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A Study on technology usage, such as AI and blockchain, in simplifying the tax filing process

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Abstract

The increasing rate of development in digital technology has led to numerous changes in many sectors, including taxation. This paper examines how new technologies, Artificial Intelligence, as well as Blockchain, can make tax returns simpler for individuals as well as for businesses. Conventional tax returns tend to be complicated, taking up considerable amounts of time, as they are susceptible to errors made by humans. Artificial Intelligence can detect errors, offer tailored support via AI-powered chatbots, as well as superior software. Additionally, Blockchain technology enhances the security of tax returns. The paper seeks to make sense of how these technologies increase efficiency, accuracy, and usability within tax filing. In addition to this, there is an emphasis on challenges encountered while adopting these systems, considering factors related to awareness, skill sets, and infrastructure. This study employs primary research, where data is collected using simple questionnaires for analysing how these technologies are accepted or perceived by individuals when used with tax filing systems, considering AI or blockchain technology. The results garnered from this research will enable policymakers, tax departments, or developers to understand the advantages of technological adaptation when filing taxes and promote adopting cutting-edge technology for an efficient tax filing process.

Keywords: Artificial Intelligence; Blockchain Technology; Tax Filing Systems; Digital Taxation; Automated Tax Compliance

Introduction

Tax returns are one of the necessary tasks for individuals, organizations, as well as business organizations. However, the traditional system of tax returns has complex procedures, paperwork, errors, as well as a long processing period. Due to an increased volume of financial information, it has become inefficient to work with tax returns in a manual system. To cater to these issues, governments and financial institutions are using innovative technology in tax administration systems.

Artificial Intelligence and Blockchain technologies are two emerging technologies that contribute greatly to the optimization of the tax filing process. Artificial Intelligence makes it easy to automate tasks that were

repetitive in nature, like entering data and computing tax liability and document validation. It also assists tax filers in obtaining real-time advice from a virtual assistant. Another emerging technology is Blockchain. It is a safe method of record management that creates a digital ledger that is tamper-proof. This inhibits tax fraud and promotes trust on both sides regarding tax returns.

In countries such as India, tax technology solutions such as e-filing websites and GST solutions are increasingly incorporating AI solutions to make tax filing easier. Blockchain technology can help make these solutions even better by enabling instant data sharing and audit trail functions. This research aims to examine the role of AI and blockchain in making tax filing easier, more accurate, less costly, and user-friendly. It is necessary to comprehend the effects of these emerging technologies to make the tax system smarter, clearer, and more efficient.

Background of the Study

Tax filing traditionally used to be a manual system that relied on paperwork and human intervention, fraught with delays and errors, with little transparency into them. As economies started to grow and transactions became increasingly more complex, it became a monumental task for tax authorities to monitor compliance or prevent tax evasion. In this context, the demands of handling large volumes of data efficiently and safely further increased the need for technological solutions.

Due to the advent of digital transformation, a number of technologies, including AI, blockchain, have surfaced as useful tools in tax administration. The AI system increases efficiency by performing calculations automatically, detecting errors, and helping taxpayers while filing their taxes online. The blockchain system increases security and transparency by providing a tamper-proof, decentralized system for records. Various governments across the globe are working on implementing these tools to develop a smart tax system. The purpose of carrying out this research is to determine how effective AI, blockchain, are at simplifying taxes while analysing taxpayer awareness, acceptance, and challenges faced while using these tools.

Problem Statement

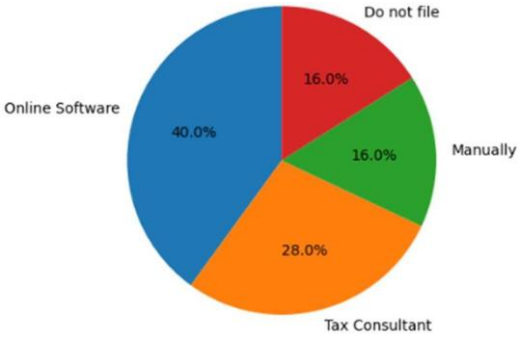
Despite the existence of digital tax filing technologies, taxpayers encounter problems due to a lack of knowledge and understanding about the technologies. The conventional method of filing taxes is prone to glitches and problems. While AI and Blockchain technologies hold the potential to make tax filing simpler, there is an imbalance in their adoption and understanding about infrastructure issues. It is necessary to research the adoption of technologies like AI and Blockchain and the issues experienced by taxpayers to make the tax filing experience better.

