Metamorphic Transformation: Critically Understanding Artificial Intelligence in Marketing

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Abstract - *Recent advances in artificial intelligence (AI) have growing avid interest from corporate sector, public sector and world governments across the globe, as they foresee increasing likelihood of bulk-produced consumer product machinery with super humanlike intelligence a reality in near times. In this research paper, we have tried to assimilate, gather different facts pertaining to different markets from various identifiable and valid sources. We have mainly used exploratory research to understand how artificial intelligence can and shall affect lives of human beings. Different areas such as consumer goods, healthcare, security systems, smart devices financial services, healthcare services, social media marketing etc. were explored for facts and details. We concluded that artificial intelligence is here to stay and make a considerable difference in human lives forever.*

Keywords: *artificial intelligence, healthcare, smart devices, social media, financial services.*

INTRODUCTION

In a recent recognized fact, the 4th Industrial Revolution has been considered the most disruptive socio-economic transformation that humanity has ever faced of yet. It engages all the ongoing technology-enabled changes that are stirring industries and countries around the world. Some instances can be of self-driving cars, internet connected devices, AI-enabled computer chips, mobile internet technologies and several more innovations that marks this massive shift to the new era.

When compared to the preceding industrial revolution, marketing domain is becoming a centre stage of many of these pioneering advancements. In fact, marketing is considered as being naturally inclined to transform, due to involvement of consumers and society with intentions of facilitating easy availability, affordability and obtaining competitive advantage in the market. Many experts all over the world agree that virtual markets will be the AI in marketing, more prevalently to be known as smart marketing. This fact has also been ascertained by 92% of marketing executives, thereby confirming that AI is surely going to the ultimate drivers of innovation in the space. [1]

While AlphaGo-Deep mind started a new age after being recognized as the first computer program to defeat a professional human player and capturing headlines all across the globe, there are still many other real advancements in artificial intelligence in process or are evolving stages in near future. There are many impressive developments in artificial intelligence–based computer programs that have made such technologies, which can learn and wisely respond including decision making in different range of real time areas and applications. The growth of consumer preferences for online alternative choices for goods and services has already catapulted many steps forward with online payments delivery systems algorithmically designed for faster payments. With AI, smarter way of selection, availability and payment are forecasted.

During the early stages of 1960's, efforts for artificial intelligence witnessed a rise in discussion when some overconfident claims were pronounced about the future capabilities of machine translation. Research funds also became scarce as such claims could not shape as thought. In the 21st century, artificial intelligence (AI) has grown into an important domain of research in almost all categories including science, engineering, medicine, business, accounting, finance, marketing, economics, stock market, education, law etc. [2]-[8]. Identifying movements of such AI growth has turned out to be a very difficult task [9]-[12]. There exist other fields of knowledge which are also being seen upon as AI applications tend to increase. [13]-[19]. It has also been seen that different businesses and nonbusiness organizations are using information technology are now considering a major shift to AI clearing major obstacles and hindrances in the path of applications [20]-[25]. One of the main motivators for AI caters to requirements of

new players to understand the basic structure of AI literature. [26]-[31].

Different literatures points towards different areas of artificial intelligence that can be divided into sixteen categories [32]-[36]. These are reasoning, programming, artificial life, belief revision, data mining, distributed AI, expert systems, genetic algorithms, knowledge representation, systems, natural language understanding, machine learning, neural networks, theorem proving, constraint satisfaction, and computation theory [37]-[39].

The advancements made in AI and its inclusion in various fields have led in the progression of AI technologies that can be seen as priceless and favorable for marketing professionals. At present, the stress has been more on usage of digital marketing than the conventional methods of marketing; which in turn provides enormous market data for AI technologies implementation. Marketing managers can use AI technologies in various operational functions such as lead generation, market research, controlling social media and customizing consumer experiences [40]. Classification of AI technologies in the field of marketing can be made for customized AI systems for specific usage and based on vendor requirements and provides software-as-a-service (SaaS) solutions which involves different features of AI. Customized and real AI technologies can be manufactured by the internal AI department of companies, outsource providers or it can either be a mix of both. The various vendor-provided solutions of AI also need customization for personal usage cases [40]. A majority of software houses and providers has given a lot in AI and technology organization such as IBM is giving their own marketing computerized solution with IBM Watson Campaign Automation. IBM Watson Campaign Automation has AI by default which is built in the solution.

