

Esports Organizer

TO DO

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1 Informative Part

1.1 Team Members

Our project's team is composed entirely of students participating in the Esports Organizer project. Every team member is directly involved in the development, design, and decision-making processes. At this stage, we do not have external partners (such as external experts, sponsors, or client organizations). Since the project is academic in nature, it is fully carried out by the student team without additional stakeholders.

While the project does not have external clients or sponsors, it still involves several types of stakeholders. Stakeholders include players, organizers, spectators, community members / clubs, developers / team members themselves that have an interest by the system's outcomes. Recognizing this distinction helps the team consider diverse perspectives when making design and implementation decisions.

Roles and responsibilities are distributed among the team members as follows:

- Experience Design Team - Focuses on the user interface and overall user experience of the platform. This includes designing intuitive layouts, ensuring visual appeal, and optimizing how users interact with the system to create a seamless and pleasant experience.

- Identity and Data Systems Team - Manages the backend infrastructure, and the data handling. This team ensures that the system can securely store, process, and retrieve user and event information while maintaining performance and reliability.
- Events and Notifications - Handles functionality related to event management and notifications. This includes handling event creation, scheduling, and ensuring timely notifications and updates are delivered to participants and spectators.
- Player and Teams Profiles Team - Oversees features related to player and team identity within the platform. This includes profile creation, team registration, and ensuring accurate representation of players and teams across tournaments and events.

To ensure smooth progress across all teams, we are implementing strong communication channels between them following Agile Development within the project. The Experience Design, Identity and Data Systems, and Event Management teams will hold weekly alignment meetings to minimize dependencies and prevent delays in design or implementation. This collaborative workflow ensures that decisions about data structures, user flows, and system needs are made jointly, maintaining consistency across the project.

1.2 Current situations, needs, ideas

Current situation

Video games are a widely popular form of entertainment where people can either enjoy casual fun with friends or compete in more structured, competitive settings. However, the competitive gaming scene is broad and diverse, which makes it harder for players to navigate. Most of the information about esports events is scattered across multiple platforms and communities, and because genre preferences vary widely, a lot of events go unnoticed. This lack of variety prevents player from discovering tournaments, joining them, or finding a community they like, reducing opportunities for players to connect with others who share similar interests.

Needs

From this situation a few needs were identified.

- Players need a **clear, reliable and centralized** platform where they can easily discover and register for esports events.
- Organizers need a reliable and effective channel to promote their events and reach their audience.
- Communities need more visibility for their events so they can attract new members and maintain engagement.
- Spectators and fans need an accessible way to follow competitions, track results, and feel part of the event experience.

Ideas

Our project aims to address these needs by implementing a digital platform for esports tournaments. This includes the following features:

- Conducting domain engineering to describe how grassroots and student esports events currently operate.
- Implementing a web-based platform with UI/UX principles that ensure accessibility, adaptability, and usability.
- Centralized events hub where player can **browse and discover** tournaments by game, date, community.
- Registration and management system to simplify how participants sign up and how organizers handle teams and brackets.
- Notification and updates feature to keep participants and spectators informed in real time.
- Community-driven interface that allows players to connect with others, share interests, and follow ongoing competitions.

These ideas were designed to reduce fragmentation, improve the visibility of events, and create a stronger and more connected esports community.

1.3 Scope, Span, and Synopsis

Scope

This project belongs to the broad domain of entertainment, gaming and event organization, with a focus on the growing field of esports. This includes players, organizers, or simply spectators who participate or follow gaming tournaments and events, whether it's online or in person. The scope covers all phases of the software engineering required for the project, including domain description, requirements engineering, software architecture, component design, implementation, and finally testing. It also considers aspects of user experience, communication, and community engagement, as these are essential in the competitive gaming environment.

Span

While the domain of the project is the global esports community, the specific focus (span) of this platform is on small to medium scale tournaments organized by local communities, including student groups and other independent gaming organizations. The platform is designed to help these organizers manage registration, brackets, communication and visibility in a way that is easy to use. Unlike large-scale esport platforms, this project emphasizes inclusivity, adaptability, and simplicity making it suitable for semi-formal competitions.

