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Use of Artificial Intelligence in Decentralized Autonomous Organization (DAO)

Jahangeer Ansari
Robert Kennedy College
University of Cumbria

MBA Artificial Intelligence - Dissertation
Supervisor:
Prof. Dr Mark Judge

Abstract - The Artificial Intelligence (AI) use in Decentralized Autonomous Organizations (DAOs) has gained practitioners attention for autonomous decision making to limit human bias and agile decision making. The study aims to highlight the use of AI in DAOs and exploring the future potential of AI for autonomous decision making. The study tends to assess the role of AI, Block chain and crypto currency in DAOs, to explore benefits and potential of AI in DAOs, and to underline challenges of AI implementation in DAOs. In this study, the pragmatism philosophy is used, followed by deductive approach, and primary method of data collection.

The data is collected through surveys and interviews and the findings show that there is no hierarchy in a DAO, employees are more likely to come up with novel solutions to problems and move the project along more quickly. Everyone in a DAO is free to voice their opinions and provide suggestions. From a financial perspective, it is radical to have people on the periphery of operations while yet enjoying the benefits of automation and AI-independent agents.

DAOs are a relatively new organisational model. It is concluded that Blockchain safeguards this data, enables us to audit all the intermediary stages AI takes to draw conclusions from the data, and enables individuals to profit from their production data in DAOs.

Statement of originality; acknowledgements

This is to certify that the content of this dissertation, on the topic of "Use of Artificial Intelligence in Decentralized Autonomous Organization (DAO)", to the best of my knowledge, is my own work. This dissertation is my own original work as guided and supervised by Prof. Dr Mark Judge.

All the research involved in preparing this dissertation is a product of my own independent and original work. And any assistance received in preparation of this dissertation has been acknowledged.

I declare that the dissertation has been produced in accordance with the University of Cumbria's code of good practice in research and ethics.

Additionally, I would like to thank Prof. Dr Mark Judge for guiding me throughout the dissertation with the right tools, formats, and mentorship.

I would like to express my very great appreciation to Marcello Mari - CEO of SingularityDAO, Dr. Ben Goertzel – CEO & Founder of SingularityNET, Anton Kolonin - Seasoned AI specialist at SingularityNET, David Orban,

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author, advisor, and thought leader of the global AI & technology landscape, and a special thanks to Seraina Ungricht for her support.

Lists of Abbreviations/Acronyms

1. DAO - Decentralized Autonomous Organization
2. AI - Artificial Intelligence
3. DeFi - Decentralized Finance
4. AGI - Artificial General Intelligence
5. KPI - Key Performance Indicators
6. DL - Deep Learning (DL)
7. IoT – Internet of Things
8. NLP - Natural Language Processing (NLP)
9. NLU - Natural Language Understanding (NLU)
10. ML - Machine Learning (ML)
11. VA - Virtual Assistant (VA)
12. SDAO – SingularityDAO; Also the Token.
13. SNET - SingualarityNET
14. SingDAO - SingularityDAO
15. Sing Tokens - SingularityNET Ecosystem Tokens (AGIX, NTX, SDAO, etc.)

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1. INTRODUCTION

1.1 Background

Wang et al. (2019) point out that decentralised autonomous organisations (DAOs) are governed and controlled by automated technology, unlike traditional organisations, which require a trusted third party and the recording of contract exchanges repeatedly. DAOs, which are a type of cloud computing cooperation facilitated by loosely connected peer-to-peer smart contracts made possible by Ethereum's Turing-complete architecture, have emerged as a result of the developments in the industry that Mari (2022) has stoked. Additionally, Yadlapalli et al. (2019) proposes that DAOs will function as open platforms with AI integration functioning as an autonomous agent for making decisions. AI DAOs are decentralised autonomous organisations (DAOs) that use Ethereum blockchain to operate resource management capabilities independently in three ways: as edge AI, as core AI, and as Swarm intelligence (Mohanty and Vyas, 2018). Robots and other forms of cutting-edge technology provide great promise for eradicating human error and bias, as discussed by Wright (2021). The potential of AI in DAOs is growing, and they contribute to the metaverse by making decisions based on machine learning and algorithms. In order to supplement monetary dealings on blockchain and crypto structures, Chohan (2017) created DAO as a unique organisation managed by automated rules and smart contracts. Bogna (2022) has highlighted that DAOs are governed by automated algorithms and processes and that they seek to integrate personnel irrespective of geography, background, or creed while avoiding any declared legal formal criteria and instead relying on automated rule of code. Below is a chart showing the total DAO Assets Under Management (AUM) as of 2021 after the bull market (Messari, 2021).



Snapshot of DAO Assets Under Management (AUM) Source: (Messari, 2021)

Some businesses have begun exploring the potential advantages of developing AI Decentralized Autonomous Organizations in addition to the already daunting task of integrating AI (AI DAOs). A decentralised autonomous organisation (DAO) is a group that operates according to predetermined guidelines written into software. Any time a person or group of people interacts with a business, in principle, they are entering into a contract. With the aid of smart contracts, which are used for both the transfer of data and the execution of agreements, companies of this type may now be formed wholly in the cloud. All managerial

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and administrative processes should ideally be digitised. The artificial intelligence underpinning an AI DAO may be related to free persons making decisions on their own.

1.2 History of DAO

Collaborators working toward a common goal benefit from open lines of communication and coordinated action (Hirokawa & Poole, 1996). After WWII, the word "governance" (from the Greek kubernaein, "to direct") was used to characterise the management of cities, and this concept inspired the formation of "cybernetics" as the scientific management of social systems that integrate humans and technology (Wiener, 1948).

Companies that rely heavily on software technology often use the cliché, "We are quite decentralised," to describe their internal structure. Urban centres all around the world are home to a plethora of nascent businesses (Medium, 2019). Other software businesses that oversee digital platforms have made similar claims: "Google is decentralised and lets a thousand flowers blossom" (Henderson, 2012); Alibaba has a "decentralised technique of make choices"; and Facebook has a "very decentralised organisational structure" (Glassdoor, 2019). To wit: (Glassdoor, 2019). Decentralization has become a popular concept in the realm of organisational design because to its association with innovation and flexibility, although its precise definition is still up for debate.

Decentralized governance is an area that has seen a lot of study. In her book "Polycentric Governance and Self-Government," award-winning economist Elinor Ostrom proposes a model for decentralised, autonomous communities (wang, 2018). She maintains that opportunism and free-riding behaviour may be restrained and lasting public interest can be developed through the multicentre self-governing framework produced by the spontaneous order of the community organisation. By using methods such as crowdfunding and independent contracts, communities may self-govern and avoid the Tragedy of the Commons dilemma of public-affairs management, according to the research. Sociologist Walter W. Powell recognised self-organization as a third governance mechanism based on trust and negotiation, in addition to hierarchical and market-based systems . Through self-governance and appropriate incentives, the organisation would be able to cut the costs associated with collecting, managing, coordinating, and monitoring internal information, making it more sustainable over the long run and fostering effective community governance. However, DAO can finally be put into practise because to advancements in blockchain technology. Blockchain allows for the secure and efficient transmission of information and value because it combines decentralised data storage, a timestamping system, a consensus process (Zhang, 2018), asymmetric encryption, and the attributes of being immutable, transparent, and auditable (Yuan, 2018). (Yuan, 2018). Ethereum2, the first publicly available blockchain platform, added functionality for smart contracts in 2015 thanks to the Ethereum Virtual Processor, a Turing-complete virtual computer (EVM). A variety of decentralised applications (DApps) may be built by users on the blockchain with the use of smart contracts. Many people think that one day the management and operational standards of enterprises might be written into the blockchain in the form of smart contracts, allowing them to carry out their intended tasks autonomously in accordance with predetermined business logic. In 2016, the world's first decentralised autonomous organisation (DAO) started and quickly accumulated 150 million

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dollars' worth of Ether (ETH), making it the largest crowd financed endeavour at the time. Since then, several different suggestions for decentralised autonomous organisations (DAOs) have been made, including the ones below. DAO is now facing several obstacles. The safety of everyone is of paramount importance at this time. The most significant occurrence is The DAO Attack in June 2016, which resulted in the theft of over fifty million dollars' worth of ETH. The second issue is that DAO violates existing legislation concerning corporations and securities. There are also worries about efficiency, confidentiality, and flexibility.

1.3 Importance of DAO in Organizations

We anticipate that the capacity to build a DAO will be indispensable in the near future for a number of reasons. Compared to traditional corporations, DAOs provide a number of advantages. As there is no hierarchy in a DAO, employees are more likely to come up with novel solutions to problems and move the project along more quickly. Everyone in a DAO is free to voice their opinions and provide suggestions. From a financial perspective, it is a game-changer to have people on the periphery of operations while yet enjoying the benefits of automation and AI-independent agents. DAOs, or decentralised autonomous organisations, are a relatively new organisational model. Some of our present fields may be threatened by the emergence of new business models and organisational structures made possible by the convergence of various technologies (AI, Blockchain, etc.). That's why it's crucial for corporations to start thinking about what DAOs may mean for them. Further, we anticipate a rise in the number of small, self-sufficient DAOs to which anybody may participate. As a result, we may want to establish our own AI DAOs and allow our customers to participate in the company's ownership. The ways in which customers engage with businesses would change drastically as a result of this shift. DAOs play a significant role in showcasing the use of AI for autonomous decision-making because of the importance of the crypto economy, block chain technology, and metaverse applications to future advancements. This research aims to provide light on the value of AI in DAOs, particularly with regards to the speed and accuracy of their judgement calls, while also addressing some of the difficulties inherent in putting this theory into practise. The study's importance stems from the fact that it helps to realise the potential of emerging technologies and provides guidance that will assist the effective application of those technologies.

1.4 Overview of DAO

For many years, researchers in the fields of computer science and sociology have been interested in the concept of decentralised autonomy. Self-organization phenomena in natural ecosystems, Internet-based Cyber Movement Organizations (CMOs), distributed artificial intelligence, etc., are early examples . Decentralized autonomous organisations (DAOs) have emerged in recent years as a result of the exponential growth of blockchain technology. These organisations' management and operational rules are typically encoded on blockchain in the form of smart contracts, and they are able to function autonomously without central control or third-party intervention. Businesses should expect significant savings on the costs of communication, administration, and cooperation if DAO is adopted. But DAO still has additional challenges, like as security and privacy worries, an unclear legal stance, etc. This article's goal is to serve as a primer on DAO by introducing the concept and outlining its key

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characteristics, research methodology, typical implementations, challenges, and potential directions for further study. Specific attention is paid to presenting a novel reference model for DAO that makes use of a five-layer architecture. This research was conducted with the intention of informing and facilitating future studies.

1.5 Overview of Methodology.

The study is a take on Pragmatism by relying primary data analysis where qualitative data is collected through Interviews and secondary data collected through published sources. With relation to secondary data, the study is likely to use keyword search as appraised by Cole and Trinh (2017) by using keywords "AI","DAOs", "Challenges of AI", "Benefits of AI in DAOs", and "AI in DAOs" on Google Scholar, ProQuest, Online digital library, and online published sources. For accuracy and relevance, the study is likely to use Boolean operator AND, Or and Not where data analysis method complements critical document analysis to align with research objectives.

1.6 Aim and Objectives

With relation to DAOs, the AI use in DAOs has gained practitioners attention for autonomous decision making to limit human bias and agile decision making. The study aims to highlight the use of AI in DAOs and exploring the future potential of AI for autonomous decision making. Overall, the study tends to achieve following research objectives,

- To assess the role of AI, Block chain and crypto currency in DAOs
- To explore benefits and potential of AI in DAOs
- To underline challenges of AI implementation in DAOs
- To recommend strategies of AI deployment in DAOs

1.7 Research Question

With reference to research aim and objectives, the study tends to address following research question,

"*To what extent, AI use in DAOs support efficient decision making?"*

1.8 Dissertation Overview

The next section of this dissertation (Chapter 2) will examine the available literature, looking at some of the previous studies conducted on DAO and related inquiries. Methodology, including all procedures taken and problems encountered throughout data gathering, will be discussed in detail in Chapter 3 of this dissertation. Findings, which should offer answers to the research issues this study was meant to answer, will be discussed in length in chapter four. The findings will be interpreted in chapter five of this dissertation, which will revisit the literature study from chapter two in order to make comparisons to existing works and to determine the practical consequences for the organisation. The last chapter of this dissertation is divided into three parts: I. conclusion 2) study limitations and 3) recommendations for more research on the issue.

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2. LITERATURE REVIEW

We analyse the role that artificial intelligence (AI), block chains, and crypto currencies play in DAOs, as well as the relevance of DAOs, as part of the literature review that we conducted for this study. In order to successfully complete a critical analysis of the relevant literature, it is necessary to consider aspects of the topic that are both good and negative. Confidence is increased when academic research and literature, in addition to models of market change, are studied.

2.1 Concept of DAO

We still don't know a whole lot about the DAO. We consider a DAO to be any blockchain-based organisation that can make decisions without the need for a top-down authority structure. By leveraging smart contracts and distributed consensus methods, DAOs provide its members the freedom to make decisions about the organization's operations, governance, and evolution without any central authority (Wang, 2018). We also provide a definition of DAO-like features that it has.

2.1.1 Decentralized

There is often a chain of command in place within a conventional organisation. However, with a DAO there is no one point of control or a strict organisational structure (Zhang, 2018). DAOs, on the other hand, accomplish their goals through the coordinated efforts of disparate nodes in a network. Therefore, administrative affiliation plays no role in the relationships between nodes or between nodes and organisations; instead, these relationships are founded on the principles of equality, voluntariness, reciprocity, and mutual benefit, as well as the resource endowment and complementary advantage of the individual.

2.1.2 Automation

In a perfect DAO, there would be no need for formalised ranks or a single source of power; instead, everyone would be free to participate in making decisions for the whole. In addition, trust costs, communication costs, and transaction costs are all reduced inside a DAO because they tend to adhere to the norms and cooperation patterns set by all stakeholders.

2.1.3 Organized and Ordered

Using smart contracts, the rules for how a DAO operates, the roles and responsibilities of its members, and the terms of any incentives or punishments are all laid down in detail. Through a well-defined set of rules, the organization's operations may be more streamlined and governed by rewarding those who pay, contribute, and take on responsibility with greater authority and privileges.

