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**PART I**

| **1. Personal Information** |
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| Student Name | Claudio Canales Sebastian Rodriguez Jerson Lienlaf  Cristobal Sanhueza |
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| Rut | Claudio: 21438692-5  Jerson: 20791226-3  Cristóbal: 20794019-4  Sebastian: 19793409-3 |
| Major | Ingenieria en informatica |
| **Campus** | **Puente alto** |

| **2. APT Project Description** |
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| Project Name | **AQUASAVE** |
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| Area(s) of Performance | *Web and Web* |
| Competencies | *Creating project management documents, real-time data handling, web software development that meets objectives* |

| **3. APT Project Justification** |
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| **Relevance of the APT Project** | *The AQUASAVE project seeks to provide a solution to the lack of control and efficient management of drinking water consumption in Chilean homes and communities, which generates unnecessary expenses, makes it difficult to detect leaks, and results in an unsustainable use of an increasingly scarce and costly resource.*   * *We chose this topic because in Chile, the access and cost of water are highly relevant problems, and technology can become a key tool to optimize its use. From the professional field of my career, this project is relevant because it involves the development of technological solutions (web and mobile platforms, real-time data management, analytics, and user experience), competencies directly linked to computer science and digital innovation.* * *The situation is located in Chile, mainly in urban and rural residential sectors, where homes and communities are the main affected parties. These users represent families from different socioeconomic levels who need to optimize their spending on basic services and, at the same time, contribute to environmental preservation.* * *The project mainly affects Chilean homes and communities, as it seeks to reduce expenses associated with drinking water consumption and facilitate the early detection of leaks. At the same time, it indirectly impacts sanitation companies and the environment by promoting a more efficient and sustainable use of this vital resource.* * *The project's value contribution is to offer a comprehensive technological tool that not only improves the family economy by saving water consumption but also promotes sustainable habits and environmental awareness, generating a positive impact both socially and in the professional field, by linking technology with the management of natural resources.* |
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| **Description of the APT Project** | *The project's objective is to develop and implement a technological platform that allows homes and communities to monitor and optimize their drinking water consumption in real-time, contributing to the reduction of family costs and the sustainable use of the resource. The project would consist of integrating measurement devices connected to an application that records, analyzes, and displays consumption in a clear and accessible way. To address the problem, it is planned to combine the use of IoT technologies, data analytics, and visualization tools, providing alerts for excessive consumption or leaks and thus encouraging more efficient and responsible water management.* |
| **Relevance of the Project with the Graduate Profile** | *My APT Project is closely related to the graduate profile since it involves designing, developing, and implementing an innovative IT solution (web and web platform) to respond to a real problem, such as the efficient management of drinking water consumption. The project integrates competencies typical of the career, such as requirements engineering, software development and deployment on various platforms, the application of standards and methodologies, in addition to a focus on the quality, security, and sustainability of the solution. It also reinforces collaborative and interdisciplinary work, analytical capacity, and critical thinking, in line with the human-centered training and the contribution to the common good of society proposed by the graduate profile.* |
| **Relationship with Professional Interests** | *Our professional interests are oriented towards software development, technological innovation, and the creation of solutions that generate a positive impact on society. The APT Project is directly related to these interests, as it allows us to apply knowledge in web and web programming, real-time data management, analytics, and information security, developing a technological solution that addresses a real problem, such as inefficient drinking water consumption in Chile. This work reflects key aspects of what we seek as future professionals: using computer science to solve concrete needs, promoting sustainability, and generating social value. Carrying out this project will contribute to our professional development by strengthening both our technical competencies and our management, innovation, and interdisciplinary teamwork skills.* |
| **Feasibility of Developing the APT Project** | *The development of the APT Project is feasible, as we have a semester duration of 4 months and 3 weekly hours assigned to the course, which allows us to organize the project stages realistically. The required materials are limited to computers, resources we already have, so it does not imply major costs.*   * *Semester duration: 4 months.* * *Hours assigned to the course: 3 weekly hours.* * *Required materials: computers for project development.* * *Facilitating external factors: teamwork and the flexibility of the bosses in the practices.* * *Difficulties or challenges: time limitation; will be solved with good planning and role distribution.* |

1. **PART II**

| **4. Objectives** |
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| General Objective | *To develop and implement a technological platform (web and mobile) that allows Chilean homes and communities to monitor, manage, and optimize their drinking water consumption in real-time, in order to reduce costs, prevent leaks, and promote a responsible and sustainable use of the water resource.* |
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| Specific Objectives | *To implement data measurement and collection devices for water consumption in homes and communities; to develop a web and mobile platform that visualizes real-time consumption in a clear and intuitive way; to generate automatic alerts for excessive consumption or leak detection; to analyze the collected data to provide recommendations for the efficient and sustainable use of water; and to promote environmental awareness and resource savings through education and consumption monitoring.* |

