UNIVERSITY OF
PLYMOUTH

In collaboration with Peninsula College

School of Technology & Engineering

BSc (Hons) Computer Science (Cyber Security)

(N/0613/6/0002)(04/2027)(MQA/PA15604)

MAL2017 – Software Engineering 2

Author:

BSCS2509254

Module Leader:

Dr. Ang Jin Sheng

Nov 19, 2025

Table Of Contents

Word Count : 1389 words

Code Repository

Github

https://github.com/Plymouth-COMP2000/design-exercises-OoiWeiChyeh.git

Low-Fidelity (Canva)

https://www.canva.com/design/DAG6g8jThn8/U2v1xyFAD7EnbmmBRLVHBA/view?utm_content=DAG6g8jThn8&utm_campaign=designshare&utm_medium=link2&utm_source=uniquelinks&utlId=h572047dd79

Prototype Presentation

https://youtu.be/iyMUmvct10Y

Introduction

About coursework, it tackles the design and implementation of a mobile restaurant management app built for two very different users: staff who need to handle day-to-day operations and guests looking to browse menus and book tables. The design come through usability testing with candidates which helped find and suggest problems people face with restaurant systems. Final implementation are following HCI (Human-Computer Interaction) principles and standard Android development patterns that still can refine better.

Exercise 1: Context of Use and User Analysis

1.1 Understanding the Context

Restaurant chain is looking to run operations better through a mobile application that serves two different user groups. The context here is pretty straightforward like restaurant are busy environments where efficiency very important and customer are expecting convenience of mobile.

Primary User:

I. Staff
   a. People that working front-of-house or in management who deal with daily operations.
   b. Need quick access to dashboard and reservation.
   c. Work environment is typically fast-paced, sometimes chaotic during peak hours.
   d. Might be using the app while standing, moving around or multitasking.
   e. Some staff may be very comfortable with mobile, while others might need more intuitive interface.

II. Guest
   a. Group is quite diverse in terms of age, tech-savviness and dining preferences.
   b. Looking for convenience when browsing menus and making reservations.
   c. Usage patterns will likely be different like some browse from home, others might be making last minute booking while on the go.
   d. Expect smooth , frustration-free experience when using the app

1.2 Environmental Considerations

The usage environment matters quite a bit here. Staff probably use the app in noisy, bright restaurant where quick glances at the screen are more common then prolonged focus. Network connectivity could be spotty in some areas of restaurant. Meanwhile, guest might user the app in various settings like different devices or resolution e.g. Phone, Tablet and Personal Computer(PC).

1.3 User Pain Points

From staff perspective, the main point appear to be around managing changing menu items like items running out and keeping track of reservations without duplicate bookings or miscommunication.

For guest, the frustration normally come from unclear availability, difficulty modify bookings or lack of transparency about reservation status. Nobody likes showing up to find their reservation wasn't properly recorded.

1.4 Technical Context

Both users must authenticate before accessing features which add security layer but also potential friction point. However, the local database for menus and reservations is a smart choice which means app can function even with unstable connectivity.

Besides, notification is interesting because it's optional. Some users will want every update but somehow someone might find constant pings annoying.

Exercise 2: Low-Fidelity Prototype and Storyboard

2.1 Design Philosophy

Interface needs to balance simplicity with functionality. Staff need speed and clarity. Moreover, guest want something pleasant to look at but straightforward enough. Thus, few principles guided the sketches like clear text labels instead of cryptic icons. Take Fitt's Law in case, larger buttons for key actions like "Confirm" (Preikstas and Schofield, 2025). Next, early introduction of colour tags for reservation. At last, repeated layout patterns so user don't feel like every interface is new puzzle.

