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FAKE NEWS DISINFORMATION AND DEEP FAKES LENARAGING DISTRIBUTED LEDGES

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Abstract—

Many people are worried about the impact of the Internet and social media on contemporary democracies due to the proliferation of deepfakes, misinformation, disinformation, and post-truth, which go by many names. Digital deceit has a social cost, an individual cost, and the potential to cause major economic losses or threats to national security because of how quickly and widely it spreads. The distributed ledger technology (DLT) known as blockchain ensures that data can be tracked and verified by producing an immutable record of transactions and a secure platform for sharing and storing information amongst peers. This review will describe the most significant uses of DLTs and highlight their primary open difficulties in order to prevent digital deception. In addition, a few suggestions are provided to help direct future studies towards the problems that need fixing in order to make today's online media more resistant to cyber-threats.

INTRODUCTION:

According to GARTNER, by 2022, most people in industrialized nations will have consumed more misinformation than truth.1 Popular examples of digital deceit include post-truth, populism, and satire, as well as click baits, cloaking, ad farms, and identity theft, all of which aim to deceive or mislead audiences and potentially inflict damage or financial gain. Digital deceit in the mass media may come from either state-run entities or non-state individuals that post material regardless of the audience's socioeconomic status or level of education. Therefore, conventional centralized methods of control and prevention are powerless against these hori zontal and decentralized communications. Without proper oversight, security breaches (such as social engineering) may occur. Furthermore, in this age of cutthroat competition, the truthfulness of information seems to be sometimes up for grabs in the sake of profit. Despite dwindling faith in mainstream media and long-standing institutions, social media's popularity is skyrocketing, making it a key platform for the spread of digital lies. The roles and duties of social media platforms are still vaguely defined, and there is a lack of sufficient oversight in the industry. The implementation of sufficient data protection regulations (such as the General Data Protection Regulation, or GDPR) and the global concentration of the social media industry are two of the many unresolved concerns. In recent times, sophisticated misinformation has been generated using advancements in artificial intelligence (AI). This led to the launch of many studies and rules aimed at identifying digital deceit.3 But experts say it's almost impossible to oversee stuff that's everywhere. In the fight against digital deceit, stakeholders and policymakers face both threats and possibilities posed by distributed ledger technology (DLTs), most notably blockchain. Without a governing body in charge, these technologies allow for a decentralized, peer-to-peer (P2P) network to function, ensuring privacy, security, and trust. To fight digital deceit, DLTs primarily regulate the media's and communications' tracability as well as transactions. Effective methods of information identification, testing, transmission, and auditing still have unsolved difficulties. While some research has explored using blockchain technology to prevent digital fraud and counterfeit reality, the majority of this work has concentrated

on identifying the information's original source. As far as the authors are aware, this is the first piece to provide a comprehensive strategy for combating deepfakes and fake news using distributed ledger technologies (DLTs), with the hope of informing academics and managers about what's to come. Therefore, this article gives a thorough explanation of how DLTs might be used to combat digital fraud, demonstrating how DLTs have the possibility to transform the media sector. What follows is an outline of the remaining content of this piece. An overview of the technology involved in digital deception as of right now is given in the "State-of-the-Art" section. In the part titled "DLT-Based Applica tions to Combat Digital Deception," many DLT-based remedies for digital deception and fake reality are detailed. Section "Challenges and Recommendations" analyses and proposes solutions to the most pressing problems with using DLT to combat digital fraud. Conclusions are the focus of the "Conclusion" section.

STATE-OF-THE ART

Distinct Features of Disinformation Campaigns We presently do not have the technology to automatically manufacture fake news, which is a sort of deception. Controversies seen during the 2016 U.S. presidential election inspired the term's coinage.2,4 Since the term could vary depending on the academic discipline (such as ethics, neurology, or eco nomics) or the individual user's perspective, a universally accepted definition of "fake news" has yet to emerge. As a rule, false news may be defined as signals that are skewed and have no connection to reality. A "deepfake" was initially a video that had been altered using a technique that swapped the faces of the actors. However, the methods used to create fictitious events are changing fast.4 These key features define digital deception as it pertains to false news and deepfakes.2. Information Type: Topics such as politics, health, and the environment are included because they are of public importance. The Author's Objective: Such material uses unethical methods of persuasion, such as propaganda or ideology-driven information, or is intentionally created to deceive, manipulate, or mislead.

