# InterestLink – Final Project Documentation

Authored By: Brittney Zimmerman, Jeremy Duong, Ray Sheikh, Fathima Afridi

University of Houston

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# System Architecture

## Overview

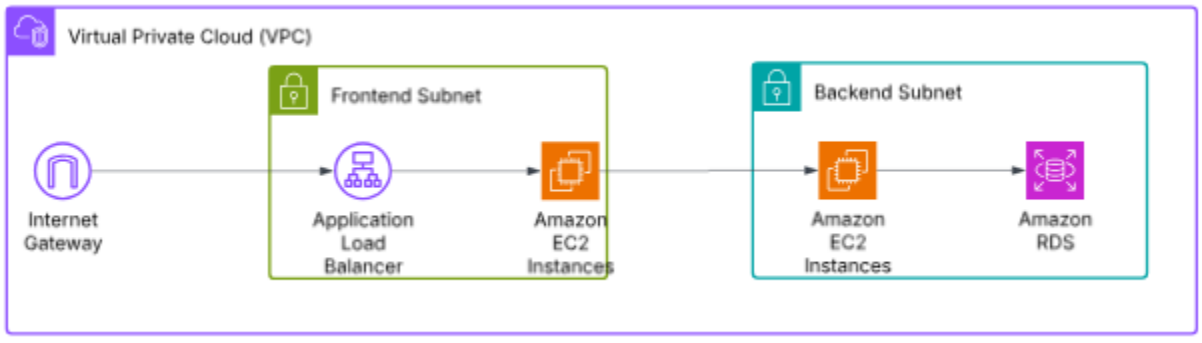
The InterestLink application is deployed on AWS using a multi-tier architecture for improved security, scalability, and separation of concerns. The system consists of the following core components:

1. **Frontend Layer**: EC2 instance running Flask
2. **Backend Layer**: EC2 instance running Express
3. **Database Layer**: AWS RDS running MySQL

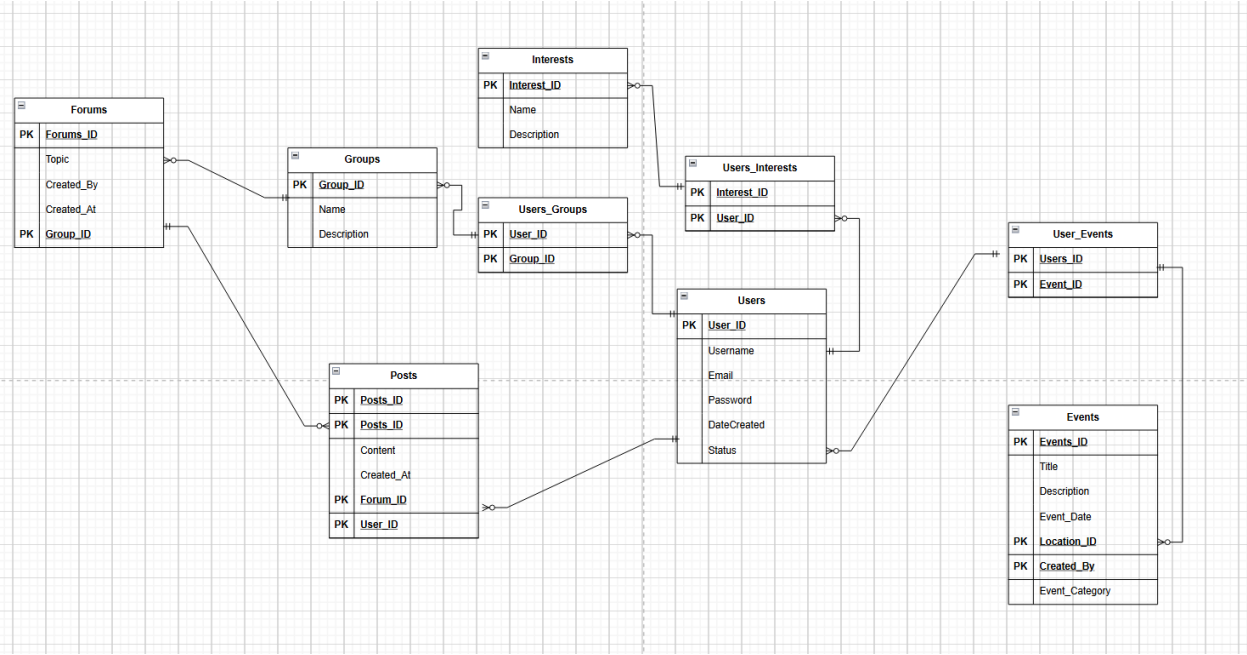
## Network Architecture

The application is deployed within a Virtual Private Cloud (VPC) with the following subnet configuration:

