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Editorial

We, at HMRITM are delighted to announce the release of Volume 7, Issue 1, of HMR Interdisciplinary Journal of Science, Technology & Education Management. HMRIJSTEM publishes articles which present novel research in the areas of engineering, science, technology and management. The Editorial Team encourages interdisciplinary research and the current issue publishes four research papers and the efforts of all authors' are significant for the successful operation of the journal.

We take this opportunity to thank all those contributors, reviewers, in making this issue an unforgettable one including all Advisory Board Members for their motivation and support in bringing out this edition of HMRIJSTEM. Suggestions and feedback from our readers are welcome for the overall improvement of quality.

Delhi
10/01/2023

Editorial Board

Addressing the AI-Enabled Cyber Threat: Evaluating International Instruments and Policy Implications for Countering Cybercrime

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Abstract: This paper examines the applicability of current international instruments in countering cybercrime with regards to Artificial Intelligence (AI) technologies. It discusses ongoing policy initiatives of international organizations that may impact the law-making process in the field of cybercrime. The implications of AI policy-making on the administration of criminal justice in countering cybercrimes are also analyzed, including the use of AI systems and applications for illegal conduct such as deep fakes. The paper concludes by offering an alternative approach to creating effective policy responses to counter cybercrime committed through AI systems.

The concept of intelligence and analysis as a process and profession is not new and has been continuously evolving in response to changes in social/cultural factors, technology, organizational needs, and analytical skill levels. It is imperative to possess up-to-date and accurate information to gain an advantage over adversaries in various fields, including politics, business, military strategy, and criminal intelligence. Understanding the historical background of intelligence and analysis is crucial to comprehending the current state and continuously evolving nature of this practice. The professional intelligence analyst must approach each task with a fresh, flexible, and innovative approach to remain relevant and useful in a practical sense.

Keywords : Cybercrime, AI, Criminal Justice Systems, Deep fakes

Introduction

As the use of Artificial Intelligence (AI) systems and applications becomes increasingly prevalent, there is growing concern regarding their potential use in cybercrime. This paper seeks to assess whether current international instruments to counter cybercrime are applicable in the context of AI technologies. It also analyzes ongoing policy initiatives of international organizations that could impact the law-making process in the field of cybercrime.

The paper examines the implications of AI policy-making on the administration of criminal justice in countering cybercrimes, including the use of AI systems for illegal conduct such as deep fakes. The study concludes by proposing an alternative approach to creating effective policy responses to counter cybercrime committed through AI systems.

To understand the relevance and continuously evolving nature of intelligence and analysis, it is crucial to review its historical background. Intelligence and analysis have always been essential in gaining an advantage over adversaries in various fields. The professional intelligence analyst must adapt and approach each task with a fresh and innovative perspective to remain useful in a practical sense.

Overall, this paper provides insights into the challenges posed by AI technologies in countering cybercrime and suggests ways to improve policy responses to mitigate their harmful effects.

Before discussing the concepts of information, intelligence, and analysis in both theoretical and practical terms, it is important to establish a

common understanding of these terms. In their simplest forms, information refers to raw data, intelligence refers to data that has been worked on and given added value or significance, and analysis refers to the process of evaluating and understanding information and intelligence to make informed decisions.

Intelligence is information that has been evaluated in context to its source and reliability, and it is capable of being understood. It has added value, as it has been worked on and processed to provide deeper insights into a particular subject or problem.

Analysis involves the resolving or separating of a thing into its component parts, the ascertainment of those parts, and the tracing of things to their source to discover the general principles behind them. It is also the process of creating a table or statement of the results of this process.

Understanding the differences between these terms and how they interact is critical, as it allows individuals to process raw data into valuable intelligence. This process involves evaluating information in its context, considering its source and reliability, and transforming it into intelligence.

Intelligence analysis is about collecting and utilizing information, evaluating it to process it into intelligence, and analyzing that intelligence to produce products that support informed decision-making. This process involves several stages, which can be broken down into a series of questions that individuals ask themselves, such as:

- What is the problem, and why is it significant or important?
- What information do we already have, or what information could we reasonably obtain that could be relevant to the problem at hand?
- What meaning can we extract from the information, and what does it tell us about what is going on?
- Are there multiple explanations for the information, or are there other alternatives or options? Are some more likely than others?
- How do these alternatives affect the decision we have to make? Are some options potentially better than others? Do some carry greater risk of success and/or failure?
- Are we ready to act with a reasonable level of confidence, or do we need to gather more information first? If so, what else do we need, and where/how can we get it?

The process of applying these questions, evaluating the answers, and then choosing how to respond is the essence of analysis. Developing an individual's analytical skills involves bringing this process under conscious control, monitoring it, improving it, and subjecting it to quality checks. This development of awareness and skill is critical, as it has practical advantages in various fields such as politics, business, military strategy, and criminal intelligence.

The introduction of the paper highlights the increasing concern about the use of AI systems in cybercrime and the need to assess the current international instruments to counter cybercrime in the context of AI technologies. The paper also aims to analyze ongoing policy initiatives of international organizations that could impact the law-making process in the field of cybercrime.

The paper examines the implications of AI policy-making on the administration of criminal justice in countering cybercrimes, including the use of AI

systems for illegal conduct such as deep fakes. It proposes an alternative approach to creating effective policy responses to counter cybercrime committed through AI systems.

To provide a better understanding of the challenges posed by AI technologies in countering cybercrime, the paper discusses the concepts of information, intelligence, and analysis in both theoretical and practical terms. It defines these terms and emphasizes the importance of understanding their differences and how they interact to process raw data into valuable intelligence.

The paper also highlights the critical role of intelligence analysis in collecting and utilizing information, evaluating it to process it into intelligence, and analyzing that intelligence to produce products that support informed decision-making. It describes the process of intelligence analysis, which involves asking several questions to extract meaning from the information and evaluate alternative options.

Overall, the paper provides valuable insights into the challenges posed by AI technologies in countering cybercrime and proposes an alternative approach to creating effective policy responses. It emphasizes the importance of understanding the concepts of information, intelligence, and analysis and the critical role of intelligence analysis in supporting informed decision-making.

