and how they align themselves in the healthcare sector. Looking through the lens of understanding disruption, let us examine the healthcare sector of India. Before we begin, we need to understand that hospitals are not so easy to disrupt. The economic model of hospitals is unlike any other industry in the world due to its intricacy; it is not feasible in any other sector and, theoretically, should not even exist. Hospitals have historically marketed themselves as a one-stop shop with all the answers to anyone's health issues. In any other business, it will be difficult to do the same because of the complexity of the resources, which are very costly and

capital-intensive. Even though, now, there are specialty clinics and hospitals that provide care, it still remains quite complex. It was predicted that, with 1.3 bn population, healthcare in India was expected to be a \$372 billion industry by 2022, which would open a large, untapped market for new healthtech startups. Further, adding fuel to the fire are the low allopathic doctors-to-patient ratio (1:1596) and access to smartphones and the internet. From doctor consultation to lab diagnosis, healthcare services and tech-equipped medical devices, these startups have touched a variety of segments like diabetes, heart attack and even cancer. From standard X-rays to MRI scans, innovation has helped doctors see a better picture of the human anatomy and hence helped in giving a better diagnosis to the patient. Another such innovation is the Vacutainer for blood sample collection instead of a normal syringe. In both cases, the characteristics of sustainable innovation are fulfilled. Even though many technologies have been introduced in healthcare, there has not been any significant low-end disruption in the hospitals primarily because they have been utilized sustainably to help doctors and hospitals. These innovations cover little to reduce healthcare costs. For example, DocsApp, an approved tech-enabled multilanguage consultation service, was founded in 2015 by renowned doctors across India with expertise in more than 18 areas, such as general medicine, pediatrics, dermatology, gynecology, neurology, psychology, psychiatry, cardiology, oncology, sexology, and weight management and many more. The company says that around 65% of its user base is from rural India who were previously dominated by traditional channels. Currently, they are offering more than 100k consultations every month. Going ahead, it is looking to launch its interface in other regional languages and plans to make provisions that will enable the user to take unlimited specialist consultations for their family as well as introduce video doctor consultations. Even though it remains to be seen whether this company will be able to disrupt hospital business models because of the complexity of services at the higher end, for example, surgeries, it still is something to look forward to.

Earlier, the people of rural India were not able to consult good specialist doctors and get proper medical attention because of their geographical disadvantage and were mostly faced with scenarios where their loved ones suffered due to medical negligence, but now, due to the growth in technology, primary education, and cheaper data, people in rural India are able to afford smartphones. There are apps like Lybrate and Portea, which have changed the format; instead of the patient going to the doctors, now the doctors are coming to the patients through their smartphones and providing consultations through video and audio calls. This has created a fairly new market of patients who were previously unable to consult proper doctors at all. Posing a threat to incumbents by “flying under the radar” in the industry are consultation apps in the healthcare sector. Even though the application remains somewhat similar, they are catering to a new base of

CHAPTER 6**A Study on Digital Transformation Empowering Human Resource Management****Chitra Krishnan^{1,*}, Richa Goel¹, Supriya Lamba Sahdev² and Jasmine Mariappan³**¹ *Symbiosis Centre for Management Studies, Noida, Symbiosis International Deemed University, Pune, India*² *ISBR Business School, Bangalore, India*³ *UTAS, Ibra, Oman*

Abstract: Due to rapid globalization and spread of digital technology, businesses and employees are under pressure to adapt to them. The term “digitalization” in the business world currently refers to the requirement for businesses to adopt it if they wish to stay current. Previous research has concentrated on how digitalization affects marketing and organizational effectiveness, including consumer preferences, buying trends, and customer relationship management. However, academic research, especially that on HRM, tends to place less emphasis on how it influences internal business. Therefore, the objective of this study is to gain more knowledge about Human Resource Management in the digital era. This study seeks to demonstrate how digital HRM can enhance organizational performance.

This study relied on secondary data from various sources such as business reports, real-world examples, websites, professional blogs, and research papers. The aim was to examine the advantages and challenges of implementing digital transformation in human resource management, using illustrative cases of organizations with innovative business practices. The findings of this research are of great importance for corporate organizations looking to adopt digital human resource management and enhance overall organizational performance.

Keywords: Artificial intelligence, Big data, Digitalization, Human resource management, Organisation performance.

INTRODUCTION

The impact of the industrial and digital revolutions on society, businesses, employment, and daily life is widely acknowledged (Krishnan, 2009). These

* **Corresponding author Chitra Krishnan:** Symbiosis Centre for Management Studies, Noida, Symbiosis International Deemed University, Pune, India E-mail: ananya.chitra@gmail.com

revolutions have greatly enhanced communication capabilities, enabling interactions with larger audiences. The integration of human resources (HR) and information technology (IT) has been ongoing for some time. HR has incorporated various technologies such as data mining, the Internet of Things, HR analytics, human resource information systems (HRIS), and more recently, artificial intelligence (Bondarouk, Harms & Lepak, 2017; Strohmeier & Piazza, 2017; Stone & Dulebohn, 2013). The advancement of technology has played a significant role in the growth and development of companies. Various industries, including HR, have recognized the advantages of leveraging technology to streamline operations and address complex organizational challenges. To remain competitive and embrace comprehensive digital transformation, HR professionals must adapt and keep pace with the latest advancements in HR technology in today's rapidly evolving technological landscape.

In the rapidly evolving global workplace, future HR professionals will need to acquire new and diverse technical skills to adapt to unexpected shifts and advancements. It is crucial for HR specialists to assess the implications of transitioning to a decentralized economy, which, if managed effectively, can bring about increased freedom and flexibility. This emerging era calls for a novel organizational structure that combines the dedication of independent individuals in a socially sustainable manner. Consequently, there is a growing demand for HR management systems that can navigate these changes proficiently, and new HR managers should be prepared to embrace and lead in this evolving landscape (Anyim, 2011).

According to Indermun (2014), the dynamic competitive market environment and the recognition of the strategic significance of HRM have significantly transformed the role of human resource managers in contemporary times. Furthermore, the advent of artificial intelligence (AI) has automated non-repetitive cognitive tasks that previously relied on extensive access to vast amounts of data, commonly referred to as "Big data". As a result, HR managers now have the opportunity to focus on more strategic and value-added initiatives within their organizations (Makridakis, 2017).

In the current environment, business is conducted to satisfy the demands of international trade. Additionally, services, management skills, and technological transfer, as well as the transfer of goods across nations, all occur. The world has become smaller due to globalization in terms of communication methods. With further innovation, the financial and economic systems around the world have been merged. Digital technology helps the association become more successful by enhancing one of its most valuable resources—its employees. Digital HRM can be defined as an overarching concept that encompasses various integration

mechanisms and elements between HRM and IT, aimed at creating value within and across organizations for both employees and management. It serves as a framework for effectively implementing strategies, policies, and practices. With the outsourcing of numerous HR-related tasks, organizations now require HR professionals with new skill sets. It is crucial for the HR management division to understand and explore the interplay between human resources and information technology in an internet-centric society, as this knowledge can greatly benefit their operations. To enhance HR performance and leverage the potential of IT, it is essential to translate the analysis into practical implementation. By embracing digital technology, organizations can achieve a balance between efficiency and innovation. Collaboration between HR management and IT is crucial, as HRM plays a central role in shaping the organizational structure of many companies. By effectively integrating HR practices with IT solutions, organizations can optimize their overall performance and ensure that their HR functions align with strategic goals.

Previous research has primarily examined the impact of digitalization on marketing, overall behavior, and customer relationship management. However, academic research, especially in the field of HRM, has devoted comparatively less attention to understanding the internal implications of digitalization on businesses. Hence, the aim of this study is to fill this research gap and gain a deeper understanding of HRM in the digital era. The objective is to explore the HRM digital research landscape and its relationship with organizational performance, thereby contributing to a more comprehensive understanding of the topic.

