Problem Statement and Goals
Software Engineering

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Table 1: Revision History

Date	Developer(s)	Change
Date1	Name(s)	Description of changes
Date2	Name(s)	Description of changes
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1 Problem Statement

1.1 Problem

The McMaster Engineering Society (MES) organizes large-scale events such as Fireball Formal, Graduation Formal, and Pub Nights, often drawing several hundred attendees. Currently, registration, ticketing, waiver collection, and check-in processes are fragmented across multiple platforms (Google Forms, spreadsheets, Discord, Instagram, etc.). This lack of centralization increases the administrative burden on student organizers and creates a confusing, inconsistent experience for attendees.

Students struggle to:

- Access clear, consolidated event information.
- Register efficiently for events and related logistics (tables, buses).
- Receive timely updates or reminders.

Organizers struggle to:

- Manage ticket sales, waitlists, and attendee data in one place.
- Track accessibility/dietary requirements effectively.
- Minimize repetitive manual effort across multiple tools.

The absence of a centralized system reduces event memorability, increases missed opportunities, and wastes volunteer time that could be spent on event quality rather than administration.

1.2 Inputs and Outputs

Inputs:

- Student event registrations (tickets, RSVPs, bus signups, table preferences).
- Waiver acknowledgements and personal details (e.g., dietary and accessibility requirements).
- Payment details for ticket purchases.
- Admin inputs for event setup (ticket types, capacities, schedules, notifications).

Outputs:

- Confirmation of event registration and digital tickets/QR codes.
- Notifications and reminders about events.
- Waitlist updates and allocations.
- Admin dashboards showing ticket sales, attendee demographics, accessibility/dietary data, and financial tracking.
- Check-in validation at event entry points.

1.3 Stakeholders

Primary Stakeholders:

- MES Event Attendees (students): Use the platform to register, purchase tickets, receive updates, and check in.
- MES Event Organizers/Volunteers: Use the platform to manage events, track registrations, ticket sales and payments, waivers, handle check-ins, and communicate with attendees.

Secondary Stakeholders:

- MES Executives: Oversee finances, risk management, and reporting.

Tertiary Stakeholders:

- Sponsors and partners: Interested in gaining visibility, engagement, and smooth execution.
- McMaster University Administration: Indirectly involved for compliance, liability via waivers, and student satisfaction.

1.4 Environment

Hardware Environment:

- Attendees: Smartphones (iOS/Android) and laptops for registration, notifications, and check-in.
- Organizers: Laptops/desktops for backend dashboards, mobile devices for on-site management and QR code scanning.

Software Environment:

- Web-based admin dashboard for event creation and analytics.
- Cross-platform mobile app for students (primary focus) with fallback web access.
- Payment integration (e.g., Stripe, Square, Paypal).
- Backend database to store user, event, and financial data.

2 Goals

Centralized Registration & Ticketing

- **Description:** The platform must consolidate ticket purchasing, registration, and RSVPs into one place.
- **Justification:** This eliminates confusion caused by scattered tools and ensures students always have access to the latest event information.

Payment Integration

- **Description:** Provide secure and flexible payment options (Stripe, Square, PayPal).
- **Justification:** Enables students to pay quickly with widely used systems while reducing cash-handling risks for organizers.

Role-Based Access Control (RBAC/FBAC)

- **Description:** Implement granular permissions so organizers only see/manage the tools relevant to their role.
- **Justification:** Reduces errors, ensures security, and improves efficiency in large event teams.

Bus & Table Sign-ups

- **Description:** Allow attendees to reserve buses and tables with automatic capacity tracking.
- **Justification:** Simplifies logistics and avoids overbooking, replacing spreadsheets and manual coordination.

Notifications & Reminders

- **Description:** Send push notifications and reminders for registrations, updates, and cancellations.
- **Justification:** Improves event memorability, prevents missed opportunities, and reduces no-shows.

Analytics & Reporting

- **Description:** Provide organizers with real-time dashboards on sales, demographics, and waitlists.
- **Justification:** Supports decision-making, improves resource allocation, and helps executives evaluate event success.

Attendee Experience

- **Description:** Ensure the platform is mobile-first, intuitive, and accessible.
- **Justification:** Reduces barriers to use, supports inclusivity, and maximizes student engagement.

3 Stretch Goals

- Personalized event recommendations based on student interests.
- Calendar integration (Google/Outlook/Apple).
- Post-event engagement features (photo gallery, feedback surveys, lost & found updates).
- Sponsor visibility tools (logos, surveys, branded features).
- Dietary/accessibility matching algorithms for meal and seating planning.

4 Extras

[For CAS 741: State whether the project is a research project. This designation, with the approval (or request) of the instructor, can be modified over the course of the term. —SS]

[For SE Capstone: List your extras. Potential extras include usability testing, code walkthroughs, user documentation, formal proof, GenderMag personas, Design Thinking, etc. (The full list is on the course outline and in Lecture 02.) Normally the number of extras will be two. Approval of the extras will be part of the discussion with the instructor for approving the project. The extras, with the approval (or request) of the instructor, can be modified over the course of the term. —SS]

Appendix — Reflection

[Not required for CAS 741 —SS]

The purpose of reflection questions is to give you a chance to assess your own learning and that of your group as a whole, and to find ways to improve in the future. Reflection is an important part of the learning process. Reflection is also an essential component of a successful software development process.

Reflections are most interesting and useful when they're honest, even if the stories they tell are imperfect. You will be marked based on your depth of thought and analysis, and not based on the content of the reflections themselves. Thus, for full marks we encourage you to answer openly and honestly and to avoid simply writing "what you think the evaluator wants to hear."

Please answer the following questions. Some questions can be answered on the team level, but where appropriate, each team member should write their own response:

1. What went well while writing this deliverable?
2. What pain points did you experience during this deliverable, and how did you resolve them?
3. How did you and your team adjust the scope of your goals to ensure they are suitable for a Capstone project (not overly ambitious but also of appropriate complexity for a senior design project)?