Dissemination Strategy: Its material is aggressively and strategically disseminated by automated means, such as trolls, phony accounts, bots, microtagging, and campaign-like behavior. The Effects of Spreading: Instability, animosity, or division are the desired outcomes of the spread, as are efforts to undermine democratic procedures (such as elections or referenda), basic rights, or the rule of law. Despite the fact that the extent to which deepfakes and fake news have affected public behavior is still debatable, there have been instances when it seems they have had a substantial effect, such as during the Brexit campaign or the independence of Catalonia.2 Misinfodemics are another example of how health misinformation (such as the effects of vaccines or the COVID-19 epidemic) may facilitate the spread of illness. On the inside, it possesses properties that make it easy to disperse quickly and broadly. Actually, deepfakes and fake news will probably go further and quicker than the truth.5 The fast advancement of enablers like AI, the Internet of Things (IoT), augmented reality (AR), and virtual reality (VR) makes it more difficult to detect.

Role of Emerging Technologies

Numerous free content-generation tools have made it simpler than ever to fabricate documents. Additionally, individuals are increasingly vulnerable to surveillance due to new technologies like the Internet of Things (IoT). Also, augmented and virtual reality's ability to mimic reality is on the rise, which is both exciting and concerning since people are less likely to think critically when immersed in such experiences, and manipulations may have a greater impact. Furthermore, the next counterfeit reality is going to be powered by artificial intelligence (AI) and natural language processing (NLP), making it very difficult for humans to identify manipulation and much more difficult for computers to do so.6 One example is the growing use of deep learning (DL) to build models like generative adversarial networks, which can realistically alter images and videos in ways that no one can detect. The effects of digital deceit

will be further amplified with the advent of deepfakes. New types of extortion might target individuals, companies, and society at large, posing further threats to democracy and national security.

Role of New Media

Communication via social media is both organized and amplified. The material that citizens consume may have been microtargeted and produced with an ulterior motive, yet they may think it is user-generated, spontaneous, unbiased, and universal.2 Moreover, under the terms of service and privacy regulations of social media platforms, individuals may have their big data (e.g., profiles, patterns) collected and sold to other entities for purposes such as automated content creation, microtargeted advertising, sophisticated demo graphic analytics, and huge profiling. For example, while advertisers may intentionally conceal their identities or utilize intermediaries, the lack of transparency makes it harder to locate them and gather digital evidence to support responsibility.

DLTs and Block chain Capabilities

Tangle and blockchain are decentralized ledger technologies (DLTs) that may provide several benefits, such as easy authentication, safe data storage, processing, and sharing; resistance to assaults; scalability; transparency; and accountability. Such characteristics, as shown in Figure 1, in conjunction with oracle-enabled smart contracts, can effectively combat deepfakes and fake news because transactions cannot be tarnished once distributed, accepted, validated by a network consensus7, and stored in blocks. In addition, all parties involved may easily audit the transactions.

DLT-BASED APPLICATIONS TO COMBAT DIGITAL DECEPTION

Although several papers have explored the potential of distributed ledger technologies (DLTs) to combat deepfakes and fake news, these studies are still in their early stages and have focused on a single application. Here we provide you the rundown on the best ways to use DLTs to find, stop, and uncover digital fraud. Dispersed Content Review: Standard methods of content moderation (such as flagging, notice, and take down) depend on a single

