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1. **PARTE I**

| **1. Antecedentes Personales** |
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| A continuación, se presenta una tabla en la que debes completar la información solicitada. |

| Nombre estudiante | **Nicolas Dávila** |
| --- | --- |
| Rut | **26.601.453.8** |
| Carrera | **Ingeniería Informática** |
| Sede | **Antonio Varas** |

| Nombre estudiante | **Cristian Contreras** |
| --- | --- |
| Rut | **18.337.951-8** |
| Carrera | **Ingeniería Informática** |
| Sede | **Antonio Varas** |

| Nombre estudiante | **Alejandro Ferrera** |
| --- | --- |
| Rut | **26.478.742-4** |
| Carrera | **Ingeniería Informática** |
| Sede | **Antonio Varas** |

| **2. Descripción Proyecto APT** |
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| En la descripción debes señalar brevemente el nombre de tu proyecto APT y las competencias del perfil de egreso que vas a poner en práctica. Si en tu carrera están definidas las áreas de desempeño, también menciona a qué áreas de desempeño está vinculado el proyecto. |

| Nombre del proyecto | *HIR Resource Management* |
| --- | --- |
| Área (s) de desempeño(s) | *IT Project Management*  *Analysis and Evaluation of IT Solutions*  *Software Development* |
| Competencias | *Develop a software solution using techniques that allow the systematization of the development and maintenance process, ensuring the achievement of objectives.*  *Build data models to support the organization’s requirements according to a defined and scalable design over time.*  *Perform certification tests on both products and processes, using industry-defined best practices.* |

| **3. Fundamentación Proyecto APT** |
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| A continuación, se presentan distintos campos que debes completar con la información solicitada. Esta sección busca que describas en detalle tu proyecto y justifiques su relevancia y pertinencia. |

