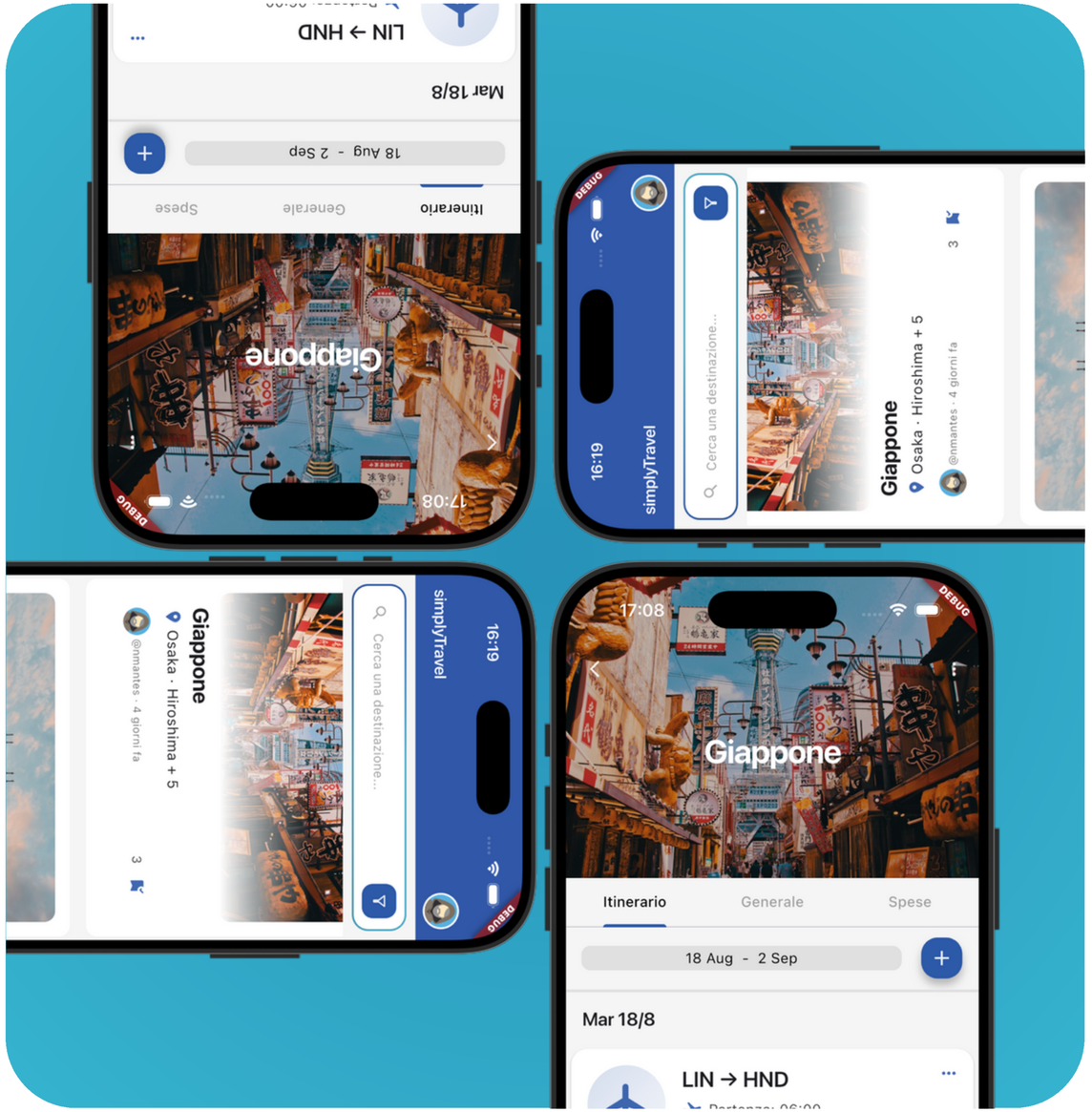
Design and Implementation of Mobile Applications

