TaxMate-An AI-Powered Application for Simplified Tax Awareness and Salary-Based Tax Calculation

[1]Mohammad Abdul Sami, [2]Moqaddas Shahreen, [3]Madanu Rajesh kumar, [4]Lahari Madabattula, [5]Araveti Vineela

[12345]Department of Artificial Intelligence and Machine Learning
[12345]Malla Reddy University, Hyderabad, India
[1]masami736768@gmail.com, [2]moqaddasshahreen@gmail.com, [3]madanurajeshkumar@gmail.com, [4]Lahariprasad2111@gmail.com, [5]vineela01@gmail.com

***Abstract*—Tax consciousness and correct taxes estimation are necessary facets of financial planning to individuals especially the employees who are on payroll who need to abide by the rules of government taxes. But, due to the complexity of tax slabs, deductions, exemption and changing tax policies continuously some individuals are unable to follow the tax rules and determine the amount payable as taxes. The conventional ways of finding taxes, in general, contain manual computations or reliance on tax professionals that can be time consuming, costly and are liable to errors by humans. In order to overcome these problems, this project is going to suggest an AI-Powered Application of the simplified tax awareness and salary-based tax calculation. With the assistance of this system, there is an intelligent platform in which the user can key in the salary information, deductions, and financial information and with the help of it, he/she is supplied with an estimate of tax liability subject to the relevant tax regulations. The app combines the power of artificial intelligence with the ability to explain everything clearly, and an offer on how to save more money on taxes and automatic calculations. The system receives user input at the backend and implement slab tax algorithms, that are displayed at the front end. The proposed system will make tax awareness and dependency on manual means less critical as it will simplify the calculation of tax and increase access to financial information. The application will further enhance financial literacy in people as it will show the tax elements in a well-organized and accessible way.**

***Index Terms*—Artificial Intelligence, Tax Awareness, Tax Calculation based on salary, Financial Literacy, Automated Tax Estimation.**

I. Introduction

1. Problem Definition

Governments are highly reliant on taxation as a means of revenue and it is also vital to the development of the economy of a country. Nevertheless, most of these people have complications with the interpretation of the tax laws, and the ability to calculate their taxes correctly. Most taxpayers are confused with the calculations of the tax due to the complex nature of tax rules, several tax slabs, deductions, exemptions and changes in the policies.

Salaried workers are also known to have problems with the calculation of their tax since they lack knowledge on tax deductions and tax regulations which are available. The conventional tax computing procedures call on one to slice the tax brackets by hand on their earnings that can be tedious and subject to mistake. There are numerous people hired by tax advisors or financial consultants, and this makes tax estimation more expensive and demanding.

The other difficulty is non-user friendly platforms to make people perceive the concept of taxation in simplified form. There are numerous online tax materials that cannot be easily understood by use of technical jargon and complicated financial description. Consequently, taxpayers are not in a position to make good use of existing deductions and exemptions.

The suggested system will solve this issue by applying a tax calculation engine as a rule-based calculator based on official government tax rules instead of basing it on machine learning datasets.

To tackle the challenges, a smart and computerized system will be necessary which will not only facilitate calculation of taxes but also to educate people on the topic of taxes.

2. Objectives of the Project

The primary goal of the project is to create an AI-based application that will ease the process of tax awareness and calculating taxes based on the salary.

The particular health goals can be divided into:

- To develop a system that will enable entry of the salary details and the calculation of the tax automatically in the system.
- To ease tax calculation through the use of preset tax slab regulations.
- To give a clear break down on the tax payable, deductions and taxable income.
- To enhance financial awareness by users on taxation.
- In order to create a web interface that is easy to interact with.

3. Limitations of the Project

- The system might fail to cover all tax regulations of any country.
- Constant changes in tax policies can necessitate changes in the system.
- The application targets primarily those that are earning salaries.
- The current version does not have such advanced features of financial planning.

II. RELATED WORK

The growth of the complexity of taxing systems has promoted the emergence of digital technologies and intelligent platforms that help people learn more about the different tax regulations and calculate their taxes. Numerous automated networks, financial guidance platforms, and other artificial intelligence-based strategies have been suggested by researchers and creators to make the calculation of taxes effeasible and enhance the tax consciousness of people.