| Relevancia del proyecto APT | *Our project aims to solve a key problem in the hospital environment: the inefficient management of medical equipment. In many hospitals, the lack of a system to accurately track and locate these devices causes delays in care, resource loss, and difficulty in managing their maintenance. This not only affects operational efficiency but can have a direct impact on patient care and safety, making it urgent to implement a technological solution that allows better control over these assets.*  *For the field of computer engineering, this project is highly relevant because it integrates key technologies such as IoT, Bluetooth-based location systems that allow real-time tracking in future versions, and cloud computing. These areas are fundamental in the development of scalable and efficient solutions in complex environments like hospitals. By creating a solution that allows real-time management and monitoring of equipment, it promotes the optimization of resources, a growing area of interest for cloud architects and developers of health-focused technological solutions.*  *The context of this project is set in Chilean hospitals, where the implementation of advanced equipment tracking technologies is still limited. Despite efforts in some high-complexity health centers to modernize their systems, many hospitals still rely on manual and inefficient processes for managing their equipment. This project is designed to fit into this reality, offering a solution that can adapt to both public and private hospitals, helping to bridge the existing technology gap.*  *The impact of this solution would benefit both medical and administrative staff, who would reduce the time spent searching for equipment, improving productivity and enabling greater availability of critical devices for care. Indirectly, patients would also benefit from faster and more efficient care, especially in emergency situations where locating specific equipment is crucial. This system, therefore, seeks to improve not only hospital efficiency but also the patient experience.*  *The value of the project lies in its ability to transform hospital management. By offering a technological solution that allows monitoring of the location, status, and usage history of medical equipment, hospitals can optimize their resources and improve their planning. This improvement in efficiency and visibility can lead to significant cost savings in the long term, as well as ensure better healthcare services. Thus, the project presents itself not only as a technological innovation but also as a key management tool for Chilean hospitals.* |
| --- | --- |
| Descripción del Proyecto APT | *Build a system aimed at improving resource management, specifically focused on managing medical equipment. The system is expected to meet the following high-level requirements:*  *For users:*   * *Simple authentication with email and password* * *Search for medical equipment on an institution map with filters* * *Search for recently used medical equipment* * *Save favorite equipment* * *Receive notifications from administrators* * *Password recovery* * *Basic profile settings* * *Mobile application*   *For administrators:*   * *Simple authentication with email and password* * *Medical equipment management (CRUD)* * *User management (CRUD)* * *Configure organization data* * *Basic profile settings* * *Web application* |
| Pertinencia del proyecto con el perfil de egreso | *The project we are developing, both for web and mobile environments, aligns directly with the graduation competencies of my degree. First, the development of this solution involves the use of techniques that systematize the development and maintenance process, ensuring that the platform functions optimally in both environments and meets the established objectives. This is essential to provide a smooth and adaptable user experience on both mobile devices and the web, while adhering to industry standards.*  *The creation of the platform requires scalable data models that allow efficient management of information related to medical equipment. This design must be flexible enough to accommodate the growth needs of hospitals and ensure that the data can be handled quickly and accurately, regardless of the volume of information. This includes both the real-time location of the equipment and its usage history, facilitating critical decision-making.*  *Finally, in terms of certification, unit tests will be conducted to ensure the quality of the software. These tests are key to validating the correct functionality of each part of the system, ensuring that both web and mobile applications operate efficiently and error-free. This guarantees that the solution complies with industry best practices, providing a reliable and robust tool for hospitals.* |
| Relación con los intereses profesionales | *The APT Project we are developing closely aligns with our professional interests in cloud architecture and software development. This project, which includes both a web and mobile application, requires designing a scalable and robust cloud solution, allowing us to deepen our experience with cloud platforms like AWS. The data management and infrastructure that support the medical equipment tracking system are critical components that reflect our interest in developing efficient, secure, and highly available architectures in enterprise environments.*  *Moreover, completing this project will help us strengthen our software development skills, especially in the area of cloud solutions. The integration of development practices and testing, such as unit tests, and the implementation of scalable data models will not only contribute to our technical growth but also prepare us to tackle future projects that require the combination of cloud architecture and software development knowledge. This will enhance our ability to design complex solutions that meet the needs of organizations in critical sectors such as healthcare* |
| Factibilidad de desarrollo del Proyecto APT | *The development of our APT Project is entirely feasible within the available time and resources. We plan to organize the work into five sprints of two weeks each, which will allow us to progress in an orderly and efficient manner, ensuring that each functionality is developed within the appropriate timeframe. This will leave sufficient time at the end of the semester for testing and refining the development, which is essential to guarantee the quality of the product. The hours allocated for the course are sufficient to advance according to the plan, and we have the necessary technical resources, such as access to development platforms, cloud environments, and project management tools.*  *As for external factors, we have the support of online resources and mature technologies that facilitate development, such as web development frameworks (NextJS) and mobile (Expo), as well as AWS cloud services. However, some factors that could hinder development include platform integration issues or potential delays in group coordination. To mitigate these risks, we will implement version control tools and maintain constant and smooth communication within the team to efficiently resolve obstacles and ensure that objectives are met within the planned deadlines.* |

1. **PARTE II**

| **4. Objetivos** |
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| En este apartado debes definir objetivos generales y específicos del Proyecto APT. Es importante aclarar que los objetivos se deben plantear en forma clara, concisa y sin dar mayores explicaciones, es decir, deben entenderse por sí solos. Se sugiere redactarlos utilizando un verbo en infinitivo, pues ello obliga a precisar acciones concretas. |

