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**DEVELOPMENT PLAN**

MIGUEL ANGEL PINZON CARO

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| *VERSION CONTROL* | | | | |
| *Version* | *Authors* | *Quality Verifier* | *Date* | *Description* |
| 1.0.0 | - Miguel Ángel Pinzón Caro  - Thomas Calderon Ramirez  - Isaac Vélez | - Isabella Wills De Moya  - Giulianna Melendez | 24/09/2024 | Initial Version |

*INITIALISATION OF THE PROJECT*

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| *Project Name* | *Project Acronyms* |
| Development of a Cross-Platform **A**pplication for **U**niting and **T**ransform **S**ocial **A**ctivities through **I**nteraction | AUTSAI |

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*PROJECT CHARTER*

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| *PROJECT NAME* | *PROJECT ACRONYMS* |
| Development of a Cross-Platform **A**pplication for **U**niting and **T**ransform **S**ocial **A**ctivities through **I**ntegration | AUTSAI |
| *PROJECT DESCRIPTION* | |
| AUTSAI is a mobile and web application designed to facilitate the organization and participation in sports and recreational activities. It allows users to connect with each other and find partners to play various sports at local venues or clubs. Users can match based on their sports interests and availability, enhancing accessibility and the sports participation experience. | |

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| *ORGANIZATION STRUCTURE* |
| 1. Project Leadership  * **Project Director:** Overall responsible for project success, overseeing and coordinating all activities.  2. Functional TeamsSoftware Development Team  * **Development Lead:** Responsible for designing and developing the mobile application for iOS and Android. * **Frontend Developers:** In charge of user interface and user experience (UX/UI). * **Backend Developers:** Responsible for business logic and database management. * **Cybersecurity Specialists:** Ensure application and user data security.  Project Management Team  * **Project Manager:** Manages project schedule, resources, and risks.  Support and Operations Team  * **Technical Support:** Provides end-user technical assistance and troubleshoots issues. * **Operations:** Manages server infrastructure and system deployment.  3. Stakeholders and Interested Parties  * **End Users:** Users of the AUTSAI application. * **Project Sponsors:** Fund and support the project. * **Marketing Team:** Responsible for user acquisition strategy and promotion.  4. Committees and Working Groups  * **Testing and QA Group:** Performs quality testing and ensures compliance with requirements. |
| This organizational structure provides a framework for effective management of the AUTSAI project, ensuring clear roles and defined responsibilities across all aspects of mobile application development and operation. |

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| *PROJECT HIERARCHY* |
| 1. Project Steering Committee  * **Project Sponsor:** Provides overall strategic direction and funding for the project. * **Project Director:** Oversees the project and ensures alignment with organizational goals.  2. Project Management Office (PMO)  * **Project Manager:** Leads the project execution, manages resources, and oversees project planning and delivery.  3. Technical TeamsDevelopment Team  * **Development Lead:** Manages the software development process and ensures adherence to project timelines and quality standards.   + **Frontend Developers:** Design and implement user interface components.   + **Backend Developers:** Develop server-side logic and integrate APIs and databases.   + **Mobile App Developers:** Focus on iOS and Android app development.   + **Quality Assurance (QA) Engineers:** Responsible for testing and ensuring product quality.  Infrastructure Team  * **Infrastructure Lead:** Manages server infrastructure, deployment, and maintenance.  Support Team  * **Technical Support Lead:** Provides user support and addresses technical issues post-launch.  4. Stakeholders  * **End Users:** Individuals who use the AUTSAI mobile application to find and join sports activities. * **Marketing Team:** Develops user acquisition strategies and promotes the application. * **Legal and Compliance:** Ensures the application meets legal and regulatory requirements.  5. External Partners and Consultants  * **Third-party Developers:** Contractors or consultants involved in specific development tasks. * **External Auditors:** Conduct audits to ensure compliance and quality assurance. |
| This hierarchy outlines the key roles and responsibilities within the AUTSAI project, ensuring clear lines of communication, accountability, and efficiency in achieving project objectives. |

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| *SPONSOR AUTHORISING THE PROJECT* | | | |
| ***Name*** | ***Company*** | ***Position*** | ***Date*** |
| Isabella Wills De Moya | Autsai Inc | CEO | 01/07/2024 |
| Miguel Angel Pinzon Caro | Autsai Inc | CTO | 01/07/2024 |