SimplyTravel



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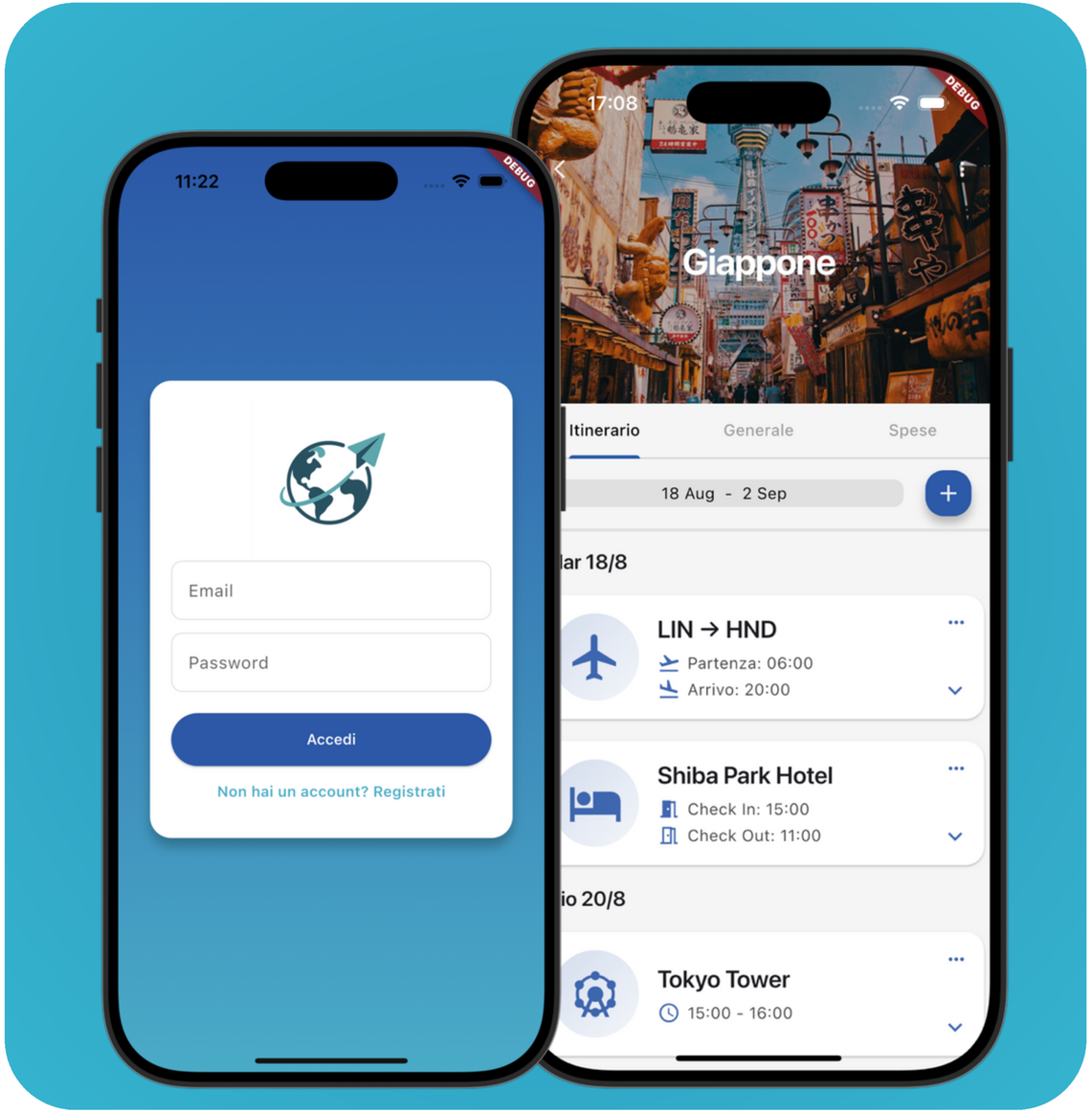
App Overview

The purpose of this application is to offer users a comprehensive travel planning experience.

It is designed to help users easily create, organize, and manage their trips, by allowing them to specify key travel details such as the mode of transportation, accommodations, and planned activities.