Objectives of the Study

1. To study the role of Artificial Intelligence and Blockchain in simplifying the tax filing process.
2. To analyse the level of awareness and acceptance of AI and blockchain-based tax systems among users.
3. To identify the challenges faced by taxpayers while using technology-driven tax filing platforms.

Data Analysis and Interpretation

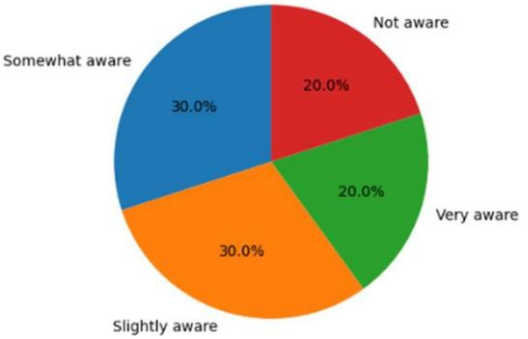
1. How do you usually file your taxes?



Interpretation

The graph reveals that online tax filing software is the preference of 40% of taxpayers, which is a result of increased dependence on technology for tax filing. Professional tax consultants are used by 28% of taxpayers, which is a sign of increased dependence on tax consultants. The graph also reveals that 16% of taxpayers file taxes manually, which is a sign of a decrease because of its time-consuming process. A total of 16% of taxpayers do not file taxes, which might be due to a lack of awareness regarding income threshold levels or because of a complex process.

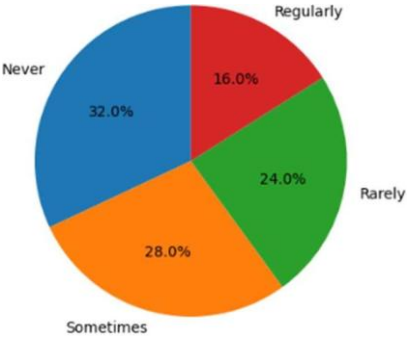
2. Are you aware of AI-based tax filing platforms?



Interpretation

The findings show that there is a moderate level of awareness about AI-based taxation platforms. Almost 60% respondents have some or slight levels of awareness about these platforms, indicating that AI in taxation is gradually becoming well-known. At the same time, 20% of respondents have not heard about such platforms at all, indicating an existing major gap in knowledge. Only a few respondents have very high levels of awareness, indicating limited exposure to highly advanced taxation technologies. This indicates that although AI-based taxation platforms do exist, awareness programs still have to be made for better adoption.

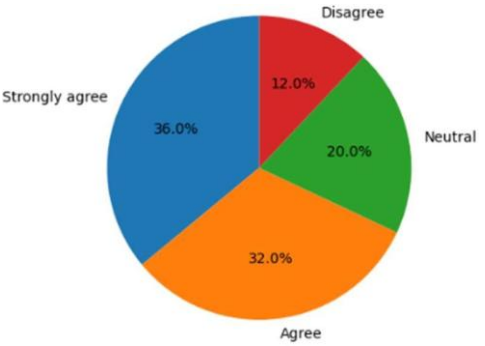
3. Have you ever used AI tools (chatbots, auto-calculation) for tax filing?



Interpretation

The report showcases the poor usage of AI tools like chatbots and auto-calculations in tax filings: 32% never use AI tools and 24% use them rarely. Only 16% of them use it regularly, which manifests the shallow hands-on experience. This awareness-usage gap could be because people do not believe in it, face technical glitches, or are not guided properly. The findings, thus, indicate that though AI has the potential to make tax filling easy, greater efforts should be made to ensure practical usage through training, friendly user-interfaces, and awareness drives.

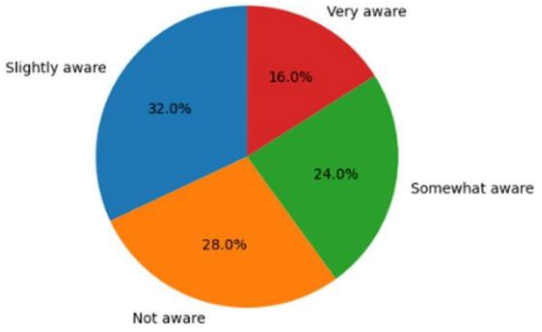
4. Do you think AI reduces errors in tax filing?



