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COSC 4P02: Software Engineering II

Ticket Express – User and Technical Manual

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1 Introduction

This document provides guidance for end-users and technical stakeholders of *Ticket Express*, an event management and ticketing platform developed for COSC 4P02. It includes step-by-step user instructions, system architecture details, and deployment procedures.

2 Installation Instructions

This section describes how to install and run the Ticket Express platform locally for testing or deployment purposes.

2.1 Prerequisites

Before installing Ticket Express, ensure that the following software is installed on your system:

- **Java Development Kit (JDK) 17 or higher:** Required to compile and run the backend server.
- **SQLite 3:** Required for local database storage.
- **Git** (optional but recommended): For cloning the project repository.

2.2 Installation Steps

1. Clone the Ticket Express repository from GitHub:

```
git clone https://github.com/DerfTastic/COSC_4P02.git
```

2. Navigate into the server directory:

```
cd COSC_4P02/code/server
```

3. Run the server using the provided scripts:

- On Windows: Double-click or execute `run.bat`
- On Linux/Mac: Run `./run.sh` from the terminal

4. Confirm that the backend server has started. By default, it listens on port 8080.

2.3 Accessing Ticket Express

Once the server is running:

1. Open a web browser (Chrome, Firefox, or Edge recommended).
2. Navigate to:
`http://localhost:8080`
3. The Ticket Express homepage should load. You can now register accounts, browse events, purchase tickets, and manage events.

2.4 Troubleshooting Tips

- Ensure no other application is using port 8080.
- Confirm Java and SQLite are correctly installed and available in the system PATH.
- If running on Linux/Mac, make sure `run.sh` has executable permissions ('`chmod +x run.sh`').

3 User Guide

This section provides a complete walkthrough of using Ticket Express from loading the website to event creation.

3.1 Supported Devices and Platforms

Ticket Express is designed to offer a seamless and responsive experience across a wide range of devices. The platform supports the following environments:

- **Desktop Computers:**
 - Operating Systems: Windows, macOS, Linux
 - Browsers: Chrome (recommended), Firefox, Microsoft Edge
- **Mobile Devices:**
 - Smartphones and tablets running iOS or Android
 - Browsers: Safari (iOS), Chrome (Android), Firefox Mobile
- **Responsive Layout:**
 - Ticket Express automatically adjusts its layout to fit the screen size and orientation.
 - Key actions such as event browsing, ticket purchasing, and QR code scanning are fully supported on both mobile and desktop devices.

The platform's user interface is optimized for accessibility, ensuring a smooth user experience regardless of the device used to access the service.

3.2 Homepage Overview

Upon accessing Ticket Express through the official deployment or local host, users are greeted with the **Homepage 1**.

When users first access Ticket Express at `http://localhost:8080`, they are welcomed by the Landing Page, which is focused on showcasing upcoming events in a clean and visually appealing layout.

Main Features of the Homepage:

- **Header Bar:**

- Logo and site name **Ticket Express** on the top left.
 - Search bar at the center allowing users to search for events by keyword.
 - Quick navigation links on the top right: **Browse Events**, **Login**, and **Signup**.

- **Event Category Carousel:**

- Users can navigate between different event categories (e.g., **Music Events**) using left and right arrows.
 - The category name (e.g., **MUSIC EVENTS**) is displayed prominently.

- **Event Cards:**

- Each event is displayed as an individual card.
 - Cards include:
 - * A banner image related to the event.
 - * Event title (e.g., *Harmony Unplugged*).
 - * A short tagline or subtitle.
 - * Event date and time with a calendar icon.
 - * Event venue location with a map pin icon.
 - * Hosting organization or performer group.
 - Clicking on an event card takes the user to the detailed Event Page.

- **Responsive Design:**

- The layout adjusts seamlessly for different screen sizes (desktop, tablet, mobile).

The homepage is designed to make discovering and exploring events intuitive, immediately drawing users into the Ticket Express platform.

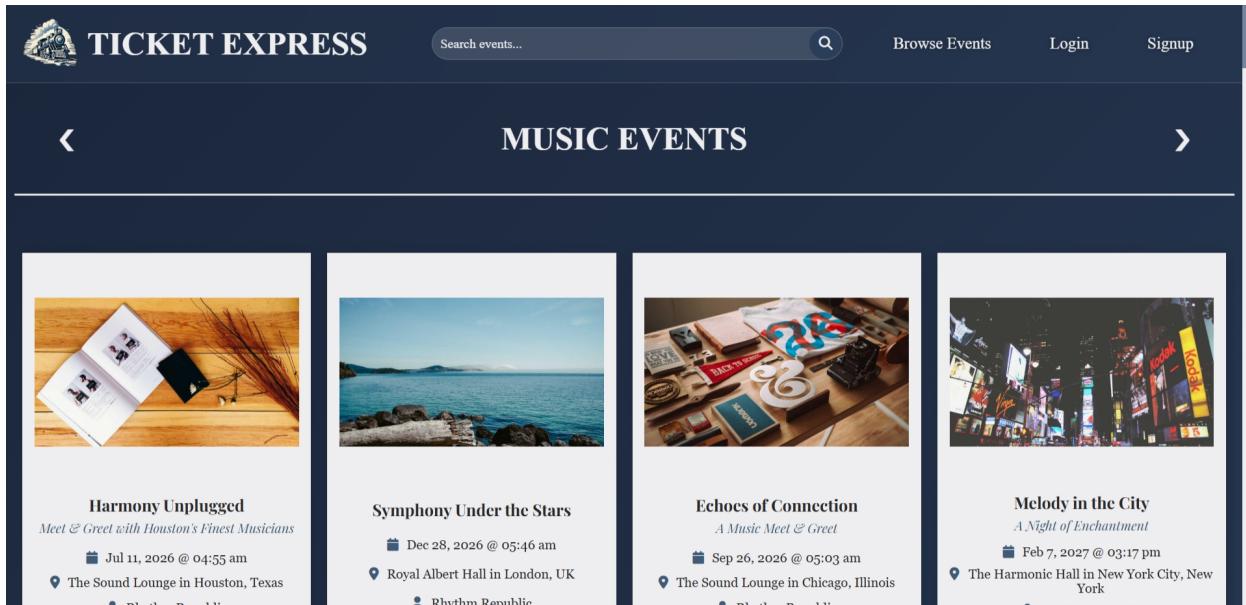


Figure 1: Homepage

Registered User Homepage:

After logging into Ticket Express, users are redirected to an enhanced version of the homepage tailored for authenticated users.

- **Navigation Bar Updates:**

- The top navigation bar now displays a **Profile Icon**, allowing users to access their account page directly.
- A **Logout** button replaces the previous Login/Signup options, enabling users to securely end their session.

- **Main Content Area Enhancements:**

- Users retain full browsing functionality of available events.
- Clicking an event tile leads to detailed information pages with ticket purchasing capabilities.
- Additional account-related features are now accessible through the profile icon.

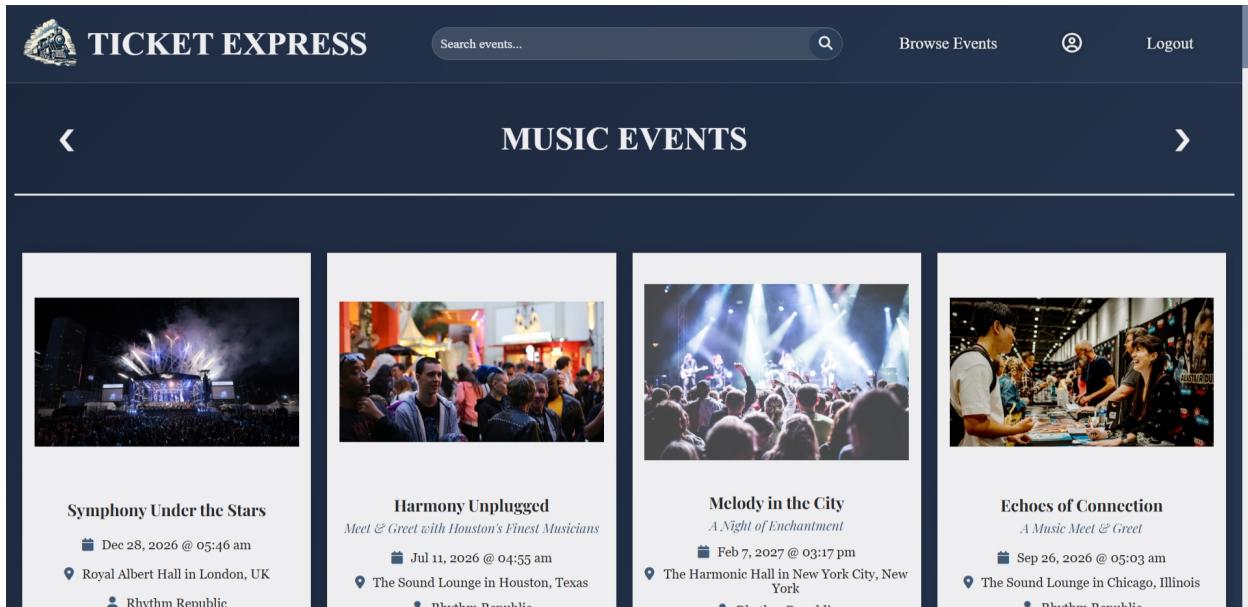


Figure 2: Homepage for a Logged-In User

3.3 Registering an Account

First, users must click the **Signup** button on the **Navigation Bar**. Upon clicking, users will be redirected to the Sign-up page. The Sign up Page in Ticket Express allows new users to quickly create an account and gain access to the platform's features.

