

Blockchain Technology as an Instrument for digital marketing

Master Thesis

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Abstract

Blockchain technology is rapidly gaining recognition as a valuable instrument for digital marketing due to its potential for data security, transparency, and efficiency. This research aims to explore the role of blockchain technology in digital marketing and its impact on marketing strategies and consumer behaviour. The study focuses on identifying the benefits, challenges, and potential risks associated with the use of blockchain in digital marketing. A qualitative research methodology was adopted for this study, employing expert interviews as the primary data collection method. A total of five blockchain and marketing experts were selected through purposive sampling, and semi-structured interviews were conducted to gather data. The data collected were analyzed using content analysis techniques. The findings of this study will contribute to the understanding of the potential of blockchain technology in future of digital marketing and the implications for marketing

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Declaration of Authorship

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List of Abbreviations

AI	: Artificial Intelligence
BCT	: Blockchain technology
TAP	: Test access point
PII	: Personal Identifiable Information
IMS	: Information system
IT	: Information technology
POW	: Proof of work
BAT	: Basic attention token
CPC	: Cost per click
CRM	: Customer relationship management

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CHAPTER - 1

1 Introduction

Since the inception of the internet and electronic commerce, there has been a concept of digital marketing, though its precise origin is questionable. Email marketing, SEO, and online advertising were early examples of digital marketing techniques. With the development of social media, mobile technology, and new ad platforms, digital marketing's reach expanded along with technological advancement. The growth and development of digital marketing have been influenced by a variety of people and businesses over the years. The leading innovators in the field of digital marketing, such as Google, Facebook, Amazon, and Microsoft, are some of the key players.

Digital marketing offers businesses the chance to connect with their target customers where they spend the majority of their time online, which is online due to the rising popularity of mobile devices and the internet. Businesses can reach their target audience with relevant and personalised content using digital channels like search engines, social media, email, and websites, and they can monitor their engagement in real-time. Digital marketing benefits customers by making it easier and more affordable for them to connect with and engage with their target audience. Businesses can tailor their marketing initiatives to reach the right customers at the right time with the right message by utilising data-driven insights and targeting strategies. This promotes brand recognition, increases website traffic, produces leads, and ultimately promotes sales. Digital marketing additionally enables companies to track the effectiveness of their campaigns and take data-driven actions to continuously enhance their marketing efforts and improve results. (Dave chaffey, Fiona ellis-chadwick,2019, p.8)

In 2008, a person or group of individuals using the pseudonym "Satoshi Nakamoto" brought forth the concept of blockchain technology through a white paper titled "Bitcoin: A Peer-to-Peer Electronic Cash System." The paper described a decentralized system for secure and transparent transfer of digital assets without the need for intermediaries. The original

purpose of the technology was to support the Bitcoin cryptocurrency, but it has since evolved and been adapted for a range of other areas and uses.

The anonymity of the creator(s) of blockchain technology has sparked much speculation and intrigue in the tech community. However, what cannot be disputed is the far-reaching impact that the technology has had. In addition to revolutionizing finance through cryptocurrencies, blockchain has also been implemented in industries such as supply chain management, voting systems, and digital identity verification.

The technology's decentralized and secure nature makes it well-suited for applications that require transparency and trust. The term "blockchain" has spread widely and now refers to both a new technology and a social promise. Blockchains are currently utilized to maintain the records of different kinds of applications, despite being initially offered as a solution for the cryptocurrency Bitcoin's record keeping mechanism.

Many believe that there is more to the blockchain. Many more believe that blockchain applications will bring down all centralized systems. People use centralized systems if they need to trust a third party but lack the means to do so on their own. Searching for situations where a mediator is required to facilitate trust will help you find areas where blockchain technology may be used. For things like Digital marketing, money transfers, voting, land records, and identity, trust is crucial. (T Laurence, 2019, p.2)

1.1 Problem statement

Although digital marketing is becoming an important component of business operations, it still has issues with data privacy, security, and trust have increased in importance for organizations and consumers alike, and finding answers to these issues is essential for the development and success of digital marketing. These problems could be solved by blockchain technology, which has the potential to transform the way digital marketing works.

Enter blockchain technology, a decentralized, secure technology that permits the secure flow of information and digital assets in a transparent manner. Blockchain technology presents a compelling choice for companies trying to stay ahead of the competition since it has the ability to improve data privacy, security, and trust in digital marketing. But despite its promise,

blockchain technology acceptance and use in digital marketing are still in their early stages, and there is not many studies on how it will affect the industry.

The integration of blockchain technology in digital marketing is a relatively new and rapidly evolving field, and its full impact and future trajectory are yet to be determined. Hence, it is crucial to have an understanding of both the benefits and challenges of using blockchain technology in digital marketing. This knowledge will help in making informed decisions and predicting the long-term effects of this integration.

Blockchain technology has the potential to transform the way digital marketing operates by increasing transparency, reducing fraud, and improving data privacy for consumers. On the other hand, challenges such as lack of standardization and slow transaction times may limit its widespread adoption in the industry. Nevertheless, as the technology continues to develop and mature, it is important for businesses and marketers to stay informed about the latest developments and advancements in this field. By doing so, they can take advantage of the opportunities presented by blockchain technology and stay ahead of the curve in the constantly evolving digital marketing landscape.

1.2 Research Objective

The purpose of this study is to explore the impact that blockchain technology will have on digital marketing and to develop a comprehensive framework for its effective integration into marketing strategies. As the field of digital marketing continues to evolve and advance, it's crucial for businesses to understand how new technologies like blockchain will shape its future. By examining the potential benefits and challenges of blockchain technology in digital marketing, the study aims to provide a roadmap for successful implementation. This could include factors such as increased transparency, improved data privacy, and reduced fraud.

The study will assess the potential advantages and difficulties of blockchain technology in digital marketing using a mixed-methods approach that includes a literature review, case studies, and expert interviews. This research will delve into the key factors that determine the success of blockchain technology in digital marketing, specifically focusing on privacy, security, and trust. It will then provide insights into how the implementation of blockchain

technology is likely to influence consumer preferences and behavior in the context of digital marketing.

The findings of this study will be of great significance for businesses and individuals looking to incorporate blockchain technology into their marketing strategies. By analyzing the potential benefits and challenges of using blockchain technology in digital marketing, the study aims to identify the key success factors for its implementation. Moreover, by forecasting its impact on consumer behaviour and preferences, the study will provide valuable information on how to effectively incorporate blockchain technology into marketing efforts.

1.3 Research Question

This academic thesis is focused on answering this research question by the end of the research:

“What is the future of digital marketing as a result of blockchain integration?”

Accordingly, to the input that is going to be received from theoretical and practical research, this question is going to be answered.

With the purpose of setting a path to go through the investigation, a Qualitative research process has been selected and various sub-questions were formulated. These sub-questions were extremely helpful during the time of research

1.4 Research Structure

The subsequent structure used for this thesis will enable the achievement of the future potentials. Initially, a theoretical analysis was created based on authors' writings in books, publications, and articles to explain the topic of user research and the key elements that surround it. As a result, topics like how to plan a research project, different types of qualitative research, and how to analyse results were also considered. The theoretical portion of the

study, on the other hand, also concentrated on the idea of human cognition, the main implications surrounding it, and the part that mental practices play in this process. Explaining human cognition from the standpoint of psychology and mental processes is crucial to gaining a deeper grasp of the topic.(Becerra Rodríguez, M. C. , 2020: p.5)

To learn more about their perspectives and experiences, experts in the fields of user research, user experience, and digital products were interviewed for the empirical study. In order to draw a conclusion, this data was compared to the results of the theoretical portion.

1.5 Organization of the study

There are five chapters in this research study. An outline of the subjects covered in each chapter is provided below:

Chapter 1: This chapter gives brief importation about the introduction, problem, and objective of the study

Chapter 2: This chapter provides the information of detail information of literature review focusing on Blockchain and digital marketing

Chapter 3: This chapter covers the methodology for the study which gives detailed information about interviews and experts that are participating on a research study

Chapter 4: This chapter focuses on the analysis and findings from the data collected from experts through interviews

Chapter 5: This chapter concludes the research,challenges,limitations and recommendations for future scope of research

CHAPTER - 2

2 Literature Research

2.1 Definition of Blockchain Technology

Blockchain technology is a decentralized, digital database that records and verifies transactions in a secure and transparent manner. It works by creating a chain of blocks, each containing a record of all previous transactions, a timestamp, and a link to the previous block.

This chain of blocks is stored across a network of computers, rather than in a single central location, which helps to ensure the security and integrity of the data (Satoshi Nakamoto, Bitcoin, 2008: p.2-6)

One of the key benefits of blockchain technology is its ability to enable secure and transparent record-keeping. Because each block in the chain contains a record of all previous transactions, it is difficult to alter the data within a block without being detected. This makes blockchain technology useful for a wide range of applications, including financial transactions, supply chain management, marketing, and even voting systems (Satoshi Nakamoto, Bitcoin, 2008: p.2-6).

There are many potential uses for blockchain technology beyond just cryptocurrency. For example, it could be used to create secure, transparent records for land titles, medical records, or even intellectual property. In the future, it is possible that blockchain technology could be used to revolutionize the way we manage and secure data in many different industries (Satoshi Nakamoto, Bitcoin, 2008: p.2-6)

Technically blockchain was divided into 3 types which are (a) centralized, (b) decentralized and, (c) distributed

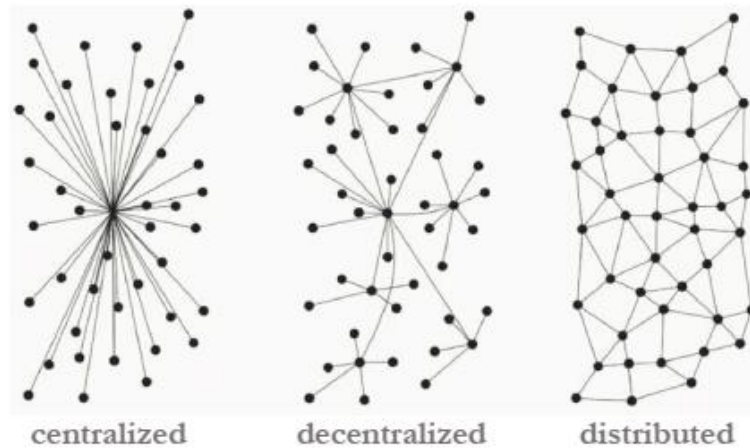


Figure 1 (Baran,1964: p.2)

- a) **Centralized blockchain:** A blockchain system that is managed by one particular entity or group is known as a centralized blockchain. This indicates that the central authority controls the management and upkeep of the blockchain and that all data processing and transaction processing takes place through this central body. In a centralized blockchain, there is only one point of control and failure, and the central entity has total control over the network and its users.

- b) **Decentralized blockchain:** A blockchain network that operates without a central authority is referred to as a decentralized blockchain. Instead, it runs on a peer-to-peer network where all users have an equal amount of influence and authority. A decentralized blockchain lacks a central authority and processes all transactions and data via a consensus mechanism among numerous network nodes. As a result, there is a greater level of security and transparency and the possibility of a single point of failure is eliminated.

- c) **Distributed blockchain:** A blockchain system known as a distributed blockchain runs on a network of several, geographically scattered nodes. As a result, there is no chance of a single point of failure and there is a high degree of decentralization possible. All data and transactions in a distributed blockchain are handled through a consensus mechanism

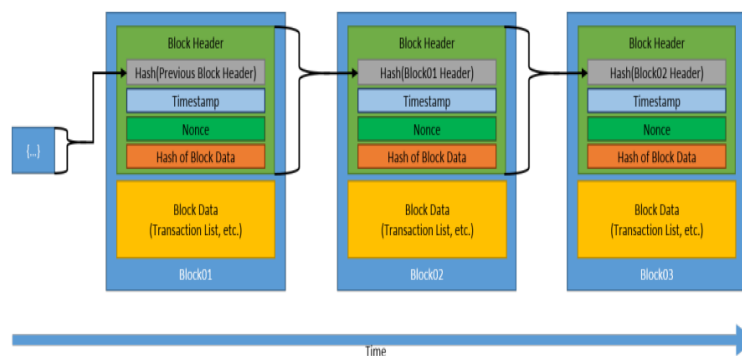
amongst several network nodes, ensuring the network's effectiveness and openness.

A blockchain is constructed by linking blocks together in a chain and storing a unique digital fingerprint of each block's header in the subsequent block. This fingerprint, known as a hash, is sensitive to any changes made to the previous block. If a block were to be altered, its hash would change, causing all following blocks to have different hashes as well. This creates a chain of hashes that are easily distinguishable if any changes are made, allowing for quick detection and rejection of altered blocks.

One of the benefits of this design is the increased security it provides. Once a block has been added to the blockchain, it cannot be altered or deleted without being detected, making the blockchain immutable and tamper-resistant. This makes it an ideal solution for secure record-keeping, especially in applications where data integrity is critical, such as financial transactions and medical records.