Interpretation

A significant proportion of respondents feel that AI assists in minimizing the chances of errors while tax filings. Approximately 68% of respondents either agreed or strongly agreed with this observation, which clearly reflects their faith in the accuracy and automation potential of AI. Around 20% of the respondents showed neutrality possibly because they haven't directly encountered AI yet. Only a few people showed discrepancies, which clearly denotes negligible resistance to AI. This observation clearly identifies the importance of AI in avoiding manual errors and promoting accurate calculations for tax filings.

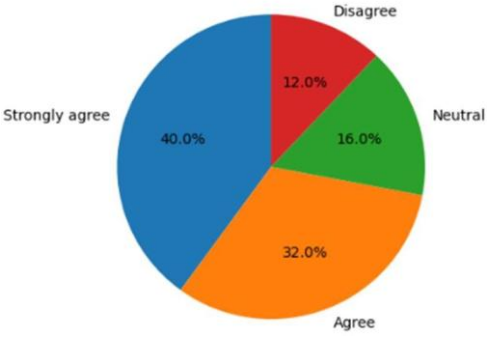
5. Are you aware of Blockchain technology in taxation?



Interpretation

Results recommend that the understanding levels for blockchain technology in taxes are not very high compared to AI. Near to 60% people are either slightly aware or not aware of the applications of blockchain technology in the taxation system. But a very few people are very aware, which means very few people have been exposed to this technology. This could be because of the technicality associated with this technology, and it has not received significant emphasis in people's daily tax submission processes.

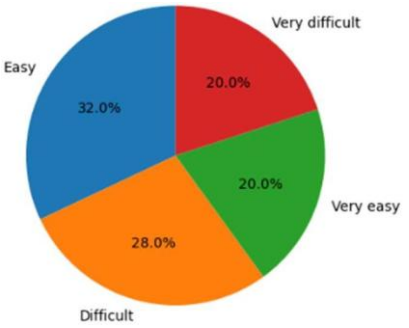
6. Blockchain helps in improving tax data security. Do you agree?



Interpretation

The results show high confidence in the capability of blockchain to enhance data security in taxation. Almost 72% of respondents are in agreement or strongly agree with the fact that blockchain technology is able to improve data security. This implies that most taxpayers consider blockchain technology as transparent and tamper-proof. A few respondents could be neutral or disagree due to lack of knowledge on the technology. The results demonstrate that once taxpayers are well-informed on blockchain technology, they will feel confident in the security aspects.

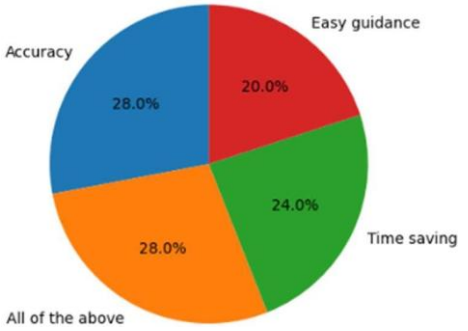
7. How easy do you find online tax filing platforms?



Interpretation

It can be observed from the results that the opinions are mixed in relation to how easy tax filing systems for online taxation are. Though 52% of the respondents find tax filing systems for online taxation easy or very easy to use, a substantial 48% find them difficult or very difficult to use. It can thus be interpreted that even if online systems are an added advantage in terms of convenience, they still have some hurdles in the user friendliness and technical aspects.

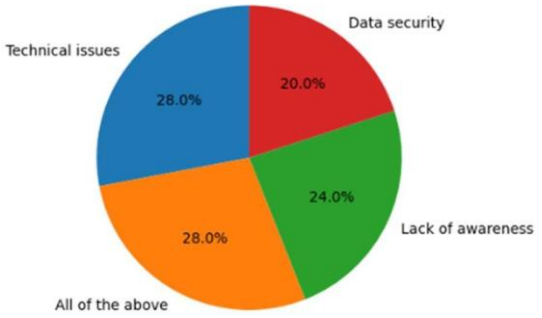
8. What is the main benefit of AI in tax filing?



Interpretation

From the analysis, the following is evident: taxpayers are aware of the various advantages of AI during tax filings. Accuracy and time-saving tools are primarily considered major advantages, and the functionality of easily navigating through AI chatbots is also of major importance. It is worth mentioning here that 28% chose the option "all of the above," which basically emphasizes the comprehensive assistance offered by AI support during tax filings. This is evident because AI has the capacity to perform calculations automatically, with reduced errors, and assist taxpayers step by step.

