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DESIGN AND DEVELOPMENT OF MY SHOP ASSISTANT MOBILE APP: A SMART RECOMMENDER FOR BUDGET TRACKING AND PERSONALIZED SHOPPING AMONG UUM STUDENTS

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ABSTRACT

My Shop Assistant is a mobile application designed to enhance the shopping experience by improving organisation and budget management. Although the number of mobile shopping apps is increasing, many still lack features that enable users to prioritise purchases, manage spending, and compare prices in a user-friendly, efficient manner. This project explores how a mobile shopping assistant can support budgeting and efficiency without requiring complex personalisation. The primary objectives are to develop an application that provides categorised shopping lists, automatic price comparison, budget tracking and priority tagging of items such as "wishlist" or "must-have". Users can view a monthly breakdown of their spending over three months and receive insights into shopping patterns, including popular and favourite items and stores, with the top three stores ranked by items on the user's shopping list. The project was developed using the Rapid Application Development (RAD) methodology, which consists of four phases: requirements planning, user design, construction and cutover. A field test was conducted with 30 respondents from Universiti Utara Malaysia (UUM), who interacted with the app and completed an online questionnaire assessing usability, usefulness, ease of use, acceptance and intent to use. The result indicated that users were very satisfied with the app, particularly with price comparison and budget tracking features. This application benefits budget-conscious individuals, including students, young adults, and frequent shoppers, by providing a useful, user-friendly way to prioritise purchases and manage their expenditure. It fills a gap in current mobile shopping tools by offering an efficient, simplified solution that does not rely on complex personalisation features.

Keywords: Mobile Shopping App, Budget Tracking, Shopping List, Price Comparison, Spending Analysis

INTRODUCTION

In today's fast-paced world, shopping for groceries, clothes, books and household items is an essential part of daily life (Davydenko & Peetz, 2020). However, the abundance of choices in stores and online can overwhelm users, leading to poor decisions, forgotten necessities and budget mismanagement. Studies show that grocery shoppers spend an average of 41 minutes in stores, with approximately 15% of that time dedicated solely to searching for products (Suryawanshi et al., 2024). This highlights the need for tools that support shopping preparation, not just the purchase itself.

Many shoppers rely on memory or handwritten lists, which are often unreliable. Distractions and cognitive fatigue during shopping cause users to forget essential items (Bazaar Mind: A Virtual Shopping Assistant, 2019). Navigating product categories and making comparisons without assistance can also increase mental strain and reduce satisfaction (Lai et al., 2020). The mental effort required to process information and make decisions is known as cognitive load, which can affect users' self-confidence and ability to solve problems independently (Roy et al., 2025). Cognitive load that exceeds an individual's information-processing capacity leads to reduced satisfaction with decisions, as users rely on simple heuristics rather than evaluating their options (Science & Mai-Quattash, 2025).

Although various shopping applications are available, most have limited capabilities for managing shopping activities across multiple stores and are mainly used to find a store's location or track a discount. Similarly, Blanke et al. (2021) observed, in a model-based review of grocery and food-shopping-related application software, that most applications are based on ad hoc design decisions and do not fully support the desired behavioural goals. Planning and list management tools can help reduce cognitive load, improve focus and facilitate smarter planning and purchases (Adaji et al., 2018). Additionally, users are more likely to adopt applications with good usability and intuitive interfaces since user evaluation and experience ultimately determine an application's success (Weichbroth, 2020).

This study presents My Shop Assistant, a smartphone app that improves shopping by enabling smart task management and personalisation to address common shopping challenges. The app allows users to create and prioritise lists, track frequently purchased items, monitor spending and add item notes. By learning from user behaviour, it personalises support to enhance shopping efficiency and decision-making. The goal of this study is to design and evaluate My Shop Assistant as an intuitive, user-friendly tool that improves planning, reduces forgetting and increases satisfaction through customizable features.

PREVIOUS WORKS

The increasing use of mobile devices has boosted the popularity of digital shopping management solutions. Nowadays, many users use mobile apps to simplify their shopping by searching for products and comparing prices on their smartphones. Businesses must adapt to their customers' mobile habits, as mobile app use has increased by more than 100% in recent years (Ahuja & Khazanchi, 2016). Although several apps cover aspects such as budgeting, list management, and collaboration, none provide a comprehensive solution. This section examines the strengths and weaknesses of three related apps: PriceCatcher, HargaPedia, and SmartShopper Malaysia.

The Ministry of Domestic Trade and Consumer Affairs (KPDN) created the PriceCatcher smartphone app to help users compare prices of more than 480 everyday items across different Malaysian retailers. Fresh fruit, dry goods, infant products, hygiene products and beverages are among the categories it covers. Location-based pricing searches, listings with the lowest prices, store directions, promotional brochures, and user-shared price updates are among the main features. Although the program is useful for tracking

prices, it has an antiquated interface and lacks contemporary features such as budgeting tools and shopping list management (PriceCatcher, 2021).

