

Blockchain Intelligence: Where Blockchain Meets Artificial Intelligence

Dr. Manmeet Barve, Associate Professor, MET Institute of Management
Ms. Neelam Maske, Assistant Professor, MET Institute of Management
Ms. Sakshi Singh, Student, MET Institute of Management

ABSTRACT

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We're in the midst of a time of unparalleled digital disruption and transformation. The breakthrough technologies that are at the heart of digital disruption and transformation are artificial intelligence and blockchain. They have become most trending and unruly technologies. Blockchain is gaining extensive attention because of cryptocurrencies and also due to its provision of secure and decentralized resource sharing manner. AI, on the other hand, offers intelligence and decision-making capabilities for machines that are similar to humans. Both AI and blockchain, spreading at a phenomenal rate and having distinct degree of technological complexity and multi-dimensional business implications, are in situations where they can benefit from each other, and help one another. The researcher of this paper explains how and why these transformative technologies and their convergence can alter marketing as we know it today. The researcher also presents a case study to summarise various marketing use cases that will be used for transformative innovations and their implications for society firms, customers, and, eventually, academic studies. This work looks at the detailed literature on the interaction and possible collaboration areas between the blockchain and AI that can benefit marketing and the list is nowhere close to being completed.

Keywords: Blockchain; Artificial Intelligence; Machine Learning.

Introduction

Blockchain in marketing, which was previously considered a fad, is now becoming mainstream as companies such as Unilever, Nestle, McDonald's, and others have signed up for the technology to improve transparency in traditional and digital marketing, and it is now being referred to as a global revolution. As blockchain is rapidly gaining widespread adoption in marketing, we must know the three fundamental reasons for it i.e., Decentralization, Immutability and Transparency. The ideas that were mere theory in Blockchain and AI technology are being replaced with valid and tried solutions solving transparency, efficiency, and tackling fraud.

More than ever before, a large number of established firms across a wide range of industries are facing an existential threat from digital disruption. The average tenure of companies on the S&P 500 is expected to shrink from 33 years in 1965 to about 14 years by 2026 (Mochari, 2016). According to Forrester research, by 2020, every business will become either a digital predator or a digital prey (Evans, 2012). The projected outcome of Forrester is bolstered by the fact that consumers are increasingly adopting digital technology-powered products and services that are

cheaper, better and/or faster. For example, consumers are shopping more from Amazon relative to traditional bricks-and-mortar stores, increasingly using Uber or Lyft instead of calling a traditional taxi service, switching from traditional broadcast television to streaming programmes on Netflix, YouTube and Amazon, and so on. Today, digital technologies are fast evolving and becoming streamlined, mobile, connected and automated, thereby shifting the level playing field for firms.

The challenge lies in the ability of each firm (especially established firms, regardless of their size) to proactively respond to the opportunities and challenges that accompany the current wave of digital disruption. From the standpoint of marketing, it entails embracing digital transformation with the overarching goal of offering a superior value proposition to the firm's customers. At the core of digital disruption resides a set of key transformative technologies. In this paper, we review three transformative technologies that currently demonstrate the strongest potential to disrupt and transform traditional business models in general and marketing practices in particular. These three promising transformative technologies are (a)

artificial intelligence (AI), (b) mixed reality and (c) blockchain.

Objective of the Paper

- The primary goal of this research is to examine different aspects of blockchain and artificial intelligence and to demonstrate the importance of marketers using it as a marketing tool for their products and services.
- The point-to-point model of airlines such as Southwest Airlines and Ryanair has disrupted the traditional hub-and-spoke model of large airlines. Similarly, advances in nanotechnology and fracking (or hydraulic fracturing) have disrupted the chemical and oil and gas industry respectively. However, such disruptions pale in comparison to the digital disruptions we are witnessing today on at least three dimensions—speed, scope and scale.

Overview of Transformative Technologies

A transformative or disruptive technology, simply put, is any technology that causes a significant shift. In this segment, we'll try to identify and comprehend three big digital disruptive technologies that have the potential to radically alter traditional marketing practises.

Blockchain

Blockchain is reshaping various market sectors as a revolutionary software technology. Since it allows for safe and decentralised resource sharing, blockchain is gaining a lot of attention. However, existing blockchain systems face a range of challenges in terms of operational maintenance, smart contract quality assurance, and malicious activity detection in blockchain data. Recent developments in artificial intelligence provide opportunities for overcoming the challenges mentioned above.

