Artificial Intelligence and Soft Computing for Industrial Transformation

IMPACT OF ARTIFICIAL INTELLIGENCE ON ORGANIZATIONAL TRANSFORMATION

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Artificial Intelligence and Soft Computing for Industrial Transformation

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Scope: Artificial Intelligence and Soft Computing Techniques play an impeccable role in industrial transformation. The topics to be covered in this book series include Artificial Intelligence, Machine Learning, Deep Learning, Neural Networks, Fuzzy Logic, Genetic Algorithms, Particle Swarm Optimization, Evolutionary Algorithms, Nature Inspired Algorithms, Simulated Annealing, Metaheuristics, Cuckoo Search, Firefly Optimization, Bio-inspired Algorithms, Ant Colony Optimization, Heuristic Search Techniques, Reinforcement Learning, Inductive Learning, Statistical Learning, Supervised and Unsupervised Learning, Association Learning and Clustering, Reasoning, Support Vector Machine, Differential Evolution Algorithms, Expert Systems, Neuro Fuzzy Hybrid Systems, Genetic Neuro Hybrid Systems, Genetic Fuzzy Hybrid Systems and other Hybridized Soft Computing Techniques and their applications for Industrial Transformation. The book series is aimed to provide comprehensive handbooks and reference books for the benefit of scientists, research scholars, students and industry professional working towards next generation industrial transformation.

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Foreword

It gives me immense pleasure to write the foreword to this book. In choosing the impact of artificial intelligence on organizational transformation as their subject, the editors have selected a subject that has great contemporary relevance. Artificial intelligence is here to stay and will continue to flourish. It has come a long way since it was conceived a few decades back. Previously, its application was confined to automation in manufacturing only, but with the passage of time has expanded to cover almost every sphere of human activity.

Organizational transformation does not happen overnight. One has to steadily and meticulously strive and work hard to achieve it. Artificial intelligence is definitely contributing in a big way towards the organizational transformation of both the manufacturing and service sectors. Against this backdrop, I am optimistic that the book will make for interesting reading. I extend my best wishes to the entire editorial team for this sterling academic endeavor.

Prof. (Dr.) Karunesh Saxena
Vice Chancellor
Sangam University Bhilwara, Rajasthan, India
October 2021

Preface

The idea of a book on the impact of artificial intelligence (AI) on organizational transformation occurred to us almost simultaneously. Even though we realized putting together an edited volume on such an ever-evolving topic would not be an easy task, the capacity that AI has to significantly transform organizations is too important to ignore. Therefore, we started deliberating as to how to include scholarly research articles written by eminent academicians on the topic. The outcome of our deliberations can be seen in the quality of the chapters included in this book, which highlight the applications and interlinkages of artificial intelligence with HR function, and its application in the banking and finance sector, along with many other diverse sectors such as energy and sports. One of the chapters even discusses how AI is revolutionizing India byte by byte.

All of us are highly grateful to the authors for taking time to contribute to this book despite the tense situation caused by the lockdown due to the COVID-19 pandemic.

The Editors
October 2021

1
Artificial Intelligence Disruption on the Brink of Revolutionizing HR and Marketing Functions

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Abstract

Artificial Intelligence (AI) disruption is rapidly revolutionizing the various functions of HR, marketing, finance, etc. Before the advent of AI, several biases occurred on part of humans in terms of hiring, promotion, performance appraisal, compensation, etc. Similarly, in marketing, the customers' needs and wants are of immense importance for marketers. Traditional marketing generally used feedback from consumers and also the managers had to rely on the market research to interpret the market trends, customers' needs, tastes, and preferences. But now AI disruption has addressed the HR issues and made substantial improvements in the prediction of precise trends, customer purchase intention, and consumer behavior.

Thus, the paper attempts to unravel how AI is revolutionizing the various functions of HR and marketing. The study elucidates that AI has revolutionized the functions of HR by removing biases in recruitment and performance appraisal and is assisting the organizations in employee engagement and retention. It has made the

orientation and onboarding process easy. AI has widely reduced the cost of the organizations with respect to hiring, training, etc. Similarly, in the field of marketing, the study also elucidates that with the advent of technological advancement during recent times (AI), a wealth of information about the consumers, their consumption patterns, and purchase behavior can be traced to a large extent. AI has opened an opportunity for marketers to enhance the effectiveness of the marketing campaigns which can be measured as a return on investment (ROI). AI is enhancing the marketing strategies for businesses. AI disruption is helping in quick and effective decisions. AI is optimizing the advertising and customer segmentation and is also helping companies with better product design to the delight of the customers.

