

PROJECT REPORT



Winnovate Systems

Project: “Smart Buggy”

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1. Introduction

Our client, a well-known chain of stores covering a wide range of products, is committed to making shopping a better experience for its customers. They want each visit to their stores to feel personalized and efficient, catering to individual tastes and needs. However, they've identified a few challenges. Firstly, customers struggle to find their way around the store and get detailed information about products, making it hard for them to decide what to buy. Secondly, the lack of personalized suggestions makes it difficult to suggest additional items and make customers happier. Lastly, though they see the potential of using technology to improve interactions, they're finding it tough to integrate it effectively to understand and adapt to the various preferences of their customers.

To tackle these issues, we took a comprehensive approach. We gathered information by talking to stakeholders, doing market research, and studying industry trends. We made sure our findings were solid by documenting everything from meeting notes to research articles. Plus, we got feedback from test runs and surveys to confirm that our ideas would work. Our goal was to bridge the gap between what customers expect and what the store can offer, making sure our solutions improve the overall shopping experience while meeting the needs of everyone involved – customers, the store, tech teams, and society as a whole.

2. Artifacts

In this section, we present the artifacts generated throughout the project lifecycle, including key documents, reports, and communication records.

2.1 Updated Project Proposal and Plans:

In the course of project development, it became necessary to revise our initial project proposal and plans to accommodate emerging insights and adjustments. The updated version of the project proposal and plans reflects these adaptations and serves as a guiding document for our ongoing efforts.

Final Proposal Overview:

Title: Revised Project Proposal and Plans

Audience: Project stakeholders, and team members

Project Objectives: The project aims to utilize technology to enhance the shopping experience for customers by seamlessly guiding them through the store, providing accessible product information, and offering personalized recommendations based on their preferences.

Scope: The scope of the project includes the development and implementation of the Smart Buggy, integrating augmented reality technology into the shopping cart. This includes features such as in-depth product information, AR recommendations, automatic price calculation, a virtual shopping assistant, generating shopping lists from recipes, and festive scavenger hunt games.

Deliverables:

1. In-depth product information displayed through AR overlays within the shopping cart.
2. Augmented reality recommendations for complementary products.
3. Automatic price calculation feature using AR technology.
4. Integration of a virtual shopping assistant into the shopping cart.
5. Ability to generate shopping lists from recipes input by users.
6. Development of festive scavenger hunt games for increased engagement.

Timelines:

The project timelines are aligned with evolving project needs and are as follows:

- Research and POC Phase: 2 weeks
- Prototyping and Testing Phase: 2 weeks
- Implementation and MVP Phase: 2 weeks
- Final Integration and Testing Phase: 1 week

These timelines are subject to adjustment based on feedback, technical challenges, and other project requirements.

This revised project proposal and plans incorporate innovative solutions aimed at addressing the identified challenges. By integrating augmented reality technology directly into the shopping cart, we aim to enhance the overall shopping experience, providing customers with seamless navigation, access to comprehensive product information, personalized recommendations, and interactive engagement opportunities.

Link to the presentation shared with sponsors:

https://drive.google.com/file/d/1efV0G866yBWtKynfkK8sf_gDf1bP0OvU/view?usp=drive_link

2.2 Internal and External Meeting Reports:

These reports encapsulate the discussions and conclusions reached in both internal team meetings and meetings with external stakeholders. They offer comprehensive insights into the progress of the project, the challenges encountered, and the subsequent steps to be taken.

Internal Team Meetings-

We conducted daily online stand-up meetings from Monday to Saturday. These sessions were aimed at assigning new tasks, reviewing the progress of ongoing tasks, addressing any challenges encountered, and collaboratively finding solutions.

Proof: https://drive.google.com/file/d/1S0ti3k9AUdqLL4Xchwh6_1xPl8oBa0Os/view?usp=drive_link

In instances where certain challenges proved particularly complex, we convened in-person meetings with all team members to collectively tackle the issue and find a resolution. Here are the reports for those meetings:

February 28, 2024

Attendance: Jayati Sakervala, Akshat Rami, Abhishek Solanki, Tirthkumar Patel, Meet Patel, Rutul Dave, Nishant Jethva, Vatsal Mori

Agenda:

- Evaluate proposed solutions.
- Select final solution.
- Allocate implementation tasks.
- Determine next steps.

Summary:

Following the evaluation of proposed solutions, the team collectively decided on the most viable option. Subsequently, tasks were allocated to team members for the implementation of the chosen solution. With the solution in place, the team outlined the next steps to be taken to ensure successful execution and project progression.

March 12, 2024

Attendance: Jayati Sakervala, Akshat Rami, Abhishek Solanki, Tirthkumar Patel, Meet Patel, Rutul Dave, Nishant Jethva, Vatsal Mori

Agenda:

- Project Setup in everyone's laptop.

Summary:

The team successfully discussed and finalized the software and tools required for setting up the project on each team member's laptop, ensuring uniformity and compatibility. A clear step-by-step procedure was established for the setup. Upon completion, verification confirmed that the project setup was successful on all laptops, ensuring that every team member has the necessary resources to commence work on the project.

March 30, 2024

Attendance: Jayati Sakervala, Akshat Rami, Abhishek Solanki, Tirthkumar Patel, Meet Patel, Rutul Dave, Nishant Jethva, Vatsal Mori

Agenda:

- Gamification feature.
- Train model for product detection.
- Integrate work done by all team members.

Summary:

The team focused on training a model for product detection, a crucial aspect of the project's functionality. Additionally, work was done on the gamification feature but we weren't able to create a complete AR game. Finally, emphasis was placed on seamlessly integrating the diverse contributions of team members.

April 4, 2024

Attendance: Jayati Sakervala, Akshat Rami, Abhishek Solanki, Tirthkumar Patel, Meet Patel, Rutul Dave, Nishant Jethva, Vatsal Mori

Agenda:

- GPS for store navigation.
- Gamification feature.
- Indicate owned ingredients for recipes.

Summary:

The team focused on implementing GPS feature for in-store navigation, create a scavenger hunt game using AR, and adding a feature of the indication of owned ingredients for recipes.



Fig 1: Internal Meeting Image - 1

April 5, 2024

Attendance: Jayati Sakervala, Akshat Rami, Abhishek Solanki, Tirthkumar Patel, Meet Patel, Rutul Dave, Nishant Jethva, Vatsal Mori

Agenda:

- GPS for store navigation.
- Gamification feature.

- Final Integration and Testing of product.

Summary:

The team gathered to do final integration and testing of the product developed.



Fig 2: Internal Meeting Image - 2

External Sponsor and Stakeholder Meeting Reports-

February 15, 2024

Attendance: Jayati Sakervala, Akshat Rami, Sabrina Amraoui, Taher Yacoub

Agenda:

- Introduction and Welcome
- Review of Problem
- Presentation of Proposed Solutions
- Discussion on Proposed Solutions
- Seeking Your Valuable Feedback
- Next Steps and Action Items

Summary:

The meeting involved me and my associate lead presenting a solution to transform the retail experience. We proposed using kiosks, online orders, a mobile app, and a loyalty program. Taher Yacoub questions the novelty and effectiveness of the solutions, suggesting they're not revolutionary and don't address their initial problem. We acknowledge the feedback and express willingness to find better solutions, asking about customer numbers to tailor their approach.