Literature Review

Digital transformation, or digitalization, is a business model that leverages digital technology across various sectors of society (Stolterman & Fors, 2004). It involves converting existing products or services into digital forms, providing advantages over physical counterparts (Gassmann *et al.*, 2014). In this process, technology and human resources collaborate to achieve remarkable outcomes. While computers excel in efficiency and speed, digital transformation allows humans to focus on their unique capabilities. The concept of digital transformation was first mentioned by Patel and McCarthy (2000), although they did not coin the term. Although research specifically focusing on digital transformation is limited, Westerman *et al.* (2011) conducted a notable study titled “Research on Digital Transformation”, defining it as the use of technology to significantly enhance company performance or reach. Stolterman and Croon Fors (2006) provided a similar definition, emphasizing the changes brought about by digital technology in all aspects of human life. Digital transformation involves radical and fundamental changes driven by digital technologies rather than

An Investigation of Industry 4.0 with Client Value Added in the Business Industry

Ravi Kumar Gupta^{1,*}, Udit Maheshwari¹, Ashutosh Priya² and Debendra Nath Das³

¹ Department of Humanities and Management Science, Madan Mohan Malaviya University of Technology, Gorakhpur, India

² Department of Applied and Regional Economics, Mahatma Jyotiba Phule Rohilkhand University, Bareilly, Uttar Pradesh, India

³ Mahatma Gandhi National Council of Rural Education, Hyderabad, India

Abstract: Industry 4.0 has transformed the way businesses operate and deliver value to their clients. This research aims to investigate the influence of Industry 4.0 on client value added. The study reviews the literature on Industry 4.0 and client value added and conducts a survey to gather data from companies that have acquired technologies of Industry 4.0. The findings of the study suggest that Industry 4.0 has a remarkable and positive influence on client value added. The adoption of Industry 4.0 technologies results in improved efficiency, enhanced quality, increased customization, and greater customer engagement, all of which contribute to a better client experience and increased client value added. The paper concludes by highlighting the importance of Industry 4.0 for businesses seeking to improve their client value added and remain competitive in the marketplace.

Keywords: Business, Client, Industry 4.0, Technological Revolution, Value Added.

INTRODUCTION

Industry 4.0, also synonymous with the 4th Industrial Revolution, is a new phase of the Industrial Revolution that has metamorphosed the way businesses operate and deliver value to their clients. It is distinguished by the amalgamation of various kinds of digital technologies into the production/manufacturing process,

* Corresponding author Ravi Kumar Gupta: Department of Humanities and Management Science, Madan Mohan Malaviya University of Technology, Gorakhpur, India; E-mail: raviguptaeco@gmail.com

including the use of automation, artificial intelligence, the Internet of Things (IoT), and supplementary technologies. The adoption of Industry 4.0 has significant implications for businesses, including the potential to enhance client value added (Chen, 2019).

Client value added is a key component of business success. It refers to the additional value that a business provides to its clients beyond the core product or service. Client value added can take many forms, such as improved quality, increased customization, better customer service, and more. By providing additional value to clients, businesses can improve client satisfaction, increase loyalty, and ultimately drive revenue growth (Demir *et al.*, 2019).

The paper investigates the impact of Industry 4.0 on client value added. The paper reviews the literature on Industry 4.0 and client value added and conducts a survey to gather data from companies that have acquired technologies of Industry 4.0. The findings of the study are intended to provide insights into the impact of Industry 4.0 on client value added and highlight the significance of Industry 4.0 for businesses seeking to improve their client value added and remain competitive in the marketplace.

LITERATURE REVIEW

The literature on Industry 4.0 and client value added suggests that the usage of technologies of Industry 4.0 has significant potential to enhance client value added. One key way in which Industry 4.0 can improve client value added is through increased efficiency. By automating processes and using real-time data to optimize production, businesses can reduce waste, minimize downtime, and improve overall productivity. This can result in cost savings for clients, as well as faster turnaround times and more reliable delivery of products and services (Drath & Horch, 2014).

Another way in which Industry 4.0 can enhance client value added is through improved quality. The use of sensors and other advanced technologies can help businesses monitor and control the quality of their products and services in real time. This can result in fewer defects, fewer product recalls, and overall higher quality products and services. Clients are likely to value this improved quality, as it can help them avoid costly downtime, rework, and other negative outcomes (Fernandez-Carames & Fraga-Lamas, 2019).

Industry 4.0 can also increase customization, which can enhance client value added. Collecting and analyzing data on client preferences and behavior help businesses tailor their different products and services to satisfy the preferences of individual clients and provide adequate and required value to them. This can

result in more personalized products and services, which can lead to higher levels of satisfaction and loyalty (Foidl & Felderer, 2015).

Finally, Industry 4.0 can improve customer engagement, which is another key component of client value added (Ivanov, & Dolgui, 2019). The use of digital technologies can permit businesses to interact with clients in more innovative and creative ways, like through social media, mobile apps, and other channels (Janowski & Bak, 2020).

EVOLUTION AND DEVELOPMENT OF INDUSTRY 4.0

Industry 4.0 is the fourth Industrial Revolution that builds on the previous three industrial revolutions and involves the integration of advanced digital technologies into the manufacturing process. The following is a brief overview of how Industry 4.0 has developed over time:

Industry 1.0

The 1st Industrial Revolution started in the late 18th and early 19th centuries with the advent of mechanized production through the use of water and steam power. This led to the creation of large factories and mass production of goods (Kagermann *et. al.*, 2013).

Industry 2.0

The 2nd Industrial Revolution took place in the late 19th and early 20th centuries with the introduction of electricity and assembly line production. This enabled the mass production of goods on a larger scale and led to the development of the consumer society (Lasi *et. al.*, 2014).

Industry 3.0

The 3rd Industrial Revolution, also called the Digital Revolution, started in the 1960s with the introduction of computer technology and automation. This led to the development of computer-aided design and manufacturing, as well as the automation of many production processes (Lee & Kao, 2019).

Industry 4.0

The 4th Industrial Revolution, or Industry 4.0, began in the late 2000s with the integration of advanced digital technologies into the manufacturing process. This includes the use of the Internet of Things (IoT), robotics, artificial intelligence and data analytics to optimize processes of production and create more efficient, flexible, and customized manufacturing systems (Schneider, 2018).

Innovations in Environment and Science: A Study on Models of Sustainable Environment across the World to Achieve SDG-9

Navita Mahajan^{1,*}

¹ Amity University, Uttar Pradesh, India

Abstract: Digitalization in the modern world opens us to new options like information without any time constraints with continuous education, but it is also a means of survival. In order to effectively satisfy consumer expectations, a firm must integrate data and find methods to enhance its core business processes. The whole industry is working on innovative models that are eco-friendly and operate on a sustainable foundation for a better future. In order to demonstrate the fundamentals of sustainability with its application in contemporary society, the present study explores the distinctive ideas, real-world examples, and models that have been adopted globally as disruptive technologies. With regard to the success of these technical processes and the present change, the research has critically examined the advantages and difficulties. In the study, the issue of SDG-9 of the UN has also been connected to how the present technologies are contributing to the digitization of industry to achieve this objective of the United Nations. The study's foundation is secondary research, which includes data on many sustainable approaches to reaching technology in diverse modes. The research offers a few well-known ideas toward the conclusion to increase this transformation's visibility and usability. The study's implications indicate that everyone participating in the appropriate transition would gain, whether it be at the level of institutional, corporate, or public entities, for policy frameworks, model designs, and distribution through such digital and sustainable models.

