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MoneyWise: A Bilingual Platform for e-Rupee Literacy

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***Abstract*— Financial literacy is one of the most common faced by the people who are not exposed to the digital payments. To educate people about e-Rupee this platform comes in handy, which was introduced by the RBI in 2022, but still some people are not aware of the advancements. This application provides the user a safe practice environment that firstly, helps the user choose their preferred language and accordingly explore and learn use of e-Rupee through modular learning, payment simulator and test their learnings by a quiz. The modules consist of introduction to e-Rupee, how does e-Rupee work, benefits of e-Rupee, Security and Privacy, etc. By playing a quiz the user gets to know how much have they understood in an interactive manner. Next we have our AI chat assistant which answers the user's doubts in both languages. With the help of simulations, the user can practice how to send money with either the scanning QR code or by directly clicking on send money.**
After performing these activities, if the user wants to check their progress they can click on the profile section to check their points and badges as rewards and the loop continues. MoneyWise is basically a combination of fintech and interactive way of learning. This way people new to banking technology and the upcoming generation can learn about digital payments. This is more of an advantage for people living in rural areas and the children because e-Rupee lets you pay directly from your wallet, linking a banking account in this is not needed. Learning about the advancements in the financial domain is necessary as it makes payments more easier and through digital payments the corruption gets decreased since we have proof of payments being done.

***Keywords*— Bilingual Toggle, Central Bank Digital Currency (CBDC), e-Rupee, Financial Literacy Simulator, Web development.**

I. INTRODUCTION

With the introduction of the Digital Rupee (e-Rupee by the Reserve Bank Of India(RBI), the nation is transitioning towards a tokenized economy and changing how we manage money. Although efficiency is promised, it even causes division. This shift scares a lot of users, mainly those from non-technical backgrounds and people living in rural areas.
Most of the financial literacy methods are passive and require the user to watch lengthy videos about the topic or read an article. MoneyWise makes learning interesting with the help of the latest features.
MoneyWise helps learn how to use e-rupee in day-to-day lives. The idea of “learning by doing” is the core of MoneyWise.

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- We developed a web application that functions with virtual play money and imitates the user interface of actual e-Rupee payment apps. With the help of this app, the fear of transaction failures goes away with time. MoneyWise boosts the user's confidence by integrating features like simulation, AI chatbot, structured learning modules and quizzes, which turn a difficult financial concept into a daily skill that is easy to grasp.
- It provides a simulated environment where users can create fake QR codes to help them adapt to the latest financial features, without any real-world financial risk, compared to the traditional banking methods. For users to not face any language barrier, we have added a smooth bilingual switch Hindi/ English as per their need and an AI – chat bot which helps the user to breakdown the financial terms into understandable terms.
- This paper describes Money Wise's design and user focused idea. It makes sense that in order to truly understand financial inclusion, we need to provide tools that puts the users confidence ahead of the technical capability. MoneyWise shows the way modern technology can be used to simplify the e-Rupee, ensuring all citizens, regardless of technical ability can access digital economy.