Main Features:

- **Title:** "Create your account!" is prominently displayed at the top of the registration form.
- **Registration Form Fields:**
 - **Full Name Field:** Users enter their full name, which is stored as part of their user profile.
 - **Email Field:** Users provide a valid email address, which will serve as their login credential and contact address.
 - **Password Field:** Users set a secure password for future logins.
- **Register Button:** A large, dark-blue **Register** button is provided to submit the registration form and create the account.
- **Login Redirect Link:** Beneath the form, users who already have an account are given a link to the Login Page.
- **Email Notification:** Once a user has created an account, they will receive an email notifying them that an account with Ticket Express has been created using this email.
- **Successful Registration:** Upon successful registration, users are automatically logged into their new account and redirected to the homepage.

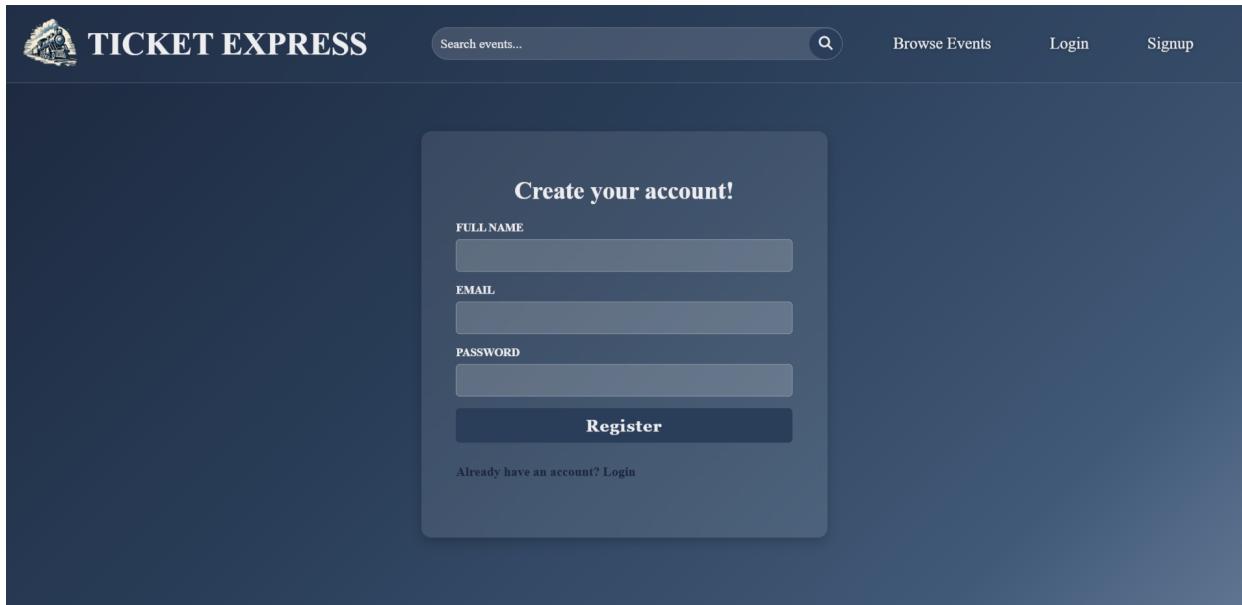


Figure 3: Sign-up page

3.4 Browsing Events

The **Browse Events** page 4 provides users with powerful tools to search, filter, and explore the full catalog of events available on Ticket Express.

Main Features of the Browse Events Page:

- **Filter Sidebar (Left Panel):**

- **Event Name:** Allows users to filter events based on title keywords.
- **Location:** Filter events by venue city or address.
- **Event Category:** Search within specific categories such as Music, Sports, Community, etc.
- **Tag:** Enter additional keywords or tags associated with events.
- **Event Date:** Select a date range (start and end) using interactive date pickers.
- **Sort By:** Dropdown menu allowing sorting by parameters such as date, popularity, or title.

- **Event Listings (Right Panel):**

- Events are presented in a ticket-themed card layout, offering an attractive and intuitive format.
- Each event ticket displays:
 - * Event banner image.
 - * Event title (bold and clickable).
 - * Event date and time.

- * Location (venue name and city).
- * Event category.
- Clicking on any event title or image redirects the user to the detailed Event Page.
- **Navigation and Responsiveness:**
 - Quick access remains available to **Homepage**, **Profile**, and **Logout** through the top navigation bar.
 - The layout is responsive across desktop, tablet, and mobile devices.

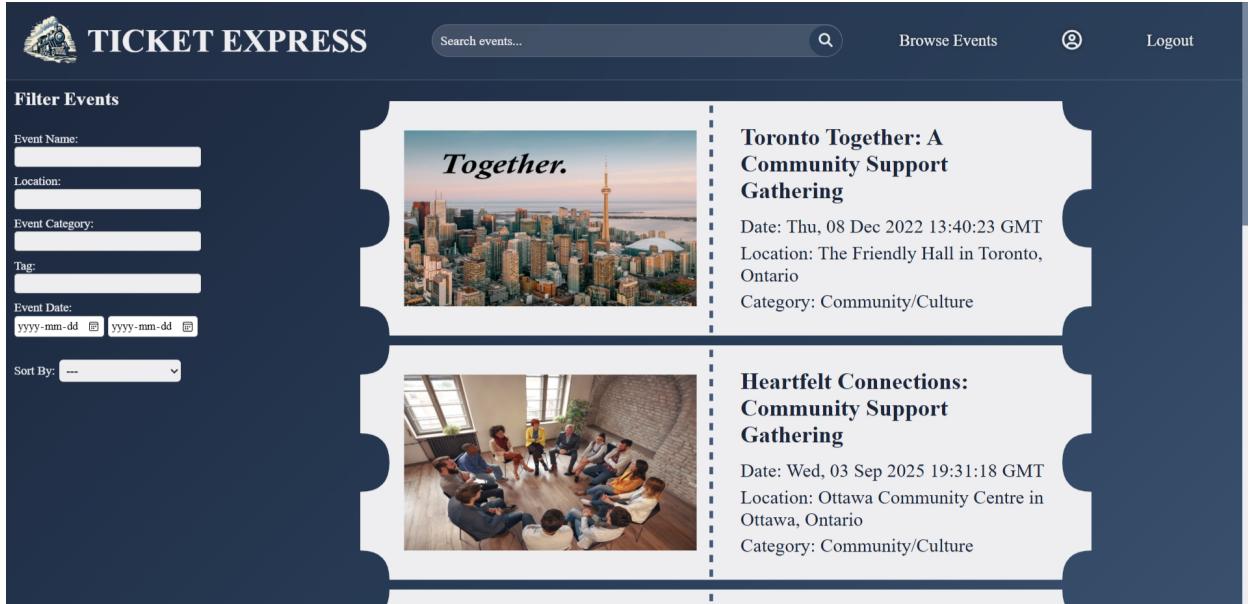


Figure 4: Browse Events Page with Filtering Options and Ticket-Style Event Listings

3.5 Individual Event Page Overview

Upon clicking an event from either the homepage or the Browse Events page, users are directed to the **Event Page** 6, which provides detailed information about the selected event.

The Event Page is structured to offer an immersive, informative, and easy-to-navigate experience for users interested in attending an event.

Top Section Features:

- **Banner Image:**
 - A full-width banner showcasing the event's promotional image is displayed at the top.
 - The event name is overlaid in bold capitalized font for high visibility.
- **Embedded Map:**

- A live Google Maps embed appears adjacent to the banner, allowing users to visualize the exact event location.
- Users can interact with the map (zoom, drag) without leaving the page.

Middle Section Features:

- **Event Metadata:**

- Displays the start and end date/time of the event.
- Lists the venue name and full address.
- Provides additional event categories or tags.

- **Event Description:**

- A detailed paragraph elaborating on the event purpose, atmosphere, activities, and any special notes for attendees.

Ticket Purchasing Section:

- **Ticket Options:**

- All available ticket types (e.g., General Admission, Free) are listed with their respective prices.
- Users can increment or decrement the number of tickets they wish to purchase for each type.

- **Purchase Button:**

- Once ticket quantities are selected, users click the **Purchase Tickets** button to complete checkout.
- If no tickets are selected, the purchase button remains disabled (grayed out).

Organizer Information Section:

- Displays the event organizer's name.
- Lists their contact information, including:
 - Phone number
 - Email address

The Event Page ensures users have all the essential information to make informed decisions about attending and simplifies the ticket purchasing process into a clean, visually unified experience.