Keywords: Digitalization, Innovation, Sustainable development, SDGs, Technology.

INTRODUCTION

The idea of sustainable innovation is a conceptual one. It draws attention to the notion that sustainable innovation entails making adjustments to a company's philosophy, beliefs, products, processes, and practices in order to innovate in a

* Corresponding author Navita Mahajan: Amity University, Uttar Pradesh, India;
E-mail: Navitamahajan07@gmail.com

way that creates environmental, social, and economic benefits (such as through effectively commercializing new ideas).

Sustainable product development and sustaining long-term corporate success are not incompatible goals. Businesses that prioritize sustainable production and consumption are increasingly benefiting from consumers' changing purchasing patterns, loyalty, and objectives.

The Global Sustainability Study (GSS), which Simon-Kucher & Partners performed in 2021, assessed more than 10,000 consumers from 17 different countries and offered insights into how consumers see sustainability and their willingness to pay for sustainable products.

It is significant to note that 80% of the respondents agreed that environmental sustainability is crucial and 63% of those respondents had already altered their purchase patterns to be more sustainable.

This shows that consumers are becoming more aware of the environmental effect of their purchase patterns, concerned about it, and ready to take action to lessen it. It also emphasizes the opportunity for businesses to generate profit *via* the creation and marketing of sustainable goods and services that cater to the demands of these environmentally concerned customers.

Sustainable Innovation and Traditional Innovation

Three critical traits set sustainable innovation apart from other types of innovation.

- Through the incorporation of environmental, social, and economic factors into their innovation processes, sustainable innovations assist companies in becoming more sustainable. By actively incorporating issues like human rights and climate change into their innovation processes, businesses can develop solutions that not only bring economic value but also have a positive impact on society and the environment. According to the definition of sustainable innovation, the goal is to “meet the needs of current generations without jeopardizing the needs of future generations.” Instead of concentrating just on immediate earnings, businesses that practice sustainable innovation search for methods that will have long-term benefits. They are more inclined to make investments in people and technology that will benefit the future.
- Sustainable innovation requires systemic thinking. Sustainable innovation involves companies looking outside of their own structure. They concentrate on the bigger system, which includes other businesses, the environment,

stakeholders, and communities to which they contribute. They are aware of the system's dependencies and links, as well as how their actions may have an impact on other businesses and vice versa.

- When long-term sustainable innovations are firmly embedded in a company's culture, they are more likely to be successful. Sustainable innovations are more likely to be successful when they are fully integrated into a company's culture and strategy, as opposed to being considered as an afterthought or a distinct endeavor, unlike traditional innovations, which are often carried out within a separate R&D department or unit. Sustainable-oriented creative ideas will be extinguished before they have a chance to develop when sustainability is not ingrained in a company's culture.

SDG 9

Goal: Establishing a robust infrastructure, promoting inclusive and sustainable industrialization, and supporting innovation are the objectives.

Motive: The primary objectives of the SDGs are societal development, environmental conservation, and economic success. These goals all depend on one another, reinforce one another, and call for action in areas like infrastructure expenditure, industrial expansion, and technology development. The global economy's dynamic structure and the rise in inequality make industrialization crucial for sustaining development. Providing everyone with high-quality opportunities is supported by resilient and creative infrastructure. Recognizing the interconnectedness of the economic, social, and environmental difficulties, SDG 9 places a strong emphasis on the value of cooperation and communication in overcoming these issues. We may increase our understanding of business and technology by cooperating and communicating clearly.

Outcome Targets:

Target 9.1: Develop sustainable, resilient and inclusive infrastructures.

Target 9.2: Promote inclusive and sustainable industrialization.

Target 9.3: Increase access to financial services and markets.

Target 9.4: Upgrade all industries and infrastructures for sustainability.

Target 9.5: Enhance research and upgrade industrial technologies.

The Sustainable Development Goal 9 (SDG 9) calls for the development of resilient infrastructure, the advancement of inclusive and sustainable

Understanding of General Population toward Global Energy Crisis: A Qualitative Study

Jaya Bharti^{1,*} and Hitaishi Singh²

¹ Department of Psychology ANDNNMM (CSJM University) Kanpur, India

² Department of Home Science (Extension Education & Communication) ANDNNMM (CSJM University) Kanpur, India

Abstract: If one goes back to the history of world energy requirements with regard to the consumption and sources of energy, the last century was largely dependent on various forms of fossil fuels. These fossil fuel sources of energy have served humanity for a prolonged era and powered the Industrial Revolution in the 17th to 18th century. However, like other natural resources, the reserves of fossil fuels are also depleting fast and are anticipated to finish completely in the coming years. Currently, the world is witnessing the greatest ever energy crisis. In the last few years, major events, especially the lockdown during the COVID-19 pandemic, post-pandemic economic rebound, the recent Russia-Ukraine war and extreme weather conditions occurring due to greenhouse gas emissions and global warming have led to a severe energy crunch in terms of fossil fuels. This has impacted the lives of the general population to a greater extent. In any such crisis, not only does the general population get directly affected, but it also plays a key role in energy conservation if they understand the nuances of the problem. Hence, an attempt has been made to find out the understanding of the general population, both males and females, about various terms related to energy and its sources, and problems resulting from this global energy crisis and their solutions. Responses were analyzed, conclusions were drawn and suggestions were provided to deal with the problem in an orderly manner.

Keywords: Alternative Energy, Energy Crisis, Energy Resources, Renewable Energy.

INTRODUCTION

Energy is the primary source of life on this earth; however, in the form of fuel, energy was the key player in the industrialization of the modern world, which began in Europe. Energy, therefore, is pivotal to attain material prosperity for any

* Corresponding author Jaya Bharti: Department of Psychology ANDNNMM (CSJM University) Kanpur, India; E-mail: Jayabharti_kn18@csjmu.ac.in

nation. This accumulation of material wealth ultimately becomes the medium for the overall development and growth of any nation. It is this reason why today all the countries across the world are desperately making all possible efforts to tap the various sources of energy in the form of fuel to achieve the path of development. “In the last century, there has been a huge exploitation of natural resources of energy for multiple purposes. Especially the industrialized nations took uninterrupted supply of cheap hydrocarbons for granted and exploited it to the extent of exhaustion” (Nashawi *et al.*, 2010).

It is estimated that if the exploitation of these energy resources continues the way it is taking place at present, then there will be a grave shortage of these resources on the earth after 2050. This situation of shortfall or interruption in the supply of energy resources is called an “energy crisis”. The energy crisis data shows that the global energy requirement has increased tremendously over the last 200 years. Experts in this field know that the resources are close to exhaustion. It is only a matter of time before conventional energy resources will end, for which we are really not ready right now. “The link between reckless consumption of these fuel energy sources for different activities, greenhouse gas emission and its consequences as global warming has been well proven through research evidence” (Reijnders & Huijbregts, 2007; Nashawi, 2010; Martins, 2018). There will certainly be a question - What are we going to do in the future without the fossil fuels that we have used in the past? The fossil fuels that have served the energy demands of mankind for long. The answer certainly is that our future is bleak as far as the availability of conventional sources of energy is concerned. During COVID-19 and afterward, the crisis became even more serious. “Europe and Asia both have had very strong economic recovery post third wave of COVID-19 pandemic. This raised tremendous demand for energy not only from industry, infrastructure sector and other businesses but also from domestic (homes) front” (Bordoff, 2021). Likewise, “in the first half of 2021, the demand for Liquefied Natural Gas (LNG) continued to grow due to switching from coal to gas to fulfill industrial power needs, especially from China” (Froley, 30 June, 2021).