II. LITERATURE REVIEW

- The base of any successful fintech application is the smooth and efficient user experience. As far as seen, the mobile banking apps need to focus on the simplicity, structure and the ease of understanding for the user to ensure the user is satisfied with the design and working of the application [1]. Apps that have personal dashboards, notification system and feedback options have seen major growth in their applications as they provide personalized experience to the user [2].For applications like MoneyWise, that give an option to learn financial technologies, it is very important that the structure and navigation should be easy to understand. Financial technology is already very complicated, so the an app like MoneyWise should simplify the learning process for the users. MoneyWise was designed with a minimal interface. The homepage gives users just 3 options- learn, quiz or simulate so there is no confusion from where to start. Someone opening a financial app for the first time should not have to figure out the interface before they get to the content.
- When its comes to usability which is important, accessibility is the measure of whether a financial tool is able to provide a range of users what they need. A study on evaluating digital payment system shows that users who are visually impaired face certain limitations, including lack of proper vision for screen readers and difficulty in understanding the graphical content [3], [4]. Excluding that language accessibility is also an important aspect which should be taken in consideration for financial inclusion for each and every user. A study by Bhatia and Khetrapaul (2025) implies that non-English speaking users, majorly the ones living in multilingual states, find it difficult to use digital banking systems because of trust issues as they are not much educated about it. The AI-based bilingual assistant includes features such as real-time translation, intent-based functionality providing languages like English, Hindi and Hinglish speaking users [5].MoneyWise solves this language barrier issue with a bilingual toggle that switches the entire app between English and Hindi according to the users choice including all the features, so the user doesn't face any issue in learning. The switch is instant and can be changed at any point without losing any progress.
- One of the most critical issues in the digital finance world today is "privacy". Nowadays, a new way known as Federated Learning (FL) has gained a lot of value because it is the probable solution for the protection of the user's data by storing it only on local devices instead of a central server. As Wang et al. pointed out in 2024 that one of the major drawback of this way is poor-quality of data from the users can affect the performance of the model. To address this issue, the PPFL-LQDP way was found to include a distributed Paillier encryption way as well as evaluation of composite data which prevents any likely data attack while flitering the bad quality data from the users model [6].Also, there are some rules that deal with the issue of privacy protection, for example the General Data Protection Regulation(GDPR). Nevertheless, according to Dorfleitner et al.(2023), despite its good intentions, the implementation of the GDPR rule in FinTech industry led to longer and more complex forms of privacy policies. Rather than increasing transparency, various organizations turned to standardized wording which decreased the level of readability as well as user understanding [7]. MoneyWise understands the importance of privacy, especially financial matters. MoneyWise actually teaches users through simulator to set a PIN before making a transaction, and if the entered pin is wrong, the user can reset it.
- In addition to this, digital financial tools can only be effective when they are used by people who know how to interpret and act on the given information which is provided. Research implies that socio-economic groups, levels of education, and financial literacy play an important role in digital financial engagement [1], [2]. Users who are financially unaware may find difficulty in working with complex dashboards and

analytics. This is exactly why MoneyWise avoids complex dashboards. Every module is written in simple language. The focus is always to keep the features as simple and conventional for the users for a better learning.

- Sustaining user engagement is another common issue faced by fintech and digital learning platforms. In gamification in e-learning environments, Khaldi et al. (2023) conducted a systematic review and came on a conclusion that, "Points, Badges and Leaderboards" are used a lot. It is also said that they are not effective if not supported by psychological theories such as "Self-Determination Theory" [8]. In MoneyWise, badges and points are only given when the user actually completes a module, quiz or a simulated transaction. The idea was to make this learning app interactive and useful.
- Looking at the existing systems, it is clear that most tools only address only one or two of these problems. Whereas, MoneyWise was designed to bring them all together- language supports, interactive learning, safe practice and gamification- all in one platform that works for users regardless of their background, language or level of comfort with technology.

III. METHODOLOGY

This is the first interface of the application when the user starts the application

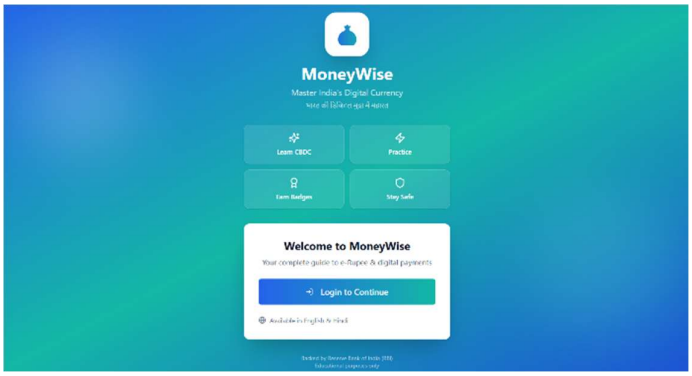

Figure 1. Interface of MoneyWise

A. Frontend Framework

React.js was used to build this app. This makes the application easy to work and it runs smoothly. The app is lightweight and it can even work on normal phones.

B. Navigation and Flow

The React Router DOM helps in navigation between different pages. The React Router DOM helps the users to use the modules, quizzes, simulation and other features easily. When the user opens that app they select the language first Hindi or English. Users can choose which feature they want to use first learning modules, AI chat assistant, quiz, payment simulator. After the user completes one activity, the dashboard is updated.
Figure 1.1 describes the working flow of application..