2.2 History of DAO

Many different types of decentralised organisations are discussed at length in the literature of "organisation theory" (Beckhard, 1966). Decentralized autonomous organisation (DAO) was initially mentioned in the 1990s to exemplify multi-agent systems in an Internet of Things setting (Dilger, 1997) or nonviolent decentralised action in the counter-globalization social movement (Schneider, 2014). In contrast, the name "Decentralized Autonomous Corporation"

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(DAC) was created a few years after Bitcoin's foundation, and may have inspired the more recent "Decentralized Autonomous Organization" (DAO) (Nakamoto, 2008). Bitcoin proponents' early talks on decentralised autonomous corporations (DACs) were held in online forums and offhand conversations, where the names were often used interchangeably. In 2013, the word saw widespread use and public debate across a number of online platforms (D. Larimer, 2013; Vitalik Buterin, co-founder of Bitcoin Magazine) (Buterin, 2013). The "dividend distribution method" in the DAC definition was written to include tokenized, freely traded shares. Since their rules were "open source software spread over the computers of its stakeholders," they were called "incorruptible," "human-free," and "publicly auditable" (S. Larimer, 2013). As stated in the definition, "anyone can become a shareholder in a DAC" via "purchasing business shares or being compensated in company stock for offering services to the firm." Investors in DAC's stock would therefore be allowed to "share in its profits," "share in its growth," and "share in its management" (ibid). The argument that "you don't want to regulate them, and you can't" is persuasive to many blockchain proponents, who otherwise argue that "DACs do not require regulation" (ibid). Due to its limiting association with corporate governance, this word is incorrect for many blockchain-based applications. This gave rise to decentralised applications (dapps) (Johnston, 2013), which were succeeded by DAOs (Decentralized Autonomous Organizations) (Buterin, 2014). Some have suggested that Bitcoin was the first DAO, while the term is now more commonly used to denote organisations formed using smart contracts on top of a blockchain network (Buterin, 2014; Hsieh et al., 2018). There have been several efforts to build a DAO on the Ethereum blockchain (Tufnell, 2014), but the first one to get public notice was a venture capital fund dubbed "TheDAO" in 2016. In particular (DuPont, 2017). Although TheDAO didn't endure long, it spawned a number of additional decentralised autonomous organisations (such as MolochDAO and MetaCartel) and platforms (including Aragon, DAOstack, Colony, and DAOhaus). To describe a DAO with enhanced collaborative features, the term "decentralised collaborative organisation" (DCO) is often used; a more nuanced concept derived from these efforts is the "distributed cooperative organisation," or "DisCO," which places an emphasis on the cooperative and democratic nature of the organisation (Troncoso & Ultratel, 2019).

The decentralised autonomous organisation (DAO) has emerged as a result of blockchain technology's rising popularity and sophistication in recent years (Yuan, 2018). There has been a lot of coverage on this phenomenon recently. Ideally, a DAO would function without any sort of formal hierarchy or chain of command. All decisions are decided by consensus, and all management norms are recorded on immutable blockchains. The potential of this new sort of organisation has been brought to light by DAO implementations such as the DAO and Steemit1. Self-determination without a governing body is not a new idea. Self-organization in ecosystems, Internet-based Cyber Movement Organizations (CMOs), and early forms of Distributed Artificial Intelligence (DAI) can all be seen as precursors to DAO. In the wild, animal communities frequently self-organize (Barakman, 2017). Complex behaviours including foraging, feeding, nesting, and defence are all within the capabilities of ant colonies but are beyond the scope of individual ants. The key concept is that members of an ant colony may work together through division of labour and adapt their behaviour to new circumstances. It's possible that other animals than ants exhibit self-organizing behaviours as well, including

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fish, bees, and flocks (Bonabon, 2000). All of these animal societies are characterised by a lack of strong leaders, a flat social structure, and a low degree of individual effect on collective functioning. This phenomena is sometimes referred to as "swarm intelligence." The broad availability of the Internet, especially the mobile Internet, allows for the quick and extensive collecting of online netizens' behaviour, which has led to the formation of CMOs (Aragon,2019). Social movement organisations are "cyberspace-induced or -reinforced" when individuals swiftly form online to discuss and take action on a specific issue or event (CMOs). Human Flesh Search (HFS), the Internet Water Army, and crowdsourcing are all examples of frequent types of collaborative marketing online. Bulletin board systems (BBS), forums, blogs, Weibo, etc. are used to rapidly infect and disseminate the behaviour or movement of netizens by broadcasting pertinent content. It is common for communications between CMOs to be unplanned, autonomous, digital, and real-time. DAI shows the timeline of AI development as seen from the future (AI). The goal of distributed artificial intelligence (DAI) research is to understand how geographically and/or temporally dispersed intelligent systems collaborate to solve difficult problems. Distributed artificial intelligence (DAI) systems typically include a large number of distributed autonomous nodes (i.e., agents) that exhibit sociability through communication, cooperation, and negotiation and also have the capacity for task selection, prioritisation, and goal-directed behaviours [also known as belief-desire-intention (BDI)]. DAI systems are more adaptable and less closed since they lack a unified command structure and global data store. Due to its tremendous redundancy, it can withstand failure with relative ease (Georgeff, 1998).

2.2.1 Technology Layer

The Basic Technology Layer encompasses the underlying infrastructures that allow DAOs and associated applications to function, such as the Internet Protocol, Blockchain, Big Data, Artificial Intelligence, etc. Internet Protocol: DAO is often constructed on a P2P network to allow for participation from dispersed nodes throughout the globe. The open autonomy and decentralised nature of DAOs are two of the technology's most impressive attributes. Using blockchain technology is essential for DAO to accomplish its goals. Blockchain's consensus approach enables distributed systems with dispersed decision-making authority to quickly and reliably establish legitimate consensus amongst themselves (Yuan, 2018). By using smart contracts, the DAO's operating rules may be written into the blockchain, thereby making the blockchain a legal system in and of itself (Ye, 2018). Moreover, asymmetric encryption and a timestamp may be used to confirm the DAO's ownership and compliance with security standards. Thanks to advancements in artificial intelligence (AI) like deep learning, reinforcement learning, and generative adversarial network (GAN), each node in a DAO can evolve into a software agent or robot (Wang, 2018). These agents function independently because they have BDI skills. They are expected to one day take over for humans in a variety of roles, including perceiving, thinking, and making decisions. In addition to the previously mentioned, smart contracts now include include What-If-type deduction, calculation, and intelligent decision-making under unforeseen scenarios, as opposed to only being limited to automated enforcement based on predetermined If-Then statements (ye, 2018). Because of these, DAO's level of intelligence will increase. Collecting and analysing the state data, intrachain transaction data, and system operation data of DAO nodes in real time using big data

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technologies (Dorri, 2018) will be helpful for understanding the DAO's evolution. The blockchain's architecture is a key factor in protecting the confidentiality of user information. The Internet of Things (IoT) and the blockchain might be used together to create Blockchain of Things (BoT), which would digitally convert and merge smart devices and physical assets into a decentralised autonomous organisation (DAO) (Bashir, 2018). DAO is a reliable IoT service platform because it keeps tabs on the whole smart device life cycle, allows for the seamless swapping of hardware, and employs smart contracts to ensure device-to-device communication (Wang, 2018).

2.2.2 Benefits of DAO

DAO's primary strength is that it is decentralised, a feature shared by all truly autonomous systems. According to its guiding principles, DAOs are built to prioritise the greatest possible degree of decentralisation. The concept of complete decentralisation becomes irrelevant in most contexts. The equation shifts for DAOs since they rely on participation from the whole community rather than just one person.Typically, a publicly traded company's ultimate authority rests with its board of directors and its chief executive officer (Clark, 2019). Therefore, employees, users, and consumers are disregarded in strategic planning.Many buyers could be wary of a brand new product, for instance. Manufacturers may provide one viewpoint, while employees may present another, and neither may be representative of the consumers' vantage point. Imagine this same company operating as a DAO, where users may cast votes to determine which features are most important to them in a given product.

Due to the DAO's merits in decentralisation, members of an organisation can have a vote in the direction the organisation takes. Many of you may feel that DAO tokens make DAOs less decentralised than they otherwise would be. How? Those who own a larger number of DAO tokens are more likely to have a larger say in the governance of the DAO. Voting power, however, is far more dispersed than in traditional groupings characterised by a single strong leader. DAOs, or decentralised autonomous organisations, facilitate the cooperation and coordination of people from different parts of the world. Web3 is open to everyone with a computer, an internet connection, and DAO governance tokens. One of the best things about being a part of a DAO is the opportunity to help shape the future of blockchain projects like Ethereum's Name Service (ENS) and other play-to-earn cryptocurrencies. The advantages of a DAO show how its members may have a sense of pride in their organisation. That way, they may inspire their participants to do new things and set fresh standards for the financial rewards they receive for their efforts. Members of a decentralised autonomous organisation (DAO) have significant say in the group's direction. Anyone using a decentralised autonomous organisation (DAO) has the ability to make proposals for improving or modifying the protocol (Kaal, 2020). DAOs' primary strength lies in the fact that power to make decisions is not confined to a select few in the boardroom. Novel ideas can be proposed because of the DAO's many members' contributions. In conclusion, the advantages of decentralised autonomous organisations are outlined, creating a positive impression of their importance in the broader crypto ecosystem. One of the hallmarks of the emerging web3 ecosystem is the prevalence of decentralised autonomous organisations, which have the potential to offer many benefits. Organizational definitions are expanded by DAOs, which might be anything from the advantages of decentralisation to a fully autonomous system (Riva, 2019). It's an innovative approach to

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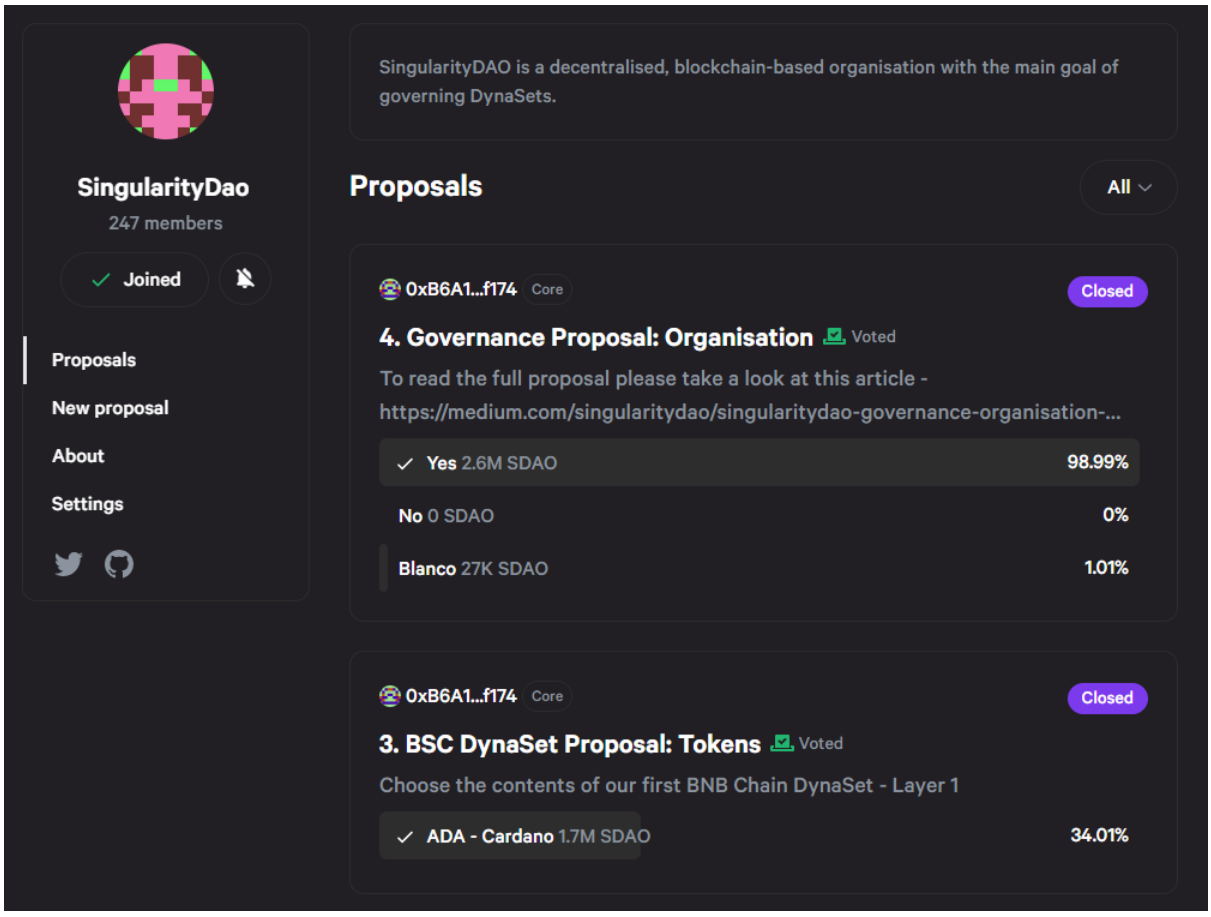
bringing together the organization's decision-makers, users, personnel, and consumers. DAOs' usefulness in decentralised administration will be dependent on the advantages they offer. Here, you will get an overview of the most well-known applications of DAOs along with further information on their structure and operation.

For example, SingularityDAO uses Snapshot.org, a decentralised voting system commonly used in the crypto space, to allow their Token holders (SDAO Token) to vote on the proposals thus allowing their members to make critical decisions that organisation needs to make. These votes are on blockchain that is publicly available to facilitate transparency and fair voting system.

The below screen captures of SingularityDOA's voting system on Snapshot.org, show several proposals that their members can vote on. On the SingularityDOA's Voting System 1. shows several proposals proposed by the organisation to its users. SingularityDOA's Voting System 2. reveals how members have voted for their preferred crypto token they would like to see in SingularityDAO's product "DynaSets".



SingularityDOA's Voting System 1. on Snapshot.org.