- **Public Subnet**: Contains the frontend EC2 instance and is accessible from the internet
- **Private Application Subnet**: Contains the backend EC2 instance, isolated from direct internet access
- **Private Database Subnet**: Contains the RDS instance, accessible only by the backend



# Updated ERD


Forums
PK Forums_ID
Topic
Created_By
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Groups
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Name
Description
Interests
PK Interest_ID
Name
Description
Users_Groups
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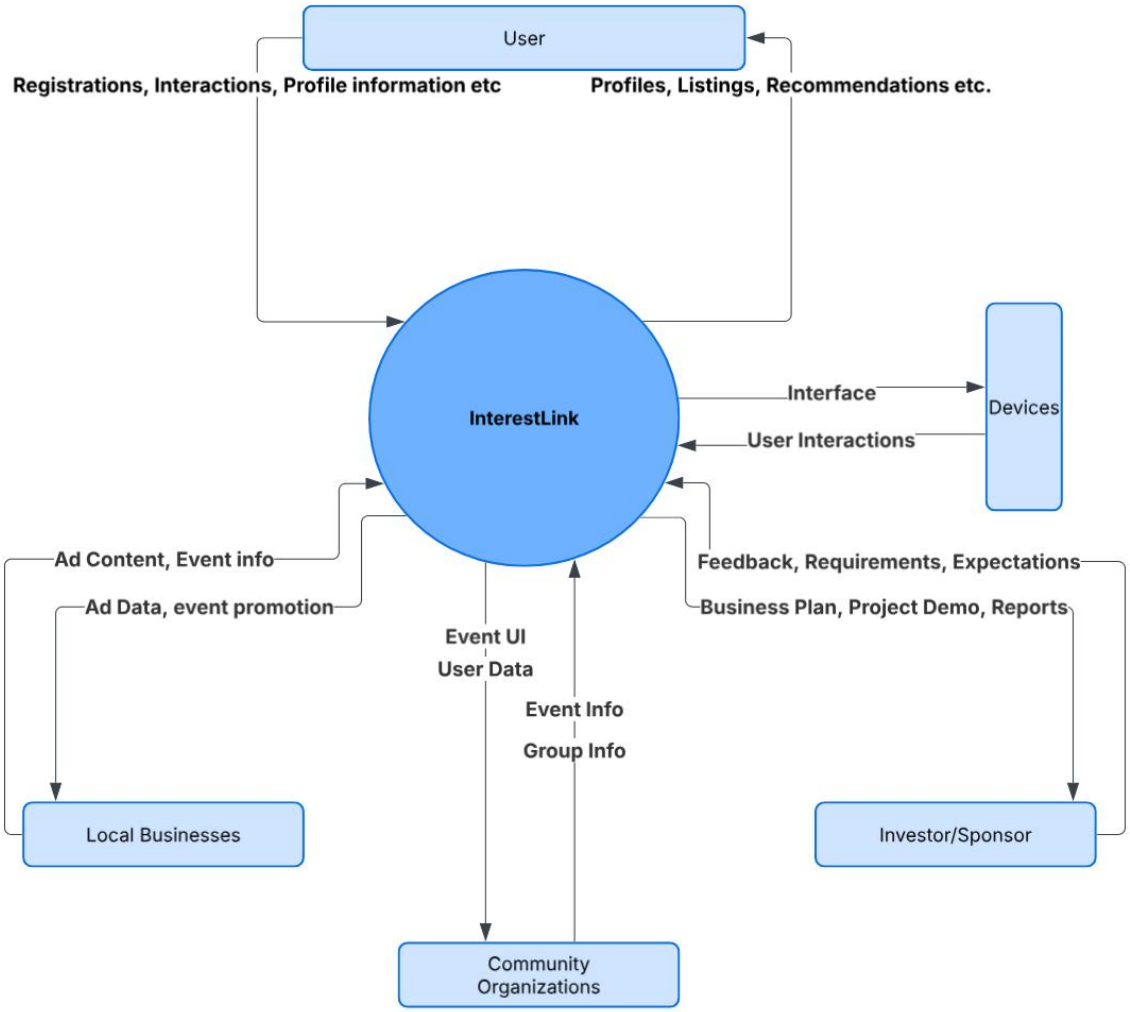
Title
Description
Event_Date
PK Location_ID
PK Created_By
Event_Category