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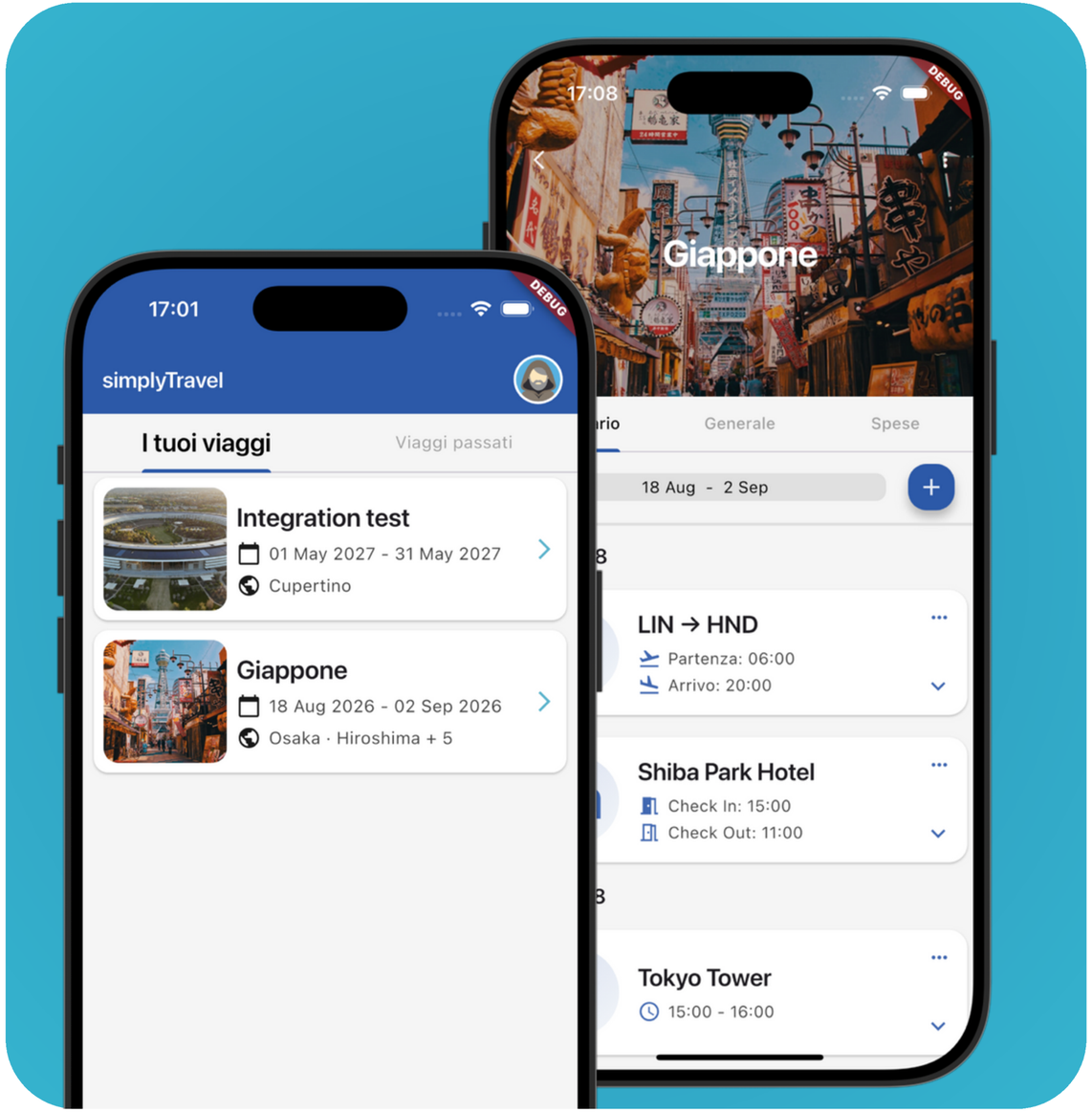
App Overview - Main feature’s

Users can:

- Create an Itinerary, specifying title, destinations, dates.
- Personalize the itinerary by adding transport, accommodation and activities.
- Visualize a maps with the destination of their trips.
- Add the trip to their personal calendar.
- Monitor their expenses through a costs report with real-time currency conversion



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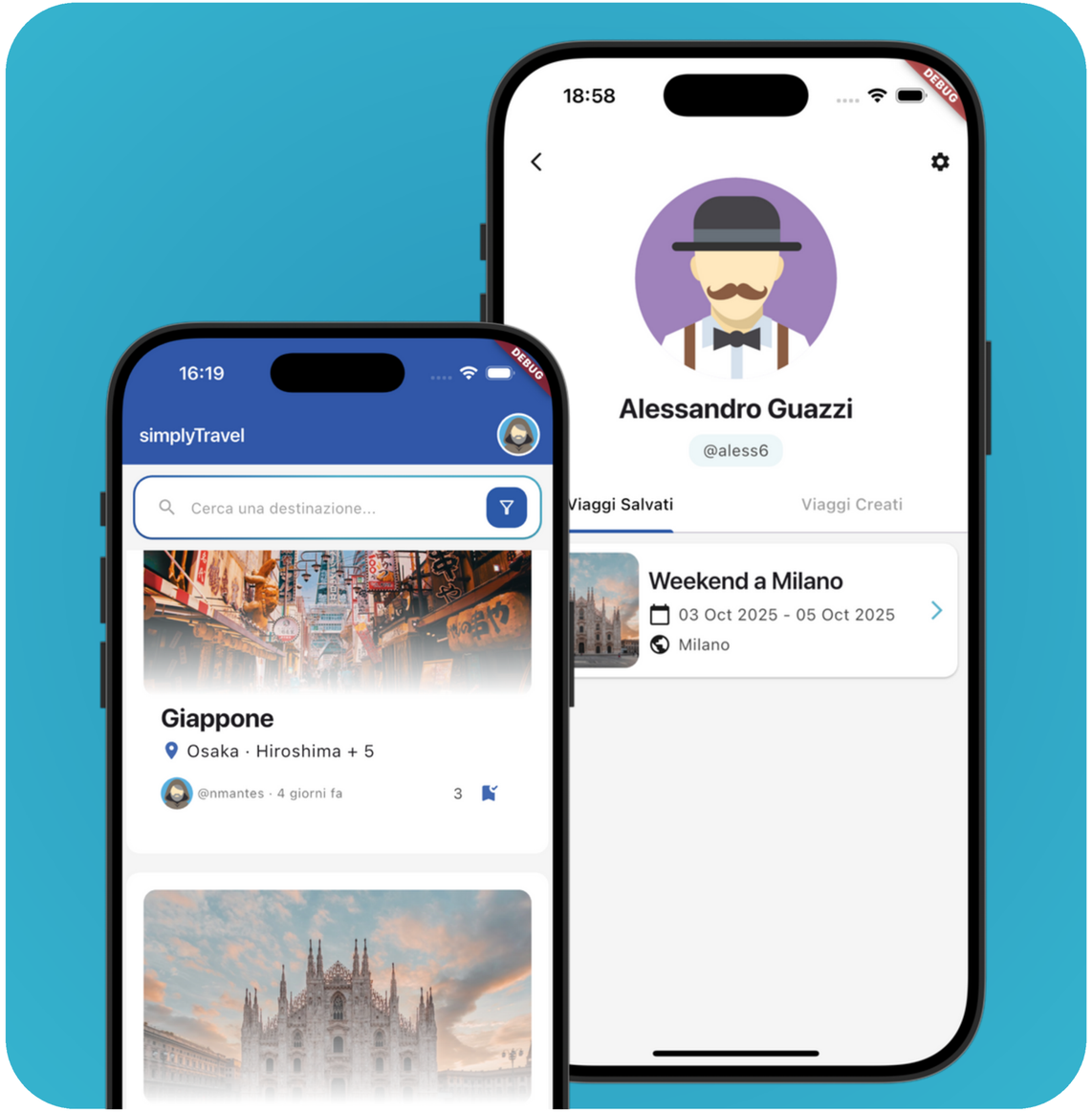
App Overview - Social features