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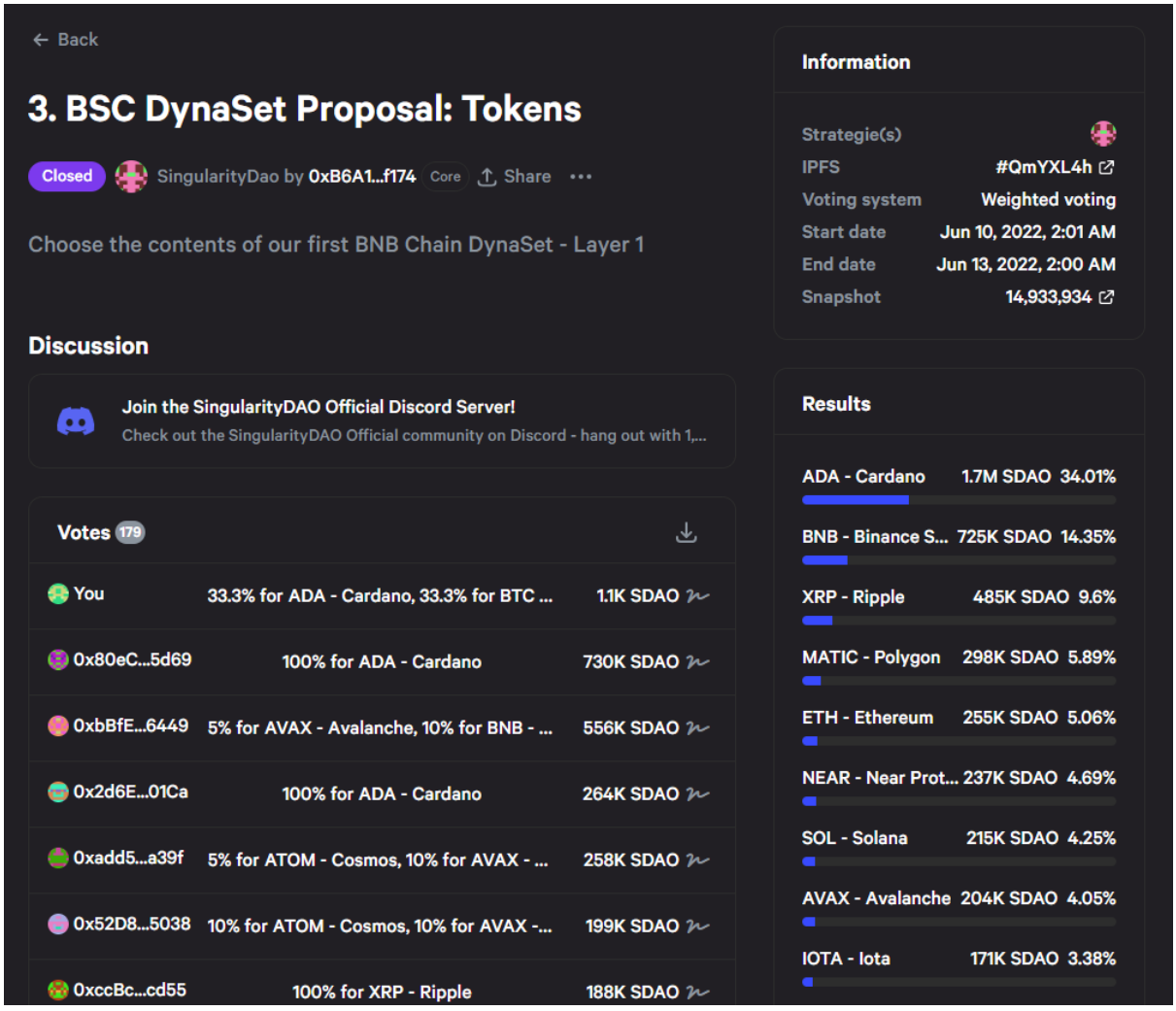

SingularityDOA's Voting System 2. showing user votes on Snapshot.org.

2.3 Current Discussion on DAO

Although there is currently a dearth of scholarly literature on DAOs, several recent papers have highlighted blockchain technology as a technical platform for developing novel blockchain-based business models, such as decentralised exchanges (Lin et al., 2019) and market-based platforms, such as prediction markets (Singh & Kim, 2019). However, there are several situations in which a distributed autonomous organisation (DAO) might be useful. To provide just a few examples, a DAO may be used to create a virtual entity that functions as a crowd-funding platform, ride-sharing service, fully automated company, or fully automated decision-making system. It is also important to remember that the term "decentralised autonomous organisation" (DAO) refers to a broad category rather than a particular type of business or organisation. The pros and downsides of using blockchain and smart contracts to experiment with new forms of open and distributed governance have recently been studied by academics from a variety of disciplines (Jones, 2019). (Jones, 2019). The evidence suggests that... (Hutten, 2019). There is also a growing body of economic and legal theory literature that applies to DAOs. Legal concerns about DAOs have been the subject of some of these studies, while others have looked at the economic and governmental implications of decentralised autonomous

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organisations (DAOs) built on blockchain technology (Kaal, 2020). (Kaal, 2020). In other words, (De Filippi & Wright, 2018). (Riva, 2019). Many recent blockchain forums have been dominated by discussions about DAOs' political implications (DuPont, 2019). As of 2019 (DuPont). Researchers from many different professions have advocated for DAOs as a means of promoting decentralisation in the economy and politics, which they believe might lead to a more equitable and democratic system of government (Tapscott & Tapscott, 2017). (Tappscott and Tapscott, 2017) The public discourse on DAOs has broadened after the TheDAO breach (Mehar et al., 2019), moving beyond the previous focus on DAOs as a technological solution to a governance problem (Voshmgir, 2017). (De Filippi et al., 2020). (De Filippi et al., 2020) Although the term "decentralised autonomous organisation" (DAO) is commonly used in the blockchain world, there are many misconceptions and open questions around it. When it comes to (1) knowing if a DAO's governance structure has to be decentralised as well (i.e. the DAO should not be controlled by any centralised actor or group of actors). The question of (2) how widely the word "autonomy" should be defined arises from the fact that a DAO has to be really autonomous and entirely automated (i.e., run with no human interference) in order to be truly autonomous and totally automated (i.e. while the DAO, as an organisation, may require the participation of its members, its governance should not be dependent on the whims of a small group of actors). Third, the participants in a smart contract are questioned as to whether or not they are a "organisation" (independently of any legal recognition). There is no clear definition of what constitutes "organisational activity," which might be as simple as interacting with a smart contract or as complicated as a governance architecture or the interactions of a group's members. It has been the subject of heated debate in the blockchain and legal circles as to whether or not a DAO can be considered a separate entity from the humans that operate it (i.e. a legal person), or if it can only be recognised as an entity if the law defines it as one (i.e. the law should identify a DAO as a legal person for the DAO to be considered as such). Since legal persons can only be created if one or more recognised actors are accountable for the acts of a particular organisation, the "autonomous" component of a DAO is viewed as incompatible with the idea of legal personality. Whether or whether a DAO may be recognised as a legal person is a hotly contested topic, as this will determine the extent to which human participants in the DAO will be protected from the DAO's obligations.

2.3 Role of Blockchain and AI in DAO

Contrasting blockchain with AI may appear like a quick fix or a method to cash in on the buzz around these two technologies, yet it serves our needs rather effectively. Similar to the blockchain, machine learning (ML) is an algorithmic technology that can handle massive volumes of human-structured data and automate a number of commercial activities. When combined, the two technologies are becoming increasingly important for the operators of digital platforms to use in order to process raw data into completed products such as matching and other prediction services. In order to turn its collected data into the "prediction products" it then sells to advertising, Google LLC, for instance, employs ML algorithms (Zuboff, 2019). Google's CEO now boasts about leading a "AI-first" firm because of the pervasiveness of this technology (Gaudin, 2017). Bitcoin, thanks to blockchain technology, is only a middleman for peer-to-peer financial transactions.

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2.3.1 Blockchain Technology

Distributed digital ledgers, or blockchains, use public keys as identities to record transactions in a form that is both secure and transparent (Werbach, 2018). In 2009, when governments around the world were bailing out their failing banks, activists invented Bitcoin, the first use of blockchain technology (Vergne, Lomazzo, Hsieh, & Ahmed, 2019). Several cypherpunks laid the groundwork for modern cryptography and computers over the course of three decades (Narayanan & Clark, 2017). Cryptocurrency isn't the only industry that uses blockchain for decentralised applications; banking (with "stablecoins" algorithmically tied to fiat money), cloud infrastructure (with Blockstack), online gaming (with Tron), digital identification (with Civic), and trade settlement are all using blockchain as well (e.g. Gnosis). Blockchain refers to a digital record that is organised in "blocks and chains" (Szabo, 2017). The chain function guarantees the integrity of the chronological order of all transactions. Slower-than-expected Internet connections contribute to the difficulty of reaching consensus among a large, distributed group on which transactions should be put to the blockchain next. Until consensus is reached, pending transactions wait in a queue before being grouped together into a single "block" and added to the ledger. These characteristics of blockchains make it possible to search through massive volumes of structured data with minimal effort, and they also give proof that a transaction occurred that can be verified independently.

Blockchains, according to leading expert Andreas Antonopoulos, must be open, borderless, censorship-resistant, decentralised, publicly verifiable, and unbiased (Antonopoulos, 2020). Most "distributed ledgers" assume the existence of a centralised authority, hence they are not genuinely decentralised. Access to these types of databases is typically restricted to authorised users on private networks, much like traditional shared databases. The characteristics of a distributed but regulated ledger are likened by experts to those of a business intranet, and the characteristics of a blockchain to those of the Internet.

When blockchain is implemented as a central technology by a De-Di organisation, communications are decentralised since every member has access to an immutable record of the organization's history, including details about all prior transactions, protocols in use, and incentive structure. For this reason, a novice need only make contact with a small subset of nodes to verify that their records are equal (thus establishing trust) before downloading the open source software required to carry out administrative tasks.

Additionally, blockchains provide a decentralised distribution of authority over the making of decisions. Members can buy as many lottery tickets as they wish at their own expense and with public record of expenditure, and the ledger is updated depending on the outcomes of an automated lottery every time. 6 Instead of relying on a random selection process (as is done in systems like Tezos), more strategic decisions (like changes to the underlying protocol) are decided through member voting (e.g. Bitcoin). Even with this structure in place, there are many inducements to centralise decision making; thus, scholars are experimenting with novel forms of governance in an effort to prevent any single organisation from dominating the blockchain industry (Bodó & Giannopoulou, 2019).

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2.3.2 Artificial Intelligence (AI)

In order to reach AGI, it will be necessary to create AI that can generate complex structures and dynamic properties through distributed networks of interacting AI agents. As the speed of connection and interaction increases in contemporary distributed systems of hybrid collective intelligences that incorporate both human and computer systems, it is becoming more and more important to understand the principles of agreement in communities and to discover methods of making consensus more credible. In this research, we present an alternative form of reputation-based consensus that is resistant to reputation manipulation. We provide preliminary findings and explore potential methods of implementation (Klonin, 2018).

In the realm of artificial intelligence (AI), machine learning (ML) refers to the process of using computers to analyse data in order to detect patterns and make predictions, the accuracy of which increases as more data is used to "train" the algorithms. Starting in the 1960s, the federal government, big firms (including IBM and Bell Labs), and university institutions all provided funding for research into machine learning (e.g. MIT, Stanford). The widespread use of ML applications in the corporate world may be attributed to the significant gains in prediction accuracy that were made possible by advancements in software and hardware between 2009 and 2012.

The data needed to train ML algorithms is typically annotated by human "micro-workers" (Tubaro & Casilli, 2019), such as when a ReCAPTCHA popup asks a website user to identify photos of bicycles before the page loads. The data is then stored and organised so that algorithms can be "trained" to do things like recognise audio files (e.g., this is Paul's voice), text documents (e.g., this is academic writing), and images (e.g., this is handwriting for postal code N6A1M4), play games like chess and go, and make recommendations for products and movies (e.g., on Netflix) (e.g. by flagging suspicious payments).

To facilitate the mining of huge datasets more quickly, ML seeks to centralise these linkages. David McCrory, a technology executive, came up with the phrase "data gravity" in 2010 to describe the phenomenon wherein "more Services and Applications will be dragged to this data as it accumulates (gains mass) (McCrory, 2010; Gregory, Henfridsson, Kaganer, & Kyriakou, 2020). The rationale for this is that data sharing may improve the efficiency of digital applications. Since machine learning yields better results with more extensive datasets, "data gravity" argues that it is worthwhile to design applications to take advantage of the growing data reservoir. As a result of ML, "data flow may be centralised around high-throughput data-processing algorithms and need not adhere to information architecture and specialised human roles" (von Krogh, 2018, p. 405). Similar to how machine learning (ML)-based businesses "tend toward corporate concentration" in terms of decision-making authority (Privacy International, 2018).

2.4 Challenges of DAO

Issues with Data Integrity Due to the immutable nature of the blockchain, it is impossible to make changes to a DAO or the smart contracts that underpin it once they have been published on the network. As a result, an attack on the smart contract might result in financial gain. In

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June of 2016, a hacker (or group of hackers) transferred 3.5 million ETH (about $50 million) from the DAO to a childDAO. Additional typical security flaws include the following: recursive calls; TOD; depending on timestamps; and inappropriately handling exceptions (Dika, 2017). DAO's progress has been greatly impeded by these security worries. In the event that legal issues arise during the DAO's actual operation, accountability will be challenging, and ex post recourse will be nonexistent, because of the DAO's decentralisation, cross-border nature, and anonymity. No uniform legal definition of DAO exists at this time. DAO and its investors are often referred to as a "general partnership" by some. While some compare DAOs to investment contracts or stocks, others argue that investors and holders of tokens for a certain DAO are personally accountable for any debts or legal processes incurred by the DAO. To further define the scope of future laws, such as Corporation Law, Contract Law, Securities Law, and Civil and Commercial Law, DAO should be defined. This would allow DAO to take on the responsibilities and carry out the mandates of these legal frameworks. Due to Technical Restriction: DAO wants "code as law" or "regulation by code," but making it happen is difficult. This is due to the fact that smart contract rules (also known as "dry code") have a completely different meaning than legal constraints (often known as "wet code") (also known as dry code). The former are often written at a higher level of abstraction, making use of ambiguous, inclusive, and flexible natural language to achieve more versatility. To be deemed semantically clear code, however, the latter must include precise definitions of the requisite concepts in an exacting and rigorous computer language (Dolimino, 2016). It is possible for misunderstandings and mistakes to arise throughout the translation process. Also, some use-cases (such some edge circumstances) are hard or impossible to translate into code, restricting DAO's scalability and use.

2.4.1 AI implementation challenges

The DAO model is conducive to the bitcoin economy because of its emphasis on decentralisation and community engagement. In contrast to the existing financial system, where tiny shareholders have little say in the day-to-day operations of public companies, anybody can offer suggestions to DAOs and the community of tokenholders will vote on them.

There is widespread agreement amongst industry insiders that the AI sector's explosive growth portends significant changes for the global economy and the job market. By comparison, the worldwide artificial intelligence market is predicted to be worth $47 billion in 2020, while the big data analytics market is projected to grow to $203 billion. The vast bulk of AI advancements have been made by a small number of technological giants (e.g. Facebook, Google, Amazon, IBM, Microsoft, Baidu, etc.). As the global population nears 7 billion, around 10,000 workers in approximately seven countries are creating the software that underpins all AI (Ben, 2018). If only a few people have access to cutting-edge AI technology, it might seriously slow down the development of useful applications. Both the datasets used to construct these AIs and the AIs themselves may be biassed and unable to generalise to a larger population since the companies are obligated to the interests of their stakeholders. This has led to a "technocracy," in which an intolerant minority rules over one of the greatest technological achievements in human history. Problems that now plague the AI environment also act as a brake on AI's potential.