In addition to its security benefits, the decentralized nature of blockchain technology allows for greater transparency and accessibility. With no central authority controlling the network, all participants have equal access to the same information, promoting fairness and trust. The decentralized nature of the blockchain also makes it resistant to censorship and downtime, making it a highly reliable and robust technology for a variety of applications. A general chain of blocks is shown in (Yaga, D, Mell, P, Roby, N, & Scarfone, K, 2018 : p.15)

Figure 2 (Yaga, D, Mell, P, Roby, & Scarfone, k, 2018: p.16)



Electronic coins, also known as cryptocurrencies, are digital assets that use a chain of digital signatures to verify ownership. These coins are transferred between owners by signing a hash of the previous transaction and the public key of the next owner and adding this information to the end of the coin. One problem with this system is the risk of double spending, where a coin is spent more than once. In the past, a central authority, such as a bank or mint, was used to prevent double-spending by checking every transaction. However, this solution relied on a single trusted party and required all transactions to go through them. (Satoshi Nakamoto, Bitcoin, 2008)

To solve this problem without relying on a central authority, transactions must be publicly announced and nodes in the network must agree on a single history of the order in which they were received. This can be achieved through the use of cryptographic proof, which allows nodes to reach consensus on the valid state of the blockchain, the shared record of all transactions. By using a decentralized consensus mechanism, it is possible to create a secure and resistant electronic cash system without the need for a central authority. This has led to the development of cryptocurrencies, such as Bitcoin, which have gained widespread adoption as a decentralized and secure form of digital currency (Satoshi Nakamoto, Bitcoin, 2008: p.2-6)

2.2 Introduction to Blockchain Technology in Digital Marketing

Blockchain technology has been classified in different ways in the literature. One classification separates applications into financial and non-financial categories, with a focus on the use of blockchain in cryptocurrency and fintech (Casino et al, 2016 : p.1) (Crosby et al, 2016: p.6-9). Another classification looks at the evolution of blockchain technology in three waves. The first wave was the emergence of cryptocurrency (such as Bitcoin), the second wave was the development of smart contract platforms (such as Ethereum and Hyperledger), and the third wave is focused on using blockchain to improve governance, business, and social systems (Swan, 2015: p.ix)

Today, digital marketing enables businesses to improve their marketing plans, create worldwide marketplaces, and increase demand for their goods and services. Blockchain technology has evolved in this dynamic market to facilitate better customer journeys. Companies are no longer dependent on launching one project after another in this recent economic expansion. Instead, businesses are concentrating on creative ways to interact with customers in order to grow their business and implement more coordinated, synergistic marketing relationship strategies. Businesses are creating a portfolio of technologies to market and sell their products, services, and ideas. They do this by employing various social media networks and advertising campaigns.

Businesses can communicate with customers through social networking platforms that are always evolving through the usage of digital marketing. As a result, consumers are playing a bigger role in the debate and having a bigger impact on the marketing system.

The rise of new technologies like the internet and blockchain has resulted in significant changes to the traditional marketing mix. Retailers and e-commerce businesses are adapting by including social networking in their marketing strategies to stay ahead of the competition. As a result of online shopping, customers leave behind data traces of personal information such as their spending habits, shopping routines, credit card information, and more, which can pose a serious cyber threat to consumers.

To address these concerns, blockchain technology offers a promising solution. The decentralized and secure nature of blockchain can provide a layer of protection for sensitive personal information, reducing the risk of cyber attacks and data breaches. Additionally, the use of blockchain can provide customers with greater control over their personal data, as they are able to choose who has access to their information and how it is used. (Idrees, S. M, & Nowostawski, M, 2022: p.271 - 273)

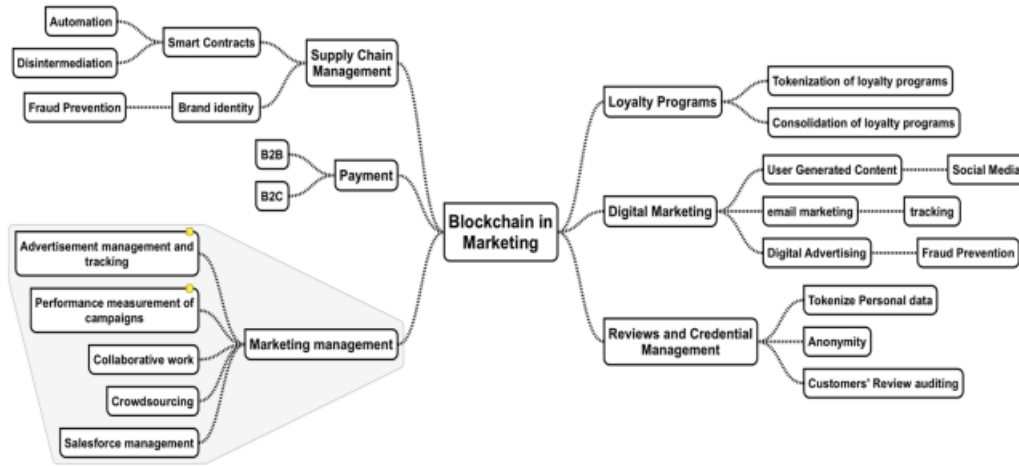


Figure 3 (Antoniadis, I, Kontsas, S, & Spinthiropoulos, K. 2019: p.4)

2.3 The Role of Blockchain in Advertising and Marketing

The use of blockchain technology in digital marketing presents a new model where consumers are paid directly by marketers for their attention, bypassing the middlemen such as Google and Facebook. As the blockchain industry grows, it is likely to challenge the dominance of the Google-Facebook duopoly in the digital advertising space. The keyword-based search may become less prominent, allowing individuals to take control of their online profiles and social graphs.

Blockchain technology gives advertisers the chance to communicate with customers directly and profit from their exposure to advertisements. For instance, it has been claimed that Google makes an average of \$73 from advertising for each active user. Companies might utilise blockchain technology to share these profits directly to customers via tailored, voluntarily consumed advertising. The transparency of blockchain enables the verification of ad delivery and consumer interaction, guaranteeing that consumers are only exposed to relevant advertising and that ads are not overserved. Customers' overall satisfaction with the advertising experience is boosted by doing this, and they are also more likely to have more faith in the marketers and the advertising medium. Blockchain technology may also aid in preventing dishonest practises like ad overcharging and phoney interaction, further boosting

the legitimacy and efficacy of advertising efforts(Harvey, C.R, Moorman, C, & Toledo, M, 2018, September 29: p.3).

In 2021, the digital advertising revenue in the United States reached a staggering \$189 billion, representing a growth of 80% since 2014. Digital advertising offers marketers various options for search and display advertising. Although digital advertising has been around since 1995, the market structure continues to evolve rapidly. As per a study of marketing technology companies, the number of companies has grown from 150 in 2011 to 7,040 in 2019 (Gordon et al, 2021 : p.1). This highlights the increasing inefficiencies in digital advertising markets.

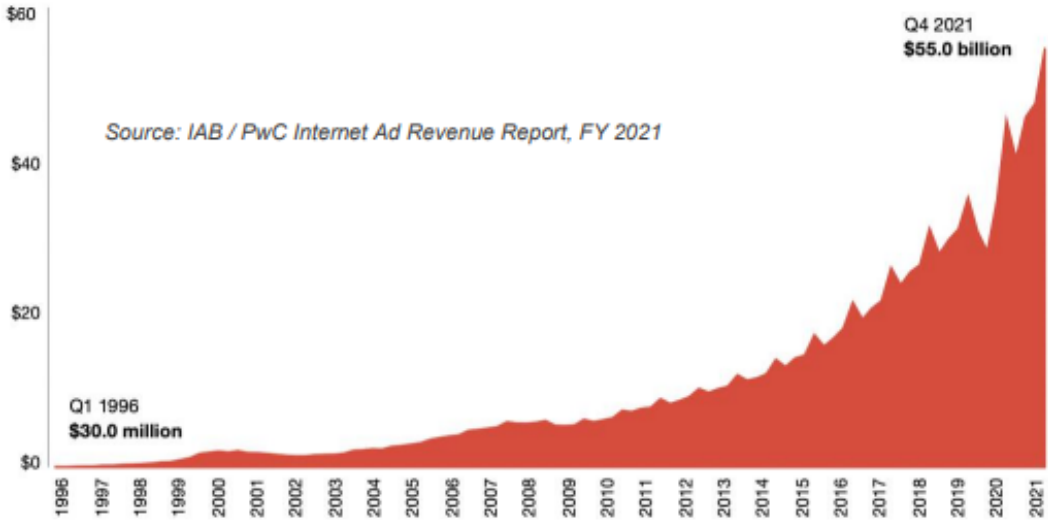


Figure1. Quarterly internet advertising revenue growth trends 1996 – 2021 (\$ billions)

Figure 4 (Digital advertising spending worldwide, 2021)

As reported by Statista, the world witnessed a historic high in global digital advertising spending, reaching \$325 billion in 2019. This figure continued to rise the following year, with a total spending of \$332 billion in 2020. The trend continued and the amount spent on digital advertising reached a new peak of \$389.29 billion in 2021. As per Statista's projections, the spending on digital advertising is expected to surpass \$441 billion, marking a new record in spending across all digital channels. (Digital advertising spending worldwide from 2021 to 2026, Statista)

2.4 Blockchain-based Platforms for Digital Advertising and Marketing

With respect to click authentication in specific, blockchain technology presents a chance to improve trust and openness in the world of digital marketing. Its implementation could reduce the prevalence of fake social media accounts and deceptive messages that inundate users. This can result in a more effective and efficient digital marketing landscape by countering click fraud and marketing spam. By using Basic Attention Token (BAT), advertisers can reward users for their attention, ensuring that the ad budget is optimally utilized by confirming that the ads are viewed by the target audience.

By utilizing blockchain technology, marketers are able to gain greater control and insight into their advertising campaigns. With blockchain, they can track the precise location of their ads, ensuring that they are reaching their intended audience. Additionally, blockchain can help to eliminate ad fraud, such as automated bots posing as real consumers, by verifying that engagement with the ads is coming from genuine followers and consumers.

This improved visibility and security can help to optimize advertising efforts and increase their overall effectiveness. It also builds trust between marketers and consumers, as it provides transparency and ensures that advertisements are not being lost to fraud or inefficiencies (Pankaj M. Madhani, 2022: p8-20)

BAT(BASIC ATTENTION TOKEN)

The purpose of Basic Attention Token is to transform the traditional advertising system through its digital advertising platform built on the Ethereum blockchain. For the first time, users have the choice of whether they want to see advertisements or not, leading to more targeted and desirable ads that are of greater value to advertisers. Additionally, users' privacy is enhanced by allowing them to choose which ads they want to view. They are also compensated with BAT for viewing ads. Not only do users benefit from more relevant content, but website operators also see increased revenue without the need for a costly intermediary like Google to take a portion of the profits.

<https://medium.datadriveninvestor.com/blockchain-based-digital-advertising-earn-bat-for-viewing-ads-85d87e746ee6>)

Brave Software, a cutting-edge privacy browser that incorporates a blockchain-based digital advertising platform, has joined forces with TAP Network, the premier advertising and data network that links brands with consumers through blockchain technology. TAP Network's objective is to empower consumers by allowing them to manage their data and safeguard their privacy, whilst providing them with tangible rewards and monetization opportunities from leading brands and advertisers. TAP Network reaches a large consumer base and has brought together top publishers, media organizations, and advertising industry partners (<https://brave.com/brave-tap-blockchain/>).

Ethereum Smart Contracts

Smart contracts are self-executing programs that are stored on a blockchain network and run automatically when specific conditions are met. These contracts aim to eliminate the need for intermediaries and ensure prompt and secure execution of agreements between parties. The process is based on simple "if/when...then" statements that are coded into the blockchain. The functioning of smart contracts is executed by a network of computers that verifies the conditions set in the contract and carries out the specified actions accordingly.

The use of smart contracts in various industries, including finance, real estate, and supply chain management, has already shown significant potential in streamlining processes and increasing efficiency. The use of blockchain technology in smart contracts ensures that all transactions are transparent, secure, and tamper-proof, making it an attractive solution for businesses and individuals alike..(<https://www.ibm.com/topics/smart-contracts#:~:text=Smart%20contracts%20are%20simply%20programs,intermediary's%20involvement%20or%20time%20loss.>)

The Ethereum blockchain provides a platform for executing smart contracts, functioning as a public blockchain. The network is powered by Ether, its digital currency. For developers who want to use the Ethereum network, it is necessary to have some Ether as payment for the computational power required to operate their smart contracts. One of the key advantages of

Ethereum over other blockchain platforms is its support for smart contracts. Smart contracts are self-executing agreements with the terms of the agreement between buyer and seller being directly written into lines of code. This allows for automated execution of the contract once the predefined conditions are met. The decentralized nature of Ethereum and its ability to run smart contracts make it an attractive option for a wide range of use cases in industries such as finance, real estate, and supply chain management.

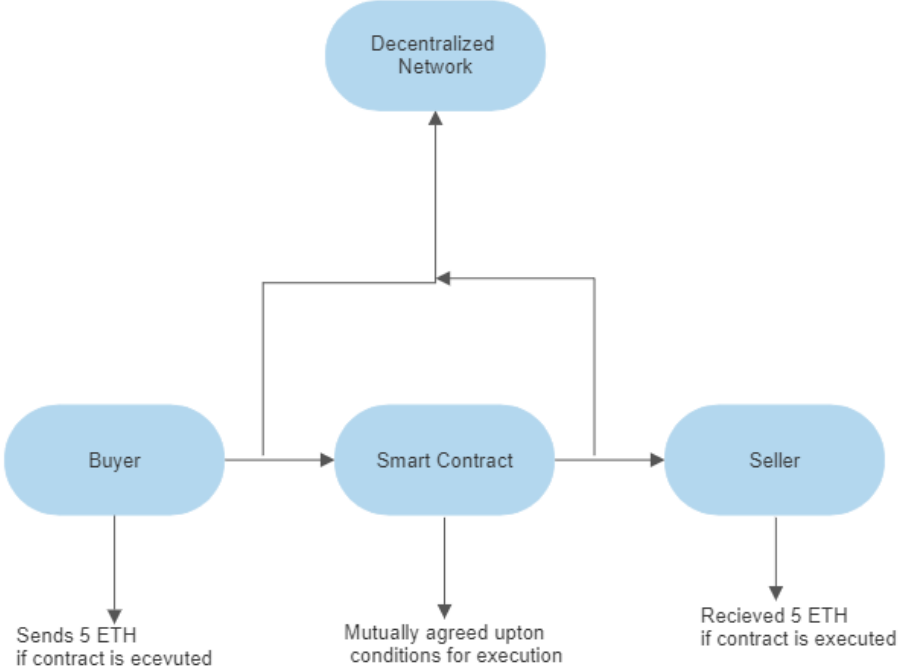


Figure 5 ,Smart contracts

With the built-in functionality of the blockchain, Ethereum is a fully decentralised and peer-to-peer platform that enables developers to perform their smart contracts publicly and safely. (<https://medium.com/digital-realm/smart-contracts-in-ethereum-blockchain-60d4890d797>)

2.5 The Impact of Blockchain on Consumer Data Privacy and Security

Blockchain-privacy and security

Blockchain technology is known for its operational aspects of privacy and security. As the world becomes increasingly digitized, the need to protect data from manipulation becomes increasingly important. To maintain safety and confidentiality in big data, a combination of artificial intelligence, privacy-preserving methods, and smart contracts can be used. Blockchain-based reputational systems have been found to provide better anonymity in the retail sector compared to traditional systems. The integration of blockchain and intelligent systems also leads to an improvement in security (Ekramifard et al., 2020: p.313). In the future, it is crucial to explore the relationship between blockchain technology, confidentiality, and cybersecurity.