| Objetivo general | *The overall objective of our project is to develop an integrated software solution that enables the efficient management of the location and status of medical equipment in hospitals and healthcare centers. This platform will feature both web and mobile interfaces, providing end-users (medical and administrative staff) with tools to track, monitor, and report the status of critical medical equipment. The solution aims to significantly improve hospital operational efficiency, reducing search times and ensuring a better response in patient care.*  *The system also aims to ensure scalability and adaptability to different hospital environments, allowing for easy integration with other existing platforms and systems. By leveraging cutting-edge cloud technologies and agile development methodologies, the project seeks to create a robust and reliable product that can be scaled and enhanced in the future to meet the changing needs of the healthcare sector.*  *At the conclusion of the project, the team will evaluate the success of the solution based on its ability to meet the initially specified requirements and its effectiveness in improving hospital resource management. This will include a review of the system’s impact on reducing equipment downtime and optimizing resource usage, in order to verify that the proposed goals have been achieved and to identify areas for improvement in future iterations.* |
| --- | --- |
| Objetivos específicos | *Develop the mobile and web application: Create the mobile and web interfaces so that medical and administrative staff can manage the location and status of medical equipment in real time. This includes setting up the project structure, creating repositories, and implementing the necessary functionalities in both environments.*  *Implement the medical equipment tracking functionality: Develop a system that allows the visualization of different hospital areas (floor/wing) on maps and the precise location of medical equipment, including the configuration of sensors like the ESP32 with SmartTag for detection and tracking.*  *Set up and develop map handling: Incorporate an interactive map visualization system that allows users to view the layout of medical equipment in each area, using images as a base for mapping and detecting devices.*  *Integrate unit testing to validate functionality: Ensure that each system component (web and mobile) functions correctly by performing unit tests to verify the behavior of key functionalities, guaranteeing product quality.* |

| **5. Metodología** |
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| En el siguiente apartado deberás describir la metodología, propia de tu disciplina, que utilizarás para resolver el proyecto APT antes descrito, incluyendo las etapas y métodos de trabajo. |

| Descripción de la Metodología |
| --- |
| *To address the problem of inefficient medical equipment management in hospitals, we will use the Scrum methodology, an agile approach that allows for iterative and collaborative project development. Scrum will help us break down the work into five two-week sprints, enabling us to deliver functional increments of the solution in short intervals, adapting to changes and new needs that may arise during development.*  *The details of our methodology are:*  *Sprint Planning: At the beginning of each sprint, a detailed plan will be created to determine which tasks will be prioritized according to the project's stage. This will include developing the mobile and web structure, implementing key functionalities (such as real-time equipment tracking), map visualization, and corresponding unit tests. The planning will be collaborative with the team to ensure that all members are aligned with the sprint's objectives.*  *Incremental Development: Each functionality will be developed and tested incrementally. We will start with essential functionalities like creating the mobile and web platform, and then add more complex features like the sensor-based tracking system and map visualization. At the end of each sprint, a demonstration of the progress will be held, allowing for early feedback and adjustments as needed.*  *Continuous Integration and Testing: Throughout the process, we will apply continuous integration principles, ensuring that the code for each component integrates correctly into the system. Unit tests will be conducted as functionalities are developed to ensure that each part of the system meets requirements and is error-free. This will help us detect issues early and fix them before they affect the overall development.*  *Review and Feedback: At the end of each sprint, a review meeting will be held where the team will evaluate the work done and gather feedback. This process will allow us to adjust the objectives for the following sprints and refine the product according to the real needs of the hospital environment.*  *Final Delivery and Refinement: Once the five sprints are completed, time will be dedicated to the final testing and refinement phase, ensuring that all developed functionalities work correctly and integrate well into the platform. This time will also allow for final adjustments based on the feedback received.* |

| **6. Evidencias** |
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| A continuación, describe qué evidencias serán evaluadas en el informe de avance y en el informe final de tu proyecto APT. Estas evidencias deben ser acordadas con tu docente. Se entenderá por evidencia los productos que se desarrollen durante el proyecto y cuyo propósito sea visibilizar o documentar cómo se ha implementado el trabajo. |