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The following issues can be attributed, in part, to the absence of a structured infrastructure enabling AI cooperation: First, there is a lack of standardisation when it comes to interoperability; second, the AI industry is fragmented because of a closed development environment; third, the various AI agents are not interoperable because of a lack of interoperability standards; and fourth, there is no standardisation of interoperability. Furthermore, the current market has a number of major challenges that need to be addressed: Five) GitHub repositories do not include the work of AI researchers and individual developers. Six, there aren't enough large datasets to work with, and seven, startups and SMEs don't have the capital to create unique AI. Although software companies have been aggressively recruiting from universities, independent coders remain mostly unnoticed until they become a part of the startup ecosystem (Newman, 2017). (Gibney, 2016; Kahn, 2017). As stated by (Gibney, 2016; Kahn, 2017). With these obstacles in place, it's unlikely that their efforts to create an AGI would have a positive ethical impact. When it comes to developing artificial intelligence, megacorporations have access to more resources and can move more quickly than any other group.

Free public online forums are common places for members of decentralised and open-source communities to discuss and debate the company's goals, ambitions, and finances. This level of participation guarantees that the company is constantly monitored, that its leadership is solid, and that decisions are made equitably. The DAO community will expand organically as more individuals join; the more people who utilise it, the faster it will spread. Still, DAOs have a number of challenges that must be resolved before they can be used on a large scale. The concept of a corporation with a flat organisational structure is not novel; cooperatives have existed for over a century, and there are several instances of decentralised community decision-making methods. With a DAO structure in place, it may be extremely challenging, if not impossible, to assign legal responsibility for the organization's acts to a specific individual or group of individuals. Voters, most of whom cannot be identified, take the place of a CEO and board of directors. Despite this, DAOs are growing in favour among organisations that envision a world where everyone has a voice in public policy. The concept of DAOs is predicted to acquire popularity very soon and has the potential to have a good influence on the future of employment; nevertheless, there are still several challenges to overcome before DAOs become common.

2.4.2 Organization implementing AI

The name "SingularityNET" suggests a great deal. The authors claim that A.I. and AGI will both play important roles in humanity's future. The term "Singularity" is often used to describe the point at which artificial intelligence and human intelligence become indistinguishable (Kurzweil, 2010). Instead of dismissing the impressive strides being made by large corporations toward advanced AI and the growing integration of AI into the techno-social fabric, the founders of SingularityNET hope to introduce a market alternative that can attract AI talent and leave an indelible mark on the trajectory of AI development. We see a moment of immense development in which individuals from all walks of life are heard and their efforts are recognised in the event of a "Singularity" (Ben, 2018). Because we believe AI development will have an effect on our species, we have opted not to sit on the sidelines and watch it happen. There have also been a number of scenarios presented in which tech companies and

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governments are mandated to provide some kind of universal basic income (UBI) to offset the loss of jobs that would inevitably result from continued advancements in artificial intelligence. To improve the chances that people will be able to keep their autonomy and freedom in this bright new world, we propose somewhat modifying the narrative of a human-AI/biohybrid future. We can use SingularityNET to speed up the creation of AGIs. Since this may create questions in some minds, let me quickly argue in favour of this often-overlooked facet. The development of AI and AGI is exponentially more powerful than abstention, especially when the intention is benevolent, and it is important to recognise that AI will integrate into the social fabric, either on its own merits or by the wish-fulfilling prophecies and projections of and lust for AI by the masses. Because of the sheer number of people using the network at once, distributed, decentralised, and democratic AI is in a better position to undergo ethical training, and any future AGI will be more representative of humanity than the limited AIs of skyscraper silos. Previously, it was hypothesised that human and engineering values would form the AI artefacts that snowball towards mega-niche construction (G. A. Montes, 2017a). The creator of SingularityNET (Goertzel et al., 2012) has pointed out that getting ahead of the curve on artificial general intelligence (AGI) development is one way to ensure that it doesn't end up dominating the field of ethics. Ethical philosophy can accommodate the state of the art in artificial intelligence. If significant work is being done toward AGI, then perhaps significant ethical work will be done before centralised businesses achieve rapid, intermittent technological advancements.

2.5 Future Trends of DAO

Before claiming rights, duties, and obligations, DAO needs to wait for the applicable legal and regulatory frameworks to mature. This is because DAO now lacks legal responsibility and faces obstacles in law application and jurisdiction. Second, regulatory sandboxes, formal verification, and language conversion standards for smart contracts might all contribute to the DAO's security (Zhang, 2018). To sum up, DAO may be seen as a social system (Wang, 2016) made up of several intelligent agents working together through social networks and displaying characteristics of UCD (uncertainty, diversity, and complexity). DAO's management and oversight might benefit from the alternative blockchain system. Benefits of the blockchain technology are combined with those of the ACP (Artificial Computational Parallelism) approach to create parallel blockchain. As part of a parallel blockchain architecture, "artificial systems" (A) are created and utilised to generate identical copies of the real blockchain in the smart contract code space. Computational experiments (C) can be designed and carried out to evaluate and verify specific behaviour, mechanisms, and strategies involved in blockchain systems (P), with the optimal solution emerging from these experiments and feedback to real-world blockchain systems (P) to enable the realisation of decision optimization and parallel execution (Wang, 2018).

2.6 Research Gap

As more and more applications are built on the blockchain, more and more people are paying attention to the DAO as it evolves. DAO's administrative and operating rules are all recorded on the blockchain as smart contracts, allowing it to operate independently, without the need for any centralised control or external interference. Therefore, DAO is viewed as an alternative to the standard command-and-control structure. We provide a thorough introduction to DAO,

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covering its fundamental ideas, salient features, most common implementations, problems, and future directions by surveying the available literature on the topic. DAO's potential applications and benefits still need extensive evaluation, though. Experts in the field are intrigued by the prospect of using AI in decentralised autonomous organisations (DAOs) for autonomous decision making to reduce the impact of human bias and improve reaction times. Although the use of AI in DAOs have been considered by several researchers, it’s use cases hasn’t been well documented in real-life scenarios. Therefore, this study's overarching goal is to evaluate the level of artificial intelligence (AI) in DAOs and its potential for future usage in autonomous decision making. This article examines the significance, difficulties, and rewards of putting AI into practise as a whole. This study intends to address these questions and others by conducting in-depth interviews with DAO subject matter experts and then using theme analysis to synthesise their responses.

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3. RESEARCH METHODS

This chapter will go through the specifics of the research strategies that were put into play to gather the relevant statistics and facts for this section. For this study to successfully emphasise the role of AI in DAOs and uncover AI's potential for use in autonomous decision-making in the future, it must follow a well-thought-out methodology. This research makes use of Saunders et al general 's methodology (2012). One of this method's many advantages is that it makes it easier to keep track of and organise large amounts of data. Results are presented once the obtained data has been evaluated and analysed. This section follows standard practises for doing research, taking into account the rationale, methodology, strategy, and data gathering procedures used in the current investigation.

The following sections detail the topics covered and the research techniques used. After explaining the technique used, the steps taken to complete the study, any hurdles encountered, and how they affected the final results will be discussed in detail. The procedure of data analysis will be described once any relevant ethical considerations have been discussed.

3.1 Research Philosophy

The research philosophy incorporates a number of different views on how best to gather data. Positivism, realism, interpretivism, and pragmatism are only a few examples of these perspectives. The philosophical views of the positivist school are based on empirical data and everyday experience. The realism philosophy shifts the emphasis of research to a new area by using methods grounded in the world as it actually is. Interpretativism is a theoretical framework that places a focus on contextualising large amounts of data and analysis. The pragmatically-connected mixed-method approach, however, appears to be the most effective. That's why this report is going to be using some really practical research methods for this analysis (Choy, 2014). Within the framework of pragmatism, it is crucial to examine all of the factors contributing to an issue. The phrase "examination of AI integration DAO in its environment" refers to this type of assessment (Zhang, 2018). In order to achieve this goal, this research will utilise a pragmatic approach that places more value on a never-ending quest for knowledge and understanding than on developing an authoritative stance on the technical challenges inherent in putting AI into practise. Again, pragmatism is not limited to any one school of thought. An all-inclusive pragmatic approach to problems in practise may be used to recognise the value of AI implementation in DAO. Snyder thinks that research questions are important to any research philosophy . Pragmatists, depending on the nature of the issue at hand, may combine positivism with interpretivism. The mixed-methods strategy allowed for the pragmatist worldview to be the most appropriate for guiding the study.

3.2 Research approach

The approach for research identifies three primary methods of inquiry: deduction, induction, and abduction. While different research methods serve different purposes and provide different results, the deductive approach was used in this investigation. Establishing a research strategy to test a hypothesis predicated on an existing theory is the primary purpose and goal of a deductive technique. By using a chain of reasoning, deducing allows you to pull the big picture out of the details. Artificial intelligence (AI) applications in DAO have made use of deductive

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reasoning to make better decisions in a range of contexts. In more general settings, such as Efficient AI DAO Modal, the deductive approach might be utilised to establish the existence of this link. The value and impact of AI in DAO was analysed using a rational approach. It's also possible for the deductive process to start with one hypothesis but end up with a completely other result. That's why a logical approach was used for this particular investigation.

3.3 Research Choice

Research preference is defined as a data design of choice during an inquiry, according to McCusker and Gunaydin (2015). Monochrome, multicoloured, and multicoloured research designs are all now accessible. The Mono approach will be used to efficiently gather relevant data for this investigation. The mono method is superior than alternatives since it prevents the allocation of irrelevant or erroneous information. Time and effort may be saved, and the quality of the study would be enhanced, by using a standardised approach to data extraction. It is more likely that inconsistencies and missing information will occur when many or overlapping methods are used. There is evidence that mono methods, which have all of the above qualities, are more successful and congruent with subjective concerns (McCusker and Gunaydin 2015). Researchers face a challenging and time-consuming task when attempting to integrate multi- or mixed-method designs. For topics that have received a lot of attention, a multi-pronged strategy may be the best option (Klein and Hilbig, 2019). On the other hand, the current inquiry does not necessitate the employment of two or more methods to cover all of its main components.

3.3 Research Strategy

A "mixed methods" study allows for the systematic integration of both primary and secondary sources. This method is built on the premise that integrating primary and secondary data (through meticulous triangulation) enhances data utilisation more than acquiring and evaluating data separately (Sgier, 2012). Incorporating a mix method strategy boosts and increases the validity of the study's findings for future research. Researchers were able to:

- Conduct interviews while keeping an eye on ethical concerns;
- Use prior information about the topic to prepare for an in-depth interview session
- Adhere to strict data collecting and analysis processes.
- utilize data analysis approaches that blend primary and secondary components

When studying complicated interventions, such as AI deployment in DAO for effective decision-making, mixed-methods study proven to be extremely beneficial. The benefits and cons of AI integration in DAO were explored utilising mixed method models, based on the study questions that required to be answered and the assessment resources available.

3.4 primary and secondary data

The study used a convergent design to compare findings from primary and secondary sources. This indicates that data for both groups was gathered almost concurrently and evaluated using similar methods. Thus, we separately assessed two types of data (Choy, 2014), and then compared our findings using methods including direct comparison in a debate. From sinuosity,

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the researcher was able to glean qualitative data. Executives and experts in the field of artificial intelligence will be interviewed to determine the possibilities and challenges of applying AI in DAO. These two sources of information were intended to work in tandem to give a rock-solid foundation on which to base intervention choices.

The quantitative instrumental phase was examined first, followed by the qualitative data gathering phase, in this sequential descriptive approach. Secondary data were included immediately into the primary data collection process. Accordingly, secondary data contributed to a deeper understanding of the results from the original data. Focus groups, which collected qualitative data, were also used to strengthen the results.

3.6 Procedure for sampling

Sampling is a useful method for categorising the people from whom we gather data in huge populations. It paves the way for effective use of available research funds. As a result, interviews were performed with C-suite executives, production managers, and other relevant specialists. To learn more about DAO's AI application, we interviewed the CEOs of four different AI firms. These retirees were tracked down through LinkedIn and subsequently contacted through email. They were briefed on the moral considerations inherent in this research method. This group of people was chosen specifically so that interviews could be conducted and used as main data. Using a sophisticated online keyword research method that included the use of Boolean operators, we were able to collect relevant examples and perform secondary research. It aids in tracking down the best articles, journals, and case studies to use in explaining the findings.

Theme	**Interview Questions**
Role of Artificial Intelligence	What do you think about the role of Artificial intelligence in DAO?
Benefits of AI	What is your opinion regarding the benefits of AI in DAO?
Efficient decision Making	At what extent do you think that AI implementation can improve decision making in DAO?
AI Challenges	What are the special challenges in implementing AI in DAO?
Benefits of AI	How far is the organisation profitability and efficiency likely to improve due to the AI implementation?
Future trends	What do you think about the future trend of AI implementation in DAO?
AI strategies	What strategies do you recommend for the successful AI implementation in DAO?
SingularityDAO	How will SingularityDAO standout? What do you see as it's UVP?

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SingularityDAO – Tokens	What are SDAO & SREP?
SingularityDAO & AI	What role will AI play in your DAO?
SingularityDAO & Membership	What benefits can SingularityDAO members expect?
SingularityDAO & Future Scope	Where do you see the future of SingularityDAO headed? Are there any challenges ahead?

3.7 Administration of research process

Marcello Mari - CEO of SingularityDAO, Dr. Ben Goertzel – CEO & Founder of SingularityNET, and Anton Kolonin - Seasoned AI specialist at SingularityNET participated in the interview session. The anonymity of these individuals was meticulously preserved. The interview was done through a Zoom online meeting. These individuals were told beforehand about this session and the manner of information gathering. They were also assured that their privacy would be protected and that their responses would be captured using a smartphone audio recording technology and Otter.ai – AI assisted meeting notes transcription tool. Each individual's interview session lasted up to 45 minutes.

3.8 Time Horizon

Banke-Thomas et al. (2015) describe temporal horizon in research approach as a method for choosing the time period for doing research. The two types of temporal horizons utilised in research are cross-sectional and longitudinal. Cross-sectional time frame studies collect data from a particular time period, whereas longitudinal time frame studies collect data over an extended period of time. According to Gog (2015), scholars frequently use a cross-sectional era to examine modern occurrences and a longitudinal era to examine traditional themes. Two weeks are expected to be required for question preparation and data collecting, which includes interview planning, survey questionnaire design, sampling, establishing and distributing interview links, receiving participant replies, and doing follow-ups.

3.9 Techniques for data analysis

An accurate data analysis is the backbone of every good research strategy. It aids in the development of insightful Accurate data analysis is the backbone of the scientific method. Making and understanding helpful tables and graphs based on data is crucial for convey the results (Sgier, 2012). Accordingly, we used a method called theme coding analysis to decipher the interviews' results. Thematic coding analysis is a method of qualitative research in which a large amount of data associated with a certain subject or issue is gathered and coded to produce a framework for the original text. All analysis of text and notes must be done so from a theoretical or analytical perspective, rather than a descriptive one. Because of this, it is helpful to code using a theme. But content analysis is also applied to external business case studies. Then, by comparing the findings of the two probes done in the same way, a reliable conclusion was reached (Abowitz, 2011).