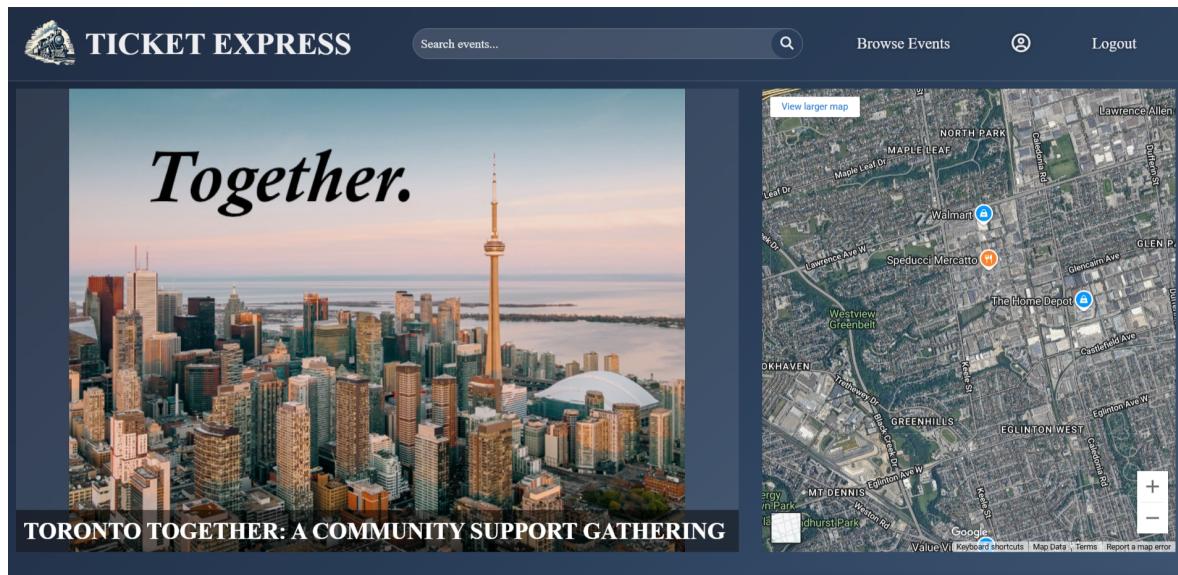


Figure 5: Top view of an Individual Event Page

December 8, 2022 @ 08:40 am - December 8, 2022 @ 02:21 pm
The Friendly Hall in Toronto, Ontario

Embrace an evening filled with warmth and connection at our local community gathering. Everyone is invited to come together in a supportive atmosphere where sharing and uplifting each other is the highlight of the night. Connect with familiar faces and make new friends, all while celebrating the resilience and spirit of our community. This is an ideal setting for storytelling, exchanging experiences, and finding solidarity through shared moments. Don't miss out on this opportunity to feel a part of something bigger and to strengthen our bonds in an inviting environment!

Tickets:

- Free - \$0.00
- General Admission - \$10.99

Organizer Information:

- Community Event Organizer
- (783) 713-7930
- support@commorganizers.com

Figure 6: Scrolled view showing ticket purchasing and organizer information

3.6 Purchasing Tickets

Steps:

1. On the Event Page, select the desired ticket type.
2. Specify the number of tickets to purchase.
3. Click the **Purchase** button.

4. A checkout confirmation screen will display.
5. Upon success, the ticket(s) are emailed and available in the user profile.

Notes:

- Each ticket is associated with a unique QR code.
- Tickets must be scanned at event check-in.

Checkout Page

Order Estimate Panel:

- A breakdown of the purchase is displayed in real-time on the right:
 - List of selected ticket types (e.g., Free Ticket, General Admission)
 - Subtotal of ticket prices
 - Additional service fees
 - Applicable taxes (e.g., GST)
 - Final Total
- This section ensures full transparency for the user prior to confirming their purchase.

Security Notice:

- Ticket Express assures users that all transactions are encrypted and secure, adhering to the platform's Privacy Policy.

Place Order Button:

- Once all fields are correctly filled out, users click **Place Order** to complete the transaction.

The screenshot shows the Ticket Express website interface. At the top, there's a navigation bar with a logo, a search bar labeled "Search events...", and links for "Browse Events", "Logout", and a user icon. Below the header, a banner displays payment method icons for Visa, Mastercard, and American Express, followed by the text "We accept Visa, Mastercard, and American Express". The main content area is titled "Payment - credit card". It contains fields for "CARD NUMBER", "EXPIRY MONTH", "EXPIRY YEAR", and "CVV". A note below the CVV field says "This 3 or 4 digit is on the back or front of your card". To the right, there's a "Card Information" section with fields for "FIRST NAME" and "LAST NAME". On the far right, there's a "Order Estimate" table showing the breakdown of the order:

Free	\$0.00	
General Admission	\$10.99	
General Admission	\$10.99	
Subtotal	\$21.98	
Service Fee	\$0.33	
Tax	\$1.10	
Total	\$23.41	

A "Place Order" button is located at the bottom of this section. Below the table, a link to "Security & Privacy" is provided, stating: "Every transaction on Ticket Express is secure. Any personal information you give us will be handled according to our Privacy Policy."

Figure 7: Empty checkout page for an event

Receipt

Ticket Details Section:

- Lists the purchased ticket types (e.g., Free, General Admission).
- Each purchased ticket includes a QR code.
- Ticket-specific metadata like event name, date, and organizer information are displayed.

QR Code:

- Each QR code serves as a digital ticket.
- Users present this QR code at event check-in for validation.

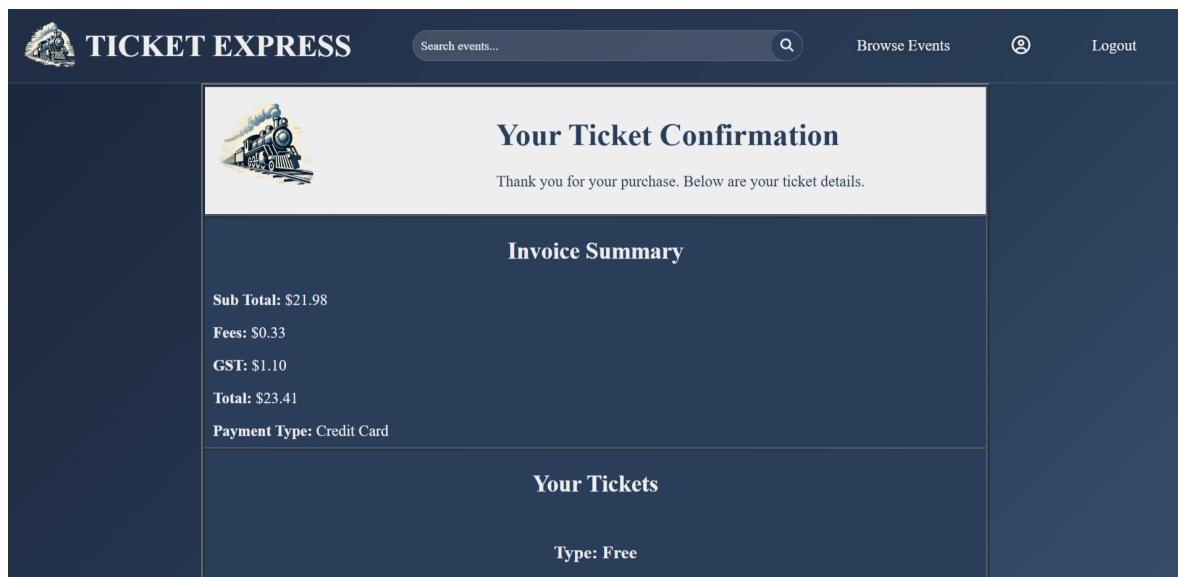


Figure 8: Empty checkout page for an event

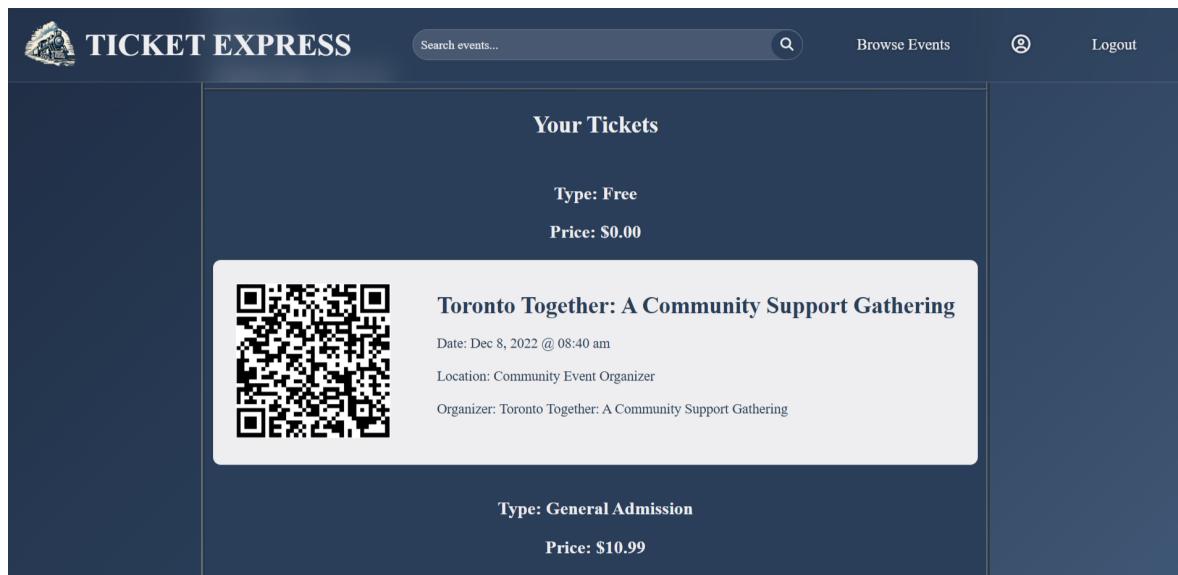


Figure 9: Empty checkout page for an event

3.7 Profile Page Overview

After logging into Ticket Express, users can access their **Profile Page** by clicking the profile icon located in the top-right corner of the navigation bar. The Profile Page allows users to personalize their account and manage event activities.