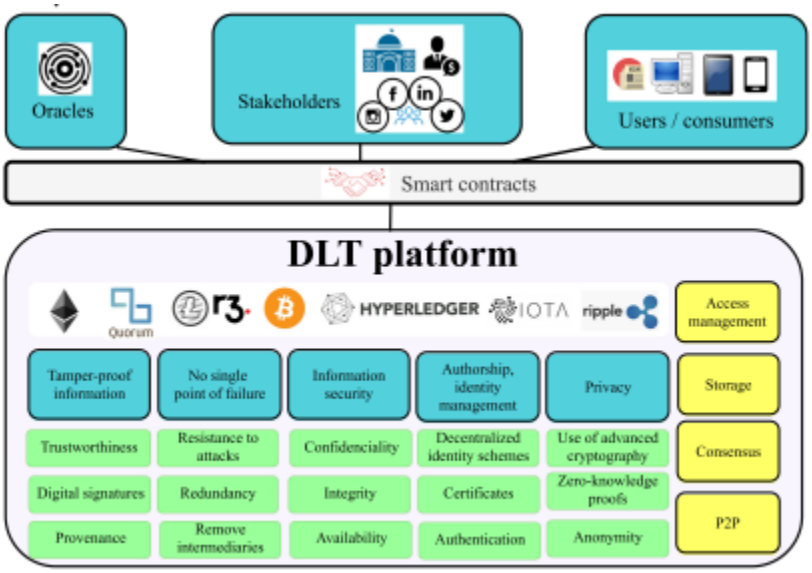

Figure 1. DLT and blockchain key capabilities to combat digital deception.

authority with the ability to remove information instantly. Since there is no central authority in distributed ledger technologies (DLTs), particularly permissionless ledgers, anyone may join or become a transaction validator, further consensus procedures are necessary. Reliability Verifiers: Any node in the network may verify whether material is part of a blockchain using the proof-of-truthfulness notion established by Qayyum et al. 8. For data storage, we use Merkle trees, which are binary trees constructed using hash pointers. Nodes at the n-1 level of the tree hold hash references to the information at the n level. To confirm the trustworthiness of a given piece of material in OðlogðnÐÐ, one might search up a single tree branch starting from the content all the way to the root (level 0). Token-Based Fact-Checking dApps: By identifying trustworthy fact checkers9—who already have an interest in verifying content—we can provide them with financial incentives (like tokens) and help them build a reputation for doing high-quality work. As the fact-checker's reputation grows, the number of prizes obtained rises. A system like this would also encourage content producers to submit their work for validation in the hopes of boosting their profile. Systems for Reputation: You may use a score to see how trustworthy a publication is and to alert readers when there are signs of bias in the information. A dynamic reputation set is suggested in Qayyum et al., 8: each non-confirmed media is given a score of zero at the outset, and the score changes as the entity distributes reliable verified news. Users who have signed up for the service, like Bit Press, are able to rate the reliability of the articles and leave comments on them.10 Subjectivity, prejudice, and the possibility of malevolent individuals all need more research, however. Community-Driven decentralized applications: Tokens may be used in crowdsourcing methods to reward the finding of truth. Users of decentralized ledger technology (DLT) social networks may easily trade tokens or money with one another inside the same network.

For example, using cryptographically signed smart contracts, users may conduct safe peer-to-peer transactions directly with one another, cutting out the middlemen. To create social decentralized apps (dApps) according to Linked Data principles, the Solid project11 suggests a suite of tools. This will lead to better privacy, access control, and storage location for data, as well as genuine data ownership. The Content Blockchain Project, an open and decentralized blockchain ecosystem for the dissemination of media content run and owned by the industry itself, is another intriguing effort. An easy-to-use program that generates ISCCs at no cost is going to be built around the International Standard Content Code (ISCC), which is similar to identifiers like the International Standard Book Number but has more functionality. Decentralized Autonomous Organizations (DAOs) are another possible redesign for social media platforms. By using smart contracts to encode operational and management norms on a blockchain, decentralized autonomous organizations (DAOs) allow self-organization and self-governance. But there are still a lot of obstacles

for DAOs to overcome, including privacy and security concerns as well as a murky legal status.13 A smart contract, which is essentially a computer program stored in the distributed database, may enhance the functioning of a DLT.Fourteen smart contracts make it possible.