Literature Survey

The utilization of knowledge has the potential to equate to power. The concept of gathering and utilizing information in a formal and structured manner to support decision-making is not a new practice. It is imperative to possess the most up-to-date and accurate information regarding adversaries' intentions and capabilities to gain an advantage over them. This principle applies to all fields, including politics, business, military strategy, and criminal intelligence. Furthermore, this process is continually evolving and developing in response to changes in social and cultural factors, technology, organizational needs, and higher levels of analytical skill.

Understanding the historical background of intelligence and analysis as a process and profession is a useful exercise. Examining the origins of intelligence and analysis helps us comprehend where we are today and how we arrived at this point. Additionally, it raises our awareness of how intelligence analysis is a continually changing and evolving practice, requiring a fresh, flexible approach, new ideas, skills, and techniques to remain relevant and useful in a practical sense. For a professional intelligence analyst, no two tasks or projects are ever exactly the same, necessitating a fresh approach for every new piece of work.

Throughout history, there are numerous examples of military, religious, and community leaders actively assigning individuals with information-gathering exercises and making decisions based on the information obtained. One of the earliest recognized texts on intelligence gathering and intelligence-based actions is "The Art of War, The Art of Strategy," written by Sun Tzu, a Chinese mercenary warlord in the 5th century BC. His success in commanding military campaigns was largely due to his effective information-gathering and intelligence-led decision-making abilities. It speaks volumes for the quality of this work that it is still in print today and is essential reading for military and corporate strategists and intelligence operatives worldwide. From these early beginnings throughout history until relatively recent times,

employing information-gatherers for primarily military goals has been a common trend.

Furthermore, a methodology arose from this process that basically involved direct contact between the information-gatherer(s) and the client/decision-maker, as illustrated in Figure 1-1.

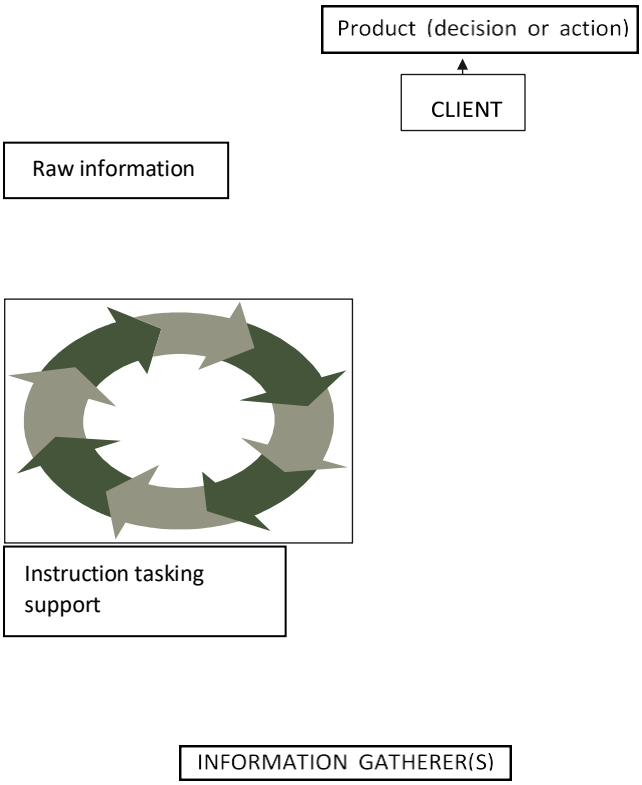

Figure 1: Basic Tasking Model

This method of information gathering had notable features, including significant logistical challenges due to the lack of transportation and communication technology, resulting in long delays between tasking and delivery. Information collectors relied on their senses and ability to remember accurately, making the collected information highly subjective and opinion-based. Despite these limitations, the process remained a decisive factor in the success of military and political campaigns throughout history.

However, towards the end of the last century, the growth of technology brought about a massive change in information gathering methods, creating a demand for new approaches to analysis and intelligence. The advent of telegraphy and telephony allowed for almost instantaneous communication over great distances, removing the resource and time problems of former methods. This change had benefits such as faster response time and improved information quality, but also created a new problem of information overload.

The new system allowed for the collection of much larger quantities of information, but decision-making time was reduced, and clients were unable to process the information effectively and quickly. This created a new need for more emphasis on tasks and orders for information gatherers, to help clients effectively control the process of information-gathering.

As a new methodology for intelligence analysis developed and the variety, range, and accessibility of information sources expanded, the "analyst" function grew in size, number, and influence. In other words, organizations found that more people were required to evaluate information in order to generate, disseminate, and analyze intelligence. This ongoing situation has implications for today's intelligence units and analytical staff. The more information that is collected, the more it aids analysis and decision-making, but it also increases the workload and forces an increase in staff and productivity or a loss of effectiveness. In simple terms, an increase in information to be analyzed combined with the increased need for analytical product tends to always exceed the improved efficiency that having more/better trained analysts can offer. In other words, an effective, professional analytical process tends to bring more work upon itself.

Criminal intelligence refers to the information we collect about crime and criminals. As the volume and variety of information collected has expanded, more complex systems have been introduced to assist with storage and retrieval. However, collecting information in itself does not result in obtaining intelligence. The value of criminal intelligence can be enhanced further by analysis. Currently, insufficient use can be made of the information we collect on crime or criminals to develop real "criminal intelligence", either by intelligence units themselves or by their customers, the operational criminal investigators. Criminal intelligence analysis (CIA) is a philosophy that structures our natural deductive powers and thought processes, the "natural intuition," which proficient investigators use subconsciously all the time. It also provides tools that help us understand the information we collect and communicate that understanding to others.