The app is not only for planning, but also for sharing.
User can:

- Share trips with the community
- Browse others' itineraries for inspiration
- Mark favourites to save interesting journeys
- Explore user profiles with achievements & medals



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App Overview - Gamification features

The app also includes gamification features, allowing users to earn badges based on their travel destinations.
Additionally, it offers tracking functionality, displaying visited countries on a world map.

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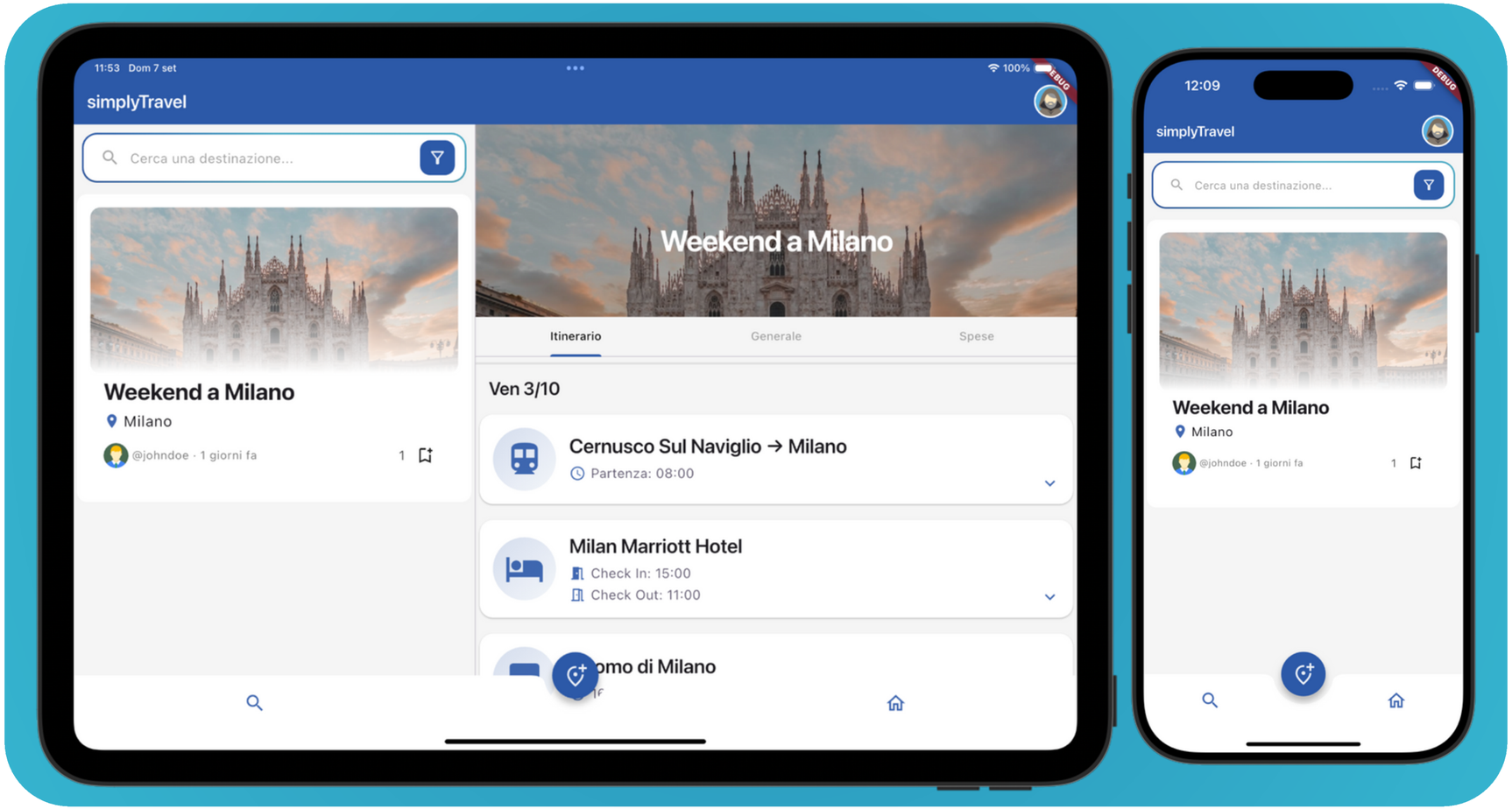
Responsive Layout



