UNIVERSITI TEKNOLOGI MARA

PICE
Public Interest Centre of Excellence

International Teaching Aid
Competition 2023

Reconnoitering Innovative Ideas in Postnormal Times

iTAC 2023

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INTERNATIONAL TEACHING AID COMPETITION
**E-PROCEEDINGS**

**PREFACE**

iTAC or International Teaching Aid Competition 2023 was a venue for academicians, researchers, industries, junior and young inventors to showcase their innovative ideas not only in the teaching and learning sphere but also in other numerous disciplines of study. This competition was organised by the Special Interest Group, Public Interest Centre of Excellence (SIG PICE) UiTM Kedah Branch, Malaysia. Its main aim was to promote the production of innovative ideas among academicians, students and also the public at large.

In accordance with the theme "Reconnoitering Innovative Ideas in Post-normal Times", the development of novel ideas from the perspectives of interdisciplinary innovations is more compelling today, especially in the post-covid 19 times. Post-pandemic initiatives are the most relevant in the current world to adapt to new ways of doing things and all these surely require networking and collaboration. Rising to the occasion, iTAC 2023 has managed to attract more than 267 participations for all categories. The staggering number of submissions has proven the relevance of this competition to the academic world and beyond in urging the culture of innovating ideas.

iTAC 2023 committee would like to thank all creative participants for showcasing their innovative ideas with us. As expected in any competition, there will be those who win and those who lose. Congratulations to all the award recipients (Diamond, Gold, Silver and Bronze) for their winning entries. Those who did not make the cut this year can always improve and join us again later.

It is hoped that iTAC 2023 has been a worthy platform for all participating innovators who have shown ingenious efforts in their products and ideas. This compilation of extended abstracts published as iTAC 2023 E-Proceedings contains insights into what current researchers, both experienced and novice, find important and relevant in the post-normal times.


Best regards,

**iTAC 2023 Committee**
**Special Interest Group, Public Interest Centre of Excellence (SIG PICE)**
**UiTM Kedah Branch**
**Malaysia**

# FINANCE PAYBUDDY:
# SMART PAYMENT BUDGETING APPLICATION WITH ARTIFICIAL INTELLIGENCE (AI) VIRTUAL ASSISTANT

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**ABSTRACT**

Recently, it is common of younger generations tend to overspend their budget which leads them to financial loss and debt especially through online payment. Our idea of the innovation is basically to build a smart payment budgeting app with AI virtual assistant that can link with credit or debit cards, and smartwatches via Bluetooth, besides a QR scanner and online transfer to make the app more flexible The main objective is to help younger generations and adults to have a good financial planning and prevent them for overspending. The novelty of our app is users are not only can make a detail monthly budgeting, but they also can automate the payments through AI system by using voice which is less than 30 seconds. If the balance in the budget category is a deficit, the AI will pop up on the phone screen or smartwatch and the alarm will remind the available spending amount. Thus, this app will benefit the society from overspending within their budgets and reduce the probability of financial loss and debt. In the future, the collaboration with the Massachusetts Institute of Technology (MIT) will help to turn our idea into a real new venture.

**Keywords:** budgeting, flexible, generation, AI, Bluetooth

## BACKGROUND

The Finance PayBuddy app is a smart payment budgeting app with AI virtual assistant. Our app also has the function to link with credit and debit cards via Bluetooth, besides a QR scanner and online transfer to make the app more flexible. This app also is not only available for smartphones but also links with smartwatches. What is so great and unique about our app is users of our app can not only make a very detailed monthly category budget with our app, but they can also make payments either on their smartphone or smartwatch by telling the AI which category that they want to spend. The page of the app that consists of each category of the budget that users have made and the virtual AI assistant will automatically appear on either users' smartphone or smartwatch when they wave their card in front of the secure reader at checkout, or their card is swiped to the device, or when they scan the QR code using our app. The AI will ask the users which category of the budget they want to spend for the payment, and the users only need to tell the AI, and the payment will be done in less than 30 seconds without the users needing to scroll, click or type the name of the category that they want to spend. Thus, for users to make payments with the app, the app needs to link with their current account in the users' bank to use their money as our app also works as an intermediary between users and a bank.

Moreover, our app and the AI virtual assistant are brilliant, fast, and secure as the payment can only be made when the AI sees the user's face and hears the user's voice during the payment process. Note that for our app, the process of authentication through biometrics is made only one time after the users register their account with our app so that the users will not have to scan their face every time they want to make a payment, as with our AI virtual assistant, it can hear, see, and recognize the users face and their voice. Users only need to enable their camera and mic in the registration process so that the AI assistant function can work. During the process of authentication in the registration process, the AI will scan the users' face 3 times for bare face, with glasses, and makeup, and then the users will need to say a phrase given 2 times so that the AI will detect and memorize their voice and the last process is fingerprint identification. In addition, the AI virtual assistant will assist them with how to use the app and what they need to do after they have done the registration process. There is also another option in the app for guidelines on how to use the app in the form of words and videos for users to refer to if they have any confusion or trouble using it.

If the users spend more than the budget that they have set in the category budget, the AI will pop up on the phone screen or smartwatch and ask them which other category they want to reduce the budget for. This is a requirement when the users overspend their category budget in order to ensure they spend the amount of money exactly as what they have set in the total budget for all categories which helps them avoid spending their overall money in the current account. Also, users can create and customize the category budget as much as they need. For instance categories for entertainment, children, groceries, lifestyle, utilities, vacation, and

whatsoever. In the category, they can put details about things they want to spend and their budget for each item so the app will automatically total up all the budget from the list for that category. Users can also check their money outflows on the monthly category budget spent report based on the bar chart at the top and the solution provided by the AI at the bottom of the page.