Salesforce, which is considered as the leading provider of Customer Relationship Management (CRM)software has also begun to provide AI service along with the Salesforce Einstein, which is also executed in the solution [40]. Paul Roetzer [41], who is the CEO of Marketing Artificial Intelligence Institute, came up with the structure for AI in marketing which is commonly known as 5Ps of Marketing AI. The structure was formed for simplifying and visualizing them [42].

The president of Broker's Resource Centre, claims in the article "How will Artificial Intelligence systems and Expert Systems impact the estate planning field?" in the "Journal of Financial Service Professionals", that more and more life insurance companies are using expert underwriting systems for simpler cross-checking of smaller "clean case" underwriting functions so the underwriter can then spend time on more difficult tasks.[43]confirmed that AI methods assist insurers in this way. [44], a former investment banker and owner of the Boulder West mortgage bank, explains in one of the articles "Instant mortgages" published in the "Washington Builder, that 65 years of traditional mortgage underwriting techniques had been discarded and replaced by AI software applications which happened almost twice in 18 months.

The modern credit evaluation system also known, as "credit scoring." was based on a 300 to 900-point scale [44]. Also, Schneider [45] confirms, in the article "An intelligent approach to automated underwriting" in the magazine "Bank Systems & Technology", that Expert Systems have already being successfully applied in the mortgage business. The also utilized the *Applications of Artificial Intelligence in Marketing* [46].

OBJECTIVES OF THE STUDY

The study aimed to identify different aspects of Artificial intelligence; understand the characteristics of Artificial intelligence in marketing process; observe the trends in AI applications in marketing and allied sectors; and understand availability of funding in AI research in marketing.

METHODS

In this research paper, our intention was to identify the practicalities of Artificial intelligence applications in marketing sector. To understand this, we have collected secondary data from various published sources such as journals, published reports. Some tables and figures have also been used based on secondary data sources. The trends were also collected from reputed sources and were acknowledged. A preliminary investigation helped in construction of the literature review part and observation technique was used to build the periphery of discussion and analysis.

DATA ANALYSIS & DISCUSSION

Market Domains

The domain of marketing is an ever-expanding phenomenon. With more products being added up on everyday basis, the range of service expansion is also emerging very fast. Some of the sub-domains can be discussed as:

a. Consumer goods

Different means of AI tools such as natural language processing, machine learning and advanced analytics are

used for different products. One such is "Hello Barbie" that listens and responds to a child. This response is due to a microphone on Barbie's necklace that records the users command and is transmitted it to the servers at Toy Talk. The recording is then analyzed to decide the appropriate response from around 8,000 lines of dialogue. Once decided, the Servers transmit such response to the intended Barbie in below a second which enables her to respond to the child. Several of users' favorite choices are stored which can be used in future discussions.

Another Multinational company Coca-Cola's has implemented new technologies into different applications to support new product development, making the most of on artificial intelligence bots and following trialing amplified reality in bottling plants.

b. Creative Arts

AI-based Chef Watson from IBM shows a hint of how artificial intelligence can substitute chef with a sous-chef in the kitchen to assist in creating recipes and recommend human chefs on food combinations to create entirely new distinctive flavors. This form of assistance between AI and humans shall be more creative in the kitchen. Creativity is the essence of marketing. Attraction in market is based on the appearance and creative designs. Tools of AI can in reality enhance creativity in the world of art and design. One such instance can be IBM's machine learning system, Watson, used hundreds of images of artist Gaudi's work beside other matching material to assist the machine learning possibilities that has historically influenced his work including culture of Barcelona, historical articles, songs, lyrics and biographies. This helped Watson system to create AI based sculpture design for human artists who could make a real time sculpture in the style of Gaudi.