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| *STAKEHOLDERS* | | |
| *NAME STAKEHOLDER* | *ROLE* | *DESCRIPTION* |
| Retailers and clubs | Intermediate user | Retailers and clubs play a crucial role in the AUTSAI platform as registered commercial entities. They will register on the platform to offer their services, such as sports facilities and equipment rentals, to the end-users. The information about these establishments, including the availability of courts or spaces, will be displayed on the platform, allowing users to make informed decisions about where to play their chosen sports. |
| Final Users | Final User | End users are the primary participants of the AUTSAI platform. They are individuals who use the application to find, book, and participate in sports activities at registered clubs or stores. Their role is central to the platform, as they drive demand for the services offered by the commercial entities and provide feedback that can influence platform improvements. |
| Developers and Technical Team | Implement platform functionalities, ensure technology integration, and resolve technical issues. | This group includes software developers, system engineers, and technology experts who design, implement, and maintain the application. |
| Platform Administrators | Administer and maintain platform integrity, manage user and business registrations, and ensure compliance with policies. | Personnel responsible for managing and overseeing the platform’s operation, including content moderation and user management. |
| Investors and Funders | Ensure financial resources are available, monitor project progress, and evaluate returns on investment | Entities or individuals who provide funding for the development and expansion of the project. |
| Technology Partners and Providers | Provide technology, technical support, and services such as geolocation APIs and databases. | Companies and providers that offer technologies, tools, and services necessary for the development and functioning of the platform. |
| Marketing and Sales Team | Develop and implement marketing strategies, manage advertising campaigns, and promote the platform through various channels. | Professionals responsible for promoting the platform and attracting new users and businesses. |
| Corporate Clients | Book facilities for corporate events and provide feedback on the use of the platform for large-scale events. | Companies or entities that might use the platform to organize corporate sports events or activities for employees. |
| Sports Organizations and Federations | Collaborate in promoting the platform, validate and certify facilities, and support the organization of sports events. | Entities that regulate and organize sports at local, regional, or national levels. |
| Regulators and Compliance Entities | Ensure the platform adheres to legal and data privacy regulations, and ensure the security and legality of operations. | Governmental bodies or regulatory entities that oversee compliance with relevant laws and regulations. |
| User Experience (UX) and User Interface (UI) Designers, Brand Designers. | Create an intuitive and attractive design that enhances platform usability and user satisfaction. | Professionals who focus on designing the user experience and interface for the application. |
| Customer Support and After-Sales Service | Provide technical support, resolve problems, and maintain effective communication with users and businesses. | Team responsible for assisting users and businesses with any issues or questions they may have. |

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| *AUTHORIZATION of the Project Manager it* | | |
| ***Name*** | Miguel Angel Pinzon Caro | ***Level of Authority*** |
| ***Report to*** | Isabella Wills de Moya | Require compliance with the project deliverables, assignment of tools and methodologies, complete coordination between the defined teams |
| ***Supervises to*** | The entire Development and Operations team |

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| *STRATEGY FRAMEWORK* | |
| *ITEM* | *Objectives* |
| 1. ***Project Vision*** | The vision of the AUTSAI project is to create an innovative and accessible mobile platform that revolutionizes the way people connect and participate in sports and recreational activities. AUTSAI will become the preferred meeting point for athletes of all ages and skill levels, facilitating the organization and participation in sports events, promoting an active and healthy lifestyle, and strengthening communities through interaction and collaboration.   1. **Innovation:** Develop an application that uses advanced technologies to offer an intuitive and efficient user experience, integrating features such as geolocation, real-time notifications, and messaging tools. 2. **Accessibility:** Ensure that the application is easy to use for people of all ages and levels of technological skill, providing user-friendly interfaces and multilingual support. 3. **Connection:** Facilitate connections between individuals who share sports interests, allowing them to organize and join activities in a simple, safe, and reliable manner. 4. **Health and Well-being:** Promote an active and healthy lifestyle by encouraging participation in sports and physical activities, reducing barriers to sports practice. 5. **Community:** Foster a sense of community and collaboration among users, enabling the formation of new friendships and social networks through sports. 6. **Scalability:** Design the platform with the capacity to grow and adapt to new demands and technologies, ensuring its relevance and sustainability in the long term. |
| 1. ***Project Mission*** | The mission of the AUTSAI project is to provide an easy-to-use mobile platform that connects people with common sports interests, facilitating the organization and participation in physical and recreational activities. Through technological innovation and a user-centered approach, AUTSAI is dedicated to improving accessibility to sports, promoting a healthy lifestyle, and strengthening local communities through interaction and collaboration in sports events.   1. **Connectivity:** Create a space where users can find and connect with others interested in the same sports activities, simplifying the process of organizing and participating in events. 2. **Ease of Use:** Develop an intuitive and accessible application for users of all ages and technological abilities, providing a smooth and enjoyable user experience. 3. **Inclusion:** Ensure the platform is inclusive, catering to a wide range of sports and skill levels, and offering support in multiple languages. 4. **Innovation:** Utilize advanced technologies to offer features such as geolocation, real-time notifications, and communication tools, ensuring users have access to the best available tools. 5. **Health and Well-being:** Promote participation in physical and sports activities as a means to improve users' overall health and well-being. 6. **Community:** Foster the creation of communities and social networks through sports, strengthening social ties and promoting collaboration and mutual support. 7. **Security:** Ensure the platform is a safe space for all users by implementing robust security measures and protecting personal data privacy. |