The initial effort in this field was drawn toward the creation of the rule-based tax calculators which utilize pre-coded tax regulations and tax slabs to calculate the tax liability. The user is able to provide income information, deductions, and exemptions through such systems and software used to compute all applicable tax rules and the amount of tax that one is expected to pay. The use of such platforms will save much manual work and will drastically minimize a couple of calculation error as compared to the conventional manual computation of taxes. Nevertheless, most of these systems are restricted with simple estimation of taxes and do not give the detailed information on tax-savings plans or on some financial planning opportunities [1].

As artificial intelligence and financial technology (FinTech) proceed, researchers have suggested applying intelligent decision-support systems to financial administration and tax obligation. Financial data can be analyzed using AI-based platforms that may find various trends and give personal financial advice. Such systems combine technologies: natural language processing, machine learning, conversational interfaces, and so forth to help users in simplified way of comprehending complex financial information. It has been revealed that AI-based financial advisory tools can be very beneficial in engaging users and accuracy in decision-making during financial planning [2], [3].

Another significant trend in this sphere is chatbots and conversational AI applications in the financial services. Financial chatbots provide customers to converse with the systems, and use natural language queries so that they get immediate answers to queries on tax laws, deductions and financial consultation. The studies of the financial service chatbots revealed that the systems are capable of assisting the users in gathering information about finances and enhancing financial literacy. Conversational systems have been built using deep learning and delivery automated answers to financial questions and help users comprehend tax and investment advice [4], [8].

The implementation of AI in improving the tax compliance process and the tax administration process has also been examined in several studies. Reportedly, as per digital transformation adoption in tax administration, artificial intelligence has the potential to assist the governments and organisations in enhancing the effectiveness of tax systems in automating tax system, identifying tax fraud, and extracting crucial insights concerning vast amounts of financial data. The technologies are capable of supporting not only taxpayers but also tax authorities as these technologies can streamline the information related to taxes and create more transparent financial services [6], [7].

Moreover, recent polls of large language models and the potentially applicable AI usage in the financial sector indicate the increasing significance of intelligent systems in the financial analysis, decision support, and automated advisory services. The technologies allow the systems to handle the intricate financial data and offer insights that aid users to make informed financial choices [5], [9], [10].

Although AI-based financial systems have advanced, most of the current tax calculation tools continue to be limited to flaws like adverse user interfaces, opportunity to lack transparency in their calculations, and lack of user-related education resources. In most instances, the users are simply provided with the net sum of the taxes, without knowing how the respective calculation was carried out, and the deductions envelope, which used to be applied.

In response to these shortcomings, the suggested system aims at the creation of a simplified tax awareness and incorporating a salary-based calculator of taxes that will combine both rule-based tax calculation and easy to understand explanations and financial understandings. The system will improve financial literacy and ensure that the accurate tax estimation is performed by providing clear and understandable results using the official tax slabs based on the concept of the structured rule engine.