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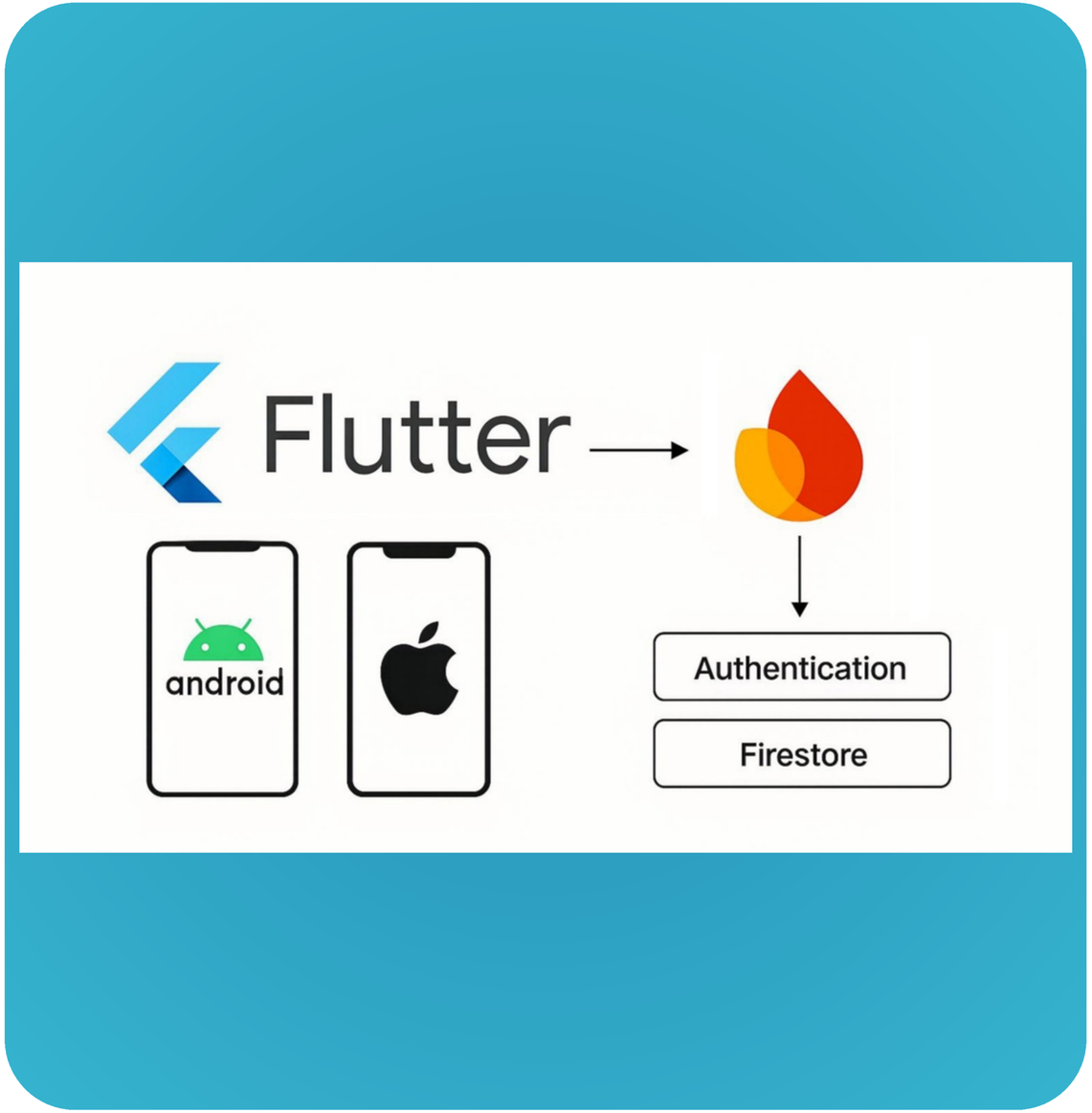
Technical Architecture

For the Front-end side we chose **Flutter** for cross-platform development, enabling a single codebase for both iOS and Android.