Main Features of the Profile Page:

- **Header Section:**

- Displays a customizable banner image across the top.
- Default background is a gradient, but users can upload their own images.
- Clicking the pencil/edit icon opens an image cropping tool for banner customization.

- **Profile Information:**

- Profile picture displayed below the banner.
- Clicking the small edit icon on the profile picture opens an image cropping tool to upload a new profile photo.
- Displays user's full name and a short biography (editable).

- **Account Controls:**

- **Edit Profile Info:** Allows users to modify their display name and personal bio.
- **Upgrade to Organizer ("Go Pro"):** Button that elevates a regular attendee account to an event organizer account, unlocking additional platform features such as event creation.

- **Contact Options (For Organizers):**

- Displays contact options such as email address and phone number for upgraded organizers.

- **Tabs for Activity Management:**

- **Purchase History:**

- * Displays a list of receipts corresponding to purchased tickets.
 - * Each receipt includes the purchase date, subtotal, and total amount paid.
 - * Receipts are styled as ticket stubs for consistency with the platform theme.

- **Upcoming Events:**

- * Lists future events that the user has registered tickets for.
 - * Clicking on an event allows the user to view or manage their ticket.

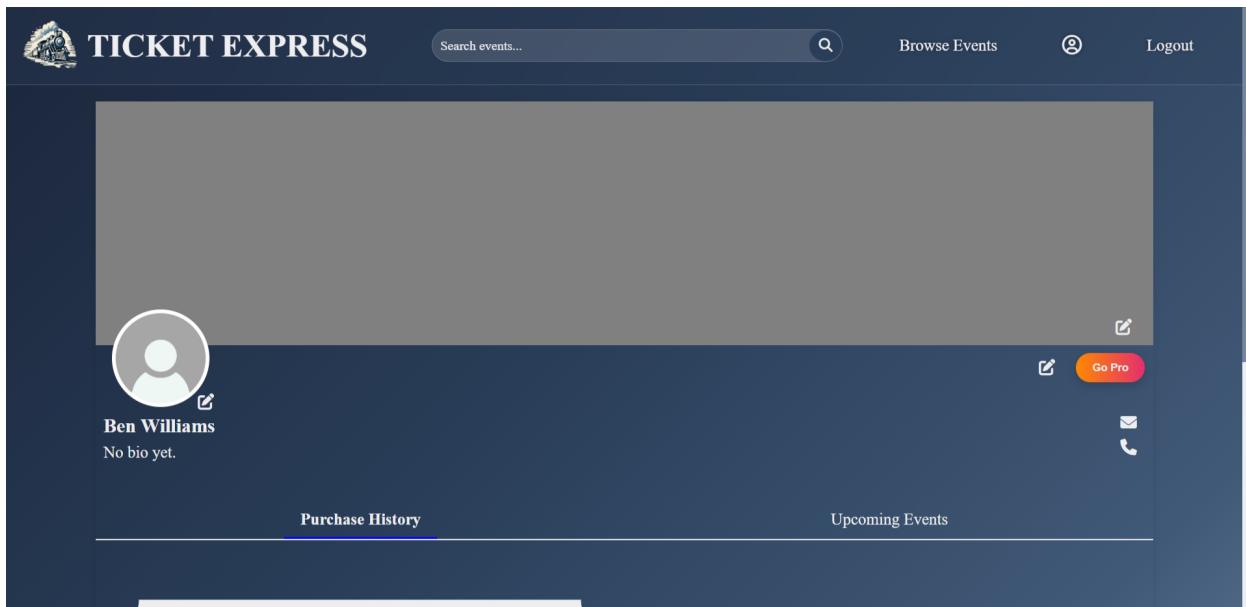


Figure 10: Default Profile Page

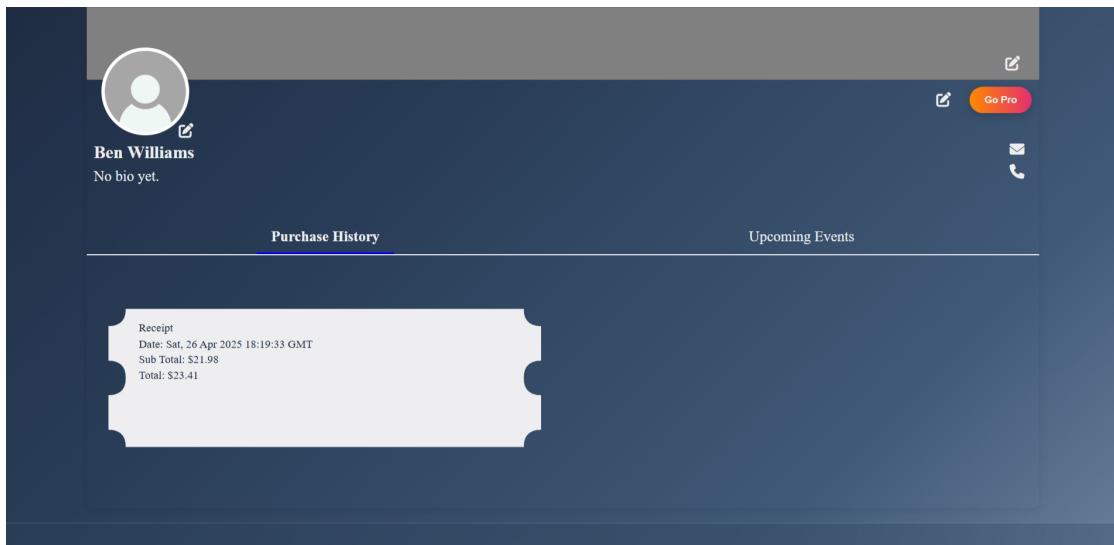


Figure 11: Purchase History showing a completed transaction