Think of blockchain as a Google doc, where only those with authorizations are allowed any contributions or access. All permissioned users have access to the same document at the same time, and any updates are visible and notified in real time. Each entry is called a 'block' that contains a timestamp and the continuation of the blocks creates a 'chain', hence the name blockchain (Keckés, 2018). Any asset such as money, land, property or identity can be digitally represented on a blockchain. Blockchain systems are designed to be super secure. Each transaction is

protected by cryptography, coding each block in a way that ensures resistance to modifications or hacking (Kumar, 2018). This allows users to solely rely on the blockchain without having to use a centralized authority such as government or bank to verify the exchanges (Conick, 2017). A centralized authority is vulnerable to large-scale security breach or failure, while a decentralized or distributed ledger sends a copy to every member in the network, thereby providing extra security (Gopal, 2018).

As seen in Figure 1.1, with the traditional centralized method of doing things, every transaction must go through a central bank, whereas with blockchain, a centralized bank becomes redundant and unnecessary when all parties are interconnected on the same network. Each member in the network has visibility and communication to each transaction. According to Gartner, the business value-add of blockchain 'will exceed \$3.1 trillion by 2030' (Gartner 2017).

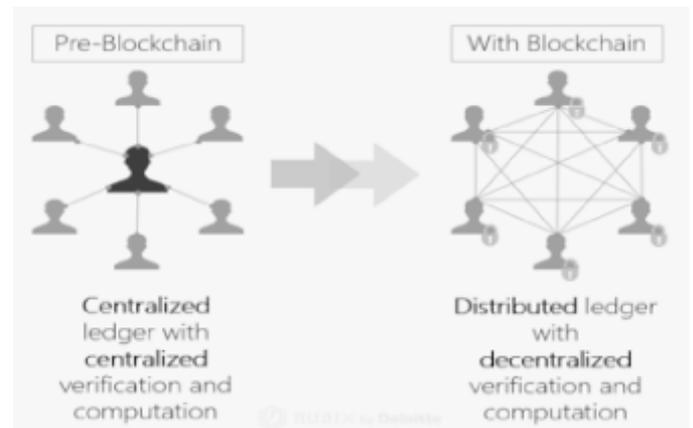


Figure 1.1: A Centralized (Conventional) Versus a Decentralized (Possible with Blockchain Technology) Business Network for Managing Exchange of Secure Transactions

Artificial Intelligence

Artificial intelligence, on the other hand, provides intelligence and decision-making capabilities to computers that are human-like. Artificial intelligence (AI) is a broad term that encompasses machine learning and cognitive computing. It refers to the capacity of intelligent agents to perform cognitive tasks.

The ability of computers to perform and imitate human-like behaviours such as perceiving, reasoning, learning, and problem-solving is known as artificial intelligence (AI). AI is predicted to have one of the most transformative impact on almost every industry

and company in the next decade or so. Artificial intelligence (AI) would undoubtedly be widely used in five years. However, we have no idea how it will appear. According to a study published by Allied Market Research, the global artificial intelligence market is projected to reach \$18.11 billion by 2025, with a CAGR of 49.6%.

Machine Learning

Machine learning is a subset of artificial intelligence that, for the most part, reflects the current state of the field. Machine learning refers to computer systems (machines) that are configured (programmed) to learn from data rather than being given clear instructions on how to perform a particular task. This problem is expected to be addressed by new machine learning methods as well as association analysis on multiple accounts. AI, machine learning, and big data analytics developments have opened up a slew of new possibilities for addressing the aforementioned blockchain issues.

Literature Review

The core of marketing hasn't changed, but the way we communicate has changed marketing. It is morphing every day. That's where the big shift has happened. The art of storytelling is very much there but how we tell the story and the medium through which we tell the story is the key. The big changes that will happen in marketing, just as in business, is artificial intelligence and machine learning. – Sanjiv Mehta, CEO & MD of Hindustan Unilever Ltd. (Mehta, 2018).

It's not that difficult to argue that marketing in the future will make increasing use of AI. Even today, the components of an AI – based approach are largely in place. Contemporary marketing is increasingly quantitative, targeted, and tied to business outcomes. Ads and promotions are increasingly customized to individual consumers in real time. Companies employ multiple channels to get to customers, but all of them increasingly employ digital content. Company marketers still work with agencies, many of which have developed analytical capabilities of their own. - Thomas H. Davenport (Artificial Intelligence for Marketing by Jim Sterne, Page 18)

One of the most popular business applications in marketing is using mixed reality to offer a cost-effective way for customers to try a firm's products before buying (Scholz, 2018). For example, the IKEA

Place app allows customers to drag and drop any piece of IKEA furniture fit to scale through the lens of a smartphone camera to see how the furniture would look in their own home (Dasey, 2017). A study by Gartner predicts that '100 million consumers will shop in augmented reality by 2020' (Pemberton, 2017).