Due to the complexities of privacy problems in internet technology services, consumers have become increasingly concerned about the privacy and security of their transactions PII . The use of cookies to collect personal information and the advancements in data collection techniques and data mining algorithms have only added to these concerns, leading to potential privacy violations among online shoppers (McParland and Connolly, 2007: p.64). A poll showed that 87% of respondents wanted businesses to delete their PII from their datasets to protect their privacy . Customers may also opt to deactivate cookies or provide false information to avoid online ad targeting (Culnan and Milne, 2001 : p.355).

Blockchain technology can help address these issues by allowing customers to trust their PII on a blockchain platform. Transactions on the platform are routed to random network nodes and are not associated with actual people (Jesus et al, 2018: p4-14). Privacy can be designed into the platform, with data in the blocks being limited to those with access and private transactions confirmed by a consensus of users in the network. The platform can also enhance privacy by enabling customers to encrypt their credentials such as user IDs, passwords, and electronic ID cards (Kosba et al, 2016: p4). With PII not being easily commoditized, customers have greater control over their information in digital advertising. The blockchain's transactional record can also provide more accurate insights into customer preferences, expectations, and brand perceptions, and provide opportunities for customers to safely exchange PII with brands (Travizano et al, 2018: p.5). Furthermore, it is important to note that

while blockchain technology has the potential to enhance privacy, it is not fool proof. There have been instances of blockchain systems being hacked and sensitive information being compromised. Thus, it is crucial for organizations and individuals to continue to develop and implement security measures to protect their information on blockchain platforms.

Empowering Digital Marketing Security

In 1997, Kalakota and Whinston defined a security threat as an event that can harm data or network resources through destruction, disclosure, data alteration, denial of service, and/or fraud, waste, and abuse . Information security is a critical aspect of (IMS)information systems, both technically and organizationally (Dubois et al, 2010: p.292). This highlights the importance of implementing preventive measures and ensuring secure transactions in the digital world to build customer trust in brands and protect personally identifiable information (PII) (Madhavaram et al, 2005: p.76).

In the context of digital marketing, the protection of information and PII, also known as "marketing security," is crucial. This involves managing and controlling customers' personal information in real-time to prevent data breaches and misuse. However, information security is a major challenge in internet marketing as customers are often hesitant to provide sensitive information such as their home addresses and credit card numbers for e-commerce and online purchases (Sathye, 1999: p.325-332). For example, online banking is still at risk of data transaction and transmission attacks or illegal use of bank cards through false authentication (Yousafzai et al, 2003: p.853). Additionally, behavioral targeting through the use of cookies also poses a threat to user privacy as cookies can be copied or stolen by unauthorized parties .

Brands need to establish a strong technological infrastructure that builds customer trust and closes security gaps to overcome these challenges in digital marketing. Blockchain technology has the potential to provide the necessary level of security, such as through asymmetric encryption, digital signatures, and access control, as well as decentralized and distributed data storage (Yanik and Kiliç, 2018: p.530-537). This decentralization and self-organization of the commercial ecosystem allows for the synchronization and integration of marketing-

related data across network members, such as pricing policies, product listings, advertisements, market research outputs, discounts, promotional benefits, and marketing strategies. By giving users more control over their PII and removing single points of failure, blockchain technology increases resilience to denial-of-service attacks and ensures network availability. The availability and accessibility of information through blockchain technology also increases accountability and allows for more precise monitoring and evaluation (Omran et al, 2017: p.4). In the event of mistakes or misappropriation, consumers and brands have some recourse and countermeasures. For example, Keybase.io is a blockchain platform that verifies the accuracy of social media users' signature chains and detects fraudulent rollbacks, promoting convenient and safe advertising models.

2.6 Use Cases of Blockchain in Digital Marketing

Developing Trust and Transparency

According to Jones (2018), consumer trust in brands is declining, and companies must work to regain this trust and build confidence with their customers. In the world of digital marketing, trust is key. Consumers need to feel confident that their transactions and personal information are safe and secure, which is why companies must work to establish trust in the digital environment. Blockchain technology has emerged as a solution to this challenge, offering transparency, consistency, and immutability to build a trustworthy system.

Rejeb et al. (2020: p.5) explain that blockchain technology can establish a "trust by design" protocol in digital marketing, creating a secure and lasting environment for consumers, businesses, and marketers. This transparency allows consumers to verify brand claims, such as sustainability or halal certification, thanks to end-to-end product traceability and monitoring. Additionally, blockchain technology can prevent fraudulent marketing practices such as the sale of counterfeit goods that violate intellectual property rights (Galvez et al, 2018: p.222-231).

In this sense, blockchain technology can serve as a tool for transparency in digital marketing. For example, NYIAX uses blockchain to create a transparent marketplace for premium advertising inventory through guaranteed contracts, demonstrating the potential for

blockchain to create a more open and trustworthy digital marketing environment (Epstein, 2017). By embracing blockchain technology, businesses can show their commitment to transparency, building stronger relationships with their customers and improving their overall brand reputation (Tapscott and Tapscott, 2016).

Reinforcing Security

Cybersecurity is a critical aspect of protecting digital assets, such as computer networks and information processed, stored, or shared by networked information systems, according to Humayun et al. (2020). Businesses must have a secure information system in place to protect their clients' data and ensure they have confidence in their services. As noted by seleminaz,A.(2021: p.87), this is known as "marketing security" and involves implementing a strong real-time management system to prevent the misuse or leakage of customer data.

The sensitive nature of client data is a significant challenge in digital marketing. Customers are concerned about the potential for cyberattacks, such as credit card fraud, identity theft, unauthorized access to accounts, and the manipulation of content and cookie abuse. Cookies, in particular, can be traced by others, compromising the privacy of clients . The cost of cybercrime is estimated to reach \$6 trillion globally by 2021 (Wertheim.s, 2020: p.64-66), making it essential for businesses to invest in a robust and secure infrastructure to protect client data and win customer trust in digital marketing.

Blockchain technology offers a cost-effective solution to these security challenges, providing a decentralized and distributed data management system for enhanced security in the digital marketing environment (Yanik and Kilic, 2018: 521-532). By incorporating blockchain security standards, such as asymmetric encryption, access control, and digital signatures, businesses can handle vast amounts of client data securely and promote the accountability and reliability that customers seek (Rejeb et al, 2020).

Blockchain technology also enables decentralized and self-organizing corporate processes, as well as the synchronization and integration of digital marketing data across all stakeholders. This may lead to increased economic prosperity and security for all parties involved, with

improved product listings, pricing, commercials, marketing strategies, discounts, promotions, and market research findings (Epstein, 2017: p.2). In conclusion, the implementation of blockchain technology in digital marketing may help to enhance security and promote customer trust, leading to increased economic prosperity for businesses.

Enhancing Privacy

Users of digital services worry a lot about the privacy and security of online transactions because they don't want their personal information to be misused by businesses. Only 20% of Americans trust businesses with their personal information, according to a study, even though 78% think secure data management is essential for businesses (IBM, 2018). Organizations can track, identify, gather, and change consumer information using data collection and mining tools, which can then be used improperly. Some users make an effort to lower this risk by giving websites false information, but this is not a sustainable solution.

Blockchain technology's application to digital marketing may be able to help with these privacy issues. A blockchain-based platform, for instance, may be more comfortable receiving personal data from online shoppers because communications are routed through unreliable network nodes, protecting their identity from fraud or manipulation (Jesus et al, 2018: p.2-18). Blockchain technology's capacity to securely encrypt usernames, passwords, and other electronic data may also draw tech-savvy online users (Kosba et al, 2016: p.839-857). Customers now have more control over how digital marketers use their personal information.

Blockchain technology has other benefits for digital marketing, including increased accountability and transparency. Consumer trust is increased because transactions on the blockchain are recorded on a public ledger that is easily accessible and verifiable. Enhanced customer engagement and more effective digital marketing strategies may result from this increased trust. Blockchain technology has the potential to improve privacy and security in digital marketing, which will be advantageous to both businesses and consumers by enabling secure and transparent data management.

Reducing Click Fraud

The internet is a crucial tool for digital marketing, as it provides businesses with a platform to promote their services and reach out to consumers. Through effective communication, companies can inform their clients about their latest offerings and create a connection with them. However, despite its importance, the advertising and marketing industry has been plagued by issues such as scams, fraud, and unethical practices.

One of the major problems facing the industry is click fraud, which is the act of fraudulently clicking on pay-per-click advertisements to increase the site's revenue or to deplete a competitor's advertising budget. This fraudulent practice can result in significant losses for businesses and is estimated to cost more than \$25 billion by 2024 (Juniper Research, 2020). Conventional countermeasures such as pay-per-click advertising methods or selling a portion of ad views have not proven to be effective. The absence of middlemen to oversee internet advertising has also made click fraud more prevalent.

To provide a secure digital marketing environment, blockchain technology offers a potential solution to the problem of click fraud. By operating in a setting where each party upholds integrity and honesty, blockchain technology may encourage participation in the digital marketing sector. Its open and auditable features can regulate the activities of ad providers and reduce information asymmetry. For example, platforms such as AdChain, which provides real-time tracking and campaign auditing, and Ubex, which combines blockchain and AI for precise digital marketing data, are available to combat click fraud (Goldin et al, 2017: White Paper). These solutions help to eliminate unnecessary advertisements, improve impressions and revenue management, and maximize the impact of advertising expenditures for marketers.

Reforming Loyalty Programs

Loyalty programs are used by companies as a tool to gather and retain customers' personal information, such as purchase history, transaction records, and product preferences. The aim is to increase brand loyalty and improve customer retention in a highly competitive market.

These programs have become more effective with advancements in technology that allow companies to gather customer data and create personalized loyalty initiatives.

However, there are concerns among customers regarding the safety of their personal information in these programs. Despite the goal of customization, many loyalty programs often have similar elements and a single objective to retain customers. This results in low customer satisfaction and the wasting of reward points. A study conducted by Bond Brand Loyalty among 68,000 consumers across four continents found that only 25% of customers feel valued and appreciated by loyalty programs. Additionally, complicated reward claim processes and deadlines can frustrate returning customers and hinder the growth of loyalty programs.

Blockchain technology has the potential to transform the design, implementation, and administration of loyalty programs in digital marketing. By linking all stakeholders, including marketers, customers, IT managers, customer support, and sales outlets, in a blockchain-based digital marketing ecosystem, it allows for more personalized and interchangeable reward point systems. Marketers can access real-time customer profiles and transaction data to create more authentic and tailored loyalty programs that enhance the customer experience. This opens up new possibilities for cooperation and customization in loyalty programs. (Magatef and Tomalieh, 2015: p.1-3).

Moreover, blockchain ensures the safety and security of customer data as it is decentralized and eliminates the risk of a single point of failure. This helps to build trust and credibility among customers, which is critical in any customer-centric marketing initiative. Also, blockchain enables transparent tracking of rewards and points, eliminating the possibility of fraud and ensuring fair distribution of benefits. By enabling personalized, secure, and trustworthy loyalty programs, it enhances customer experience and helps companies build stronger relationships with their customers. This, in turn, drives customer loyalty, increases sales and revenue, and boosts brand recognition and reputation.

Championing Disintermediation

Businesses used to heavily rely on middlemen for distributing their products and services. However, the trend has changed with digitization which has led to the emergence of new digital intermediaries. The internet has paved the way for a new era of disintermediation where online intermediaries provide better goods and services, leading to a permanent transformation in the value chain (Rejeb et al, 2020: p.2-3).

Nowadays, companies have to interact with their customers through social media platforms such as Facebook, Twitter, and YouTube and depend on data and advertisements to generate revenue. While these platforms help companies reach their target audience, they also put control in the hands of the intermediaries (Nieves and Diaz-Meneses, 2016: p.1-4). Additionally, businesses still need to rely on intermediaries to understand the impact of blockchain on digital marketing, which limits their control over distribution choices and their ability to find new customers and develop niche products (Tönnissen and Teuteberg, 2020: p.5-8).

However, blockchain technology has the potential to change this by allowing businesses to bypass intermediaries and establish closer connections with their customers. By deploying a blockchain-based digital marketing system, companies can improve customer targeting, expand their online advertising campaigns, and enhance their customer service. Blockchain can also reduce the fees paid to credit card issuers such as processing fees and sales commissions (Harvey et al, 2018 : <https://hbr.org/2018/10/how-blockchain-can-help-marketers-build-better-relationships-with-their-customers>).

Brands can use blockchain-based digital marketing to provide incentives to customers for sharing information, through cryptocurrency awards, micropayments, and cash-backs. This direct connection between businesses and customers can strengthen the bond between them and increase customer satisfaction. Customers can also benefit from these initiatives by offering genuine product evaluations in exchange for rewards (Rejeb et al, 2020: p.7).