2.2 Story Board

Figure 1 : Staff Storyboard

Figure 2 : Guest Storyboard

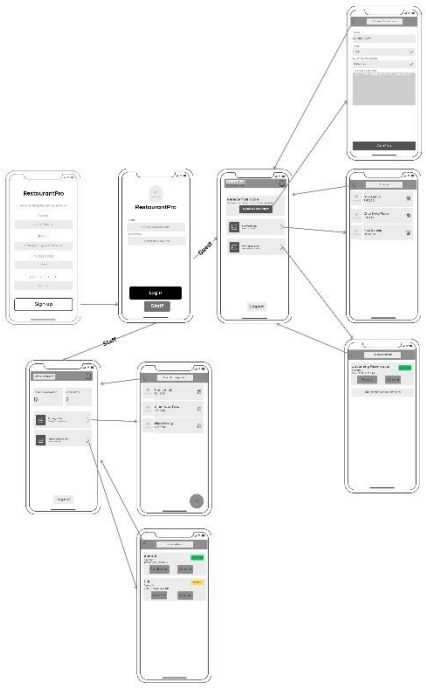

Figure 3 : Low-Fidelity of prototype (Link provided in Code Repository)

Exercise 3: Formative Usability Evaluation

3.1 Method

A paper-based think aloud test was used, partly because the design was in flux and it's easier to response when everything is still sketch level. I presented drawed screens and switched them manually as participants navigated through tasks. The consent form is included in the appendices.

3.2 Participants

Participant 1 – Staff in The Ship Campus (TSC) Windjammer Café

Figure 4 : Paper-based User Testing - Staff

i. Familiar with real reservation workflows
ii. Had never seen the prototype before
iii. Focused heavily on speed and clarity