HargaPedia is a mobile app that helps Malaysian consumers compare prices of groceries and health & beauty products across supermarkets, pharmacies and online stores. It helps users determine the optimal time to buy using an A-B-C system: "Ambil je!" indicates the lowest price, "Boleh la" indicates a good bargain, and "Chup dulu" indicates rising prices. The app helps customers save up to 30% by providing price tracking, store brochures, and alerts when products reach their lowest prices. Despite being user-friendly and educational, HargaPedia primarily focuses on price comparison and does not offer services such as budget management or shopping lists (HargaPedia, n.d.).

SmartShopper Malaysia is a mobile app that helps users save money on groceries by comparing prices across major retailers. Based on specific things, it recommends the best places to shop with features like the "Savings Planner." With more than 500,000 users, the app offers a large selection of goods from Tesco, Mydin, Guardian and Watsons, including food, hygiene and baby supplies. Although it provides promotions and helpful tools, beginning users may find its numerous features overwhelming (SmartShopper Malaysia, n.d.). A comparative summary of these applications is provided in Table 1 to illustrate their core features, strengths and weaknesses.

Table 1

Comparison Between Three Existing Shop Assistant Apps

Aspects	PriceCatcher	HargaPedia	SmartShopper Malaysia
Main Function	Compare prices of 480+ daily items in stores	Compare grocery/health & beauty prices using the A-B-C system	Compare prices and suggest the best retailer for each product.
Product Categories	Fresh produce, dry goods, baby items, hygiene and beverages	Grocery and health & beauty products	Grocery, baby items, toiletries and personal care
Stores Coverage	Physical stores only	Mix of online and physical retailers	Wide coverage of major stores
Price Comparison Method	Location-based search with lowest price listings	A-B-C label system simplifies decision-making	“Savings Planner” recommends the best store for each item.
Personalized Recommendations	None	Limited (via price tags like “Ambil je!”)	Yes, personalised suggestions via Savings Planner
Shopping List Feature	No	No	Yes
Budgeting Tool	No	No	No, but it helps save indirectly

Strengths	Government source, verified pricing, useful for tracking	Easy-to-use, helps time purchases well, 30% savings potential	Personalised shopping help, broad retailer coverage and widely adopted
Weaknesses	Dated interface, lacks advanced features	No list and budget tools, limited to price checking	It can be complex for beginners, with limited coverage in some areas

My Shop Assistant significantly enhances users' shopping experiences by transforming an everyday activity into a more organised and streamlined process. The app was more than simply another shopping tool. It offered a well-considered design that facilitates better control, planning, and decision-making, all of which can lead to long-term improvements in users' satisfaction and purchasing habits. Its importance stems from how it provides order and clarity to an otherwise disorganised and ineffective experience.The application encouraged healthier spending by incorporating features like spending summaries and priorities. It allows users to manage their time better and reduce cognitive strain by using it to plan and maintain control while making purchases. This is especially important in the digital age, where multitasking and making quick decisions are common but often overwhelming.

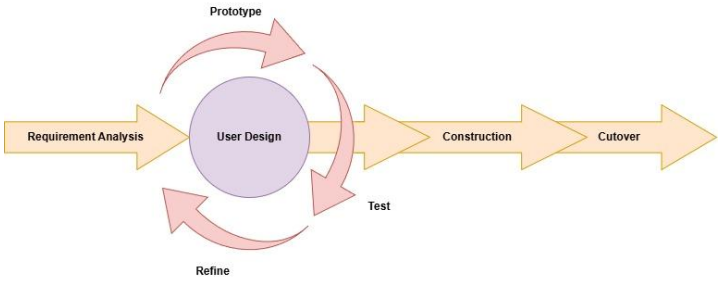
Additionally, the app's clean interface and accessible features make it easy for a wide range of users to adopt and use consistently. It provides users with feasible, user-friendly, and effective tools, making list operations easier and helping with budgeting. Instead of relying on memory or manual tracking, users can make purchases with greater confidence, knowing they have well-organised tools at their fingertips.This project's significance goes beyond ease of use, as it encourages personal financial responsibility, organised living, and a digital solution that simplifies and reduces the stress of everyday shopping. It makes a significant contribution to the growing need for useful, user-centred mobile apps that address pressing real-world issues.

METHODOLOGY

This project employs the Rapid Application Development (RAD) approach, which emphasises four essential elements: people, tools, methodology, and management to facilitate quick, accurate, and effective system development (Yen & Davis, 2019). It works especially well for projects like My Shop Assistant, where quick prototyping and continuous user input are crucial. RAD is ideal for creating a responsive, user-centred application, as it also improves documentation, user participation, and communication. Implementation studies of RAD methods not only prioritise speed of development but also specifically measure and improve usability aspects to enhance user experience (Bahari & Pramudwiatmoko, 2024). The four iterative steps of the technique are requirements planning, user design, construction and cutover. All of these phases are illustrated in Figure 1.