2.7 Challenges and Limitations of Implementing Blockchain in Digital Marketing

The implementation of blockchain technology in marketing has contributed to an increase in consumer trust in products and brands. This improved trust and communication between businesses and their customers can be seen as a result of different forms of digital marketing. With the use of blockchain, consumers can interact with businesses directly, bypassing intermediaries and reducing the cost of promotions. This, in turn, benefits the consumer as the value saved by businesses can be passed on to them in the form of discounts, building their confidence (Vovchenko, 2017: p.195-210).

Blockchain technology is also advantageous for businesses that aim to offer value to consumers while taking advantage of the openness of information based on blockchains (Kouhizadeh and Sarkis, 2018: p-2). However, the adoption of blockchain in marketing is not without its challenges. The cost of processing and storing data on the blockchain, as well as the complex procedures for companies and their partner organizations, can be significant (Smith, 2017: p6-9). Additionally, the absence of a suitable organizational structure can make it difficult for companies to integrate blockchain technology into their marketing campaigns.

Despite these challenges, businesses are still exploring ways to leverage blockchain technology in their marketing strategies. By providing transparency and security, blockchain technology can help companies build trust with their customers and provide valuable services. In the future, the integration of blockchain technology into marketing activities is expected to become more seamless and widely adopted, leading to even greater benefits for both businesses and consumers.

Here are the challenges and limitations :

Lack of knowledge about technology: Though blockchain technologies have potential benefits there is lack of technical expertise about blockchain technology (Iansiti and Lakhani, 2017: p4-7) . Blockchain technology is expensive lack of knowledge in technology mistakes could cost too high

Scalability :

Implementation of block chain technology need to verify large transactions with in blocks is quite difficult since its still a relatively new technology and companies which produces massive large scale could fall in trouble (Ertemel, 2018: p.44)

High cost :

Setting up blockchain technology is expensive. Because only large businesses can currently implement this technology in their business processes, smaller businesses are unable to compete. It is really tough for small companies to invest huge amounts of money on blockchain technology (Rejeb et al, 2020: p.8) also as blockchain technology infrastructure spreads, installation costs are predicted to decline, making it more affordable to implement in smaller businesses

Lack of trust among companies :

The use of blockchain technology to replace middlemen with completely transparent processes is still a relatively new method of data sharing. Compared to businesses that are enthusiastic about the benefits of technology, there are more businesses that are fearful and afraid (Scherf and Becker, 2020: p.13-17)

As a result, a significant obstacle to the adoption of blockchain technology for open data sharing is the lack of trust for it among businesses. Without adequate comprehension and analysis, many businesses may be reluctant to incorporate blockchain into their marketing strategies because they perceive it as a risky or uncertain technology. The marketing sector may adopt and use blockchain technology more slowly as a result of this lack of trust ((Rejeb et al, 2020: p.8).

2.8 summary of Findings and Gaps in the Literature

Despite the increasing attention in the implementation of blockchain technology in digital marketing, there is limited research and understanding of its potential impact and implementation. The majority of the literature now in existence concentrates on the technical features of blockchain and its potential advantages for digital marketing. On the practical application and adoption of blockchain technology in digital marketing, there is, however, little research. This includes a lack of research on the implementation's critical success criteria, its adoption's difficulties and constraints, and the effects of blockchain technology on customer preferences and behaviour.

Studies that examine the potential effects of blockchain technology on digital marketing and offer useful suggestions for its incorporation are similarly limited. A comprehensive framework for the successful integration of blockchain technology in digital marketing is thus insufficient in the literature as a result. Research is also required to assess how blockchain technology will affect the digital marketing sector in future

Additionally, there aren't many studies that examine how blockchain technology is being used in digital marketing from a worldwide viewpoint. While considerable research has been done on the effects of blockchain technology in particular areas or regions, there has been much less research done on the worldwide effects and ramifications of blockchain technology in digital marketing. As a result, there is a gap in the literature about knowledge of the potential advantages and difficulties of blockchain technology in digital marketing from a worldwide standpoint.

There is a need for further studies to understand the role of blockchain technology in the future of digital marketing. This research should aim to establish a comprehensive framework for effectively integrating blockchain technology into marketing strategies. Additionally, the research should examine the effects of blockchain on consumer behavior and preferences, as well as explore practical applications and the rate of adoption of blockchain technology in the marketing sector.

It's worth noting that blockchain technology has the potential to revolutionize the way digital marketing operates, offering improved transparency, security and efficiency in transactions. For instance, blockchain can enable marketers to establish a decentralized system for data management and enable secure and transparent tracking of consumer data and interactions. These capabilities could provide new opportunities for marketers to create personalized, trustworthy and engaging experiences for their customers. However, the full impact and extent of blockchain in the marketing field are yet to be determined and the above-mentioned research will play a crucial role in shaping the future of blockchain in digital marketing.

CHAPTER – 3

3 Methodology

3.1 Theoretical part

Research Question was formulated to define outcome of this thesis reads as follows

“What is the future of digital marketing as a result of block chain integration?”

To get a proper result for the above-stated research question. It is important to break down and analyze the research question, to find what kind of data is needed and what methods of data collection are needed. As previously discussed, the study aims to gain future insights of blockchain integration into digital marketing. Though Blockchain 2.0 which is referred to as smart contracts was currently available, many industries were still in the trial phase and not much data was available to go for the Quantitative approach.

With the purpose of setting a path to go through the investigation, Qualitative research process have been selected and three sub questions were formulated. These sub questions extremely helpful in a guided interview

- I. What is the function of blockchain in managing data?
- II. How is blockchain connected to marketing?
- III. What is the significance of Ethereum and Basic Attention Tokens (BAT) in the realm of digital marketing?

These inquiries delve into the potential uses and impact of blockchain in the field of digital marketing, including the ways in which blockchain technology can be used to handle data and the relationship between blockchain and marketing. Additionally, the role of specific blockchain platforms like Ethereum and BAT in the digital marketing industry will also be explored. The result of present thesis aims to provide valuable information on how blockchain evolved into digital marketing and how it makes changes in future. This sub questions cover all the aspects and set a path to

the overarching research question

3.2 Theoretical research structure

There will be a procedure for creating the theoretical research. This structure resulted from an analysis of the thesis statement and the research question, followed by a list-making exercise to identify the key variables. The study covered topics including how to select participants, how to organize and carry out an expert interview, how to validate blockchain correctly, and how to analyze outcomes in digital marketing to put the findings to use.

It is crucial to comprehend digital marketing, the gap that currently exists between it and its potential future following integration with blockchain. This section of the research was therefore primarily concerned with researching the fundamentals of the blockchain and associated digital marketing, such as human-computer interface, reasonability, and problem-solving.

This framework was created for an explanatory study, in which questions about "how" or "why" will be investigated to get the answer to the research question. This kind of study establishes a connection between the factors that were previously researched in order to comprehend the subject's findings. The development of a research structure tries to convey the theory behind how to reply to the research question while supporting the research investigation. This study configuration links the body of existing knowledge and builds a framework for subsequent empirical research. Due to its structure, this study is able to generalize from one phenomenon while also describing other phenomena

3.3 Execution Method

3.3.1 Qualitative Expert Interview

Blockchain and digital marketing industry specialists have been interviewed in a semi-structured manner to acquire a deeper grasp of the current situation and identify issues that can be examined in future studies. posing open-ended inquiries. The expert interview is utilized as a stand-alone approach since the study's goal is to compare the contents and

differences of expert knowledge in the digital marketing and blockchain industries. According to Gläser and Laudel, the following criteria must be taken into consideration when selecting experts

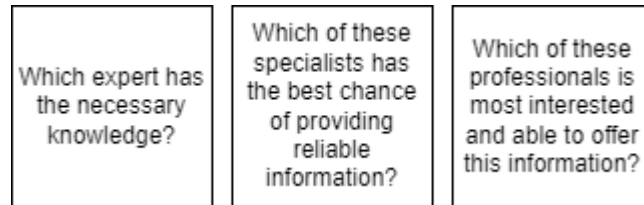


Figure 6: Criteria for selecting experts (Gläser and Laudel, 2006)

3.3.2 Expert Interview

The qualitative research phase was conducted using a semi-structured interview like explained before. Because it is structured to cover subjects relating to the research topic, this type of interview offers up a wide range of options, but it also gives participants the opportunity to add additional meanings and insights to the study's primary focus (Galletta (2013, p.245)).

This type of interview can be divided into portions, moving from questions about experiences or opinions to questions about theories as the interview progresses. This enables discussion of the relevant theory subjects while paying attention to the participant's experiences. In order to have a beneficial reciprocity, it is a one-time or repeated event that necessitates the participation of both the participant and the researcher.

From the early 1990s, expert interviews have greatly evolved. Expert interviews have diverse approaches depending on what part they are playing in a study, but they have been used in history throughout the years (Bogner, Littig and Menz (2009, p. 1)). Because of the extensive network they maintain by virtue of their expertise, the expert can also suggest possible candidates for conducting interviews and therefore widening the circle of experts. A legitimate outcome, accurate results, and real data are all guaranteed when expert interviews are conducted. It is not up to the researcher to decide who qualifies as an expert; rather, a person is deemed

an expert when they have the institutionalized power to shape reality(Bogner, Littig and Menz (2009, p. 19)).

3.4 Participation

11 people were contacted for research. Among them 5 were agreed, The contacts were made through social media called Linked In.Though 5 out of 4 experts live and work in berlin, experts requested to participate online due to their busy schedules. so all five interviews were done remotely through zoom call and google meet. All participants showed up themselves very happy and open to participate on research. which showed their interest on subject and their willingness to communicate their ideas and knowledge

3.5 Interview Framework

As previously mentioned, the semi structured interview was chosen as the survey method from the area of qualitative social research. In order to ensure that every key topic was covered during the interview, a framework for the interview was created. Gläser and Laudel concluded that while the interviewer should be flexible, the questions should be given to particular subjects. The number of questions must also take into account the allotted time and subject matter. The questions must also be completely framed so that each interview partner hears them in the same way. (Gläser, J, Laudel, G, Expert interviews and Qualitative Content Analysis, 2010, p. 193)

Experts' names are provided on this research paper and experts working companies are avoided to ensure the interviewees' anonymity. The experts who were questioned are referred to as E1, E2, E3, E4 and E5. An outline of the experts who were interviewed is given in the table below.

Table 1 : Test participants

S.No	Expert Name	Field, Location
Expert 1	Shikar Bhatt	Blockchain developer, Berlin
Expert 2	Ba Yang	Blockchain engineer, Berlin
Expert 3	Martin Grozev	Marketing manager, Berlin
Expert 4	Martin Silvester Kyanja	Marketing manager, Tanzania
Expert 5	Leonard Mashimi	Blockchain analyst, Berlin

Table 2: Experts and field of expertise

Expert	Field of expertise	Language
E1	Blockchain developer with deep knowledge of the features of Blockchain	English
E2	Blockchain Engineer with deep knowledge of the features of Blockchain	English
E3	Marketing Manager with strong experience in future insights into digital marketing	English
E4	Marketing Manager with strong experience in future insights into digital marketing	English
E5	Blockchain analyst of a Blockchain-Based company with an in-depth knowledge of the future of digital marketing with the integration of blockchain	English

3.5 List of interview questions

The questions were developed with the primary intention of using the expertise and insights that each expert had in their judgments to address the research questions and objectives presented at the outset of the study. As previously indicated, the interviews were carried out as semi-structured interviews, with the questions serving as a guide but not as a strict framework for the research. The interview was conducted as a conversation while adhering to a semi-structured format with the implicit goal of putting the interviewee at ease. Where both the interviewer and the interviewee introduced themselves and discussed the interview process, as well as the interviewee's work experience in the field

1. Can you describe your experience in developing blockchain solutions for digital marketing?
2. How does blockchain technology help improve the transparency and security of digital marketing campaigns?
3. Can you share some examples of successful blockchain-based digital marketing campaigns you have developed or worked on?
4. What are the challenges you have faced in implementing blockchain solutions for digital marketing?
5. How do you think blockchain technology can be integrated with other marketing technologies such as AI, data analytics, and CRM?
6. How do you envision the future of blockchain technology in digital marketing and its potential impact on the industry?
7. Can you provide insights on how blockchain technology can enhance customer engagement and the customer experience in digital marketing?
8. How do you approach data privacy and security concerns when developing blockchain solutions for digital marketing?
9. How do you stay updated on the latest advancements and trends in blockchain technology for digital marketing?

10. How do you view the potential of blockchain technology in the field of digital marketing?
11. Can you describe some of the ways in which blockchain technology has been used for digital marketing purposes?
12. How does blockchain technology differ from traditional marketing methods?
13. What are the benefits of using blockchain technology for digital marketing?
14. Can you provide examples of successful blockchain-based marketing campaigns or initiatives?
15. How do you see the future of blockchain technology in the world of digital marketing?
16. How do you think blockchain technology will impact the role of digital marketers in the near future?
17. What do you see as the biggest challenges facing blockchain technology in the digital marketing industry?
18. How do you stay up-to-date with the latest trends and advancements in blockchain technology and digital marketing?
19. Can you explain how blockchain technology can be used for digital marketing?
20. What are the benefits of using blockchain for digital marketing compared to traditional methods?
21. How does blockchain enhance security and privacy in digital marketing campaigns?
22. Can you describe a successful blockchain-based digital marketing campaign you have managed?
23. How do you ensure the transparency of digital marketing data in a blockchain-based system?
24. Can you explain how blockchain can be used to track customer behaviour and preferences in real time?
25. How does blockchain technology impact the customer experience in digital marketing?
26. What challenges have you faced while implementing blockchain technology in digital marketing and how did you overcome them?
27. Can you discuss the future potential of blockchain technology in digital marketing and its potential impact on the industry?