Participant 2 – University Student

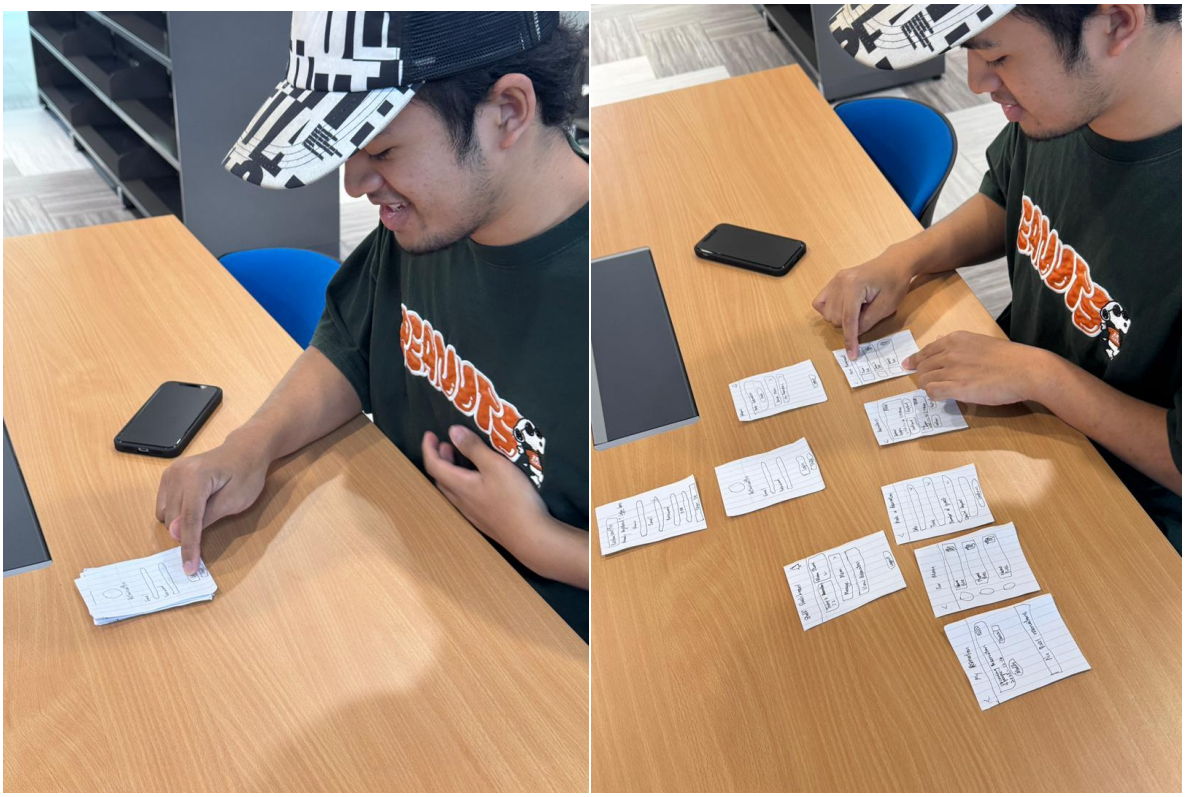

Figure 5 : Paper-based User Testing - Guest

i. Fits the guest-user profile
ii. Regular user of food booking apps
iii. More attentive to layout, spacing, and general “feel”

3.3 Key Observations & User Quotes

1) From Staff
    a. Worried the reservation list “would get messy during the lunch rush.”
    b. Felt the “Add Menu Item” button was too easy to overlook.
    c. Liked the idea of colour coding: “I can spot urgent ones quickly.”
2) From Student
    a. Found “Modify Reservation” too vague and preferred straightforward wording like “Edit Booking.”
    b. Wanted clearer feedback when a booking is confirmed (“a tick, maybe a coloured flash”).
    c. Mentioned the time selector feeling cramped on the sketch.
3) General Notes
    a. Both users struggled a bit with inconsistent spacing between screens.
    b. Both expected icons for main navigation items.
    c. The test made it obvious which labels didn’t match user expectations.

3.4 Identified Issues

After user testing sessions with participants, it was few issues I concluded like ambiguous terminology (“Modify”). Next, small or poorly positioned buttons for key actions. Last, lack of filtering or sorting tools for staff bookings with uneven spacing between UI elements.

Exercise 4: Redesigned User Interfaces

Based on the usability testing feedback from both participants, I've made several changes to address the issues they encountered. Here's what changed and why:

Interface Element	Initial Design (Exercise 2)	Issues Identified	Redesigned Solution	Rationale
Login Screen	Separate login pages for Staff and Guest	Not explicitly tested, but violates Occam's Razor principle	Single unified login page that routes users automatically based on credentials	Simpler user experience - users don't need to remember which
Add Menu Item Button	Standard-sized button mixed with other UI	Staff participant noted it was "too easy to overlook"	Extended Floating Action Button (FAB) with text label "Add Menu Item"	Always visible while scrolling, uses both icon and text for clarity. FAB's
Reservation Status Indicators	Text-only status labels	Staff wanted faster visual scanning during "lunch rush"	Color-coded vertical bars + status badges (green=confirmed, yellow=pending,	Immediate visual recognition without reading text. Staff mentioned: "I can
Modify Reservation Label	Button labeled "Modify Reservation"	Student participant found it "too vague"	Changed to "Edit Booking"	More direct language that matches user expectations. "Edit" is a common term
Time Selector	Basic text input field in sketch	Student mentioned it felt "cramped"	Native Android TimePicker dialog with large touch targets	Prevents input errors, faster than typing, follows platform conventions
Booking Confirmation Feedback	Simple text confirmation	Student wanted "a tick, maybe a coloured flash"	Added visual confirmation with success icon and brief animation	Provides immediate feedback that action completed successfully
Reservation List Spacing	Inconsistent margins in paper prototype	Both users "struggled with inconsistent spacing"	Standardized 16dp padding throughout, consistent card heights	Creates visual rhythm, easier to scan quickly
Navigation Icons	Some screens used text-only navigation	Both users "expected icons for main navigation items"	Bottom navigation with clear icons (Dashboard, Menu, Reservations, Profile)	Industry standard pattern, reduces cognitive load
Filter/Sort Options	Not present in initial design	Staff mentioned list "would get messy during lunch rush"	Added chip filters for status and search bar at top	Allows quick filtering without leaving the screen

Figure 6 : Comparison of Initial vs. Redesigned Interfaces

4.1 Updated Storyboard

The storyboard narratives remain largely the same as Exercise 2, but with visual updates reflecting the redesigned interfaces:

1. **Staff Flow**: Wayden logs in through the unified login, sees the improved dashboard with color-coded metrics and uses the prominent FAB to quickly add menu items during the morning setup
2. **Guest Flow**: Farah logs in, browses the visually appealing menu with large food images, and makes a reservation using the streamlined form with native pickers

The core user journeys haven't changed, but the interactions should feel smoother and more polished.