C. System Design

So our main users are mostly the people with slower internet, so most of our main features work directly on the frontend. The user's progress which is shown on the dashboard which has the streaks, badges, points are saved in the localStorage. That means the app doesn't need a very strong login system. The main features through which the user learns are: modules which the user can read and understand, quiz acts as a test by which the user gets to know how much it has understood, payment simulator to practice how payments are done. The dashboard updates this all features as the user completes them with time. Every component is built separately in React and React Router DOM manages their navigation between pages.

D. Visual Feedback

We have used Framer Motion for animations, this helps the make the app for interactive and attractive for the user to use it, it can be seen when the user tries its first simulated payment or quiz, the animation comes on the screen from the badge it is then flashed on the dashboard. It acts as a reward system

E. Bilingual Toggle

When the user logins then on the home page there is a button where the user can choose which language they want to learn in English or Hindi. So that learning is made easy for everyone we have used this feature and all the features will be available in the language the user chooses. When the user chooses a language it gets saved in a global state via context API which is given by React this why it is available for all the features.

F. AI Chat Assistant

The AI Chat Assistant is connected to a large language model through an API. Whenever the user types a question, it gets sent to the model along with instructions telling it to only talk about e-Rupee and digital finance topics, in simple language, and in whichever language the user has chosen. The reply shows up right there in the chat. This gives users a private space to ask anything without feeling embarrassed, especially if it is something basic they feel they 'should already know."

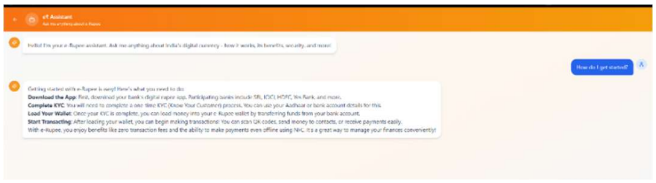

Figure 2. This image displays the chat assistant answering the question

G. Payment Simulator

The simulator gives the user a virtual wallet with a set starting balance. They can either create a QR code for a certain amount or scan one to "pay". Once they scan and confirm, they enter a PIN, and if its correct, the amount gets deducted from their balance, a success animation plays, and the transaction gets saved. If the PIN is entered wrong, the error message is displayed and the PIN is supposed to be reset. No real money is involved anywhere in this process. It is a dummy simulator for teaching the user how to use it. In the background, the simulator gives the user a virtual wallet with a preset starting balance. QR codes are generated dynamically using a QR code library based on the amount entered. Once scanned, the user enters a PIN to confirm the payment and it works if the PIN is correct. This was a deliberate design choice since in real life, three wrong PIN attempts can lock a person out of payments for almost 24 hours, and we wanted users to feel that same sense of caution here, just without the real-world risk. Since you can be locked out of your account for almost 24 hours after three failed PIN entries, we tried to make the same scene here so user learns what all problems it can face while making a real transaction.

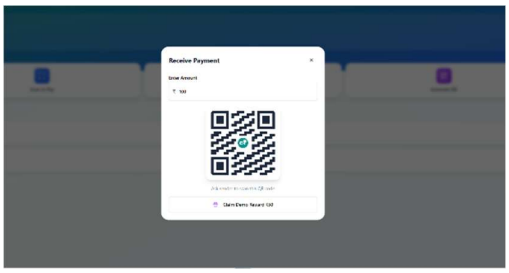

Figure 3. User creates a e-Rupee QR Code

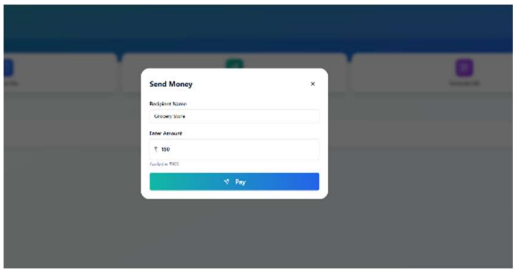

Figure 4. App confirms payment as successful

H. Gamification System

Gamification was designed into MoneyWise incentivizing true interaction and not just superficial interaction. Points awarded for interactions were based on a set number system with a certain point value assigned for completing each course, a different point value for passing the quiz, and an established number of points for completing a simulated transaction. Points earned are accumulated in the user's profile and are visible on their dashboard along with graphical representations of their total points earned. Users earn badges by achieving certain predefined milestones. Each of these badges has a name and a small animation that will play for the user when they first achieve that particular milestone. The streak meter records consecutive day(s) of activity and will be displayed continuously on the user's dashboard.