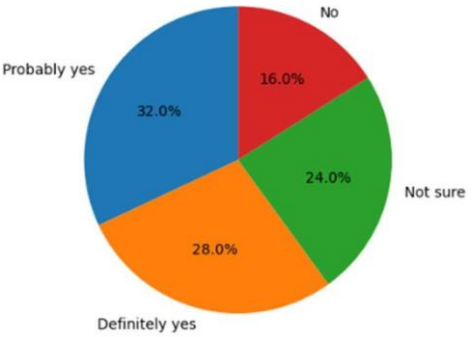
9. What is the major challenge in using technology-based tax systems?



Interpretation

The findings have revealed that the user is faced with various challenges while utilizing the technology-driven tax systems. Technical problems/bugs are experienced by a majority of the respondents, while the absence of awareness and the issue of data security are also important. A substantial number of the respondents selected the option "all of the above," thereby denoting that the aforementioned issues are interconnected. These stated concerns may deter the user from availing themselves of the technology-driven tax systems.

10.Would you prefer AI and blockchain-based tax systems in the future?



Interpretation

The analysis shows a positive attitude towards the future use of AI and blockchain-based tax systems. About 60% of respondents are willing to adopt these technologies, indicating strong acceptance potential. However, 24% remain unsure, and 16% are not willing, possibly due to trust or usability concerns. This suggests that while future adoption is promising, additional efforts are needed to build confidence among hesitant users. Improving awareness, system transparency, and ease of use can further enhance acceptance of advanced tax technologies.

Testing of Hypotheses

The study hypothesizes that the majority of taxpayers prefer online tax filing methods over manual filing. It is assumed that higher awareness of the AI-based tax platforms leads to increased usage of the AI tools in tax

filing. The study further hypothesizes that the use of AI significantly reduces errors and saves time in the tax filing process. It is also assumed that awareness about blockchain technology has a positive influence on trust in tax data security. Finally, this study hypothesizes that taxpayers have positive preferences toward adopting AI and blockchain-based tax systems in the future.

Review of literature

1. Rao (2020)

Rao (2020) analysed the implications experienced by taxpayers during the adoption process for digital tax filing services offered in developing nations. The case analysis indicated that a lack of digital literacy and internet access were the significant hurdles. Despite the assistance provided by calculations offered by AI, taxpayers lacked awareness regarding the capabilities offered by the system. The author highlighted that the digital divide is significant for citizens living in rural areas compared with those living in urban areas.

2. Anderson (2021)

Anderson (2021) examined upcoming trends in tax technology. The research forecasted a rise in AI, blockchain, and machine learning in taxation. Customized tax services and online tracing were projected as major innovations. Ethics in AI and the protection of sensitive information were emphasized in this research. The conclusion drawn by Anderson was that a more transparent and customer-friendly tax system would emerge as a result of technological advancements.

Research Methodology

The research method followed by the study is descriptive, as it helps break down the usage of modern technologies like Artificial Intelligence and Blockchain for making the process of tax filing simpler. The research will further concentrate on understanding awareness, adoption, perception, and problems associated with the use of technology-integrated tax systems. The business research method involves the usage of a structured questionnaire for gathering data, whereas secondary data has been obtained from research papers, journals, reports, as well as websites. The research method allows for the systematic interpretation of data. Graphs and percentages have been employed for data analysis.

Research Design

The research design for this research is descriptive, as the purpose of the research is to describe and analyse the status of AI technology and blockchain in the filing of taxes. The research does not entail controlling the variables for manipulation of the research. The research design was done in a structured questionnaire that aids in collecting data in a uniform manner. The research design for the research is applicable in determining the behaviour of users in the real world. The research also does not entail experimentation.

Sample Size

The sample size chosen in this study is composed of 50 respondents. The respondents include both employed and self-employed professionals and small business taxpayers who are conversant with the tax filing system. A sample size of 50 is sufficient and fair in this preliminary analysis within the constraints of this study. A

sample size of 50 is adequate and easy for data compilation as well as analysis using percentages. Despite this small sample size, quite a lot can be gathered about perceptions in relation to AI and Blockchain tax filing.

Sampling Technique

In this study, the selection of respondents is done on a convenience sampling basis. Under this technique, the respondents are selected based on their availability and willingness to respond to the survey. The convenience sampling technique is effective in exploratory and descriptive studies where rapid data collection is required. Convenience sampling saves time and cost when primary data is collected. However, for this study, the attempt has been made to involve respondents from different age groups and occupational backgrounds in order to secure variable opinion. This technique supports the study's objective of understanding general user perception towards technology-based tax filing systems.