“Also due to obstacles on coal-fired descent, economic rebound, and cold weather, demand for LNG increased in countries like Japan, Korea, and Taiwan.” (Elliott, 14 September, 2021)

“The picture seemed horrifying. Power crunch in China has already started leading to the closure of factories”, and in “India too, the situation is getting worse due to coal shortage”(Singh and Zhang, 27 September, 2022, S. Sundaria, *et al.*, 05 October, 2022). This is not only hampering the already obstructed and slowed economic growth but also has multiple ill consequences.

Therefore, “many countries of the world have started taking serious measures to deal with this situation by reducing the use of fossil fuels and promoting the use of innovative new energy sources such as solar power, wind power and biodiesel and increasing stocks” (Lazarus and Eselt, 2018; Leonard *et al.*, 2020).

Perhaps this was the reason why 193 countries of the world came together and signed the official document of SDGs 2030, formally named “Transforming Our World: The 2030 Agenda for Sustainable Development” (Pietrocmoli *et al.*, 2019; United Nations, 2015; Ahmed T. and D. Zhang, November, 2020). These goals were formulated and articulated by the United Nations after 2015 to set the development agenda for the future.

“A lot of attention and concern has been shown towards energy and its judicious and clean consumption by most countries of the world considering it as the key component for ensuring sustainable and inclusive development across the globe” (Pietrosemoli *et al.*, 2019). “This is confirmed by the fact that the world’s energy utilization has increased considerably from 8,588.9 million tons in 1995 to 13,147.3 million tons in 2015”, which “further rose to 0.8% in 2020. This was 0.2% higher than the projected worldwide energy consumption by the International Energy Agency (IEA) of 0.6% for 2020 as compared to 2019” (Ahmad *et al.*, 2020; Dong *et al.*, 2020a; IEA, 2020b).

This is a matter of great worry for the whole world community, and this is not where we are going to stop. Despite several attempts to keep a check on the amount and type of energy consumption, the picture is grim. Several international research projects on global energy needs and consumption have been carried out (Cooperation, 2015). “Global energy projects have been taken on radar and investigated by national agencies of various governments and international organizations” (Kohl W.L. Oil, 2019). But as technological advancement and population growth are taking place at a rapid pace, the requirement for energy usage is also rising. “Today’s call is making the supply of reliable and clean energy sources available and accessible for better and improved wellbeing of mankind”, which seems to be a big challenge (Central Statistics Office, Ministry of Statistics and Programme Implementation, GOI, 2020).

In addition, the “shift in the demand of coal in the power and manufacturing sector is expected to lead to further increased future energy consumption and consequently crisis” (Ahmad T. and D. Zhang, November, 2020). The critical situation that the world is expected to face in the coming years is the constantly increasing demand for energy from all regions across the globe. However, “this demand may vary from country to country and region to region”. In this context, IEA (2017) estimates that “out of total projected world energy requirement of 739

Changing Competitive Business Dynamics of OTT Platforms' Viewership for Transformational Digital Engagement: Post-Pandemic Entrepreneurship

Aurodeep Kamal^{1,*}, Abhiraj Malia¹, Biswajit Das¹, Ipseeta Satpathy¹ and Bhubaneswari Bisoyi²

¹ KIIT School of Management, KIIT University, Bhubaneswar, Odisha, India

² Sri Sri University, Cuttack, Odisha, India

Abstract: This research aims to understand possible parameters that influenced the viewership and acceptability with regard to OTT (Over the Top) platforms in the midst of the COVID-19 lockdown. The consumption of content by the general audience and its perception have evolved exponentially over the years. The advent of the internet has made the process more accessible and convenient. The emergence of OTT Platforms has enabled various service providers to deliver digital content like movies, shows, standups and documentaries to consumers *via* an internet connection. Favorable features like a wide catalog of genres and shows, flexible pricing and packaging allow a plethora of devices to deliver content at the sheer convenience of the consumer. There is an ever-expanding demand for such services, leading to substantial adoption rates amongst the masses. The inception of the COVID-19 pandemic has positively enhanced the OTT landscape in terms of consumer viewership, production and distribution of content across OTT platforms and customer engagement from the service provider's end. The growth rate of subscriptions for OTT service providers increased seven times in March 2020 in comparison to preceding years. It can be surmised that OTT platforms have inevitably become a part of the life of the average person. There are a lot of parameters that have affected the inclusion and growth of this service, like intention of use, accessibility, content quality and free time, to name a few.

Keywords: Accessibility, Consumer Viewership, Content Consumption, Customer Engagement, Intention of Use, OTT (Over the Top).

* Corresponding author Aurodeep Kamal: KIIT School of Management, KIIT University, Bhubaneswar, Odisha, India; E-mail: aurodeep.naarm19@gmail.com

INTRODUCTION

The materialization of the digital era in the international market has dawned on innumerable big industries, with entertainment market subtleties being noticeable emblems of such phenomenon. The emergence of over-the-top (OTT) platforms such as Netflix and Amazon Prime confronted the practicalities of conventional content watching behaviors of customers on a global scale, as well as in India. In January 2016, Netflix took the industry by surprise, revealing a synchronized introduction in 130 countries, including Korea, in an effort that marked “the birth of a global Internet TV network”. OTT Platforms are streaming services designed to let consumers watch video content, online or offline. According to Mordor Intelligence, “The OTT Market was valued at USD 101.42 Billion in 2020 and is expected to reach USD 223.07 Billion by 2026, indicating a CAGR of 13.87%.”

2008 saw the introduction of BigFlix, India’s first OTT platform, launched by Reliance Corporation. Following ‘Renaissance’, post-2016 was a significant era for Indians all over. People became increasingly aware of things around the world, thanks to the easy availability of high-speed internet to the masses on a wide scale. Adding to this is the rapidly increasing adoption of smartphones. When people cut the cord of their cable service and switch to watching television online, this is known as cord cutting. The desire to avoid advertising has been noted as one element that encourages cable cord-cutting. Ownership of high-end technology combined with the convenience of internet diffusion has led to people being exposed to multitudes of content. This was highly noticeable during the COVID-19 pandemic, as the most preferred mode of obtaining information during the pandemic while under lockdown was through the internet. The rise of Internet-based, over-the-top (OTT) streaming platforms, which bypass conventional distribution routes, is the main factor driving this change in media consumption. Most relevant sources of infodemiology involve mass social media such as Instagram and Facebook in addition to search engines, health websites, blogs and forums. The crippling effect of COVID-19 has especially impacted the growth of OTT services and the corresponding customer base. Over the course of a few successive years, far-reaching changes will be noticed in how content is consumed. One of them being Over the Top Content Consumption. In India, however, this surge in popularity of such platforms was not seen overnight. Netflix faced challenges in an attempt to acquire five million subscribers. However, in developing nations, consumers are hesitant to spend money on OTT platforms and instead choose to use the free content that is available online. India has also experienced a paradigm change from traditional television to OTT platforms during the last few years. Along with global content that is produced and made available for consumption, the ushering of indigenously-produced content has brought in a lot of rural masses into the mix. This has diversified the

visual media-consuming demographic into various categories. As a result, consumers were categorized as “cord loyalists”, “non-pay TV” and “cord couplers”.