March 1, 2024

Attendance: Jayati Sakervala, Akshat Rami, Aznam Yacoub, Sabrina Amraoui, Taher Yacoub.

Agenda:

- Proof of Concept Presentation

Summary:

During the meeting, we presented a proof of concept aimed at transforming the retail experience. We discussed the problem statement, proposed unique solutions, presented the solution design, and showcased a video demonstration. The proposed solution included creating a mobile application with AR product information, navigation and wayfinding, and gamification for store exploration. Feedback from the sponsors highlighted concerns about practicality and user engagement, prompting discussions on potential improvements, such as incorporating digital screens for non-phone users and considering accessibility for all customer demographics.

March 11, 2024

Attendance: Jayati Sakervala, Akshat Rami, Sabrina Amraoui, Taher Yacoub.

Agenda:

- Introduction to the new approach.
- Discussion on how it addresses the challenges previously identified.
- Any concerns or considerations from sponsor's end.

Summary:

The presentation discussed a new shopping solution integrating augmented reality (AR) in a smart shopping cart. The cart scans products, provides real-time information, offers personalized recommendations, and simplifies checkout. It also assists in creating shopping lists based on recipes and includes gamification elements. The "Smart Buggy" integrates a tablet and cameras for enhanced shopping experience. Feedback emphasized the need for a visual prototype and praised the innovative approach.

March 21, 2024

Attendance: Jayati Sakervala, Akshat Rami, Aznam Yacoub, Sabrina Amraoui, Taher Yacoub, Clair.

Agenda:

- Welcome and Introduction
- Overview of Current Progress
- Demonstration of Product Features
- Feedback and Discussion
- Next Steps and Action Items - Outline of the next steps in the development process.

Summary:

The meeting involved me and my associate lead demonstrating the features (product information by AR overlay, add product to cart by scanning barcode, store navigation, chat bot, recipe suggestions) we had developed till then. Various concerns and questions were raised by the sponsors regarding how the checkout process will work after products are added in the cart, what will we do if the position of product is changed for navigation, what future enhancements can we give after providing the complete product, and product detection if they are not in white background. The meeting ended with them being happy with the progress in product development and with all their questions answered.

March 30, 2024

Attendance: Jayati Sakervala, Akshat Rami, Abhishek Solanki, Aznam Yacoub, Sabrina Amraoui, Taher Yacoub, Clair.

Agenda:

- MVP presentation.

Summary:

During the meeting, the team conducted a live demo of their product, "Smart Buddy". We showcased various features including navigating within the store, product information through AR overlays, scanning products and adding them to cart, recipe suggestions with navigation for the products required for recipe, chatbot integration and checking out. The sponsors addressed questions regarding security measures for checkout and discussed future developments such as gamification, add GPS for navigation, and integrating a feature to indicate owned ingredients for recipes. The meeting concluded positively with gratitude exchanged between team members and sponsors.

These meeting reports serve as vital documentation of the project's journey, ensuring transparency, alignment, and informed decision-making amongst all involved parties.

2.3 Backlogs:

Initial Backlog:

The first backlog we prepared was for the Phase 2 – POC. There were three user stories which we decided for this phase:

1) UI Design: Creating a design of the product with these features - inventory Management: admin view for products (quantity, location), Navigation: Search for product aisle and position, Detailed Product Info: Display name, brand, ingredients, allergens, Search Recommendations: Suggest similar available products, Voice Assistant: Voice search and results.

2) Database Design

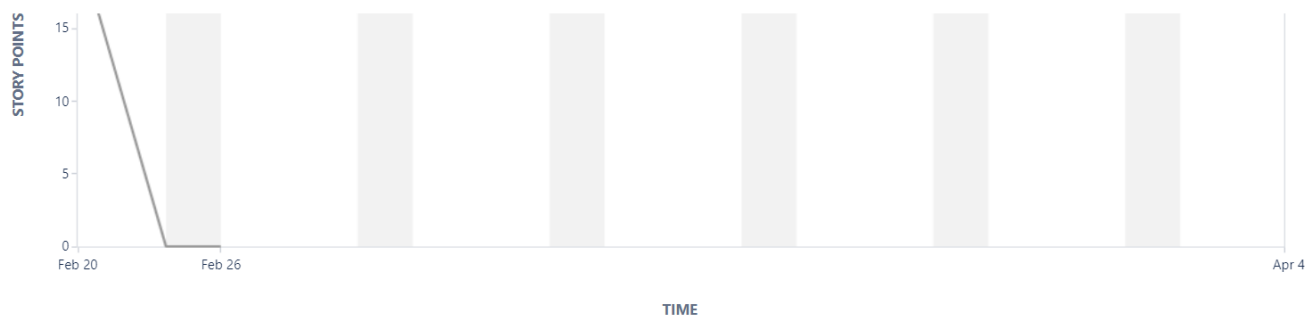
3) AR overlays for Product Information.

<https://jayati.atlassian.net/jira/software/c/projects/POC/boards/1/reports/sprint-retrospective?sprint=1>

Projects / Phase2 POC / POC board / Reports

Sprint Report

▼ How to read this chart



Status Report

Completed Issues

[View in Issue Navigator](#)

Key	Summary	Issue Type	Priority	Status	Story Points (4)
POC-1	UI Design	Story	High	DONE	2
POC-7	Database Design	Task	Highest	DONE	2

Fig 3: Jira Backlog - 1

Second Backlog:

The second backlog we prepared was for the Phase 2 – Prototype. There were six user stories which we decided for this phase:

1) Detailed AR Overlays

2) Add Product to cart by Barcode

3) Recipe Suggestions

4) AR Recommendation

5) Virtual Shopping Assistant (Chatbot)

6) Integration & Testing

<https://jayati.atlassian.net/jira/software/projects/PRO/boards/3/reports/burndown?source=overview>

Select Sprint 1 and Sprint 2

Issues

The screenshot displays the Jira Backlog interface. At the top, there are navigation tabs: 'Apps', 'Share', 'Export issues', 'LIST VIEW', and 'DETAIL VIEW'. Below these is a search bar and a filter section with 'Project', 'Type', 'Status', 'Assignee', 'Key', and 'More' buttons. The main content area shows a list of issues on the left and a detailed view of a selected issue on the right.

Issue List:

- Implement Recipe-Based Shopping List and Meal Suggestions (PRO-5, T)
- Implement AR-Based Automatic Price Calculation in Shopping Cart (PRO-3, RD)
- Implement AR Overlays for In-Depth Product Information in Shopping Cart (PRO-1, AS)

Issue Details (PRO-8 / PRO-5):

Title: Implement Recipe-Based Shopping List and Meal Suggestions

Description: To enhance the cooking experience and provide meal inspiration to users, we propose implementing the ability for users to input a recipe they want to make and generate a shopping list based on the ingredients needed. Additionally, we will suggest recipes based on the items purchased to inspire users with meal ideas using their recent purchases.