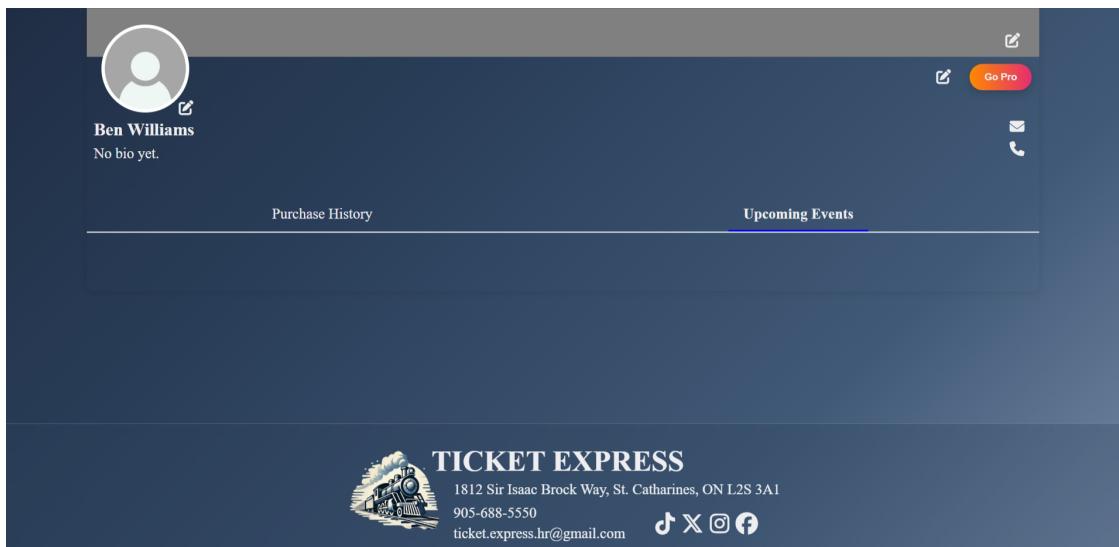


Figure 12: Empty Upcoming Events tab

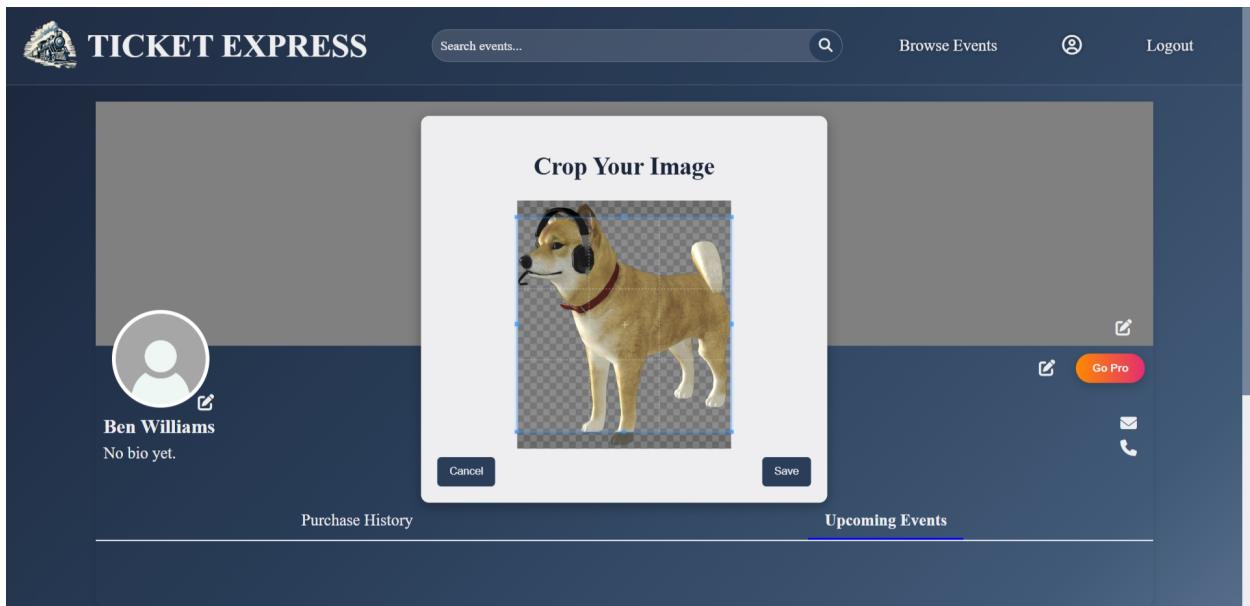


Figure 13: Profile Picture Editing Tool

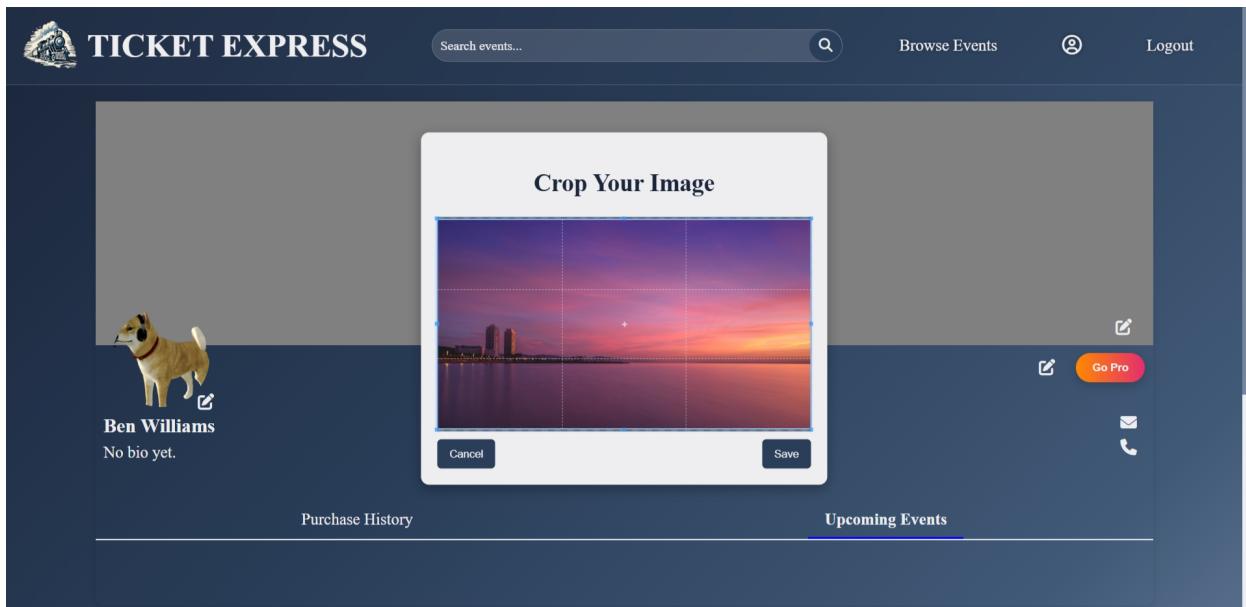


Figure 14: Banner Image Editing Tool

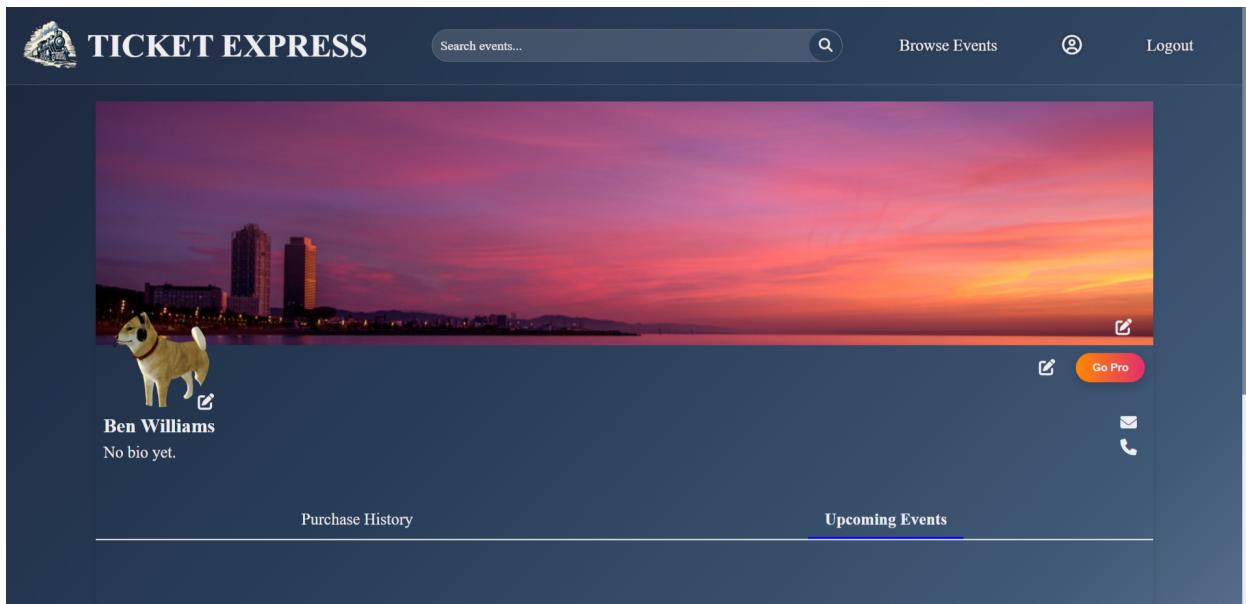


Figure 15: Customized Profile Page

The Profile Page enables users to personalize their account, review past purchases, and transition from an attendee to an event organizer role within the Ticket Express ecosystem.

3.8 Upgrading to Organizer Account (Go Pro)

Registered users on Ticket Express initially have an **attendee** role, which allows them to browse events and purchase tickets. To create and manage their own events, users must upgrade their account to an **Organizer Account** by purchasing the "Go Pro" package.

Accessing the Upgrade Option:

- Users navigate to their **Profile Page** after logging in.
- A prominent **Go Pro** button is displayed near the user's banner and profile picture (see Figure 16).
- Clicking this button redirects the user to the dedicated **Account Upgrade Checkout Page**.

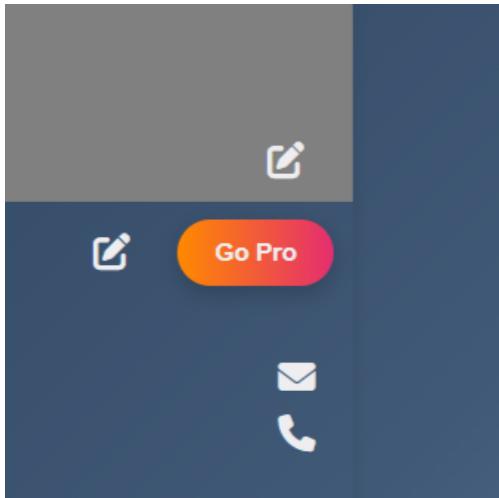


Figure 16: Go Pro Button on User Profile Page

Go Pro Checkout Page:

- The checkout page closely resembles the regular ticket purchase page.
- Users are prompted to enter their **Card Information** and **Billing Information**.
- The **Order Estimate** section on the right-hand side displays the total cost of the Organizer Account upgrade (see Figure 17).
- Clicking **Place Order** finalizes the upgrade.