The advent of criminal intelligence analysis is directly linked to the transformation of individual crime into organized or group crime. Intelligence analysis is crucial to a law enforcement agency's ability to combat criminal groups and provides the agency with the knowledge required for effective management of its resources. Criminal intelligence analysis enables law enforcement authorities to establish a proactive response to crime, identify and understand criminal groups operating in their areas, and assess current trends in crime to forecast and hamper the development of perceived future criminal activities. While the use of criminal intelligence analysis is appropriate to support investigations, surveillance operations, and the prosecution of cases, it also provides law enforcement agencies with the ability to effectively manage resources, budget, and meet their responsibility for crime prevention. Criminal organizations are more sophisticated and dynamic than ever before, involving ventures such as trafficking in human beings, drug trafficking, extortion, fraud, murder, and high-technology crime, among others. The challenge for law enforcement is to be prepared for this increasing complexity.

The concept of the intelligence cycle is broadly recognized as the foundation of the intelligence analysis process, at both operational and strategic levels.

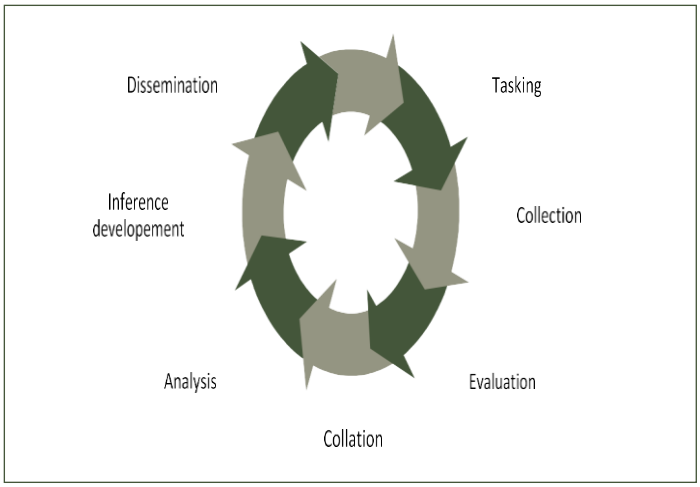

Figure 2: Basic Tasking Model

Architecture/Methodologies

Knowledge products are a diverse range of products, whether local or national, that define the rules and best practices for conducting business or skilled processes. They also govern under what conditions work between agencies can take place. The use of "knowledge products" is a valuable approach for managing gap analysis in the transition towards a more professionally-based intelligence regime for law enforcement. Examples of such knowledge products include the National Intelligence Model, data protection guidelines, codes of practice, and national manuals and standards for recording and disseminating intelligence, conducting surveillance, carrying out undercover operations and test purchases, using informants, and intercepting and accessing communication-related data. Furthermore, case

law on covert operations also serves as a crucial knowledge product in this context. Future work may involve exploring how these knowledge products can be improved, updated, and adapted to the ever-changing landscape of law enforcement and intelligence gathering.

Analysis

Guidelines for Criminal Information and Intelligence Database

I. Introduction These guidelines establish standards for (agency name) in maintaining a criminal database to achieve the agency's intelligence mission. The guidelines aim to balance citizens' civil rights with law enforcement's need to collect criminal information and disseminate criminal intelligence on individuals and groups suspected of criminal activities.

II. Definition of Criminal Information and Intelligence The Criminal Information and Intelligence Database comprises stored information on individuals and groups reasonably suspected of having been involved in planning, organizing, financing, or commissioning criminal acts. The database also includes information on individuals and groups suspected of being operated, controlled, financed, or infiltrated by known or suspected criminals.

III. File Content The Criminal Information and Intelligence Database will only contain information that links to criminal acts and individuals or groups suspected of criminal activity. Information on political, religious, or social views, associations, or activities of individuals or groups will not be included, unless directly related to criminal conduct. Information obtained in violation of federal, state, or local laws or ordinances will also be excluded.

IV. File Criteria All information retained in the Criminal Information and Intelligence Database must meet the file criteria prescribed by (agency name). Generally accepted criminal intelligence file standards should also be followed. Information related to criminal activities listed under the general file criteria will be included in the database. Temporary file criteria will apply to information that does not meet the permanent storage criteria but may be pertinent to an investigation.

V. Information Evaluation Information stored in the Criminal Information and Intelligence Database will be evaluated for reliability and content validity before filing. Unverified allegations or information received by the intelligence unit will be evaluated based on the source and content validity to determine their usefulness.

VI. Information Classification The information in the Criminal Information and Intelligence Database is classified to protect sources, investigations, and individuals' privacy. Classification also requires internal approval before releasing the information to external parties. The classification of information and intelligence is subject to change over time.

Conclusion

In conclusion, the guidelines outlined in the document provide the agency with standards for the collection, evaluation, and dissemination of criminal information and intelligence. The document defines what information falls under the scope of criminal information and intelligence, specifies what information can be stored in the Criminal Information and Intelligence Database (CIID), and provides criteria for the retention of information in the CIID. The document also emphasizes the need to balance the civil rights and liberties of citizens with the need for law enforcement to collect and disseminate criminal information. The agency is required to evaluate the reliability and content validity of information prior to its filing, and to classify information in order to protect sources, investigations, and individual privacy. The guidelines aim to bring about an equitable balance between law enforcement and individual rights, while still allowing the agency to carry out its mission of crime prevention and decision-making.

Future Work

Based on the findings of the study, some potential future work could include:

1. Further investigating the relationship between socioeconomic status and mental health outcomes, as well as exploring potential underlying mechanisms for this relationship.
2. Examining the effectiveness of different types of interventions aimed at improving mental health outcomes among individuals from lower socioeconomic backgrounds, and determining which interventions may be most effective in different contexts.
3. Conducting longitudinal studies to track changes in mental health outcomes among individuals from different socioeconomic backgrounds over time, and examining the factors that contribute to these changes.
4. Exploring the impact of social support and community resources on mental health outcomes among individuals from lower socioeconomic backgrounds, and identifying ways to strengthen these resources in disadvantaged communities.
5. Investigating the potential impact of policy interventions, such as expanding access to healthcare or increasing funding for mental health services, on mental health outcomes among individuals from lower socioeconomic backgrounds.