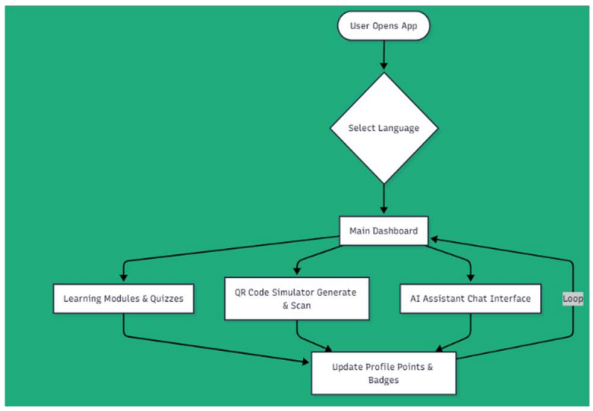

Figure 5. Flowchart of MoneyWise

The diagram in figure 1.4 demonstrates how a user will navigate through this app. A user will begin by selecting either Hindi or English as their preferred language for all subsequent screens. Once a language is selected, the user will land on a dashboard from where they can perform any one of three activities: access modules, chat with an AI Chat Assistant or take a quiz. The user can complete these activities in any order. When a user completes any activity, they will automatically return to their dashboard, and their points, badges and streaks will have been updated according to the activity just completed. The user can then select another activity to complete, and they can continue to do so in a loop for all future use of this app. Instead of having to complete each activity in a specific, linear order, MoneyWise allows a user to move freely through the app while continuously tracking the user's progress through the background.

IV. Implementation

A. Quiz Score Calculation

Quiz Score (%) = (Correct Answers / Total Questions) × 100
Quiz Performance is determined by the number of correct responses given in a quiz.
The percentage score, is calculated by dividing the number of correct responses by the total number of questions to determine how many total questions have been answered correctly; then multiplying that result by 100.
The result of the above equation becomes the user's percentage score, which is displayed immediately after they complete the quiz. It is shown on a feedback screen, where it also highlights any incorrect responses and the rationale for why those responses are incorrect. This provides an opportunity for users to learn from their attempts at each quiz section, regardless of the percentage of the score that they received.
Users with scores lower than seventy percent will receive encouragement to return to the learning module for additional review, prior to retaking the quiz.

B. Module Completion Percentage

Module Completion (%) = (Completed Modules / Total Modules) × 100
The completion percentage for a learning process is calculated as follows:
A user will have completed a module once they have gone through all content in the module. The progress of the user through the modules completed over the total number of modules that will be counted towards this completion will be reported as a percentage, in relation to the total modules completed.
The completion percentage is displayed to the user via the progress bar in their dashboard. The user experience will benefit from seeing small increments in the completion percentage, as they provide a sense of progress for any user who is learning something new and is unfamiliar with how to learn it.

C. Wallet Balance Calculation (Simulator)

Updated Balance = Previous Balance – Transaction Amount
The simulated transaction updates your wallet balance real time
All users begin with the same amount of virtual money in their wallet. After every transaction, the amount of money in your wallet will be updated according to this formula, just like it would in the real world. Over time, a user will develop an understanding of how their wallet balance changes every time they pay someone.

D. Transaction Calculation

Count of all transactions, i.e., total transactions from end-user perspective.
Count of All Transactions = n
Where:
N = number of transactions completed.
The transaction count or transaction count increases after each end-user completes a complete transaction. It is listed as a single statistic on a user's profile. Seeing a cumulative increase of transaction count provides evidence to end-users as to how much they have practiced leading to building confidence.

E. Streak Calculation

The daily learning streak is determined from continuous days of activity.
Streak Days = Number of consecutive active days
To determine a user's daily learning streak, today's date is compared to the last date of stored activity from localStorage. If one day has elapsed since last recorded activity, then the daily learning streak will increase by one; if not, the daily learning streak resets. This feature aims to create regular habits to increase the likelihood of truly learning something new by coming back regularly.

F. Expense Percentage (Category-wise Analysis)

$$E\% = (E_{category} / I_{total}) \text{ X } 100$$

As customers perform more transactions, their expenditures become increasingly divided into various categories of activities (like buying groceries or using public transportation). This formula calculates the proportion of total simulated expenditure assigned to each activity category, with the results being represented in simple charts. Further illustrating the concept of expense tracking through a tactile approach is this charting option.