Synopsis

This project aims to design and develop a web-based platform that facilitates the organization and participation of esports tournaments. The system will centralize key processes such as event discovery, player registration, tournament scheduling, and results publishing. It will also provide real-time notifications, and public results for spectators.

The project will be conducted through standard software engineering phases:

- Domain description to understand the current practices of student esport events.

- Requirements analysis to capture user and stakeholder needs.
- Software architecture and design to define the system's structure and components.
- Implementation of core features in line with the defined requirements.
- Testing and validation to ensure functionality, usability, and reliability.

In summary, this project delivers not only a working system but also serves as a solution to improve how other esports platform organize tournaments and shape user experiences.

1.4 Other activities than just developing source code

Our project is not limited to just source code. Through research, each team worked to ensure the system is meaningful and effective for the gaming community, addressing problems seen in other platforms.

Domain Engineering

- Situation: The esports and gaming community is broad and diverse, with many different stakeholders (players, organizers, spectators). Without a clear description of the domain, the team risks misunderstanding the environment.
- Need: Developers require a structured understanding of the domain in order to identify relevant actors, workflows, and challenges.
- Implementation: Conducted research on existing platforms (e.g., Start.gg, Battlefy, Toornament) to understand current solutions.

Requirements Engineering

- Situation: There is no formal list of user needs or expectations for this system.
- Need: Developers need precise requirements to define what functionalities the system must provide.
- Implementation: Gather requirements through research, observation of other platforms, and discussions, and translate them into functional and non-functional requirements. Collecting and documenting needs from players, organizers, and communities.

Software Architecture and Component Design

- Situation: Without a defined architecture, the system could become inconsistent or unscalable.
- Need: A structured design that organizes the system into clear components and ensures maintainability.
- Implementation: Planning the system's structure, including front-end, back-end, and database interactions.

Implementation

- Situation: The functionalities identified in the requirements do not yet exist.

- Need: To build a working system that satisfies the requirements.
- Implementation: Setting up the React environment with Vite, researching rendering strategies (CSR, SSR, SSG), and creating UI components.

Testing

- Situation: Without testing, errors and usability issues may remain hidden.
- Need: To validate correctness, performance, and user experience.
- Implementation: Planning for future milestones to ensure usability, accessibility, and reliability.

Documentation

- Establishing AsciiDoc for documentation as code and summarizing research.

Collaboration & Team Organization

- Teams were divided into Experience Design, Communities & Social Features, Events & Notifications, Identity & Data Systems, and Player & Team Profiles. Each team performed initial research, role assignment, and task planning.

By addressing these activities alongside source code development, the project ensures a complete and professional software engineering process that increases the chances of success and usability of the final system.

The Milestone 1 accomplishments included: * Experience Design Team - branding, style guides, Figma mockups, user journeys, and feature page prototypes. * Communities & Social Features Team, Data Backend Team - React setup, research on JSX, Virtual DOM, props vs. state, localization, and documentation workflow. * All teams - established project repository, did their corresponding research, GitHub workflows, and cross-team communication for requirements.

1.5 Derived Goals

In addition to its main goals of centralizing event discovery, simplifying registration, and strengthening community engagement, the Esports Organizer project also seeks to achieve several secondary goals:

- Promote fair play and inclusivity in all competitive tournaments.
- Increase the visibility of local and student-led esports initiatives.
- Encourage partnerships among various gaming communities.
- Support the learning process and skill development for players and teams.
- Raise consciousness about esports culture and its values.

These derived goals add value beyond the platform's main purpose, helping to strengthen communities, improve collaboration, and build long-term engagement in esports.

2 Descriptive Part

2.1 Domain Description

This section describes the essential components and interactions within an esports tournament platform. It defines how players, teams, and organizers interact through the platform and identifies the terminology and conceptual abstractions that structure the system. The description includes a rough sketch of the domain, key terms, a narrative of typical processes, and breakdowns of events, actions, behaviors, and function signatures.

2.1.1 Rough Sketch

- Players register in a community and can either create new teams or join existing ones advertised within the platform.
- Each team designates a captain, who manages invitations, roster changes, and tournament registrations.
- Organizers publish tournament announcements with eligibility rules such as age limits, roster size, or regional restrictions.
- Teams submit their rosters before the registration deadline, depending on the ruleset, limited roster chances may be permitted later.
- Tournament seeding is determined by prior rankings, past results, or qualifiers.
- Supported formats include single-elimination, double-elimination, Swiss, or round-robin.
- Teams must check in before each match; missing a grace period may cause a forfeit.
- Results are recorded; tiebreakers decide standings in round-robins or Swiss.
- Spectators and media follow brackets, standings, and schedules.



