QRCS Accessible Donation Prototype – Testing Report

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Overview

As part of our commitment to improving accessibility for visually impaired users, we developed a Flutter-based proof-of-concept interface redesign for our client's donation application. Our goal was to ensure all users, regardless of visual ability, could independently access and use the donation features.

Peer Review Testing Results

Observation: Button Alignment Issues

Issue: During development, our team encountered alignment challenges due to simultaneous work on UI elements—specifically donation buttons and navigation components.

Feedback:

- The donation amount buttons were slightly misaligned when rendered on smaller screen sizes.
- We noticed overlapping padding on the 'Add to cart' and 'Donate' buttons which caused tap-target issues.
- Some of the icons were missing semantic labels.
- One team member implemented buttons using a Row, while another used Wrap, leading to inconsistencies.

Resolution: We standardized all button layouts using Column with consistent padding and spacing, ensuring compatibility across devices.

Screen Reader Testing Results (VoiceOver on iOS)

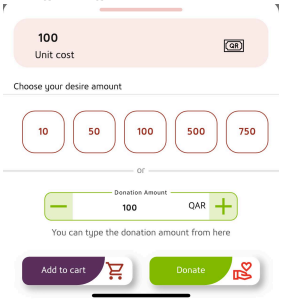
We conducted VoiceOver screen reader testing on both the **original** and **redesigned** donation screens. Below are comparative results, including screenshots and actual VoiceOver outputs. Videos of the before and after of the screen reader outputs are here.

Before Redesign

VoiceOver Output Observations:

- **Issue:** "Swipe up for more details" not recognized.

    - VoiceOver could not interpret the swipe gesture, leaving users unaware of more options.
- *"1 QAR. You can type the donation amount from here." (what does it usually say)*
- The entire project description text was **not read aloud**, making the purpose of the campaign inaccessible. This is because the swipe-up feature blocks the project information behind it, therefore, not enabling the screen reader to access it.

UI Element	**Results/ScreenReader Transcript:**
The image	Not read by the screen reader
Back button, shopping cart icon, menu button, share button	Not read by the screen reader
Project details: • Project title: General Sadaqa • Project reference number: LCN:PFL/QCCR2024/3 • Project description: Sadaqa is a great form of goodness, as it purifies souls & proves true faith…	Not read by the screen reader
Swipe up feature 	While using the screen reader, the swipe-up functionality wasn't working and did not allow users to view the other donation method (selected a pre-defined donation amounts)
Donation buttons: • Minus, Add, Donate	"Minus" "Add" "Donate"
Donation amount [input] QAR	Once a donation amount is added, the screen reader reads it: "Donation amount 60 QAR"
Donation amount area: • Expected: "You can type the donation amount from here"	"You can type the donation amount from here"
Unit cost information	"Unit Cost 100"

After Redesign

VoiceOver Output Observations:

- *"Project Description. Image: Stacked coins with green plants."*
- *"General Sadaqa. Sadaqa is a great form of goodness... will be used for 5 purposes: relief of refugees..."*
- *"Expiring in 786 days. Beneficiaries: 72,000. Goal: 7 million QAR. Raised: 6.1 million QAR."*
- *"Donation amount. Default: 50 QAR. Input desired amount: 0 QAR."*
- *"Button: Add to cart."*

Test Case	**Result/Screen Reader Transcript:**
Test case 1: VoiceOver reads all semantic labels for the icons (back button, shopping cart icon, menu button, share button)	• "Back button" • "Shopping cart button" • "Menu button" • "Share button"
Test case 2: VoiceOver reads all text displayed in the page (e.g., General Sadaqa title, description, beneficiaries, expiry info, goal raised, progress percentages, donation instructions)	• "General Sadaqa" • "LCN:PFL/QCCR2024/3" • "Sadaqa is a great form of goodness, as it purifies souls & proves true faith…"
Test case 3: VoiceOver reads the progress ring percentage correctly (87.33% reached, 12.67% remaining), including the circular graphic if semantically labeled	"Fundraising progress is 87.33% of the goal reached and 12.67% remaining"
Test case 4: VoiceOver reads the expiry date ("Expiring in 784 days") and associates it properly with the label	"This project will be expiring in 784 days"
Test case 5: VoiceOver reads the total number of beneficiaries ("70,000 beneficiaries")	"This project has 70,000 beneficiaries"
Test Case 6: VoiceOver reads the Goal (Goal: 7,000,000 QAR) and the money raised (Raised: 6,112,811 QAR)	"This project has a goal of 7,000,000 QAR and has raised 6,112,811 QAR"
Test case 7: VoiceOver correctly identifies the "Donation Amount" input field and announces the default value "50 QAR"	• "Donation amount default: 50 QAR" • "'Donation amount input field, default is 50 QAR, enter desired amount in QAR
Test case 8: VoiceOver properly reads and focuses on the input field when custom value "100" is entered	"You have entered 335 QAR"
Test case 9: VoiceOver announces error or helper text when input is left empty ""	"Input is required"

Test case 10: VoiceOver takes the user immediately to the numbers keyboard to prevent "alphabetic inputs like "abc"	True. When inputting a donation amount, the user is only shown the number-keyboard, to streamline the donation process and prevent confusion with multiple keyword options.
Test case 11: VoiceOver handles "0" entry and announces any constraints or warnings (e.g., "Minimum donation is 1 QAR")	"Minimum donation amount is 1 QAR"
Test case 12: VoiceOver announces "Add to Cart" button clearly	"Add to cart button"
Test case 13: VoiceOver successfully navigates the entire page using swipe gestures, ensuring logical focus order from top to bottom	Yes

Improvements Noted:

- All key information is now **readable** via screen reader.
- No swipe gestures required to access donation amounts.
- Improved logical reading order and field descriptions.
- Clear labeling of interactive elements (e.g., buttons, input fields).