c. Music Markets

There has been a considerable growth in online music markets. The key has been learning through inputs of millions of discussions, headlines of newspaper, speech and other details that can facilitate in creating themes for lyrics. Composers are now getting ideas from machines like WATSON which uses machine learning and intelligence to create lyrics, rhythm for music composers. This also includes how audiences' moods, feelings can be used in lyrics recommendations that can potentially be hit songs in future.

d. Energy

The domain of energy has also been affected with the need for artificial intelligence. one such instance can be BP, the global energy leader, which has been keen in foreseeing the opportunities artificial intelligence and big data can offer to the energy industry. Achievements of new levels of performance, improvement in the use of resources, safety, reliability of oil and gas production and refining operations etc. They have been using it in the from sensors that can predict the situation at each work site using AI technologies to perk up operations Another giant , GE Power utilizes big data, machine learning and Internet of Things (IoT) technologies simultaneously to create an "internet of energy."[47] The vision of a "digital power plant." has been a key source of motivation to use advanced analytics, machine learning for power, maintenance, operations and business optimization.

e. Financial Services

The global market dependencies on financial services has been undeniable. The amount of data gathered, improvement in storage technology, high processing speed has led to collection of enormous data approximately 3.6 petabytes of data (and growing considerably) [48] that includes marketing databases, transactional records and public information records among host of other databases. Financial firms are now enthusiastically in fusing machine learning into their products to set new strides for faster and more efficient decision-making. Process optimization is ensured over time with machines learning to differentiate between crucial data points from ordinary data points. Data analytics and machine learning is used predominantly by American Express which processes $1 trillion in transaction and possesses 110 million AmEx cards in operational process. This helps them to predict fraud situations and save millions of dollars that can be lost otherwise. They have also created apps for customer networking and payment systems which offers different financial services of lending money, loan applications, transaction payments and other special offers.

f. Healthcare

Another vital sector has been healthcare where massive amounts of real-time data flow and decision making are needed. In China, The Infer vison machines assists radiologists to cope up with the demand of reviewing 1.4 billion CT scans each year predicting early signs of lung cancer. Infer vision machines are trained and learning algorithms that supplement the work quality of radiologists to for accurate and efficient diagnosis of cancer. [49]

Google's DeepMind is working on neuroscience for creating a machine that can imitate the thought processes of human brains. There remains a huge potential, prospects and possibilities for healthcare applications

that can reduce plan treatment time and diagnose ailments using such super AI machines.

g. Automobile Marketing

Cars and automobiles are related to complex processes which also generates massive multiple data in different ways. Component failure, service requirements, driver convenience, passenger convenience, effect of road conditions on auto-parts etc. are deeply monitored using artificial intelligence by Volvo. BMW also utilizes AI and database decision making systems for creating advanced technologies including driverless technology with level 5 autonomy for future (Self driving vehicle without any human intervention, projected for the year 2021 release).[50]

h. Farming

Agriculture and farming are also getting affected by the AI tech revolution with John Deere company providing data-driven analytical tools and automation for farmers. The acquisition of Blue River Technology that is based on advanced machine learning algorithms which allows robots to take visual databased decisions for pesticide treatments. They also offer GPS systems-based ploughing and sowing automated farm vehicles and Farm sight system enabling agricultural decision-making [51].

i. Media

Products such as SMART speakers enable two-way communication with listeners response recorded and included in the story. this has been possible due to smart speakers Amazon Echo and Google Home which has been tested in the BBC project, during Man audio drama that allows listeners to engage in a two-way conversation via their smart speaker. This kind of voice-activated devices are looked upon as human substitution response systems for the future.

In another such effort, robots wrote 30,000 local news stories each month news automation specialist Urbs Media in a project called RADAR (Reporters and Data and Robots) initiated by UK news agency Press Association (PA). [52] These machines gathers data government, public services and local authorities, and usesnatural language generation technology to rewrite local news stories.