facilitate the incorporation of business logic, limitations, and validations into parties' agreements over transactions. In addition, many organizations (like publishers) may have their identities registered, updated, or revoked using smart contracts. Their status and reputation score can also be determined using these contracts.8 Extra Services Based on Platforms: A number of organizations and online platforms have taken steps to combat misinformation, including Mozilla, Facebook, and Twitter, as well as trade groups including EACA, IAB Europe, and WFA.15 To bolster the news industry's commitment to high-quality journalism, Google, for one, has launched the Google News Initiative.4 Assistance with Notarization: One solution to the difficulty of validating huge data news streams is the automatic management of non-tampered material and multinode content verification. Once transactions are saved, DLTs automatically ensure data integrity. Because of this quality, DLTs are a necessary backbone for notarization services.16 However, how to check data for forgeries before adding them to a block remains a major concern. Services Concerning Provenance and Ownership: By tracing the material's origins, DLT technology would make content fraud almost difficult, and it would hold the owner responsible in the event that a counterfeit was detected. A good example is the work of Huckle et al.17, who proposed an Ethereum framework for digital media authenticity and provenance verification using standardized metadata. On the other hand, the suggested approach has significant limitations when it comes to detecting false resources; in other words, it cannot establish the overall authenticity of a tale. One such approach is detailed in the article17, where the writers provide a first version of the "Provenator," a tool that users may use to verify the authenticity of media assets by storing provenance information (such as objects, events, agents, and rights) on the Ethereum blockchain. Monitoring and Retracing Services: To determine where news stories originate, Shang et al.18 maintain a record of timestamps and the connections between various blocks. Presented below is the suggested model.

To begin, the media uploads relevant material, categories, and other data to the blockchain whenever they write news. Afterwards, the release date, hash value, and timestamp of the preblock are captured during the news communication process in order to construct the chain structure. Thirdly, thanks to the information saved and the chain structure of the blockchain, readers may easily determine where news came from when they consume it. The authors note that additional exploration into the building of the full trace ability system is necessary, despite the scheme's apparent promise. In another pertinent idea, the authors provide a system that utilizes smart contracts, an Ethereum name service, an interplanetary file system, and multimedia history tracking on the Ethereum platform. Forensics: It is difficult to verify, with any degree of certainty, that devices, material, and intellectual property are being utilized lawfully and authorized. Forensics may reconstruct events to answer "what," "when," "where," and "how" in the event of a security breach, intellectual property infringement, or counterfeit. The cryptographic assurance of content integrity makes digital evidence offered by DLT-based notary services indisputable. In conclusion, this section covered a wide variety of DLT-based applications, each with its own set of technical requirements for privacy, interoperability, performance, scalability, and resilience. These applications may be utilized alone or in combination with one another. Also, keep in mind that the apps you suggested can handle any kind of media file, but most of the academic solutions you referenced were made to combat disinformation (i.e., text). I should mention that start-ups' traceability and tracking services, as well as new platform-based services offered by major media platforms, will have the most immediate and significant effect. Nonetheless, other, game-changing approaches like decentralization.

CHALLENGES AND RECOMMENDATIONS

Researchers are now concentrating on one kind of fake news—verifiably erroneous content—while ignoring other forms of misinformation. Cryptographic hashes, the foundation of most digital fraud detection solutions, are noise-sensitive and may produce different hashes if a letter, pixel, or bit in a piece of material is changed.17 Although perceptual hashes provide very different hashes when two resources are drastically different, they yield quite similar results when the resources are same. The use of a semantic similarity index to information produced by various sources is another potential solution to this issue. Because of their effects on performance metrics like transaction throughput and scalability, the consensus techniques and degree of decentralization needed for a given use case should inform the optimization of the DLT architecture. Because user-generated material may be used to train ML/DL models to generate false content, protecting user privacy and the integrity of social media posts is an important cybersecurity concern. Solutions built on distributed ledger technology (DLT) may encrypt the material in a manner that makes every transaction and interaction with it traceable. Since much of the encryption utilized by DLTs today is susceptible to certain quantum computing attacks, we need to look at post-quantum blockchain solutions.19 Concerning DLT compliance with GDPR20, there are still unanswered questions, particularly about the controller's function, the practicability of data anonymization, and the simplicity of subject rights. Platforms of the future will need to strike a balance between the protection of personal data and the moderation of content (such as the right to receive information or freedom of speech).

This compromise will be necessary to guarantee transparency and safety. Furthermore, worries about trustless technical systems controlled by a small number of powerful actors mediating social interactions and transactions persist. Collaborations across sectors (such as media, government, and business) are necessary to keep up with the ever-changing problem of detecting digital deceit and counterfeit reality. Furthermore, generic intervention mechanisms (such as tailored solutions) do not have a silver bullet. On its alone, a DLT-based system cannot determine if material is legitimate. So, it's crucial to build a system that can withstand data falsification assaults, which inject the DLT with fake data. To combat this, it is advised to use contextual information (such as social context features, domain location, and temporal patterns) to support the media's credibility. Combining DLT with AI and NLP techniques to get profound insights into similarities and to measure trustworthiness is an area that might be explored further in future study. Artificial intelligence is better at creating digital fraud than it is at detecting it.4 Present methods rely significantly on training datasets and underlying protocols and algorithms for their accuracy. Additionally, because to the intricate nature of the interactions and information flows on social media platforms, a range of trust measures based on DLT and innovative AI approaches are needed to prevent deceit.4 Preventing the propagation of false reality should be the long-term goal.