The growth of online streaming services has introduced the culture of “binge-watching”, where multiple instances of a show can be watched in a single go. Factors like self-efficacy, attitude, purpose of use, skepticism towards technology, and overall convenience designate a drastic shift. This consequentially led to a rise in overall OTT viewership amongst the general populace, as people relied more on entertainment being delivered to devices of their choice due to the shutting down of theatres and the availability of run-of-the-mill content on cable television. This is true especially as the number of market players is increasing. As people have started watching content on OTT platforms progressively, the fact that OTT platforms have seen substantial inorganic growth by taking up the market share of other platforms has been evident. It is crucial for such services to keep satiating the consumers’ demand in an effort to retain their target and, at the same time, keep up a healthy environment that attracts new demographics. Due to the widespread use of the internet during the pandemic for a variety of reasons, people's need for data has skyrocketed. Given the expanding digital divide in contemporary nations, the discussion of zero-rating systems has been revived by the rise in Internet data usage. Businesses can give customers access to data from their websites and services without charging them for the use of the data, thanks to zero-rating programs. Normally, this is not permitted because it violates the principles of net neutrality, which state that all internet traffic must be treated equally in terms of priority and cost.

When it comes to age groups, the competition between YouTube, Netflix, and traditional TV primarily affects the younger generations, for whom these services serve as strong substitutes, whilst older generations continue to be more devoted to TV. Following such a shockwave, the way we perceive entertainment has drastically changed. Production houses find it rather convenient and profitable to opt for an OTT release over a theatrical one. With all the buzz in the appropriate circles, OTTs are quickly persuading those who were on the fence to switch, across different age and demographic groups, since they are viewed as an aspirational medium of content consumption. Acceptance and subscription rates amongst customers have seemingly skyrocketed, owing to interest in the wide ocean of content available on the platform. As far as India is concerned, the playing field is literally booming with potential for more growth, especially with budding OTT players like Zee5 and SonyLIV. The increase in customer base is not just significant in urban areas but will also percolate the rural market as well. Features like cheap data rates, increasing customer base of smartphones and

Women-Driven Innovation in Industry 5.0 Post Pandemic

Neeru Sidana^{1*} and Richa Goel²

¹ Amity School of Economics (ASE) Amity University, Noida, U.P., India

² SCMS, Noida, U.P. Symbiosis International University, Pune, India

Abstract: The COVID-19 pandemic has affected women disproportionately, with women-led businesses suffering an economic blow and decades of progress that had been made towards gender equality being erased. As per the UN 2030 Agenda, one of the ways to address global challenges like poverty and foster prosperity (SDG 5 & 9) is to put greater focus on catalyzing innovative entrepreneurship among women. The resultant economic empowerment will pave the way for greater gender equity. Recent literature in this field has highlighted a lacuna for additional support for women-based enterprises in order to recover from the impacts of the pandemic and resume their operations. Such support could be provided in the form of stimulus funding or government grants and financing provided by the private sector. Additionally, capital should be provided to innovate and implement modern technologies and skill advancement programs to help these enterprises gain a competitive advantage. Such initiatives are crucial in order to provide active support to nurture the projects that can aid women entrepreneurs in adapting to new technologies, develop digital literacy, and access financial support and capital in order to run their businesses. Particularly from the lens of Industry 5.0, this study takes a hard look at honing down the key factors that can contribute toward fostering an environment of innovation among women entrepreneurs. Additionally, this study provides insights into the relevant literature with a specific focus on future research opportunities using a literature review approach covering 40-50 literature reviews, as well as identifies expository aspects that can promote the revolution navigated by female entrepreneurs.

Keywords: Entrepreneurial success, Industry 5.0, Risk-taking, Women entrepreneurs, Women-driven innovation.

INTRODUCTION

Industry 5.0 is considered to be an antithesis to the vision of Industry 4.0. Sustainability and resilience have become an important issue after the COVID-19

* Corresponding authors Neeru Sidana: Amity School of Economics (ASE) Amity University, Noida, U.P., India; E-mail: nsidana@amity.edu

pandemic. Because of this, policymakers and organizations increasingly pay attention to Industry 5.0 with an aim to place human workers at the midpoint of innovation, exploiting the impact of technology on our society. This is aligned with the objectives of the United Nations Sustainable Development Goals (Huang *et al.*, 2022; Carayannis *et al.*, 2022). The crucial role of women will be experienced in Industry 5.0 in the workplace. The empowerment of women worldwide is the most important SDGs.

It has been recognized as a statistically proven and accepted fact that women entrepreneurs have a significant role to play in the country's economic development (Hassan *et al.*, 2020). Job creation can be witnessed as a result of the participation of women in the labor force. Electronic manufacturing is an industry where more than 50% of the employees are women. Businesses that have women at the helm are considered to bring creativity into the operations (Balhara and Singh, 2015).

As per a report prepared by (GEM) Global Entrepreneurship Monitor in 2015, the participation of women in areas of innovation like entrepreneurship does not only contribute in favor of the development of a nation. If we look at the MSME owner's portfolio, then 20.37% of women hold ownership, comprising around 23.3% of Indian Labour Force positions. Indian women are also heading startup businesses, as 45% of startups are in the name of women. Some major startups run by women include Nykaa (USD 12.5 billion), MobiKwik (USD 750 million), and Byju's (USD 18 Billion). As per McKinsey Global (2022), India provides an added US\$ 700 billion to global GDP by increasing female participation. The manufacturing and agriculture sectors have witnessed a visible participation of women. Women can help their families come out of poverty and contribute to household income. Bright prospects for the country can be seen through an increased literacy rate of 8.8% in FY 2021.

Societies can be transformed with the development of women entrepreneurship. This opportunity is still unachievable because of less participation of women in entrepreneurial activities India's performance in the female entrepreneur index is very low. It is believed that uncertainties of characteristics give new dimensions to women innovators (Abd *et al.*, 2019). Presently, there is a need to study some factors such as a drive for achievement, risk-taking abilities, self-confidence and creativity because these characteristics are often cited as compared to others based on previous studies (Mendryk & Dylon, 2014 Hassan *et al.*, 2014; Ummah & Gunapalan, 2012; Hoe *et al.*, 2012; Lai *et al.*, 2010). Tulus (2009) stressed that women innovators need to understand the abilities and personality characteristics that are needed in order to bring success to their ventures. Evidently, timely identification of the factors will help them to grow their business. The purpose of

the present study is to know the functional relationship between entrepreneurial characteristics, experience of work, and women-driven innovation.

Research Objectives

The following research objectives are evaluated:

- To know expository aspects that can promote revolution navigated by female founders.
- To understand the relationship between identified critical factors and sustained growth.
- To identify the many implications and strategies that could aid policymakers in building a sustainable women-driven infrastructure.

RQ1: What are the major barriers restraining women from moving towards innovation post pandemic?

RQ2: Which research gaps and further research areas are suggested?

The research is organized as follows: Section 2 is ‘Literature review’, which provides a comprehensive overview of research already existing in this field. In this section, a detailed analysis of the factors behind women-led innovation and their role with regard to Industry 5.0 has been presented. In section 3 of the paper, the relationship between factors of women-driven innovation and sustainable development goals has been highlighted. Section 4 of the study provides suggested strategies for policymakers to drive innovation among women workforce for Industry 5.0. Finally, Section 6 discusses the conclusion of the present study.

Methodology/Strategy

This study will be conducted in four phases:

Phase 1: Reviewing past and current research conducted by the researchers using the LR approach to identify the research gap and investigate the critical factors fostering innovation driven by women entrepreneurs.

Phase 2: Developing a robust framework/model for conceptualizing and encouraging women-driven innovation. The authors then identify the broad challenges to encourage it and use the model thus created to develop directions for future research.