While **Firebase** provides our backend infrastructure through Authentication for secure user management and Firestore as our NoSQL database with real-time synchronization.



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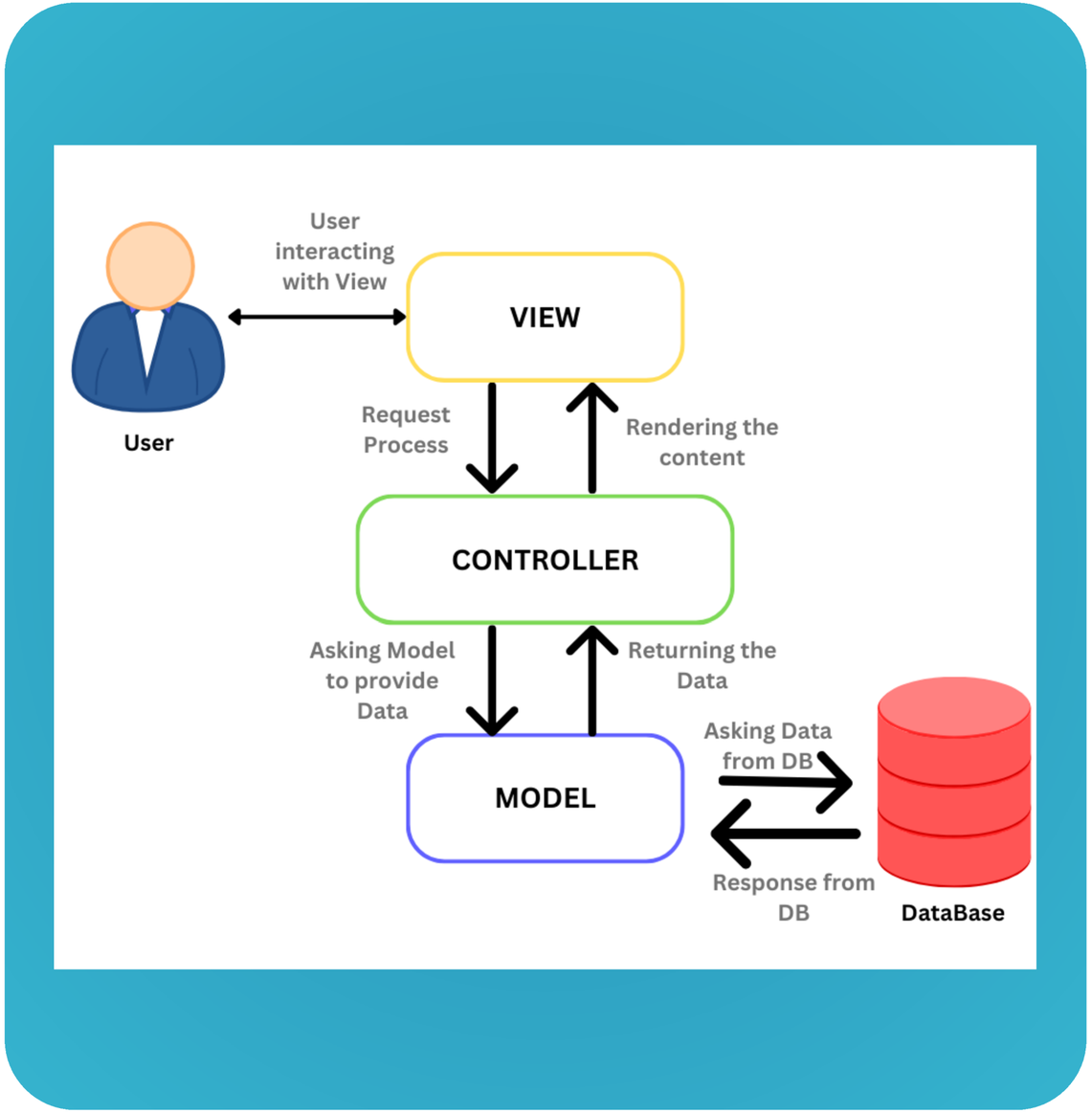
Technical Architecture 2

The architecture follows a simplified MVC pattern with clear separation:

- Model handles data structures and database interactions,
- View manages UI components
- Controller orchestrates business logic.