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| *CRITICAL SUCCESS FACTORS* |
| 1. **User-Centric Design and Usability**    * **Intuitive User Interface**: Design a user-friendly interface that is easy to navigate for users of all ages and technological proficiencies.    * **Accessibility**: Ensure the application is accessible to users with disabilities, providing features like voice commands and screen readers.    * **Multilingual Support**: Offer support in multiple languages to cater to a global audience. 2. **Robust and Scalable Technology Infrastructure**    * **High Performance**: Develop a platform that can handle a large number of concurrent users without performance degradation.    * **Scalability**: Design the system architecture to easily scale as the user base grows and as new features are added.    * **Cross-Platform Compatibility**: Ensure seamless performance across different devices and operating systems, including iOS, Android, and web browsers. 3. **Advanced Features and Functionality**    * **Geolocation Services**: Integrate accurate geolocation services to help users find and book nearby sports facilities.    * **Real-Time Notifications**: Implement real-time notifications for updates on bookings, matches, and communication between users.    * **Interactive Features**: Provide interactive features such as in-app messaging, user reviews, and ratings for facilities. 4. **Strong Partnerships and Collaborations**    * **Engage Sports Facilities and Clubs**: Build strong relationships with sports facilities and clubs to ensure their active participation and accurate availability of their spaces.    * **Community Building**: Foster a community of sports enthusiasts through events, challenges, and social media integration.    * **Corporate Partnerships**: Establish partnerships with brands and companies for sponsorships and promotional activities. 5. **Effective Marketing and User Acquisition**    * **Targeted Marketing Campaigns**: Execute targeted marketing campaigns to attract users from different demographics.    * **Social Media Engagement**: Leverage social media platforms to engage with potential users and create buzz around the application.    * **Referral Programs**: Implement referral programs to encourage existing users to invite friends and expand the user base. 6. **Data Security and Privacy**    * **GDPR Compliance**: Ensure full compliance with GDPR and other relevant data protection regulations.    * **Secure Data Handling**: Implement robust security measures to protect user data from breaches and unauthorized access.    * **Transparent Privacy Policies**: Maintain clear and transparent privacy policies to build trust with users. 7. **Continuous Improvement and User Feedback**    * **User Feedback Mechanisms**: Set up mechanisms to regularly collect and analyze user feedback to make informed improvements.    * **Regular Updates**: Continuously update the application with new features, bug fixes, and performance improvements based on user feedback and technological advancements.    * **Beta Testing**: Conduct thorough beta testing with a diverse group of users to identify and resolve issues before full-scale deployment. |