Managing Knowledge Processes and Conceptual Review for Higher Education Institutions

Neha Rastogi^{1,*}, Rajeev Ranjan² and Tilottama Singh³

¹ Doon Business School, India

² Uttarakhand University

³ Uttarakhand Institute of Management, Uttarakhand University, Dehradun, India

Abstract: Higher education is the backbone of any country, which decides where we stand and where we want to move ahead. The objective of higher education is to provide a platform for students to enhance their knowledge, skills and attitude in their chosen area of specialization. Each course has its objectives and learning outcomes, which are to be expected after completion of the particular course. Despite all efforts, there is a huge gap in terms of the right set of skills required to make a student employable. This is one of the bottlenecks in the entire system of the teaching-learning process. Do we just want to provide a degree that is a piece of paper, or do we want to create an ecosystem in which we want to produce the manpower that can create a difference after the completion of the chosen specialization? The dream of the middle class is to get their livelihood after completion of the course, but in the current scenario, it is very hard to get a job. Whatever the reasons are, we have to accept that we are not able to generate the right set of skills among the students pursuing higher education. The objective of education is not only to get a job but to increase overall learning and understanding of the overall human ecosystem. Creating an entrepreneurial ecosystem is another option, but it is very hard to arrange all the resources required to start an entrepreneurial setup. The author, through this research, wants to find out the gap in the system and will suggest a revised mechanism to achieve the objectives of higher education.

Keywords: Employability, Entrepreneurship, Higher education, Policy framework, Skill.

INTRODUCTION

Students pursuing higher education have a dream that after completion of the chosen specialization, they will be able to get a job either in private or public service. 90% of middle-class students have a dream that after completion of their chosen specialization, they will get a job that will help them earn their livelihood.

* Corresponding author Neha Rastogi: Doon Business School, India; E-mail: acsneha89@gmail.com

The students who have a family business have the option to either opt for a job or continue with their family business. Only a few of them think out of the box and dare to think of an entrepreneurial setup. The paper presents the picture of higher education with special reference to India. Earlier, pursuing higher education in a specified course was very tough because there was a limited number of institutions that provided higher education, and the students who were very bright would get admission to these selected institutions. Privatization has significantly shaped higher education. The main focus of private institutions is on admissions and creating infrastructure. Creating an infrastructure needs funds, and for generating funds, a source is very important. Admission of the students to these institutions is the only source of funds. This has led to the development of a new business model – the customer and service provider model (Commercial). The ancient Indians trusted in the proclamation “Thamasoma Jyotirgamaya”—light scatters dimness. The reality with regards to suggestions (Satyam), the decency innate in morals (Shivam) and the magnificence of involvement (Sundaram) are all light that drives us to that which perseveres. Since ages, the place from where one can get true education was called a University / Higher Educational Institutions. After this, we transferred our interest to finalize “What to teach and how to teach”. Globalization has made us convert students with skills into marketable resources. By 2030, India will be among the countries with the most young population in the world. With almost 140 million individuals in the school-going age, one in every four alumni in the world will be a result of the Indian advanced education framework (Ernst and Young, 2013). Post-independence, on the basis of the belief that teaching and research would go ahead of grade specifications and lead to notable scholars who could bring revolution in the progress of the country, the foundation of the Centre of Excellency was laid down. In the current scenario, India's higher education system is the world's third largest in terms of scholars, next to China and the United States. India's 11% of youth is in higher education as compared to 20% in China. Even after having a substantial number of universities, none is among the top 150 Universities in the world (QS ranking 2020). Though IIT Mumbai, IIT Delhi (182) and IIS (184) rank 152, 182 and 184, respectively, according to the QS ranking 2020. The top-rated universities and institutes of India, like IITs, IIMs, Delhi University, Jawaharlal University *etc.*, require a student to be extra bright. What about other scholars? IITs, IIMs, and NITs have just 3% of the total students; the remaining 97% of students attend other higher educational institutes (central, state, deemed and private universities and affiliated colleges) in the country. As per the results of a survey across India, around 770 thousand undergraduate students were enrolled in private state universities in the academic year 2019. India is home to several private universities and institutes that were founded with the only objective of creating straightforward profit.

REVIEW OF LITERATURE

Swati Sharma (2016), after reviewing literature, identified three key areas for future research. The first area of research is the link between education level and employment distribution. Second, there is a need to examine the differences among the various social groups in terms of the relationship between edifying level attainment and employment consequences. Third, additional research is required across various states to understand the relationship between education and employment outcomes. Thomas Asha E. and Bhasi. M (2018), in their findings, found that efforts need to focus on improving outcome-based learning. Instructional quality needs to be improved by providing better training and development to the teachers offering higher education. Low-skilled teachers need specific guidance to reach the acceptable level to teach the students. Coopers and Lybrand (1998) define the employability skills of the students in terms of four key skills: 1. Traditional intellectual skills. 2. Key skills in terms of communication. 3. Personal attributes like self-reliance and motivation. 4. Knowledge of organization about how they work. Dearing (1997) stated that students must be aware of their personal development well in advance before they apply for the job. The nature of the job and requirements should match the skill set before they apply for any job. Atkins (1999) stated that the criticism of the shortcomings of graduate recruits by the employer is not so much the result of the failure of the higher education curriculum, but it is a failure of the transfer process that matters a lot. Brennan *et al.* (1996), in a survey conducted on graduate students across Europe and the UK, found that teamwork, oral communication, skills for solving problems and working under pressure, are among the top 10 skills they viewed as important to make the students employable. Atlay and Harris (2000) commented that it is important to work on the culture and values in the institutions offering higher education. A nourished culture and values can help improve the learning environment for the benefit of the students and staff. Harpe *et al.* (2000) concluded in their findings that in academics, the concept of individualism exists and without the staff commitment, nothing can be achieved. Hussain (2005), in his study, stated that employment opportunities are less in higher education. Warrick, Daniels and Scott (2010) emphasized the collaborative relationship of the education system with employment. This will help in increasing employability among the students pursuing higher education. Tynjala, Valimaa and Sarja (2003) suggested the integration of education and working practices to enhance the productivity of a nation with practical knowledge. Sumanth S. Hiremath *et al.* (2016) concluded that the higher education system needs to be vibrant, competitive and meaningful. To cope with these changes, teachers are expected to excel in every sphere of higher education, which includes improved classroom teaching and live practical projects in practice with the regular classroom. The teacher has to perform the role of a counselor, administrator and policymaker to

CHAPTER 13

Implementation of Internet of Things (IoT) in Human Resource Management: An Overview

Arpita Nayak^{1,*}, Ipseeta Satpathy¹, B.C.M. Patnaik¹, Sukanta Kumar Baral² and Flavio De Sao Pedro Filho³

¹ KIIT School of Management, KIIT University, Bhubaneswar, Odisha, India

² Department of Commerce, Indira Gandhi National Tribal University, Madhya Pradesh, India

³ Department of Management and Economics, Federal University, Rondonia, Brazil

Abstract: The Internet of Things (IoT) is one of the most significant technological advancements in recent years. Simply described, the Internet of Things is a mechanism in which all individuals, companies, and devices are linked to each other over a network segment to continually exchange data without the need for human participation, completely stirring up business. Because of these technologies, tracking efficiency has never been easier. Communication tools, wearable computing gadgets, trackers, and other technologies have had a greater impact on business and everyday life than ever before. In order to respond to technological advancements, executives are emphasizing the use of IoT, and human resource management is not exempted. HR managers utilize IoT to gather relevant information about some major components like future workers, as well as improve performance evaluation, recruitment, training and development, and employee engagement. This paper aims to give an overview of the implementation of IoT in HRM. From the evolution of a mobile job seeker to the incorporation of microchips to manage staff, the expanding nature of the Internet of Things (IoT) affects the way human resources function in companies as well as the way businesses operate.

Keywords: ATS, Actuators, Benefits of IoT, Compensation management, Employee engagement, Employee, Evolution, HRM, Human resource management, HR planning, Internet of Things (IoT), Job Performance, Performance evaluation, Recruitment, Sensors, Training and Development, Technology, Technological Innovation, Workplace.