Tasks:

- Design the user interface for inputting a recipe and displaying the generated

Comments:

JS: Add a comment...

Pro tip: press **M** to comment

Details Panel:

- Assignee: Tirth Patel (T)
- Labels: None
- Parent: NEW (PRO-8 Create Prototype)
- Story point estimate: 2

Fig 4: Jira Backlog - 2

The screenshot displays the Jira Backlog interface. At the top, there are navigation tabs: 'Apps', 'Share', 'Export issues', 'LIST VIEW', and 'DETAIL VIEW'. Below these is a search bar and a filter section with 'Project', 'Type', 'Status', 'Assignee', 'Key', and 'More' buttons. The main content area shows a list of issues on the left and a detailed view of a selected issue on the right.

Issue List:

- Integrate Virtual Shopping Assistant into Shopping Cart (PRO-4, N)
- Implement AR Recommendations for Cross-Selling in Shopping Cart (PRO-2, VM)

Issue Details (PRO-8 / PRO-4):

Title: Integrate Virtual Shopping Assistant into Shopping Cart

Description: To enhance the shopping experience and provide personalized assistance to customers, we propose integrating a virtual shopping assistant into the shopping cart. The assistant will offer personalized product recommendations, provide step-by-step navigation to find products, answer customer queries, and offer assistance throughout the shopping journey.

Tasks:

- Research and select suitable technologies for developing the virtual

Comments:

JS: Add a comment...

Pro tip: press **M** to comment

Details Panel:

- Assignee: Njethva78 (N)
- Labels: None
- Parent: NEW (PRO-8 Create Prototype)
- Story point estimate: 2

Fig 5: Jira Backlog - 3

Third Backlog:

The third backlog we prepared was for the Phase 2 – MVP. There were seven user stories which we decided for this phase:

- 1) Gamification
- 2) Map creation for navigation
- 3) Dashboard
- 4) Product Detection by image recognition
- 5) Access To Cart Page
- 6) More AR Overlays for Product Information
- 7) Integration

Sprint 3

Projects / Smart Buggy

Backlog

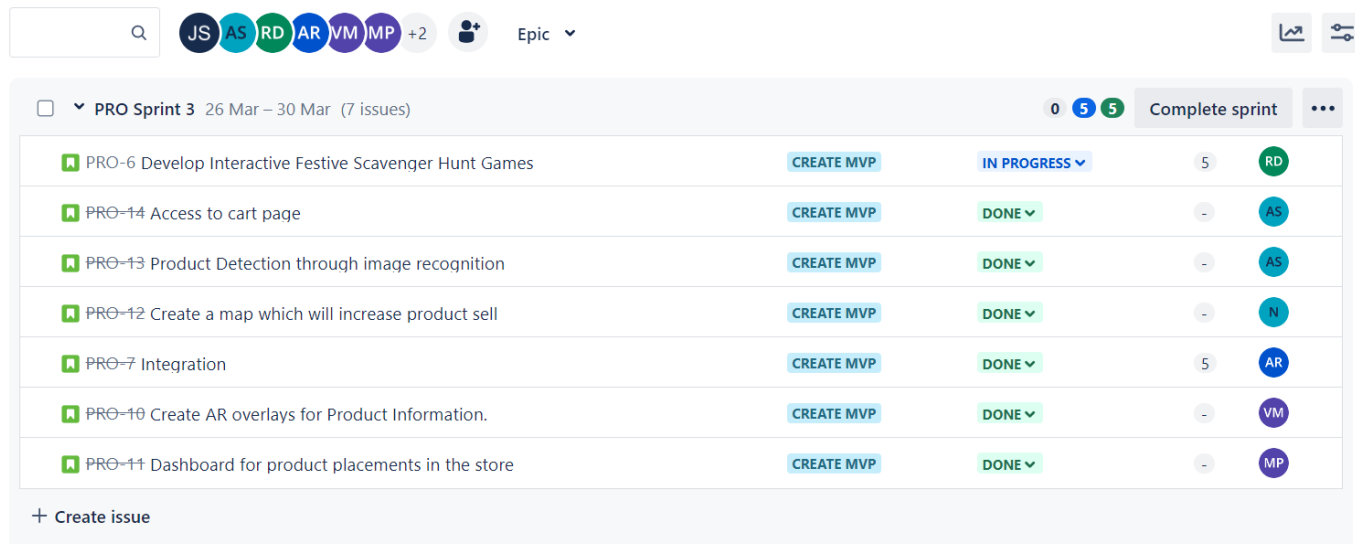


Fig 6: Jira Backlog - 4

2.4 Links to Records:

- Kitchenham, B., Pfleeger, S. L., Pickard, L. M., Jones, P. W., Hoaglin, D. C., El Emam, K., & Rosenberg, J. (2002). "Preliminary guidelines for empirical research in software engineering". IEEE Transactions on Software Engineering, 28(8), 721-734.
- Prasad, K. V. S., Karthik, K., Kumar, O. C., Prathiksha, B. S., & Salimath, K. (2023, December). Smart Shopping Trolley with Automated Billing. In IOP Conference Series: Materials Science and Engineering (Vol. 1295, No. 1, p. 012008). IOP Publishing.
- Álvarez Márquez, J. O., & Ziegler, J. (2023). Creating Omni-Channel In-Store Shopping Experiences through Augmented-Reality-Based Product Recommending and Comparison. International Journal of Human-Computer Interaction, 1-26.
- Danee, R., Mhatre, J., Raje, Y., Huddedar, S., & Pujari, V. (2023, April). Navigating the Aisles: An Augmented Reality Solution for Gamified Indoor Grocery Store Navigation. In International Conference on Information and Communication Technology for Intelligent Systems (pp. 419-426). Singapore: Springer Nature Singapore.
- Kang, J. Y. M., Kim, J. E., Lee, J. Y., & Lin, S. H. (2023). How mobile augmented reality digitally transforms the retail sector: examining trust in augmented reality apps and online/offline store patronage intention. Journal of Fashion Marketing and Management: An International Journal, 27(1), 161-181.
- <https://www.forbes.com/sites/pamdanziger/2023/08/03/smart-carts-may-bethe-disruptive-technology-grocery-stores-need-now/?sh=7fc3114a4588>

2.5 Evidence of Email Communication:

Here, is the link to the evidence for the email communications we did with the sponsors and stakeholders:

https://drive.google.com/drive/folders/1XCSYzLgIIDO3JRXIjIDvKy7eFZ8tQxbz?usp=drive_link

2.6 Evidence of Making Appointments:

Here, is the link to the evidence for the appointments we took with the sponsors and stakeholders:
https://drive.google.com/drive/folders/1yaE035G6u2qs6HWKMKmWJpef81liv0hR?usp=drive_link