Thus, the managers should look to AI as a tool for empowering and supporting their employees rather than replacing them. Since AI automates various process-oriented and administrative tasks, therefore managers should adopt AI so that they may shift their focus from administrative tasks to cross-functional reasoning tasks. Such a human-machine association will generate various new jobs and will pave way for innovation.

Keywords: Artificial intelligence, disruption, HR, marketing, chatbots, algorithms, machine learning

1.1 Introduction

Artificial Intelligence (AI) that was coined by McCarthy [3] is a branch of computer science encompassing areas such as machine learning (ML) and cognitive computing. AI can also be divided into the categories as strong AI, weak AI, and super intelligent AI. The strong AI or Artificial General Intelligence (AGI) refers to a system with logic, sensory and cognitive abilities that rely on the association of data to

produce human brain-like decisions. The weak AI or Artificial Narrow Intelligence (ANI) is the system that focuses on a single task and work in a particular domain [34]. Super intelligent AI is a futuristic system that shall surpass the cognitive abilities and intelligence of human beings.

The study by Carbonell *et al*. has mentioned that ML is a basic requirement for the generation and development of AI [8]. The prominent ML tools are as follows:

a) Neural Network or Artificial Neural Network (ANN): It comprises of many interconnected nodes (like neurons in the brain) and works on the rules that define what kind of output to be generated based on input.

b) Support Vector Machine (SVM): It is used for predicting time series predictions.

c) Natural Language Processing (NLP): It consists of a) Natural Language Understanding (NLU) and b) Natural Language Generation (NLG). NLU converts the natural language into computer language; therefore, it is termed as Speech Recognition or speech to text conversion. It uses Hidden Markov Model (HMM).

According to Merriam Webster.com, "Artificial Intelligence is a branch of computer science dealing with the simulation of intelligent behavior in computers."

According to John McCarthy, AI is "the science and engineering of making intelligent machines, especially intelligent computer programs" [22]. AI simulates intelligent behavior in computers. In ML, the machine learns on its own based on patterns and training data sets. It enables machines to process like the human brain.

It is revolutionizing various industries. The study conducted by Xaxis [35] concluded that AI will be the next industrial

revolution. The economic impact of AI is estimated to reach 13 trillion dollars by 2030 [7].

A survey conducted by Deloitte on 250 executives on the benefits endowed by AI revealed that 51% of the executives were of the view that AI enhances the features, functions, and performance of the product, 36% of the employees were of the view that AI optimizes internal business operations, 36% of employees indicated that AI frees up the workforce to be more creative by automating tasks, 35% indicated that AI assists in making better decisions, 32% of the employees revealed that AI helps in creating new products, 30% of employees suggested that AI helps in optimizing external processes like marketing and sales, 25% of employees were of the view that AI helps in pursuing new markets, 25% revealed that AI helps in capturing and applying scarce knowledge where needed, whereas only 22% of employees indicated that AI reduced headcount through automation [9]. Figure 1.1 depicts the benefits endowed by AI on organizations. Thus, it can be seen that no aspect of management has been left untouched by AI. AI is gaining prominence in various managerial functions like HR, finance, and marketing. AI brings with it personalized experience.

A study carried by Oracle and human resources advisory and research firm, Future Workplace revealed that 80% of Asia Pacific (APAC) countries surveyed indicated that 50% of their employees are currently availing AI in some or the other form in their organization. The results also indicate that 77% of employees in China and 78% of employees in India have adopted AI which is more than double the 32% in France and 38% in the United Kingdom [23].