G. Points Calculation

Total Points (TP) = $\sum Pi$
Where:
Pi = Points earned from each activity
The total points earned through user activities such as quiz, module, and activity completion, Build over time, and are shown on profile with associated badges, giving a single number assigned to user to show the amount of usage and engagement with the platform.
Points are earned for each one of the three categories of activity: module, quiz, and transaction, and have their own associated value.

V. Results and Discussions

The MoneyWise testing was directed toward primary elements, learning modules, quizzes, AI Chat Assistant, Payment Simulator, Dashboard and Privacy Centre. A key part of this testing was determining how well each feature functioned by observing if they aided users in understanding and practicing e-Rupee simulated transactions.User responses, task completion, feature accuracy and average response time were considered during testing process.

A. Feature Performance

TABLE I: SHOWS THE OVERALL PERFORMANCE OF MAJOR FEATURES

Module/Feature	Success Rate (%)	Average Response Time (s)
Learning Modules	96	0.8
Quiz System	94	0.6
AI Chat Assistant	91	1.5
Payment Simulator	98	1.2
Dashboard and Progress Tracking	97	0.7

The payment simulator achieved the highest success rate of 98%, followed by the dashboard and learning modules. The AI Chat Assistant took slightly more time because it had to process user questions and respond in selected language. It answered common e-Rupee questions well, but some technical questions received general responses. The dashboard and progress-tracking feature achieved a success rate of 97%, while the learning modules achieved 96%.

B. User Testing and Feature Validation

User testing was conducted to check whether participants could independently complete the main activities on MoneyWise. The results are presented in Table 2

TABLE II

Activity	Total users tested	Successful Completions	Success Rate (%)
Module completion	50	48	96
Quiz attempt	50	47	94
QR payment simulation	50	49	98
AI chat interaction	50	46	92
PIN setup and verification	50	48	96

Table 2 shows that 49 out of 50 users successfully completed the QR- payment simulation, giving it the highest success rate of 98%. Module completion and PIN setup both achieved a success rate of 96%, while 47 users successful attempted the quiz.

The AI Chat Assistant achieved a success rate of 92%. Most users received useful answers, but a few technical or unclear questions were not answered precisely. Overall, the results show that most users could understand and the use the application without requiring outside help.

C. Gamification and Dashboard

MoneyWise gamification with a dashboard to make the learning process more engaging and easier to follow. Users receive points for correct quiz answers, unlock badges after completing topics, maintain learning streaks, and view their overall progress through dashboard. Figure 1.5 shows the quiz section, where users can test their understanding after completing a quiz. Figure 1.6 shows the dashboard, which displays quiz points, completed modules, progress percentage, and learning streaks in one place. During testing, the dashboard helped users clearly understand how much content they had completed and what was still remaining. However, interest reduced after all available badges were unlocked. Future versions can solve this by introducing weekly challenges, bonus quizzes and learning new activities.

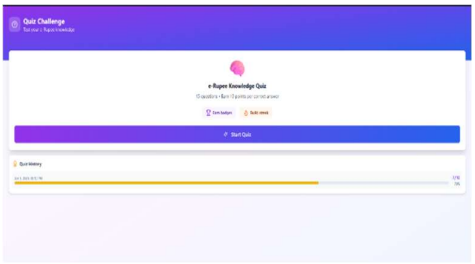

Figure 6. The image displays the quiz section

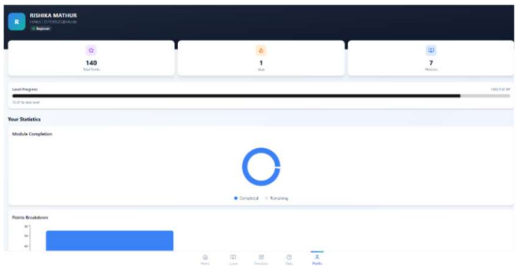

Figure 7. The image displays the dashboard which has the statistics are accurate about the streaks, module completion and the quiz points

D. Privacy Centre

The privacy centre, which teaches users about PIN safety, secure payments, and common digital- payment risks. Figure 1.7 shows the PIN-setting feature, while Figure 1.8 shows the incorrect-PIN warning displayed to the user. The incorrect-PIN feature was designed to create an experience similar to a real payment application, but without any actual financial risk. During testing, users became more careful while entering their PIN after receiving an incorrect-PIN warning. This showed that the Privacy Centre was useful not only for giving information but also for building safer payment habits.