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| *TECHNOLOGIES USED* |
| **Frontend** |
| * Framework:   + React Native – JavaScript - TypeScript   + Next.Js – JavaScript -Css - Html * Application and explication: * React Native – JavaScript, TypeScript * **Cross-Platform Development:**   + **Advantage**: With React Native, you can write a single codebase that runs on both iOS and Android.   + **Why it matters**: This significantly reduces the time and resources needed for development since you don’t need to maintain separate teams for each platform. * **Uses JavaScript:**   + **Advantage**: React Native uses JavaScript, one of the most popular and widely adopted programming languages.   + **Why it matters**: Most developers are familiar with JavaScript, making it easier to form a team and speed up the development process. You can also leverage JavaScript’s extensive libraries and tools. * **Native User Experience:**   + **Advantage**: React Native allows you to create components that translate into native elements for each platform.   + **Why it matters**: This means you can provide a smooth and high-performance user experience, similar to applications developed natively, without sacrificing aesthetics or functionality. * **Growing Ecosystem and Community:**   + **Advantage**: React Native has a large and active community with many third-party libraries and resources available.   + **Why it matters**: The community makes it easier to find solutions to common problems, and there are many UI libraries, utilities, and plugins that speed up development and solve complex problems without the need to write code from scratch. * **Ease integration with Backend:**   + **Advantage**: React Native integrates easily with various backend options like Firebase, AWS Amplify, or any RESTful or GraphQL backend.   + **Why it matters**: This allows for quick and effective integration with backend services that support authentication, real-time databases, file storage, and more. * NEXT.JS – JavaScript, Css, Html * **Server-Side Rendering (SSR) and Static Generation:**   + **Better SEO:** Server-side rendering improves SEO as search engines can more easily index the content.   + **Performance:** Static generation allows serving pre-calculated pages quickly, enhancing performance and user experience. * **Developer Experience:**   + **Simple Setup:** Next.js offers minimal configuration, allowing developers to focus on application logic instead of environment setup.   + **Page-Based Routing System:** Route creation is straightforward and based on the file structure, making navigation and code maintenance easier. * **Integrated API Support:**   + **API Routes:** Next.js allows defining API routes within the same application, facilitating backend and frontend development in a single project. * **Automatic Optimization:**   + **Code Splitting and Preloading:** Next.js automatically splits the code and preloads pages to improve performance.   + **Image Optimization:** Next.js includes native image optimization, enhancing loading speed. * **React Ecosystem:**   + **Full Compatibility:** Next.js is built on React, allowing leveraging all React features and libraries.   **Conclusion:** Choosing Next.js for web development and React Native for mobile applications allows leveraging the best of both worlds: optimized performance and excellent user experience on the web, along with efficient and consistent development for mobile applications across multiple platforms. |
| **Backend** |
| * Framework:   + Express.js - JavaScript   + Node.js – JavaScript   + SpringBoot - Java * Application and explication: * **Express.js:**   + **Minimal and Flexible:** Express.js is a minimalistic and flexible web application framework for Node.js, offering robust features for building web and mobile applications.   + **Middleware:** Supports a wide range of middleware modules, which can be used to perform additional tasks on request and response objects.   + **Routing:** Provides a powerful routing system for handling different HTTP methods and URLs. * **Node.js:**   + **Event-Driven Architecture:** Node.js uses an event-driven, non-blocking I/O model, which makes it lightweight and efficient for handling concurrent operations.   + **JavaScript Everywhere:** Allows developers to use JavaScript for both frontend and backend development, promoting code reusability and reducing the learning curve.   + **Performance:** Ideal for building scalable network applications, with the ability to handle a large number of simultaneous connections with high throughput.   **Spring Boot with Java:**   * **Spring Boot:**   + **Rapid Development:** Spring Boot simplifies the setup and development of new Spring applications, reducing boilerplate code and configuration.   + **Microservices:** Provides built-in support for developing microservices, making it easier to build and deploy individual components.   + **Production-Ready Features:** Includes embedded servers, health checks, and metrics to help manage applications in production. * **Java:**   + **Enterprise-Grade:** Java is a robust, object-oriented programming language commonly used for large-scale enterprise applications.   + **Portability:** Write once, run anywhere capability ensures that Java applications can run on any device that supports Java.   + **Extensive Libraries and Frameworks:** Rich ecosystem of libraries and frameworks that enhance functionality and development speed. |
| **Geolocation** |
| * **Google Maps API:** * **Features:** Provides detailed maps, geocoding, place searches, routes, and more. * **Integration:** Easy to integrate with web and mobile applications via RESTful API calls. * **Advantages:** Extensive documentation, high accuracy, and support for multiple platforms. |
| **Database** |
| **Choosing Firebase as Initial Backend**   1. **Agility in Development**: Firebase is known for its ease of use and rapid integration, allowing you to accelerate the development process. With features like user authentication, cloud storage, and real-time databases, you can build and launch your application quickly without worrying about infrastructure management. 2. **Scalability**: Firebase is designed to automatically scale as your application grows. This is crucial for an application like AUTSAI, which may experience traffic spikes. Starting with Firebase allows you to focus on developing features and user experience without the burden of server management. 3. **Native Integration with React Native**: Firebase offers libraries and SDKs that easily integrate with React Native, meaning you can use a single technology across both frontend and backend. This simplifies the development process and reduces the learning curve for the team. 4. **Real-Time Functionality**: Firebase's ability to handle real-time data is fundamental for a social application. This allows users to see updates instantly, which is essential for features like comments and likes on posts. 5. **User Management**: Firebase provides secure and easy-to-implement authentication solutions, allowing for efficient management of user registrations and sessions. This is especially important for applications that rely on social interaction.   **Future Plan**  **Scaling to AWS**: As your application grows and reaches a significant user volume, scaling to AWS services will provide you with more granular control over the infrastructure, along with advanced analytics and performance tools. AWS offers a variety of services, such as AWS Lambda, S3, and DynamoDB, which can be used to build a more robust and customized architecture.  **Conclusion**  Starting with Firebase is an effective strategy for launching your application quickly and efficiently, allowing you to focus on user experience and application features. As your user base grows, transitioning to AWS will enable you to benefit from greater scalability and control, adapting the infrastructure to meet the specific needs of your application. |