Exercise 5: High-Fidelity Android UI Implementation

I've implemented the high-fidelity UI for the Staff user type in Android Studio on creating production-ready layouts that follow Material Design principles while incorporating all the feedback from Exercise 3. Simplicity is the key. So, by using the principle of Occam's razor here. For example, how WordPress and other CMS are not distinguished login types: There is a single log-in page and everyone gets to the page that corresponds to their user role I've structured everything using XML layouts with ConstraintLayout as the base, which gives good performance and flexibility for different screen sizes.

5.1 Color Palette Implementation

Following the provided scheme (F4E7E1, FF9B45, D5451B, 521C0D), I created semantic color names in colors.xml:

a) Primary cream for backgrounds
b) Orange for call-to-action buttons and highlights
c) Red for important actions (like delete)
d) Deep brown for text and headers

5.2 Key Layouts Created

1. Login Activity

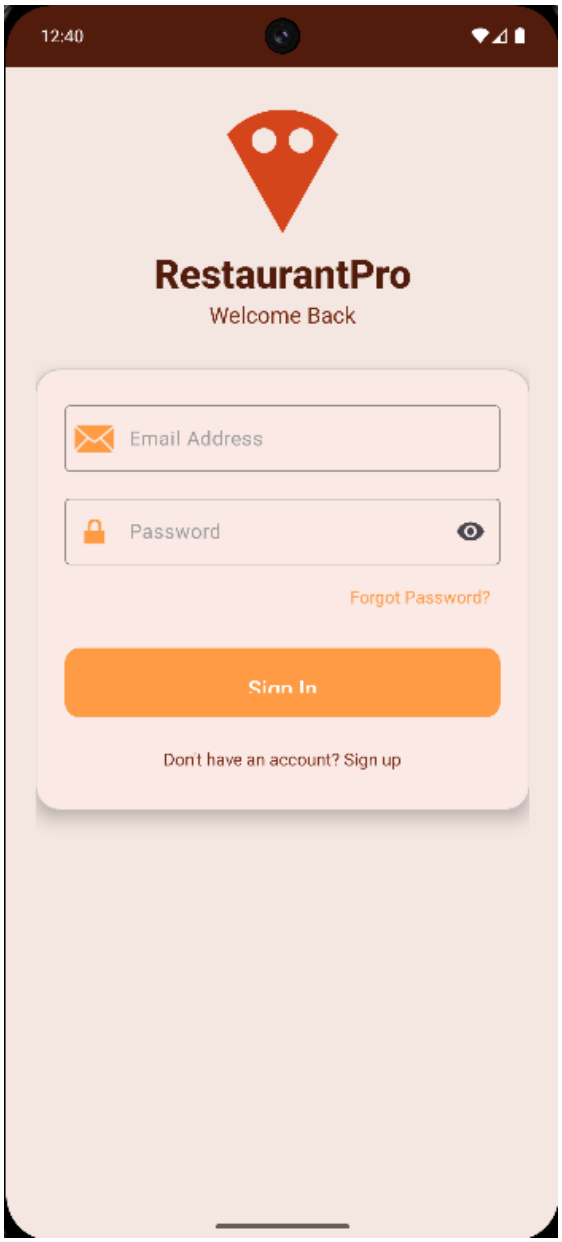

Figure 7 : Screenshot in activity_login.xml

The unified login screen uses Material TextInputLayout components with proper validation hints. I've added a ScrollView wrapper so the keyboard doesn't cover input fields on smaller devices. The login button has a custom selector drawable that changes color when pressed, giving immediate tactile feedback.