Figure 1

Rapid Application Development (RAD)



The first phase, Requirements Planning, focuses on gathering initial user input to establish broad objectives for the application. This phase uses early research and interviews to identify essential expectations, such as budget tracking and shopping list management, rather than to create fixed technological specifications. A variety of user interviews were conducted to examine shoppers' expectations, difficulties, and future buying habits. The information gathered helped determine the project's priorities and served as the foundation for organising the app's key functionalities.

During the User Design phase, rapid prototypes are created and improved in response to user input. Through iterative design and feedback cycles, users engage with early versions of the app and help shape key features such as item displays and list layouts. This guarantees that the changing design will always be useful and user-centred. RAD's strength lies in its flexibility and responsiveness to evolve user needs, which is particularly advantageous for developing systems whose requirements may change as the project progresses (Singgalen, 2024).

In the Construction phase, the app was developed incrementally by using the validated prototypes. This led to a homogeneous group of users who tested the My Shop Assistant application. Every component was developed in discrete modules and subjected to ongoing testing. Thirty respondents from Universiti Utara Malaysia (UUM) participated in usability testing, interacting with the app and offering insightful comments. Their answers made it easier to identify errors, improve navigation, and enhance the overall user experience. Simultaneous testing and improvement enabled the development to make changes in real time.

Finally, the Cutover phase marks the deployment of the fully developed app. The application was prepared for distribution as an APK for Android devices following extensive system testing and performance evaluations. Additionally, post-launch feedback is collected to address any remaining issues and to inform future enhancements. This final step ensures the application is reliable, usable and prepared for daily use.

PROTOTYPE DEVELOPMENT

My Shop Assistant app provides a simple, user-friendly interface to help users manage their shopping activities effectively. The main page shows the total amount spent, the most popular shopping categories and priority items like wishlists and must-haves. Other key features include a shopping list page for adding and prioritising items, a budget tracker for monitoring spending, a price comparison tool that suggests the

best stores and a notes page for adding remarks on specific items. In addition, the app displays favourite stores on the insights page and tracks favourite and popular items based on purchase frequency. These tools make it easier for users to manage their money, stay organised, and shop more wisely.

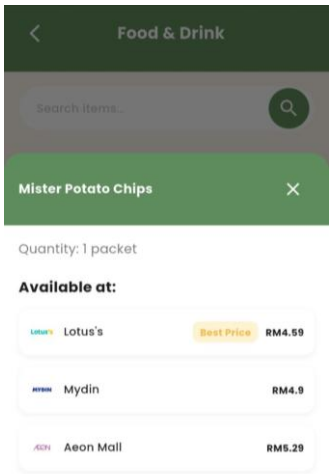
Figure 2

Home page Interface

Figure 2 shows the home page interface, which provides users with a quick, user-friendly overview of their spending and purchasing habits. Three main summary cards are displayed at the top, which are “Favourite Items", which takes users to an insights page with frequently purchased items. Next is "Total Spent", which shows the total amount spent from the beginning to the present, along with the option to view monthly spending details derived from the formula **Total Spent = ∑ (Price of Each Item)** and "Top Category", which highlights the shopping category with the highest total spending. Users can compare prices across categories and quickly add items to their lists.

Figure 3

Item Details Price Comparison



This interface appears when a user selects an item from a category card, such as the “Food & Drink” category. It shows the chosen item, like in this example, one packet of "Mister Potato Chips" and provides a list of stores that sell it, along with its price. A "Best Price" tag makes it easy for users to quickly identify the best option by highlighting the lowest prices. Based on Figure 3, the app indicates that Lotus offers the lowest price at RM4.59, while Mydin and Aeon Mall have the lowest prices at RM4.90 and RM5.29, respectively. By making it easy to compare prices and select the stores that best suit their tastes and budgets, this interface helps customers make well-informed purchases.

Figure 4

Shopping List Interface

Figure 4 shows the shopping list interface, a centralised hub where users can create and manage shopping lists by category. A progress bar, green when within the budget and red when over the limit, is used to

illustrate each list's current spending against a user-defined budget. The formula **(Current Spend ÷ Allocated Budget) × 100%** automatically calculates the proportion of the budget used, making it easy for users to monitor their spending in real time. In addition, the interface shows the number of items added, the date and time the list was created and a quick-add "+" button that lets users create a new list.