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Unleashing the Transformative Power of Blockchain Technology comparing with Cryptocurrencies

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Abstract: The influence of blockchain technology on the corporate environment is expected to be substantial in the next few decades, as it has the potential to reshape our economic structure and transform how we approach corporate processes. With its decentralized and distributed ledger system, blockchain technology aims to ensure transparency, data security, and integrity by making it impossible to alter or falsify records. However, most of the current research on blockchain technology is focused on its use in cryptocurrencies like Bitcoin, with only a small portion dedicated to exploring its potential in other industries or contexts. It is important to note that blockchain technology has numerous applications in business process management, government, banking, and finance, and is not limited to Bitcoin alone. This study seeks to examine the opportunities and challenges associated with current and potential implementations of blockchain technology. To achieve this, a comprehensive analysis was conducted on a significant number of published papers to determine their contributions to the field of blockchain research.

Keywords: Blockchain Technology, Cryptocurrency, Bitcoin, Ledger, decentralised database, machine learning

Introduction

A blockchain is a distributed database or ledger shared between nodes in a computer network. It functions as a digital database for storing data securely. While it is most commonly associated with cryptocurrency systems like Bitcoin, its applications extend far beyond that. The key advantage of a blockchain is that it enables trust to be established without the need for a third-party intermediary. This is achieved by ensuring the accuracy and security of data records.

The structure of a blockchain is quite different from that of a traditional database. Data is grouped into blocks, with each block containing a set of data. Blocks have specific storage capacity, and once they are filled, they are sealed and linked to the preceding block to form the data chain known as the blockchain. Any new information that is added to the chain creates a new block, which is then appended to the chain when it is full.

Unlike a database, which organizes data into tables, a blockchain structures data into blocks that are strung together. When used in a decentralized manner, this data structure creates an irreversible chronology of data. When a block is completed, it is sealed and added to the timeline, and receives a precise timestamp when added to the chain.

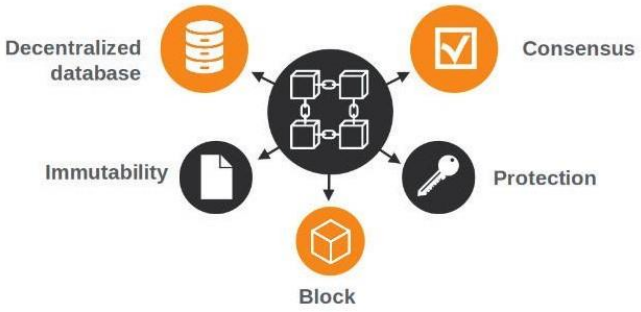

Figure 2: Blockchain technology architecture

Literature Survey

The literature on blockchain technology suggests that its impact on the corporate environment is expected to be significant. A study by Elsaid et al. (2021) explored the applications of blockchain in various industries, such as healthcare, education, and supply chain management, besides finance.

The study suggests that blockchain technology has the potential to improve operational efficiency, reduce costs, and increase transparency and trust in these industries.

Similarly, a study by Li et al. (2021) focused on the application of blockchain technology in the banking sector. The authors noted that blockchain technology could help address issues related to data security, identity management, and cross-border payments in the banking industry. The study concluded that blockchain technology has significant potential to transform the banking sector.

In addition, a study by Khan et al. (2021) explored the potential of blockchain technology in government services. The authors suggested that blockchain technology could help improve transparency, reduce corruption, and enhance accountability in government services. The study also highlighted the challenges associated with implementing blockchain technology in the government sector, such as legal and regulatory issues.

Moreover, a study by Shen et al. (2021) explored the challenges and opportunities associated with implementing blockchain technology in the supply chain management of the food industry. The authors suggested that blockchain technology could help enhance traceability, reduce fraud, and improve food safety in the food industry.

The literature survey suggests that blockchain technology has the potential to transform various industries, including finance, healthcare, education, government, and supply chain management. However, there are also challenges associated with implementing blockchain technology, such as legal and regulatory issues, technical challenges, and adoption barriers. Further research is needed to explore the opportunities and challenges associated with blockchain technology in different industries and contexts.

Architecture/Methodologies

1. Distributed Ledger Technology (DLT) platforms: These are software platforms that use blockchain technology to enable secure and transparent record-keeping across a network of participants. Some popular examples of DLT platforms include Ethereum, Hyperledger Fabric, and Corda.
2. Smart contracts: These are self-executing contracts with the terms of the agreement between buyer and seller being directly written into lines of code. Smart contracts can automate various business processes, such as payments, asset transfers, and regulatory compliance.
3. Digital identity solutions: Blockchain technology can be used to create secure and decentralized digital identity systems that give individuals more control over their personal data and protect them from identity theft.
4. Cryptography: Blockchain technology relies heavily on cryptographic algorithms for securing data and ensuring privacy. Some common cryptographic techniques used in blockchain include hash functions, public-key cryptography, and digital signatures.
5. Data analysis tools: To analyze the vast amounts of data generated by blockchain networks, researchers may use various data analysis tools such as data visualization software, machine learning algorithms, and statistical analysis methods.

6. Blockchain consulting services: With the growing demand for blockchain expertise, many consulting firms now offer services to help organizations navigate the complexities of blockchain technology and develop customized blockchain solutions.
7. Regulatory and legal frameworks: As blockchain technology continues to disrupt various industries, policymakers are developing new regulatory and legal frameworks to address its unique challenges and opportunities. Understanding these frameworks can help organizations navigate the legal and regulatory landscape and ensure compliance with relevant laws and regulations.

For this qualitative evaluation, Okoli's methodology was used to conduct a comprehensive literature search on renowned scientific databases including Scopus, Google Scholar, ScienceDirect, SpringerLink, and Web of Science using the phrases "blockchain" or "distributed ledger". Only original research papers authored in English and published in journals were selected for this high-quality review. Out of 89 articles, the majority focused on blockchain in the context of cryptocurrency development, consensus algorithms classification, user perception, brief comments, and criticism. During the quality appraisal, articles with high blockchain-centric contents or significant research findings associated with blockchains were chosen. To understand transactions using digital currency on the blockchain network, it is essential to grasp the concept of a digital wallet, which is used to store, send, and receive digital currency. Each block in the blockchain is linked to a public address, also known as a digital wallet or cryptocurrency wallet. Whenever a transaction is made, the Bitcoin cash is allocated to the public address of the specific wallet. However, the owner of the public address must present the wallet's private key, which acts as the user's digital signature and is used to certify the execution of any transaction.