3. Staff Dashboard

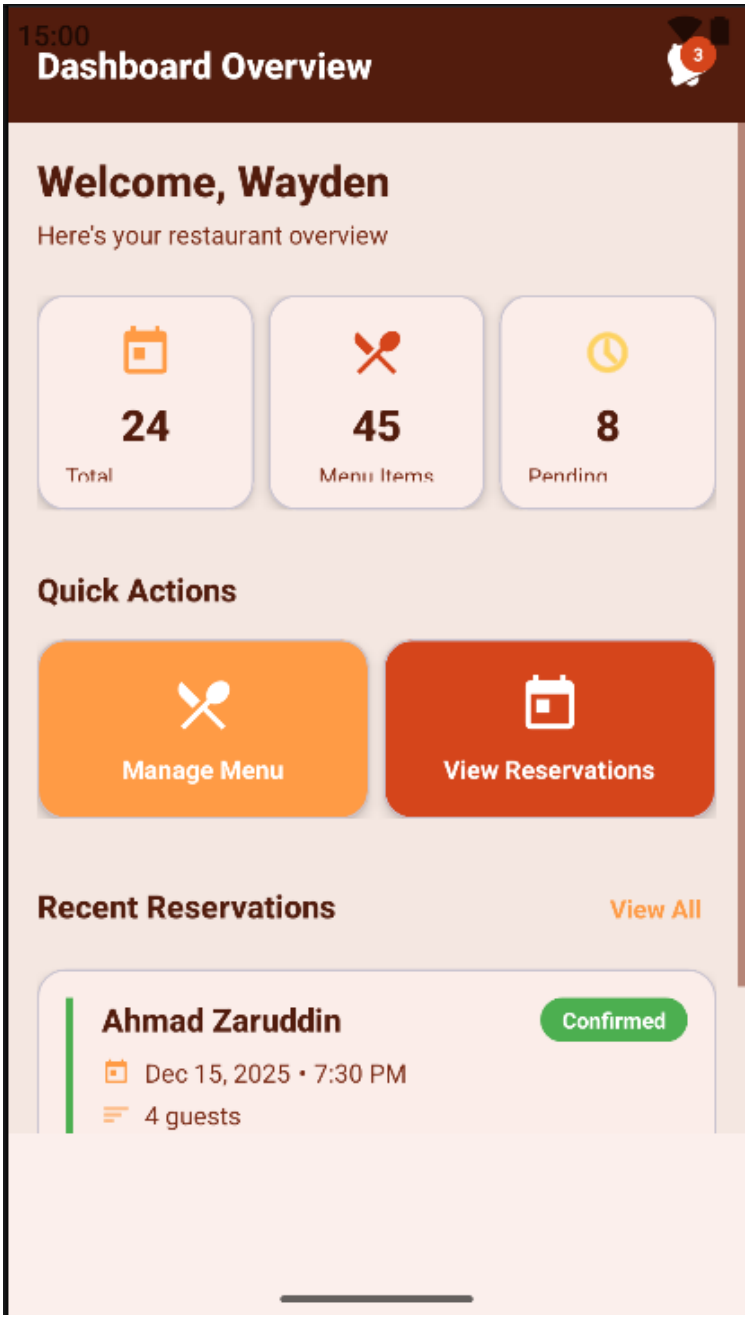

Figure 8 : Screenshot in activity_staff_dashboard.xml

This is probably the most complex layout. The statistics cards use a weighted LinearLayout inside a parent container, so they resize proportionally. The notification badge is positioned using a FrameLayout overlay - a bit hacky but works cleanly. The RecyclerView for recent reservations is set to nestedScrollingEnabled="false" since it's inside a ScrollView which prevents scroll conflicts.