* **Corresponding author Arpita Nayak:** KIIT School of Management, KIIT University, Bhubaneswar, Odisha, India; E-mail: 2181158@ksom.ac.in

INTRODUCTION

The phrase “Internet of Things” is 16 years old. However, the notion of connected devices has been around for a while—at least since the 1970s. At the time, the notion was known as “integrated internet” or “embedded devices”. However, it was Procter & Gamble employee Kevin Ashton who invented the term “Internet of Things” in 1999. The business environment has evolved in light of the emergence of the information era and the increased rise of economic globalization. With 21.5 billion devices expected to be wired by 2025, IoT is currently present in every area and niche. It has indicated a paradigm change in the world of information technology. Millions of gadgets, ranging from high-end industrial equipment to children's toys, are now linked to the internet. Two main parts make up the Internet of Things. The first is a physical item or “thing” that you wish to link to make it intelligent. The connection, on the other hand, is handled by the embedded system. While the first half of this may seem simple, the second half involves a complicated procedure that could involve several sensors, actuators, interfaces, a data analysis layer, and other parts. Because of their interconnection, all of these things can be programmed, and communicated with one another and with people. Companies that do not consider training their personnel for the Internet of Things will fall behind. Indeed, according to a recent study published in CIO Magazine, 33% of firms would benefit from extra capabilities, while 47% of organizations lack IoT skills entirely. So, to stay ahead of the competition, create and train your personnel for the IoT age. IoT devices and structures enable enterprises to improve their safety ratings while also collecting vital data about their equipment, operations, clients, and much more. The Internet of Things ecosystem is made up of sensing and embedding components (sensors, actuators), communication (protocols, IoT gateways), IoT cloud, IoT analytics, data management, and end-user service interfaces. As a result, many businesses have begun to recognize the importance of maximizing the value of their human resources and using them as a source of advantage in competition. However, to accomplish this goal, we must not only develop sound HR planning but also use a variety of tools and techniques. Using IoT, all resources are connected to the internet and monitored remotely. IoT and personal safety include anything from surveillance systems (such as ADP, Ring, and Nest doorbells) to lights, cameras, and appliances that link to our phones, computers, or other devices *via* Wi-Fi Internet connections. The active gathering of data aims to give various workplace departments insights into existing or future concerns that may have a significant influence on the overall efficiency of their firm. This involves concerns such as employee mental health, occupational health, and the development of initiatives to provide employees with greater safety and security. IoT is changing how we live our lives, giving us a deeper understanding of how the world around us functions. Leaders in today's scenario look to have a good

impact on the unification of management resources and thus lower management expenses by enhancing the design of HRM information technology. HRM informatization will greatly aid enterprise management, and they recommended that advanced management systems have features like “labor costing”, “data report generation”, “monitoring recruitment”, “tracking compensation and benefits” and “automatic attendance” in addition to HR data management and payroll accounting. Organizations are already earning major benefits from IoT-based projects, according to a Harvard Business Review poll, with 58% reporting enhanced business cooperation. Video conferencing, which formerly required the use of fixed equipment, will soon be accessible from any area of a corporate base using a computer, laptop, iPad, or smartphone. HR management helps close the productivity gap between employees and the specific priorities of the organization. A strong HR management team leads the organization towards a better competitive environment. IoT in the workplace provides several interesting opportunities for the HR sector and employees to participate in novel ways and RE-CONSIDER their working environment. With just a few resources, it can be shown that the organization's development is appropriately maintained through the use of HRM procedures. High-performance information technology is used to sustain the evolution of human resource management. To sustain the change of HRM toward an attractive recruiting process, digital technologies are being leveraged more. This research seeks to provide an overview of IoT deployment in several key areas of human resource management, such as the recruitment process, training and development, compensation management, and performance management, and how it contributes to the efficient operation of the same. The IoT sector will see a \$1 trillion and \$3 trillion boom by 2025, according to forecasts, as a result of the transition from basic connections to IoT-powered apps, platforms, and services. IoT combines two essential components: a communication medium and connectivity with an increasing number of intelligent items. As connection increases the possibilities of the linked system and the connected devices, it contributes to the production of rich data whose analysis offers decision-makers incredibly important insights. Employees today arrive at work with smartphones or smart watches affixed to their wrists that provide high-speed Internet access, including the log-in and log-off time of their work time, along with other notifications, indicating a workforce embedded in and around IoT. The possible effects of these phenomena on HR practices, employees, and employers should be the focus of HR managers and employers. For example, IoT can assist a project planning tool in immediately communicating a company's employment needs to its hiring system or department. In organizations as a whole and HRM, in particular, IoTs are necessary to supervise efficiency, security, objectivity without bias, and straight forwardness. The direct connection between the use of data innovation, human resources and innovation assets enhances

Artificial Intelligence (AI): A Metamorphic Transformation in Healthcare Services

B.C.M. Patnaik¹, Ipseeta Satpathy^{1,*} and S. K. Baral²

¹ KIIT School of Management, KIIT University, Bhubaneswar, Odisha, India

² Department of Commerce, Indira Gandhi National Tribal University, Madhya Pradesh, India

Abstract: Artificial intelligence plays a key role in all aspects of human existence, and technology is meant to improve human well-being. In this aspect, healthcare is a major field, and artificial intelligence is ushering in rapid progress. Artificial intelligence has provided several solutions that were previously unattainable, such as diagnosis, treatment, prevention, and therapy. Medical experts have traditionally been responsible for prediction, forecasting, as well as identification or decision-making, which are the main objectives of Artificial Intelligence (AI). AI is capable of providing a better healthcare service in the form of smart devices. By integrating artificial intelligence with the Internet of Things (IoT), compact and mobile devices are now making human life more comfortable. Aside from diagnosing diseases such as Alzheimer's, these devices are also used to provide appropriate treatment for various brain disorders. Considering the relevance of the same, the study is undertaken to understand the patient's and healthcare provider's (doctors and nursing staff) perception of AI. The scope of the study includes super specialty private hospitals in the capital region of Odisha and Vizag of Andhra Pradesh. Around 387 samples were collected for analyzing the data, which included 142 patients, 153 nursing staff, and the rest were doctors. The period of the study was six months, from December 2021 to May 2022. The entire analysis was done under nine parameters: Robot-assisted surgery, virtual nursing assistants, administrative workflow assistants, fraud detection, prescription error recognition, automated image diagnosis, cyber security, connected medical devices, and identification of clinical trial participants with 33 attributes.

Keywords: Artificial intelligence, Clinical error, Health care, Patient data, Patient safety, Report analysis.

* Corresponding author Ipseeta Satpathy: KIIT School of Management, KIIT University, Bhubaneswar, Odisha, India;
E-mail: ipseeta@ksom.ac.in

BACKGROUND OF THE STUDY

AI offers significant opportunities for progress and innovation since it solves cognitive problems that would normally require human intelligence. Voice recognition, recommendation systems, and self-driving cars are all examples of the practical successes of AI in various domains. Future developments in AI are likely to become even more significant. Spending on artificial intelligence is predicted to increase to 97.9 billion by 2023, according to the International Data Corporation. AI has a lot of potential to improve people's health and well-being since electronic health records (EHRs) and other patient-related data are becoming increasingly available, *e.g.*, by augmenting clinicians' diagnostic work, signaling prevention opportunities, and offering personalized treatment recommendations, among other things. Even though some simple assistive tools have been deployed in the field.

AI research, development, and deployment is growing in the health sector as well. This is due to the potential of AI to promote healthy lifestyles, detect infectious diseases and environmental hazards early and treat them, and prevent diseases from occurring. For example, the World Health Organization (WHO) has set a target called “triple billion” that aims to improve the health and well-being of 1 billion people by providing universal health coverage, reducing the risk of health emergencies, and enhancing the protection against health emergencies. AI is expected to help it achieve these goals.