The screenshot shows the payment section of the Ticket Express website. At the top, there are three status buttons: 'Fail Name', 'Fail Card', and 'success'. Below them is the heading 'Payment - credit card' with icons for VISA, MasterCard, and American Express. A note says 'We accept Visa, Mastercard, and American Express'. The 'Card Information' section contains fields for 'CARD NUMBER', 'EXPIRY MONTH' (MM), 'EXPIRY YEAR' (YY), and 'CVV'. A small note below the CVV field says 'This 3 or 4 digit is on the back or front of your card'. The 'Billing Information' section has fields for 'FIRST NAME' and 'LAST NAME'. To the right, a 'Order Estimate' table shows the following details:

	\$50.00
Subtotal	\$50.00
Service Fee	\$0.75
Tax	\$2.50
Total	\$53.25

A 'Place Order' button is located at the bottom of the estimate table. Below the table, a 'Security & Privacy' section states: 'Every transaction on Ticket Express is secure. Any personal information you give us will be handled according to our Privacy Policy.'

Figure 17: Organizer Account Upgrade Checkout Page

Upgrade Confirmation Page:

- Upon successful payment, users are redirected to a **Receipt Page**.
- The receipt confirms the purchase and displays an **Account Organizer Upgrade** under the purchased items (see Figures 18 and 19).
- After the upgrade, users gain access to organizer-specific features such as creating and managing events.

The screenshot shows the top section of a receipt page. At the top, there is a logo of a train and the text 'TICKET EXPRESS'. A search bar and navigation links for 'Browse Events', 'Create Events', and 'Logout' are visible. The main content area has a heading 'Your Ticket Confirmation' with a train icon. A note says 'Thank you for your purchase. Below are your ticket details.' Below this is a section titled 'Invoice Summary' with the following details:

Sub Total:	\$50.00
Fees:	\$0.75
GST:	\$2.50
Total:	\$53.25
Payment Type:	Credit Card

Below the summary is a section titled 'Your Tickets' with the subtext 'Account Organizer Upgrade'.

Figure 18: Organizer Upgrade Receipt – Top Section

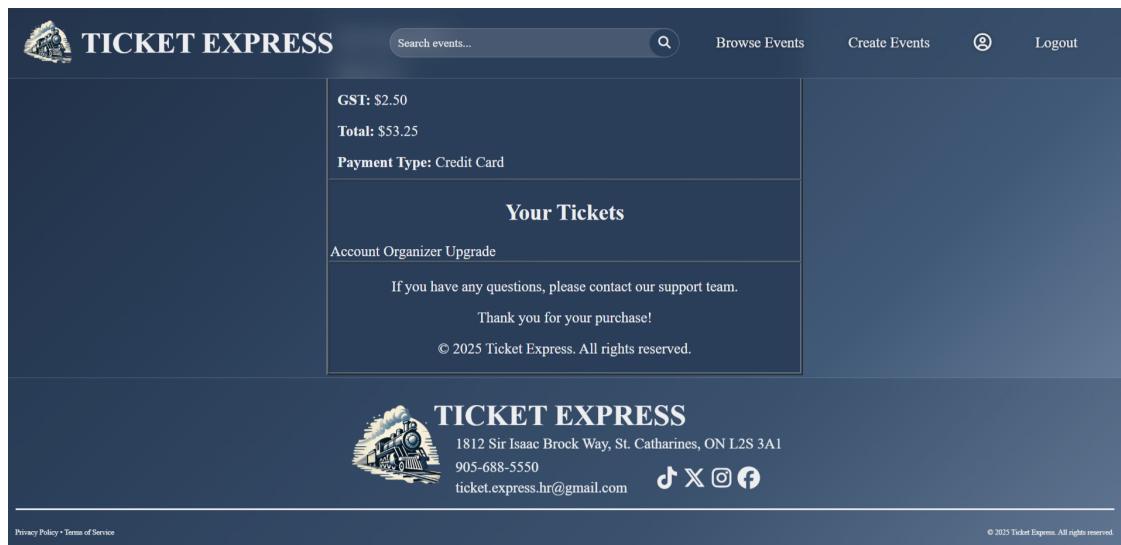


Figure 19: Organizer Upgrade Receipt – Bottom Section

Upgrading to an organizer unlocks full event hosting capabilities within the Ticket Express platform, allowing users to contribute actively to the event ecosystem.

3.9 Creating and Managing Events

Registered users who upgrade to organizer accounts can create and manage events through the **Create Events** interface. Event creation is divided into a clean and intuitive step-by-step process.

Event Creation Workflow:

1. Step 1: Enter Event Information

- Users input the **Event Title**, **Event Description**, **Event Location**, **Event Date**, **Start Time**, and **End Time**.
- The event location is automatically mapped using Google Maps integration, displaying a map with a pin at the provided location.

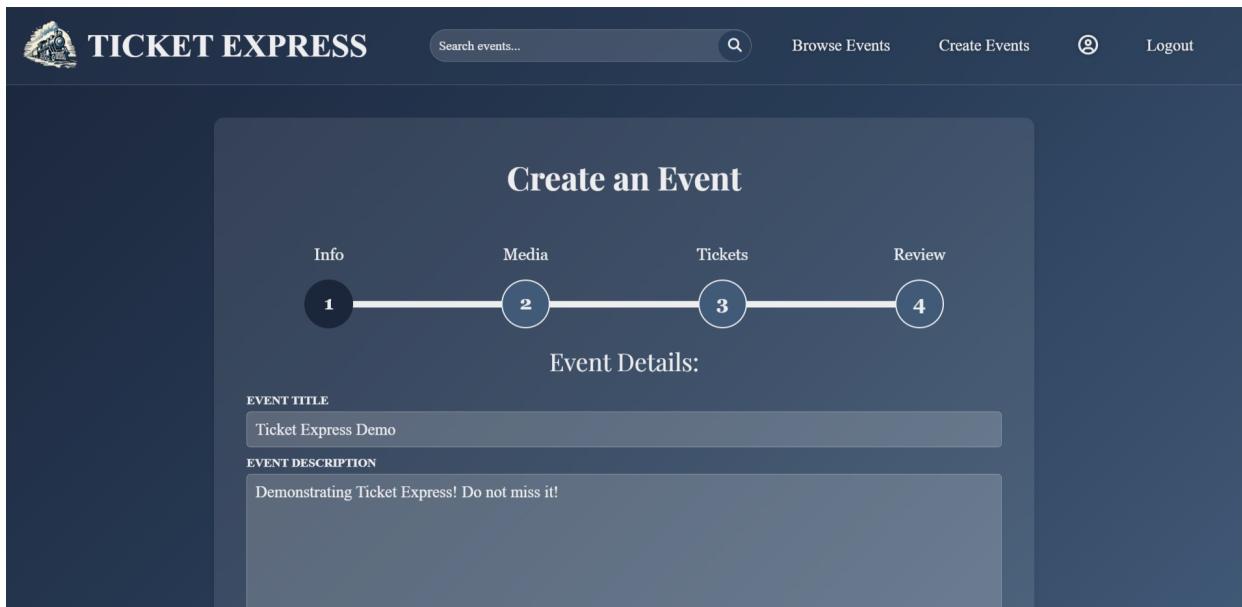


Figure 20: Create Events Information Page

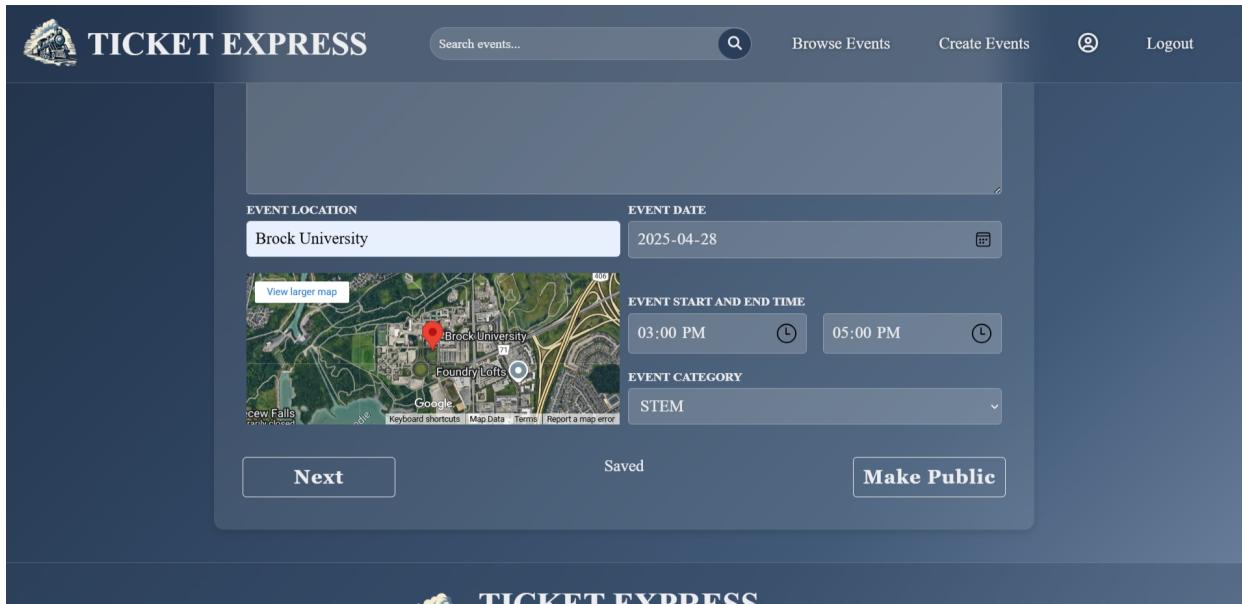


Figure 21: Entering Basic Event Information (Location, Date, Time)

2. Step 2: Upload Event Media

- Organizers can upload a banner image to visually represent their event.
- Users also provide **Event Tags** (keywords) to help categorize and improve searchability.