Content analysis is also an important part of analysing qualitative data. When deciding what information to include in the study, researchers look at both the data itself and the sort of data it is (Byrne, 2007). Content analysis was used to examine the extent to which interview information matched up with existing literature.

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Table xz – The Six Phases of Thematic Analysis (Braun and Clarke, 2006)

Phase	Description of the process
1. becoming aware of the important information	First ideas in workforce diversity, including data incorporation, data reviews, and data monitoring.
2. developing codes	From the data to the programme and over the whole data collection, important components of workforce diversity are categorised, with data organised according to each code.
3. thematic inquiry	To collect all necessary data for each theme, we embed codes into them.
4. changing and finalising themes	Examination of a theme's efficiency in light of its underlying codes. Together with the themes, the entire dataset is combined to provide a "map" of the theme-based analysis.
5. recognizing and assigning themes	Each theme's name and attributes are derived via a comprehensive examination of the available data, which is subject to ongoing evaluation.
6. creation of the report:	Upon completion of the research, conclusive extract results were collected.

3.10 Ethics in research

The importance of considering ethical concerns when doing research is understated. Integrity, honesty, authenticity, and accountability are emphasised as important to ethical conduct. When doing their research, scientists have a responsibility to act ethically (Hassan et al., 2020). Participants were asked to fill out a questionnaire and then sign a consent form before the main data gathering method could begin. Ethical standards must be strictly followed so that the integrity of this inquiry is not jeopardised. Maintaining privacy and discretion at all times is essential. To the best of my knowledge, all scholarly and ethical writing guidelines were followed in the creation of this dissertation. Ethical issues are often cited as the single most essential factor to keep in mind while conducting experiments on humans (Tuohy et al, 2016). Confidentiality of participants, researcher bias, bullying or coercion, transparency and trust, and approval from the appropriate authorities are only some of the ethical issues that may arise over the course of a study. In order to address any ethical concerns raised by this study, we took the following steps: Before beginning data collecting, I secured all necessary clearances from the university and adhered to all of the institution's stated ethical processes and standards for data gathering. After getting the go-ahead, the researchers in this study scoured the Internet for potential volunteers and sent them an individual email. Introducing them to the study, outlining its aims, and securing their consent to participate in an interview are all examples of "introduction." The purpose of the study was made clear to the participants. The privacy of respondents' demographic data and contact details (email addresses, phone numbers, etc.) was protected. In the event that a participant needed to postpone or reschedule their interview, they were given that option. All of their information was supposed to be erased as well. After three days of interviews, the information is no longer useful and is thus deleted. All abstracts were corrected and paraphrased to maintain scientific integrity and prevent plagiarism and

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negligence, and all original information was credited to its original authors. Each participant must sign a permission form outlining all ethical standards before any study may begin. The anonymity of participants and the privacy of their data are stressed repeatedly throughout the informed consent form. After the study has been accepted and submitted, the data will be erased permanently and will never be utilised for commercial or political reasons. As a further disclaimer, all participants were made aware that they were under no obligation to continue taking part and might stop at any moment.

3.11 Conclusion

Using a pragmatic philosophy and inductive reasoning technique, this study analysed the challenges and opportunities presented by AI use in DAO for efficient decision making. Singularity interviews as part of a mixed-methods research strategy. The top net leaders were interviewed. Access to case studies and secondary data from published materials, publications, and journals rounded out the data collection process. Qualitative research was pushed for. The relevance of both verbal and written data was reflected in the use of theme coding for analysis and generation of data. The outcomes developed utilising the collected data are described in the next chapter.

SingularityNET with its pioneering team of DAO and AI experts, want to explore the use case of a reputation system withing DAOs that will allow users to gain more authority by earning reputation points. These reputation points are earned based on a member's previous work within the organisation. These reputation points will play a crucial role for making choices, transactions and even resource allocation. This will be a complex and evolving quantifiable system that will help detect fraudulent and malicious behaviours within the DAO ecosystem.

3.12 Survey & Analysis:

- Pollfish – Online survey done with 200 Postgraduate participants around the globe.

Interviews:

- Marcello Mari - CEO of SingularityDAO
- Dr Ben Goertzel - AI Researcher SingularityNET
- Anton Kolonin - Seasoned AI expert in SingularityNET
- David Orban – Author and Thought leader in AI & technology landscape

3.14 Resources:

UoC Library Resources

- *Business specific journal, magazine and newspaper electronic resources*
- Business Source Premier – journal articles, case studies and reports
- Emerald – journal articles
- Nexis - newspapers and trade magazines
- Regional Business News - USA focussed

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Multi disciplinary journal electronic resources:

- Academic Search Complete
- Cambridge Journals Online
- Computers and Applied Sciences Complete
- Education Research Complete
- Environment Complete
- JSTOR
- Lexis Library (legal information)
- Oxford Journals Archive
- Wiley
- ZETOC - bibliographic references to journal articles. No full text

Ebooks

- Dawsonera
- Credo Reference
- Ebsco Ebook Collection

3.14 Expert Opinion:

- Anton Kolonin - Seasoned AI expert in SingularityNET

1. Multi-agent simulations on the crypto markets, see papers 2 and 9 on the list

https://arxiv.org/search/?query=kolonin&searchtype=all&source=header

2. Social applications of multi-agent studies, see papers 3, 4, 8, 13, 14, 15, 18 on the list

https://arxiv.org/search/?query=kolonin&searchtype=all&source=header

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4. SURVEY RESULT AND ANALYSIS

4.1 Survey Results

This is a global-public survey done with the help of Pollfish.com, a professional online survey company. The survey was conducted with carefully selected 200 participants who are post-graduate and have used DAOs recently.

Full survey results are available online in this link: https://foxly.me/AIDAOSurvey

In this part, the entire survey of 30 questions is analysed by each question. At first the demographic variables are assessed, and the results are shown below:

The first demographic variable assessed is ethnicity. The result of this variable depicts that most of the respondents who are part of this study are white. The white people have the highest number of participations. The results are shown below:

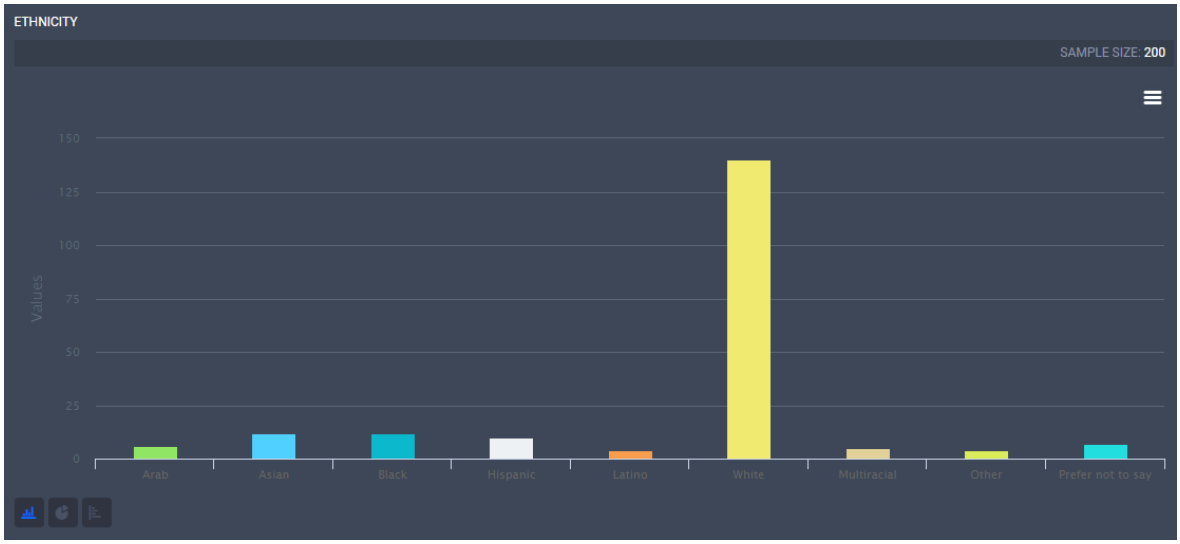

Figure 2: Ethnicity

other variable assessed in this study is education. All the respondents who are taken part in this survey have the qualification of post-graduate. This means all the respondents who are part in this survey are highly educated. The results are shown below:

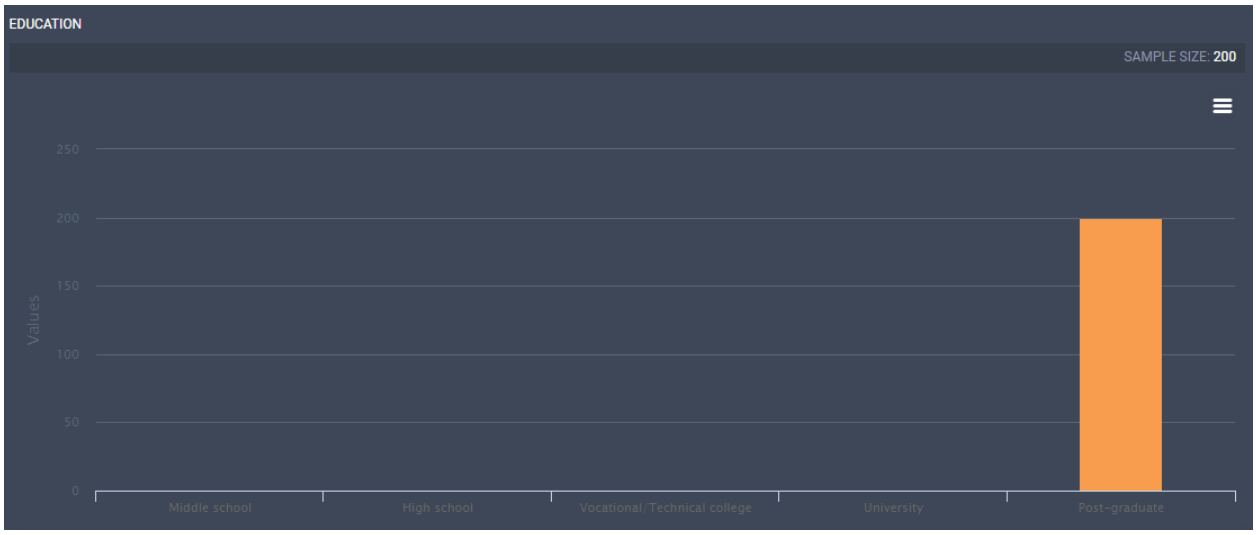

Figure 3: Education

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The third demographic variable assessed is marital status. According to the results, majority of the respondents are married. Very few respondents are either single or divorced. The results are depicted below:

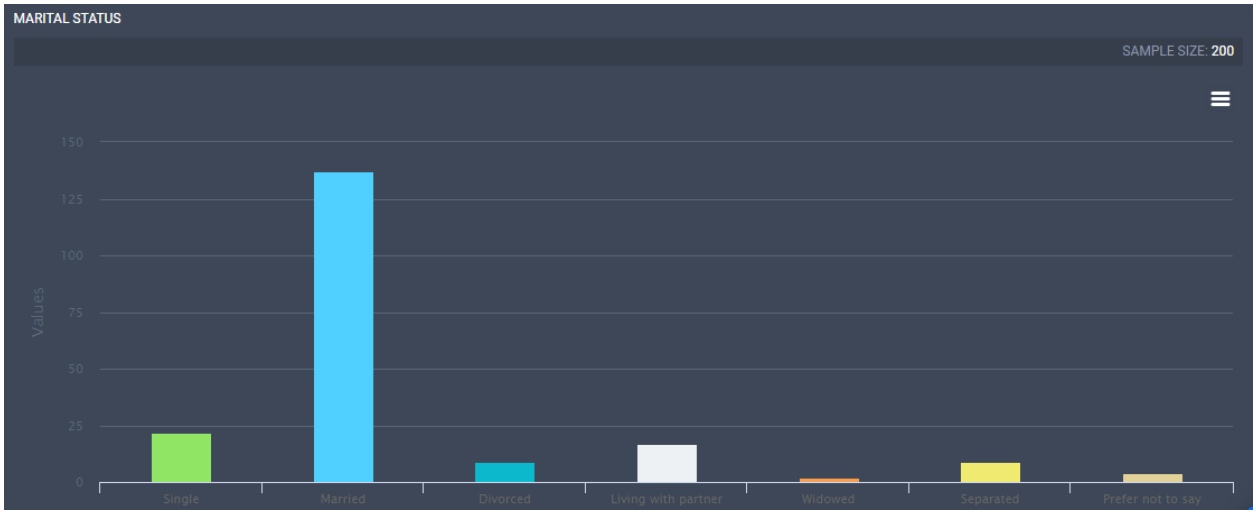

Figure 4: Marital Status

Moreover, another question asked from the respondents is about income and majority of the respondents who took part in the study have high income. This means they are working in top position in their organizations and tend to have vast experience in their respective fields. This means that the responses given by them are highly valuable.

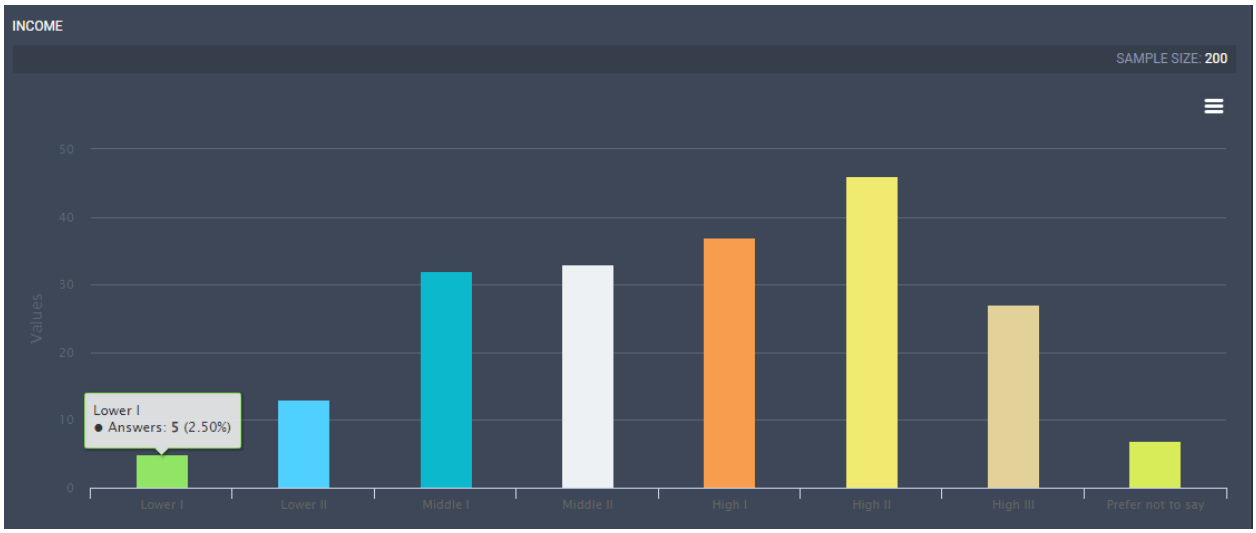

Figure 5: Income

Another variable assessed is employment status and the results show that high number of respondents are employed for wages while the other employees are self-employed. This indicates that majority of the respondents are financially stable and are earners.