III. PROPOSED METHODOLOGY

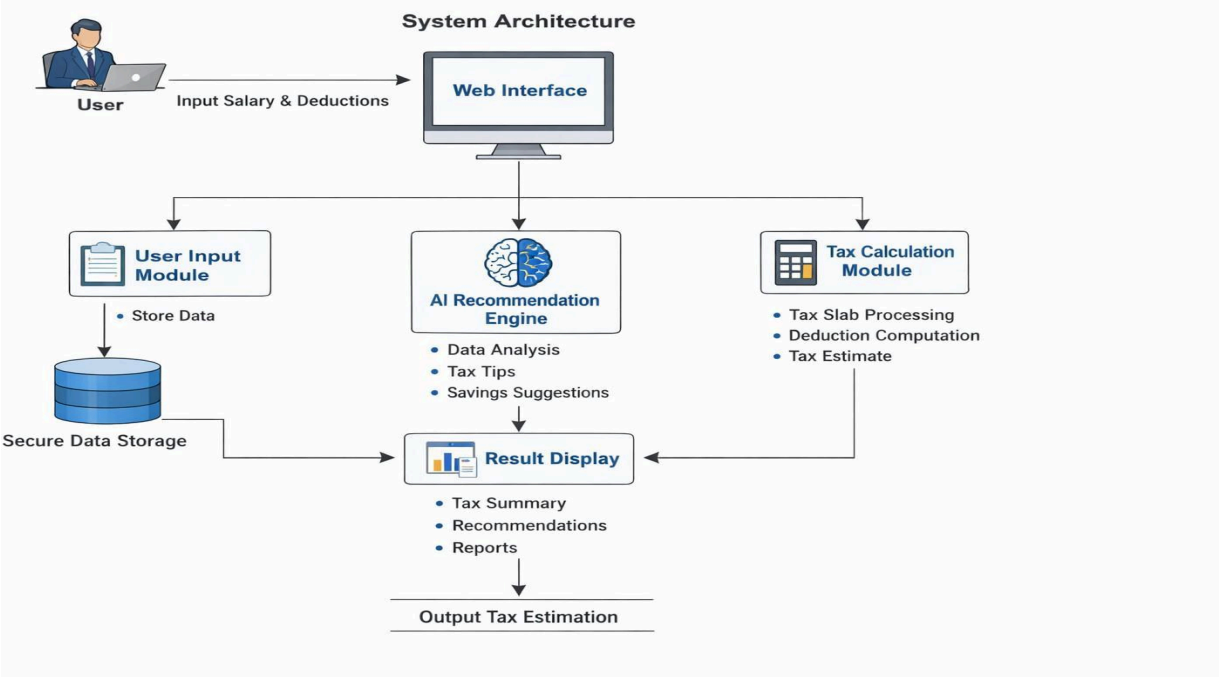


Fig 1: System Architecture

1. User Registration and Authentication Module.

Users can create an account and have safe access to the system with the help of this module. It captures unprotected data like user login details like user name, password, email and user details. Authors allow other users limited access to their financial information.

The functions of this module include:

- User account creation
- Https: Have a secure login and authentication.
- User profile management
- Protection of data security and privacy.

This module will make sure the data of the users are kept safely and will not be accessed by any other person unless he or she has the relevant authority.

2. User Input Module

The User Input Module gathers the financial data of the user needed in calculating the taxes. The user will key in the information that includes annual salary, bonuses, deductions and investments. Input parameters include:

- Annual salary
- Allowances and bonuses
- Standard deductions
- Investment deductions
- Insurance and home mortgage information.

This module authenticates data entered and passes it to calculation of tax module further processing.

3. **Tax Calculation Module**

The Tax Calculation Module executes the calculation of the system. It takes the input data and processes it to arrive at the rules of the tax slab against which the total tax is to be paid.
Activities undertaken by this module include:

- Sum total earnings every year.
- Less deductions and exemptions allowed.
- Determine taxable income.
- Tax the taxable income using the rates of tax slabs.
- Calculate the sum of tax to be paid.

This module will guarantee good estimates of tax by automatically enforcing preset tax rules.

4. **Data Acquisition Module**

The system suggested is not based on the use of a conventional dataset to train or make predictions. Rather it uses an engine based on rule computing logic that is based on governmental tax regulations. The official portal of the Income Tax Department of India and government publications on taxation were used to gather tax slabs, deductions, exemptions, and other taxation rules [15].

These tax rules were reviewed and transformed into organised conditional logic in the system. The rule engine will automatically consider the inputs entered by the user, including annual salary, deductions, and investments and implement the relevant taxable slab rules to compute the taxable income as well as the computed tax.

The rule-based system can be easily updated to reflect any modification in tax policies, as such changes can only be made by updating the variables of interest in the tax slab and the rules governing the deductions without having to retrain any machine learning models.

5. **AI Recommendation Module**

The smart AI Recommendation Module examine the finances of the user and will give smart recommendations on how to optimize the taxes. It assists users in determining the available tax-saving opportunities as well as bettering their financial planning.