# Updated DFD

Context



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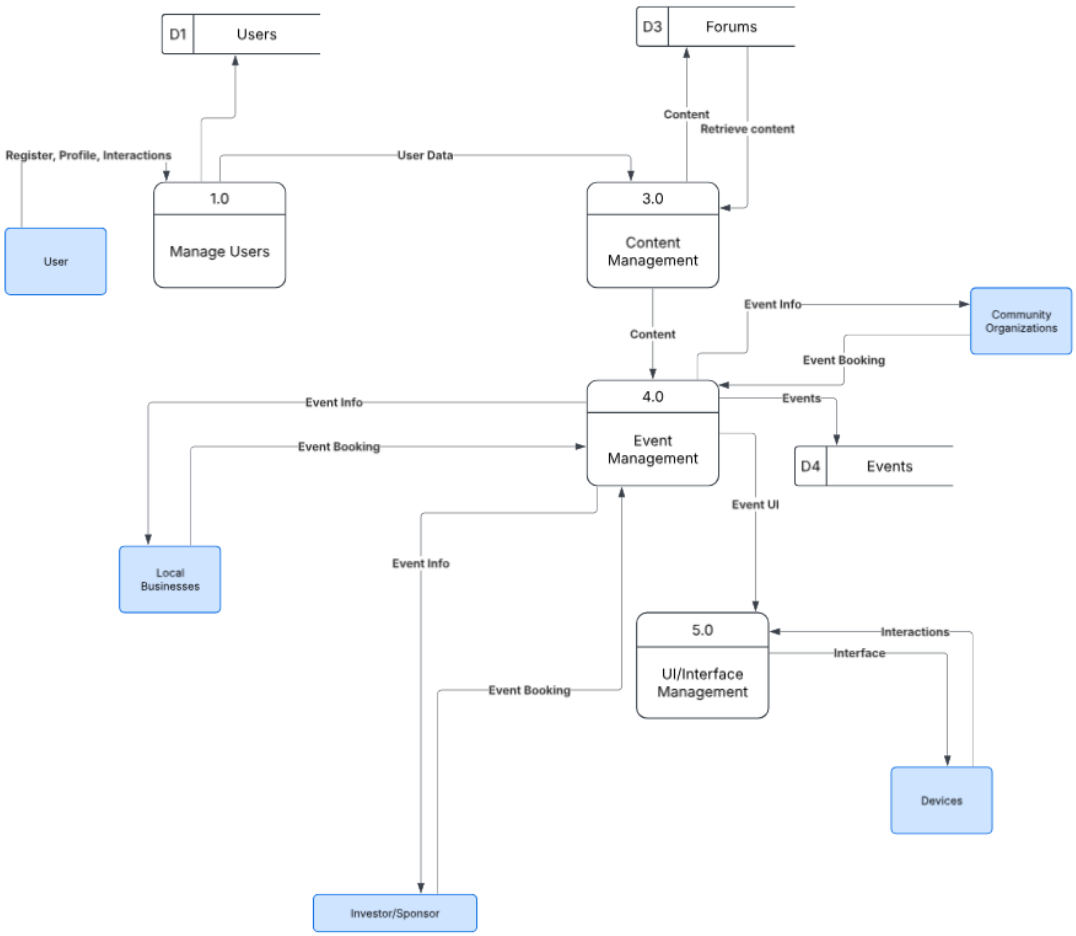

D1
Users
D3
Forums
Content
Retrieve content
Register, Profile, Interactions
User Data
1.0
Manage Users
3.0
Content Management
User
Event Info
Community Organizations
Content
Event Booking
Event Info
4.0
Event Management
Events
Event Booking
D4
Events
Event UI
Local Businesses
Event Info
5.0
UI/Interface Management
Interactions
Interface
Event Booking
Devices
Investor/Sponsor

# Final User Documentation

## Getting Started

### Create an Account

1. Click "Register" on the homepage
2. Enter your username, email, and password
3. Click "Create Account"

### Log In

1. Click "Login" on the homepage
2. Enter your email and password
3. Click "Log In"

### Bio

1. Control your account by clicking on settings
2. Add a bio and click update profile

### Change Password

1. Click on settings
2. Enter in new password
3. Confirm new password

## Finding Things to Do

### Discover Events

1. Click "Events" in the menu
2. Browse events based on your interests

3. Click on any event for details
4. Click "RSVP" to join

### Create an Event

1. Click "Create Event" on the Events page
2. Fill in event details (title, date, location)
3. Select related interests
4. Click "Create"

### Join Groups

1. Click "Groups" in the menu
2. Find a group you like
3. Click "Join Group"

### Start a Group

1. Click "Create Group" on the Groups page
2. Name your group and add a description
3. Select related interests
4. Click "Create Group"