Another major implementation has been made by Netflix which predicts suggestive watchable programmed for individual users based on Big data analytics [53]. Also, content creation is determined, analyzed, reviewed, updated along with investments for future creative content creation. This self-reliance has led them to organize and deploy multiple seasons of a new show or program rather than just a single episode.

j. Retail

Retail companies must evolve with increasing competition, increasing customer expectations, enhance customer experiences (both online & offline). One such company is Burberry, which is a digital business and luxury fashion brand who have been reinventing themselves by using big data and Artificial Intelligence to battle fake products and improve sales along with improving of customer relationships [54]. They have created apps and customized loyalty programs for different customers based on their previous shopping habits and positive experiences. Wal-Mart, the largest world retailer has been using big data, machine learning, AI and the Internet of things to transform retail environment and facilitate better service to its customers. They are making continuous efforts to create a flawless experience between the online customer experience and the in-store experience (including 11,000 brick-and-mortar stores distancing itself from Amazon. Some of the new modifications include use of the Scan and Go feature on the app, Pick-up Towers and are also on the verge to introduce facial recognition technology to verify sadness or happiness among customers.

k. Service

The contribution of Microsoft with Cortana, a virtual assistant, Chatbots that run Skype cannot be denied. These services are being provided to other companies that are utilizing Microsoft AI Platform to construct their own intelligent tools.

Concepts like cloud computing, geo-mapping and machine learning and many new concepts of Google are using AI and satellite data to prevent illegal fishing. These can provide timely data of fish catch and reports of illegal fishing on locational basis. On the other hand, Disney group has also been keen on is getting even better using big data that has enabled them to introduce products such as Magic Band wristband that acts as an ID, hotel room key, tickets, Fast Passes and also as payment system. It also enables them to predict guests' needs and convey an incredible, custom-made experiences. Google brain project (2011) [55] has enabled video recommendations on YouTube, based on learning's from viewers' habits and preferences during streaming of contents. Another Google's project of self-driving car division is based on deep learning. Google utilizes machine learning identify the right configuration of hardware and coolers that can be made available to data centers for minimizing the amount of energy expended to continue them as operational.

l. Social Media

Social medias such as Twitter, Facebook, Instagram etc. These applications have recommender systems that has enabled them to act against inappropriate or racist content and also improve users experience, these applications process a lot of data using deep neural networks which helps them to learn users' preferences over time.

Deep learning technologies and neural networks uses pytorch platform to deep learn from large unstructured datasets such as status update by almost 2 billion users in Facebook. Similarly, Instagram's big data and artificial intelligence can be used to objectify advertising and confront cyberbullying, remove unpleasant comments, battle spam and augment the user experience [56].

Benefits of Artificial intelligence

AI increasingly becomes a matter of international politics. The year 2018 witnessed major powers gradually putting more fences to protect their national interests when it comes to trade and defense. This has been more evident than in the relationship between the world's two AI superpowers, the US and China. Major countries such as China and US have both realized that Artificial intelligence research, development, adaptation, deployment and successful implementation holds the keys to future dominance(as seen in both trade and defense developments).On one hand, Chinese tech manufacturer Huawei has declared plans to enlarge and expand its own AI processing chips, thereby reducing the requirements for the country's thriving AI industry to depend on US major manufacturers suppliers like Intel and Nvidia [57]. On the other hand, Google has faced public criticism for its perceptible readiness to continue doing business with Chinese tech companies with fears that exchange technologies could be militarized in future. Nationalism can lead to many potential dangers with one being falling into authoritarian hands and second being restrictions on freedom and speech in the longer duration. Although academic and industrial exchanges may have a bright future, a sudden rapid military deployment or usage can be potentially very harmful.

- **A Move Towards "Transparent AI"**

Trust on usage of Artificial intelligence has to be created. This could be a problem since population data privacy and management are handled differently across the world [58]. A newer version i.e. AI Open Scale technology concept provides real-time purview into the actual decisions being made, how they are being made, depicting associations between data that is utilized, weighting of decisions and probability for bias in information and preventing unethical decisions from being taken or implemented.