3. Development Documents

3.1 Provisional and Effective Planning

TASK	START DATE	END DATE	TASK DESCRIPTION	TASK ANALYSIS	PROVISIONAL ASSIGNEE
POC Task					
UI Design	Feb 20, 2024	Feb 23, 2024	Design of our product UI in Figma.	Success	Rutul Dave, Tirth Patel & Nishant Jethva
Database Design	Feb 20, 2024	Feb 23, 2024	Design of our database in MongoDB	Success	Akshat Rami & Jayati Sakervala
Basic AR Overlays (Product information)	Feb 20, 2024	Feb 29, 2024	Created AR overlays for few products to get their information.	Success	Abhishek Solanki, Vatsal Mori & Meet Patel
Prototype Task					
Detailed AR Overlays	March 08, 2024	March 13, 2024	Created AR overlays for more products to get their information.	Success	Abhishek Solanki & Meet
Add Product by Barcode	March 08, 2024	March 14, 2024	Add the product in the cart by scanning their barcode.	Success	Rutul Dave
Recipe Suggestions	March 08, 2024	March 12, 2024	Give recipe suggestions for particular food items.	Success	Tirth Patel

AR Recommendation	March 08, 2024	March 13, 2024	Give recommendation based on products added in cart.	Success	Vatsal Mori
Virtual Shopping Assistant (Chatbot)	March 08, 2024	March 12, 2024	Created a chatbot to give answers to customer's questions.	Success	Nishant Jethva
Integration & Testing	March 13, 2024	March 14, 2024	Integrated all the features created till now and tested them.	Success	Abhishek Solanki & Meet Patel
MVP Task					
Gamification	March 18, 2024	NA	In progress with creating AR scavenger hunt game.	Failure – Getting errors while creating AR elements.	Rutul Dave & Tirth Patel
Navigation	March 18, 2024	March 29, 2024	Created a map to give directions within the store.	Success	Nishant Jethva
Dashboard	March 18, 2024	March 29, 2024	Created dashboard for admin to manage products.	Success	Meet Patel
Product Detection	March 18, 2024	March 29, 2024	Detect product by using image recognition and adding them to cart.	Success	Abhishek Solanki & Meet Patel
Access To Cart	March 26, 2024	March 29, 2024	A scanner page to scan the user's card to access the cart.	Success	Abhishek Solanki
More AR Overlays	March 26, 2024	March 29, 2024	Created AR overlays for more products to get their information.	Success	Vatsal Mori
Integration	March 29, 2024	March 30, 2024	Integrated all the features created till now and tested	Success	Abhishek Solanki & Tirth Patel

			them.		
Production & Operations (Final Phase)					
Gamification	April 01, 2024	April 05, 2024	In progress with creating AR scavenger hunt game.	Success	Abhishek Solanki, Rutul Dave & Meet Patel
GPS Navigation	April 01, 2024	April 05, 2024	Integrating GPS within the map of store for navigation.	Success	Vatsal Mori & Tirth Patel
Updating Recipe Feature	April 01, 2024	April 05, 2024	Added option to select ingredients which the customer already has.	Success	Nishant Jethva
Final Integration	April 05, 2024	April 06, 2024	Integrated all the features created till now and tested them.	Success	Abhishek Solanki & Vatsal Mori

Table 1: Provisional and Effective planning.

4. Requirement Specifications Document

4.1 Functional requirements

AR Overlays in Shopping Carts:

- Enable AR overlays in shopping carts to provide instant access to product details.
- Ensure compatibility with mobile devices to support seamless integration and accessibility for users.
- Implement AR features that allow users to view product information by pointing their device camera at items in the store.

AI-Powered Personalized Recommendations:

- Develop AI algorithms to analyze user preferences and shopping history.
- Provide personalized product recommendations based on AI analysis.
- Enable users to opt-in or opt-out of personalized recommendations to respect privacy preferences.

Streamlined Checkout Process:

- Utilize AI algorithms to automatically scan items in the shopping cart during checkout.
- Implement secure payment processing mechanisms to facilitate smooth and secure transactions.

Virtual Shopping Assistant:

- Integrate a virtual shopping assistant to guide users through the shopping experience.
- Enable the assistant to answer queries about products, promotions, and store layout.
- Implement a feature for the assistant to suggest recipes based on purchased items.

Navigation Map:

- Develop a navigation map feature to help customers locate specific products within the store.

- Enable users to input a product name or category and receive directions to its location.

Interactive Games:

- Integrate interactive games to enhance customer engagement and promote new products.
- Design games that encourage users to explore different sections of the store and interact with featured products.

4.2 Non-Functional Requirements

Performance:

- Ensure fast loading times for AR overlays and virtual shopping assistant responses.
- Implement efficient algorithms to handle personalized recommendations and checkout processes seamlessly.

Security:

- Implement robust security measures to protect user data and payment information.
- Utilize encryption protocols for secure communication between the app and backend servers.

Usability:

- Design an intuitive user interface for easy navigation and interaction.
- Provide clear instructions and guidance for using AR features, virtual shopping assistant, and interactive games.

Scalability:

- Design the system architecture to accommodate a large number of users and store locations.
- Implement scalable backend infrastructure to handle increased traffic during peak shopping periods.

4.3 Constraints

Hardware Compatibility:

- Ensure compatibility with a wide range of mobile devices to maximize accessibility for users.

Network Connectivity:

- Require a stable internet connection for accessing AR overlays, AI algorithms, and backend services.

4.4 Regulatory Compliance

Privacy Regulations:

- Comply with data privacy regulations such as GDPR and CCPA.
- Obtain user consent for collecting and processing personal data for personalized recommendations.

4.5 Documentation Requirements

User Manual:

- Provide a comprehensive user manual detailing how to use the AR features, virtual shopping assistant, navigation map, and interactive games.

Technical Documentation:

- Document the system architecture, API specifications, and implementation details for developers and IT administrators.

5. Testing Plan and Test Results

In conducting the software testing phase, black box testing methodologies were employed extensively. This approach enabled an unbiased examination of the system's functionalities without delving into its internal structures, ensuring a thorough assessment from an end-user perspective. By focusing solely on inputs and outputs, black box testing allowed for comprehensive validation of the software's behavior against specified requirements and use cases. Through this method, critical issues were identified and rectified, contributing to the overall enhancement of the software's reliability and performance. Features with possible test cases:

5.1 Product Information

In the feature “product information”, once the user clicks on icon, a window will open where the user can scan the product for AR overlay which gives the user AR information.

Test Case - A

Specification: If the user clicks on the "Product Information" feature icon

Pre-conditions: The application is pre-installed in the device.

Steps:

1. Start the device in which the application is present.
2. Navigate to the screen where the application is present.
3. "Click" on the application to start it.
4. Once the application has started, "click" on the feature named “Product Information”.

Expected Output: It opens product scanning window.

Actual Output: It opens product scanning window.

Test Case - B

Specification: If a user places a product in-front of the scanner (camera)

Pre-conditions: The application “Smart Buggy” has started and is running. The feature “product information” is opened. The product scanning window where the camera input is opened.

Steps:

1. Take the product you want to get information for.
2. Place it in-front of the camera scanner.

Expected Output: The AR information will be displayed on the product.

Actual Output: The AR information will be displayed on the product.

Test Case - C

Specification: If a user does not do anything (no clicking / no physical interaction with the application and the feature/device)

Pre-conditions: NA

Steps: NA

Expected Output: There will be no change in the application.