Figure 2.1.1 – Tournament and Community Interaction Flow. This diagram illustrates the relationship between players, organizers, and communities. It shows how tournaments are advertised, how teams are formed and registered, and how interactions move from creation to competition within the ecosystem.

2.1.2 Terminology

- **Player:** An individual who registers on the platform to participate in esports tournaments.
- **Team:** A structured group of players with shared identity, team name, score and confirmation status (isConfirmed), led by a captain.
- **Captain:** A designated team member responsible for managing team activities, including roster changes and tournament registrations.
- **Tournament:** A competitive event where teams compete against each other in a structured format.
- **Match:** A single game or series of games played between two teams within a tournament
- **Organizer:** An individual or group responsible for setting up and managing tournaments.
- **Spectator:** An individual who watches the tournaments and follows the progress of teams and matches.
- **Community:** A group of players and teams that share common interests and participate in tournaments together.

2.1.3 domain terminology in relation to domain rough sketch

The Rough Sketch describes the dynamic, real-world actions that occur within the platform — such as “team registration,” “match reporting,” or “roster updates.” These represent domain events and procedural details observed in operation.

*The Terminology section abstracts these raw observations into reusable, stable concepts. For example:

*`15-minute grace period` → becomes Check-In Policy

**`Missed match due to delay` → becomes Forfeit Event

*`Map veto order` → becomes Match Preparation Protocol

*`Roster changes allowed until Day 1` → becomes Roster Update Policy

This abstraction process establishes consistency across the documentation, allowing the same concept (e.g., “check-in”) to be used precisely throughout requirements, design, and implementation. It also enables closure — where each defined concept connects seamlessly to a corresponding function or entity in the system model (e.g., a Team object includes isConfirmed to represent check-in status).

2.1.4 Narrative

The esports tournament process begins with the organizer, who creates and publishes the tournament on the platform. The organizer defines important parameters such as the tournament name, format, ruleset, and registration window. Once registration opens, teams—created by players within communities—can submit their rosters. Each team must designate a captain, who serves as the primary contact for communications, match coordination, and administrative updates.

During the registration phase, eligibility is verified (account status, ranking limits, and roster size). If the number of registered teams exceeds capacity, the extra teams are placed on a waitlist queue. When registration closes, the tournament bracket generation algorithm initializes:

*For single-elimination tournaments, the bracket is structured as a balanced binary tree, ensuring fair seeding based on rank or random assignment.

*Teams may receive byes if the total participant count is not a power of two.

As the event progresses, matches are conducted round by round. Winners advance automatically to the next stage, while losers are eliminated. After every match, results are updated in real time through the system's front end, using listeners or state updates that propagate score and bracket changes across the platform. Once the final match concludes, the tournament state transitions to “closed,” and the results are recorded for ranking and statistical purposes.

This process represents the complete lifecycle of an esports competition, integrating the behaviors of players, teams, and organizers into a unified flow that the platform supports and tracks programmatically.

2.1.5 Events, Actions, Behaviors

Events, actions, and behaviors describe the system's dynamic elements during tournament operations. Based on the tournament flow described in the reference document, these elements can be categorized as follows:

- Event (instantaneous state change)
 - "Team registration window has closed."
 - "Match #3 has been completed with a score of 2–1."
 - "Tournament bracket successfully generated."
 - "Player connection lost during match."
 - "Roster update deadline reached."
- Action (an act carried out once)
 - Create a tournament.
 - Register a team for a tournament.
 - Generate tournament bracket.
 - Assign a team captain.

- Update match results.
- Record a forfeit.
- Send notification to players.
- Perform map veto.
- Behavior (multi-step process composed of actions/events)
 - Run Tournament Flow: Create → Register → Generate Bracket → Conduct Matches → Update Results → Close Tournament.
 - Handle Registration: Check eligibility → Validate team → Add to confirmed or waitlist → Confirm participation.
 - Update Bracket Progression: Identify match → Update scores → Propagate winners to the next match → Refresh tournament state. **Manage Real-Time Updates: Listen for database changes → Trigger UI updates → Re-render bracket with new data.