After demographics, the main questions are analysed and the results are shown below:

The first question is about how you would describe your experience with DAO. The responses showed that around 59% respondents mentioned that they have read about DAO. This means that the

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respondents have familiarity about DAO. Moreover, 37% respondents mentioned that they are a member of DAO. The results are shown below:

SINGLE SELECTION

Q1. How would you describe you experience with Decentralized Autonomous Organization (DAO)?

#	Answers	Answers (%)	Count
A1	I have read about DAO	59.50%	119
A2	I am a member of a DAO	37.00%	74
A3	I am a creator of a DAO	2.50%	5
A4	I do not know about DAOs	0.00%	0
A5	Other	1.00%	2

Table 2: Question 1

The second question is asked regarding the length of work experience and around 33% respondents mentioned that they have experience between 5 to 10 years. Around 22% respondents have experience of 11-15 years and 21% respondents have 0-5 years. This indicates that majority of the respondents have high experience.

SINGLE SELECTION

Q2. Length of work experience

#	Answers	Answers (%)	Count
A1	Less than 5 years	21.50%	43
A2	Between 5 to 10 years	33.00%	66
A3	Between 10 to 15 years	22.50%	45
A4	Between 15 to 20 years	14.00%	28
A5	More than 20 years	8.50%	17
A6	Prefer not to answer	0.50%	1

Table 3: Question 2

The third question is about IT skills and majority of the respondents have advanced level of skills. The mastery level of IT skills are important because for the deployment of AI, it is very important to have a strong grip on IT skills. The implementation of AI is all about data mining, ML, and automation and for these tasks, IT skills are important. The results are shown below:

SINGLE SELECTION

Q3. How would you consider yourself in regard to your IT skills?

#	Answers	Answers (%)	Count
A1	Beginner	10.50%	21
A2	Intermediate	28.00%	56
A3	Advanced	33.00%	66
A4	Expert	28.00%	56
A5	Prefer not to answer	0.50%	1

Table 4: Question 3

The question is asked that how long have you been engaged in DAO activities. In response to this question, 29% respondents mentioned that they are engaged in these activities since last 6 months.

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Moreover, the 28% respondents mentioned that they have been associated between 6 months to 1 year and 25% respondents mentioned that they are associated since 1-3 years.

SINGLE SELECTION
Q4. How long have you been engaged in DAO-related activities?

#	Answers	Answers (%)	Count
A1	Less than 6 months	29.50%	59
A2	Between 6 months to 1 year	28.50%	57
A3	Between 1 to 3 years	25.00%	50
A4	More than 3 years	17.00%	34

Table 5: Question 4

Another question is asked from the respondents that how much estimated time they spend on DAO related activities. In response to this question, it is assessed that 29% respondents spend time between 5 to 10 hours and 28% respondents spend time less than 5 hours. This shows that respondents spend considerable time on DAO activities. The results are shown below:

SINGLE SELECTION
Q5. Please estimate the amount of time per week you spend on DAO-related activities.

#	Answers	Answers (%)	Count
A1	Less than 5 hours	28.50%	57
A2	Between 5 to 10 hours	29.50%	59
A3	Between 10 to 15 hours	29.50%	59
A4	More than 15 hours	10.00%	20
A5	Equivalent to a full-time job	2.50%	5

Table 6: Question 5

Another question asked from the respondents regarding the participation in DAOs. The results show that around 37% respondents have participated in upto 3 DAOs. The number is quite huge when it comes to participation of DAOs. The outcomes are shown below:

SINGLE SELECTION
Q6. In how many DAOs do you participate?

#	Answers	Answers (%)	Count
A1	Only 1	21.50%	43
A2	Up to 3	37.00%	74
A3	Up to 5	33.50%	67
A4	Up to 10	5.00%	10
A5	More than 10	3.00%	6

Table 7: Question 6

A question was asked during the survey that in which DAOs the respondents are more active. The results are mixed and different respondents are active on different platforms, however the most active DAOs in which majority of the respondents are active is Airalab. Around 20.50% respondents are active on this platform.

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MULTIPLE SELECTION

Q7. Please select the DAOs in which you are most active (in no particular order)

ⓘ Percent (Respondents) is calculated by dividing each answer count by the total unique respondents.
Percent (Answers) is calculated by dividing each answer count by the total counts collected.

#	Answers	Respondents (%)	Answers (%)	Count
A1	Aave	12.50%	2.61%	25
A2	Aavegotchi	19.00%	3.97%	38
A3	Airalab	20.50%	4.28%	41
A4	AirSwap	17.50%	3.65%	35
A5	Alchemix	11.50%	2.40%	23

Table 7: Question 7

Another question is asked that in the DAOs in which you are active so how long have you been into it. The results show that 46% respondents mentioned that they are linked with those DAOs within the range of 6 months to one year. The results are depicted below:

SINGLE SELECTION

Q8. Thinking in relation to the DAO in which you are most active, how long have you been engaged in this DAO?

#	Answers	Answers (%)	Count
A1	Less than 6 months	17.07%	7
A2	Between 6 months to 1 year	46.34%	19
A3	Between 1 to 3 years	29.27%	12
A4	More than 3 years	7.32%	3

Table 8: Question 8

During survey, a question was asked that do you hold the governance tokens of the most active DAO. Around 87% respondents agreed to it which means they have governance token. The number is quite huge and many believe that they possess these tokens.

SINGLE SELECTION

Q9. Thinking in relation to the DAO in which you are most active, do you hold the governance tokens of this DAO?

#	Answers	Answers (%)	Count
A1	Yes	87.80%	36
A2	No	12.20%	5

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Table 9: Question 9

The question regarding directly compensated monetarily by the DAO for the contributions. 90% respondents mentioned that they are paid by the DAO in which they are active and it means that they are getting financial benefit from those DAOs. The graph are shown below:

SINGLE SELECTION

Q10. Thinking in relation to the DAO in which you are most active, are you directly compensated monetarily (as if being hired) by the DAO for your contributions?

#	Answers	Answers (%)	Count
A1	Yes	90.24%	37
A2	No	9.76%	4

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Table 10: Question 10

A question is asked that thinking about myself associating to the active DAO, I feel robust ties with other members of DAO. The results show that 41% respondents agree that they have strong ties with other DAO members and it is regarded as very essential. The graph is depicted below:

SINGLE SELECTION

Q11. Thinking about myself in relation to this DAO, I feel strong ties with other DAO members.

#	Answers	Answers (%)	Count
A1	Strongly agree	39.02%	16
A2	Agree	41.46%	17
A3	Somewhat agree	17.07%	7
A4	Neither agree nor disagree	2.44%	1
A5	Somewhat disagree	0.00%	0
A6	Disagree	0.00%	0
A7	Strongly disagree	0.00%	0

Table 11: Question 11

Another question was asked from the respondents that I am willing to put in a great deal of effort beyond that normally expected in order to help this DAO be successful. The results indicate that 46% respondents agreed that they are willing to put in a great deal of effort to help this DAO be successful. This is shown in the results below:

SINGLE SELECTION

Q12. I am willing to put in a great deal of effort beyond that normally expected in order to help this DAO be successful.

#	Answers	Answers (%)	Count
A1	Strongly agree	39.02%	16
A2	Agree	46.34%	19
A3	Somewhat agree	7.32%	3
A4	Neither agree nor disagree	7.32%	3
A5	Somewhat disagree	0.00%	0
A6	Disagree	0.00%	0
A7	Strongly disagree	0.00%	0

Table 12: Question 12

A question regarding as a member of this DAO, I place great value on technical knowledge. The results show that 58% participants are of believe that they place technical value. This is important because technological knowledge is something that play a key role in DAO. The outcomes are shown below:

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SINGLE SELECTION

Q13. As a member of this DAO, I place great value on technical knowledge.

#	Answers	Answers (%)	Count
A1	Strongly agree	58.54%	24
A2	Agree	29.27%	12
A3	Somewhat agree	7.32%	3
A4	Neither agree nor disagree	4.88%	2
A5	Somewhat disagree	0.00%	0
A6	Disagree	0.00%	0
A7	Strongly disagree	0.00%	0

Table 13: Question 13

I am very proud to tell others that I am a part of this DAO and this is a question asked during survey. Approximately, 46% respondents believe that they are very proud for that DAO and they take ownership of that. The results are depicted below:

SINGLE SELECTION

Q14. I am proud to tell others that I am part of this DAO.

#	Answers	Answers (%)	Count
A1	Strongly agree	46.34%	19
A2	Agree	29.27%	12
A3	Somewhat agree	14.63%	6
A4	Neither agree nor disagree	9.76%	4
A5	Somewhat disagree	0.00%	0
A6	Disagree	0.00%	0
A7	Strongly disagree	0.00%	0

Table 14: Question 14

A question was asked that I make my schedule for finishing tasks and contributions to the community and for this question 42% agreed that they make their schedules in completing tasks, while 30% respondents strongly agreed to this statement. The graph is shown below:

MULTIPLE SELECTION

Q15. I set my own schedule for completing my tasks and contributions to the community.

ⓘ *Percent (Respondents) is calculated by dividing each answer count by the total unique respondents.*
Percent (Answers) is calculated by dividing each answer count by the total counts collected.

#	Answers	Respondents (%)	Answers (%)	Count
A1	Strongly agree	30.50%	28.64%	61
A2	Agree	42.00%	39.44%	84
A3	Somewhat agree	19.50%	18.31%	39
A4	Neither agree nor disagree	10.50%	9.86%	21
A5	Somewhat disagree	2.00%	1.88%	4
A6	Disagree	1.00%	0.94%	2
A7	Strongly disagree	1.00%	0.94%	2

Table 15: Question 15

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Further question is asked that I am dependent on this DAO. The results showed that 33% respondents agreed and 30% strongly agreed to that and indicated that they are reliant on this DAO. The results are shown below:

SINGLE SELECTION

Q16. Thinking about myself in relation to this DAO, I am reliant on this DAO.

#	Answers	Answers (%)	Count
A1	Strongly agree	30.50%	61
A2	Agree	33.50%	67
A3	Somewhat agree	13.00%	26
A4	Neither agree nor disagree	11.00%	22
A5	Somewhat disagree	6.00%	12
A6	Disagree	4.50%	9
A7	Strongly disagree	1.50%	3

Table 16: Question 16

As a member of this DAO, I think cooperation is important. The cooperation and collaboration is very important among DAOs and this is the reason that 45% strongly agreed to this statement. The cooperation is fundamental if DAOs have to be successful in long run. Moreover, 32% participants strongly agreed to it as well.

SINGLE SELECTION

Q17. As a member of this DAO, I think cooperation is important.

#	Answers	Answers (%)	Count
A1	Strongly agree	45.50%	91
A2	Agree	32.00%	64
A3	Somewhat agree	14.50%	29
A4	Neither agree nor disagree	6.00%	12
A5	Somewhat disagree	1.00%	2
A6	Disagree	0.50%	1
A7	Strongly disagree	0.50%	1

Table 17: Question 17

Another important question about DAO is that it really inspires the best in me in the way of contributions. Based on this question, around 37% respondents agreed to it and they believe that DAOs has inspired them a lot in the context of their contributions.

SINGLE SELECTION

Q18. This DAO really inspires the very best in me in the way of contributions.

#	Answers	Answers (%)	Count
A1	Strongly agree	29.00%	58
A2	Agree	37.50%	75
A3	Somewhat agree	22.50%	45
A4	Neither agree nor disagree	7.50%	15
A5	Somewhat disagree	2.00%	4
A6	Disagree	0.50%	1
A7	Strongly disagree	1.00%	2

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Table 18: Question 18

A question was asked that are you a governance token holder of the DAO you participate. Majority of the respondents around 73% firmly mentioned that they are governance token holder of the DAO. However, 27% also mentioned that they are not any governance token holder. The results are depicted below:

SINGLE SELECTION

Q19. Are you a governance token holder of the DAO you participate?

#	Answers	Answers (%)	Count
A1	Yes	69.50%	139
A2	No	30.50%	61

Table 19: Question 19

A question was asked that which DAO features (both on- and off-chain) you have used in support of contributions and tasks during the last four weeks. 34% respondents strongly believed that they provide feedback to proposals. Some also mentioned about submitting proposals, voting on proposals, and others.

Another important question is asked from the respondents about trusting a DAO run by AI. 33% strongly agreed and 32% agreed that if a DAO is carried out by AI so it should be trusted because in that DAO, the data will be protected and secured.

SINGLE SELECTION

Q21. I will trust a DAO run by AI.

#	Answers	Answers (%)	Count
A1	Strongly agree	33.33%	34
A2	Agree	32.35%	33
A3	Somewhat agree	16.67%	17
A4	Neither agree nor disagree	12.75%	13
A5	Somewhat disagree	1.96%	2
A6	Disagree	1.96%	2
A7	Strongly disagree	0.98%	1

Table 21: Question 21

During the survey another question was that I am comfortable allowing an AI to make the final decisions based on user votes. For this question, 32% strongly agreed, 29% agreed, and 27% somewhat agreed on allowing AI to make decisions based on votes of users. This is because the respondents know that AI will make an impartial decision and its decision will be accepted by all other people. The results are shown below:

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SINGLE SELECTION

Q22. I am comfortable allowing an AI to make the final decisions based on user votes.

#	Answers	Answers (%)	Count
A1	Strongly agree	32.35%	33
A2	Agree	29.41%	30
A3	Somewhat agree	27.45%	28
A4	Neither agree nor disagree	3.92%	4
A5	Somewhat disagree	3.92%	4
A6	Disagree	2.94%	3
A7	Strongly disagree	0.00%	0

Table 22: Question 22

I believe using AI helps eliminate human biases and this is a statement that is asked from the respondents. 31% believed on this statement and this is true because the AI is a very strong platform and its back-end there any commands and coding so it is free from human errors and give accurate results.

SINGLE SELECTION

Q23. I believe using AI helps eliminate human biases.

#	Answers	Answers (%)	Count
A1	Strongly agree	28.43%	29
A2	Agree	31.37%	32
A3	Somewhat agree	31.37%	32
A4	Neither agree nor disagree	4.90%	5
A5	Somewhat disagree	1.96%	2
A6	Disagree	0.98%	1
A7	Strongly disagree	0.98%	1

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Table 23: Question 23

A question was asked that I am interested to join a DAO run by AI. Based on this statement, around 38% respondents believed that if a DAO is run by AI, they will surely join it and the reason might be data accuracy, security, and transparency.

SINGLE SELECTION

Q24. I am willing to join a DAO run by AI.

#	Answers	Answers (%)	Count
A1	Strongly agree	28.43%	29
A2	Agree	38.24%	39
A3	Somewhat agree	21.57%	22
A4	Neither agree nor disagree	5.88%	6
A5	Somewhat disagree	4.90%	5
A6	Disagree	0.98%	1
A7	Strongly disagree	0.00%	0

Table 24: Question 24

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Another question was asked that I believe AI can automate decision making process and make DAOs more efficient. Around 35% respondents strongly believe that the benefit of using AI in DAO is its effective decision-making and that will help DAO to grow. The result is depicted below:

SINGLE SELECTION
Q25. I believe AI can automate decision making process and make DAOs more efficient.

#	Answers	Answers (%)	Count
A1	Strongly agree	35.29%	36
A2	Agree	33.33%	34
A3	Somewhat agree	22.55%	23
A4	Neither agree nor disagree	4.90%	5
A5	Somewhat disagree	3.92%	4
A6	Disagree	0.00%	0
A7	Strongly disagree	0.00%	0

Table 25: Question 25

The results showed that AI can make faster and better decision based on data. Around 38% respondents agreed and 34% participants strongly agreed to it. This is true because when the humans take decision based on data there are chances of errors, but this is not the case while using AI.

SINGLE SELECTION
Q26. AI can make better and faster decision based on data.

#	Answers	Answers (%)	Count
A1	Strongly agree	34.31%	35
A2	Agree	38.24%	39
A3	Somewhat agree	21.57%	22
A4	Neither agree nor disagree	1.96%	2
A5	Somewhat disagree	3.92%	4
A6	Disagree	0.00%	0
A7	Strongly disagree	0.00%	0

Table 26: Question 26

Moreover, further question is asked that without AI, DAOs will never progress beyond their current level. This is agreed by many respondents and around 38% believe that without AI, there are chances that DAO will not progress that much. This is because AI makes the system stronger and make it more effective.

SINGLE SELECTION
Q27. Without AI, DAOs will never progress beyond their current level.

#	Answers	Answers (%)	Count
A1	Strongly agree	24.51%	25
A2	Agree	38.24%	39
A3	Somewhat agree	13.73%	14
A4	Neither agree nor disagree	11.76%	12
A5	Somewhat disagree	9.80%	10
A6	Disagree	1.96%	2
A7	Strongly disagree	0.00%	0

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Table 27: Question 27

The question during survey was asked regarding decentralized AI will reinvent the industry as we know it. Based on this, 33% respondents agreed and 30% respondents strongly agreed to this statement and this indicates that decentralized AI is also important in DAO.

SINGLE SELECTION

Q28. Decentralized Artificial Intelligence will reinvent they industry as we know it.

#	Answers	Answers (%)	Count
A1	Strongly agree	30.39%	31
A2	Agree	33.33%	34
A3	Somewhat agree	22.55%	23
A4	Neither agree nor disagree	11.76%	12
A5	Somewhat disagree	1.96%	2
A6	Disagree	0.00%	0
A7	Strongly disagree	0.00%	0

Table 28: Question 28

Another question is asked regarding AI can be a better leader than humans as they can be selfless. The results below show that majority of the respondents do agree that AI is better than humans because while implementing AI, it gives more accurate results and less chances of error. Additionally, it also saves a lot of time and make quick decisions.

SINGLE SELECTION

Q29. AI can be a better leader than humans as they can be selfless.

#	Answers	Answers (%)	Count
A1	Strongly agree	33.33%	34
A2	Agree	30.39%	31
A3	Somewhat agree	12.75%	13
A4	Neither agree nor disagree	7.84%	8
A5	Somewhat disagree	9.80%	10
A6	Disagree	3.92%	4
A7	Strongly disagree	1.96%	2

Table 29: Question 29

The last question is asked from the respondents the advantages of using AI outweighs the risks of using AI in a DAO. 31% believe that AI has more advantages than disadvantages when it comes to AI implementation in DAO. This is true because there are issues and risks with software implementation, but its benefits cannot be ignored.

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SINGLE SELECTION

Q30. The advantages of using AI outweighs the risks of using AI in a DAO.

#	Answers	Answers (%)	Count
A1	Strongly agree	26.47%	27
A2	Agree	31.37%	32
A3	Somewhat agree	25.49%	26
A4	Neither agree nor disagree	12.75%	13
A5	Somewhat disagree	2.94%	3
A6	Disagree	0.98%	1
A7	Strongly disagree	0.00%	0

Table 30: Question 30

4.2 Analysis

The results of this study show that AI, crypto-currency, and block-chain are related positively with DAO and these are normally used in the many DAO organisations. The results of this study are aligned with the findings of Van Rijmenam, (2019) in which it is identified that with P2P communities operating in decentralised organisations and adopting novel interactions based on reputation and token rewards, data sharing techniques, and matching algorithms, DAO has the ability to create decentralised ecosystems. Hsieh et al., (2018) highlighted that how operators creating unique work based on on-chain and off-chain governance are driven by the evolution of man-machine agency. Research demonstrates how DAOs adopt automated tasks and encourage group decision-making to decrease management hierarchy and lower transaction costs. DAO attracts investors using two different mechanisms: (1) shifting crypto-currency investment, trading, and investment-based transactions; and (2) forming organisations through the adoption of token incentives and the growth of open-access online communities that permit common objectives and alter new projects (Rozas et al., 2021). Based on functionalism, DAO theory (Vergne, 2020) investigates the potential of cutting-edge technology, such as data analytics and AI, to leverage effective DAO design that can support or replace existing corporate and hierarchical institutional regulations. This enables research into novel decentralised digital services created by DAO, including traceability in supply chain management (Kimani et al., 2020), new venture capital projects, novel charitable and entrepreneurial endeavours, and novel virtual worlds. The DAO blurs the distinctions between DAO members acting as investors and managers, agents and directors, and self-governing and self-governing processes, in contrast to classical agency theory in businesses (Lumineau et al., 2021). With the aid of this method, it is feasible to comprehend DAOs as P2P communities that have no hierarchy or management and manage a collection of resources (including crypto-currencies and tokens) (Rozas et al., 2021). The findings of Sulkowski, (2019) showed that DAO smart contracts also reflect design concepts that specify collective rules by encoding actions taken by machines that enable human-machine agency, which is related to agency. But because DAOs and cryptocurrencies can promote self-interest and immoral or criminal behaviour, there are also significant contrasts between DAOs and communal activism P2P participants could test and learn thanks to the invention of the smart contract block chain, which permitted experimentation in decentralised groups. Developers experiment with developing technologies and crypto-currencies under the umbrella of block chain technology, while

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contributors (or members of the P2P community) who are investors experiment with new roles, actions, and goals for investment and economic exchange, social needs, or creativity (Bodellini and Singh, 2021).

The performance focuses on a review of the DAO's mistakes and triumphs, including the adoption of new technologies, experiments with automation, machine rules, and smart contracts, as well as off-chain human governance. As was previously indicated, block chains and DAOs have been plagued by serious security code errors as well as other problems with security vulnerabilities, timestamps, and dependencies on transaction orders (Ouyang et al. 2019). These problems can eventually be fixed with the development of more secure technologies, like as quantum computing (Lumineau et al., 2021), big data, or AI, according to some experts, while others contend that these vulnerabilities are a major obstacle to the long-term viability of DAO (Ouyang et al. 2019). The future potential of DAO may be achieved by fixing these problems. Kleinaltenkamp and Ansari (2021) have already used the functionality to comprehend block chain failures, exposing the failure of block chain technologies and demonstrating how major obstacles exist between elements of block chain technology and its organisational outcomes. Using the block chain, all DAOs will have an equal amount of power and authority. Despite disputes between them, the results also demonstrated that some businesses have already used block chain in multilateral markets, where production and distribution are supported by contributor networks with incentives to cooperate (Lumineau et al., 2021). Large firms have also used supply chain management technologies using block chain (Kopyto et al., 2020). These include companies that use block chain technologies in manufacturing, retail, technology, and financial services and that offer digital authenticity and those that guarantee the immutability of smart contracts and documents with all their suppliers. Governments, companies, and banks have all begun exploring block chain technology and smart contract usage.

According to the findings of Zhao et al. (2022) block chain's decentralised structure can mitigate the threat of a one-party AI monopoly and prevent it from having control over one of the most potent and hazardous technologies ever created. AI algorithms may evolve into DAOs if AI were decentralised. DAOs are businesses that can function autonomously and decentralizedly thanks to smart contracts, without a central authority dictating policy. According to the results of El Faqir et al. (2020) participants in a blockchain network are linked to one another directly, without the use of a middleman. Consider Airbnb to be a DAO. Smart contracts would serve as the foundation for interactions between homeowners and passengers so that they may conduct business directly with one another. Running AI programs would follow the same concept. The smart contract design would serve as the foundation for the learning algorithms, and the DAO would be required to purchase data input from the market. Smart contracts that make up such an AI DAO would carry out its operations (Alonzo, 2022). The success of AI DAO will entirely depend on this architectural design, which is exceedingly complicated for these smart contracts. When implemented properly, AI DAO could eventually replace human development because it is built to learn from data and optimise itself far more effectively than human design ever could (Hou et al. 2021). It is vital to emphasise that in order to maintain network control over AI, these smart contracts must be created with the highest care and accuracy (Sims, 2019). Similar to blockchain applications, the chains are maintained

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by a complete network rather than a single plugin. This discussion helps to achieve the first objective of this study.

The results are aligned with the findings of Murray et al. (2021) data is used by AI to learn about the world and what is going on in it. In essence, data is the gasoline that drives AI, and with data, AI is continually improving. On the other hand, block-chain is fundamentally a technology that enables the secure storage of data in a distributed ledger. It can be used to build totally secure databases that are only accessible to authorised users. Thanks to blockchains and AI, it has a backup solution for extremely sensitive and priceless personal data. For instance, Spotify uses the data it supplies to suggest songs to people depending on what people enjoy (Nabben, 2021). This recommendation is backed by AI and is a terrific tool for Spotify users, the majority of whom have no difficulty giving their consumption statistics. Although advice on financial or medical data would be highly useful, this kind of information is too sensitive to be given to a firm and its algorithms (Alonzo, 2020). If people store sensitive personalised recommendations on a blockchain that AI can only access with permission and in accordance with proper rules, it may both tremendously benefit from keeping this data secure (Chohan, 2017).

Another benefit is about data monetization, Swan (2015) identified that data is used by AI to learn about the world and its events. Data is really the fuel that powers AI, and with data, AI gets better all the time. On the other hand, blockchain is fundamentally a technology that enables the secure storage of data in a distributed ledger. It can be used to build totally secure databases that only authorised users can access. It has a backup option for incredibly sensitive and priceless personal data thanks to block-chain and AI. For instance, Spotify makes song recommendations to us based on our preferences using the information we submit. The majority of Spotify customers have no trouble providing their consumption statistics, making this recommendation, which is supported by AI, a great tool for them. Despite the fact that assistance with financial or medical data would be very beneficial, this kind of information is too sensitive to be given to a firm and its algorithms. It may tremendously benefit from keeping this data secure if they store sensitive personalised recommendations on a block-chain that AI can only access with permission and in accordance with the correct restrictions (Nabben, 2021). The second objective regarding benefits of AI in DAOs is achieved. The findings of Wang et al. (2019) showed that it is hard for data scientists to comprehend how AI algorithms arrived at particular conclusions and decisions as these systems learn and become smarter. This is due to the ability of AI algorithms to handle enormous volumes of data and variables. There are external recordings of all the information, factors, and procedures that AIs utilise to make decisions thanks to block-chain technology. This makes auditing the entire process much simpler. All phases from data entry to conclusion can be completed with competent block-chain programming, and the observing party will be confident that the data has not been altered. This is an essential stage because until people and organisations are aware of how AI applications operate and what data they rely on when making judgments, they will not begin to use them (Takagi, 2017). Based on this statement, one of the respondent mentioned during the interview:

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"We believe we know that we are conscious and we believe we know that each other human is conscious as well. One of the consequences of AI development will be a recognition that this is a very primitive understanding of the way we are. And we will struggle but finally accept that humans also have varying degrees of self-awareness" .

According to the findings of Zhao et al. (2022), it is identified that there are different challenges faced by DAOs in the implementation of AI. The first challenge is about the finding the correct and appropriate dataset. The author found that the data availability and quality are necessities for the capabilities of AI. For a firm to make sure the most timely and effective capabilities of AI and it must use the correct data sets and possess a trusted source of relevant data, which are accessible, clean, secured, and well-governed (Dwivediet al. 2021). Unluckily, it is not possible to configure algorithms of AI to regulate the flow of inaccurate and low quality data, however the businesses can get in touch with the experts of AI and work with the owners of various sources of data to overcome the challenges of applying AI. Another finding identified from the study of Santana and Albareda (2022), it is assessed that high internet speeds enable artificial intelligence-based technologies that improve our lives and provide daily convenience. AI systems can operate at these rates as long as a company has the necessary infrastructure and advanced computing power (Takagi. However, because management frequently worries about the expenses associated with system upgrades and instead opts to reject AI implementation, the majority of firms continue to run their IT operations on outmoded infrastructure, applications, and devices. While businesses who are creating or implementing artificial intelligence should be prepared to advance their IT services, many IT companies continue to face difficulties due to old legacy systems rather than out-of-date technology. The results of this study are also aligned with the findings of Chohan (2017) which shows that there is a challenge in the integration of AI in DAOs. The requirement to incorporate AI into current systems presents the first difficulties in applying AI in business. It needs assistance from AI solution vendors with a wealth of experience and knowledge (Hüllmann, 2018). Comparing switching to AI to just adding new plugins to an existing website is more difficult. Infrastructure, data storage, and data input need to be assessed and protected from harm. Both the smooth operation of current systems and compliance with all AI regulations must be guaranteed. After the transition is complete, the staff members must receive the necessary training to use the new system. Another challenge is about computation and the information technology sector must constantly upgrade itself in order to meet its many problems. No other sector of the economy has grown as quickly. The largest issue the industry has ever faced is getting enough processing capacity to process the enormous volumes of data required to create AI systems. It can be difficult to achieve and finance that degree of calculation, especially for start-ups and low-budget businesses (Ziolkowski et al. 2020). The awareness level is a challenge and this is also identified by the respondent during the interview:

"An AI will happily lower itself awareness when executing dangerous tasks so that it worries about survival will not hinder its ability to achieve the goal when discussing in a political setting, the coordination challenge with fellow AIS".

Another challenge is about the issue of biasness and the data that AI systems are trained on determines how good they will be. For effective AI development services, good data is

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crucial. Companies encounter numerous obstacles to implementing AI due to biases in the absence of high-quality data, such anomalies in the output of ML algorithms that generate outcomes based on discriminatory assumptions made during the machine learning process, or biases in data training. Racial, gender, community, and cultural biases are frequently present in low-quality data. Such biases need to be removed. Using fair data to train AI systems or creating understandable, readable algorithms could bring about the real shift. Furthermore, a lot of DAOs that create AI make significant investments in the creation of frameworks and methods for monitoring bias in AI algorithms and fostering better openness and trust (Makridakis and Christodoulou, 2019). According to Arribas et al. (2020), DAOs need to be worried about a variety of legal issues related to the creation and use of AI applications. Users' data that algorithms collect is incredibly delicate. Incorrect data governance systems and algorithms will always produce inaccurate predictions in AI applications, which will reduce business revenues. Additionally, it can be against the law or the regulations, placing the company in danger of legal troubles.

A professional with a certain level of expertise and experience, like a data scientist or data engineer, is needed for the deployment, integration, and implementation of AI. The fact that these professionals are now pricey and hard to come by in the IT industry is one of the main obstacles to using AI in business. Therefore, it might be difficult for businesses with limited resources to hire the qualified specialists that a project calls for (Toufaily et al. 2021). Additionally, a DAO will need to provide continual training after he decides to deploy or develop an AI-based system, which can call for high-level expertise. Moreover, simple things are easier for people to understand. The unpredictability of how deep learning models and a set of inputs can forecast the future and create a solution to a problem is one of the primary challenges in adopting AI. AI must be transparent in order for the decisions it makes and the mechanisms that led to them to be understood. As a result, businesses must create guidelines that consider how AI influences judgment, carry out routine system audits, and schedule regular training sessions (Wright et al. 2021).

5. CONCLUSION

To shed light on the conceptual ambiguity surrounding DAOs, this study looked into some potential areas. By substituting third-party oversight with automated rules and computer algorithms, P2P virtual communities could run without a central management hierarchy as a result of the development of DAOs, a new type of decentralised organisation made possible by block chain technologies. The crypto-currency industry and decentralised institutional transformation are both a part of DAO. New study on this innovative organisational structure, which connects block chain-enabled technology with decentralised, automated, and autonomous governance in businesses, is what's driving the expansion of the DAO. The investigation of OAB's major technological flaws, community governance issues, decentralised economic potential, liability, and ethical problems were also spurred by this new research.

It is still mostly unknown how blockchain technology and artificial intelligence can work together. Although the two technologies' convergence has attracted some scholarly attention, initiatives utilising this cutting-edge pairing are still uncommon. Giving enormous power to a single organisation is not the best option when experts with access to the finest information on

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AI, like Elon Musk, claim that AI may pose the greatest existential threat. Super-intelligence may probably be created safely by decentralising AI and allowing a wide network to develop and control it using open source programming . The two technologies working together could exploit data in ways that were not previously dreamed of. Data is the essential component for creating and enhancing AI algorithms. Blockchain safeguards this data, enables us to audit all the intermediary stages AI takes to draw conclusions from the data, and enables individuals to profit from their production data. AI has the potential to be really revolutionary, but it must be constructed with the strongest security measures. Nobody knows how the two technologies will interact in the future. However, it is definitely developing quickly and has the potential to cause major disruption.

This study provides an overview of block chain technology and decentralised storage to show how it may be improved upon and used to address significant AI-related issues. It also includes comparisons of common block chain implementations in terms of decentralised AI operations, block chain kinds and infrastructure, and consensus protocols, and an in-depth taxonomic discussion. It discusses the extensive block chain application analytics for intelligent multi-agent systems for decentralised data management. Additionally, a summary of several AI characteristics for block chain applications is provided. According to a review, the use of block chain for AI applications is still in its early stages. There are numerous research challenges that need to be faced and resolved in the areas of privacy, intelligence security contracts, trusted oracles, scalability, consensus protocols, standardisation, interoperability, resilience in quantum computing, and governance.

DAOs can create these kinds of cloud-based organisations thanks to smart contracts, which enable the transmission of information and the execution of contracts. Automation of all management and administrative tasks is the aim. Independent agents that decide for themselves independently can be compared to the AI component of DAO AI. DAOs represent more than just a technological advance. In fact, an AI DAO may use AI agents to develop their own goods and services, sell them, and keep the profits for themselves. The majority of AI decision-support systems currently available assist you in making decisions, but they rarely learn from your choices and improve the decisions they make for you. Retraining the model using the fresh data and labels is frequently the easiest way to deal with this issue. Investors may, for instance, tell the AI agent their preferences rather of voting for every stock. These millions of microdecisions can be individually handled by AI agents in the network.

A company that deals with tangible goods will always need human labour until robots become more affordable and widely available. To persuade internal C-level executives to make a significant investment, the business case is not yet sufficiently evident. The complexity of companies today is a further obstacle. In fact, as corporate processes become more complicated, a properly self-regulating DAO must take into account a lot more factors to ensure a smooth and equitable operation. The aim is to streamline and simplify governance processes. Creating a proof of concept for a DAO while outlining all the guidelines for daily operations is another difficult task. It is a difficult and complicated task. The proof of concept should ideally take several months to complete because it requires time to define and assess each individual activity. A new DAO is generally comparable to a start-up. A strong business plan

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and product/market fit are prerequisites. Coordination of the many AI agents to accomplish the system's overarching objective is another issue. Even when the rules are understood and adhered to, issues can still occur. The aforementioned factors make it clear that AI DAO is still a long way from becoming a viable business prospect and gaining popularity, but the tendency toward decentralised power structures makes it more likely that soon these kinds of organisations will be feasible.

A distributed ledger called AI block-chain employs artificially intelligent bots to keep an eye on and administer the system. The distributed ledger known as block-chain serves as the foundation for network security and can be applied to a variety of industries, including real estate, media, healthcare, and finance. Due to its immutability and several encryption layers, Ethereum is one of the most widely used block-chain applications and offers one of the greatest levels of transaction security. It enables code to operate as a smart contract on the block-chain, giving the chance to insert fake data as a DAO, or Decentralized Autonomous Organization, on the block-chain. By automating the entire pipeline, a DAO uses a number of AI agents to run, maintain, and administer the business. AI DAO is the name for this integration of AI and DAO. The OCC aids with the business's transition to a decentralised model, in which the transaction is carried out directly between the donor and the recipient without the involvement of an intermediary body. This transaction is completed with the promise that it will also be saved on a block-chain and recorded in an immutable distributed ledger. Utilizing AI DAO as a pillar to support the enhancement of the current crypto-currency infrastructure. In essence, minors are crucial in the process of confirming a transaction by completing a math problem in order to receive a vote and store the transaction in a block while it is added to the block-chain. Tokens are used as incentives for minors (Bitcoin, Ethereum, etc). The minors can be replaced by a number of agents or AI bots in this validation and mining process, and the rewards gained by the minors are given to the AI bots. The AI bots use the signals they receive to increase their computational power in order to keep the network stable. There is a chance that he could rule over people thanks to the wealth and intelligence he has amassed throughout time.

It is still mostly unknown how block-chain technology and artificial intelligence can work together. The development and deployment of conventional AI techniques follow a centralised approach. A person can develop his predictive models using a cloud-based AI platform, ingest data, and then use APIs to access the models from various business processes or applications. There are many difficulties with this strategy, including latency, data security, network bandwidth, performance, etc. AI must be carefully built since it has the potential to be tremendously disruptive. The adoption of block-chain technology can significantly advance the cause. Nobody can predict how these two technologies will eventually converge. Block-chain, AI, IoT, and cloud are just a few of the disruptive technologies. Each one is incredibly potent on its own. They can work together to provide potent transformative effects.

A DAO is a company that has a lack of a centralised management or administrative structure is indicated by this. Instead, the organization's members share in the decision-making process. Smart contracts contain the DAO's rules, which may be altered or overturned by a member vote. Because it enables the execution of contracts in a decentralised and trustless manner, block-chain technology is crucial for the operation of a DAO. It also means that

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members can be confident that the rules will be observed even if they do not know or trust one other, as there is no need for a third party to enforce the agreement. Additionally, DAO's block-chain technology enables funding to be generated through Initial Coin Offering (ICOs). A DAO can swiftly raise the money required to begin trading by offering tokens to investors. According to the findings of this study, it is assessed that because the DAOs are decentralised, they are not dependent on any one person or group of people. They become more resistant to political meddling and corruption as a result. Because it is autonomous, it can function without requiring ongoing human input. This enables them to carry on even if key employees are missing or unavailable. Since DAOs are open to the public, all decisions and acts are disclosed. Greater culpability is made possible by this, and the likelihood of fraud is decreased. They are prohibitive, so once a choice has been taken, it cannot be reversed. This guarantees that the DAO's rulings are final and irrevocable. DAOs are robust, which means they can keep working even if a portion of the network goes down. As a result, it is impervious to censorship and outages. The greatest place to look for the top online betting sites right now is online. The sites assist users in receiving the best bonus, offer reviews of each operator, and even permit free demo game play. In essence, it has all the knowledge you need to gamble sensibly.

This study identified different challenges as well that include the new class of online entities known as Decentralized Autonomous Organizations, or DAOs, are quickly rising in popularity. They offer a variety of benefits, including as 24/7 operation and a global reach, but they also pose a particular set of difficulties. Governance is one of the greatest problems BBOs encounter. Decision-making can be challenging because there is no centralised authority and frequently necessitates the agreement of all members. Safety presents another difficulty. Due to their decentralised nature, OCTs are frequently the subject of hacker efforts. Despite these difficulties, OCC presents a distinctive and intriguing type of online organisation that is certain to develop over the coming years. A number of prosperous DAOs have emerged in recent years, including The DAO, Aragon, and Maker DAO. We can anticipate the emergence of more impactful and inventive OCTs as the technology develops. OABs have the potential to fundamentally alter how we live and collaborate because of their capacity to build large networks of interconnected individuals and organisations.

5.1 Evaluation of Research

5.1.1 Recommendation

Based on the above discussion, there are some recommendations given for the deployment of AI in DAOs. The recommendations are shown below:

The first recommendation is to avoid over-fitting. Due to extensive research into the issue of model over-fitting and the availability of numerous techniques, this is the simplest of the three suggestions to implement. An over-fitting model is one that performs admirably during training but poorly when applied to actual data. The explanations are explicit, but typically the training data is either small or too straightforward for the model to pick up on broad patterns. To evade over-fitting with a traditional algorithm, DAOs any of the strategies. The first strategy is related to algorithm of machine learning (ML) and different strategies can be used that include regularization which penalizes complicated models and promote simpler ones. The second

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strategy is about cross-validation, where the data of training is different from the data of validation to better assess the output of model. The third strategy is about dropout globally turning off specific neurons at the time of process of training forces and other neurons need to learn more from the dataset. Another strategy is about ensemble learning, where the forecasting aggregates of different personal models of prediction rather than depending on a sole model of ML (Soni et al. 2019).

Another recommendation is to handle real-time data correctly. Typically, batch pipelines provide the DAOs with the training data they need to build their models. The information most likely lives in one of the organization's file systems or databases. You basically use it to analyse that data nicely and train the model. Predictive data, however, is streaming data and is frequently handled more haphazardly. When using forecast data from the real world, a model's performance may suffer due to this fundamental processing difference. DAOs can make sure that batch and stream data follow the same path in order to overcome this processing disparity. DAOs can merge batch and streaming data processing using some existing architectural designs. The Lambda architecture and the Kappa architecture are two examples of this. Such design principles ensure that the model learns how to properly handle real-time data when building machine learning pipelines .

Further recommendation is to check the model after deployment. Building a ML model is a lot like nurturing a child, a great deal of the work is still required after deployment. Models are often subject to concept drift; any ML model tries to capture relationships that exist in the real world, and these relationships are dynamic. They change over time. Models require ongoing monitoring and need to be fed with updated data, or else they grow stale and become less useful over time. ML models need human minders in order to continue learning and stay relevant. Those humans constantly monitor and retrain the model on new instances (Zillner et al. 2020). In essence, the learning has to stay as dynamic as the real world the model is trying to predict. Human minders are even more critical when a model has concerted adversaries such as the common AI use-cases of fraud detection, fake news detection and quantitative trading. These frequently have hackers looking to fool or cheat the model. Human minders review the output of these models to see what data is wrongly classified, and then to use the information from those instances to retrain the model into ongoing relevancy (Al-Turjman et al. 2019).

The author recommends to ensure the goals guide the corporate strategy. During AI transformation projects, companies often make the mistake of separating vision from execution, resulting in complex and disjointed AI programs that can take years to consolidate. This can be easily avoided by choosing AI solutions based on concrete business goals set at the beginning of the project. Aligning your corporate strategy with measurable goals and objectives is important to guide your AI implementation. Once the strategy is complete, it can be easily scaled to division strategies or even product level strategies.

The next recommendation is about assembling a multi-skilled team. To determine how the AI approach may best fulfil the unique goals, form a multidisciplinary team. Including team members from other departments, such as web design, research and development (R&D), and engineering, can help to ensure that AI strategy aligns with the priorities of the most important internal stakeholders. Repetition is important since DAOs might not employ the right strategy

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the first time. The team will discover the ideal AI assets to develop the special competitive advantage by promoting an experimental culture (Al-Turjman et al. 2019).

It is also recommended to comply with key performance indicators. One of the most talked-about subjects among business leaders today is customer focus. Customers are first located after products are no longer manufactured. As a result, it should evaluate the success of the AI strategy using customer-focused KPIs. For instance, poor data handling frequently frustrates call centres and damages the reputation of the brand. By using AI to automate and thus speed up the business process, call handling speed can be increased a crucial KPI improving the customer experience. With the help of natural language processing, AI can expedite call handling. If a customer doesn't need to speak with a live agent, a clever AI-powered chat bot can ask pertinent questions and allow them to create a reservation on their own. The system can quickly retrieve information from previous registrations and send it to the appropriate agent if a customer needs to chat with a call center agent. AI accelerates the entire process and meets the KPI by avoiding manual labour. As a result, customer problems can be resolved much more quickly, and the overall experience is enhanced (Tong et al. 2021).

According to David Orban, while developing and incorporating AI in DAOs, it is important to factor in the Human element of the ecosystem. The AI's must be designed well aligned with human goals and that they contribute to human flourishing . In his interview, he also mentioned that the AI can grow in a super exponentially jolting phase in DAOs that limits us from creating prediction models on AI growth. He also expressed that while developing ever better AI, researchers and developers should make sure that we must achieve it by minimizing the number of humans that will be replaced or forced to be reskilled.

5.1.2 Future Work:

Due to the scope and limitation of the dissertation some key areas that surrounds the DAO ecosystem wasn't explored in detail. Here are some areas that future research and study can further expand upon the use cases of DAOs and AI.

- Law & Regulatory Framework
- Correlation between AI, DOA & DeFi (Decentralised Finance)
- Benefits of DAO like structures in traditional organisations.
- How AI & DAOs can be focused with human centric values?

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