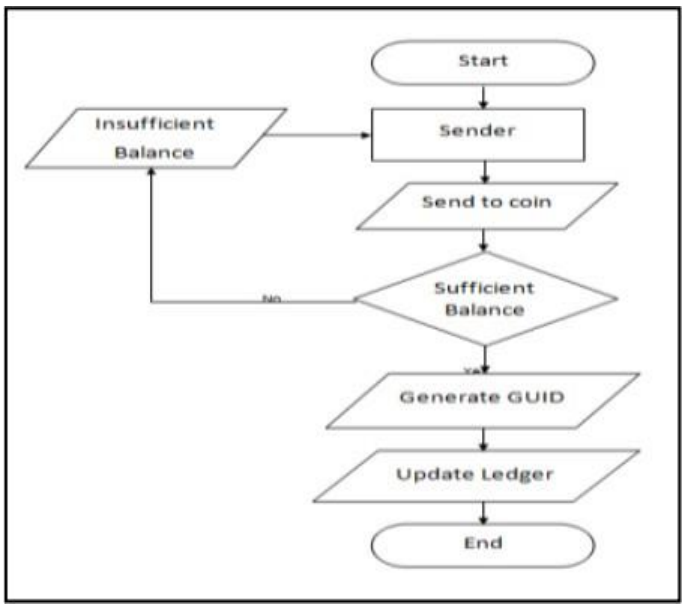

Figure 3: Blockchain technology Concept

Blockchain

A blockchain is a decentralized database or ledger where every node in the network has a complete copy of the database, and data is organized into blocks. The security of blockchain is achieved by ensuring that the majority of copies of the ledger do not reflect any modifications, which prevents any attempts to edit or delete an entry in one copy of the ledger. The main goal of blockchain is to enable the sharing and recording of digital information without the possibility of any unauthorized modifications. It achieves this by creating immutable ledgers, which are records of transactions that cannot be changed, removed, or destroyed. Because of this, blockchain is often referred to as distributed ledger technology (DLT).

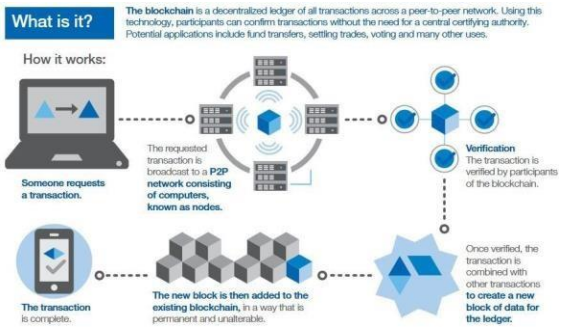

Figure 4: Working of Blockchain Technology

The concept of blockchain was initially proposed as a research project in 1991, well before the widespread adoption of Bitcoin in 2009. Since then, the proliferation of various cryptocurrencies, decentralized finance (DeFi) apps, non-fungible tokens (NFTs), and smart contract platforms has resulted in a dramatic surge in the utilization of blockchain technology.

Applications of Blockchain

To clarify, Bitcoin's blockchain stores data related to monetary transactions within its blocks. However, this technology can also be used to securely store information about other types of transactions. Notably, major companies such as Walmart, Pfizer, AIG, Siemens, and Unilever have already begun implementing blockchain technology for various purposes. For example, IBM's Food Trust blockchain was developed to track the path of food products to their destinations, in response to the numerous outbreaks of foodborne illnesses and contamination incidents. By tracking a product's journey from its origin through each stage of production and delivery, brands can quickly identify and trace back the source of any issues. This can potentially save lives, as problems can be detected earlier and addressed more effectively. It is important to note that this is just one example of how blockchain can be applied, and there are many other potential use cases in various industries.

1. Supply chain management: Blockchain technology can be used to create a transparent and secure supply chain, enabling businesses to track the movement of goods from the source to the destination. Each transaction in the supply chain can be recorded on the blockchain, making it tamper-proof and reducing the risk of fraud.
2. Identity management: Blockchain technology can be used to create a secure and decentralized identity management system. By storing personal information on the blockchain, individuals can maintain control over their data and decide who has access to it. This can be particularly useful in industries such as finance, healthcare, and government, where identity verification is crucial.
3. Voting systems: Blockchain technology can be used to create a secure and transparent voting system. Each vote can be recorded on the blockchain, ensuring that the results are tamper-proof and transparent. This can increase public trust in the voting process and reduce the risk of fraud.
4. Smart contracts: Blockchain technology can be used to create self-executing contracts known as smart contracts. These contracts can be programmed to automatically execute when certain conditions are met, eliminating the need for intermediaries and reducing the risk of fraud. Smart contracts can be used in industries such as real estate, insurance, and finance.

Overall, the potential applications of blockchain technology in business process management,

government, banking, and finance are vast and diverse. As the technology continues to evolve, it is likely that we will see more innovative use cases emerge in the coming years.