Transformative Technologies and Marketing Practice

The research methodology used in the paper investigates the different aspects of the artificial intelligence marketing philosophy. This is a descriptive analysis in which examples are cited based on references from secondary sources and those from the author's own personal experiences. The study recommends a few steps that marketers should take to boost their marketing strategies. According to a report conducted earlier this year, businesses will increase their marketing budgets by an average of 80% over the next few years to keep up with the changes.

Transformative innovations have had and will continue to have a significant effect on marketing activities. In this part, we'll look at a few AI and blockchain marketing applications. A thorough analysis of all marketing applications is outside the reach of this article.

This is fantastic news for marketing teams, as they can now recruit top talent. Increased funding would enable marketing employees to stay longer and boost overall strategies. If you want to keep up with your rivals, you can review your marketing budget to see if an increase is necessary. The best thing you can do to keep your marketing department up to date and even ahead of the game in digital marketing is to include training in latest technical advances.

AI for Marketing

We live in an era where a marketer who does not incorporate artificial intelligence into his or her marketing strategy is still behind the times. Artificial intelligence is not only used to execute marketing campaigns, but it is often used to build them.

According to Facebook's artificial research scientists, artificial intelligence systems are going to be an extension to our brains the same way cars are extensions to our legs.

Sales, operations, customer service, and customer insights were the four key business fields where AI has

the most immediate effect on marketing. A significant advantage of AI (over conventional statistical methods) comes from the superior ability of AI algorithms to 'learn' from large datasets (Grewal, 2018). According to a Capgemini study, '79% of organizations implementing AI generate new insights and better analysis' (Stacombe, 2017). Supervised learning techniques are being increasingly employed by marketing organizations to predict all aspects of customer behaviour including customer churn (Everett, 2018).

Unsupervised learning algorithms of AI also continue to be implemented across a wide range of marketing applications. State-of-the-art recommendation engines of companies such as Netflix and Amazon, search engine queries on Google, and advanced techniques to segment customers are all powered with unprecedented speed and precision by AI-based algorithms that employ unsupervised learning (McCracken, 2017); (Neapolitan, 2018). Firms can use unsupervised learning to identify anomalies in customer behaviour such as fraudulent and/or another outlier behaviour (Kose, 2017).

Blockchain for Marketing

Blockchain's potential to impact the practice of marketing lies in leveraging the ability of blockchain for verifying transactions, tracking ship ping, ensuring standards of production, security, targeting digital ads and reducing business operation costs (Conick, 2017). With the overall increase in digital consumption, both firms and consumers are susceptible to hacking and fraud. Blockchain's secure cryptography renders networks immune to hacking, thereby offering an ideal platform for sharing, storing and transferring confidential information (Zackiewicz, 2018). Currently, digital ad platforms like Google and Facebook run digital ads and report back ad metrics to the respective firms (running the ad campaigns). Blockchain technology may be used to verify ad delivery, assuring that it goes to the targeted customers and is not altered by click fraud, or bots, and is delivered at the most optimal frequency (Ghose, 2018).

Consequences for Consumers, Businesses, and Academic Research

AI and blockchain are two ground-breaking innovations that can radically alter marketing practises. As a consequence, the adoption would (or has) have significant consequences for customers and

businesses.

Transformative technologies can provide greater value to customers in the form of (a) lower prices (as a result of cost reductions by the respective firm implementing transformative technologies to increase operating efficiencies), and (b) access to higher-quality products/services, courtesy of digital transformative technologies, (c) faster response times as a result of the streamlining/automation of operations like customer care and supply chain, and (d) a better experience as a result of technology-assisted improvements like augmented reality.

What effect will transformative technology have on customers and businesses? Firms assist in defining the research agenda for the future. We can see that, (a) Developing methodological improvements of machine learning algorithms for solving further marketing problems and/or enhancing marketing ROI, as well as developing explainable AI algorithms that may be of greater benefit to marketers, (b) evaluating creative ways to integrate blockchain technology with the ultimate goal of winning customer trust; and (c) experimenting with groundbreaking virtual reality technologies with the goal of improving consumer experience and interaction. are promising research areas.