A new potential is emerging for improving patient safety outcomes and the quality of care with the integration of artificial intelligence (AI) into the healthcare system. AI can be broadly defined as a computer program that is capable of making intelligent decisions. Artificial intelligence is defined in this review as the ability to analyze healthcare data, identify risks, and reveal hidden knowledge. Several healthcare-related areas have been improved with artificial intelligence, including diagnosis, drug development, and personalized medicine. Clinicians may be able to make better diagnoses with the help of artificial intelligence. As a means of identifying, assessing, and mitigating threats to patient safety, artificial intelligence (AI) has also been embedded in electronic health record (EHR) systems. Clinical efficiency is not necessarily a function of AI accuracy. Artificial intelligence can be used in both clinical as well as diagnostic settings in the healthcare industry. The application of artificial intelligence to healthcare presents a powerful tool for revealing subtle patterns in data, which are then interpreted by clinicians for identifying new medical and health-related problems. Research on AI in diagnosis, such as the identification of diseases, has focused mainly on recent studies and reviews.

AI is gradually changing medical practice. Several AI applications in medicine can be used in a variety of medical fields, such as clinical, diagnostic, rehabilitative, surgical, and predictive practices. Other critical areas of medicine where AI is making an impact are clinical decision-making and disease diagnosis. AI technologies can ingest, analyze, and report large volumes of data across different modalities to detect disease and guide clinical decisions.

Health services management and patient care can also benefit from these technologies. Clinical creativity and critical thinking will be emphasized by using technology to reduce care costs and repetitive operations. Fig. (1) depicts the four dominant variables for AI healthcare, and Fig. (2) explains Artificial Intelligence (AI) route to patient safety via “Clinical” and “Diagnostic” level interventions DSS: decision support.

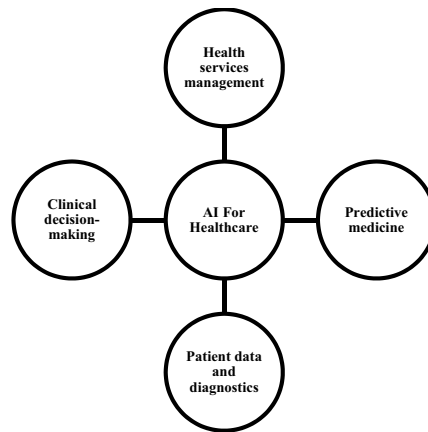


Fig. (1). Four dominant variables for AI healthcare: health services management, clinical decision-making, predictive medicine, and patient data and diagnosis. Source – Author’s Elaboration.

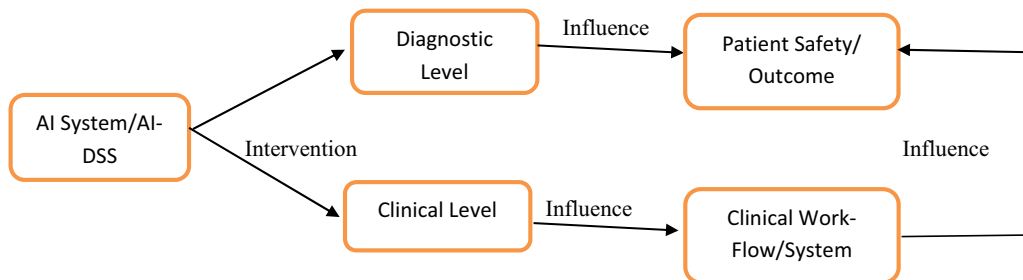


Fig. (2). Artificial Intelligence (AI) route to patient safety via “Clinical” and “Diagnostic” level interventions DSS: decision support. Source – Author’s Framework.

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Sukanta Kumar Baral

Prof. S.K. Baral has 28 years of rich experience in academia by holding several important positions at various levels. He is currently working as professor in the Department of Commerce, Faculty of Commerce and Management, Indra Gandhi National Tribal University (Amarkantak, Madhya Pradesh, India). He has developed a novel approach to deliver by elucidating the connections and contributory ties between policy, poverty, behaviour, and socio-economic status through the combination of creative field experiments and rigorous empirical analysis through international collaborations. He has contributed 185 research papers in various reputed national and international journals and contributed 37 book chapters. He has been conferred with 35 national and international awards to his credit. He has authored 17 books, and edited 20 books. He has earned 07 Indian copyrights and 5 patents.



Richa Goel

Prof. Richa Goel is an accomplished academic with more than 23 years of experience in economics and management. She is an associate professor at Symbiosis Centre for Management studies Noida, Symbiosis International University, Pune. She holds a Ph.D. in management with expertise in diversity management. Her projects on E-Shiksha, women empowerment, and inclusive banking gained recognition from New Zealand, Ministry of Finance. She has more than 20 books and a number of papers published with leading publishers like Springer, Emerald, IGI Global, Bentham, Bloomsbury, Taylors & Francis etc. With numerous papers in UGC, Scopus, ABDC journals, she is acting as the lead editor for Scopus international journals and as special issue editor for Journal of Sustainable Finance indexed with Q1 ranking.



Tilottama Singh

Prof. Tilottama Singh is a certified HR analyst from IIM and a proficient academic, researcher, and trainer with more than 14 years of experience in human resources and work dynamics. Presently, working as head of the department in the school of management, Uttaranchal Institute of Management, Uttaranchal University, Dehradun. Her areas of expertise are human resources, entrepreneurship and strategy. She started her career in the hotel industry with Leela Kempinski in the corporate head office in human resources and training. She obtained master's in human resources & management. Having an enriched research portfolio with Scopus and international refereed journals, book chapters, and conference presentations, she has been awarded with the best presentation award in international conferences like IEOM, MIDAS, and many more. She also serves as a member of AIMA and acts to lead and liaise between the student community and the industry delegates, with a keen interest in training and building sustainable models for business and society.



Erdener Kaynak

Prof. Erdener Kaynak has conducted post-doctoral research studies at universities and research institutions in North and South America, Europe, Africa, the Middle East and Asia-Pacific. He received many awards and distinctions from international institutions and societies. He has 25 books and over 200 scholarly and professional articles published. He serves as editor-in-chief of Journal of Euromarketing. Besides, he is on the editorial review boards of some of the leading marketing and international business journals of U.S. and European origin. He has been a senior training advisor, business consultant, and chief advisor to international agencies and many country governments. In addition, he has worked for the Inter-American Development Bank, the United Nations Development Program, the Swedish International Development Agency, the U.S. Agency for International Development, Vice Chancellors of the University of Brunei Darussalam and University of the South Pacific etc.. For a period of two years, he served as education and technology advisor to the president of Kyrgyz Republic.



Vishal Jain

Prof. Vishal Jain is presently working as an associate professor at the Department of Computer Science and Engineering, Sharda School of Engineering and Technology, Sharda University, Greater Noida, India. He obtained a Ph.D. (CSE), M.Tech 5 (CSE), MBA (HR), MCA, MCP and CCNA. He has over 1500 research citation indices with Google Scholar (h-index score 19 and i-10 index 35). He has authored over 100 research papers in reputed conferences and journals, including Web of Science and Scopus and authored and edited more than 50 books with various reputed publishers. He is the series editor of 10 book series. He is a life member of CSI, ISTE, and a senior member of IEEE. His research areas include information retrieval, semantic web, ontology engineering, data mining, ad hoc networks, and sensor networks. He received a number of awards such as Young Active Member Award for the year 2012–13 from the Computer Society of India, Best Faculty Award for the year 2017 and Best Researcher Award for the year 2019 from BVICAM, New Delhi.