## Connecting with Others

### Join Discussions

1. Go to any group you've joined
2. Click "Forums"
3. Read and reply to topics or create your own

### Find People with Similar Interests

1. Click "Matches" in the menu
2. Browse suggested connections
3. Click "Connect" to send a request

# Logs

## Decision Logs

**InterestLink Project Decision Log**

| *ID* | *Decision* | *Description* | *Comments* | *Owner* | *Status* |
|---|---|---|---|---|---|
| *1* | Technology Stack Selection | Selected Express.js for frontend and Flask for backend | Frontend will handle UI rendering EJS templates while backend Use of RESTful APIs | Architecture Team | Approved |
| *2* | MySQL for backend | MySQL selected as the database technology for the application | Relational database needed | Database Team | Approved |
| *3* | AWS with cost analysis for servers | AWS selected as the cloud provider with EC2, RDS, and VPC | Cost analysis shows t3.medium for frontend, t3.large for backend, and db.t3.large for RDS will be sufficient | Infrastructure Team | Approved |
| *4* | Three-tier architecture | Implemented separate tiers for presentation, | Improves security and scalability by isolating components | Architecture Team | Approved |

| | | | | | |
|---|---|---|---|---|---|
| | | application logic, and data | | | |
| 7 | Session-based authentication | Implemented session-based auth using express-session | Simpler implementation than token-based for this application structure | Security Team | Approved |
| 8 | Bootstrap for UI framework | Selected Bootstrap 5 for frontend styling | Provides responsive design and consistent UI components with minimal custom CSS | UI Team | Approved |
| 9 | Manual database backups | Weekly manual snapshots in addition to automated RDS backups | Ensures additional recovery points beyond the automated 7-day retention | Operations Team | Approved |

## Change Control Logs

**InterestLink Simple Change Log**

| ID | CHANGE | REASON | STATUS |
|---|---|---|---|
| **1** | Removed interest-based matching feature | Simplify MVP for faster launch | Complete |
| **2** | Removed role-based access control | Simplify security model | Complete |
| **3** | Updated database schema | Remove unnecessary tables after feature changes | Complete |

| | | | |
|---|---|---|---|
| **4** | Removed related API endpoints | Clean up deprecated functionality | Complete |
| **5** | Updated user interface | Remove matching elements from dashboard | Complete |
| **6** | Updated documentation | Reflect current iteration | Complete |

## Issues Log

**InterestLink Simple Issues Log**

| ID | ISSUE | SEVERITY | STATUS | OWNER |
|---|---|---|---|---|
| **1** | Database connection timeout | High | Fixed | Database Team |
| **2** | Session data lost after server restart | Medium | Fixed | Backend Team |
| **4** | Event creation fails | High | Fixed | Backend Team |
| **5** | Slow page loads | Medium | Fixed | Frontend Team |
| **6** | Search not working | Medium | Fixed | Backend Team |
| **8** | Login not working | High | Fixed | UI Team |
| **9** | Registration API not working | Medium | Fixed | Backend Team |
| **10** | SSL certificate expiration warning | High | Fixed | DevOps Team |

# Revised Market Analysis

## InterestLink Market Strategy & Revenue Roadmap

## Current Market Strategy

### Core Business Model

- **Standard Website Experience** - A unified experience for all users without tiered access
- **Interest-Based Community Platform** - Connecting users based on shared interests, events, and groups
- **Partnership Revenue Focus** - Primary monetization through business partnerships

### Current Revenue Stream: Partnership Model

1. **Event Advertising Revenue**
    - Partners pay to promote their events on the platform
    - Targeted promotion based on user interests and groups
    - Pricing tiers based on promotion prominence and duration
2. **Partner Integration Opportunities**
    - Featured partner groups within the platform
    - Partner-sponsored forums and discussion threads
    - Exclusive partner-hosted virtual and physical events
3. **Value Proposition to Partners**
    - Access to highly segmented interest groups
    - Higher conversion rates through interest-based targeting
    - Direct engagement with relevant community members
4. **Current Pricing Structure**
    - Event promotion: $10-$15 per event based on targeting options
    - Featured partner status: $30 per month

### Key Performance Indicators

- Partner acquisition rate
- Event promotion conversion rates
- User engagement with partner content
- Revenue per partner

# Future Revenue Possibilities

### 1. Premium Membership Options

- **Enhanced Profile Features** - Advanced customization
- **Premium Content Access** - Exclusive webinars, courses, and digital resources

### 2. Transaction-Based Revenue

- **Marketplace for Interest-Based Services/Products** - With commission structure
- **Paid Events & Workshops** - Platform fee for paid event registrations
- **Expert Connection Service** - Facilitating paid consultations with subject matter experts
- **Digital Content Sales** - Courses, guides, or other content related to specific interests