Actual Output: There will be no change in the application.

Test Case - D

Specification: If a user suddenly minimizes the application when a feature is open, and then if he/she opens the application again.

Pre-conditions: The device has started and is running. The application has started and is running. Any one feature is opened.

Steps:

1. Directly click on the home button to minimize the application and go to the home page of the device.
2. Once again navigate to the application and open it again.

Expected Output: The window that will open will be the feature window.

Actual Output: The window that will open will be the feature window.

Test Case - E

Specification: If a user suddenly closes the application when a feature is open, and then if he/she opens the application again.

Pre-conditions: The device has started and is running. The application has started and is running. Any one feature is opened.

Steps:

1. Directly click on the home button to minimize the application and go to the home page of the device.
2. Once again navigate to the application and open it again.

Expected Output: The window that will open will be the main home window of the application.

Actual Output: The window that will open will be the main home window of the application.

5.2 Navigate Products

In the feature “Navigate Products”, once the user clicks on icon, a window will open where the user can input product name and click on search. Then the user can click on open maps where a map will open and the user can get direction to the selected product.

Test Case - A

Specification: If the user clicks on the " Navigate Products " feature icon

Pre-conditions: The application is pre-installed in the device.

Steps:

1. Start the device in which the application is present.
2. Navigate to the screen where the application is present.
3. "Click" on the application to start it.
4. Once the application has started, "click" on the feature named “Navigate Products”.

Expected Output: It opens the search product window.

Actual Output: It opens the search product window.

Test Case - B

Specification: If the user gives input of current location in the field “from” and “destination”.

Pre-conditions: The application is pre-installed in the device and running. The feature navigate map is running and the fields from and to are visible to the user. User is able to click and type in the fields.

Steps:

1. Click on the field “From” and select your current location in the store.
2. Click on the field “To” and select your destination location for which you need assistance.

Expected Output: A navigation will start and the user can view directions to the selected aisle/product.

Actual Output: A navigation route starts and the user is able to view directions to the selected aisle/product.

Test Case - C

Specification: Once the user moves in the real physical world while the navigation has started.

Pre-conditions: The application is pre-installed in the device and running. The feature navigate map is running and the fields from and to are visible to the user. has given “from” and “to” fields and is able to view the get directions.

Steps:

1. Once the user follows the given path in the navigation to the aisle.

Expected Output: Live location and marker will be updated based on the user location.

Actual Output: Live location and marker will be updated based on the user location.

5.3 Get Recipes

In the feature “Get recipes”, once the user clicks on icon, a window will open where the user can input recipe name and click on search. Then the user can click on any of the suggested list of recipes. Once the user clicks on any of the recipe listed, they will be redirected to a new window where list of ingredients for that recipe will be listed. Along side to the ingredient, if the ingredient is present in the store there will be a button present to open map which will help user to navigate to the product in the store.

Test case – A:

Specification: If the user clicks on the " Get recipes " feature icon

Pre-conditions: The application is pre-installed in the device.

Steps:

1. Start the device in which the application is present.
2. Navigate to the screen where the application is present.
3. "Click" on the application to start it.
4. Once the application has started, "click" on the feature named “Get recipes”.

Expected Output: It should open the search recipe window.

Actual Output: It opens the search recipe window.

Test case – B:

Specification: User searches for recipe name or any keyword related to the recipe.

Pre-conditions: The application is pre-installed in the device. The feature “Get recipe” is already opened. The “Enter recipe name” bar is visible to the user and the user is able to type.

Steps:

1. "Click" on the “Enter recipe name” bar.
2. Once “clicked” user can type in any recipe name or any keyword related to the recipe that they have thought of.

Expected Output: If there are any recipes for the user input, the user will get list of recipes related to the user input.

Actual Output: It gives list of recipes related to the user input. The number of suggested recipes are 5.

Test case – C:

Specification: User inputs invalid characters such as number or special characters.

Pre-conditions: The application is pre-installed in the device. The feature “Get recipe” is already opened. The “Enter recipe name” bar is visible to the user and the user is able to type.

Steps:

1. "Click" on the “Enter recipe name” bar.
2. Once “clicked” user can type in any number or special characters.

Expected Output: There will be no listing of any recipes.

Actual Output: There is no listing in of any recipes.

Test case – D:

Specification: Once the user has “clicked” on any of the listed recipe.

Pre-conditions: The application is pre-installed in the device. The feature “Get recipe” is already opened. The “Enter recipe name” bar is visible to the user and the user has typed a keyword and the list of suggested recipes are visible to the user.

Steps:

1. Once the user has clicked on any of the listed recipes.

Expected Output: The ingredients that are in the recipes are listed.

Actual Output: The ingredients that are in the recipes are listed.

Test case – E:

Specification: User can click on the selected ingredients for their knowledge to keep a track of which ingredients they have taken

Pre-conditions: The application is pre-installed in the device. The feature “Get recipe” is already opened. The “Enter recipe name” bar is visible to the user and the user has typed a keyword and the list of suggested recipes are visible to the user.

Steps:

1. Once the user has clicked on any of the listed recipes.
2. List of ingredients for the selected recipes are listed.

Expected Output: User can select or un-select the ingredients based on whether do they have the ingredient or not.

Actual Output: The function of selecting and un-selecting the ingredients based on whether do they have the ingredients or not.

5.4 Recipes from ingredients

In the feature “Recipes from ingredients”, once the user clicks on icon, a window will open where the user can input ingredients name in comma separated value format and click on search. Once the user clicks search, they will be given the list of recipes which have the ingredients which the user have given input. Along with the recipes they will be given which ingredient they have and what they don’t, based on the search items that they have given input.

Test case – A:

Specification: If the user clicks on the " Recipes from ingredients " feature icon

Pre-conditions: application is pre-installed in the device.

Steps:

1. Start the device in which the application is present.
2. Navigate to the screen where the application is present.
3. "Click" on the application to start it.
4. Once the application has started, "click" on the feature named “Recipes from ingredients”.

Expected Output: It should open the search recipe window.

Actual Output: It opens the search recipe window.

Test case – B:

Specification: User searches for ingredient name related to the recipe in comma separated value.

Pre-conditions: The application is pre-installed in the device. The feature “Recipes from ingredients” is already opened. The “Enter ingredients” bar is visible to the user and the user is able to type.

Steps:

1. "Click" on the “Enter ingredient” bar.
2. Once “clicked” user can type in any ingredient name related to the recipe in comma separated value format (e.g.: ingredient1, ingredient 2, ingredient3, etc.).

Expected Output: If there are any recipes that has ingredients which matches the one the user has given input of, it’ll return those recipes with missing ingredients which they don’t have based on based on the search items that they have given input.

Actual Output: If there are any recipes that has ingredients which matches the one the user has given input of, it’ll return those recipes with missing ingredients which they don’t have based on based on the search items that they have given input.

Test case – C:

Specification: User inputs invalid characters such as number or special characters.

Pre-conditions: The application is pre-installed in the device. The feature “Recipes from ingredients” is already opened. The “Enter ingredient” bar is visible to the user and the user is able to type.