These behavioral groupings form the operational backbone of the esports system. Each process is modeled to support agile and event-driven design principles, ensuring the platform reacts to real-time changes (e.g., new registrations, match completions, or team updates) without manual intervention.

2.1.6 Function Signatures

Function signatures define how the system's operations are represented programmatically — describing inputs, outputs, and failure conditions. Derived from the registration, bracket generation, and update logic described in the reference file, the following function abstractions represent key behaviors in the tournament system:

*createTournament(organizer, name, format, maxSlots, rules) → Tournament | Failure Creates a new tournament entry with defined parameters. *registerTeam(team, tournament) → Confirmation | Waitlist | Denied Registers a team if it meets eligibility requirements and if slots are available. *generateBrackets(tournament) → BracketStructure | Failure Creates a bracket layout based on participant count and format (single/double elimination). *recordMatchResult(matchID, winnerID, score) → UpdatedBracket | Failure Updates match data and propagates the winning team to the next round. *updateTeamScore(teamID, points) → UpdatedTeam | Failure Adjusts a team's total score and updates leaderboard standings. *checkInTeam(teamID, tournamentID) → StatusUpdated | Timeout Verifies attendance before match start; returns timeout if grace period expires.

Each function maintains closure within the domain: the output (e.g., a BracketStructure or UpdatedTeam) can directly serve as input to another function in the system, supporting modularity and composability in software design.

2.2 Requirements

2.2.1 User Stories, Epics, Features

Epics

- As a gamer, I want to discover local tournaments and communities, so that I can participate on the tournaments and meet players with similar interests to myself.
- As a tournament organizer, I want to announce and manage events so that I can attract the maximum number of participants and grow the competitive scene.
- As a competitive player, I want to track my performance and rankings, so that I can measure progress and compare myself with others.
- As a casual player, I want to join or create teams for my favorite games so that I can play cooperatively and find new friends to play my favorite games.

User Stories

- As a gamer, I want to follow specific communities so that I receive notifications about upcoming events.
- As a gamer, I want to create a new community for a game without an existing one so that I can gather players with similar interests.
- As a competitive player, I want to view my local ranking so that I can see how I compare with others in my region.
- As a competitive gamer, I want to join a team for my favorite game so that I can participate in team-based competitions.
- As an organizer, I want to create tournament brackets so that matches are structured and easy to follow.
- As an organizer, I want to notify users about new tournaments so that they are aware and can sign up.

Features

- Tournament and event search by both game and location.
- Community following and customizable notifications.
- Local and regional ranking system based on tournament results.
- Team creation and management tools.
- Bracket generation for competitions.
- Organizer tools for posting and updating events.
- Option to create new communities for games without an existing competitive scene.

2.2.2 Personas

Persona 1: Alex the Competitive Player

- **Age:** 21
- **Background:** University student, plays multiple esports titles, highly motivated by rankings and

performance.

- **Goals:**

- Find tournaments to test and improve skills.
- Track rankings and stats across games.

- **Frustrations:**

- Difficult to keep up with scattered tournament announcements.
- Lacks a centralized platform to measure performance.

Persona 2: Maria the Organizer

- **Age:** 34

- **Background:** Works in event management, organizes local gaming tournaments on weekends.

- **Goals:**

- Announce tournaments easily to the right audience.
- Manage brackets and notify participants quickly.

- **Frustrations:**

- Promotion spread thin across many platforms.
- Hard to build consistent communities for recurring events.

Persona 3: Liam the Casual Gamer

- **Age:** 26

- **Background:** Plays games for fun after work, sometimes interested in casual competitions.

- **Goals:**

- Discover local communities for his favorite games.
- Join teams to participate in friendly competitions.

- **Frustrations:**

- Overwhelmed by too many platforms and event sources.
- Wants simple notifications without constantly monitoring social media.

2.2.3 Domain Requirements

- Events must be associated with an existing videogame.
- Every event created must have at least one organizer.
- Only the event organizer should have permission to edit or cancel their events.
- Each event must have a starting date, ending date, and location, whether it is physical or online.
- Each team must consist of one or more users.
- Events must have a limit of participants.