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External Services & API

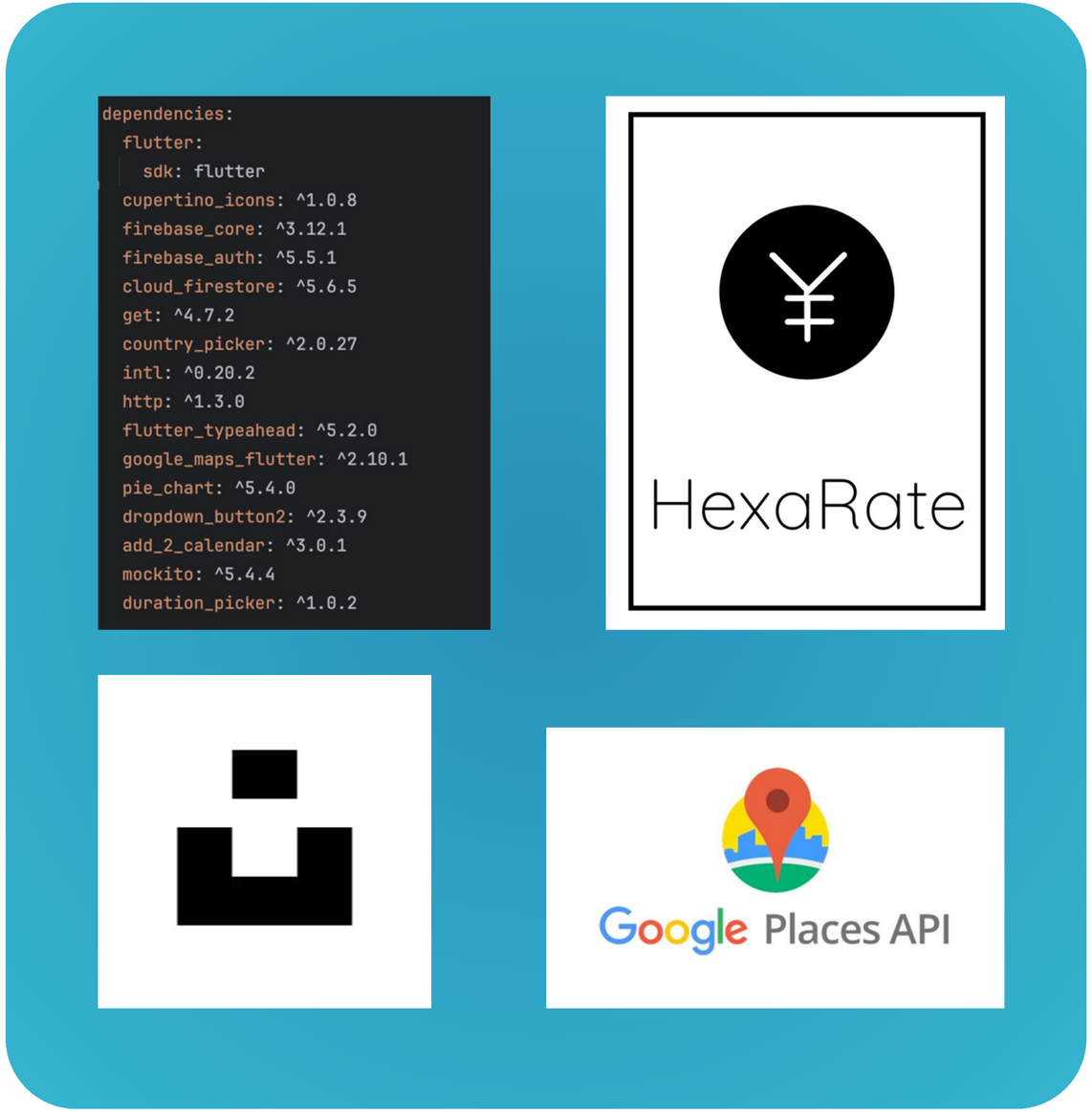
Our app integrates several external services & API

Main external Flutter Packages:

- country_picker – for country selection.
- google_maps_flutter – to display interactive maps and locations.
- add_2_calendar – to add events to users' calendars.

APIs:

- Google Places API – for accurate location search and integration with Google Maps.
- Unsplash API – to provide high-quality images of locations.
- Hexarate API – for real-time currency conversion.



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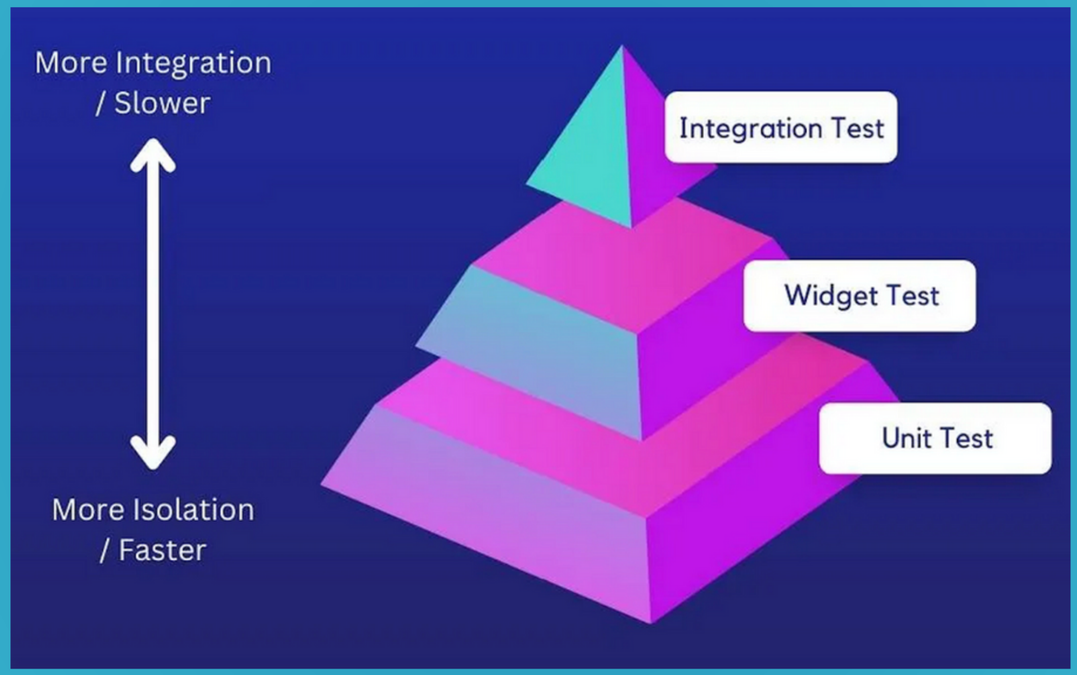
Testing