4. **Menu Management**

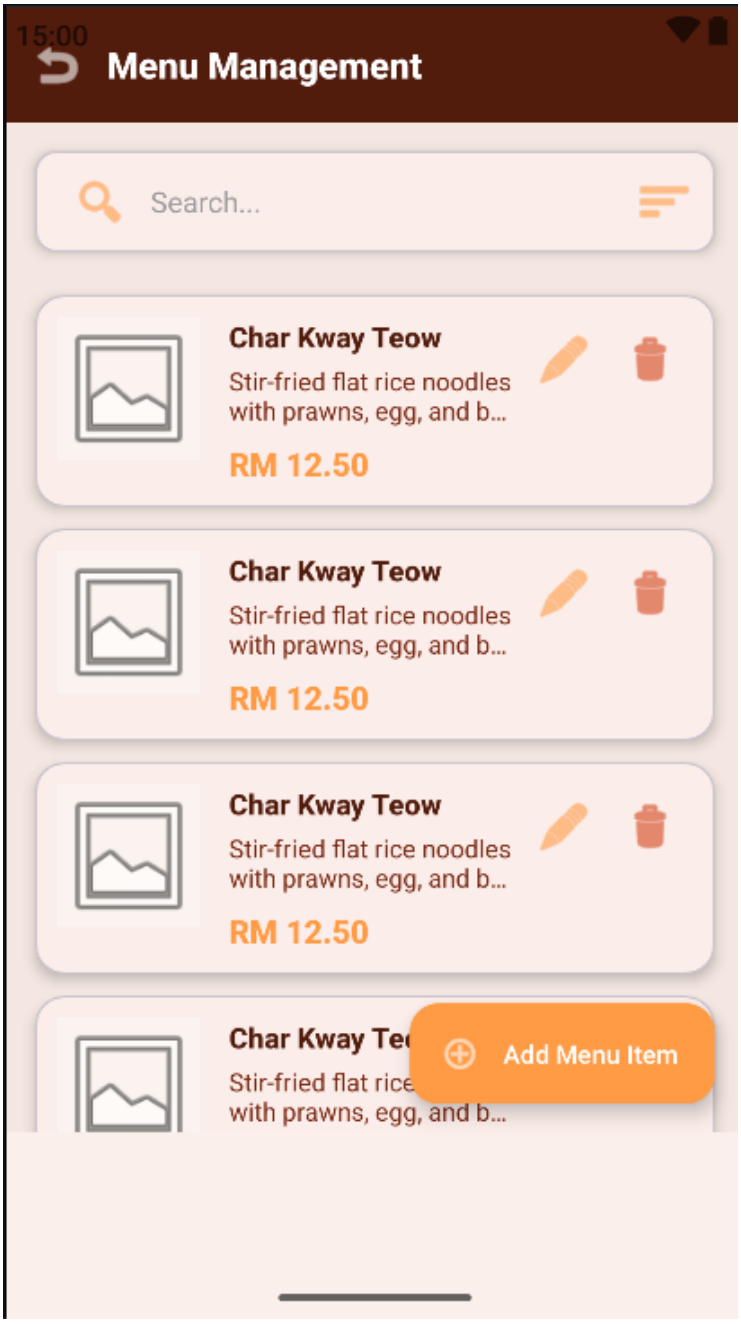

Figure 9 : Screenshot in activity_menu_management.xml

The search bar is actually a CardView with an EditText inside - gives it that raised, modern look. The Extended FAB for adding items is anchored to the bottom right with appropriate margins. I used app:layout_constraintBottom_toTopOf to position it above the bottom navigation so they don't overlap.