Key functions include:

- Deduction usage analysis.
- Recommendation of investment choices.
- Recognition of opportunities of tax saving.
- Individual financial recommendations.

This module fosters the personal knowledge of taxation of the user and promotes superior financial decisions.

6. **Data Storage Module**

The Data Storage Module handles storage of user information, tax information and system information. It gives care to the fact that fiscal information is kept safe and can be accessed at the appropriate time.

Functions include:

- Secure database storage
- Calculations Data Retrieval.
- Tax report and result storage.

- Data backup and management

Through this module the integrity and confidentiality of the user's financial information is ensured.

7. Result Display Module

Result Display Module gives a clear and understandable format to the end user of the system. It presents the detailed information on calculation of tax process and gives a summary of the findings.

Outputs displayed include:

- Taxable income
- Total tax payable
- Deduction summary
- Tax-saving recommendations based on AI.
- Tax reports and summaries

To facilitate understanding of the results, the results are presented in a graph and tabular format as well as summaries.

100	1.6	96
200	2.4	95
500	3.9	93

IV. EXPERIMENTAL RESULTS

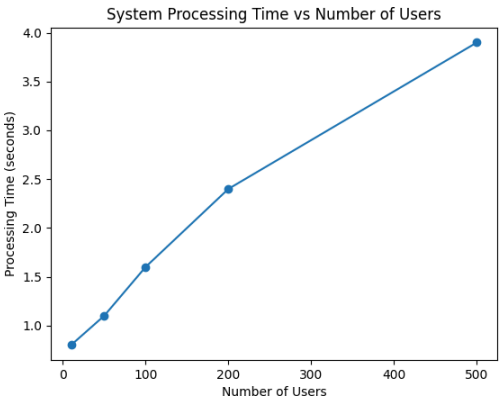
Experimental test of the suggested tax awareness and salary-based calculation of taxation system was conducted to test the accuracy, efficiency, and utility of the rule-based calculation engine of taxation. The system has not been based on any machine learning data thus the assessment was done by feeding to the system some simulated user inputs, various salary ranges, and deduction scenarios.

The system uses predetermined government tax slabs regulation and deduction regulations to calculate the taxable income and the overall tax due. Several test cases were run with alteration of parameters on annual salary, standard deductions, investment deductions, and insurance contributions. The calculations of the results were also checked with the manual calculation of the taxes applying to the official tax rules to identify whether the results were correct.

The experiments proved that the system is correct in calculating tax and giving comprehensible tax distributions such as taxable income, allowances, and all payments of taxes to be paid to the government. The automated method greatly saves time that should have been taken to estimate the tax rate using the manual calculation technique.

In order to measure the performance of a system, user requests ranging in numbers were simulated and the time it took to reply to those requests was recorded. Viewing the results, the system is highly efficient with low response time even in cases when there are several user requests.

Table 1:System Performance An

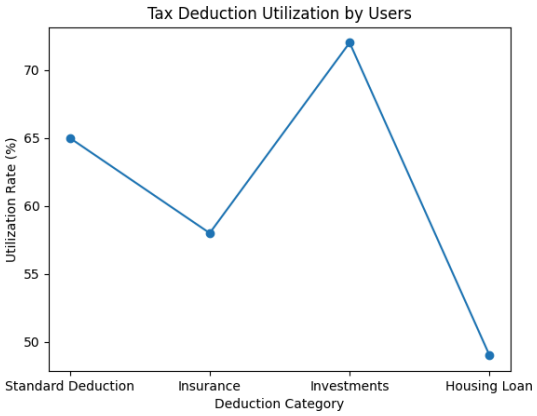


Deduction Type	Users Utilizing (%)
Standard Deduction	65
Health Insurance	58
Investment Schemes	72
Housing Loan	49

Fig 1:System Processing Time vs Number of Users

Table 2:Tax Deduction Utilizatio

Number of Users	Processing Time (seconds)	System Efficiency (%)
10	0.8	98
50	1.1	97



V. CONCLUSION

In this article, another AI-enabled solution to facilitate easier tax awareness and calculation of tax based on the salary was created, which allows people to learn and approximate their tax payment in an effective way. The proposed system is a comprehensive system that incorporates an engine, with rule based tax computation, which will use official tax slab regulations and deduction policies to compute automatically the rule based tax payable under specified circumstances that the user has provided. The system helps in giving the user a clear picture of the taxable income, deductions, and the resultant tax liability by enabling the user to input his or her annual salary, deductions, and investments.