The application tests are performed in two distinct environments, depending on the type of test:

- Mock Environment (Unit/widget testing): In this environment, all external services are replaced with mock versions. This allows us to isolate and test the behavior of our application independently of external services.

- Deploy Environment (Integration testing): In this environment, tests are executed on a real device, essential for verifying the integration of our app with real external services.



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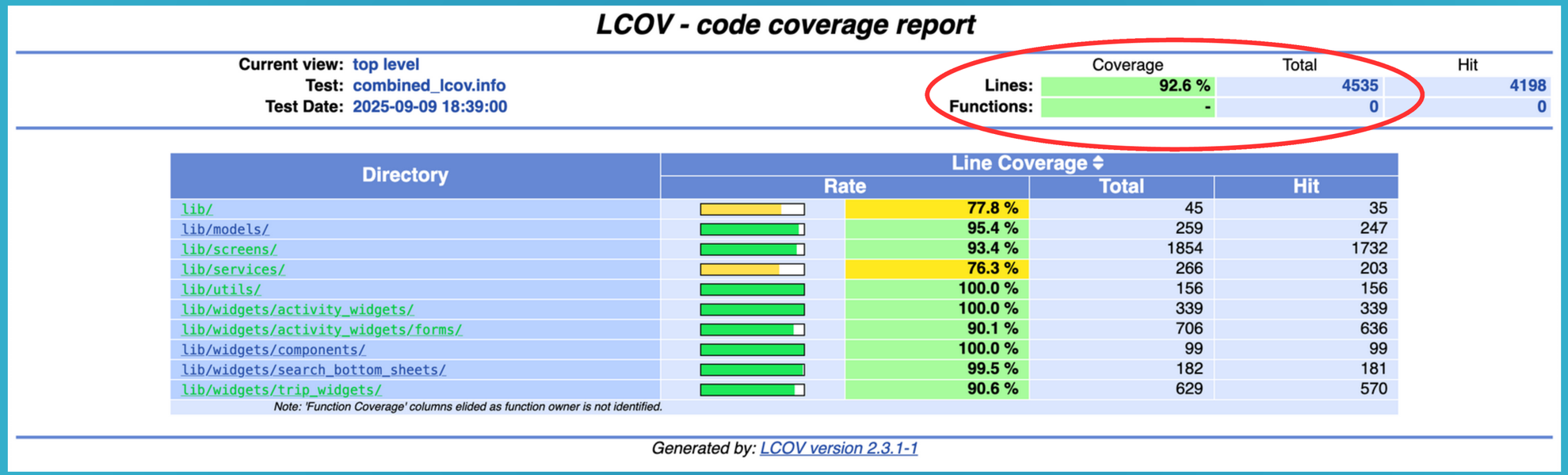
Coverage analysis

Our combined unit, widget, and integration testing achieved **92.6% coverage** across 4,535 lines of code, using 197 widget/unit tests and 24 integration tests.



LCOV - code coverage report

Current view: top level
Test: combined_lcov.info
Test Date: 2025-09-09 18:39:00

	Coverage	Total	Hit
Lines:	92.6 %	4535	4198
Functions:	-	0	0

Directory	Line Coverage Rate	Total	Hit
lib/	77.8 %	45	35
lib/models/	95.4 %	259	247
lib/screens/	93.4 %	1854	1732
lib/services/	76.3 %	266	203
lib/utils/	100.0 %	156	156
lib/widgets/activity_widgets/	100.0 %	339	339
lib/widgets/activity_widgets/forms/	90.1 %	706	636
lib/widgets/components/	100.0 %	99	99
lib/widgets/search_bottom_sheets/	99.5 %	182	181
lib/widgets/trip_widgets/	90.6 %	629	570

Note: 'Function Coverage' columns elided as function owner is not identified.

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DEMO