| **Tipo de evidencia**  **(avance o final)** | **Nombre de la evidencia** | **Descripción** | **Justificación** |
| --- | --- | --- | --- |
| **WORD** | **1.1\_APT122\_AutoevaluacionCompetenciasFase1** | *Self-assessment of competencies* | **Individual self-assessment** |
| **WORD** | **\_1.2\_APT122\_DiarioReflexionFase1** | **Individual reflection journal** | **Individual reflections on the curriculum and competencies** |
| **WORD** | **1.3\_APT122\_AutoevaluaciónFase1** | **Self-assessment of Report 1.5** | **Individual self-assessment on the completion of Report 1.5** |
| **WORD** | **1.4\_APT122\_FormativaFase1** | **Rubric guide for the evaluation of Report 1.5** | **Group self-assessment on the completion of Report 1.5** |
| **WORD** | **1.5\_GuiaEstudiante\_Fase 1\_Definicion Proyecto APT** | **Project definition report** | **Complete project definition phase 1** |

| **7. Plan de Trabajo** |
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| En la siguiente tabla define la planificación de tu Proyecto APT de acuerdo a lo requerido. |

| **Plan de Trabajo Proyecto APT** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| Competencia o unidades de competencias | Nombre de Actividades/Tareas | Descripción Actividades/Tareas | Recursos | Duración de la actividad | Responsable[[1]](#footnote-0) | Observaciones |
| *C1: Perform certification tests on both products and processes using industry-defined best practices.* | *Implementation of unit tests and testing period after project completion:* | *Unit tests will be implemented in the mobile application, web, and backend, aiming for 80% coverage.* | *Since the entire team is involved in development, this will be a cross-functional task for all team members.* | *Testing will be done in 4 out of the 5 sprints, in all tasks involving development.* | *Entire team* | *The goal is to achieve 80% coverage and conduct refinement testing after project completion with the entire team.* |
| *C2: Manage IT projects, offering decision-making alternatives according to the organization’s requirements.* | *Manage planning flow in Jira and ensure compliance with methodologies:* | *The person in charge will be responsible for the complete management of activities related to the selected agile methodology.* | *The project management tool Jira will be used, and only one person will manage it.* | *This will be cross-functional and will last throughout all 5 sprints.* | *Nicolas Dávila* | *N/A* |
| *C3: Build data models to support the organization’s requirements according to a defined and scalable design over time.* | *Design and build data models to support the organization’s requirements:* | *Design and creation of data models, including database implementation, to meet the requirements.* | *AWS, SupaBase, and PostgreSQL technologies will be used, with the effort handled by one person per sprint.* | *This task will last for 2 sprints, which will be the first ones planned.* | *Alejandro Ferrera* | *The mentioned technologies must be used as they have been defined as the technology stack: AWS, Supabase, and PostgreSQL.* |
| *C4: Develop a software solution using techniques that systematize the development and maintenance process, ensuring the achievement of objectives.* | *Development of a web application*  *Development of a mobile application*  *Development and integration of IoT services* | *These tasks will be carried out with respect to the following epics:*  *E1: Creation/Configuration of Mobile*  *E2: Mobile Home Module*  *E3: Mobile Search Module*  *E4: Mobile Settings Module*  *E5: Mobile Notifications Module*  *E6: Creation/Configuration of Admin*  *E7: Admin User Management*  *E8: Admin Equipment Management* | *The use of the technology stack established in* [*Confluence*](https://shield9.atlassian.net/wiki/spaces/SD/pages/131404/Stack+tecnol+gico) *will be considered, and development will be the responsibility of all team members within their respective tasks.* | *This will span the 5 planned sprints.* | *Entire team* | *The team must adhere to the technology stack standard defined by the team.* |
| *C5: Communicate orally and in writing using the English language in socio-occupational situations at an elementary level in an intensive mode, according to the TOEIC and CEFR competency table.* | *Communicate orally and in writing using the English language:* | *Communicate orally and in writing in English in situations where the assessment requires it.* | *This will be the responsibility of all team members during the corresponding phases.* | *It will mainly take place in the first sprint and during the deliveries after the planned sprints are completed.* | *Entire team* | *N/A* |

| **8. Carta Gantt** |
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| Busca un formato de Carta Gantt que te acomode y organiza en este las actividades planificadas en el punto anterior considerando el periodo asignado para el desarrollo de tu Proyecto APT. Debes mantener la temporalidad del periodo académico en el desarrollo de las tres fases que contempla la Asignatura de Portafolio de Título. |