Figure 4

Shopping List Interface

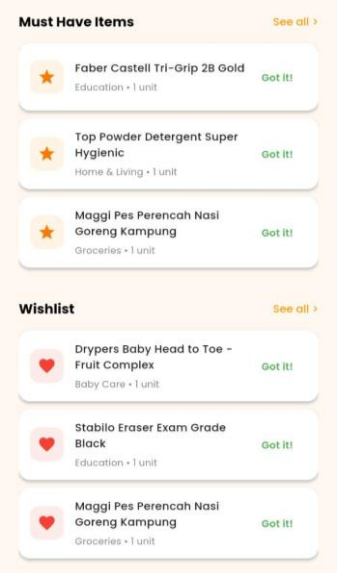
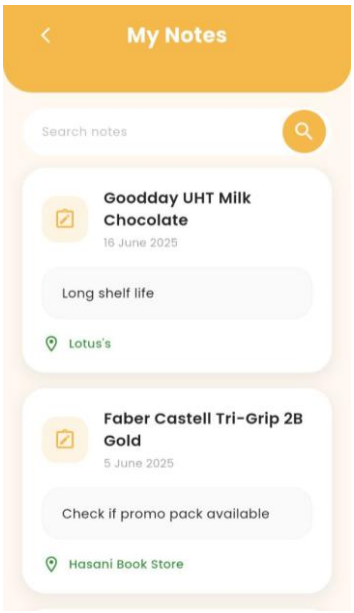


Figure 5 illustrates the priority items section on the home page, which allows users to manage their most important purchases. It is separated into two categories: "Must Have Items," which are essentials the user must have immediately, and "Wishlist," which includes items the user wants to buy when money permits. This section allows users to get a quick view without having to go through their shopping list to find the priority items. Each item has a "Got it!" button to indicate that it has been purchased, along with its name, category and quantity.

Figure 6

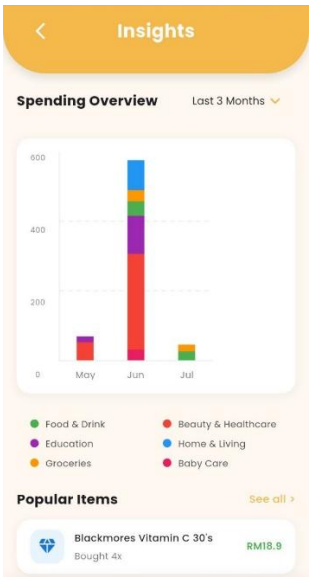
Notes Interface



This figure shows a unique feature that allows users to track remarks about specific items linked to their shopping lists. The notes are easily viewable, editable and updatable by users. This tool makes it easy to track additional item details.

Figure 7

Spending Overview and Popular Items Section

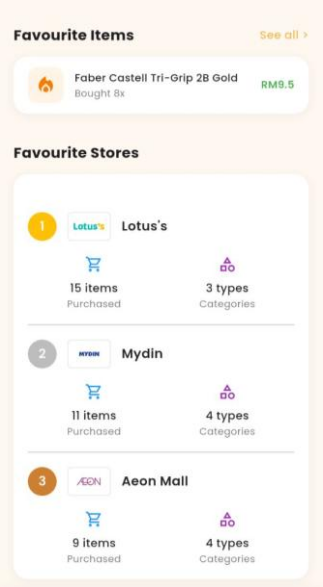


This figure shows the insights interface, which provides users with a concise, analytical overview of their spending patterns. The "Spending Overview" tool helps users identify trends and patterns in their spending by displaying categorised expenses for a selected period of 1, 2, or 3 months in a multicoloured stacked bar chart. Additionally, the "Popular Items" section uses the condition $3 > \text{Purchase Count} \leq 5$ to emphasise products that have been purchased at least 3 times but no more than 5 times. The name, price and total

purchases of each popular item are shown, making it easier for users to track frequently purchased items and identify their shopping behaviours.

Figure 8

Favourite Items and Favourite Stores Section



This figure shows an extended insight interface where the "Favourite Items" section displays items that have been bought 6 or more times, based on the Purchase Count condition**. ≥ 6.** The Favourite Stores section ranks stores based on all of their shopping list created according to two criteria, which are the total number of items bought from each store and the number of categories the user browses across. The rankings reflect actual buying patterns influenced by price comparisons, as the app automatically selects the store with the lowest price for each item on the shopping list.

RESULTS AND DISCUSSION

Realising the importance of usability evaluation following the RAD methodology suggested by Bahari and Pramudwiatmoko (2024), we measured the mobile app's usability to enhance the user experience. The usability evaluation of the application was conducted based on constructs derived from the Technology Acceptance Model (TAM), which explains user acceptance of information systems through factors such as perceived usefulness and perceived ease of use (Xiao & Goulias, 2022). The usability evaluation was conducted with 30 participants who tested the My Shop Assistant application. The online questionnaire gathered both demographic information and user feedback across five key evaluation areas: Usability, Perceived Ease of Use, Perceived Usefulness, User Acceptance, and Intention to Use. Each of these categories included targeted statements rated on a Likert scale, allowing respondents to indicate their level of agreement with usability-related claims. The results provide insights into how well the application meets user expectations in terms of functionality, accessibility and relevance.