28. How do you measure the metrics of success on blockchain based marketing campaigns?
29. What are the limitations and drawbacks of using blockchain technology in digital marketing?
30. What do you think about landscape of blockchain evolving in next few years?

3.5.1 Categorization of question

Table 2: Sub questions, Experts, and Interview Question numbers

Sub question	Expert	Expert field	Question number
1	E1	Blockchain developer	Q1 to Q9
1	E2	Blockchain Engineer	Q9 to Q18
2	E3	Marketing manager	Q19 to Q27
2	E4	Marketing manager	Q19 to Q27
3	E5	Block chain analyst	Q28 to Q 30

3.6 Evaluation of experts

A key component of the research is evaluating an expert because the findings, which will arise from the process's conflicting perspectives, will determine the study's outcome. Data analysis may resume and continue in qualitative research investigations when conclusions are being transcribed into a report (Schneider et al. (2014, p. 133)). According to (Schneider et al. (2014, p. 133)) Codification, the first phase in the analysis, is required for all evaluations of the interviews. But due to technology advancement, a tool of artificial intelligence “otter.ai” that is helpful to directly record while interviews are happening on zoom or google meet and give instant auto transcription during interview .

Following the first phase, the classification stage was carried out, which essentially entails the

logical grouping of the previously gathered transcribed. Finally, an establishment of categories and subcategories in order was performed in order to locate useful insights to generate further findings. The goal is to have the fewest amount of categories feasible at the end. In order to break the transcription of the entire conversation into more easily digestible thoughts, this search for recurring ideas seeks to first discover concepts that are assumed to be frequent during the interviews

3.7 Digital automated Transcription

To maintain the same conditions, the interviews were conducted in English, which was the language spoken by all of the participants. To establish the same input for each interview, the questions and introduction paragraph were all written in English. The author of this thesis transcribed each interview as a technique to begin analyzing the earlier interviews and to have notions appropriated for the study of the data presented for additional conclusions.

Several factors were taken into account when transcribing the interviews because the punctuation, spelling, and level of detail all influence how the transcript is read by those who would be evaluating it (Green and Thorogood (2004, p. 101)). Punctuation is an important consideration in the process since proper punctuation affects the quality of the transcription. Participants do not always properly signal the beginning or end of a statement by changing their vocal modulation (Seidman (2006, p. 115)).

Within the transcription process, the following stages must be taken: The initial transcription, in which each word is entered word by word or, as noted before, before editing, followed by a proofreading step to ensure that everything is in order. Also, if it's pertinent, additional team members can read the transcript to review the results once more. This is the time to make any necessary final adjustments.

With the interviewee's permission, the interviews were digitally recorded with the help of AI software called "otter.ai" It provide automated transcription. As a result, there is no data loss, and a qualitatively higher result is produced. The interviewer can totally concentrate on the other person during the conversation thanks to the sound recording, which is another benefit. This results in a dialogue that is much more natural. (Gläser and Laudel, G., , 2010, p. 193). Standard spelling was used in

the following translation to remove pauses and non-verbal cues. To make the analysis process simpler, slang terms and imperfect phrase constructions have also been fixed. Furthermore, due to a lack of content-related significance, the transcript excluded small talk, interview procedure explanations, as well as personal tales or situation-related interruptions.

3.8 Execution of Interview

Expert interviews conducted between January 10 to January 20, 2023 and the interviews are carried out through skype and telephone, each interview last from 15 to 25 minutes. Interviews are conducted in English language. Interviews are digitally recorded with the

CHAPTER - 4

4 Interview analysis and findings

4.1 Analysis of a blockchain developer

4.1.1 Developing blockchain solutions

Studying the approach used by developers to produce these solutions is crucial when considering the potential of blockchain as a tool for digital marketing. Our research of qualitative interview data revealed that block chain developers frequently adhere to an organized process, starting with a thorough comprehension of the issue or use case they are attempting to address. This entails recognizing the problems with the current system and looking into the advantages of employing blockchain technology to solve these problems(Transcript E1,2023, p.72).

From there, programmers usually produce a proof-of-concept to verify their theories and then modify the solution as necessary. To ensure the solution is secure and scalable, this iterative approach frequently entails cooperation with other developers and stakeholders.Overall, our analysis shows that blockchain developers approach problem-solving in this area with care and data-driven reasoning, which is crucial when creating solutions that have the potential to upend sectors like digital marketing. These developers are able to produce solutions that are both novel and practical by comprehending the particular advantages and constraints of blockchain technology. These solutions may pave the way for a more safe and open digital marketing environment in the years to come(Transcript E1,2023, p.72).

4.1.2 Successful blockchain campaigns

In the area of digital marketing, smart contracts have become a potent tool for utilizing blockchain technology. We did a qualitative interview analysis of a blockchain developer who had successfully created a blockchain campaign utilizing smart contracts in order to better

grasp the possibilities of this strategy. Our findings indicate that a thorough understanding of both the technical and strategic facets of blockchain technology is the key to success in this field. The smart contract's developer underlined the need for thorough rule- and logic definition, as well as for making sure the system was both secure and scalable. To make sure the contract was compliant, frequently required close collaboration with other engineers as well as with the legal and compliance divisions

Increasing potential users' knowledge and adoption of the blockchain campaign was a significant difficulty that the developer faced. To get around this, the platform's developer used a number of marketing strategies, like social media outreach and influencer relationships, to spark interest and increase traffic(Transcript E1,2023, p.72).

4.1.3 Blockchain integration with other marketing technologies

As blockchain technology develops further, there is rising curiosity about how it may be combined with other marketing technologies, including artificial intelligence (AI), to produce even more potent and efficient solutions. We did a qualitative interview study with a blockchain developer who had expertise combining blockchain with AI in order to better grasp the potential of this approach(Transcript E1,2023, p.73).

According to our research, one of the major advantages of this strategy is the capacity to develop more precise and data-driven marketing campaigns. Developers can ensure that the data used by AI algorithms is accurate and trustworthy by utilizing the decentralized and secure features of blockchain, which will result in more precise targeting and customisation(Transcript E1,2023, p.73).

Yet, combining blockchain and AI does present certain difficulties. The developer we spoke with stressed the need of making sure the two systems are completely interoperable and capable of integrating effortlessly. This frequently required cooperation across several teams and stakeholders as well as a great deal of technical knowledge.Building awareness and adoption of these new solutions among potential users presented another difficulty to the developer. In order to convince potential clients of the advantages of blockchain and AI and

to foster trust in these cutting-edge technologies, sophisticated marketing and communication tactics were required(Transcript E1,2023, p.73).

Overall, our report suggests that combining blockchain with other marketing technologies, like AI, may result in more effective and successful commercial solutions. To ensure the adoption and implementation of this strategy, however, extensive technical know-how, collaboration, as well as strong marketing and communication strategies are needed.

4.1.4 Future of blockchain technology in digital marketing

As blockchain technology develops, excitement in how it can change the world of digital marketing is growing. We did a qualitative interview study of a blockchain developer who had experience in this field to better understand the potential of blockchain in this industry.

Our research indicates that a variety of fresh and cutting-edge uses are going to define the future of blockchain in digital marketing. Blockchain might be used, for instance, to build ad networks that are more safe and transparent, giving advertisers more control and insight over where their content is being displayed(Transcript E1,2023, p.73).

The development of new loyalty programs and rewards systems, which might take advantage of the decentralized and secure nature of blockchain to create more adaptable and efficient incentive structures, is another possible use of blockchain in digital marketing. In order for blockchain to completely fulfill its promise in digital marketing, there are also important obstacles that must be overcome. The need for more education and awareness among potential users is a major problem, since many firms are still ignorant of the potential uses and advantages of blockchain technology. Technical difficulties must also be overcome, such as ensuring compatibility between various blockchain systems and creating efficient governance and standardization procedures(Transcript E1,2023, p.73).

Overall, our analysis points to a complicated and exciting future for blockchain in digital marketing. While there are several chances to use this technology to develop more open, safe, and efficient marketing solutions, there are also many obstacles that must be overcome in order to ensure its adoption and deployment(Transcript E1,2023, p.73).

4.1.5 Privacy and data concerns on developing blockchain solutions.

Concern over how blockchain technology can be utilized to preserve user privacy and data is developing as it is employed more and more in the area of digital marketing. We did a qualitative interview study with a blockchain developer who had expertise with blockchain solutions for digital marketing in order to better understand how developers are addressing these issues(Transcript E1,2023, p.73).

According to our research, managing privacy and data concerns calls for a diversified strategy. A crucial tactic emphasized by the developer we spoke with was the adoption of secure, decentralized networks, which provide users more control over who may access their data. The developer also underlined the significance of openness and user consent in the gathering and use of data. This frequently entailed creating user agreements and privacy rules that were concise and easy to understand, as well as giving consumers more control over their data through tools like opt-outs and data deletion(Transcript E1,2023, p.73).

In addition, there are substantial technical issues that must be resolved in order to guarantee the confidentiality and security of user data on blockchain networks. These concerns include things like making sure data is sent and stored securely, as well as creating efficient encryption and hashing algorithms to guard against unauthorized access.

In conclusion, our analysis shows that addressing privacy and data concerns on blockchain systems necessitates a blend of technical know-how and successful communication and marketing techniques. Developers in this field have the opportunity to create new, more privacy-focused solutions for digital marketing and to add value to both organizations and customers by exploiting the special capabilities of blockchain technology to enable better control and transparency over user data.

4.2 analysis of a blockchain engineer

4.2.1 Potentiality of blockchain in the field of digital marketing

As blockchain technology develops further, curiosity in how it can change a variety of industries, including digital marketing, is growing. We carried out a qualitative interview study with a blockchain engineer who has experience in this industry to better grasp the possibilities of blockchain in this space(Transcript E2,2023, p.74).

Our research suggests that blockchain technology has enormous potential for digital marketing. This potential might have a big impact on how companies connect with their customers, track data, and run marketing campaigns. In particular, blockchain offers the potential to improve data security and privacy, lower fraud and advertising inefficiencies, and provide more efficient ways to track and manage loyalty programs and consumer rewards(Transcript E2,2023, p.74).

The usage of blockchain in programmatic advertising was one particular use case that our interviewee found to be really compelling. Programmatic advertising could change by utilizing the decentralized characteristics of blockchain to build more transparent and secure ad networks, eliminating fraud, and enhancing targeting and conversion rates.The development of rewards systems and loyalty programs is another excellent application for blockchain technology in digital marketing. Businesses might establish more flexible and effective incentives for their customers by utilizing smart contracts and blockchain technology, increasing value while lowering fraud and abuse(Transcript E2,2023, p.74).

4.2.2 Blockchain differs from traditional marketing methods.

To administer and track advertising campaigns and user data, traditional marketing techniques frequently rely on centralized intermediaries, such as advertising platforms or data brokers. Blockchain technology, on the other hand, is decentralized, which means that it runs on a distributed network of nodes that authenticate and record transactions in a secure and transparent manner.

We did a qualitative interview study with a blockchain engineer with experience in this field to better understand the distinctions between blockchain and conventional marketing strategies(Transcript E2,2023, p.75).

According to our research, blockchain has a number of significant advantages over conventional marketing strategies, particularly in terms of data security, privacy, and transparency. Businesses can lower the risk of fraud and abuse and give customers more control by utilizing blockchain to build more secure and transparent ad networks(Transcript E2,2023, p.75).

Additionally, blockchain enables businesses to design more customized and effective incentives for their customers by providing greater flexibility and efficiency in terms of loyalty programs and rewards systems. Customers' involvement and loyalty may rise as a result, and marketing initiatives may perform better overall.To effectively utilize the promise of blockchain in digital marketing, there are important technological difficulties that must be overcome. Scalability, interoperability, and interaction with other marketing technology, such as AI and machine learning, are some of these concerns(Transcript E2,2023, p.75).

4.2.3 Biggest challenges facing blockchain in the digital marketing industry

For blockchain technology to be widely used, a number of issues that arise from its application in the digital marketing sector must be resolved. Scalability, privacy, and regulation are some of the key issues that blockchain in the digital marketing sector must deal with(Transcript E2,2023, p.75).

In the blockchain industry, scalability is a major problem that has an impact on how well decentralized apps operate. The current limitations of blockchain technology are the lengthy transaction processing times and expensive fees. Blockchain needs to be able to process a large volume of transactions quickly and affordably in order to be a useful tool in digital marketing(Transcript E2,2023, p.75).

Another significant obstacle for blockchain in the digital marketing sector is privacy. It can be both a strength and a weakness if blockchain technology is used to provide immutable, transparent records of transactions. While the blockchain's transparency can help prevent fraud and boost confidence, it can also make it difficult to retain anonymity.The implementation of blockchain in the digital marketing sector is also hampered by regulation. Worldwide regulatory frameworks are still being developed, and it is unclear how blockchain

technology will be governed. Blockchain technology must be able to support the different regulatory standards that apply to digital marketing campaigns and activities.

4.2.4 Benefits of using blockchain technology in digital marketing

Blockchain technology has many advantages for digital marketing, including improved efficiency, security, and transparency. The transparency that blockchain offers, enabling immutable and tamper-proof records of transactions, is a big benefit. If customers can see the specifics of their transactions and feel certain they are receiving what they paid for, this transparency can increase trust between businesses and consumers. Blockchain technology can also greatly improve the security of online marketing initiatives. Blockchain's decentralized structure makes it much harder for hackers to alter transactions, lowering the likelihood of fraud. Additionally, the implementation of smart contracts within the blockchain can further boost security by automating procedures like payments and contract execution, decreasing the need for human intervention in these operations (Transcript E2, 2023, p.76).

