

# Event Lottery System

## CRC Cards – Full Release (Halfway + Final)

Covering all User Stories across Halfway Checkpoint and Final Release

### Entity Classes

User «Entity» <i>User Stories: US 01.02.01, 01.02.02, 01.07.01</i>	
Responsibilities	Collaborators
<ul style="list-style-type: none"><li>Store user profile: name, email, optional phone number</li><li>Hold unique device ID for passwordless authentication</li><li>Track user role: Entrant / Organizer / Admin</li><li>Store notification preference flag</li><li>Provide profile data for display and update</li><li>Support profile deletion (cascade to registrations)</li></ul>	<ul style="list-style-type: none"><li>Entrant</li><li>Organizer</li><li>DeviceManager</li><li>FirebaseManager</li><li>EntrantRegistration</li><li>NotificationService</li></ul>

Entrant «Entity (Role)» <i>User Stories: US 01.01.01, 01.01.02, 01.05.02, 01.05.03, 01.06.01, 01.06.02, 01.04.01, 01.04.02 [Halfway]   US 01.04.03, 01.02.04, 01.01.04, 01.05.05, 01.02.03 [Final]</i>	
Responsibilities	Collaborators
<ul style="list-style-type: none"><li>Extend User with entrant-specific behaviour</li><li>Join the waiting list for a specific event</li><li>Leave the waiting list for a specific event</li><li>Accept an invitation when selected by the lottery</li><li>Decline an invitation when selected by the lottery</li><li>Scan a QR code to view event details and join waiting list</li><li>Receive lottery win/loss notifications</li><li>View number of total entrants on a waiting list</li><li>Maintain list of events currently registered for</li><li>[Final] Opt out of receiving notifications from organizers and admins</li><li>[Final] Delete own profile and cascade remove registrations</li><li>[Final] Filter browsable events by interest and availability</li><li>[Final] View history of all registered events and selection outcomes</li><li>[Final] View lottery selection criteria and guidelines</li></ul>	<ul style="list-style-type: none"><li>User</li><li>WaitingList</li><li>EntrantRegistration</li><li>EventDetailActivity</li><li>QRCodeManager</li><li>NotificationService</li><li>FirebaseManager</li><li>EventHistoryActivity</li></ul>

Organizer «Entity (Role)» <i>User Stories: US 02.01.01, 02.01.04, 02.02.01, 02.04.01, 02.04.02, 02.05.01-03, 02.06.01, 02.06.03, 02.06.04, 02.07.01, 02.07.02 [Halfway]   US 02.02.02, 02.02.03, 02.03.01, 02.06.02, 02.06.05, 02.07.03 [Final]</i>	
Responsibilities	Collaborators
<ul style="list-style-type: none"><li>Extend User with organizer-specific behaviour</li><li>Create a new event with details, registration period, and optional capacity</li><li>Upload and update a promotional poster image for an event</li><li>Trigger the lottery draw after registration closes</li><li>Specify number of entrants to sample in a draw</li><li>Trigger replacement draw when a selected entrant declines</li></ul>	<ul style="list-style-type: none"><li>User</li><li>Event</li><li>WaitingList</li><li>LotteryService</li><li>NotificationService</li><li>ImageManager</li><li>QRCodeManager</li><li>GeolocationManager</li></ul>

<ul style="list-style-type: none"> <li>View waiting list, selected list, and final enrolled list for owned events</li> <li>Cancel individual entrants from an event</li> <li>Send broadcast notifications to waiting-list or selected entrants</li> <li>Manage multiple owned events from the organiser dashboard</li> <li>[Final] Enable or disable geolocation requirement for an event</li> <li>[Final] View map of where entrants joined from (geolocation)</li> <li>[Final] Optionally limit the number of entrants on the waiting list</li> <li>[Final] View list of cancelled entrants</li> <li>[Final] Export final enrolled list as CSV</li> <li>[Final] Send notifications to cancelled entrants</li> </ul>	<ul style="list-style-type: none"> <li>OrganizerDashboardActivity</li> <li>FirebaseManager</li> </ul>
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<h3 style="text-align: center;">Admin «Entity (Role)»</h3> <p>User Stories: US 03.01.01, 03.02.01, 03.03.01, 03.04.01, 03.05.01, 03.06.01, 03.07.01, 03.08.01 [Final]</p>	
Responsibilities	Collaborators
<ul style="list-style-type: none"> <li>Extend User with administrator-specific privileges</li> <li>Browse all events across the system</li> <li>Remove any event that violates app policy</li> <li>Browse all user profiles across the system</li> <li>Remove any user profile that violates app policy</li> <li>Remove organizers that violate app policy</li> <li>Browse all uploaded images in the system</li> <li>Remove any image that violates app policy</li> <li>Review logs of all notifications sent by organizers to entrants</li> </ul>	<ul style="list-style-type: none"> <li>User</li> <li>Event</li> <li>FirebaseManager</li> <li>ImageManager</li> <li>NotificationService</li> <li>AdminDashboardActivity</li> </ul>