Steps:

1. "Click" on the “Enter ingredient” bar.
2. Once “clicked” user can type in any number or special characters.

Expected Output: There will be no listing of any recipes.

Actual Output: There are no listing in of any recipes.

5.5 Chat with us

In the feature “Chat with us”, once the user clicks on icon, a window will open where the user can converse with the chatbot to get information.

Test case – A:

Specification: If the user clicks on the " Chat with us " feature icon.

Pre-conditions: The application is pre-installed in the device.

Steps:

1. Start the device in which the application is present.
2. Navigate to the screen where the application is present.
3. "Click" on the application to start it.
4. Once the application has started, "click" on the feature named “Chat with us”.

Expected Output: It opens the chat window.

Actual Output: It opens the chat window.

Test case – B:

Specification: If the user clicks on the “Chat with bot” chat bar in the chat window.

Pre-conditions: The application is pre-installed in the device and is running. The feature “Chat with bot” is already running and chat window is visible to the user.

Steps:

1. User “clicks” on the chat bar.

Expected Output: Keyboard opens so the user can type the msg.

Actual Output: Keyboard opens so the user can type the msg.

Test case – C:

Specification: User starts the conversation with any message.

Pre-conditions: The application is pre-installed in the device and is running. The feature “Chat with bot” is already running. Chat window is visible to the user and user is able to chat with the chatbot.

Steps:

1. Once the user inputs “any message” at the start in the chat bar.

Expected Output: The chatbot gives output as “Hello, welcome to our store.” And in next line “how can I help you?”

Actual Output: The chatbot gives output as “Hello, welcome to our store.” And in next line “how can I help you?”

Test case – D:

Specification: If user inputs any message/any question at the start of the chat in the chat bar.

Pre-conditions: The application is pre-installed in the device and is running. The feature “Chat with bot” is already running. Chat window is visible to the user and user is able to chat with the chatbot.

Steps:

1. Once the user inputs “any message” at the start in the chat bar.

Expected Output: The chatbot should any the question if the user has asked any.

Actual Output: The chatbot gives output as “Hello, welcome to our store.” And in next line “how can I help you?”. And it does not answer to the question asked.

Test case – E:

Specification: If user inputs any message/any question after the chatbot has given “Hello, welcome to our store.” And in next line “how can I help you?”.

Input Value: Any question regarding the store/products/discount.

Pre-conditions: The application is pre-installed in the device and is running. The feature “Chat with bot” is already running. Chat window is visible to the user and user is able to chat with the chatbot.

Steps:

1. User types the question in the chat bar.

Expected Output: The chatbot should answer to the question based on the knowledge provided or if it is outside of its knowledge base it’ll answer an AI chatbot.

Actual Output: The chatbot answers to the question based on the knowledge provided or if it is outside of its knowledge base it’ll answer an AI chatbot.

Test case – F:

Specification: Once the chat bot has given an answer, the user will be prompted to “Is there anything else I can help you with?”, the user can select either of the option “Yes” or “No”.

Pre-conditions: The application is pre-installed in the device and is running. The feature “Chat with bot” is already running. Chat window is visible to the user and user is able to chat with the chatbot. User has already asked a question to the chatbot and the chatbot has given reply to the user. User is able to see “Is there anything else I can help you with?”, the user can select either of the option “Yes” or “No”.

Steps:

1. User “clicks” anyone of the options for the suggested “Yes” or “No”.

Expected Output: If the User has “clicked” on the option “Yes”, then the User will be prompted to ask the question. If the User has “clicked” on the option “No”, then the User will be prompted “Would you like to hear any joke or fun fact?”

Actual Output: If the User has “clicked” on the option “Yes”, then the User will be prompted to ask the question. If the User has “clicked” on the option “No”, then the User will be prompted “Would you like to hear any joke or fun fact?” and three options will be prompted to the user “Joke” or “Funfact” or “End”.

Test case – G:

Specification: Once the user has “clicked” “No” for the question “Is there anything else I can help you with?”. The user will be prompted “Would you like to hear any joke or fun fact?” along with three options “Joke” or “Funfact” or “End”.

Pre-conditions: The application is pre-installed in the device and is running. The feature “Chat with bot” is already running. Chat window is visible to the user and user is able to chat with the chatbot. User has already asked a question to the chatbot and the chatbot has given reply to the user. User is able to see “Is there anything else I can help you with?”, the user can select either of the option “Yes” or “No”. User has selected “No” for the question “Is there anything else I can help you with?”. “Would you like to hear any joke or fun fact?” along with three options “Joke” or “Funfact” or “End” is visible to the User.

Steps:

1. User “clicks” anyone of the options for the suggested “Joke” or “Funfact” or “End”.

Expected Output: If the User has “clicked” on the option “Joke”, then the User will be given a joke and the chat will end with the text “Thank you and have a great day”. If the User has “clicked” on the option “Funfact”, then the User will be given a Funfact and the chat will end with the text “Thank you and have a

great day". If the User has "clicked" on the option "End", then the chat will end with the text "Thank you and have a great day".

Actual Output: If the User has "clicked" on the option "Joke", then the User will be given a joke and the chat will end with the text "Thank you and have a great day". If the User has "clicked" on the option "Funfact", then the User will be given a Funfact and the chat will end with the text "Thank you and have a great day". If the User has "clicked" on the option "End", then the chat will end with the text "Thank you and have a great day".

5.6 Scan Products

In the feature "Scan Products", once the user clicks on the icon, a window will open where the user can scan the product through the camera. Once the product is scanned it'll be detected and the product will be added to the cart. Once the product is added to the cart, a dialog box will appear which states to scan another product or return to home screen.

Test case – A:

Specification: If the user clicks on the " Scan Products " feature icon.

Pre-conditions: The application is pre-installed in the device.

Steps:

1. Start the device in which the application is present.
2. Navigate to the screen where the application is present.
3. "Click" on the application to start it.
4. Once the application has started, "click" on the feature named "Scan Products".

Expected Output: It opens the Scan Products window with the camera input.

Actual Output: It opens the Scan Products window with the camera input.

Test case – B:

Specification: If the user places a product in-front of the camera to scan the product the product should be scanned and added to the cart.

Pre-conditions: The application is pre-installed in the device and running. The feature "Scan Products" is running and the camera input window is open and is visible to the user.

Steps:

1. Place/Show/Make it visible and clear enough, the product in-front of the camera input.

Expected Output: The product is scanned, and it is detected and the product is added to cart along with the dialog box to either continue scanning another product or return to home screen.

Actual Output: The product is scanned, and it is detected and the product is added to cart along with the dialog box to either continue scanning another product or return to home screen.

5.7 AR interactive Game

In the feature "AR interactive Game", once the user clicks on the icon, a window will open where the user can play interactive AR game. How to play the game: Once the game loads the user will be able to view all the available treasure chests available nearby in Map view. In the top right corner, there are ellipses on clicking it the listing form will open where the most nearby treasure chest will have option of "open in AR" and for those which are far away there will be an option to "route" which will open the maps direction to those. If the user clicks on the "open in AR" the camera feed will start and there will be treasure chest visible to the user and the user can click on them to retrieve them and gain points. Once the treasure for a location is picked it will disappear from the map and will not be visible to the user.