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| *TECHNOLOGY INTEGRATION* |
| * **FRONTEND AND BACKEND INTEGRATION** * **Compatibility:** Both Express.js/Node.js and Spring Boot can easily integrate with frontend frameworks like Next.js due to their support for RESTful APIs and GraphQL, enabling seamless data exchange. * **Scalability and Performance:** Node.js and Express.js provide fast and scalable backend services that complement the performance needs of modern web applications developed with Next.js and React Native. * **Flexibility in Database Choices:** Using Firebase or MongoDB for unstructured data and Postgres/MySQL for structured data allows developers to choose the best storage solutions based on application requirements. * **CONCLUSION:** Using Express.js with Node.js, Spring Boot with Java, and a combination of Firebase, MongoDB, and SQL databases provides a robust, flexible, and scalable backend architecture. This setup supports seamless integration with frontend technologies like Next.js and Flutter, ensuring efficient data handling, real-time updates, and high performance for modern web and mobile applications. * **INTEGRATION OF GEOLOCATION BETWEEN THE BACKEND AND FRONTEND** * **Integration with Express.js and Node.js** * **RESTful API:**   + **Description:** Create endpoints in Express.js to handle geolocation requests (e.g., /geolocation).   + **Advantages:** Facilitates communication between the frontend and backend.   + **Use:** Send requests to geolocation services like Google Maps API from the backend. * **Integration With Spring Boot and Java** * **REST Services:** * **Description:** Develop RESTful services in Spring Boot to handle geolocation requests. * **Advantages:** Separation of business logic and API. * **Use:** Implement controllers that interact with geolocation APIs and databases. * **Security and Authentication:** * **Description:** Implement OAuth2 or JWT to secure geolocation requests. * **Advantages:** Security and access control. * **Use:** Protect geolocation endpoints with authentication and authorization. * **Databases for User Geolocation Management** * **Firebase:**   + **Real-Time Database:**     - **Description:** Store user locations and data in real-time.     - **Advantages:** Real-time synchronization, easy to use.     - **Use:** Ideal for applications requiring instant updates. * **MongoDB:**   + **GeoJSON Support:**     - **Description:** Use GeoJSON documents to store geolocation data.     - **Advantages:** Flexible and scalable storage.     - **Use:** Store locations and perform geospatial queries. * **Postgres (PostGIS):**   + **PostGIS Extension:**     - **Description:** Extend PostgreSQL with support for geospatial data.     - **Advantages:** Advanced queries and high precision.     - **Use:** Perform complex geospatial operations, such as distance calculations. * **MySQL:**   + **Spatial Extensions:**     - **Description:** Use spatial functions to store and query geolocation data.     - **Advantages:** Compatibility and performance.     - **Use:** Handle geospatial data in an SQL environment. * **Integration With Frontend Technologies** * **Next.js:**   + **API Routes:**     - **Description:** Create API routes in Next.js to interact with the backend.     - **Advantages:** Facilitates communication between frontend and backend.     - **Use:** Send and receive geolocation data to and from the backend. * **React:**   + **React Maps:**     - **Description:** Use the React Maps library to display maps and geolocation data.     - **Advantages:** Compatible with Google Maps and Apple Maps.     - **Use:** Display locations and routes in mobile applications. * **WebSockets:**   + **Description:** Implement WebSockets for real-time location updates.   + **Advantages:** Bidirectional and real-time communication.   + **Use:** Notify location changes instantly in the frontend.   **CONCLUSION**  To efficiently integrate geolocation in applications using Express.js, Node.js, Spring Boot, Firebase, MongoDB, Postgres, and MySQL, it's essential to leverage the capabilities of each technology. This includes using RESTful APIs for communication, middleware for data processing, geospatial-supported databases, and frontend tools like Next.js and React Next.js for an optimal user experience. |