| **5. Methodology** |
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| Description of the Methodology |
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| *The development of the AquaSave (APT) project will be carried out using the agile methodology Scrum, a framework widely used in computer engineering for managing software projects. Scrum is based on an iterative and incremental approach, where work is organized into short cycles called sprints, which allow for the continuous delivery of value, early adaptation to changes, and constant improvement of the team. Within this methodology, three main roles are distinguished: the Product Owner, in charge of managing and prioritizing the backlog with the most relevant functionalities for users; the Scrum Master, who acts as a facilitator of the process and ensures that good practices are followed; and the development team, responsible for designing, implementing, and validating the planned solutions. The work process includes stages such as sprint planning, in which the objectives and tasks to be developed are defined; the execution, where the team implements and tests the functionalities; the daily meeting or Daily Scrum, which allows for coordinating efforts and detecting obstacles; the sprint review, in which progress is presented to stakeholders for feedback; and the retrospective, an instance in which the team reflects on what has been done and defines improvements for the next cycle.*  *The choice of Scrum for AquaSave is justified because the project requires flexibility and adaptability to changes, given that it seeks to respond to the real needs of users regarding water consumption. This approach allows for the progressive delivery of functional results, fosters constant collaboration between team members and stakeholders, and ensures continuous improvement in product quality. In this sense, Scrum guarantees that AquaSave evolves in an orderly, efficient, and user-centered way, contributing to the creation of a scalable and sustainable technological solution for water saving in Chilean homes.* |

| **6. Evidence** |
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| **Type of Evidence** | **Evidence Name** | **Description** | **Justification** |
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| **Progress** | APT project definition | Document that defines the APT project to be carried out.To define what project will be worked on in this APT. | Document that defines the APT project to be carried out.To define what project will be worked on in this APT. |
| **Progress** | Charter | Initial document of the project phase that defines the scope of the project. | To know the limits that the project may have in its development. |
| **Progress** | ERS | Document that specifies the system requirements and the project proposal. | To show the proposal and specifications of the requirements of the project to be carried out. |
| **Progress** | System requirements | Document of the functional and non-functional requirements of the system. | They allow knowing what the system does and how it interacts with users or processes. |
| **Progress** | Gantt Chart | Project timeline. | It allows for planning and controlling project times and tasks. |
| **Progress** | Extended use cases | Document that describes the user's actions with the system. | They ensure that the system responds to the user's needs. |
| **Progress** | Mockups | A static and realistic visual representation of a design that simulates the final appearance of a product. | They validate the design and interface before development. |
| **Progress** | Architecture Document (DAS) | A detailed document that describes the structure, components, relationships, and key decisions of the software system, serving as a guide for its planning, development, and implementation. | A technical guide that ensures consistency and scalability. |
| **Progress** | Business process (TO-BE) | It represents the future and improved state of a process, designed to achieve the strategic objectives of the organization more efficiently and effectively. | It defines the improvement and efficiency of future processes. |
| **Progress** | Data Dictionary | A document that defines the terminologies used in the project development. | It unifies criteria and avoids ambiguities in the information. |
| **Progress** | APT Development | Second phase of the project definition. | It consolidates the project's definition and viability. |
| **Progress** | Database model | A conceptual framework that defines the logical structure, organization, and data management within a database system. | It defines how data will be organized to ensure consistency and efficiency. |
| **Progress** | Database table creation | The creation of tables in a database is a fundamental step to organize and store information in a structured way. | It allows for structuring and storing information in an orderly manner. |
| **Progress** | PL/SQL queries | Queries necessary for the project. | They facilitate obtaining the necessary information for the project. |
| **Progress** | Final APT report | Third phase of the project definition. | To deliver a report related to our APT. |
| **Final** | 100% system development | Delivery of the software at 100%. | It ensures the complete delivery of the product to the user. |
| **Final** | Test plan | To define the performance of the system quality tests and the type of tests to be carried out, along with the quality validation metrics. | It guarantees the system's quality through validations. |
| **Final** | Change control matrix | A document that allows managing the changes made in the project. | It allows managing and recording modifications in the project. |
| **Final** | Scope verification | A document that presents the fulfilled project requirements. | It confirms that the project's requirements were met. |
| **Final** | User manual | A document that describes the use of the system. | It facilitates the correct use of the system by users. |
| **Final** | Closing report | A document that grants a closing to the product's realization process. | It formalizes the project's closing with the results obtained. |
| **Final** | APT presentation documentT | Final phase and delivery of our APT document. | It exposes the final version and results of the project.. |