- Once the limit is reached, no more users should be allowed to register for the event.
- Once an event is over, no registrations or modifications to the event should be allowed.
- The results of an event must be recorded once the event is finished.
- Appropriate ranking updates must be done based on the results of finished events.

2.2.4 Interface Requirements

- The system must allow for users to create and manage events.
- The system must allow users to search for events and communities within specific locations.
- The system must track, and update user rankings as needed.
- The system must allow users to join teams and communities of their choice.
- If a community or team does not exist for a certain game, the system must allow the user to create one.
- The system must allow event organizers to edit their events, start and end dates and location, until the event has started.
- Any registrations passed the start or end of an event must not be allowed.
- The system must allow event organizers to record event results once the event has finished.
- The system must notify users of new events relevant to their interests.

2.2.5 Machine Requirements

- The system must support at least 450 users at a time with an average response time of 2 seconds or less.
- The system must be available at least 99% of the time per month.
- The system must be able to keep user data secure within the website.
- The system must be able to handle at least 750 registered users without major performance decrease.

2.3 Implementation

The implementation stage translates the requirements described in Section 2.2 into a working system. While requirements define **what** the platform must achieve, the implementation details **how** these goals were realized.

The **software architecture** captures the big picture of the system: * Main modules include authentication, user profiles, tournament management, match reporting, and community management. * These modules communicate through well defined APIs and shared data stored in Firestore. * A web interface built with React ensures accessibility and usability for different types of users like players, organizers, communities.

The **software design** explains how each component is realized: * **Authentication:** Implemented with Firebase Authentication and OAuth2 providers such as Google, Discord, and Twitch. * **User**

profiles: Stored in Firestore, including usernames, emails, stats, teams, and communities. * **Tournament management:** Collections store brackets, matches, and schedules, enforcing limits on participants like defined in Section 2.2.3 Domain Requirements. * **Match reporting:** Organizers and players update results, which automatically update user rankings. * **Communities and teams:** Users can create or join them, ensuring inclusivity and adaptability.

Diagrams and screen mockups complement the text: * Architecture diagrams highlight module interactions. * Sequence diagrams show workflows such as user login and event creation. * Figma mockups illustrate how the interface supports usage scenarios.

2.3.1 Selected Fragments of the Implementation

Selected fragments are only included when they clarify explanations and complement the documentation. By themselves, they are not useful. For this stage of the project, no fragments are presented since the system is still under development. Once code and designs are available, they will be added to illustrate how Section 2.2 requirements are met in practice.

Best practices followed in this documentation: * **No screenshots** of code — only properly formatted snippets. * **Scalable images** (SVG, PDF) for diagrams and mockups instead of raster images (JPEG, PNG). * **Fragments included only when they clarify**, never for their own sake.

3 Analytic Part

3.1 Concept Analysis

Based on our understanding of the esports domain and the problem space, we identify the following key concepts with their derivation from stakeholder input:

Game vs Gaming Community: Games are the software titles (Tekken, Valorant), while Gaming Communities are groups of players who compete in specific games within geographic regions.

Derived from: "people who play Tekken" and "Valorant players in our city" indicate distinct player groups organized around specific game titles within geographic boundaries.

Tournament vs Match: Tournaments are organized competitive events with multiple participants, while Matches are individual competitions between players/teams within tournaments. The bracket reference indicates tournaments contain structured match progressions.

Derived from: "organize tournaments," "track results from multiple events," and "bracket" references demonstrate the hierarchical relationship between tournaments and their constituent matches.

Geographic Locality: Multiple references to "local," "in our city," and "geographic areas" reveal that competitive gaming operates within Local Competitive Scenes - geographically-bounded communities where players can feasibly attend in-person events.

Derived from: "hard to know who's actually good in our area," "local competitive scene," and "in our city" emphasize the geographic boundaries that define competitive communities.

Performance and Rankings: The "3rd place" and "ranking across events" statements show that **Competition Results** and **Player Rankings** are important domain concepts that currently exist in fragmented form.

Derived from: "I got 3rd place at X tournament," "track my performance across events," and "hard to know who's actually good", indicates that performance tracking and comparative rankings are central concerns.