The enhanced efficiency that blockchain technology brings is another advantage when used in digital marketing. Because blockchain eliminates middlemen and simplifies procedures, it can dramatically lower transaction costs. As a result, running digital marketing campaigns and activities may take less time and money (Transcript E2, 2023, p.76).

Therefore, applying blockchain technology to digital marketing has great advantages and has the ability to completely alter this field of work. Blockchain can help firms boost client trust by enhancing efficiency, security, and transparency while lowering the costs and risks involved with digital marketing initiatives.

4.2.5 Future potential of blockchain in digital marketing

Blockchain technology has a huge future potential in digital marketing and is ready to completely transform the sector in many ways. Blockchain technology has a huge potential for the development of a transparent, decentralized environment for digital marketing, allowing companies to engage with customers directly and securely without the use of

middlemen. Loyalty programs and rewards systems that are based on decentralized ledgers are two examples of new business models for digital marketing that can be made possible by blockchain technology. Customers may have more control over their data and more individualized experiences thanks to these solutions, which will enhance engagement and loyalty.

Blockchain technology can also improve the personalisation and targeting of digital marketing initiatives. Businesses may collect more precise and thorough data on their customers, resulting in more targeted and personalized advertising, by taking use of the transparent and immutable characteristics of blockchain ledgers. Blockchain technology can be used in digital marketing to reduce fraud and boost consumer and business trust. Customers may have more access to their transactions thanks to blockchain, which also ensures that their data is secure and they get what they paid for.

In conclusion, blockchain technology has enormous potential for the future of digital marketing and the capacity to fundamentally alter the sector. Blockchain can help organizations gain the trust of their customers and develop more individualized and targeted marketing efforts by enhancing transparency, security, and efficiency. We can anticipate additional cutting-edge applications of blockchain in digital marketing as the technology develops.

4.3 analysis of a marketing manager

4.3.1 Blockchain use cases in digital marketing.

Although blockchain technology has a lot of potential for digital marketing, it is now having trouble becoming more widely accepted. Blockchain can be used by companies in a variety of inventive ways to provide them a competitive advantage. Businesses can, for instance, use blockchain-based loyalty programs in addition to holding contests, or they can give customers special benefits for interacting with their brand on the blockchain (Transcript E3, 2023, p.77).

Influencer marketing is another powerful tool for promoting blockchain-based goods and services. Influencers with expertise in and enthusiasm for blockchain technology can aid in raising the profile and legitimacy of blockchain-based businesses.

There are still many ways for firms to benefit from using blockchain, even though it is not yet widely used in digital marketing. Businesses can use blockchain to increase brand awareness, develop consumer loyalty, and eventually boost sales by being innovative, community-driven, and adaptive. It will be interesting to see how blockchain-based marketing methods develop and mature as the technology advances(Transcript E3,2023, p.77).

4.3.2 Impact of customer experience in digital marketing

The success of a company in the area of digital marketing is greatly influenced by the customer experience. The phrase "customer experience" describes how customers connect with a company through all of its touchpoints, including as websites, social media, and other digital platforms. Negative customer experiences might have the opposite effect from what is intended in terms of brand loyalty and sales growth(Transcript E3,2023, p.77).

Customers now expect personalized and flawless experiences in the digital era, and companies that fall short of these demands risk losing clients to rivals. This means that customer preferences, behaviors, and pain points must be taken into account while developing digital marketing strategy(Transcript E3,2023, p.77).

A pleasant customer experience may not only draw in and keep customers, but it can also result in favourable word-of-mouth promotion, which can be very beneficial for businesses. Customers who are happy with a company are more inclined to recommend it to their friends and family, enhancing its reputation and expanding its market. Delivering timely, interesting, and valuable information across all touchpoints is what organizations must prioritize if they want to give a pleasant consumer experience through digital marketing. To achieve this, it may be necessary to use data and analytics to comprehend client behaviour and preferences and to develop individualized experiences that appeal to each individual customer.

It is impossible to emphasize the importance of customer experience in digital marketing. Businesses may forge lasting relationships with their customers by putting them at the core of their digital marketing strategy.

4.3.3 Transparency and accountability in the industry

In digital marketing, accountability and transparency are essential components. Customers want to be certain that the goods and services they are purchasing are of the highest calibre, and that the businesses with which they are doing business are honest and reliable. However, given the intricate network of middlemen and players, ensuring transparency and accountability in the digital marketing sector can be difficult. Blockchain technology has significant potential in this area. Blockchain is a decentralized, open-source ledger that makes record-keeping safe and unchangeable. Businesses may improve transparency and accountability in the sector by implementing blockchain in digital marketing. Businesses can give customers a clear and reliable perspective of a product's route from production to sale by using blockchain, for instance(Transcript E3,2023, pp.77-78).

Blockchain can potentially be used to improve accountability and transparency in the world of online advertising. Businesses may make sure that everyone involved in an advertising campaign is held responsible for their activities by employing blockchain-based smart contracts. Smart contracts, for instance, may make sure that impressions are counted correctly and that advertisers are charged fairly for the impressions they receive. The digital marketing sector might benefit greatly from a major improvement in openness and accountability thanks to blockchain technology. Businesses can give customers the information they need to make informed purchases by implementing blockchain-based solutions, and they can also make sure that everyone involved in the sector is held responsible for their actions. It will be interesting to observe how blockchain technology is increasingly incorporated into the landscape of digital marketing as it continues to develop(Transcript E3,2023, pp.77-78).

4.3.4 Blockchain to improve customer engagement in digital marketing campaigns

Blockchain technology may be utilized to increase customer involvement in digital marketing efforts and is not just for cryptocurrencies. The decentralized and open nature of blockchain technology can provide companies new opportunities to engage with customers and foster

loyalty. Using loyalty programs is one way that blockchain may increase customer engagement. Businesses may give customers a safe and transparent way to accrue and use rewards by developing blockchain-based loyalty programs. Additionally to giving businesses valuable consumer data they may use to enhance their marketing efforts, this can aid to build customer loyalty and retention (Transcript E3, 2023, p.78).

Gamification is just another method that blockchain may increase customer engagement. Businesses may encourage customers to participate with their brand in a fun and dynamic way by developing blockchain-based games that reward users with cryptocurrencies or other digital assets. By doing this, businesses can gain more insight into the preferences and habits of their customers while also fostering brand awareness and brand loyalty. Additionally, blockchain can be utilized to increase the security and openness of customer data. Businesses may give customers more control over their data while also assuring that it is secure and shielded from hackers by keeping client data on a decentralized blockchain network (Transcript E3, 2023, p.78).

The use of blockchain technology has the potential to greatly increase consumer involvement with online marketing initiatives. Businesses can provide their clients a new degree of transparency and confidence while also motivating them to interact with their brand in novel and interesting ways by implementing blockchain-based solutions. It will be interesting to observe how blockchain is increasingly incorporated into consumer interaction strategies as the environment of digital marketing continues to change.

4.3.5 Smart contracts in digital marketing

Avalanche, Solana, and Ethereum are just a few of the blockchain systems where smart contracts can be built. They immediately take effect when certain circumstances are satisfied since they are self-executing and enforceable. Smart contracts have a variety of uses, ranging from straightforward financial transactions to intricate supply chain management systems. A smart contract creates an immutable and transparent record of the transaction by encoding the terms and conditions of the contract in code and storing them on the blockchain. As a

result, there is no longer a need for middlemen like banks or attorneys, which can lower transaction costs and boost efficiency(Transcript E3,2023, p.78).

Just a handful of the blockchain platforms where smart contracts can be created include Avalanche, Solana, and Ethereum. They are self-executing and enforceable, and when specific conditions are met, they come into force immediately. There are many applications for smart contracts, from simple financial transactions to complex supply chain management systems. By encoding the contract's terms and conditions in code and storing them on the blockchain, a smart contract establishes an unchangeable and transparent record of the transaction. As a result, the need for intermediaries like banks or lawyers disappears, which can reduce transaction costs and increase efficiency(Transcript E3,2023, p.78).

4.4 analysis of a marketing manager

4.4.1 Traditional marketing methods or blockchain technologies in digital marketing

Digital marketing strategies are more well-liked and successful in the world of marketing. Although traditional marketing strategies may reach a broad spectrum of potential consumers, they frequently fall short of identifying particular people who are really interested in the good or service being given. On the other hand, digital marketing tools frequently draw people who genuinely care about a given subject, leading to more effective marketing campaigns. For instance, a recent study in Dodoma, Tanzania, promoted a gathering using radio advertisements, but just 20 people showed up(Transcript E4,2023, p.78).

However, the attendance rise to 100 persons when digital marketing strategies including influencer marketing, linking on Eventbrite, and posting on WhatsApp groups were used. To better target potential customers and maximize the likelihood of success, businesses must integrate digital marketing strategies into their overall marketing plans. As of now traditional marketing methods are more useful than using blockchain technologies(Transcript E4,2023, p.78)

4.4.2 Successful marketing campaigns

To use digital marketing techniques like influencer marketing and community building on social media platforms to effectively promote blockchain technologies in the East African region. I have successfully raised awareness of Filecoin in the IPFS and the final coin blockchain technology by planning meetups and running webinars. Our group has expanded greatly as a result of my work, and we have significantly increased our Twitter following. We have also put into practice practical tactics to strengthen our efforts in addition to digital marketing, such as the development of a new system to better advertise our technology. The numerous hackathons we've held and the rising interest in blockchain technology in our area are proof that our efforts have been successful. These results show how effective digital marketing is at spreading the word about and increasing interest in new technology(Transcript E4,2023, p.79).

4.4.3 Tracking consumer behavior and preference in real-time

Blockchain technology has attracted a lot of attention recently in the field of digital marketing. Real-time tracking of consumer behavior and preferences is one of the potential uses of blockchain technology in digital marketing. This can help marketers improve their entire marketing strategy and create more individualized marketing efforts carried out a thorough investigation using both primary and secondary data sources to examine the potential of blockchain technology for tracking customer behavior and preferences. To get insights into consumer behavior and preferences, we gathered information from a variety of sources, including surveys, online reviews, and social media platforms(Transcript E4,2023, p.79).

According to the results of our investigation, blockchain technology can be a useful tool for monitoring consumer preferences and behavior in real time. Marketers may gather and analyze customer data in a transparent and secure way by utilizing blockchain's decentralized and secure nature. In order to create more successful marketing campaigns, marketers may benefit from a greater understanding of their target market.

A further benefit of using blockchain technology is that it might give users more control over their personal data. Consumers can choose who to share their data with and exercise more control over the marketing messages they receive by granting them ownership of their data.

4.4.4 Successful smart contract campaign

The development of the Fire Coin virtual machine and the use of smart contracts in Tanzania will be examined. With the eventual goal of developing an alternative for Ethereum,

Technically Ethereum was pretty famous for its cryptography and it was quite famous for smart contracts as well but the gas fee was pretty high, since site coin is currently congested with expensive fuel fees, the project is concentrated on developing strategies and concepts for how to write smart contracts using the Fire Coin virtual machine. the virtual machine has been created, including the test net phase's successful launch and the virtual machine's impending launch in March. This also emphasizes the importance of open Hack Days in motivating Tanzanians to launch enterprises across a range of industries and construct them using the Fire Coin virtual machine(Transcript E4,2023, p.80).

4.4.5 Future potential impact on industry using block chain in digital marketing

Blockchain technology may absolutely be used in digital marketing, not just for data storage but also for analytics. Blockchain technology is a feasible choice for marketers to adopt due to its speedier calculation speed. Micro grants and other features are some of the possible advantages of utilizing blockchain technology in digital marketing. The disadvantages, however, stem from the fact that many direct marketing customers lack the programming skills and understanding required to fully exploit blockchain technology because they are not programmers. Knowledge of solidity or rust is necessary to build a smart contract that may be used in digital marketing. Without this information, it would be necessary to hire a third party developer, which can be more expensive than engaging a typical developer(Transcript E4,2023, p.81).

. In conclusion, blockchain technology has enormous promise for digital marketing, but in order to effectively capitalize on it, the skills and resources are required (Transcript E4, 2023, p.81).

4.5 analysis of blockchain analyst

4.5.1 metric measure the success of blockchain based marketing campaigns

To evaluate the success of blockchain-based marketing initiatives, certain criteria must be used to gauge their success. Engagement rate, which measures the degree of user participation with a given campaign, is one such indicator. To inspire people to interact with a campaign, blockchain-based marketing initiatives can include a variety of engagement mechanisms like competitions, social media sharing, or referral schemes. The conversion rate, which gauges the proportion of users who do a desired action, like completing a purchase or signing up for a newsletter, can also be used to assess the success of blockchain-based marketing initiatives. Blockchain technology can be used to build trustworthy and open payment systems that encourage users to behave in a certain way (Transcript E5, 2023, pp.82-83).

Blockchain-based marketing initiatives can make use of data analytics to learn more about user behavior and then customize their campaigns to better suit their target market's demands and preferences. Overall, blockchain technology offers a lot of potential for application in digital marketing, and blockchain-based marketing campaigns may be evaluated for success using a mix of engagement and conversion metrics as well as data analytics (Transcript E5, 2023, pp.82-83).

4.5.2 limitations and drawbacks of using blockchain technology in digital marketing

There are a number of restrictions and drawbacks to take into account despite the potential advantages of employing blockchain technology in digital marketing. The price of setting up and maintaining a blockchain-based system is a significant barrier for small and medium-sized firms, and it can be prohibitively expensive. However, because to its complexity, blockchain technology may be challenging for marketers to comprehend and utilize effectively, which might limit acceptance and impede the creation of new applications. A further difficulty is the potential for regulatory ambiguity and legal challenges, given that blockchain technology is still a relatively new and unproven area of the law. Last but not least, there are worries about how blockchain will affect the environment because it requires a lot of energy and could have an impact on global warming. Due to these restrictions. These restrictions and drawbacks imply that, despite the potential of blockchain technology as a tool for digital marketing, it is not a solution and needs to be carefully weighed in terms of its advantages and disadvantages(Transcript E5,2023, pp.82-83)..