Business Application of AI and Blockchain in Marketing

1. A way to change how marketing teams learn about their leads: AI now provides marketing teams with more information about their potential clients than it did previously. For example, the teams can now gain insight into the identity of their website users and quickly determine whether or not they are a good match for their goods. It may also be used to demonstrate potential applications for a product, and any product flaws that might exist.

2. It can help sales teams turn more leads: Sales teams can now use LeadBot to differentiate between website users who are likely to buy their goods and those who aren't. This smart certification process aids the sales team in closing leads produced by their marketing counterparts. This is a win-win situation for both sides.

3. It is always willing to assist: Helping is important in sales and marketing. People need someone who can respond to their questions quickly. The sales and marketing teams cannot afford a customer support team that is available 24 hours a day, seven days a

week to answer questions and respond to leads. AI provides an “intelligent assistant” that can answer questions within the shortest time possible and at all times of the day throughout the week.

4. It ensures that an advertising is delivered to the intended audience and that it is not over-served to ensure optimum frequency. Promotion contractors should verify that the ad caught the attention of a target user, demonstrating that their contractual duty was met.

5. It can check how target individuals react to advertising or the effectiveness of any advertisements delivered to them. Marketers may use ad networks like BitTeaser to help them achieve this.

6. Publishers, tech firms, agencies, contractors, and other stakeholders who need to be paid for the production, distribution, or output of ads or other services can use the technology.

7. Consumers that have indirect data, such as behavioural and psychographic data, may be compensated using blockchain technology.

8. Consumers who provide direct data, such as personally identifiable information, preferences, and purchasing plans, will be rewarded.

9. It encourages advertisers to be transparent about how they use customer data.

10. It provides customers with information on how advertisers use their data in aggregate.

11. It is beneficial when paying customers for the use of previously produced material, such as images or videos of a company.

12. It helps advertisers reward customers for contributing new content to their campaigns.

13. With minimal human interaction, blockchain can collect, search, store, and automatically update and verify databases. This is thought to change the way consumer insights are approached. Since it prioritises data-driven marketing, blockchain is the ideal underlying medium for generating ideas.

Digital Era Marketing Strategies

Because of the availability of assistive devices in today's world, many companies are thriving. Social networking is the most widely used form of technology in marketing. Social networking has proven to be a valuable tool in the creation of marketing strategies and is important for business growth. Not just because we are living in the modern age, but also because it is easy. With all of these emerging innovations, businesses must develop new marketing strategies to sell their products. A few of them are discussed further down.

Content Marketing: Because of its importance in social media, multimedia, and mobile search, content marketing has become a major focus for many brands. Many businesses are also unaware of the significance of trends and how content marketing underpins almost all forms of digital marketing. The importance of brand recognition cannot be overstated.

Mobile Marketing: Many people now use smart phones and tablets because they are convenient and time-saving because they can take them with them everywhere, they go and use them whenever they want. The ever-increasing number of people who own smartphones and tablets has made the availability of marketing content for mobile platforms a necessity. Businesses should update their websites to make them mobile-friendly.

Integrated digital marketing: Integrated marketing is essential to ensure that all marketing messaging and communications campaigns are consistent and focused on the consumer. For example, Google created Google + for a variety of purposes, one of which is to be able to see and capture social signals and patterns.

Continuous Marketing: One of the most common marketing tactics right now is to actively and repeatedly remind customers about the product. However, it is also important to strike a balance between online and offline product promotion.

Personalized Marketing: Because of media saturation, marketing via conventional media such as television becomes less successful. Personalized marketing is a modern marketing technique that has recently emerged. Person messages are read and crafted using computer software. Customers' actions will be read by the computer, which will then provide them with relevant information.

Visual Marketing: This technique can be implemented using Instagram, Pinterest, Slideshare, and other social media platforms. The ability to embed a marketing message and signal in an item or image is needed. This latest marketing trend is being used to increase digital marketing participation.

Conclusion

This article first reviews the blockchain technologies with AI and analysed the challenges in blockchain systems. The researcher then introduced opportunities

brought by AI to blockchain systems and named such integration of blockchain and AI as blockchain intelligence.

We need to build one-on-one relationships with customers. It is the urgent need; it is what will allow us to thrive in the new world. The mind and heart are at the heart of marketing. It all comes down to intellect and emotion. We must not only have practical advantages, but we must also occupy emotional space in the minds of our customers.

Marketing has evolved as a result of the way we interact with customers. Every day, it changes, and that is where the major shift has occurred. Artificial intelligence and machine learning are driving major changes in marketing. It opens up new storytelling and marketing possibilities. People's interactions with information, technology, brands, and services will change as a result.

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