Scope of the Study

The research work is limited in its scope to the examination of the use of Artificial Intelligence & Blockchain in making the taxation system simpler. The selected research work is on user awareness, adoption, benefits, and challenges associated with technology-based taxation. The research work is applicable for taxpayers using online taxation systems. The research work is limited in its scope to selected respondents. It does not cover the whole population. The research work does not involve the examination of technical details, as the focus is on user perception.

Limitations of the Study

1. The research only covers a sample size of 50 respondents, which may not be a good representation of the whole population.

2. The information gathered is based on opinions from respondents, which might not be objectively categorized.

3. Convenience sampling is employed in the study. There is a possibility of bias in convenience samples.

4. Time and resources allowed only very basic analysis and no statistically rigorous testing.

5. The research concentrates only on technology related to artificial intelligence and blockchain without including other new forms of technology in taxation.

Data Analysis and Interpretation

The collected data on the structured questionnaire was processed by using some simple statistical methods such as percentage analysis. The result obtained from 50 respondents was classified, tabulated, and then processed in a systematic manner in order to derive some information about the usage, understanding, and perception of Artificial Intelligence & Blockchain in the taxation return filing system. For better understanding and comprehension of the research findings, the processed data has been represented in the form of graphs & charts, mostly pie-chart & bar diagram. These graphs & charts are efficient in understanding the responses & comparisons. There is an explanation of every graph in a manner that remains quite effective

in deriving some efficient conclusions for the research. The graphs & charts assist in making the research findings accurate, catchy, & quite comprehensible.

Findings of the Study

1. The conclusion from the survey is that the majority of respondents prefer online tax filing methods to manual filing. This suggests that, because of convenience and time-saving, there is growing use of digital platforms. Tax consultants are still highly relied upon by a certain segment of users. Manual filing is decreasing gradually.

2. Awareness of AI-based tax filing platforms stands at a moderate level, where, though many of the respondents have heard about AI tools, only a few of them are fully aware of its features. This shows information on AI in taxation has not reached all users. The awareness programs will help improve the adoption.

3. Applications of AI tools, including chatbots and auto-calculation features, however, are at relatively low levels. The large majority of the respondents have never used, or have used only seldom, AI-based applications while filing their taxes. This reflects a gap between awareness and actual use. Proper guidance may increase the levels of usage.

4. The majority of respondents believe that AI helps in reducing errors in tax filing, and they feel that the use of automated calculations and validations improves accuracy. This infuses a very positive perception into the minds of people by instilling trust in this technology. This encourages further integration of AI into the tax systems.

5. The awareness is relatively lower with respect to blockchain technology than it was with AI. The majority of the participants in this survey are either somewhat aware or not aware of any blockchain applications in filing their taxes. This suggests a general lack of exposure to blockchain technologies. Simplified explanations improve understanding.

Suggestions / Recommendations

1. The concerned taxation departments as well as technology solution providers must work on creating an awareness campaign for educating taxpayers on the benefits of implementing Artificial Intelligence and blockchain technology in taxation filing solutions. There could be an improvement in user confidence because of the enhanced knowledge.

2. Online tax filing websites also need to become more friendly and user-friendly, with less complex interfaces and instructions, to help people with limited technical knowledge.

3. Functions like chatbots or auto-calc in the use of AI technology need to be developed to give accurate and timely assistance so as to minimise reliance on tax consultants.

4. Strict data security and transparent data privacy policies should be adopted in an endeavour to increase trust in user data, especially in respect to blockchain systems.

5. “It is important to guarantee the maintenance of digital tax platforms by providing regular technical assistance. This will help keep the number of technology-related mistakes to a minimum, thus enhancing the functionality of the digital tax platforms."”

6. Training sessions or demo tutorials should be conducted by both government and private platforms in order to promote the usage of AI-powered tax filing solutions.

Conclusion

Based on the conclusion, the application and implementation of Artificial Intelligence and Blockchain in tax filing procedures hold great potential to simplify tax filing, eliminate errors, and ensure taxpayer data security. Findings from this study make it evident that most taxpayers support online tax filing software and understand the benefits that can be achieved using AI applications like calculative values and instant assistance. The use of Blockchain has also been appreciated because of its role in ensuring transparency and creating tamper-proof records, though awareness about this innovation remains low. Based on this study, a lack of prior knowledge, ease, and security concerns make it a challenge to fully utilize these applications. Another conclusion from this study shows that though awareness about these applications exists, their utilization has not reached the required levels among taxpayers.

Declaration of Conflicting Interests

The authors declare no potential conflicts of interest with respect to the research, authorship and publication of this article.

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