Figure 9

Usability Experience Chart

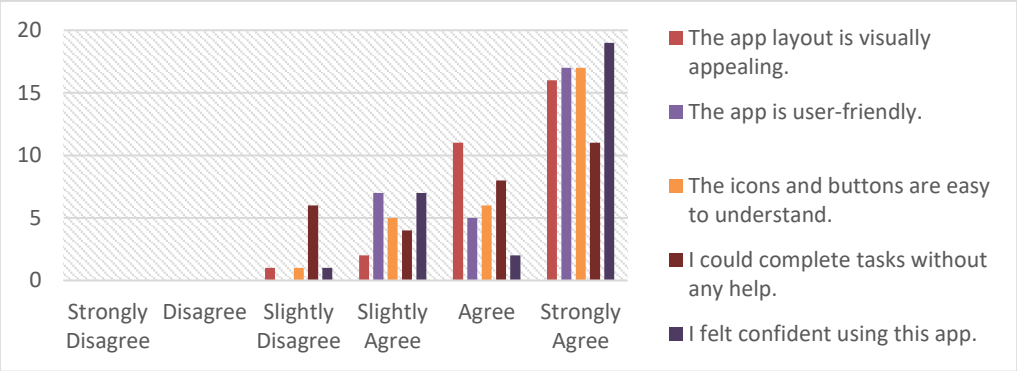


Figure 9 shows that users had a positive experience with the application, as most responses clustered at the higher end of the 6-point scale. The visual appeal of the application, the ease of use, and the simplicity of the icons and buttons were rated very highly, with averages above 5.3, indicating that the interface design makes it easy for users to use and understand the application. These aspects also contributed to users' high level of confidence in using the application. However, the lower average for users completing tasks without assistance (4.83) suggests that users had some difficulties with the application, implying that guidance could also be improved to make it even easier to use.

Figure 10

Perceived Ease of Use Chart

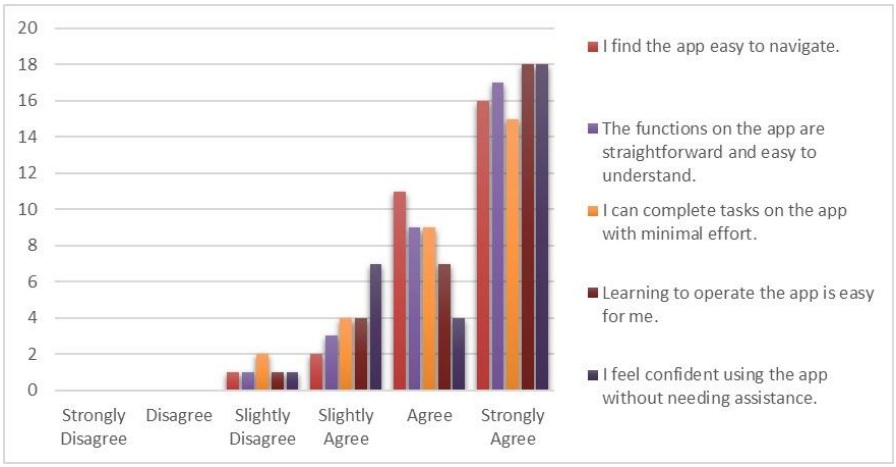


Figure 10 shows that the application is very user-friendly, with high levels of agreement across all evaluated elements. More specifically, the features of navigation, understanding the application's functionality, and learning the application scored the highest average values, at 5.40 out of 6, indicating that users could easily understand and use the application with little difficulty. These results seem to confirm the assumption that the application's interface design enables user interaction. Additionally, users reported high confidence when working with the application, though slightly lower average values for completing tasks independently and for task efficiency (5.23 and 5.30, respectively) suggest these aspects could be optimised slightly.