| **7. Work Plan** |
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| **APT Project Work Plan** | | | | | | |
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| **Competence or Competence Units** | **Name of Activities/Tasks** | **Description of Activities/Tasks** | **Resources** | **Duration of the Activity** | **Responsible** | **Observations** |
| *Project Management* | *Project Charter* | *Initial document that defines the project's scope* | *Desktop PCs, laptops, tablets, or cell phones* | *11-08-2025*  *18-08-2025* | *Jerson Lienlaf* | *Allows for knowing the limits of the project's development.* |
| *Project Management* | *Requirements Template* | *Document of the system's functional and non-functional requirements* | *Desktop PCs, laptops, tablets, or cell phones* | *18-08-2025*  *25-08-2025* | *Project team* | *Allows for knowing what the system does and how it interacts with users.* |
| *Project Management* | *ERS Report* | *Document that specifies the system's requirements and the project proposal* | *Desktop PCs, laptops, tablets, or cell phones* | *18-08-2025*  *25-08-2025* | *Project team* | *Allows for showing the proposal and requirement specifications.* |
| *Prototyping* | *Mockups* | *A realistic visual and aesthetic representation of a design that simulates the final appearance of the product* | *Desktop PCs, laptops, tablets, or cell phones* | *11-08-2025*  *18-08-2025* | *Claudio Canales* | *Validates the design and interface before development.* |
| *Project Management* | *Gantt Chart* | *Project timeline* | *Desktop PCs, laptops, tablets, or cell phones* | *18-08-2025*  *25-08-2025* | *Jerson Lienlaf* | *Allows for planning and controlling times and taskks.* |
| *Project Management* | *Extended Use Cases* | *Document that describes the user's actions with the system* | *Desktop PCs, laptops, tablets, or cell phones* | *25-08-2025*  *01-09-2025* | *Project team* | *Ensures that the system responds to the user's needs.* |
| *Architecture* | *DAS Document* | *Detailed document that describes the structure, components, relationships, and key decisions of the system* | *Desktop PCs, laptops, tablets, or cell phones* |  | *Claudio Canales* | *Technical guide that ensures consistency and scalability.* |
| *Business* | *To-be business process document* | *Represents the future and improved state of a process* | *Desktop PCs, laptops, tablets, or cell phones* |  | *Project team* | *Defines the improvement and efficiency of future processes..* |
| *Project Management* | *Data Dictionary* | *Document that defines the terminologies used in the development* | *Desktop PCs, laptops, tablets, or cell phones* |  | *Jerson Lienlaf* | *Unifies criteria and avoids ambiguities in the information.* |
| *APT Project* | *APT project development* | *Second phase of the project definition* | *Desktop PCs, laptops, tablets, or cell phones* |  | *Project team* | *Consolidates the project's definition and viability.* |
| *APT Project* | *Final APT Report* | *Last phase of the project definition* | *Desktop PCs, laptops, tablets, or cell phones* |  | *Project team* | *Delivers a report related to our APT.* |
| *Databases* | *Development of the DB model along with the necessary scripts* | *Conceptual framework that defines the structure and organization of data* | *Desktop PCs, laptops, tablets, or cell phones* |  | *Jerson Lienlaf* | *Defines how data will be organized to ensure consistency and efficiency.* |
| *Software Development* | *100% system development* | *100% software delivery* | *Desktop PCs, laptops, tablets, or cell phones* |  | *Claudio Canales y Cristobal Sanhueza* | *Ensures the complete delivery of the product to the user.* |
| *Quality* | *Test Plan* | *Defines the performance of system quality tests and the type of tests to be carried out* | *Desktop PCs, laptops, tablets, or cell phones* |  | *Sebastian Rodriguez and Cristobal Sanhueza* | *Guarantees the system's quality through validations.* |
| *Quality* | *Change control matrix* | *Document that allows managing and recording the changes made in the project* | *Desktop PCs, laptops, tablets, or cell phones* |  | *Sebastian Rodriguez and Cristobal Sanhueza* | *Allows managing and recording modifications in the project.* |
| *Quality* | *Scope verification* | *Document that presents the fulfilled project requirements* | *Desktop PCs, laptops, tablets, or cell phones* |  | *Sebastian Rodriguez and Cristobal Sanhueza* | *Confirms that the project's requirements were met.* |
| *Project Management* | *User Manuals* | *Document that describes the use of the system* | *Desktop PCs, laptops, tablets, or cell phones* |  | *Project team* | *Facilitates the correct use of the system by users.* |
| *Project Management* | *Project closing minutes* | *Document that grants a closing to the product realization process* | *Desktop PCs, laptops, tablets, or cell phones* |  | *Jerson Lienlaf* | *Formalizes the project's closing with the results obtained.* |
| *APT Project* | *APT presentation document* | *Last phase and delivery of our APT document* | *Desktop PCs, laptops, tablets, or cell phones* |  | *Project team* | *Exposes the final version and results of the project.* |

| **8. Gantt Chart** |
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| **Activity** | **Phase 1** | | | | **Phase 2** | | | | | | | | | | | | **Phase 3** | | | |
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| **W 1** | **W 2** | **W 3** | **W 4** | **W 5** | **W 6** | **W 7** | **W 8** | **W9** | **W10** | **W11** | **W12** | **W13** | **W14** | **W15** | **W 16** | | **W17** | **W18** |
| **Project APT definition** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **Project Charter** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **Charter Approval** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **General requirements definition** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **Mockups** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **ERS Report** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **Use Cases** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **DAS Architecture document** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **To-Be business process document** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **Data dictionary** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **APT project development** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **Final APT reportT** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **Database model creation** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **Creation of database table scripts** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **Creation of PL/SQL query scriptsL** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **100% system development** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **Test plan** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **Change control matrix** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **Scope verification** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **User manuals** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **Project closing minutes** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **APT presentation documentT** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |