

Fake Media Detection Based on Natural Language Processing and Blockchain Approaches

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Abstract

Given the recent developments and advancements in the software engineering field, the internet-based entertainment network is one of the most important aspects of human existence. This environment has established itself as a popular forum for exchanging information and news on all topics as well as daily reports, which is the major period for information collecting and transmission. There are a variety of advantages to this environment, but from another angle, there are a lot of false data and information that lead readers and clients astray while they are looking for the information they need. One of the major problems with this approach is the lack of reliable data and true new insight regarding internet entertainment data. To combat this problem, we have created an integrated framework for various @block chain and normal language processing (NLP) components that applies AI techniques to recognize fake news and better anticipate fake client records and postings. This methodology uses the Support Learning approach. The decentralized block chain structure was used, which provides the framework of computerized contents authority verification, to work on this stage with regard to security. More specifically, the goal of this framework is to promote a secure environment for spotting and identifying fake news in online entertainment companies.

1.INTRODUCTION

Fighting false news begins as an unusual problem in informal organizations at the application layer of information and data utilization and then grows into a significant and challenging issue in data headway that arises in the political, financial, and discretionary domains. The publishing of false statistics highlights the organization's assets' perpetual inefficiency. We gathered the online entertainment materials from Face book and Twitter, two popular social media sites for exchanging information with a big audience and spreading a tone of daily news and messages on numerous

subjects. As a result of the easily accessible support and a contextual inquiry, it also contains the material in its totality and authenticity. This work uses block chain, NLP, and AI approaches to validate fraudulent users and data. The proposed framework is a defense tactic against the idea of fraudulent information extraction fusing with game elements, to be more precise. Support learning is the learning-based computation that raises the quality of the framework in light of the supplied data. In the case that the data is faulty, the framework bans utilizing comparable data in order to reduce the fraudulent and incorrect data rating. Utilizing Normal Language Processing (NLP) for a thorough text analysis and developing a false news counteraction framework rather than a geographic one in light of the shared components

- Setting up financial sources and putting the power convention verification into practice. This interaction is necessary for the system to find bogus client data and records. use the Support Learning method to predict the framework's rate of learning and eliminate false records

In an effort to prevent the transmission of erroneous information, it is necessary to identify the connections between the contents, distinguish between the relative importance, and analyze the organization of the transmitted material.

1.1 NATURAL LANGUAGEPROCESSING

The field of software engineering known as "natural language processing" (NLP) focuses on making it possible for computers to comprehend text and spoken words in a manner that is similar to that of humans. NLP blends computational etymological rule-based demonstration of human language with facts, artificial intelligence, and advanced learning models. With the help of these advancements, PCs can now completely "comprehend" human language as message or audio information, including the speaker's or essayist's expectation and point of view. Computer programmers that translate text between languages reply to spoken commands, and summaries enormous volumes of text quickly and even constantly are all powered by NLP. NLP is used in voice-activated GPS systems, digital assistants, speech-to-message transcription programmers, Chatbots for customer care, and other shopping conveniences. However, NLP also contributes significantly to large-scale commercial strategies that improve critical business processes, promote employee productivity, and simplify operations.

1.2 BLOCKCHAIN

With the use of a blockchain, data may be stored in a form that makes system modifications, hacking, and fraud difficult or impossible. The simplest definition of a blockchain is a network of computers that copies and disseminates a digital record of transactions throughout the whole network. Each participant's ledger receives a copy of every new transaction that occurs on the

blockchain, and each block in the chain consists of several transactions. The decentralized database that is controlled by several users is known as distributed ledger technology (DLT). A blockchain is a continually expanding database of unchangeable transactional records that have undergone cryptographic authentication and have been shared by all network participants. Each record has a time stamp and references previous transactions. Anyone with access rights can use this information to travel back in time to any moment in a transactional event's past that belongs to any participant. A blockchain is one form of the more generic concept of networked ledgers.

1.3 FAKE MEDIA

Fake news is information that is false or misleading yet is reported as news. The destruction of someone or something's reputation or the generations of advertising revenue are frequent objectives of false news. Despite the reality that false information has always been shared throughout history, the term "fake news" was first used in the 1890s, a time when spectacular newspaper tales were common. The term, which has no specific definition, is frequently used to describe all false information. High-profile people have also used it to describe any negative news that pertains to them. Disinformation is also the deliberate spread of misleading information, and it is commonly produced and spread by hostile foreign actors, especially during election seasons. Stories with sensationalist or click bait headlines without any underlying material are some examples of fake news, as are satirical articles that are misconstrued as the genuine thing. Due to the variety of false news sources, researchers are beginning to adopt the term "information disorder" since it is more objective and informative.

2.LITERATURE SURVEY

2.1 A STUDY OF MACHINE LEARNING AND NLP'S EFFECT ON SOCIAL MEDIA DETECTION OF FAKE NEWS

Chetan Agrawal, Anjana Pandey, and others have proposed Due to the massive and exponential growth of the online social network, the trio of Face book, Twitter, and Whatsapp presented us with a big challenge in the form of fake news. Recent events, such as false information regarding the "US presidential election," opinion spam during the "Brexit vote," and long-tail chains of viral rumors following various natural catastrophes throughout the world, have greatly confused the public and caused issues with law and order. Researchers were also drawn to the speedy spread of incorrect information, and they started investigating its roots and developing methods and instruments to assist stop and swiftly spot rumors in the media.The Natural Language Processing (NLP) and Machine Learning (ML) algorithms have become the incredibly important and required

tools to recognize fake news in the current day. When machine learning was used to help natural language processing (NLP), it produced a number of spectacular results that weren't possible with only manual fact-checking or a basic text detection method. We have explored the role of NLP, machine learning, and several detection techniques built on these in the context of spotting false news in great detail. succinct definitions of the key terminology used in machine learning and NLP. We concluded by shedding some light on forthcoming advances, outstanding issues, challenges, and potential avenues for NLP and ML-based research.

2.2 FAKECHAIN: A TRUST-PROOF BLOCKCHAIN STRUCTURE FOR SOCIAL MEDIA NETWORKS

Voting is a crucial part of any democracy, but in the current day, a number of parties try to sway elections by disseminating untrue information on social media. The problem of employing data mining techniques to identify bogus news is presently unsolved in its entirety. In our study, we proposed a centralized blockchain-based architecture for the task of recognizing bogus news. The essential component of our solution is the use of data mining as a consensus technique to validate the material uploaded on social networks. Our design makes it possible to identify false news, warn viewers about it, hold those who spread it accountable, and even reward individuals who contribute true information on the network. Voting is an essential component of any democracy, but in the modern world, several parties attempt to influence elections by spreading false information on social media. The entire issue of using data mining tools to spot fake news is still open to debate. For the purpose of identifying fake news, we proposed a centralized blockchain-based architecture in our study. The use of data mining as a consensus approach to authenticate the content shared on social networks is a crucial part of our strategy. With the help of our design, fake news can be recognized, viewers may be alerted to it, those who distribute it can be held accountable, and those who provide accurate information can even get rewards. Our concept refers to each news source as a network node on the blockchain. Because of this, news organizations are all miners. Because any source that disseminates news may be evaluated based on the information it has supplied, this type of architecture is utilized to guarantee the veracity of any network source. Since avoiding bogus news spam on social networks is the primary goal of our architecture, we chose to use a centralized blockchain. News sources are full nodes that are in charge of reading and publishing transactions in the blockchain in addition to participating in mining. Light clients may view the information on the blockchain, but they cannot add new stuff. As a consensus algorithm, the truth-discovery technique is the one we choose. When a mining node indicates the veracity of the news that has been obtained from each source, it becomes more dependable. As payback, the trustworthiness of the nodes that

disseminate incorrect information is decreased. The nodes that have also reported true news will gain a little increase in reliability, even if they are unable to mine the block. In order to avoid monopolizing the network with computational power, our approach will use the PoS algorithm concept, where nodes with higher degrees of trustworthiness have more possibilities to mine new blocks. Our tests evaluated the contract gas cost for the proposed architecture because our proof of concept used the Ethereum network. While analyzing the gas cost of each contract, we modify the functions that are included in the contracts for the standard and pure types. The blockchain is allowed to store data and be used as a processing source for routine operations by the network. Only pure functions use the Ethereum network as a processing source. Table 2 displays the contract's gas costs for the two categories of function. After evaluating the recommended design's performance, we ran a test to verify the system's effectiveness in a real-world setting. We were able to emulate the recommended architecture by executing three smart contracts with different news items published in each one. We developed the test with the aid of seven, fourteen, and twenty-one news sources.

2.3 A DEEP LEARNING-BASED REVIEW OF FAKE NEWS IDENTIFICATION

A significant issue is that businesses across all sectors are now having trouble figuring out workable strategies for spotting internet bogus news. It might be difficult to spot fake information because it is constantly put online to deceive users. When compared to different machine learning methods, deep learning-based systems can detect bogus news with more accuracy. Previous review papers seldom included deep learning for the detection of false news and instead tended to concentrate on data mining and machine learning techniques. New deep learning-based techniques, however, such as Attention, Generative Adversarial Networks, and Bidirectional Encoder Representations for Transformers are not included in current surveys. This study makes a concerted attempt to take cutting-edge false news detection algorithms into account. We begin by explaining the detrimental repercussions of false information. We then describe the dataset and the NLP techniques used in past investigations. A comprehensive evaluation of deep learning-based tactics has been offered in order to categories common methodologies. The crucial evaluation parameters for identifying bogus news are also covered. However, we provide further recommendations for improving false news detection methods in anticipated future research fields. There has always been misleading information since the beginning of human society. However, the spread of erroneous information increases as contemporary technologies and the global media landscape alter. The social, political, and economic situations may be significantly harmed by fake news. False information and news may take many different forms. The impact of fake news is crucial because knowledge affects how we view the world. We base our decisions on the facts available to us. Based on the information

we gather, we form an opinion on a situation or a collection of people. We are unable to make informed decisions if we come across contrived, biased, or erroneous information online. The primary implications of fake news are as follows: Effect on Innocence Victims: Rumors may have a major impact on specific people. These people can be the targets of harassment on social media. Additionally, they can encounter slander and threats that could have negative repercussions. People shouldn't judge individuals hastily or believe incorrect information shared on social media. Health Effects: More people are turning to the Internet to find out about health-related news. Fake news about health has the power to impact people's lives. The spread of bogus news is becoming worse as more people use social media. Researchers are putting a lot of effort into coming up with solutions that would safeguard society against fake news. This survey examines the overall topic of categorizing fake news by examining key studies. Given that complex frameworks dominate this industry, it's critical to have a firm understanding of the most recent methods for identifying bogus news. We investigated advanced DL and NLP-based false news detection methods as a result. We offered a taxonomy of techniques for recognizing fake news. We compared the benefits and drawbacks of several DL architectures and NLP techniques. We investigated a variety of assessment measures. An overview of the experimental findings from past studies is presented. We provided a brief summary of probable future research projects in this field. Fake news identification will remain a crucial research field for some time after the release of cutting-edge deep learning network designs. The likelihood of getting incorrect results is decreased by using deep learning-based models. This work will undoubtedly aid researchers in the field of fake news detection in having a better awareness of present problems, remedies, and prospective future directions.

2.4 NLP AND RANDOM FOREST CLASSIFIER IN DYNAMIC FAKE NEWS DETECTION

Social media networks are one of the important aspects of human existence, thanks to contemporary technology and developments in the field of computer science. This environment, which is the major time for data gathering and transmission, has established itself as a popular forum for the exchange of news and information on a range of subjects as well as daily reports. Although there are numerous advantages to this environment, there are also a lot of fake reports and pieces of information that lead readers and users to believe they are getting the right information. The lack of trustworthy news and true information on social media is one of the main problems with this system. In order to solve this issue, we have developed an integrated blockchain and natural language processing (NLP) strategy that makes use of machine learning techniques to more accurately predict bogus user accounts and postings and identify fake news. The Reinforcement Learning approach is applied in this process. The security of this platform was enhanced by the usage of the decentralized

blockchain architecture, which provides the basis for digital content authority proof. The purpose of this strategy is to offer a secure platform that can anticipate and identify false news in social media networks. We acquired the social media content for this case study from Twitter and Face book, two popular platforms for information sharing, where millions of news items and postings are made every day on a variety of topics by thousands of individuals. The objective of this project is to use machine learning, natural language processing, and the blockchain to verify fake individuals and data. More specifically, the approach is a preventative strategy built on strategies that incorporate gamification components with integrated fake data mining approaches. Reinforcement learning is a learning-based technique that improves the system's performance in response to input. The methodology prevents using similar prior information to decrease the grade for misleading and erroneous information if the information is wrong. Utilizing Natural Language Processing (NLP) to create a fake news prevention system rather than a detection system by doing in-depth text analysis based on common contents. Implementing the procedure for authorization verification and establishing a financial base. The robust method used by this system to spot fake user information and accounts. • removing fake accounts and calculating the system's learning rate using the reinforcement learning technique. Analyze the relationship between the materials and extrapolate a similar meaning and structure to stop the spread of fake news. This method has been applied to choose high-quality samples and eliminate the news's weak labels in order to identify fraudulent news. The related works and the currently proposed Endeavour differ in that there is no trust in this process. In this case, before people can post news on social media, they must register on the blockchain network. The stages involved in data preparation, such as data cleaning, segmentation, stop words, feature extraction, word indexing, and embedding, are crucial. One of them is NLP. Data preparation is in charge of cleaning the data before starting any processing on it. After passing through feature extraction in the following stage, the data is subsequently converted into vectors and recorded into a database. The data that has been gathered for feature extraction is used to periodically send a query to the data source in order to look for the pertinent news on the Internet. The news may be sorted into a list based on distance and query by the feature extraction module after comparing its contents to news storage to gauge how similar they are.

2.5 DEEP LEARNING FOR FAKE NEWS DETECTION IN A PAIRWISE TEXTUAL INPUT SCHEMA

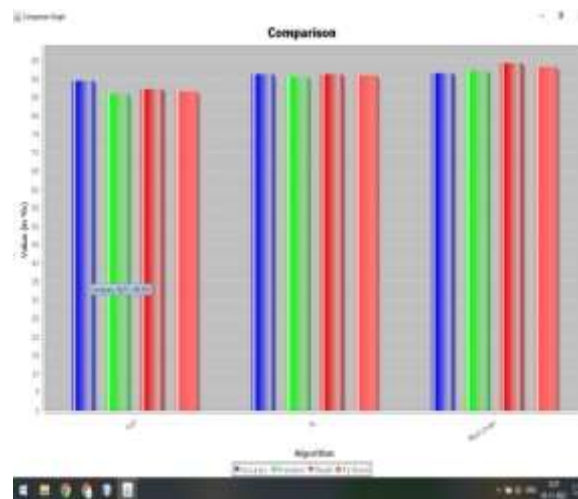
The last 10 years have seen a rapid spread of large volumes of online material among an increasing number of social network members. Bad actors that create, disseminate, and reproduce false information typically take advantage of this phenomenon. In this study, we propose an

innovative approach for the automatic detection of fake news on Twitter that combines (a) pair wise text input, (b) a novel deep learning architecture that permits flexible input fusion at various network layers, and (c) a range of input modes, including word embeddings and both linguistic and network account features. Additionally, a thorough experimental setup performs classification tests using the news headlines and information that have been cleverly separated from tweets. Our main findings show that identifying bogus news is generally quite accurate. The recommended deep learning architecture outperforms even the most sophisticated classifiers while using less traits and embeddings from the tweet text. The problem of identifying fake news has been approached in the past in a number of different ways; however the bulk of reported approaches rely on a narrow set of true and false news data that are already available, widely utilized, and tested. In particular, the demonstrations in Hong Kong in the summer of 2019 are a circumstance where the current study provides the framework for developing a new Twitter data set containing real/fake news about. Using the provided false tweets by Twitter as well as the process of gathering and validating genuine tweet news pertinent to the current event, a best practice environment is developed for constructing fake/real news data sets with meaningful inferred conclusions. Another novel feature of the suggested technique is the design of the input to the learning schema. Tweet vectors are often used in paired situations. A real vector and a possible fake vector are present in every pair of vectors. It's appropriate classification is determined by how similar or different the latter is from the former. The great performance of fake news detection in the literature is mostly attributable to the effective usage of just account-based characteristics or purely language aspects. In contrast to earlier research, the current work strongly emphasizes the use of multimodal input, which can include everything from automatically generated word embeddings from unstructured text to string-based and morphological features (number of syllables, number of long sentences, etc.), as well as higher-level linguistic features (like the Flesh-Kincaid level, the adverbs-adjectives rate, etc.), to network account-related features. The detection of bogus news is the first use of the novel deep learning architecture that was proposed. The deep learning network uses various combinations of the aforementioned input categories. In order to get the highest level of classification accuracy, input is flexibly fusing into the network at several levels. Our work provides a detailed comparison of the proposed model with popular categorization models, in line with recent work. In testing employing these models, the performance of the models is also assessed and directly compared with that of the recommended matched schema using the same input. The proposed paper also offers a comprehensive overview of recent work on the detection of fake news using machine learning. Extensive discussion is given to the best network designs and classification models, as well as earlier studies using a variety of data

types (news articles, tweets, etc.), different categories of attributes (network account, linguistic, etc.), and numerous data types.

3.EXISTING SYSTEM

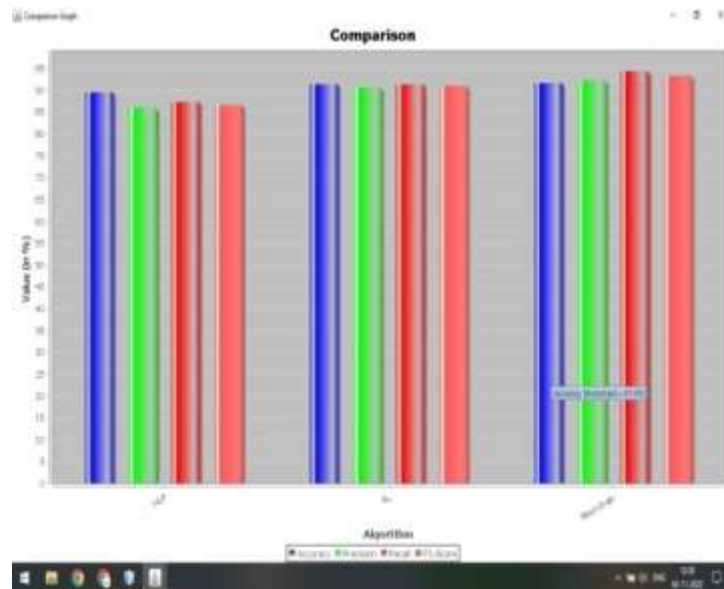
Recent technological advancements and the employment of programmes in daily life have created a problem as a result of the broadcasting of bad and needless situations on social media. One of the social media sites mentioned above, Twitter, has a sizable user base. Every day, millions of tweets with a wide range of terminology and themes are shared. The blockchain technology and machine learning are crucial in the battle against the spread of misleading information. There are several deep learning algorithms for detection that are based on vast amounts of data. Convolution neural networks (CNN) were also examined for the classification of text and images. The combination of three components—the fake news detector, reinforcement learning, and annotator—was proposed as a framework for false news identification. By choosing high-quality samples and eliminating the weak labels from the material, this procedure has been used to detect fake news.



Picture 3.1

4.PROPOSED SYSTEM

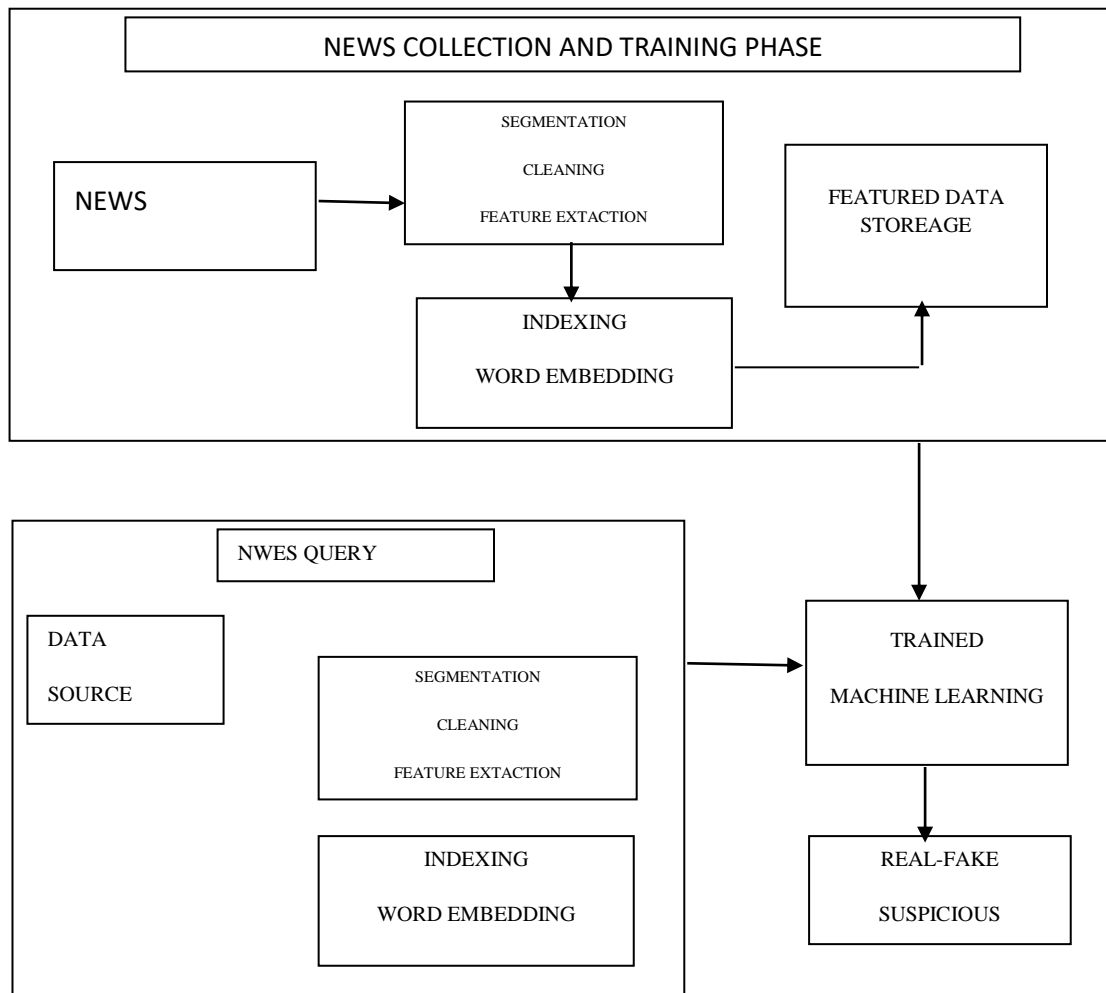
The detection of fake news utilizing a mix of Natural Language Processing, Reinforcement Learning (RL), and block chain is explained in length in this section. The system's two key components are its learning phases and its suggested data security strategy.



Picture 4.1

4.1 FAKE NEWS DETECTION USING NATURAL LANGUAGE PROCESSING

Data cleaning, segmentation, stop words, feature extraction, word indexing, and embedding are important steps in the data preparation process. NLP is one among them. Before beginning any processing on the data, data preparation is responsible for cleaning it. The data is then transformed into vectors and saved into a database after feature extraction in the next phase. A query is sent to the data source on a recurring basis using the data that has been collected for feature extraction to look for the relevant news on the Internet. The feature extraction module may group the news into a list based on distance and query after comparing its contents to the news storage to determine how similar they are.



4.2 FAKE NEWS DETECTION USING REINFORCEMENT LEARNING

Deep reinforcement learning combines deep learning with reinforcement learning to make decisions from unstructured data. Most of the news that circulates on social media has to be verified in order to be believed. The key justification for include this algorithm in the proposed system is its learning-based element, which is a step in the right direction toward enhancing the efficacy of fake news identification. Markov Decision Process is used to create problems (MDP). In order to take action and get the prize for the state that follows, each timestamp agent must be physically present in that state. The agent chooses a learning approach based on growing incentive returns that are assembled into a news list.

4.3 FAKE NEWS DETECTION USING BLOCKCHAIN.

The blockchain idea was initially popularized by the Bit coin platform since every node may participate in the network and be a miner. Proof-of-Work (PoW), Proof-of-Authority (PoA), and Proof-of-Stake are a few examples of this (PoS). One of the newest additions to the Byzantine Fault

Tolerant (BFT) algorithm is PoA. The chosen party proposes the next algorithmic block and is in charge of mining. PoA offers a speedier communications technique and performs better than BFT. The network assumptions that underlie PoA implementation disclose what is most advantageous for system preservation. The correspondence identity is connected to the platform's validator identification, such as the credibility scorer. The scenario offered for detecting fake news on a blockchain is based on PoA with a high transaction rate. The credibility score of the consensus was applied. A crucial step in the organization of news is the identification of the organizations with the ability to register and have them take part in transaction and publishing validation. As a news organization, we don't rely on the dependability and legitimacy of news sources in the actual world to grow the network. Some organizations, like CNN and the BBC, require an application before they may register on the blockchain. Certain information, such precise figures or documents, is needed for data authenticity and news organization accreditation. We will check for correctness before granting permission to use this content on TV, in newspapers, or on the radio. the next level of integrating news registrations into a blockchain uses smart contract rules to verify node authentication. A record of the entire process is stored on the blockchain. A crucial component of the suggested system is Proof-of-Authority (PoA), a consensus technique for the identification of fake news. The following news outlet may request publishing once you upload the news and seek node authentication. The publication has an impact on where the credibility score is placed. During this phase, some nodes adopt the role of validators to vouch for the accuracy of the news and the transaction. More specifically, the transaction enters the validation step when the news is submitted for verification. Each participant is given a credibility score based on their behavior during this process. Each member typically has a primary key and credit score. The person with the greatest primary credibility score will be awarded the individual ID after registering with the blockchain network.

4.4 DATA NORMALIZATION

One skew aspect of the data values in the acquired dataset is the time series frequency of the shared news. To prevent skewers and produce a consistent range of data values, data normalization is crucial. Among other methods for normalizing data, decimal scaling normalization, z-score normalization, and min-max normalization are used. The normalization method used in this operation is min-max normalization. This method scales the characteristics between zero and one in order to normalize them and provide data features in uniform mode.

5. PERFORMANCE EVALUATION OF BLOCKCHAIN FRAMEWORK

In this part, the performance of the blockchain network is assessed. To assess this system's efficacy, we used the PBFT and RAFT consensus algorithms. For nodes of the bounded type, the PBFT offers Byzantine fault tolerance (Bft) with minimal latency and high transaction rates. The PBFT method has issues with poor scalability and huge transmission records for consensus messages. The blockchain network being utilized has permissions. The primary justification for utilizing PBFT in a secure environment is that it is message-based. Because of its high throughput and low latency, Proof of Authority (PoA) is a popular technique in permission blockchain. Use of the RAFT approach results in low TL and high TT. It makes use of log synchronization to maintain data consistency. The selection of the leader node, log synchronization, member updates, and data consistency are the four main RAFT algorithm-based phases. User profiles, news sharing strategies, news record histories, services, news supply, and data analysis are the main features of the recommended system. Personal data is displayed on the user's user profile. It makes it possible to create, modify, and delete profiles. The news-scheduling module shows user-related news information and the status of the item. In order to safely collect and deposit news on the blockchain, users may inspect the status and content of the news. The administrator can go over the distributed ledger's capabilities and news record history. For upcoming plans, the data analysis module provides analytical information on the hidden data in the news.

6. CONCLUSION

The spread of fake news, which arises from a lack of faith in the veracity of the material shared on social media, is one of the most well-known study issues in modern technology. In this post, we discussed how to use blockchain technology and machine learning techniques to create a trust-based architecture for news that is shared online. We used a learning-based method called reinforcement learning to construct a trustworthy decision-making architecture that is suitable for the Proof-of-Authority protocol. We combined it with a unique consensus algorithm, blockchain architecture, and smart contracts. In this process, social media is crucial. It is crucial to look into and enhance the Proof-of-Authority protocol and user validation since the shared information platform promotes erroneous information.

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