Fig 8

We also have a feature in the privacy center, where we set a pin and that pin is only to be used by the user. To show that the incorrect pin pop-up message works as well. This is quite an essential feature because while doing a payment in real life, if we enter the wrong pin thrice, the payment system stops for a while, and you can't do any payments for at least 24 hours. Which causes a risk to your bank account as well.

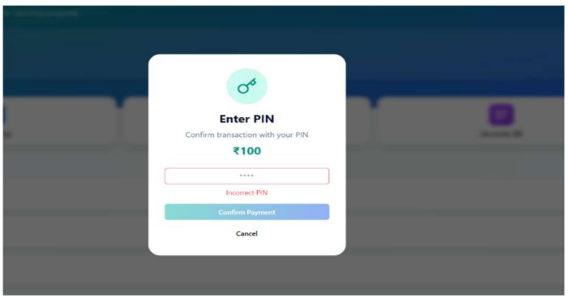

Figure 9. The figure shows the incorrect pin message

VI. Discussion

Most existing digital-finance learning systems mainly provide written content, videos, or basic awareness material. MoneyWise improves on this by combining bilingual learning modules, quizzes, an AI Chat Assistant, a payment simulator, gamification, progress tracking, and security awareness in one platform. The risk-free simulator enables users to engage in practice QR scanning, enter an amount, PIN verification and confirm payments without the use of real cash. Additionally, the support of both English and Hindi and an Artificial Intelligence (AI) Assistant adds to the overall accessibility and interactivity of the platform as opposed to more traditional, static modes of learning. MoneyWise is also distinguished by its Dashboard and Privacy Centre - the Dashboard includes scores, badges, module progress and how long you've been learning (or what we call your Learning Streak); the Privacy Centre allows you to set a PIN, and experience Incorrect PIN warnings in a controlled environment. This type of hands-on learning supports users in their ability to learn, develop, practice using, ask questions about and monitor their progress with basic payment habits - therefore making MoneyWise a better solution for those who have never used e-Rupee. While current systems are non-integrated, separating the Learning, Practice and Support components, MoneyWise combines all three components into one e-learning platform. The user can learn the concept, test the knowledge, practice the transaction, ask questions and then monitor their progress - without having to go through different applications. Therefore, MoneyWise is ideally suited to first time e-Rupee users and will help build their confidence when using digital payments independently.

VII. Future Scope

There is considerable potential for further expansion at MoneyWise. Adding an offline mode for users with limited or inconsistent internet access would allow them to continue learning about digital transactions while still having access to MoneyWise. Utilizing biometric verification, two-factor authentication, fraud notifications and additional realistic safety scenarios would better educate users on the risks associated with using digital payments. For younger users, MoneyWise could add features that would allow parents or institutions to monitor their activity via a safe, protected way. Additionally, by providing users with monthly spending summaries, customised recommendations, additional badges, weekly challenges and progress reports, MoneyWise can engage and retain users more effectively. The AI Chat Assistant can be improved by integrating verified information from RBI and e-Rupee into the AI system, resulting in more accurate responses to technical and policy-related inquiries.

VII. Conclusion

e-Rupee and MoneyWise were created to provide an easy to use, engaging and helpful tool for learning about e-Rupee. This is especially important for those who feel that they do not know how to use digital payments, or who are not comfortable learning solely in English. e-Rupee and MoneyWise are designed with 4 key features: 1) Bilingual learning modules and quizzes; 2) AI Chat Assistant; 3) A risk-free payment simulator; 4) Gamification; 5) A progress dashboard, 6) A Privacy Centre. Testing showed that users successfully completed

the primary activities on the MoneyWise platform, and users gained additional confidence after using the platform to practise making transactions without using real money. The PIN feature of the application provided additional security and made the application more accessible by encouraging safer payment habits. Points, badges and streaks also motivated users to remain engaged in their learning process.

Overall, MoneyWise allows users to learn the basics of financial literacy and to improve their learning experience in multiple ways: there is a way to both learn and practise simultaneously; the application provides an opportunity for users to ask questions; and users can easily track their learning progress in one application. Future updates to MoneyWise (offline capability, improved security measures, improved analytics and improved AI assistant) should further improve the application's usefulness as an onboarding and financial literacy tool for first-time users of e-Rupee.

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