<h3 style="text-align: center;">Event «Entity»</h3> <p>User Stories: US 02.01.01, 02.01.04, 02.04.01, 02.04.02, 01.01.03</p>	
Responsibilities	Collaborators
<ul style="list-style-type: none"> <li>Store event details: name, description, date/time, location</li> <li>Hold registration open/close timestamps</li> <li>Maintain optional capacity limit for waiting list</li> <li>Store reference to promotional poster image</li> <li>Hold unique QR code payload (deep-link URL)</li> <li>Track organizer (owner) reference</li> <li>Expose event state: Draft / Open / Closed / Completed</li> </ul>	<ul style="list-style-type: none"> <li>FirebaseManager</li> <li>QRCodeManager</li> <li>ImageManager</li> <li>WaitingList</li> <li>LotteryService</li> <li>User (Organizer)</li> </ul>

<h3 style="text-align: center;">WaitingList «Entity»</h3> <p>User Stories: US 01.01.01, 01.01.02, 01.05.04, 02.02.01, 02.06.01, 02.06.03</p>	
Responsibilities	Collaborators
<ul style="list-style-type: none"> <li>Maintain ordered collection of EntrantRegistration records for an event</li> <li>Enforce optional capacity limit on join</li> <li>Prevent duplicate entries for the same user</li> <li>Report total count of waiting entrants</li> <li>Separate registrations by status: waiting / selected / accepted / declined / cancelled</li> <li>Provide pool of eligible entrants for lottery draws</li> <li>Return sub-lists for organiser views (waiting, selected, enrolled, cancelled)</li> </ul>	<ul style="list-style-type: none"> <li>Event</li> <li>EntrantRegistration</li> <li>LotteryService</li> <li>FirebaseManager</li> </ul>

<b>EntrantRegistration</b> «Entity» <i>User Stories: US 01.01.01, 01.01.02, 01.05.02, 01.05.03, 02.06.04</i>	
Responsibilities	Collaborators
<ul style="list-style-type: none"> <li>Record the association between a User and an Event on the waiting list</li> <li>Track registration status: WAITING / SELECTED / ACCEPTED / DECLINED / CANCELLED</li> <li>Store join timestamp and optional geolocation at join time</li> <li>Support status transitions driven by lottery and user responses</li> <li>Notify changes to WaitingList and LotteryService on status update</li> </ul>	<ul style="list-style-type: none"> <li>User</li> <li>Event</li> <li>WaitingList</li> <li>NotificationService</li> <li>FirebaseManager</li> </ul>

<b>Notification</b> «Entity» <i>User Stories: US 01.04.01, 01.04.02, 02.07.01, 02.07.02</i>	
Responsibilities	Collaborators
<ul style="list-style-type: none"> <li>Store notification payload: title, message body, event reference, recipient list</li> <li>Record send timestamp and delivery status</li> <li>Track notification type: SELECTED / NOT_SELECTED / ORGANIZER_MESSAGE</li> <li>Support opt-out check before delivery</li> </ul>	<ul style="list-style-type: none"> <li>NotificationService</li> <li>User</li> <li>FirebaseManager</li> </ul>

<b>NotificationLog</b> «Entity» <i>User Stories: US 03.08.01 [Final]</i>	
Responsibilities	Collaborators
<ul style="list-style-type: none"> <li>Record each notification send event: sender, recipient list, message, timestamp</li> <li>Store notification type and associated event reference</li> <li>Provide queryable log for admin review</li> <li>Support filtering by organizer, event, or date range</li> </ul>	<ul style="list-style-type: none"> <li>Notification</li> <li>NotificationService</li> <li>FirebaseManager</li> <li>Admin</li> </ul>