- **AI and automation drilling deeper into every business**

Recently, the merits of using AI in increasingly potential areas including manufacturing, product reliability, machinery reporting, maintenance schedules, supply chain management, customer relationship management etc. have been realized with newer applications being customized developed for operational activities. The predictive technologies are being intrinsically researched and worked upon for testing and real-time phase wise implementation. Financial transactions are analyzed [59] on real time basis for better investments and reinvestments opportunities along with supervised retail experiences for both online and offline customers.

New revenue streams are being discovered with ample data at hand. Many companies are diversifying into providing data-as –a –service providers with revenues foresighted. It has been predicted by 2020, more companies will garner and require huge AI manpower for their basic, operational and support functions.

More jobs will be created by AI than will be lost to it. The deployment of AI, as predicted by Gartner (2019) [60], initially can be somewhat challenging for human resources while in the long run shall provide increasing number of employment opportunities for the AI educated youth.

Initially, around 1.8 million jobs can be lost to automation with marketing in sectors such as education, healthcare, and the public sector singled out as possibly to take a hit of around 2.3 million can be created. There shall be more requirements of artificial intelligence trained professionals rather than basic educated professionals. In case of doctors and lawyers, AI service providers have made determined attempt to advertise their technologies as means of assistance for human professionals, supporting them with recurring tasks while leaving the real decision making to them.

Therefore, training to work along with AI machines shall also be requirement of the future (niti ayog, 2018) [61]. Back office operations shall move swiftly to such machines (as predicted by former Citigroup CEO Vikram Pandit in the year 2017). [62]

AI assistants are predicted to become truly useful. Many consumers, audiences have already witnessed AI assistant systems such as SIRI, ALEXA or Google Assistants providing consumer support, entertainment and assistance in search of vital information. This can

only be seen as the beginning as vast potential lies ahead in future. Arranging, scheduling, reporting can be systematically organized with the help of AI assistants with higher bandwidth of wireless internet available (4G technology and Future 5G technology). This has already begun to change how we see, compare, order products, pay for products and services online. Machines have started to learn faster and also predict future requirements of products and services on schedule.

Examples of AI applications

- Automated customer support

Businesses across nations have either diverted or thinking of saving costs on human resources in operational and support channels by switching to more intellectual and inventive tasks otherwise. This has been facilitated by AI-enabled customer assistants that can fulfill customer queries such as order status for customers and assisting in search for a more suitable product based on consumer requirements, along with other such needs. Some of the reasons include by sending reminders and notifications, offering instant answers reducing waiting time and provide more up selling opportunities with customized approach. These have indeed proved to be moving towards customer satisfaction and retention.

- **Personalized shopping experience**

At present, a large section of Customers is seen adopting online store for random or selectable shopping. Google Analytics is playing a vital role by supplying necessary information like location, browser, device etc, along with average time spent by consumers on different pages. Application of artificial intelligence seemingly assists online stores to gather these pieces of data on different pages and aggregate them to personalize each customer's experience. This analysis results in sending sensible alerts, messages, graphic visuals that are dynamic and appeals to consumers based on situation, time or day in a year. A major improvement can also be in terms of international currency changes facilitating global online orders. Companies like Amazon, **Alibaba, Club factory** etc. have greatly benefited from this development.

- **Healthcare**

Ai in Healthcare sector has proven to be of great assistance in terms of saving time for patients, visit scheduling, monitoring assistance, bill payments, health research, patient diagnosis, streamlining processes although medical costs, surgeries costs are increasing with every other day in business. Also, AI-boosted technology assists pathologists [63] in analyzing of tissue samples which leads better future diagnosis and possibility of better treatment in future. Online medical counseling is also available that connects patients or would-be-patients to concerned doctors who can provide online consultation against a standard online fee. Medical supplies can also be affected with better inventory management systems with artificial intelligence predictions.