4.5.3 landscape of blockchain evolving in next few years

With new blockchain applications and use cases being found every day, the landscape is quickly changing. Blockchain technology has a lot of potential in the field of digital marketing, for example. Blockchain technology offers a mechanism to increase trust and openness in marketing and advertising as customers' concerns about data privacy and the security of their personal information grow(Transcript E5,2023, pp.82-83)..

With the help of blockchain, marketers can design safe and open advertising campaigns that give customers authority over their own data and a just reward for their attention. Moreover, loyalty programs, safe micropayments, and the validity of products may all be verified using blockchain technology. With new blockchain applications and use cases being found every day, the landscape is quickly changing. Blockchain technology has a lot of potential in the field of digital marketing, for example. Blockchain technology offers a mechanism to increase trust and openness in marketing and advertising as customers' concerns about data privacy and

the security of their personal information grow. With the help of blockchain, marketers can design safe and open advertising campaigns that give customers authority over their own data and a just reward for their attention. Moreover, loyalty programs, safe micropayments, and the validity of products may all be verified using blockchain technology (Transcript E5, 2023, pp. 82-83).⁶¹

4.6 Limitations of blockchain technology in digital marketing

Blockchain is one of the most important technological developments taking on right now. There is no question that blockchain is having a significant impact on the digital marketing sector. Nevertheless, using blockchain has some drawbacks, the first of which is that the data it contains is not mobile. Well, a variety of systems, such as the supply chain and financial ones, can profit from it. However it is obvious that a blockchain network is fragile and may be easily taken over by an entity if a company owns 50% or more of the nodes. Another issue is that once data has been entered, it cannot be deleted. Thus users simply cannot get rid of the evidence of your data.

Second, many technology types are available in blockchain. And if a user chooses the most well-known one, Ethereum, individuals will discover numerous inefficiencies in the system. If you try to join the network, you will run into storage issues for several nodes. The blockchain's size is also still increasing, which slows down the entire network. So, this is definitely not suitable for commercial blockchain, where it is crucial for the network to be both quick and secure. Well, the inefficiencies are getting better because to blockchain technology.

Thirdly, everybody who has used blockchain technology is aware that it is significantly more secure than other platforms. Yet, this does not imply that the platform is 100 percent secure. In actuality, there are numerous ways in which the user must make a compromise in this situation. Examples of problems that render blockchain technology insecure and ineffective include double spending, cryptographic cracking, 51% attacks, and DDoS attacks. Users will experience all of these issues, which you must manage in any case.

Fourthly, the enormous energy consumption of these difficult mathematical puzzles renders them less than ideal for use in the real world. This is due to the introduction of blockchain technology with Bitcoin. The miner must therefore solve complex issues each time a new

transaction is added to the ledger, using a lot of energy in the process. There are various consensus algorithms that have solved the issues, even though not all blockchains operate in the same way.

The fifth and most significant drawback of using blockchain is the high cost associated with deployment. Hyper ledger is actually a component of blockchain technology that requires a significant financial investment from the enterprise. There are, after all, expenses related to employing engineers, supervising teams working on various areas of blockchain technology, and paying license fees if you choose to use paid blockchain technology. The maintenance costs related to the solution must also be considered by the organization. That may cost millions of dollars for many businesses.

CHAPTER -5

5.1 Results

As explained above on methodology to find answer for research question three sub questions were generated ,and these sub questions set an path to the research hypothesis , from analysis of expert interviews these sub questions were answered

Sub Q1 : What is the function of blockchain in managing data?

Firstly blockchain functions were started in cryptocurrency which deal in financial sector in early 2008 but later on blockchain 2.0 which is evolved and started using for marketing.The biggest problem in marketing are not marketing method but the way how middle man in marketing handling data.At the moment with present data handling methods in digital marketing even user don't know how his personal details which includes mobile no ,address and even including bank details were

transferred from one to millions of middle men in advertising and various other industries .Very best example can be when user search for some product on amazon and if he doesn't buy .Later on when he browsing something on google or facebook or yahoo etc... browsing platforms the product which user search on amazon will be in visible form of ads on these search platforms like google and yahoo etc...It means without the user permission the big tech companies and middle man were selling user interests and data to other companies .A recent study stated that google is earning around \$70 per active user on google searching through ads.

Now with blockchain technology the user can choose what type of advertisement user would like to watch and user data will be secured in blocks with block chain technology .if a third party want to use or transfer the user data .user will get to know that who theft his data and also if user enabled smart contract without the permission of user no third parties can enter into block and take user data and the biggest benefits for orgainastions with block chain technology are they interact directly with their consumers ,since there are no middle man the amount they spend on third parties will be directly given to their valuable customers in form of loyalty programs

Sub Q2: How is blockchain connected to marketing?

With technological advancement, digital marketing has evolved with technologies and at present biggest problem in digital marketing is gaining consumer trust withholding in data and bring advertisements to consumers on what they are interested at . For example, a consumer was really interested to buy and iPhone and looking for a better offer on market to buy with traditional marketing methods the advertising companies display advertising of various other branded phones of their clients who want to sell their mobile desperately by paying higher bids for their to advertising companies. Because of this cconsumerswill be forced to buy other branded phone by manipulating him by constantly showing other branded advertisements but with blockchain, things are different for example brave is a browser founded by co-founder of Mozilla Firefox and cofounder of java type script.The browser specialty was it has an inbuilt ad blocker and user can decide

how many ads he can visit in an hour based on user interest and the advertiser will split the amount that spent for advertising to content creators and visitors .and the money and data will be stored in secured block which cannot be tampered or changed ,In this way the organizations will be connected directly to the consumers by avoiding third parties and the amount they spend on advertising will be directly given in form of rewards to consumers with crptocurrencies by rewarding them organisations will earn cosumer trust by handling their data safely

Sub Q3 :What is the significance of Ethereum and Basic Attention Tokens (BAT) in the realm of digital marketing?

Ethereum was an famous cryptocurrency and known for its high transaction speed in crypto world. The world of digital marketing has a great deal of potential to be revolutionized by Ethereum and Basic Attention Tokens (BAT). The smart contract features of Ethereum allow for safe and open transactions between advertising, publishers, and customers. This can simplify the process of purchasing and selling advertising space and boost the precision of ad targeting, resulting in a higher return on investment for advertisers and greater relevance for consumers.

BAT, which is based on the Ethereum blockchain, promises to upend the established digital advertising business by giving consumers access to a decentralized browser and rewarding them for seeing adverts. This not only helps marketers by ensuring that their advertisements are seen by interested viewers, but it also gives individuals more autonomy over their data and privacy.

In general, blockchain technology has the ability to address concerns about privacy, transparency, and trust in digital marketing, creating a more moral and effective ecosystem. It will be fascinating to see how technology will influence digital marketing as it continues to develop and mature.

5.2 Conclusion

After examining various experts from the fields of blockchain and Digital marketing it is clear that blockchain technology is the future of digital marketing by providing

a decentralized ledger organizations will gain consumer trust and also institutions and organizations will get benefit of lowering their cost in business. But their certain cons as well. As explained before though blockchain was introduced in early 2008, still it was on trial phase on many industries with very less experienced employees working on blockchain technologies. Though companies and organizations will get huge benefits after integration of blockchain technology with digital marketing but it is really difficult for small and medium-scale organizations to adopt blockchain technologies because of its huge cost structure and to work on blockchain technologies organizations and companies need to hire blockchain developers and engineers which could be costly for medium and small scale industries. For instance at the moment blockchain engineers and developers are getting paid highest on tech industries. Also from early 2023 Artificial intelligence was booming, At the moment blockchain alone cannot automate digital marketing due to its high-cost structure but integrating blockchain technologies with AI could give better results in field of digital marketing which will result in efficient work with less employees and help to gain consumer trust

Definitely blockchain is going to be integrated completely with digital marketing in future but not at the moment this could take several years with technological improvement of blockchain into blockchain 4.0 and blockchain 5.0, Complete integration of blockchain into digital marketing is highly possible

5.2.1 Future scope of research

Blockchain technology's application to digital marketing is a relatively new field of study with exciting promise. Blockchain can increase security, trust, and transparency in a number of areas of digital marketing, including advertising, data management, and customer engagement.

According to the research's results, blockchain technology can offer a solid foundation for creating more powerful and successful digital marketing solutions. Decentralization, transparency, and security features of blockchain can help address some of the major issues the digital marketing sector is now dealing with, such as fraud, privacy worries, and a lack of confidence between advertisers,

publishers, and consumers.

Blockchain technology, nevertheless, still faces a number of obstacles and constraints that need to be overcome in digital marketing. For instance, blockchain technology is still in its infancy, and many technical and practical concerns, such as scalability, interoperability, and user adoption, still need to be handled. In addition, there are regulatory and legal issues that may differ depending on the location when using blockchain for digital marketing.

In conclusion, this research has shed important light on the potential and difficulties of applying blockchain technology to digital marketing. The results of your study can be used as a springboard for additional research and development in this area as well as to guide current research and practice in the area of digital marketing.

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Transcripts of expert Interview

Interview with E1(Expert 1)

Interview #1 shikar Bhatt (Blockchain Developer)

Interviewer: First of all thank you very much for joining me today .and our conversation will be recorded for transcription purpose will it be ok for you?

Expert 1: ok I agree

Interviewer: well my thesis focuses on block chain as instrument for digital marketing and currently iam studying at BBW Hochschule berlin for my research purpose I will be asking few questions related to blockchain since you are block chain developer your experience and opinions will be highly appreciated. Can you please introduce yourself soo we can start our interview will it be ok for you?

Expert 1: OK,Iam shikar bhatt. Basically I am from india ,Ive been working as web developer in india from past 5 years and recently I moved to berlin and iam working as block chain developer and my job was to code for smart contracts and testing

Interviewer: oh nice ! lets start our interview. Can you describe your experience in developing blockchain solutions for digital marketing?

Expert 1: Ok ,recently I started working with blockchain technologies ,being a programmer my job is to produce a proof-of-concept to verify their theories and modify necessary solution for it and working in teams and submitting our reports to stake holders and that's the work currently iam doing ,and I believe building blockchain solutions is not really an easy task ,its of huge budget simple mistake could cost a lot in industries

Interviewer: ok ,moving on to next question .Can you please explain about successful blockchain campaigns you worked with?

Expert 1: Like I explained before currently iam working on smart contracts ,smart contracts can be used for pretty much anything, best use cases in digital marketing as well.I cant revel the project name but I can explain indetail about smart contracts and my job.being an programmer I code for the contract and my job is to make sure its secure and only if both parties agreed then only then contract will be executed if one of them denied then it remains same and the cryptomoney/data wont be shared to another party

Interviewer: Oh nice,whats going to happen if blockchain will intergarte with other marketing technologies?

Expert 1: I really don't much idea about other blockchain technologies but I can say that combining both AI and blockchain would give an amazing results in digital marketing .Due to strong community support of blockchain technologies ,if AI and blockchain combined together in future it gives an pretty good commercial results

Interviewer: What is the future of blockchain technology in digital marketing

Expert 1 : That's an interesting question, definitely blockchain is going to be future of digital marketing due it to its decentralized nature. Unlike many advantages there are many disadvantages to use it now .at present lack of sufficient blockchain developers and blockchain engineers it is really tough for industries to adopt blockchain solutions .

Being a blockchain developer I can say definitely it can be future due it its strong benefits in handling data and strong layer of security in blockchain .It is almost impossible to hack data.

Interviewer : what measures do you take while handling privacy and data concerns on developing blockchain solutions?

Expert 1 : basically managing privacy and data concerns calls for a diversified strategy is a crucial tactic emphasized by the developer we spoke with was the adoption of secure, decentralized networks, which we provide users more control over who may access their data. we also underlined the significance of openness and user consent in the gathering and use of data. Well it is frequently entailed creating user agreements and privacy rules that were concise and easy to understand, as well as giving consumers more control over their data through tools like opt-outs and data deletion.

Also there are substantial technical issues that must be resolved in order to guarantee the confidentiality and security of user data on blockchain networks and These concerns include many things like making sure data is sent and stored securely and as well as creating efficient encryption and hashing the algorithms to guard against the unauthorized access

Interviewer: A very good answer.Thank you very much for your valuable answers and that's the end of our interview do you have any questions to ask ?

Expert 1: NO,But I have an request please make sure that you don't post anything about my working company .

Interviewer: Ofcourse I will not.can I mention your name as participant ?

Expert 1: Yes, you can

Interviewer: Alright. Then we end our interview here. Thank you for your time

Interview 2# Ba Yang (Blockchain Engineer)

Interviewer: First of all thank you very much for joining me today .and our conversation will be recorded for transcription purpose will it be ok for you?

Expert 2: yes ,That's ok

Interviewer: well my thesis focuses on block chain as instrument for digital marketing and currently iam studying at BBW Hochschule berlin for my research purpose I will be asking a few questions related to blockchain since you are block chain engineer your experience and opinions are highly appreciated. Can you please introduce yourself so we can start our interview will it be ok for you?

Expert 2: Myself iam Bayang. I am from Nigeria, Ive been working as a Machine learning engineer and Blockchain engineer in Munich from the past 7 years and currently I am working as a Machine learning engineer and cofounder of deep file my job was to code for algorithms and test those algorithms.

Interviewer: oh nice, we will begin our interview now. starting with our first question. What is potentiality of blockchain in the field of marketing

Expert 2: To explain in detail, The usage of blockchain in programmatic advertising was one of the most particular use case and Programmatic advertising will definately change by utilizing the decentralized characteristics of blockchain to build more transparent and secure ad networks and also eliminating fraud, and enhancing targeting and conversion rates .and To deploy rewards systems and loyalty programs is also an another excellent application for blockchain technology in digital marketing. Businesses might establish more flexible and effective incentives for consumer by utilizing smart contracts and blockchain technology, increasing value while lowering fraud and abuse.