## Controller / Service Classes

<b>LotteryService</b> «Controller» <i>User Stories: US 02.05.01, 02.05.02, 02.05.03, 01.05.01</i>	
Responsibilities	Collaborators
<ul style="list-style-type: none"> <li>Perform random sampling to select N entrants from the WaitingList</li> <li>Guarantee fair, unbiased random selection algorithm</li> <li>Trigger organizer-initiated draw after registration closes</li> <li>Handle replacement draws when selected entrant declines</li> <li>Update EntrantRegistration statuses to SELECTED after draw</li> <li>Invoke NotificationService to alert winners and non-winners</li> <li>Persist draw results via FirebaseManager</li> </ul>	<ul style="list-style-type: none"> <li>WaitingList</li> <li>EntrantRegistration</li> <li>NotificationService</li> <li>FirebaseManager</li> <li>Event</li> </ul>

<b>NotificationService</b> «Controller» <i>User Stories: US 01.04.01, 01.04.02, 02.07.01, 02.07.02</i>	
Responsibilities	Collaborators
<ul style="list-style-type: none"> <li>Send push notifications to selected / non-selected entrants after lottery</li> <li>Broadcast organizer messages to all waiting-list or selected entrants</li> <li>Respect per-user notification opt-out preference before sending</li> <li>Use Firebase Cloud Messaging (FCM) to deliver messages</li> <li>Log each notification send event for audit trail</li> <li>Queue and retry failed deliveries</li> </ul>	<ul style="list-style-type: none"> <li>User</li> <li>Notification</li> <li>FirebaseManager</li> <li>LotteryService</li> </ul>

<b>QRCodeManager</b> «Controller» <i>User Stories: US 02.01.01, 01.06.01, 01.06.02</i>	
Responsibilities	Collaborators
<ul style="list-style-type: none"> <li>Generate a unique deep-link QR code payload for each new event</li> <li>Encode event ID into QR code for device scanning</li> <li>Invoke device camera via ZXing / ML Kit for QR scanning</li> <li>Parse scanned QR payload to extract event ID</li> <li>Navigate to Event Detail screen on successful scan</li> <li>Return error state if QR code is invalid or event not found</li> </ul>	<ul style="list-style-type: none"> <li>Event</li> <li>FirebaseManager</li> <li>DeviceManager</li> <li>EventDetailActivity</li> </ul>

<b>ImageManager</b> «Controller» <i>User Stories: US 02.04.01, 02.04.02</i>	
Responsibilities	Collaborators
<ul style="list-style-type: none"> <li>Launch device image picker / camera intent for poster selection</li> <li>Compress and validate image before upload</li> <li>Upload event poster to Firebase Storage and return download URL</li> <li>Replace existing poster image on update</li> <li>Provide placeholder image when no poster is available</li> <li>Support image deletion (admin moderation hook)</li> </ul>	<ul style="list-style-type: none"> <li>Event</li> <li>FirebaseManager</li> <li>DeviceManager</li> </ul>

<b>GeolocationManager</b> «Controller» <i>User Stories: US 02.02.02, 02.02.03 [Final]</i>	
Responsibilities	Collaborators
<ul style="list-style-type: none"> <li>Request and obtain device GPS / network location on waiting list join</li> <li>Store location coordinates in EntrantRegistration when geolocation is enabled</li> <li>Provide location data to OrganizerDashboardActivity for map display</li> <li>Respect organizer toggle: only capture location when geolocation is enabled for event</li> <li>Handle location permission requests gracefully with fallback</li> </ul>	<ul style="list-style-type: none"> <li>EntrantRegistration</li> <li>DeviceManager</li> <li>OrganizerDashboardActivity</li> <li>FirebaseManager</li> </ul>

## Infrastructure / Boundary Classes

<b>FirebaseManager</b> «Boundary / Persistence» <i>User Stories: All user stories (cross-cutting)</i>	
Responsibilities	Collaborators
<ul style="list-style-type: none"> <li>Serve as single access point for all Firestore read/write operations</li> <li>Manage Firebase Authentication (anonymous / device-ID-based sign-in)</li> <li>Interface with Firebase Cloud Messaging for push notifications</li> <li>Interface with Firebase Storage for image upload/download</li> <li>Provide real-time listeners for waiting list and event updates</li> <li>Handle offline persistence and synchronisation</li> <li>Abstract Firestore collection paths: users, events, waitingLists, notifications</li> <li>Enforce Firestore security rules (role-based access)</li> </ul>	<ul style="list-style-type: none"> <li>User</li> <li>Event</li> <li>WaitingList</li> <li>EntrantRegistration</li> <li>Notification</li> <li>NotificationService</li> <li>ImageManager</li> <li>LotteryService</li> </ul>