Individual vs Team Competition: Some games support both individual and team play (e.g., fighting games typically individual, MOBAs typically team-based). Our domain model must accommodate both.

Derived from: References to "players" (individual) and the diversity of game types mentioned (Tekken as fighting game, Valorant as team-based) imply different competition structures.

Casual vs Competitive Players: The distinction between someone who "plays games" and someone who "competes in tournaments" is crucial for our domain focus.

Derived from: "people who play Tekken" versus "organize tournaments" and "track results from multiple events" distinguish recreational players from competitive participants who engage in structured competition.

[database wrapper diagram] | *database_wrapper_diagram.png*

The diagram above illustrates our system's data architecture, which directly implements the domain concepts identified in our analysis. The architecture consists of four primary components:

Database Wrapper: Serves as the central data management layer, handling the creation, deletion, and modification of events, users, and teams. This component ensures consistent data operations across all entity types and maintains data integrity throughout the system.

Users Entity: Represents individual competitive players (mapping to our "Competitive Players" concept), storing user ID, username, email, password, and account creation timestamp. This entity distinguishes tournament participants from casual players.

Teams Entity: Accommodates team-based competition (supporting our "Individual vs Team Competition" concept), containing team name, members, organizer ID, rank metrics, and capacity constraints. This enables team-based games while maintaining performance tracking.

Events Entity: Implements our "Tournament" concept, storing event name, game subject, organizer, participants, location (supporting "Geographic Locality"), dates, completion status, and participant capacity. This entity provides the foundation for tracking "Competition Results" across the "Local Competitive Scene."

The relationships between entities enable tracking individual and team performance across multiple events, managing team compositions, associating events with geographic locations, and linking organizers to their tournaments.

3.2 validation and verification

Validation determines whether stakeholders agree with our understanding of the esports domain as we have documented it.

Domain Concept Validation:

Present our identified concepts to stakeholders and ask for their agreement:

- Present our concept of **Gaming Community** as "groups of players who compete in specific games within geographic regions" to community members and verify this reflects their experience
- Share our understanding of **Local Competitive Scene** as "geographically-bounded communities where players can feasibly attend in-person events" with tournament organizers and participants

Domain Understanding Validation:

Present our domain analysis directly to stakeholders:

- Share our understanding that tournaments contain structured match progressions organized in brackets, and verify this reflects how competitive events actually operate
- Show our understanding that competition results and player rankings currently exist in fragmented form across different platforms, and ask stakeholders if this characterizes their current situation

Terminology Validation:

Present our terminology definitions to stakeholders and ask for confirmation:

- Confirm that our definition of **Match** as individual competitions within tournaments aligns with how stakeholders use this term
- Check that our concept boundaries between different domain entities match stakeholder understanding

Verification Strategy

All concepts in the domain are used consistently across documentation, requirements, and architecture. Requirements clearly trace back to domain properties, and every property that affects the system generates the right requirements. The software architecture covers all specified requirements without gaps, with components having clear responsibilities. The data model represents all domain concepts without conflicts. Implementation matches the design, with unit tests covering all components and interfaces working as specified. Finally, every requirement has a matching test case, and testing environments reflect the operational conditions defined.

Success Criteria

Validation Success Indicators: - Stakeholders recognize their experiences in our domain scenarios and confirm our understanding is accurate - Stakeholders agree with our concept definitions and

the relationships we've identified between domain entities - When stakeholders suggest modifications, they represent refinements rather than fundamental misunderstandings of the domain

Verification Success Indicators: - All cross-references between project documents are accurate and consistent - Domain concepts are used consistently across all development phases - Requirements properly trace to domain properties without gaps or contradictions - Software architecture adequately addresses all specified requirements without conflicts

Application of Topics

TO DO

LogBook

Section Name	Member	Added or Modified	Description
Rough Sketch	Pedro Bonilla	Added	Added a Flowchart to better explain the way communities, players, teams, and organizers work.
Informative Section 1.1	Yamilet Gomez	Modified	Clarified distinction between clients and stakeholders; added explanation on internal team communication to prevent dependency issues; rephrased statement about project being carried out only by students.
Descriptive Section 2.1.1 - 2.1.6	Hector Rivera	Modified	Modified several sections to improve clarity and fix formatting issues in the Narrative, Domain Terminology, and Function Signatures sections.