Automated Accessibility Testing Using Flutter's accessibility_tools (v2.4.1)

To complement our manual and peer review testing, we conducted **automated accessibility testing** using the Flutter package accessibility_tools, version 2.4.1. This package provides real-time analysis of widget trees during development to ensure compliance with accessibility standards.

How Automated Testing Was Conducted

Integration into the App:

We added accessibility_tools to our Flutter project as a development-only dependency in the pubspec.yaml file.

```
dev_dependencies:
    accessibility_tools: ^2.4.1
```

1. **Running the Tools in Dev Mode:**

We activated the accessibility overlay and ran the app in development mode using:

```
flutter run --debug
```

The accessibility overlay visually marked widgets that failed accessibility checks, such as:

- Inadequate touch target sizes

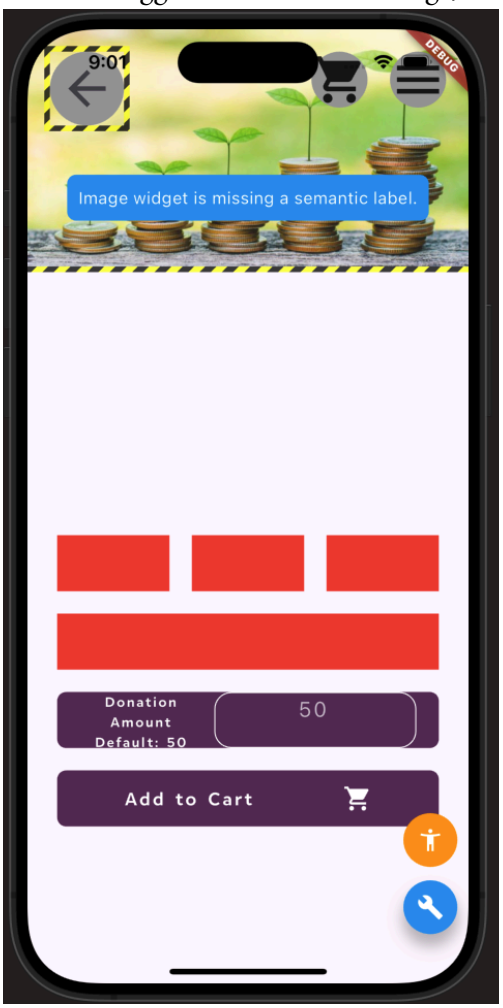
- Checking for semantic labels
- Checking for font overflows
- Checking for image labels

2. **Using AccessibilityChecker:**

We wrapped our widget tree with the AccessibilityTools widget provided by the package to enable real-time analysis during UI rendering.

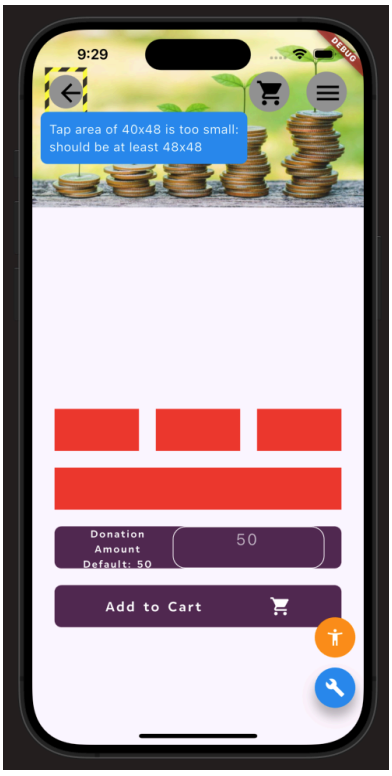
```
return AccessibilityTools(
  child: MyApp(),
);
```

3. **Issue Identification and Resolution:**
    - The tool flagged one unlabeled image, which we corrected by adding a semanticLabel.



- The tool flagged one unlabeled icon, which we corrected by adding a semanticLabel.

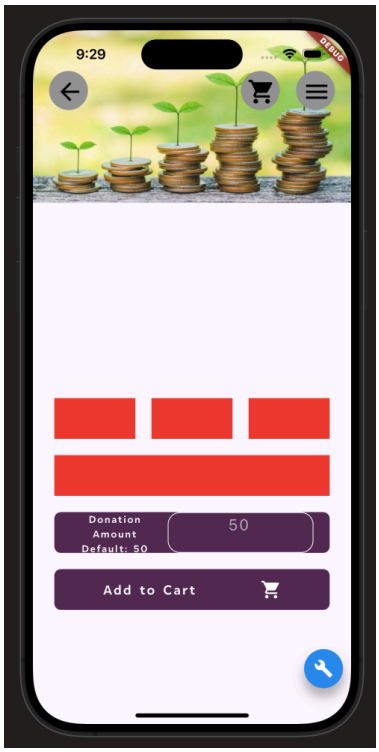
- Numerous tap area warnings helped us increase button padding to meet minimum tap target guidelines.



- All remaining UI elements were confirmed to have appropriate labels and structure.

4. **Re-Verification:**

After resolving all flagged issues, we re-ran the accessibility tools and confirmed **zero remaining errors or warnings**, ensuring compliance with WCAG accessibility principles.



Conclusion

Our peer review and accessibility testing demonstrated significant improvements in the new donation page's usability for visually impaired users. The redesign eliminates gesture barriers, provides full VoiceOver compatibility, and improves layout consistency. Future enhancements will include haptic feedback for button presses and audio confirmations of donation submission.