Figure 11

Perceived Usefulness Chart

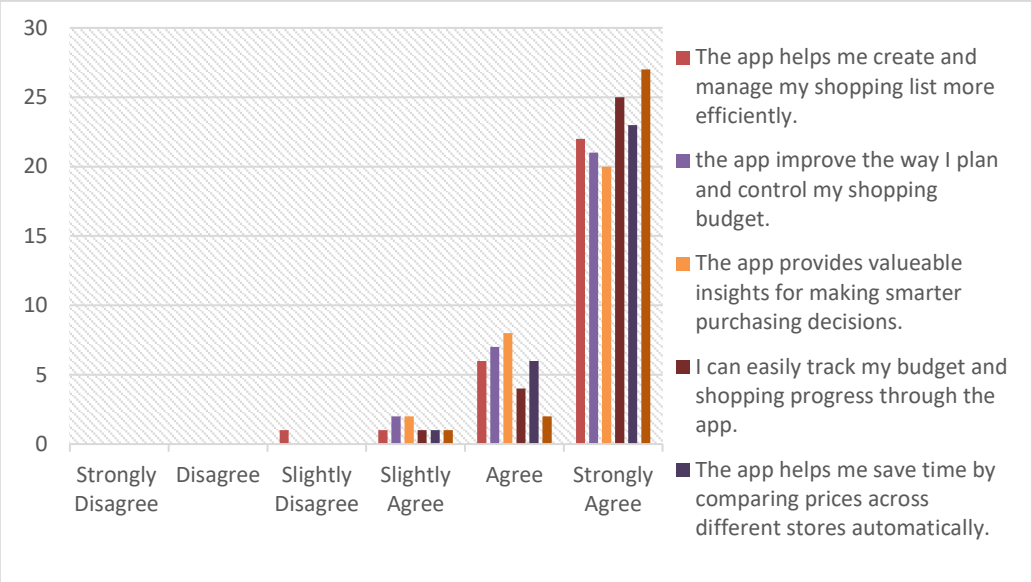


Figure 11 shows that the app gets an average rating of 5.70, indicating that it is very helpful. The application's features allowed users to identify the best stores and prices (5.80), track their spending and shopping progress (5.77) and save time by automatically comparing prices (5.73). This shows the application's effectiveness in ensuring the smooth running of the user's activities. The application was also recognised for its effectiveness in managing shopping lists and providing useful information to make the right purchasing decisions.

Figure 12

Perceived Acceptance Chart

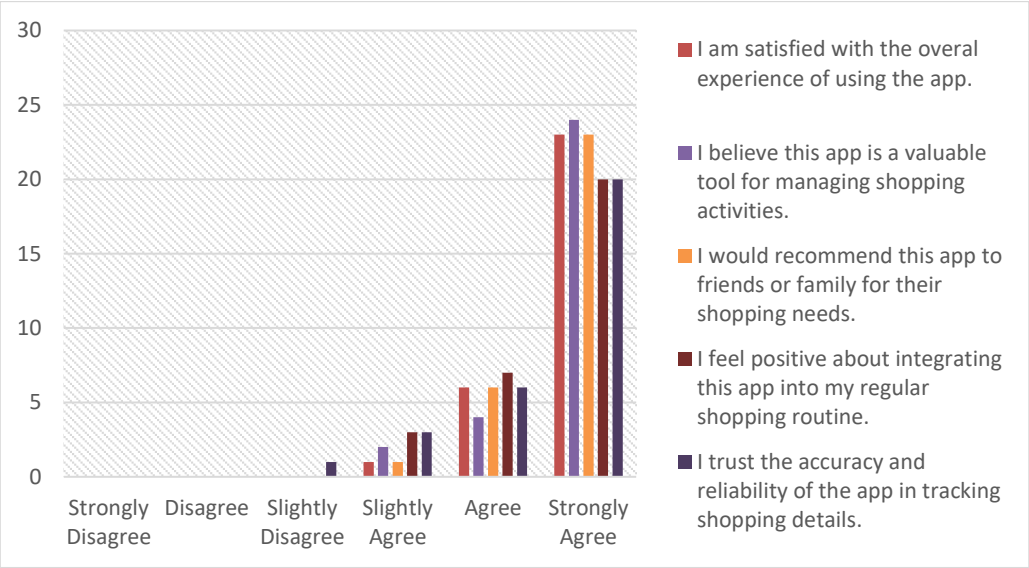


Figure 12 shows that the application has been well received by users, as indicated by an impressive average score of 5.65. This is based on users' satisfaction with the application and their willingness to refer it to others who need it. Additionally, users have found it beneficial for their shopping activities and are willing to integrate it into their daily activities. Moreover, users have confidence in the application's accuracy. However, slightly lower scores in some acceptance-related aspects suggest minor opportunities for further improvement to strengthen overall user adoption.