**The planning was initially done in Spanish, but the names of the epics will be written in English:**

**E1: Creation/Configuration Mobile**

**E2: Mobile Home Module**

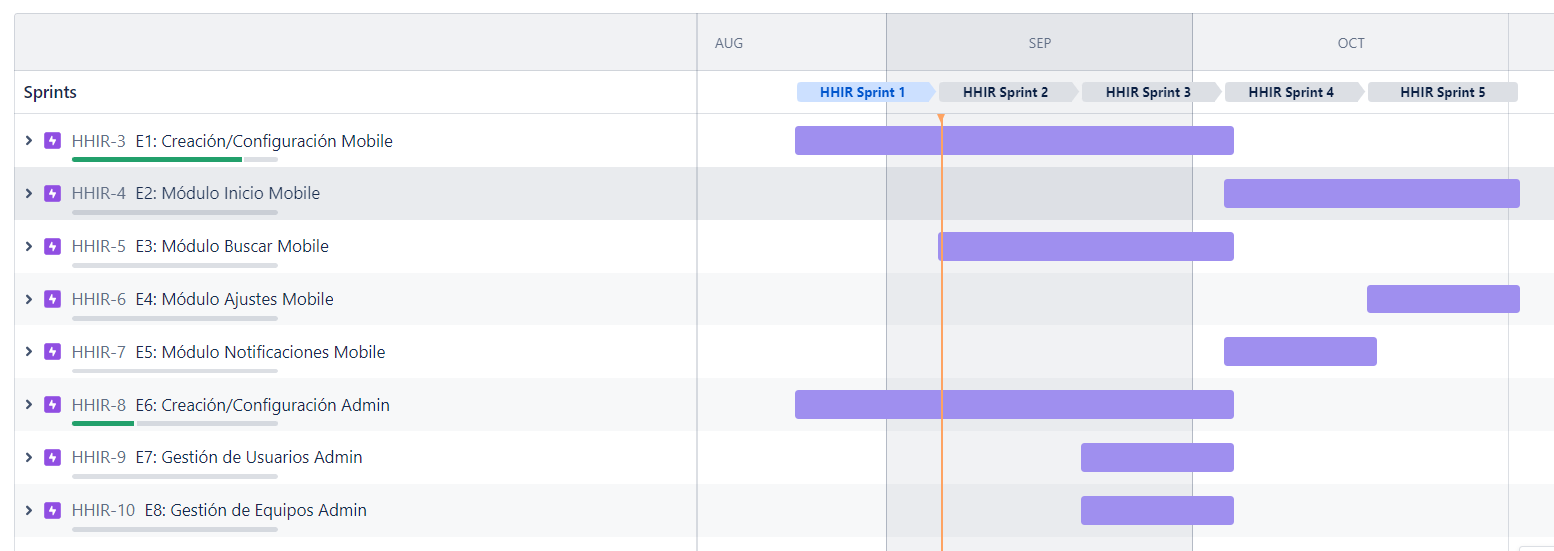
**E3: Mobile Search Module**

**E4: Mobile Settings Module**

**E5: Mobile Notifications Module**

**E6: Creation/Configuration Admin**

**E7: Admin User Management**

**E8: Admin Equipment Management**

1. En caso de que el Proyecto APT sea grupal, en esta columna deben indicar el nombre de los responsables de cada tarea o actividad. Esto posteriormente permitirá diferenciar la evaluación por cada integrante. [↑](#footnote-ref-0)