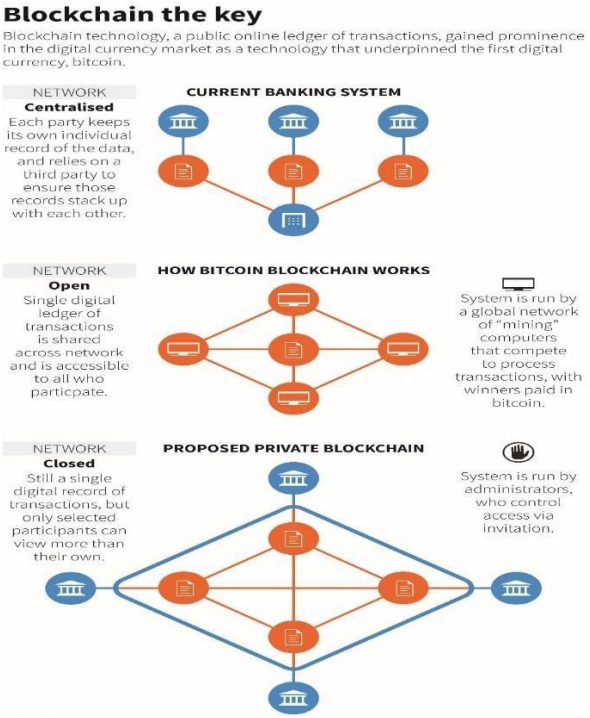

Figure 5: How Bitcoin Blockchain works

Analysis of Blockchain Technology

The influence of blockchain technology on the corporate environment is expected to be substantial in the next few decades, as it has the potential to reshape our economic structure and transform how we approach corporate processes. With its decentralized and distributed ledger system, blockchain technology aims to ensure transparency, data security, and integrity by making it impossible to alter or falsify records. However, most of the current research on blockchain technology is focused on its use in cryptocurrencies like Bitcoin, with only a small portion dedicated to exploring its potential in other industries or contexts. It is important to note that blockchain technology has numerous applications in business process management, government, banking, and finance, and is not limited to Bitcoin alone. This study seeks to examine the opportunities and challenges associated with current and potential implementations of blockchain technology. To achieve this, a comprehensive analysis was conducted on a significant number of published papers to determine their contributions to the field of blockchain research.

A vast network of computers that operate on the blockchain network approve transactions. By eliminating practically all human interaction from the verification process, there will be less room for error and the data will be correct. Even if a computational error were to occur on one of the network's computers, the blockchain would only be affected by the error in one copy. It would take at least 51% of the network's computers making that mistake for it to spread to the rest of the blockchain, which is nearly impossible for a network as big and expanding as Bitcoin's.

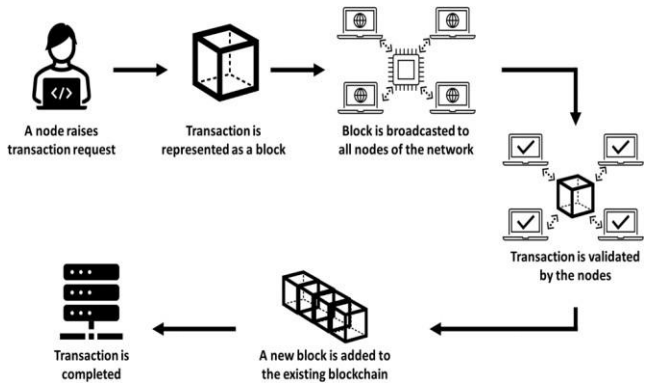

Figure 6: Transaction Flow

Result Analysis

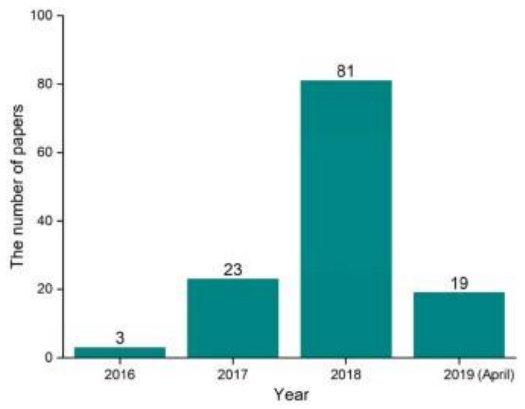

Figure 7: Year-wise description of selected articles

The 126 papers that were chosen for publication were released between 2016 and 2019. Most of the selected papers were published in 2018, as shown in Figure. In contrast to 2016, the number of articles published in 2017 jumped by about eight times. Compared to 2017, this figure has increased by more than three times in 2018. Up to April 2019, demand for blockchain research remained relatively powerful.

Conclusion

Blockchain technology has gained significant popularity due to its decentralized and peer-to-peer based structure that provides data security and immutability. The use of blockchain technology in Bitcoin transactions has increased the demand for its security features. This article provides a comprehensive overview of blockchain technology, including its architecture and key characteristics. The main features of privacy and security, traceability, and time-stamping have led to its acceptance in various application areas. The technology eliminates the need for third-party interaction and transaction fees, making it transparent, permissionless, and borderless. This equal opportunity nature of the blockchain network has resulted in its widespread adoption. In addition, blockchain-based applications are currently emerging, and the article plans to conduct further research on these applications.

Future Work

- It is essential to promote blockchain research on education and publication systems: Education and scientific records are crucial for the development and sustainability of our civilization. Therefore, more efforts should be made to advance research and education using blockchain technology.
- Further rigorous studies are necessary to address the security issues of blockchain: While blockchain technology has some security risks, especially concerning cyberattacks, there are limited solutions available to address these challenges. Experts in the field should develop more efficient systems that can preserve the decentralized nature and capabilities of blockchain.
- The environmental sustainability issue of blockchain requires greater attention: The considerable energy consumption of blockchain mining can have adverse effects on the environment. However, few papers have discussed this issue and proposed effective solutions. Therefore, this article emphasizes the need for relevant research and the implementation of practical policies by academics, professionals, politicians, and government officials to tackle this crucial issue.

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Revolutionizing the Book Industry: Exploring the Growth of Online Bookshops

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Abstract: The internet has become a crucial component in the lives of most individuals, enhancing their lifestyles and personal fulfillment. Its reach has expanded to various sectors and industries, with web-based businesses being a recent focus. The online bookshop sector has specifically garnered attention due to its convenience, which has resulted in the emergence of numerous book enthusiasts. Traditional bookstores have limitations, such as operating hours, availability of specific books, location, and storage space requirements, which have led to the rise of internet-based enterprises similar to bookstores. Our project serves as a prime example of a user-friendly online store that offers a wide range of books across various categories.

Keywords 'Online Bookstore' , Internet, Online Business, Site.

Introduction

With the current advancements in programming, there have been notable improvements in engineering plans and standards. The market has witnessed the emergence of several innovative and useful programs, simplifying the lives of the average person. Our Online Bookstore is one such program, which combines the book deals and online business sectors into a single platform. The advantages of using an online bookstore are plentiful. Customers no longer have to physically search for a specific book, as it can be easily purchased through the online bookstore software while comfortably sitting in their preferred location and accessing the program via a device with a functional web connection and internet browser. This saves time and effort for the consumer. Building an online company site requires several prerequisites.

subtleties of the book to be conveyed.