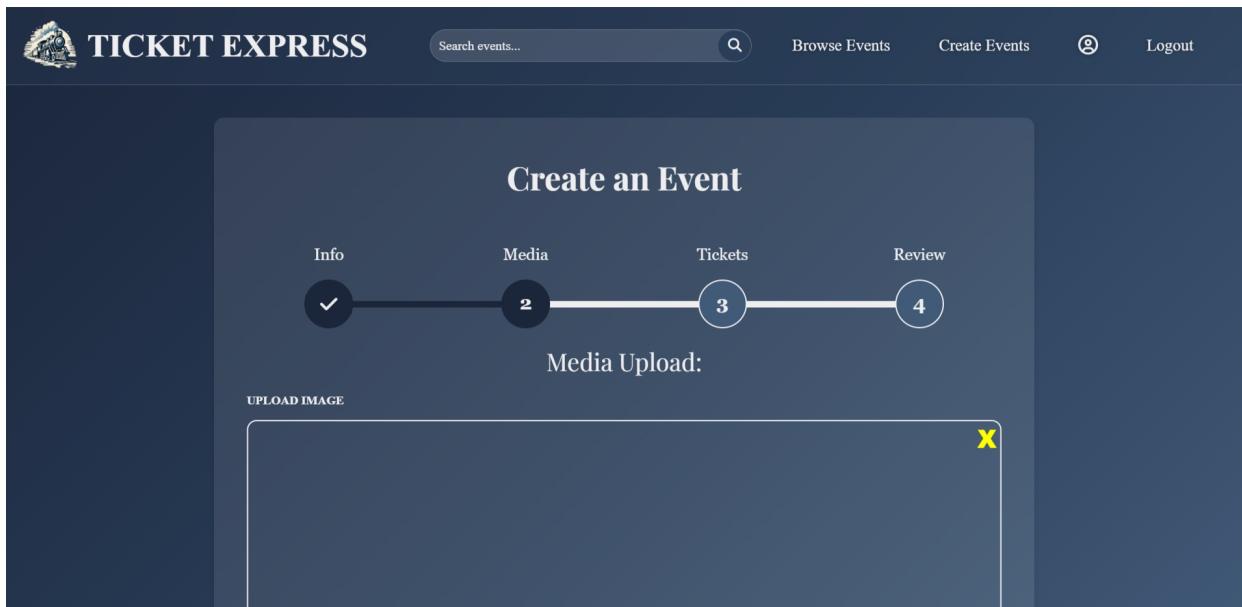


Figure 22: Upload Media (Step 2)

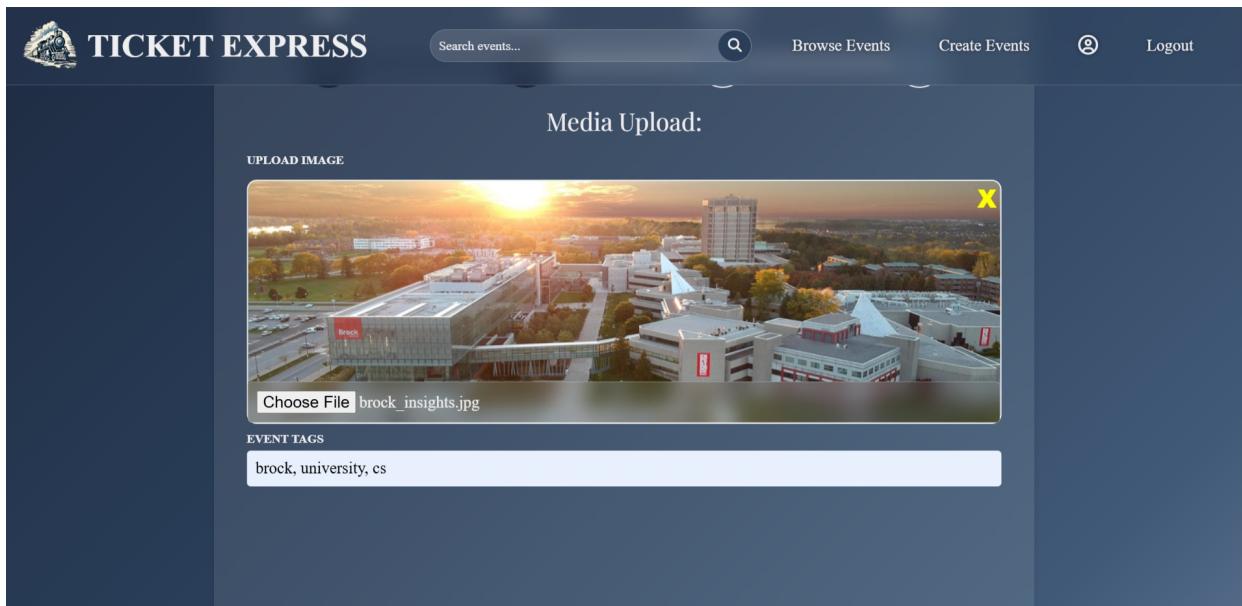


Figure 23: Example wallpaper uploaded

3. Step 3: Configure Ticketing and Pricing

- Organizers define ticket types (e.g., General Admission, VIP).
- For each ticket type, they specify:
 - Ticket Type (dropdown selection)
 - Quantity Available
 - Price per Ticket
- The **Ticket Release Date** and **Release Time** are also configured.

- Tickets can be added or removed dynamically.

Create an Event

Info Media **Tickets** Review

1 2 3 4

Tickets & Pricing:

TICKET RELEASE DATE
2025-04-27

TICKET RELEASE TIME
12:00 PM

Add Ticket

Figure 24: Configured ticket release dates

Tickets & Pricing:	
TICKET RELEASE DATE 2025-04-27	TICKET TYPE General Admission
TICKET RELEASE TIME 12:00 PM	TICKET TYPE: GENERAL 99
	PRICE 99.99
Add Ticket	Delete
	TICKET TYPE VIP
	TICKET TYPE: GENERAL 10
	PRICE 9000.01
	Delete

Figure 25: Different ticket types for an event

4. Step 4: Review and Publish

- A review page summarizes all event details, allowing organizers to verify correctness.
- If satisfied, organizers can **Make the Event Public** to make it visible to all users.

- If not yet ready, events can be saved as drafts by clicking **Previous** and revisiting the details later.

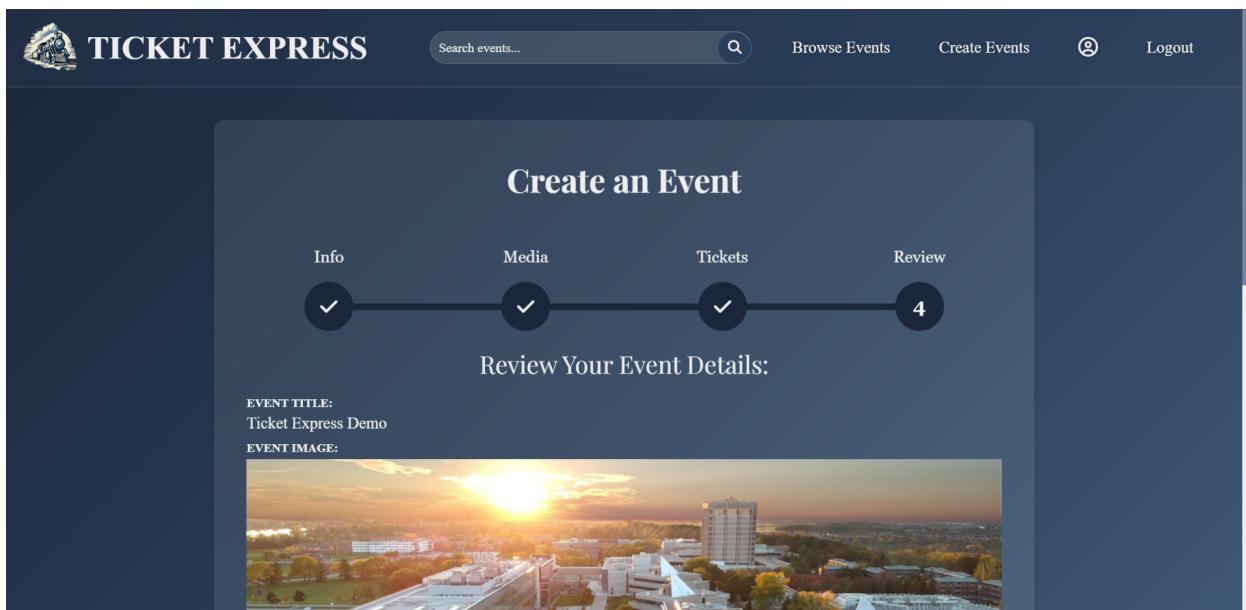


Figure 26: Review and Publish Event (1)