<b>DeviceManager</b> «Boundary» <i>User Stories: US 01.07.01, 02.04.01, 01.06.01</i>	
Responsibilities	Collaborators
<ul style="list-style-type: none"> <li>Retrieve or generate a stable unique device identifier (Android ID / UUID)</li> <li>Provide device ID to FirebaseManager for passwordless authentication</li> <li>Manage camera permission request and camera intent launching (QR scan)</li> <li>Manage storage/media permission request for image picker</li> <li>Expose device geolocation (GPS/network) for optional join-location capture</li> <li>Cache device ID securely in SharedPreferences</li> </ul>	<ul style="list-style-type: none"> <li>FirebaseManager</li> <li>QRCodeManager</li> <li>ImageManager</li> <li>User</li> </ul>

## UI Activity Classes (Boundary)

<b>MainActivity</b> «Boundary (UI)» <i>User Stories: US 01.07.01, 01.01.03</i>	
Responsibilities	Collaborators
<ul style="list-style-type: none"> <li>Entry point: detect device ID and authenticate with FirebaseManager</li> <li>Determine user role and route to correct home screen</li> <li>Display event browse list for entrants</li> <li>Provide navigation to organiser dashboard or admin panel</li> <li>Handle deep-link intents from QR code scans</li> </ul>	<ul style="list-style-type: none"> <li>DeviceManager</li> <li>FirebaseManager</li> <li>User</li> <li>EventBrowseActivity</li> <li>OrganizerDashboardActivity</li> </ul>

<b>ProfileActivity</b> «Boundary (UI)» <i>User Stories: US 01.02.01, 01.02.02</i>	
<b>Responsibilities</b>	<b>Collaborators</b>
<ul style="list-style-type: none"> <li>Display and allow editing of user name, email, phone</li> <li>Validate form inputs before saving</li> <li>Call FirebaseManager to persist profile updates</li> <li>Display profile picture (auto-generated avatar or uploaded photo)</li> <li>Provide option to delete account</li> </ul>	<ul style="list-style-type: none"> <li>User</li> <li>FirebaseManager</li> <li>ImageManager</li> </ul>

<b>EventBrowseActivity</b> «Boundary (UI)» <i>User Stories: US 01.01.03, 01.05.04, 01.06.01</i>	
<b>Responsibilities</b>	<b>Collaborators</b>
<ul style="list-style-type: none"> <li>Display scrollable list of all available open events fetched from Firestore</li> <li>Show key event summary per item: name, date, location, waiting list count</li> <li>Provide real-time updates to event list via FirebaseManager listener</li> <li>Navigate to EventDetailActivity on event item tap</li> <li>Launch QR scanner via QRCodeManager from browse screen</li> <li>Show empty state when no events are available</li> <li>Display waiting list count per event (US 01.05.04)</li> </ul>	<ul style="list-style-type: none"> <li>Event</li> <li>FirebaseManager</li> <li>EventDetailActivity</li> <li>QRCodeManager</li> <li>MainActivity</li> </ul>

<b>EventDetailActivity</b> «Boundary (UI)» <i>User Stories: US 01.06.01, 01.06.02, 01.01.01, 01.01.02, 01.05.02, 01.05.03, 01.05.04</i>	
<b>Responsibilities</b>	<b>Collaborators</b>
<ul style="list-style-type: none"> <li>Display full event details: name, description, date, location, poster</li> <li>Show current waiting list count and capacity</li> <li>Provide Join / Leave waiting list action buttons</li> <li>Present Accept / Decline invitation buttons when user is SELECTED</li> <li>Navigate to QR scanner via QRCodeManager</li> <li>Refresh real-time status via FirebaseManager listener</li> </ul>	<ul style="list-style-type: none"> <li>Event</li> <li>WaitingList</li> <li>EntrantRegistration</li> <li>QRCodeManager</li> <li>FirebaseManager</li> <li>NotificationService</li> </ul>