Test Case – A:

Specification: If the user clicks on the " AR interactive Game " feature icon.

Pre-conditions: The application is pre-installed in the device.

Steps:

1. Start the device in which the application is present.
2. Navigate to the screen where the application is present.
3. "Click" on the application to start it.
4. Once the application has started, "click" on the feature named "AR interactive Game".

Expected Output: It opens the game window.

Actual Output: It opens the game window.

Test Case – B:

Specification: User is able to view all the available treasures nearby in that store and the user is able to view the options "Open in AR" for the nearby treasures and "View Route" for treasures which are far away.

Pre-conditions: The application is pre-installed in the device. User has clicked on the feature "AR interactive game" and it is running.

Steps:

1. As the user has clear view of the map on starting the feature of "AR interactive Game"
2. Once the user "clicks" on top right corner there will appear list for all the treasures.
3. In the list the user is able to view the options "Open in AR" for the nearby treasures and "View Route" for treasures which are far away.

Expected Output: On selecting the option "Open in AR", window will open where the user will be able to view the surrounding in AR and also be able to play the treasure hunt game.

Actual Output: On selecting the option "Open in AR", window will open where the user will be able to view the surrounding in AR and also be able to play the treasure hunt game.

Test Case – C:

Specification: On completing the game, the user will be given a coupon code which the user can use to get additional discounts.

Pre-conditions: The application is pre-installed in the device. The user has clicked on the feature "AR interactive game" and it is running.

Steps:

1. Once the user has completed playing game a dialog box will appear with the points that the user has scored and along with it a coupon code.

Expected Output: The given coupon code can be used to get additional discount.

Actual Output: The given coupon code can be used to get additional discount.

6. Quality Control Document

6.1 Definition of Quality

Internal Quality: Refers to the adherence to project standards, procedures, and methodologies within the project team.

External Quality: Relates to the satisfaction of the client's requirements and the overall effectiveness and performance of the delivered product.

6.2 Observable/Measurable Metrics

Defect Density: Number of defects per size of the product.

Customer Satisfaction Score (CSAT): Surveys conducted to measure client satisfaction.

On-time Delivery: Percentage of deliverables completed within agreed-upon timelines.

Functionality Compliance: Percentage of features implemented correctly.

Accessibility Compliance: Adherence to accessibility standards for users with disabilities.

Usability Metrics: User feedback on ease of navigation, understanding, and interaction.

Accuracy of Recommendations: Percentage of accurate product recommendations provided by the system.

Inventory Accuracy: Discrepancy rate between recorded inventory and actual stock.

6.3 Persons Responsible for Quality:

Quality Assurance Manager: Oversees the implementation of quality standards and procedures.

Project Manager: Ensures that quality requirements are integrated into project planning and execution.

Development Team: Responsible for adhering to coding and development standards.

6.4 Actions to Assess and Evaluate Quality:

Regular Quality Audits: Scheduled inspections to assess compliance with standards.

Peer Reviews: Team members review each other's work to identify defects and ensure adherence to standards.

User Testing: Involving end-users to gather feedback on product usability and satisfaction.

Continuous Integration Testing: Automated testing of code changes to detect defects early in the development process.

Requirement Traceability Matrix: Ensuring that all requirements are met as per the client's specifications.

6.5 Corrective Actions:

Defect Resolution Process: Documented procedure for identifying, reporting, and resolving defects.

Root Cause Analysis: Investigating the underlying reasons for quality issues and implementing preventive measures.

Re-training: Providing additional training to team members where quality issues arise due to skill gaps.

6.6 Documents for Quality Evaluation:

Test Plans and Reports: Test plans detail testing strategies for software functionality, performance, and usability, including objectives, scenarios, test cases, and acceptance criteria. Test reports document testing outcomes, such as defects, coverage, and deviations.

Quality Assurance Checklists: Comprehensive lists of criteria and standards ensure software quality, covering coding standards, documentation completeness, and requirement adherence.

Project Documentation: Includes requirements specifications, design documents, architecture diagrams, and user manuals, providing an overview of project scope, objectives, and implementation.

Code Reviews and Inspection Reports: Peers systematically examine source code to identify defects, improve quality, and ensure coding standards adherence. Inspection reports detail findings and recommendations.

User Feedback and Satisfaction Surveys: Capture user preferences, pain points, and enhancement suggestions to improve overall product quality.

Change Management Documentation: Tracks software modifications, including requirement changes, bug fixes, and feature enhancements, providing a record of project lifecycle changes.

6.7 Evolving the Quality Plan:

Regular Review Meetings: Assessing the effectiveness of quality processes and making necessary adjustments.

Lessons Learned Sessions: Capturing insights from past projects to improve future quality management practices.

6.8 Standards and Regulations:

Coding Standards: Follow industry-standard coding conventions such as those defined by the IEEE or ISO.

Document Standards: Utilize templates for documentation following organizational guidelines.

Accessibility Standards: Adhere to accessibility guidelines such as WCAG (Web Content Accessibility Guidelines).

Development Standards: Use frameworks and methodologies like Agile or Scrum for development.

Regulatory Compliance: Comply with relevant laws and regulations governing the industry.

6.9 Artifact Archiving Process:

Artifact archiving is a critical aspect of project management, ensuring that all project-related documents, codebases, and resources are systematically organized, stored, and accessible throughout the project lifecycle and beyond. The artifact archiving process involves defining protocols and procedures for the creation, storage, retrieval, and management of project artifacts to facilitate collaboration, version control, and knowledge transfer within the team.

Documentation and Code Repository: Establish a centralized repository, such as a version control system (Git), to store all project-related artifacts, including code files, design documents, requirements specifications, test plans, and user manuals. A versioning scheme helps to track changes and updates to artifacts over time systematically.

6.10 Issue Tracking Process:

Utilize issue-tracking tools such as JIRA to log, prioritize, and resolve issues.

6.11 Document Revision Procedures:

All documents undergo version control, with changes tracked and reviewed before approval.

6.12 Verification and Validation Process:

Verification: ensuring that the product meets specified requirements through reviews, inspections, and testing.

Validation: Confirming that the product satisfies the client's needs and expectations through user acceptance testing.

7. Risk Control Document

The risk management plan is divided into two sections: Product Risk and Project Risk, each addressing potential risks associated with the implementation of the project aimed at enhancing the in-store shopping experience for the client's chain of stores.

7.1 Product Risk

7.1.1 Technological Risks:

Risk: Compatibility issues between different technology components.

Mitigation Plan:

- Conduct thorough compatibility testing during the development phase to identify and resolve integration issues.
- Utilize standardized protocols and APIs to ensure interoperability among diverse technology components.

Contingency Plan:

- Maintain close collaboration with technology vendors to address compatibility issues promptly.
- Implement alternative technology solutions or workarounds to mitigate disruptions in case of compatibility failures.