## PROBLEM STATEMENT

The problem that we are trying to solve with our application is the people that are having trouble following through with their budget. There are a lot of factors that can lead to people having trouble with following their budget. One example is, people are not taking budgeting seriously. When they are not keeping their budget in check, it shows that they are ignorant about how important it is to follow your budget for the future. This is a problem because of the recent pandemic that hit globally, it affected everyone's financial state due to various reasons.

We did a survey with a Google Form asking people of ages ranging from 20 to 49 about their monthly budgeting in hopes to see the results whether leaning on the positive or negative side of the spectrum. The results show that more than 50% of the respondents tend to overspend more than they planned to spend on something. Other than that, we can see that 23 people out of 31 are having trouble managing their monthly financing. That is 74% of the total respondents admitting that they are having trouble with said matter.

Do you guys have any problem managing your budget?
31 responses

25.8%

74.2%

- ● Yes
- ● No
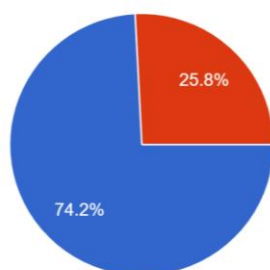
Do you tend to overspend without knowing?
31 responses

51.6%

45.2%

- ● Always
- ● Sometimes
- ● Never
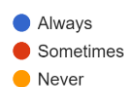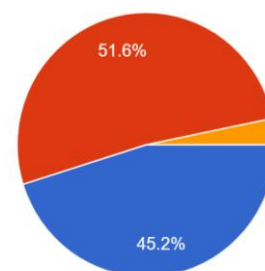
## OBJECTIVES

Our objective in creating this app is to help younger generations and adults, especially those who have trouble following through with their budgets, become wiser and better financial managers and prevent overspending. The app's objective is also to help people understand budgeting and have maximum control over their individual finances. This app was also developed to help users with insights and analysis of their financial habits with the help of an Artificial Intelligence virtual assistant, which will give users solutions and recommendations to not overspend their money. This may include visualizations in the form of charts and reports that help users understand their spending patterns, identify trends, and make informed decisions to improve their financial health.

## NOVELTY

The novelty of our app is users of our app can also make payments with the budgeting app either on their smartphone or smartwatch through AI virtual assistant. Furthermore, our AI virtual assistant has the ability to hear, listen, see, and recognize users' faces and voices which makes the app and the payment fast, smart, and secure. In addition, what makes it unique from other budgeting apps and software is the function to reduce the budget in another category when the amount of money spent in the category budget exceeds to ensure they spend accordingly as what is in their total budget for all categories. Moreover, the Finance PayBuddy app has an excellent data analysis where it highlights the crucial data that users need to focus on to reduce their spending for that category. It also has an annotation and a hybrid title for the chart which consists of insight, legend, and a call to action to briefly emphasize what users need to know and need to act on which makes the report more effective to achieve the app's objectives.

## COMMERCIALIZATION POTENTIALS

We are hoping to collaborate with the Massachusetts Institute of Technology (MIT) as it is the top world university and offers many innovation and entrepreneurship (I&E) programs. We believe this collaboration will help turn our idea into a venture and it would be a great honor for us to learn from and work with them. Also, we are hoping that we can form a partnership with other banking institutions as our app works as an intermediary between users and a bank, so the partnership is crucial for our app to work as the app needs to link with users' current account and their credit and debit cards so that users can use money and make payment.

## BENEFIT TO COMMUNITY

Enhanced budgeting capabilities

The app allows users to create highly detailed monthly category budgets, enabling them to allocate their funds to specific categories and track their spending more effectively.

Improved financial decision-making

By using the app, users gain a better understanding of their spending habits and can make more informed financial decisions.

Real-time deficit management

One of the app's notable features is its ability to monitor the user's budget and account balances in real time.

Societal benefits

The app's focus on promoting wise financial management and preventing overspending and debt contributes to the overall financial well-being of individuals and society.


**FEEDBACK FROM COMMUNITY**

In our survey, we asked the respondents among the young people if they are interested to have an app that could help with their personal budgeting and notify them about their spending. Out of 100 respondents, 87% had responded positively towards this app. Majority of them are agreed and will have a possibility to purchase the unique features from this app. This shows there is a high opportunity and strong evidence for us to develop this AI app


**CONCLUSION AND REFLECTION**

To conclude, our idea of this innovation through Finance PayBuddy application is to help people that have problems with financing literacy and handle their money effectively. We are focusing on younger generations and adults that help them to prepare their financial budget and spend money wisely. Our teamwork are motivated from the early stage of the brainstorming until the end result. Each of us will work together to help the community and find out the new knowledge throughout the process of developing the app.


**ACKNOWLEDGEMENTS**

We would like to express our sincere gratitude to the iTAC team for giving us a chance to participate in this project's amazing experience of the innovation competition. This is because if it is not because of this project, our idea to create Finance PayBuddy app that could help younger generations and those who have trouble with financial management would not exist. Furthermore, we are also grateful to our

advisor, Madam Siti Nazirah binti Omar from UiTM Alor Gajah Campus for assisting us with this project to give our best in working on this project. Last but not least, we would like to give a huge thanks to our team members for the days and nights of brainstorming and the endless efforts in completing this noble project together that could perhaps benefit society one day.

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