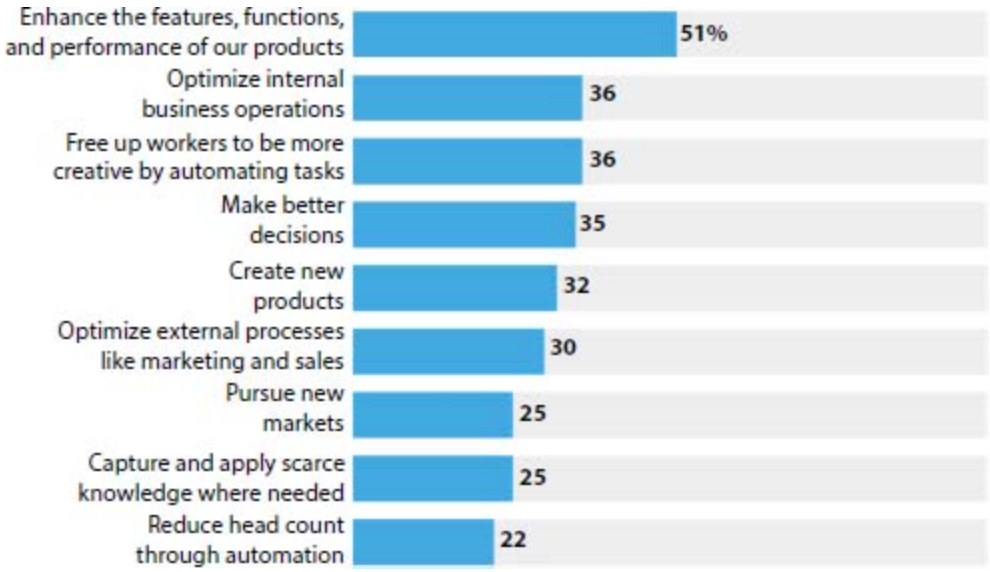

Figure 1.1 Benefits of Artificial Intelligence. Source: Deloitte 2017.

1.2 Research Methodology

The study is exploratory in nature. The researchers have explored various studies on the role of AI in the various functions of HR and marketing.

1.2.1 Research Objectives

1. To explore how AI disruption is revolutionizing HR functions.
2. To explore how AI disruption is revolutionizing marketing functions.

1.2.2 Data Collection

The study is based on secondary data, sourced from various databases like Ebsco, Google Scholar, and ProQuest.

1.3 Artificial Intelligence in HRM

Research suggests that biasness creeps in when humans are assigned the task of hiring, promotion, performance appraisal, compensation, etc. For instance, racial discrimination occurs when humans are assigned the task of hiring [29]. Another study conducted by Mckinsey and Leanln revealed that entry-level women faced discrimination during the promotion as against their male counterparts [20]. Employees also face discrimination during performance appraisal on grounds of their age [33]. Research also suggests that women face discrimination while receiving compensation and promotion [18]. AI helps in overcoming such biasness. AI is used in all the aspects of HRM like recruitment, engaging the applicants and the employees, orientation, onboarding, performance evaluation, training, compensation, and employee retention. These aspects are discussed below in detail.

1.3.1 Recruitment

As against the traditional recruitment process, recruiters are now using chatbots that are powered by AI (ML) [10]. Chatbots use natural language processing to facilitate real-time interaction with the applicants through skype, email, social media, etc. They are useful in gathering a pool of information from the applicants regarding their competencies, qualification, and experience and can even generate their profile, based on the information gathered. They are programmed in such a way that they can comprehend written and oral communication and can address routine queries of the applicants appropriately. Furthermore, these chatbots are efficient enough to even prescreen potential job applicants by matching their competencies, traits, experience, culture fit, etc., with the open positions and can schedule an interview for the applicants. With the advent of AI in recruitment, the hiring process has become faster as it can auto-screen thousands

of resumes in a minute which are free from biases. Examples of various chatbots used by organizations are a) IBM Watson Recruitment, b) Jobs Intelligence Maestro of DBS Bank, which has successfully decreased the time involved in screening per candidate from 32 minutes to 8 minutes [26], and c) Mya, which provides 24/7 support.

1.3.2 Engaging the Applicants and Employees

Earlier, when AI was not introduced in HR, engaging the employees was time-consuming. Now, various software backed by AI like chatbots and Applicant Tracking System can engage the applicants by addressing their routine queries on a real-time basis and update them regarding their current status. The striking feature of these chatbots is that they become robust and smarter with every interaction. Example of engaging the applicants: IBM uses Watson Candidate Assistant (WCA) to engage its applicants in personalized conversation and also suggests the job positions that resonate with their competencies and experiences in which they can excel. Such engagement is a win-win situation for both the applicants and the organization. The applicants feel delighted and the organizations also become free from committing costly hiring mistakes.

Example of engaging the employees: AI-backed Amber chatbot, which is used by Oyo, Marico Ltd., and many more, is instrumental in identifying disengaged workforce in the organization. Thus, the organizations can take measures to engage the disengaged workforce.

1.3.3 Orientation and Onboarding

Organizations organize orientation programs for acquainting the new joiners regarding the organizational culture, rules and regulations, employee benefits, etc.