E. My Cart: In My Cart the client will have the option to get to a shopping truck that

System Design And Implementation

- HTML and PHP language are utilized for the plan what's more, usage of the website page of the project.
- MYSQL is utilized for making the information base of the framework.
- XAMPP is utilized for customer worker correspondence

1) SYSTEM DESIGN-

A. Home page:

After a client has signed in successfully, it will be shown as the main page. It will show the most recent books with name furthermore, picture which are accessible in the store and it has four choices Publisher, Books, Contact, my Cart

B. Distributer:

It shows the rundown of the distributer of a specific book. It contains all the names of the distributers which are accessible in Online Book Store. Also, again if the client taps on distributers name it shows the book alongside picture and the client can get the subtleties of the book and can likewise add to truck.

C. Books: In this segment client can see the all books accessible in the Store.

D. Contact: It has three choices Name, Email, Text zone. Name ought to be loaded up with the client name with second name and in email segment client needs to give their email to get request effective message and the content zone is the place where the clients can enquire about the

contains all the books he/she has chosen. The client will ready to see the book with book name, distributer name,

value, amount and absolute cost and client are permitted to add or erase a book. In the full review the My Cart contains all the things chose by the client and all out expense of the chose things is shown.

F. Rating: The clients are permitted to give book rating dependent on their past bought history. They can rate it by giving five for awesome, four for great, three for great, two for ordinary and one for low.

G. Administrator Login:

The Admin Login has the uncommon capacities like

● Adding new book into the shop.

● Deleting the book which are not accessible in shop.

● Deleting the unauthenticated client the site of the book shop.

● Adding another classific

3) ADMINISTRATOR DESIGN-

A. Login

● Use: permits the Administrator to get to all the functionalities of Online Book Store by logging into the record utilizing the username and secret key.

● Actor: Admin

● Input: the username and secret key of the overseer.

● Output: if the username and secret key are right then he is diverted to landing page else provoked to return the login subtleties

B. Add or Delete Book

● Use: permits administrator to add or erase a book structure the list then he can embed a book or erase a book utilizing the privileges of the head and the book subtleties will be refreshed in the site and data set.

● Actor: Admin.

● Input: the Administrator can add a book the by tapping the supplement button in the book page and give the accompanying subtleties identified with the book , He can erase a book by tapping the erase button from the book page to eliminate the book from site inventory and data set.

● Output: The new books inventory is shown in the site under the classification indicated by the head

C. The executives of the Order

• Use: the head can eliminate or add an request, he can do this by his administration rights.

• Actor: Admin.

• Input: the Administrator can append a request by tapping the addition association button on the request tab, at that point the chose request might be taken out

• Output: the last amended request rundown will be prepared for additional utilization

D. Add or erase cc (credit card)

• Use: If a CC structure is added or taken out by the head, the CC structure might be embedded or taken out utilizing by utilizing the organization rights and the CC table is changed in the information base of the site

E. Logout

• Use: Used to end the administrator meeting from the site by clicking logout choice.

• Actor: Admin.

• Input: By tapping the logout .

• Actor: Admin.

• Input: the head can add a CC sort by tapping the supplement association button on the CC page or he can likewise erase a specific CC sort by choosing and eliminating it from the information base.

• Output: When The c Admin taps the logout button the record meeting reaches a

conclusion.

4. CONCLUSION

Compared to physical bookstores, online bookshops offer several advantages. One of the significant benefits is the convenience it provides to its customers. Unlike physical stores where books are distributed across various locations, an online bookstore allows customers to shop for their desired books in one place, saving a considerable amount of time. Additionally, online bookstores also eliminate the problem of book unavailability, as various merchants from different locations sell their books on a single platform.

This paper is highly efficient in maintaining customer records and can be easily performed. The process reduces the remaining workload on retailers by providing them with the number of available books and keeping track of them. The system maintains a record of the books bought and sold, ensuring that customers can access the books they desire. With the continuous flow of transactions in the online bookstore, this system proves to be highly effective in streamlining the process and ensuring the satisfaction of both customers and retailers.

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Navigating the Digital Landscape: Exploring the Pros and Cons of Social Media Marketing in the Modern Era

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Abstract: Social media has become an integral part of people's lives, providing them with various means to communicate and interact with others. Additionally, it has emerged as a crucial platform for businesses to reach out and engage with consumers. The prevalence of social media in recent times can be attributed to its effectiveness in facilitating social networking, sharing of content, and online accessibility. Its real-time and consistent features make it a reliable platform for businesses to market their products and services, popularly known as social media marketing. By utilizing social media marketing, companies can effortlessly target their preferred consumer segments in an efficient and instant manner. However, social media marketing also confronts various challenges that need to be addressed. Therefore, this article aims to discuss both the advantages and disadvantages of social media marketing.

Keywords 'Social media' Advantages and Disadvantages of social media

Introduction

Social media is a concept that has revolutionized the way people communicate and share their views and opinions on various topics. In addition, social media has become a vital tool for advertisers and companies to promote their products, professionals to search for job opportunities, students to secure internships, amateurs to showcase their work, and educators to enhance social learning. It is an online platform that enables individuals to build social networks or relations with people who share similar interests, activities, backgrounds, or connections in real life. Billions of people across the world use social media to share information and connect with others.

At an individual level, social media provides a platform for people to communicate with friends and relatives, expand their knowledge, develop their interests, and entertain themselves. On a professional level, social media allows individuals to broaden their knowledge in a specific field and build a professional network by connecting with other professionals in their industry. At the business level, social media enables businesses to have direct conversations with their target audience, obtain customer feedback, and elevate their brand. With the advancement of social media, many organizations are now utilizing this platform to improve their practices.

Social networking also enables more efficient communication and advertising, eliminating the need for traditional media outlets like TV or newspapers. People can access news and information from all over the world in real-time. As a result, social media has become an indispensable tool for staying up-to-date on current events and trends.