(Scientific Evidence: "Ensuring Interoperability and Compatibility of Technology Components in Complex Systems" - IEEE Transactions on Engineering Management)

7.1.2 Hardware Failure Risks:

Risk: Potential hardware failures in critical components such as the kiosk system, POS system, smart beacons/NFC tags, and cloud-based servers could disrupt operations and affect the overall customer experience.

Mitigation Plan:

- Conduct routine maintenance and proactive monitoring of hardware systems to identify and address potential issues before they escalate.
- Source hardware components from reputable manufacturers with a track record of reliability and durability.

Contingency Plan:

- Maintain a supply of backup hardware components to enable rapid replacement in case of failure, minimizing downtime and service disruptions.

- Establish service level agreements (SLAs) with hardware vendors to ensure prompt response and resolution in the event of hardware failures.
- Implement load balancing and distributed computing strategies to distribute workloads across multiple servers and minimize the risk of service outages.

(Scientific Evidence: "Reliability Engineering Principles for Hardware Systems" - International Journal of Reliability, Quality, and Safety Engineering)

7.1.3 Data Security and Privacy Risks:

Risk: Unauthorized access to customer data leads to breaches of privacy regulations.

Mitigation Plan:

- Conduct regular security audits and vulnerability assessments to identify and remediate potential security loopholes.

Contingency Plan:

- Activate incident response protocols and notify regulatory authorities immediately in case of a data breach or security incident.
- Provide affected customers with timely notifications and support services to mitigate the impact of privacy breaches.

(Scientific Evidence: "Best Practices for Data Security and Privacy Compliance in Retail Environments" - Journal of Information Security)

7.2 Project Risk

7.2.1 Operational Risks:

Risk: Inadequate training of store staff in utilizing new systems and technologies.

Mitigation Plan:

- Design and implement comprehensive training programs tailored to the specific needs and skill levels of store personnel to provide guidance.
- Provide hands-on training sessions and user manuals to facilitate learning and adoption of new technologies.

Contingency Plan:

- Establish a dedicated support hotline or helpdesk to address technical queries and provide on-demand assistance to store staff.
- Deploy experienced trainers or consultants to troubleshoot issues and provide onsite support during the initial rollout phase.

(Scientific Evidence: "Effective Training Strategies for Technology Adoption in Retail Environments" - Journal of Retailing)

7.2.2 Communication Failure Risks:

Risk: Despite the structured communication process outlined, there remains a risk of communication failures which could impede project progress and decision-making.

Mitigation Plan:

- Implement redundant communication channels such as email and phone calls in addition to virtual meetings to ensure information dissemination even in the event of platform failures.
- Conduct regular checks on communication tools and platforms to identify and resolve technical issues proactively.
- Provide training and guidelines to team members on effective communication practices and protocols to minimize misunderstandings and misinterpretations.
- Establish clear escalation paths and alternative contact points for urgent communications to mitigate delays in critical decision-making processes.

Contingency Plan:

- Maintain comprehensive documentation of communication protocols, including contact details and escalation procedures, to facilitate swift resolution of communication breakdowns.
- Utilize backup communication platforms or secondary channels as contingency measures in case of prolonged disruptions to primary communication channels.
- Implement real-time monitoring and alerting systems to detect and address communication failures promptly.
- Conduct post-mortem analyses following communication breakdowns to identify root causes and implement preventive measures for future incidents.

(Scientific Evidence: "Understanding the Impact of Communication Failures on Development and Productivity" - Journal of Software Engineering Research and Development)

7.2.3 Resource Constraints:

Risk: Inadequate availability of human resources, including team members with specialized skills or domain knowledge, may lead to project delays or compromised quality.

Mitigation:

- Conduct a thorough assessment of resource requirements at the project outset and allocate resources accordingly.
- Cross-train team members to mitigate dependencies on individuals with specialized skills.
- Explore outsourcing options or hiring additional resources to supplement internal capacity.

Contingency:

- Implement agile resource management strategies to reallocate resources dynamically based on changing project needs.
- Prioritize critical tasks and deliverables to ensure optimal resource utilization in case of constraints.

(Boehm, B., & Turner, R. (2003). Balancing Agility and Discipline: A Guide for the Perplexed. Addison-Wesley Professional.)

7.2.4 Scope Creep:

Risk: Uncontrolled expansion of project scope due to evolving requirements or stakeholder expectations may lead to schedule overruns and budgetary constraints.

Mitigation:

- Establish clear and well-defined project scope boundaries through detailed requirement elicitation and stakeholder engagement.
- Implement change control processes to evaluate and approve proposed scope changes based on predefined criteria.
- Conduct regular reviews of project scope against defined objectives to identify and address potential scope creep early.

Contingency:

- Prioritize deliverables based on project objectives and critical success factors to accommodate changes within available resources and timelines.
- Negotiate with stakeholders to defer non-essential scope changes to subsequent project phases to maintain project focus and alignment with strategic goals.

(Wysocki, R. K. (2011). Effective Project Management: Traditional, Agile, Extreme. John Wiley & Sons.)

8. Source Code

8.1 Git Repository

- <https://github.com/jayati2031/Transforming-Retail-Experience>

8.2 Code Documentation

- Link to our Code Documentation: <https://drive.google.com/drive/folders/1Kk-a--fuPRSXPIe5NS7LafFPLAxKYkp?usp=sharing>

9. Deployment of our application

We have decided to exclusively deploy our application within our sponsor's chain of stores, ensuring a tailored experience for our valued customers. This means our application will not be available on the App Store. We are excited to offer a unique, in-store experience designed specifically for our customers. Our dedicated team of engineers will expertly install and deploy the application across all devices utilized in the shopping carts.

10. User Manual

This is the link to our “Smart Buggy” User Manual: https://drive.google.com/file/d/1Tj3nByCuP-_OfX2-ea5teCM8vHyzaY7N/view?usp=drive_link

11. Conclusion

The team's solution transforms shopping carts with augmented reality (AR) technology, allowing users to easily access product details by pointing their device at items. AI algorithms enhance the experience by offering personalized recommendations. The checkout process is streamlined with automatic item scanning, saving time and reducing errors.

A virtual shopping assistant guides users, answers questions, and suggests recipes based on purchases. A navigation map helps locate products, especially useful in large stores. Interactive games within the system entertain shoppers and offer rewards, like discounts, enhancing engagement. In summary, the solution integrates AR, AI, and interactive elements to provide a personalized, convenient, and enjoyable shopping experience, revolutionizing traditional shopping.

The idea of a "just walk out" retail experience can be used in the future. Providing a seamless shopping experience is the idea behind this, allowing customers to enter the store, select the things they want, and leave without having to go through the typical checkout procedure. This is how it operates:

Entry: To enter the business, customers utilize the app. At the entry gates, a special QR code created by the app is scanned.

Shopping: Following that, patrons are free to peruse the store and take any merchandise they like to buy. Together with a selection of food and drink goods, the stores usually include a few necessities for the home.

Checkout: The store's cameras and sensors watch the things that consumers pick up as they take them off the shelf. The products are immediately added to the user's virtual cart within the application.

Exit: Consumers just walk out of the store after doing their purchasing. The customer's account gets billed by the app for the products they removed, and the app receives a receipt.