Interviewer: That's really a very good answer. moving on to next question .can you explain why blockchain differs from traditional marketing methods?

Expert 2: This is bit complicated question for me because I don't have much experience on digital marketing but I will try to answer that, for traditional marketing methods a administer need to track advertising campaigns and user data, traditional marketing techniques frequently rely on centralized intermediaries, such as advertising platforms or data brokers But Blockchain technology, on the other hand, is decentralized, which means that it runs on a distributed network of nodes that authenticate and record transactions in a secure and transparent manner. Also it help industries to gain trust from their consumers by enabling loyalty programs

Interviewer: What are the Biggest challenges facing by blockchain in digital marketing industry?

Expert 2: At the moment blockchain technology to be widely used there are no of issues that rise from its use cases on marketing.The biggest challenge at moment are current limitations of blockchain are the lengthy transaction processing times and expensive fees,I can say that in cryptography language that includes financial sector and also Blockchain needs to be able to process a large volume of transactions quickly and affordably in order to be a useful tool in digital marketing

Well, another challenge I can say was privacy . it can be a strength and also it can be a weakness if blockchain is used to provide immutable, transparent records of transactions. While blockchain's transparency can help to prevent fraud and boost confidence also it can also make it difficult to retain its anonymity

Interviewer: Do you think only these two are biggest challenges ?

Expert 2: At the moment only these are problems.but who know in future many ma arise

Interviewer: Yes That's true.moving on to next question what are the benefits of busing Blockchain technology in digital marketing?

Expert 2:Basically there are many benefits of using blockchain in digital marketing.the most important characteristic of blockchain was immutable and tamper proof records of transactions which realy help for industries to create trust among consumers .that they are not selling their data to another opanies another benefit can be security i can say. block chain technologies 0are built with huge security this will be really helpful for less

fraud especillay in smart contracts, payment execution which can automate the process and decrease human effort operations also running digital marketing campaigns consume less time and money

Interviewer: ok nice.can you please explain future benefits of blockchain in digital marketing?

Expert 2: I believe block chain is going to be the feature not only for digital marketing but also for many other sectors like financial and supply chain etc..because blockchain will remove middle man who acts in between consumer and owner this could result in spending less money for digital marketing for companies and these companies can use that money in form of promotions or discounts lets say as customer loyalty programs.which will give clear transpacency for consumers and products where their products are going and to whom its going to and everything I possible only because of blockchain and its decentralised nature.But blockchain cannot achieve top level at this point of time, still there are certain regulations but in future definnately block chain will achive its heights

Interviewer: Nice,Thank you very much for your answers and opinions .Thats the end of our interview .do you have any questions ?

Expert 2: To be honest ,no

Interviewer: That's the end of your interview,once again thank you very much for your time

Interview 3# Martin Grozev (Marketing manager)

Interviewer: First of all thank you very much for joining me today .and our conversation will be recorded for transcription purpose will it be ok for you?

Expert 3: yes ,That's ok

Interviewer: well my thesis focuses on block chain as instrument for digital marketing and currently iam studying at BBW Hochschule berlin for my research purpose I will be asking a few questions related to blockchain since you are block chain engineer your experience and opinions are highly appreciated. Can we start?

Expert 3: ok sure

Interviewer: can you please explain block chain use cases in digital marketing?

Expert 3: Yeah. Well, blockchain has been developing over the years, quite quite quickly and substantially. So, right now it's actually very hard. To advertise anything on the blockchain because it's mostly considered Well, Blockchain is mostly considered crypto, even though blockchain is much more than crypto. But currently, there's a lot of push against it. So there's a lot of different mediums platforms that you can use to gain a competitive edge, which I think in the future will change. But for now, mainstream digital marketing doesn't really work. So you have to really think outside the box. So digital marketing, most important, I think, to to use for showing any blockchain is or any any any company on the blockchain is contests. I think this is the best way to do it. On let's say, Twitter, or discord or anywhere, so community pushes the contests and everything is surrounded by the community. So any blockchain project has to have a strong community in order to succeed. In essence, normal advertisements do not work, because they mostly get cancelled.

Interviewer: what is the impact of customer experience in digital marketing?

Expert 3: Well, block blockchain is not a blockchain is not really like a thing. It's it's different blockchain. So let's say there's an there's a game and this thing is developed using Blockchain. So then the game whenever a user goes on the game, whenever they play the game, the game would ask the user to they want it to be tracked. So it's the blockchain itself does not track is the decentralized applications, which would have either tracking or no tracking capabilities.

Interviewer: ok,moving on to next question How block chain can improve customer engagement in digital marketing campaigns?

Expert 3: Yes, so, digital marketing has gone through very like a variety of levels. And now we are at a point where so basically the customer has always gotten something for free, and they've given up their data for it. So the customer has been the products but the customer has only received engagement from whatever they're doing. As an example, Facebook, you scroll and you look at videos, but they capture your data, they capture your they capture everything. So now with the blockchain technology developing, whenever you let's say, let's say you're on a social media created on the blockchain, you usually earn some kind of points. Whether it's tokens, whether it's a native currency, but you earn something for being

Interviewer: nice, I have a short question like, during my research, I found out a little bit about smart contracts and which were given by Aetherium and Avalanche. Can you please if you know can you please explain about it like, how does it work exactly.

Expert 3: For smart contracts, you have avalanche Solana, you have Aetherium the several platforms where you create a smart contract and this smart contracts. You can use it for pretty much anything depending on what you create the smart what you want the smart contract to be. So it's a smart contracts are the highway between cities, we can put a link that gets you from one place to the other.

Interviewer: ok. what are block benefits of using Blockchain? In digital marketing rather than some traditional marketing methods?

Expert 3: Well, the non traditional marketing methods right now because the community of blockchain community uses those methods, then they only get the advertisements from the specific blockchain related companies. So it's very, very targeted. So if you have a good ad, you can have a very high CTR level, which means that your ads performs very efficiently, which is what you want. So you don't reach many people but the people that you reach they're very good potential customers.

Interviewer: A very good answer.thats all for todays interview .Once again thank you very much for your time and your valuable answers

Interview 4# Martin silvester kuanja (Marketing manager)

Interviewer: First of all thank you very much for joining me today .and our conversation will be recorded for transcription purpose will it be ok for you?

Expert 4: yes ,That's ok

Interviewer: well my thesis focuses on block chain as instrument for digital marketing and currently iam studying at BBW Hochschule berlin for the purpose of my master thesis. I will be asking a few questions related to blockchain since you are block chain engineer your experience and opinions are highly appreciated. Can you please introduce yourself?

Expert 4: My name is Matthew Sylvester I am based in Tanzania. Professionally, I'm digital marketing specialist. But I am also the ecosystem leader of file coin, the file coin blockchain in Tanzania and I'm in charge of all the activities of a coin in Tanzania.

Interviewer: Perfect. Thank you. Now, let's move further. Can you please explain how blockchain technology can be used for digital marketing?

Expert 4: Now that is my challenge was I wanted to ask you how to further explain it. Because majorly I am just doing marketing of the blockchain with my skills.

Interviewer: Yeah, no problem. Like what are whatever your experiences are? You can share with me.

Expert 4: Yeah, it's it's mainly been spreading mainly awareness of blockchain technologies, especially in our region, East African region. Using digital marketing I've mainly been using influencers and building communities not only with Natalia with the social, mainly with the social platforms and also bringing meetups and so far it has been good we have so far the the community has grown we have now a very good Twitter following we have many hackathons we have seen but it's just mainly been spreading awareness of the file coin in the IPFS and the final coin blockchain technology using my digital marketing skills and also not only on the digital side but also putting into the practical side hosting webinars and things like that. One of the things we've gone to also we are trying to improve like we are trying to bring on board the new system of that was built on to market it. The huddle, have you heard about her? Sorry. Have you heard about huddle? Huddle, huddle? No, actually, it was built on filecoin It works like zoom.

Interviewer: Okay, it was built with Blockchain technologies. Web three technologies. Yeah. Yeah. So this is that the project you're working now.

Expert 4: Now it's what we are trying to bring awareness. There are some of the projects on the ecosystem that we are trying to bring more usability by sharing them online, pushing them with influencers, pushing them in our online communities, the most active online communities on Twitter, telegram and WhatsApp.

Interviewer: Yeah. Also, like I would like to ask something like, what do you think, like block digital marketing with Blockchain technologies or better or traditional marketing techniques are better

Expert 4: I think they do marketing, digital marketing. The like digital marketing techniques are better because they are the traditional techniques are usually they usually cover a wide range but you don't cover specifically the people who are interested. You know? The digital marketing technologies tend to get more people who are really, really interested in the particular topic. For example, when we put out their links, that people were interested in joining our meetup and we put them on social media, we get more signups than just actually saying how we did it in Dodoma. We did a sample in one of the cities in Tanzania. We had a meetup there. We did a radio ad. And then later on, but that meetup didn't say goodbye expectations. We expected around 50 people we ended up getting around 20. The next time we used influencers. And we also use the we put a link on Eventbrite and we also shared on the WhatsApp groups in the in the normal community we've got 100 people.

Interviewer: It is safer to handle of data on stuff privacy than the traditional digital marketing techniques. Like is that true?

Expert 4: Yeah, it is true. For example, the ecosystem I work with file coin is mainly based on data storage. It is it is web three decentralized data storage. It gives an extra layer of security kovair layer no the cryptography and everything that comes with it gives an extra layer of security, whereby nada is not easily installed. Can I think something like clusters, it so if you're not in the system, you cannot get it all it is?

Interviewer: yeah.also is would like to ask Is there any threat to use blockchain technologies in digital marketing?

Expert 4: and digital marketing, the cyber threat acts up when you lose your keys, your secret keys, I will say but only someone can get access to them. That is one of the insecurities the security problems, but I would say it is quite safe compared to compared to the most of the web two applications. It is quite competitive. To application.

Interviewer: Perfect. Have you been working with smart contracts?

Expert 4: Yeah, currently we are working with we are building smart contracts because we are building what we call the fire coin virtual machine. Actually this month, last month, we had our first first event to introduce smart contracts. So that people can build a smart contract with solidity. So we are trying to create as many solutions as we can and ideas on how people can build those smart contracts using the filecoin virtual machine. You know, we want to create a replacement because you know Aetherium is very, very

congested with very high fuel, fees, you know the gas fees are really really high. So we are coming up there when they came up with a fire going virtual machine it will be fully launched in March. So we are now in the we are on the test net phase on the kind of the test net phase. So we we are encouraging we have open Hack Day in like 10 days. We want to encourage men of the Tanzanians to do startups in whatever field so that they can build them on that and then they'll get micro grants and everything else.

Interviewer: well its really interesting. And finally, one last question. Like what do you believe like, Can blockchain technologies completely integrated with digital marketing in future? Like is it possible?

Expert 4: Yeah, it is very possible and totally with data storage, but also with analytics. Because remember, computation on the blockchain is faster

Interviewer: Yeah. Do you think there are any like what is it what do I say? Like any negatives of using Blockchain technologies in digital marketing? Like do you feel

Expert 4: because many of the digital marketing users many of the digital marketing people are not programmers. And to fully maximize the blockchain technology, you have to have that extra knowledge to maximize it for example, to build a smart contract that can apply in digital marketing that can help you you need good knowledge of at least solidity or rust or something like that. Otherwise, you have to pay a third party to do it for you. And remember, Blockchain programmers are very expensive compared to the normal developers. Yeah, it's.

So in case you have that, some that extra aid you want, for example, smart contracts that can help you maybe collect that, transfer that or something like that, or collect that. It is it will need you to build something on solidity and it's not it's not very, very easy. is another thing. You can say like when it comes to the cost, like the costs of for example, if you have to use the middle quite expensive compared to others, but when you use other things like the other chains like Solana by Nance smart chain throw all us fail coin, the gas fees are cheaper, but people actually ended up most of the people are now only aware with etherium because etherium is the one that gave a layer to that where you can easily build so many people are very convinced that with etherium and then they don't know other things, but I think that is the main one only challenge in the development side. But on the other side like storage speed. There are more advantages on the other side.

Interviewer: Thank you very much for the valuable information and your opinions .That's all for the interview

Interview 5# Leonard Mashimi (Blockchain analyst)

Interviewer: First of all thank you very much for joining me today .and our conversation will be recorded for transcription purpose will it be ok for you?

Expert 5: That's ok

Interviewer: how can you measure the success of blockchain based campaigns?

Expert 5: That's a good question,to measure success certain criteria must be followed ,I mean to gauge success.for example engagement rate which measures the degree of user participation in the campaign that's one indicator to measure. Also to inspire people, variety of engagement mechanisms will be followed like competitions, social media sharing, referral schemes etc.. at this point conversion rate,will be really helpful for measuring success rate

Interviewer: That's a pretty good answer moving on to next question.what do you think about limitations and drawbacks using blockchain technology in digital marketing?

Expert 5: well, there are enormous restrictions and drawbacks to take into account despite potential benefits .the price of setting up blockchain technologies pretty high.That could be really big barrier for small and medium sized firms also lastly pretty important one, blockchain technologies need lot of energy that could show high impact on global warming

Interviewer: ok,what do you think about the landscape of blockchain in next few years

Expert 5: with blockchain technologies every day new use cases are being found in different sectors with that marketers can safely design and make open advertisements that gives customers authority over their own data and rewards for their attention.well finally I can say that blockchain offers a mechanism to increase trust and openness in marketing to consumers and product owners

Interviewer: Once again thank you very much for giving valuable information.Thats all for today's interview