In contrast to the traditional manual methods of tax calculation, the proposed application can make the process of taxation simpler as it allows automating the application of the tax rules and providing the results in the structured and easily comprehensible format. The system will also enhance financial awareness by clarifying the element of taxes and pointing out any deductions made available and possible savings on tax. The experimental analysis has shown that the system can make precise estimates of the tax with minimal processing time and high efficiency even when multiple user requests are being attended to. Comprehensively speaking, the proposed solution makes more financial information more accessible, minimizes the possibility of making mistakes in calculations, and helps people make better financial decisions regarding taxation.

Future Scope

Despite the fact the system proposed is an efficient and user-friendly solution to calculation of the taxes based on salary, a number of enhancements can be made in the future to have better capabilities. The inclusion of real-time updates of tax laws according to public government websites could be one of the potential improvements that would ensure the system automatically follows the policy changes. There is also an option of expanding the application to guarantee various income classes such as business income, capital gains, and other types of revenue than salaried income.

The further development of the system can also be based on the innovative methods of artificial intelligence, including machine-learning models and natural language processing, to make tax planning recommendations more personalized and engage the financial guidance. Connection with the conversational AI chatbots would enable users to pose questions about the taxes and be provided with the answer and the rest (natural language response) immediately.

The other valuable improvement would be the creation of mobile application and cloud based implementation where users can have access to tax calculation and financial advisory services 24 hours and using any device. Moreover, the system might be connected to the financial management

applications and digital banking solutions to offer a more holistic individual finance and tax planning ecosystem. These enhancements would make the system smarter, easier to scale and address the needs of a wider audience in the management of their taxation and financial planning issues.

References

[1] Tax Intelligent Decision-Making Language Model https://www.researchgate.net/publication/381755155_Tax_intelligent_Decisionmaking_Language_Model

[2] AI-Powered Decision Support Systems for Enhancing Tax Compliance https://papers.ssrn.com/sol3/Delivery.cfm?abstractid= 5281689

[3] The Impact of Artificial Intelligence on Tax Compliance and Reporting https://www.ijmsrt.com/storages/download-paper/IJ MSRT24NOV024

[4] A Financial Service Chatbot Based on Deep Bidirectional Transformers https://arxiv.org/abs/2003.0498

[5] A Survey of Large Language Models for Financial Applications https://ora.ox.ac.uk/objects/uuid:ae41ce77-4c07-4b88-a4de-cfb6bc6331b5

[6] Artificial Intelligence in Tax Administration (OECD Report) https://www.oecd.org/tax/forum-on-tax-administratio n/artificial-intelligence-tax-administration.pdf

[7] Digital Transformation in Tax Administration https://www.oecd.org/tax/forum-on-tax-administratio n/digital-transformation-tax-administration.pdf

[8] Natural Language Processing for Financial Applications https://arxiv.org/abs/2006.08097

[9] Financial Question Answering Using Deep Learning https://arxiv.org/abs/2101.08076

[10] AI and Machine Learning in Financial Technology https://arxiv.org/abs/2107.09084

[11] Conversational AI in Financial Services https://arxiv.org/abs/2104.03442

[12] FinTech Applications in Personal Finance Management https://www.sciencedirect.com/science/article/pii/S24 05918819300421

[13] Artificial Intelligence for Financial Decision Support Systems https://arxiv.org/abs/1904.02464

[14] Future of Tax Administration – Deloitte Insights https://www2.deloitte.com/us/en/insights/industry/pu blic-sector/future-of-tax-administration.html

[15] Income Tax Department of India – Official Portal https://www.incometax.gov.in/iec/foportal