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| *SCOPE* |
| *Product Description* |
| AUTSAI is an innovative mobile application designed to connect people with common sports interests, facilitating the organization and participation in sports and recreational activities. The platform offers an intuitive and accessible experience, promoting an active and healthy lifestyle and strengthening communities through interaction and collaboration. |

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| *Requisites* |
| *General Functional* |
| **RFAUTSAI-000: User Connection:**   * **Search and Match:** Users can search and match with other users who share similar sports interests. * **User Profiles:** Each user can create a detailed profile that includes their sports interests, skill level, and availability. |
| **RFAUTSAI-001**: **Activity Organization:**   * **Event Creation:** Users can create and manage sports events, inviting others to join. * **Integrated Calendar:** A calendar for planning and tracking events and activities. * **Real-Time Notifications:** Users receive alerts and updates about events and activities. |
| **RFAUTSAI-002: Geolocation and Interactive Map:**   * **Event Locations:** Sports events can be geographically located, allowing users to find nearby activities. * **Directions and Navigation:** Integrated map functionality to help users reach event locations. |
| **RFAUTSAI-003: Communication:**   * **Internal Messaging:** Messaging tools for users to communicate with each other and with event organizers. * **Groups and Communities:** Users can form groups based on specific interests and participate in community discussions. |
| **RFAUTSAI-004: Health and Well-being:**   * **Activity Tracking:** Users can log and track their physical activity and sports progress. * **Personalized Recommendations:** Personalized tips and suggestions based on the user’s interests and goals. |
| **RFAUTSAI-005:** **Security and Privacy:**   * **Privacy Controls:** Users have control over the visibility of their profile and shared information. * **Data Security:** Robust measures to protect personal information and user data. |
| *Nonfunctional* |
| **RNFAUTSAI-000: Accessibility and Usability:** User-friendly interface and multilingual support for users of all ages and abilities. |
| **RNFAUTSAI-001**: **Promotion of a Healthy Lifestyle:** Facilitates participation in sports and physical activities, encouraging an active lifestyle. |
| **RNFAUTSAI-002: Community Building:** Promotes the creation of communities and social networks through sports. |
| **RNFAUTSAI -003: Flexibility and Scalability:** Designed to grow and adapt to new demands and technologies. |

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| *TEAM STRUCTURE AND MAIN ROLES AND RESPONSABILITIES* | | |
| *NAME ROLE* | *TYPE ROLE* | *RESPONSABILITIES* |
| Project Financier | Financial shareholder of the project | This role is the one that finances the project in its entirety. |
| Project Manager (PM) | Director Project | Responsible for planning, implementing and monitoring projects to achieve specific objectives.[10] |
| Developer (DEV) | Project Team | The work of a developer involves designing, implementing, debugging and optimizing software, as well as maintaining and constantly updating the solutions created. [11] |
| Quality Assurance (QA) | Project Team | The main objective of QA is to identify and prevent defects in the software, ensuring that the delivered product is reliable. [12] |
| Engineer DevOps | Project Team | Professional specializing in the development, implementation and maintenance of practices and tools that pursue continuous integration, continuous delivery (CI/CD) and automation within the software development lifecycle. [13] |
| Designer (UX/UI) | Project Team | Professional in charge of creating digital interfaces that are intuitive, functional and enjoyable for the end user. [14] |
| Data Engineer | Project Team | Professional for the design, implementation and management of systems and processes that enable the efficient acquisition, storage, transformation and analysis of large volumes of data.[15] |

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| *SIGNATURE OF THE PROJECT* | | | |
| ***Name*** | ***Company*** | ***Position*** | ***Signature*** |
| Miguel Angel Pinzon Caro | Kronos Corporation | Project Financier and Project Manager |  |