- **Finance**

Business finance, stock finance is becoming more and more collaborative with artificial intelligence. [64]AI systems can gather market data, social, political and cultural events and provide viable alternatives for selecting areas or stocks for higher return on investments. Business to business transactions are also affected by higher level of intelligence inputs assisting in algorithmic trading, currency exchange, bank transfers, wire transfers, stock movements etc. Automated advisors can generate notifications, alerts, stock preferences, expert suggestions thus saving human time and effort resulting in efficient and effective returns on investments.

Many such software programs, apps are also available for individual investors who have made investments in stock markets, mutual funds, offshore investments, gold trading, currency trading etc.

- **Smart home devices**

The demand for Smart gadgets and equipment's is sharply rising with different alternatives, designs at competitive pricing available on online and offline markets. Smart devices such as Amazon Echo has already made inroads into the psychology and mindsets of average global consumers. Smart lights by Philips, amazon emitting controlled light rays based on environment is also available in online stores. Amazon's cloud cam also intelligently captures and records data in indoor home- setup. [65]. Smart doorbells by NEST with facial recognition can trace and differentiate between known and unknown faces of visitors. Smart home cooling systems (Ecobee3) can reduce hot and cold spots in different rooms. [66]. Xiaomi's Smart shoes with ability to generate electricity while walking, health tracking, location finder are also changing the concept of how shoes can be worn and used for multiple benefits.

- **Security and surveillance**

AI is also getting integrated with security and surveillance systems. With technologies like facial recognition, voice recognition, image processing technology, sensor data capture and storage, the scope of security systems are expanding very fast. Better enhanced cameras powered by solar cell batteries with massive storage capacity in cloud systems changes the

possibilities of security management systems. Companies such as Xiaomi, ADT, simplisafe, vivnet, Honeywell are providing alternatives for consumers worldwide [67].

FINDINGS & CONCLUSIONS

Artificial intelligence is now providing ample scope for consumer goods such as TOYTALK with voice recognition systems enabling data capturing and faster internet leading to data transfer and efficient processing. Creative arts and designs leading to attractive designs in existing or newer products. Online Music Industry is using AI to create lyrics, composition based on popular trends of consumer tastes and preferences.

Healthcare industry implementing AI for customer servicing, scheduling, diagnosis, online counseling, bill payments etc. is on the rise.

AI home assistants powered by Alexa systems such Amazon Echo is assisting in managing household along with connectivity to outside world and market.

Online shopping is accelerating with more and more companies offering alternative products worldwide and global consumers rise in demand for innovative products at competitive prices.

Social media advertisements is also growing with companies and brands studying audience preferences, likes, dislikes and customized advertising, notifications on social media user pages on Facebook, Instagram, twitter etc.

Security and surveillance devices are getting smarter with both individual and businesses employing them at an increasing rate.

Therefore, from the above findings, we can understand that the prospects of artificial intelligence is greater than ever before and shall continue to rise at accelerating pace in future also. Every human being shall be affected in different magnitude irrespective of differences in jobs, business or country of residence.

STUDY LIMITATIONS

The current study has certain limitations which can be as follows: the study is limited to availability of secondary data from different relevant sources; the study findings cannot be generalized for other application areas of business; there may exist more unanticipated challenges that may arise in future in terms of use of artificial intelligence in marketing; and the study needs to be extended over a long period of time to study the transformatory effects of artificial intelligence on marketing activities.

RECOMMENDATIONS

Basing on the conclusion, this study recommends that consumers should prepare themselves for the utility benefits that can be derived from the future possibilities of usage of artificial intelligence. Such can range from the selection of alternative products and services such as smart gadgets, healthcare services along with ease in payment methods with added security, doorstep delivery services and more can be anticipated in future. On the other hand, entrepreneurs and organizations should adapt modern techniques of marketing that can not only reduce costs but also facing stiff competition in cut throat market situations, adding more loyal customers for long term business and resolving sustainability issues.

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