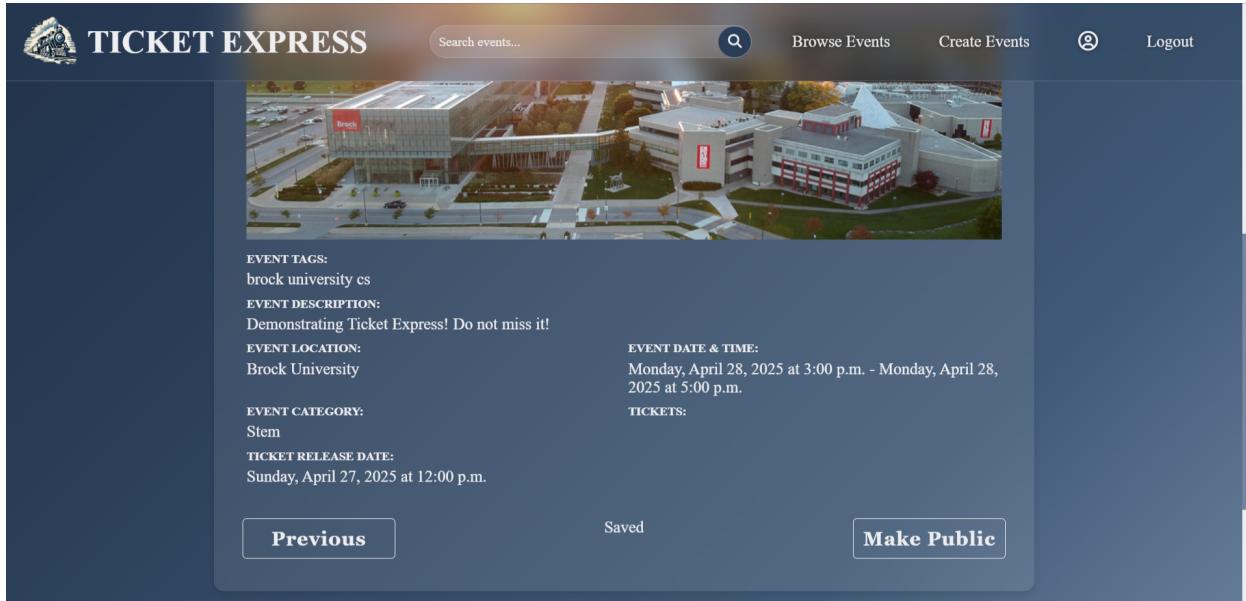


Figure 27: Review and Publish Event (2)

Managing Events after Creation:

- Once published, events appear publicly in the **Browse Events** section.

- Events display key information, including:
 - Event Name, Date/Time, Location, Category, and Organizer Name
- Clicking an event directs users to the Event Page for detailed descriptions, ticket selection, and purchase.

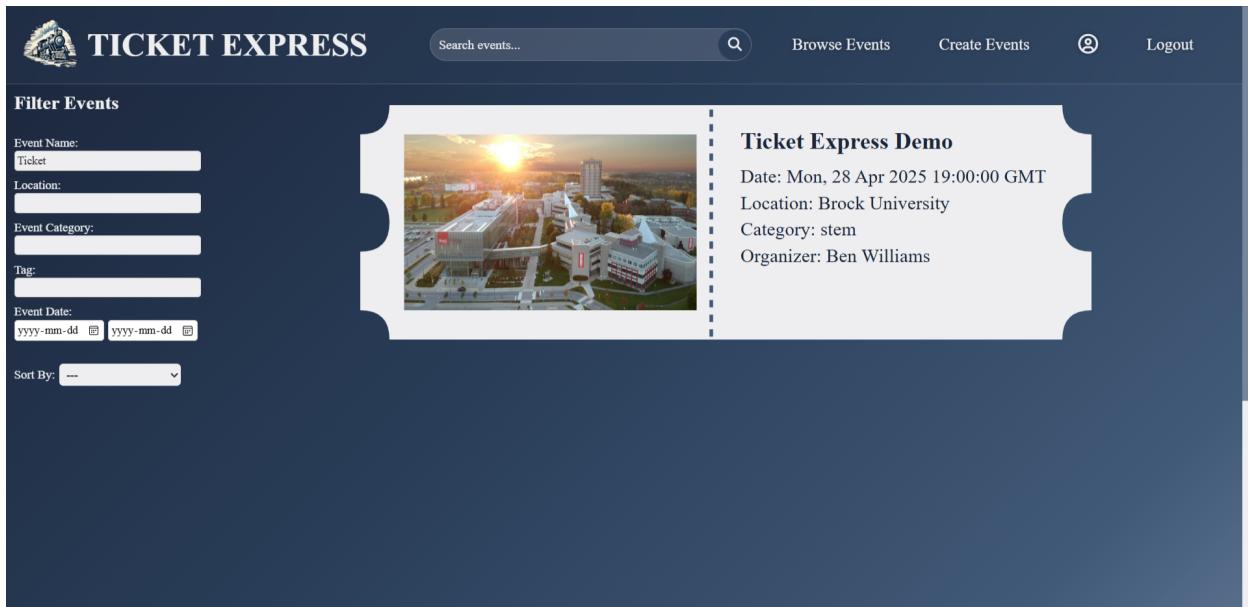


Figure 28: Public Event Listing After Publishing

The event creation process in Ticket Express is designed to be highly intuitive, ensuring that organizers can easily launch professional-looking event pages with minimal friction. The multi-step layout guides users naturally through each required detail while giving them opportunities to preview and correct mistakes before publishing.

4 System Architecture Overview

Ticket Express is structured as a modular, three-tiered web application that follows a frontend-backend-database architecture.

4.1 Frontend Layer

The frontend is responsible for all user interaction and presentation. It is built using:

- HTML5, CSS3, JavaScript (ES6)
- Handlebars templates for dynamic rendering
- QR code scanning integration for event check-in

The frontend communicates with the backend exclusively via REST-style API calls using JSON data.

4.2 Backend Layer

The backend server is a custom Java-based application using:

- Java's built-in `HttpServer` for HTTP request handling
- A custom routing framework using annotations
- Controllers (APIs) for accounts, events, tickets, admin functions
- Media file serving for event banners and QR codes

The backend enforces session management, business logic, and communication with the database.

4.3 Database Layer

Ticket Express uses a lightweight SQLite relational database for persistent data storage. The database schema includes:

- Users table
- Events table
- Tickets table
- Orders table
- Sessions table

Each database operation is performed through a managed database layer using prepared statements and transaction handling to ensure security and data consistency.

4.4 Inter-layer Communication

- Frontend communicates with Backend over HTTP (port 8080) via JSON payloads.
- Backend communicates with the Database through SQL queries managed by the database abstraction layer.

- Media assets (images, QR codes) are served through dedicated endpoints in the backend.

A high-level architecture diagram is provided in the Software Requirements Specification (SRS) document for detailed visualization.

5 Technical Guide

5.1 Backend System Overview

Ticket Express uses a custom Java-based web server that handles HTTP requests, session management, database interactions, and email services.

Key backend components:

- **WebServerImpl**: Initializes and mounts backend services.
- **DbManagerImpl**: Manages SQLite database operations.
- **MailServer**: Sends email notifications using SMTP.
- **API Endpoints**: RESTful routes for account management, event handling, ticket sales.

5.2 Frontend System Overview

The frontend is built using HTML5, CSS3, JavaScript (ES6), and Handlebars templates.

- **Dynamic Content**: JavaScript fetches API data and populates templates.
- **Responsive Design**: Mobile, tablet, and desktop compatibility.
- **UI Enhancements**: Carousel displays, ticket counters, and QR code integration.

5.3 Database Structure Overview

Data is stored in a relational SQLite database.

- **Users Table**: Stores account information and roles.
- **Events Table**: Event metadata and organizer association.
- **Tickets Table**: Ticket types linked to events.
- **Orders Table**: Records of user purchases.
- **Sessions Table**: Active user sessions with expiration control.

5.4 Deployment Overview (Localhost + Server Hosting)

Local Deployment Steps:

1. Clone the repository from GitHub.
2. Ensure Java 17 and SQLite3 are installed.
3. Navigate to the ‘server’ directory and run ‘./run.sh’ (Linux/Mac) or ‘run.bat’ (Windows).
4. Access the platform at ‘<http://localhost:8080/>’.

Production Deployment involves hosting the backend server on a Linux server with public HTTP exposure, secure SMTP access, and persistent SQLite storage.

6 Glossary

Term	Definition
Ticket	A digital artifact that grants event access, identified by a QR code.
Event	A scheduled activity available for ticketed entry.
Organizer	A user responsible for creating and managing events.
Session Token	A secure identifier maintaining user login state.