<b>NotificationInboxActivity</b> «Boundary (UI)» <i>User Stories: US 01.04.01, 01.04.02, 02.07.01, 02.07.02</i>	
<b>Responsibilities</b>	<b>Collaborators</b>
<ul style="list-style-type: none"> <li>Display list of all notifications received by the current entrant</li> <li>Show notification type clearly: selected (won), not selected (lost), organizer message</li> <li>Mark notifications as read on open</li> <li>Show timestamp and associated event name for each notification</li> <li>Provide navigation to relevant EventDetailActivity from a notification item</li> <li>Show empty state when no notifications exist</li> <li>Display unread notification badge count in navigation</li> </ul>	<ul style="list-style-type: none"> <li>Notification</li> <li>FirebaseManager</li> <li>EventDetailActivity</li> <li>NotificationService</li> <li>User</li> </ul>

<b>CreateEventActivity</b> «Boundary (UI)» <i>User Stories: US 02.01.01, 02.01.04, 02.04.01</i>	
Responsibilities	Collaborators
<ul style="list-style-type: none"> <li>Provide form for organiser to enter event name, description, date/time/location</li> <li>Allow setting of registration open/close dates</li> <li>Allow optional waiting list capacity input</li> <li>Trigger ImageManager for poster upload</li> <li>Call FirebaseManager to save event and trigger QRCodeManager to generate QR</li> <li>Display generated QR code for sharing</li> </ul>	<ul style="list-style-type: none"> <li>Event</li> <li>FirebaseManager</li> <li>QRCodeManager</li> <li>ImageManager</li> <li>User (Organizer)</li> </ul>

<b>OrganizerDashboardActivity</b> «Boundary (UI)» <i>User Stories: US 02.02.01, 02.05.01, 02.06.01, 02.06.03, 02.06.04, 02.07.01, 02.07.02 [Halfway]   US 02.02.02, 02.02.03, 02.03.01, 02.06.02, 02.06.05, 02.07.03 [Final]</i>	
Responsibilities	Collaborators
<ul style="list-style-type: none"> <li>List all events owned by the organiser</li> <li>Navigate to event-specific waiting list, selected list, and enrolled list views</li> <li>Provide 'Draw Lottery' button to invoke LotteryService</li> <li>Allow organiser to input number of entrants to select in draw</li> <li>Provide 'Send Notification' controls for waiting-list and selected entrants</li> <li>Allow organiser to cancel individual entrants</li> <li>Show event status summary: waiting / selected / enrolled counts</li> <li>[Final] Toggle geolocation requirement on/off per event</li> <li>[Final] Display Google Map showing locations where entrants joined from</li> <li>[Final] Set optional waiting list capacity limit on event creation/edit</li> <li>[Final] Display list of cancelled entrants</li> <li>[Final] Export enrolled list as CSV file</li> <li>[Final] Send notification to cancelled entrants</li> </ul>	<ul style="list-style-type: none"> <li>Event</li> <li>WaitingList</li> <li>LotteryService</li> <li>NotificationService</li> <li>GeolocationManager</li> <li>FirebaseManager</li> <li>User (Organizer)</li> </ul>

<b>EventHistoryActivity</b> «Boundary (UI)» <i>User Stories: US 01.02.03 [Final]</i>	
Responsibilities	Collaborators
<ul style="list-style-type: none"> <li>Display full history of events the entrant has registered for</li> <li>Show outcome per event: waiting / selected / accepted / declined / cancelled / not selected</li> <li>Group or sort history by date</li> <li>Navigate to EventDetailActivity for past event details</li> <li>Fetch history from FirebaseManager using entrant's registration records</li> </ul>	<ul style="list-style-type: none"> <li>EntrantRegistration</li> <li>Event</li> <li>FirebaseManager</li> <li>EventDetailActivity</li> <li>Entrant</li> </ul>

## **AdminDashboardActivity** «Boundary (UI)»

User Stories: US 03.01.01, 03.02.01, 03.03.01, 03.04.01, 03.05.01, 03.06.01, 03.07.01, 03.08.01 [Final]

Responsibilities	Collaborators
<ul style="list-style-type: none"><li>• Provide tabbed or sectioned view: Events / Profiles / Images / Logs</li><li>• Browse and search all events across the system</li><li>• Allow admin to remove any event</li><li>• Browse and search all user profiles</li><li>• Allow admin to remove any user profile or organizer</li><li>• Browse all uploaded images in Firebase Storage</li><li>• Allow admin to remove any image</li><li>• Display notification log with filter by organizer, event, or date</li><li>• Confirm destructive actions (delete) with dialog before executing</li></ul>	<ul style="list-style-type: none"><li>• Admin</li><li>• Event</li><li>• User</li><li>• ImageManager</li><li>• NotificationLog</li><li>• FirebaseManager</li></ul>