CONCLUSION

When building a peer-to-peer platform to combat digital fraud, DLTs can provide provenance, consensus, and traceability. Several other methods to regulate material were suggested and examined in this article, which also covered various apps that are presently under development. Despite some technical and practical limitations, distributed ledger technology (DLT) offers trust mechanisms that can make it superior to other technologies in preventing digital deception, auditing, ensuring authenticity, enabling accountability, and eliminating counterfactual reality. In addition, it would be great if academics in the future could work together to create AI and DLT solutions that tackle digital fraud from every angle.

REFERENCES

1. K. Panetta, Gartner Top Strategic Predictions for 2018 and Beyond. Gartner, Stamford, CA, USA, 2017.

2. 2. J. Bayer, N. Bitiukova, P. Bard, J. Szak ^ acs, ^ A. Alemanno, and E. Uszkiewicz, Disinformation and Propaganda—Impact on the Functioning of the Rule of Law in the EU and its Member State. HEC Paris Research Paper LAW-2019-1341, 2019.
3. C. Wardle and H. Derakhshan, "Information Disorder: Toward an interdisciplinary framework for research and policy making," Council of Europe Policy Report DGI(2017)09, 2017.
4. Z. Shae and J. Tsai, "AI blockchain platform for trusting news," in Proc. IEEE 39th Int. Conf. Distrib. Comput. Syst., Dallas, TX, USA, 2019, pp. 1610–1619.
5. S. Vosoughi, D. Roy, and S. Aral, "The spread of true and false news online," Science, vol. 359, no. 6380, pp. 1146–1151, 2018.
6. H. Kim et al., "Deep video portraits," ACM Trans. Graph., vol. 37, no. 4, p. 163, 2018. 7. A. Shahaab, B. Lidgey, C. Hewage, and I. Khan, "Applicability and appropriateness of distributed ledgers consensus protocols in public and private sectors: A systematic review," IEEE Access, vol.
7. 7, pp. 43622–43636, 2019. 8. A. Qayyum, J. Qadir, M. U. Janjua, and F. Sher, "Using blockchain to rein in the new post-truth world and check the spread of fake news,"IT Professional, vol. 21, no. 4, pp. 16–24, 1 Jul./Aug. 2019.
8. X. Zhang and A. A. Ghorbani, "An overview of online fake news: Characterization, detection, and discussion," Inf. Process. Manage., vol. 57, no. 2, 2020, Art. no. 102025.
9. BitPress Official Webpage, Feb. 2020. [Online]. Available: https://bitpress.news/
10. 11. Solid Official Webpage, Feb. 2020. [Online]. Available: https://solid.mit.edu/
11. 12. Content Blockchain Project Official Webpage Feb. 2020. [Online]. Available: https://irights-lab.de/ en/launch-of-the-content-blockchain-project/
12. 13. S. Wang, W. Ding, J. Li, Y. Yuan, L. Ouyang, and F. Wang, "Decentralized autonomous organizations: Concept, model, and applications," IEEE Trans. Comput. Soc. Syst., vol. 6, no. 5, pp. 870–878, Oct. 2019. 14. H. R. Hasan and K. Salah, "Combating deepfake videos using blockchain and smart contracts," IEEE Access, vol. 7, pp. 41596–41606, 2019.
13. 15. First Results of the EU Code of Practice Against Disinformation. Feb. 2020. [Online]. Available: https:// ec.europa.eu/digital-single-market/en/news/firstresults-eu-code-practice-against-disinformation
14. 16. G. Song, S. Kim, H. Hwang, and K. Lee, "Blockchainbased notarization for social media," in Proc. IEEE Int. Conf. Consum. Electron., Las Vegas, NV, USA, 2019, pp. 1–2.