Figure 13

Intent to Use Chart

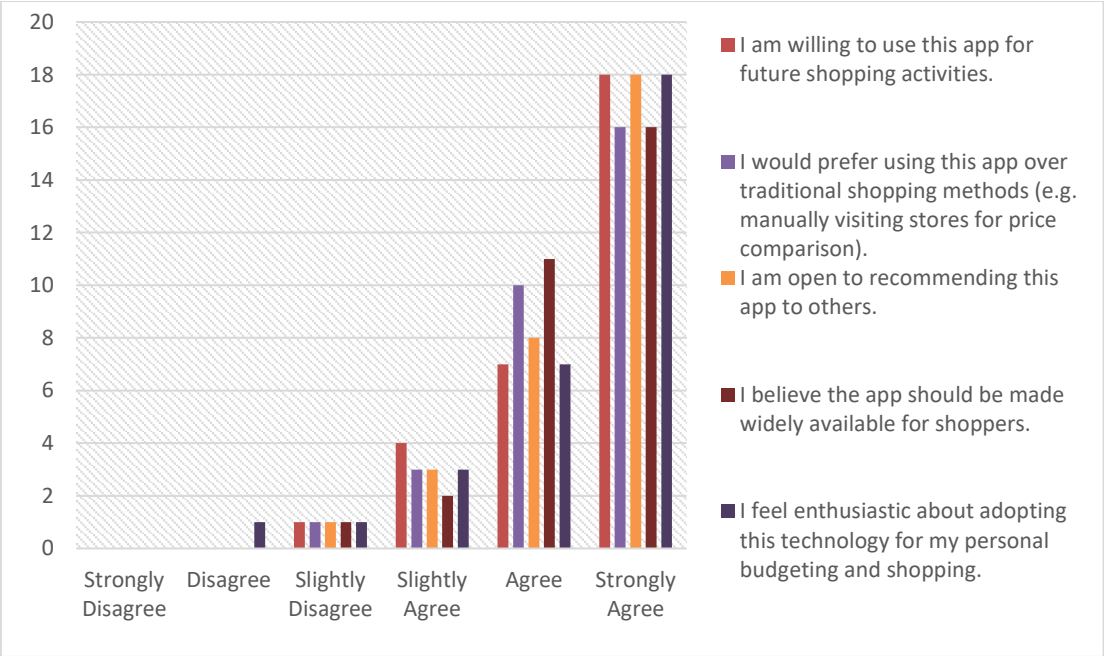
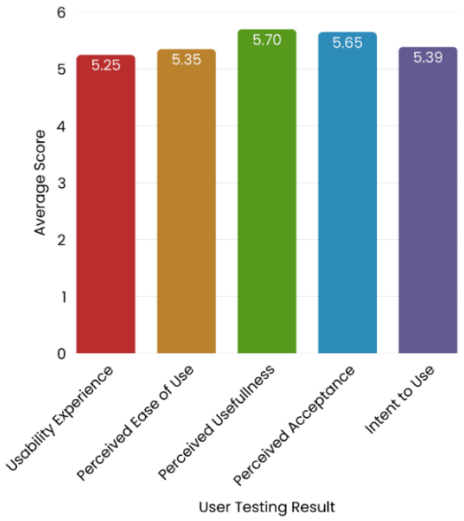


Figure 13 illustrates users' favourable behavioural intentions toward the application. The average score of 5.39 out of 6 supports this. Users will use the application for their next shopping activity (5.40), prefer it over conventional shopping (5.37), and are willing to promote it to others (5.43). The users are also very enthusiastic about using the application for personal budgeting and shopping purposes (5.33). Users are also largely in agreement that the application should be widely available (5.40).

Figure 14

User Testing Results Chart



The findings show that the app provides a positive experience across usability, ease of use, usefulness, acceptance and intent to use. The average score for the usability experience was 5.25 out of 6. Users were generally more confident when using the app because of its clear design and attractive visuals. Nonetheless, a marginally lower score for independent task completion (4.83) indicates a need for more in-app instructions or more transparent workflows to ensure users can complete jobs without assistance.

The app had a score of 5.35 for ease of use, meaning that users found it simple to use and navigate. The app's layout simplifies its features, enabling users to quickly become familiar with them and complete tasks with minimal effort, ensuring accessibility for a wide range of users. The app's usefulness was the highest-rated category, with an average score of 5.70. Users appreciated its ability to track spending patterns, compare prices across stores, and help them make better purchase decisions. The standout feature was its ability to recommend the best stores with the lowest prices; it received the highest individual score of 5.80, highlighting the time and money savings it can provide.

The app received a score of 5.65 for perceived acceptance, indicating high user pleasure and trust. By saying that the app is a helpful tool for managing shopping and that they want to recommend it to friends and family, users demonstrated their confidence in its relevance and dependability. Although users are generally receptive to continuous use, their intent-to-use score of 5.39 suggests they may require additional engagement strategies to maintain their interest over time. Regular upgrades, personalised features or loyalty rewards can all encourage consistent use over time. Overall, the findings show that the app successfully meets user needs while offering a practical and user-centred experience. With just minor adjustments to user training and retention tactics, the app has huge potential for broad use and sustained engagement.

My Shop Assistant has proven to be an effective and user-friendly tool that meets key user needs such as budgeting, price comparison and shopping organisation. Users expressed satisfaction with its appearance, usability and essential features, but they also suggested several enhancements to boost overall functionality. These include improving store and category selections, simplifying navigation, and introducing features such as dark mode and nearby store tracking. Enhancing user satisfaction and retention may be achieved by including customisation options, in-app training, and engagement tools such as loyalty points. If these recommendations are taken into consideration for future updates, the app has a good chance of becoming a more complete and widely used digital shopping assistant.

CONCLUSION

My Shop Assistant mobile application effectively meets the demand for a useful, easy-to-use shopping tool, particularly among young adults. It helps users manage their budgets, organise their shopping lists, and compare prices across stores, all on one platform. Most of the 30 respondents who took part in usability testing thought the application was helpful, simple to use and time-saving. Although the response was generally very good, some users need assistance to complete activities without guidance. In future work, this can be enhanced by including more precise instructions or tooltips. It is also important to note that future research should consider larger, more diverse user groups and longitudinal testing to enhance the study's generalisability. My Shop Assistant exhibits great promise as a digital assistant for more intelligent, well-organised purchasing; it is a valuable tool for daily planning and proper budgeting, encouraging improved financial habits.

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REFERENCES

Ahuja, V., & Khazanchi, D. (2016). Creation of a Conceptual Model for the Adoption of Mobile Apps for Shopping from E-Commerce Sites–An Indian Context. *Procedia Computer Science*, *91*, 609–616. https://doi.org/10.1016/j.procs.2016.07.152

Bahari, A. F., & Pramudwiatmoko, A. (2024). Implementation of Rapid Application Development (RAD) Method for Mobile-Based Ice Cream Ordering Application. *MALCOM Indonesian Journal of Machine Learning and Computer Science*, *5*(1), 283–291. https://doi.org/10.57152/malcom.v5i1.1747

Bazaar Mind: a virtual shopping assistant. (2019, July 1). *IEEE Conference Publication | IEEE Xplore*. https://ieeexplore.ieee.org/abstract/document/8807446

Blanke, J., Billieux, J., & Vögele, C. (2021). Improving food shopping behaviour: A model-based review of mobile applications to assist with healthy and sustainable grocery shopping. *Computers in Human Behaviour Reports*, *4*, 100147. https://doi.org/10.1016/j.chbr.2021.100147

Davydenko, M., & Peetz, J. (2020). Shopping less with shopping lists: Planning individual expenses, the adequacy of time affects purchasing behaviour when online grocery shopping. *Journal of Consumer Behaviour, 19*(3), 240–251. https://doi.org/10.1002/cb.1812

HargaPedia | Check prices as easy as ABC! (n.d.). *HargaPedia*. https://www.hargapedia.com.my/

Lai, T. M., Bui, T., & Lipka, N. (2020, July 7). ISA: an intelligent shopping assistant. *arXiv.org*.

https://arxiv.org/abs/2007.03805

PriceCatcher. (2021, April 11). *PriceCatcher*. https://pricecatcher.kpdn.gov.my/

Roy, J., Mila, S. P., & Ahammed, M. T. (2025). Intelligent Shopping Soft Assistant: A Digital Solution for Collaborative and Efficient Shopping. *2025 International Conference on Quantum Photonics, Artificial Intelligence, and Networking (QPAIN)*, 1–5. https://doi.org/10.1109/qpain66474.2025.11172143

Science, G. C. F. B., & Mai-Quattash. (2025, September 22). *The impact of cognitive load on Decision-Making Efficiency*. *Global Council for Behavioural Science.* https://gc-bs.org/articles/the-impact-of-cognitive-load-on-decision-making-efficiency/

Singgalen, Y. A. (2024). Implementation of Rapid Application Development (RAD) for the community-based ecotourism monitoring system. *Journal of Information System Research (JOSH)*, *5*(2), 520–530. https://doi.org/10.47065/josh.v5i2.4749

SmartShopper Malaysia. (n.d.). *SmartShopper Malaysia on the App Store*. Apple. https://apps.apple.com/my/app/smartshopper-malaysia/id849030829

Suryawanshi, R., Shirsath, B., Bhande, B., Todkar, A., Awate, A., & Tajmohammed, K. (2024). TechCart: A Smart Shopping Experience. *TechRxiv*.https://doi.org/10.36227/techrxiv.173014788.86495967/v1

Weichbroth, P. (2020). Usability of Mobile Applications: A Systematic Literature Study. *IEEE Access*, *8*, 55563–55577. https://doi.org/10.1109/access.2020.2981892

Xiao, J., & Goulias, K. G. (2022). Perceived usefulness and intentions to adopt autonomous vehicles. *Transportation Research Part A: Policy and Practice,* 161, 170–185. https://doi.org/10.1016/j.tra.2022.05.007

Yen, D. C., & Davis, W. S. (2019). Rapid application development (RAD). In *CRC Press eBooks* (pp. 247–252). https://doi.org/10.1201/9781420049107-32