5. **Reservation Item**

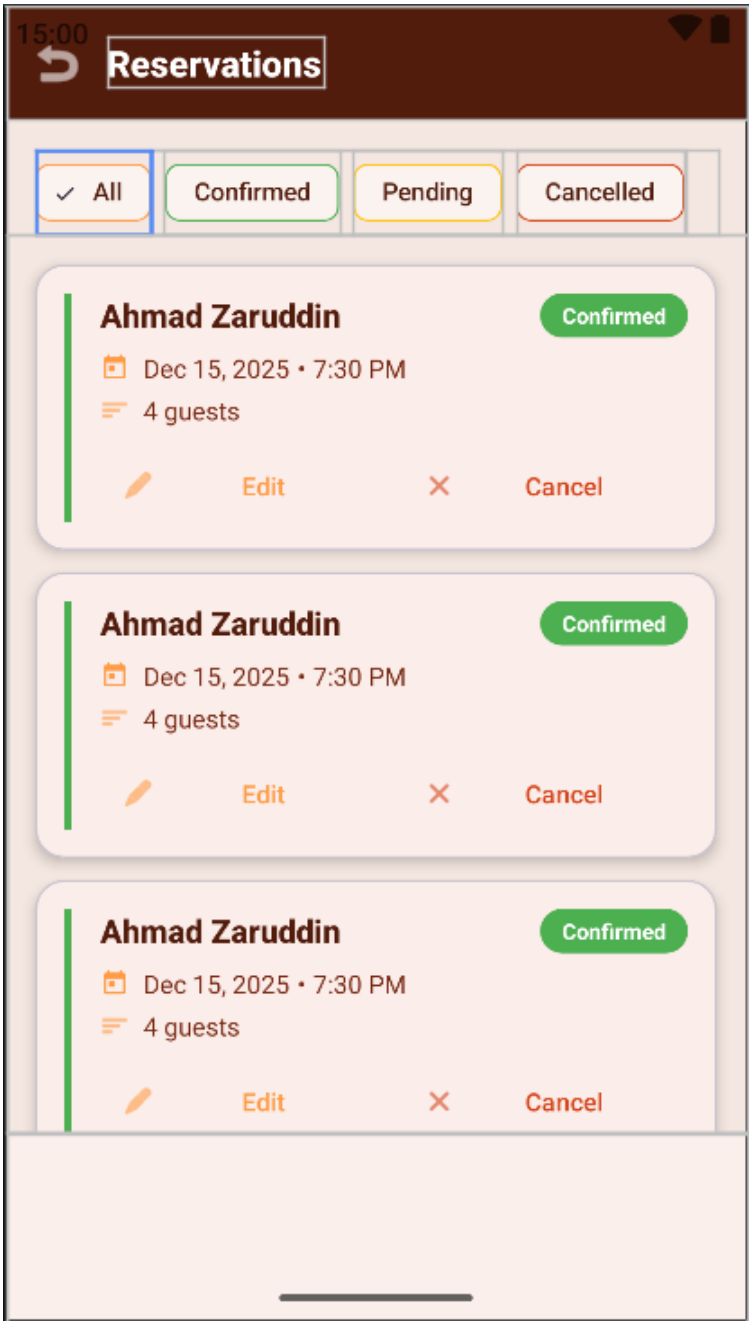

Figure 10 : Screenshot in item_reservation.xml

Each reservation card has a 4dp colored bar on the left edge that changes based on status. This is just a simple View with dynamic background color. The action buttons (Edit/Cancel) use TextButton style to keep them lightweight within the card.

Conclusion

Some elements looked fine on paper but felt cramped on screen especially on smaller phone previews. Thus, adjusting margins and constraints took a bit of trial and error but the layouts now hold up well across orientations. The interface feels ready for functionality to be added without needing major structural changes.

References

Preikstas, V. and Schofield, D. (2025) 'Exploring Fitts' Law in Virtual Reality Applications', SSRG International Journal of Computer Science and Engineering, 12, pp. 1–18. Available at: https://doi.org/10.14445/23488387/IJCSE-V12I12P101 (Accessed by 31 Oct 2025).

Appendices

Appendix A : Consent Form (Guest)

Consent Form

[Interview]

Investigating how restaurant management app could be developed to enhance daily operations from scratch.

Student : BSCS2509254
Email : bscs2509254@peninsulamalaysia.edu.my

I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason.

I agree to participate in this study and to the use of quotes in publications.

SHAHRIDAN NORIMAN BIN BAHARUD DIN	24/11/2025	
Name of Participant	**Date**	**Signature**
Ooi Wei Chyeh	24/11/2025	
Name of Student	**Date**	**Signature**

Appendix B : Consent Form (Staff)

Consent Form

[Interview]

Investigating how restaurant management app could be developed to enhance daily operations from scratch.

Student : BSCS2509254
Email : bscs2509254@peninsulamalaysia.edu.my

I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason.

I agree to participate in this study and to the use of quotes in publications.

Barsha	25/11/2025	
Name of Participant	**Date**	**Signature**
Ooi Wei Chyeh	25/11/2025	
Name of Student	**Date**	**Signature**