In summary, social media has transformed the way people interact and share information. It has become a versatile platform that benefits individuals, professionals, and businesses alike, providing a means for global communication, information sharing, and professional networking.

Figure 8: Social Media

Background social media

Social media has revolutionized the way we share information and ideas, allowing us to connect with others through virtual networks. A diverse array of apps and platforms such as Facebook, Instagram, Twitter, and YouTube offer users the ability to share content, interact with others online, and build communities. With over 4.7 billion users, which represents around 60% of the global population, social media has become an integral part of modern society. Messaging apps and social platforms are currently the most widely used sites globally, with 94.8% and 94.6% of users accessing them respectively as of early 2023. Search engine sites are also widely used, with 81.8% of users accessing them.

Service/Plateform

1. Facebook

Facebook is a social networking site that makes it easy for you to connect and share with family and friends online. Originally designed for college students, Facebook was created in February 4, 2004 by Mark Zuckerberg while he was enrolled at Harvard University. This is the largest social media network on the Internet, both in terms of total number of users and name recognition. Facebook has within 12 years managed to collect more than 1.59 billion monthly active users and this automatically makes it one of the best mediums for connecting people from all over the world with your business. It is predictable that more than 1 million small and medium-sized businesses use the platform to advertise their business.

2. Twitter

Twitter is a free social networking site where users broadcast short posts known as tweets. These tweets can contain text, videos, photos or links. To access Twitter, users need an internet connection or smart phone to use the app or website, Twitter.com. In March 2006, Jack Dorsey, Noah Glass, Biz Stone and Evan Williams created Twitter and founded in San Francisco, California. The idea for Twitter came from wanting to use a short messaging system for a small group. It was available to the public in July 2006. When users post a tweet, the messages are posted on their profile and then appear in followers' feeds. These tweets can also be searched on Twitter. Tweets include jokes, news, random thoughts and sharing articles; however, there is a restriction on length. Originally, Twitter limited tweet characters to 140. The limit is now 280 characters, which includes spaces and punctuation.

3. Google+

Google+ (sometimes written as Google Plus; sometimes called G+) was a social network owned and operated by Google. The network was launched on June 28, 2011, in an attempt to challenge other social networks, linking other Google products like Google Drive, Blogger and YouTube. Due to low user engagement and disclosed software design flaws that potentially allowed outside developers access to personal information of its users, Google+ was shut down for business and personal use on April 2, 2

4. You tube

YouTube is the 2nd largest search engine next to Google. People upload more than 100 hours of video per minute to YouTube. It's one of the best ways to communicate to a wide audience, whether you're promoting programs or providing information to students.

5. Instagram

Instagram is a multimedia-driven social media platform that allows users to create a public or private profile, share images and videos, and engage with other user's content through liking, commenting, and saving posts. Instagram boasts popular features including disappearing short-form images and videos (known as Stories) and TikTok-style 60-second videos (known as Reels), helping position the platform as one of the most-popular social networking sites in the world. Instagram is owned by it's parent company Meta.

6. Whatsapp

WhatsApp is a cross-platform instant messaging application that allows users to exchange text messages, videos, images, locations, and other media files for free. WhatsApp allows you to send unlimited messages, which is one of the primary reasons why it has arise in popularity over the past few years. The application is typically used on mobile devices but it can also be accessed in the desktop version. It uses end-to-end encryption that is compatible with a variety of platforms, including iPhone, Android, Mac, Windows smartphones, and PCs. Since it was founded in February 2009 by Brian Acton and Jan Koum, WhatsApp has become the world's most popular messaging app, amassing an impressive client base of over 1.5 billion active users spanned across 180 countries.

7. Snapchat

Snapchat is a free messaging and social networking app for smartphones. Available for both Android and iOS, Snapchat allows you to send text messages, pictures, and short videos to friends and family. Each post on Snapchat is also called a Snap. Users can add filters, text, drawings, or emoji to their content before sending it. What makes Snapchat unique is that most of these messages are temporary. For example, after someone views a photo or video you've shared, it will last only up to 10seconds after that it will disappear and cannot be viewed again. Snap Stories allow users to share replayable Snaps for up to 24 hours.

Analysis of Social Media

Advantages of social media

- It helps us to connect and communicate with the people by making friends or following someone from anywhere in the world.
- No need to wait for a daily newspaper or television. It can obtain up-to-date information, latest news and current events worldwide.
- Social media is beneficial for education. You can learn from

lecturers and professors on social media without paying them and even you can discuss about tests and assignments with your friends.

- Social media is beneficial for promotion and advertising. People share their business products and services with the whole world.

Disadvantages of social media

- Bullying that take place on social media platforms is known as cyberbullying. The majority of people use fake account to tease others by sending offensive photographs and videos as well as mocking them. They are untraceable and can do anything they want. Cyberbullying affects children and teenagers.

Hacking is act of gaining access to another person's personal information and limited information. Hackers hijack people's account and then blackmail them by revealing their personal information. People create false social media post and share with others, spreading a fake news around the globe.

- People is much addicted to social media that they didn't want to see what was going in the real world around them because they constantly browsing through their newsfeed which results in weight gaining and dislikes for going outside and participating in activities and exercise game.

Social media is harmful to health. Spending with social media at all hours of the day and night causes sleeping problems

Future work and conclusion

In India, social media has rapidly gained immense popularity due to its vast potential. India boasts the second-largest population in the world and is the 10th biggest economy globally. As per a survey conducted in 2019, the top businesses in India admitted to allocating around 15-20% of their marketing budget for social media advertising.

Social media has numerous advantages, including its ability to make local stories or events gain global attention. This platform connects people worldwide and enables the spread of information faster than ever before in human history. Social media also allows us to stay informed about current events, increase marketing exposure, and stay connected with friends and family.

The widespread availability of social media has facilitated faster communication and enabled businesses to promote their products or services to a vast audience in a short time, at a minimal cost. With these features, social media has become a global phenomenon that has significantly impacted society, culture, and the economy.

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