### 3. Data & Insights

- **Aggregated Trend Reports** - Selling anonymized interest trends to market researchers
- **Custom Research Opportunities** - Opt-in research panels for partners
- **Industry Benchmarking** - Comparative data on community engagement
- **Predictive Interest Analytics** - Early trend identification for partners

### 4. Enterprise Solutions

- **Corporate Team Building** - Interest-based team formation and activities
- **Enterprise Community Management** - Private instances for large organizations
- **HR & Recruitment Tools** - Interest-based candidate matching
- **B2B Networking Platform** - Business partnership matchmaking based on complementary interests

### 5. Value-Added Services

- **Personalized Interest Recommendations** - AI-driven content and connection suggestions
- **Enhanced Discovery Tools** - Advanced search and filtering capabilities
- **Custom Group Features** - Enhanced tools for group administrators
- **Integration with External Platforms** - Calendar systems, productivity tools, social media

# Scalability

**InterestLink: Scalability Strategy**

**Business Growth Opportunities**

- **Expansion**: Geographic and demographic market reach
- **Data Analytics**: Enhanced recommendation capabilities
- **Freemium Models**: Tiered service offerings
- **Additional Revenue Streams**: Partnerships, premium features, advertising

**Technical Implementation with AWS**

**Infrastructure Advantages**

- **Secure & Reliable Scaling**: Enterprise-grade security with high availability
- **Exponential User Growth Support**: Architecture designed for rapid audience expansion
- **Autoscaling Capabilities**: Dynamic resource allocation based on traffic patterns
- **Consistent Performance**: Maintained responsiveness during usage spikes
- **Deployment Strategy**
- **CloudFormation Implementation**: Rapid infrastructure deployment
- **Security Best Practices**: Built-in compliance and protection measures
- **Reliability Architecture**: Redundancy and fault tolerance
- **Application Support Framework**: Optimized for InterestLink's specific needs
- **Growth Projection**

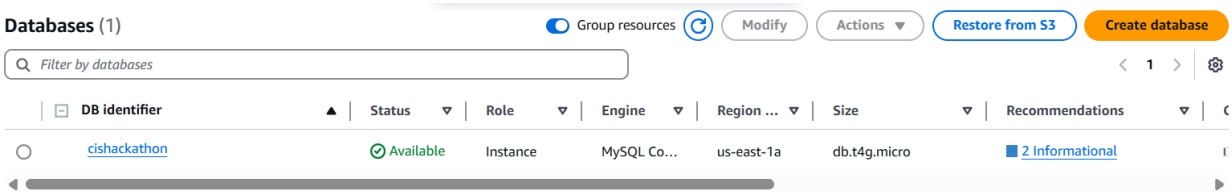
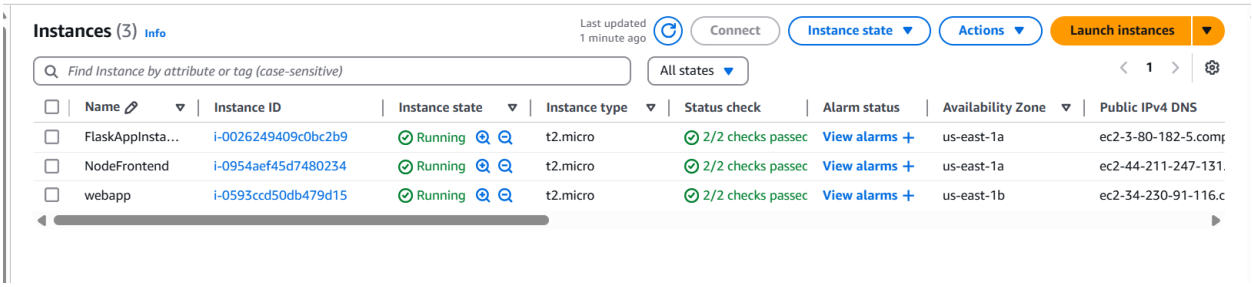
As users are attracted to the platform, our AWS infrastructure will seamlessly scale to maintain performance while optimizing operational costs.

# Automation

**InterestLink: Automation Strategy**

**Key Automations**

- **User-Facing**
  - AI recommendations for events/businesses
  - Smart notifications
  - Content filtering
- **Business Insights**
  - Automated listing verification
  - Campaign optimization
  - Analytics dashboard generation
- **Infrastructure**
  - On-demand resource scaling
  - AI-powered content moderation
  - Security monitoring
  - Cloudformation

**Results**

- 70% less manual content management
- 3x better user-event matching
- Support for 100x growth with minimal staff increase