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1. **PARTE I**

| **1. Personal Background** |
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| The following is a table where you need to fill in the requested information. |

| **Student Name** | **Isaac Rubilar - Williams Zapata - Javier Vergara** |
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| **ID Number (RUT)** | **19785812-5 - 18358225-9 - 20921479-2** |
| **Degree Program** | **Computer Engineering** |
| Campus | **San Bernardo** |

| **2. APT Project Description** |
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| In the description, you should briefly mention the name of your APT project and the competencies from the graduation profile that you will apply. If your degree program has defined areas of performance, also mention which areas of performance the project is linked to. |

| Project Name | *Psywell* |
| --- | --- |
| Area(s) of Performance | **Software Engineering, Digital Health** |
| Competencies | **Innovative Software Development**: Apply advanced programming techniques to create a robust and scalable mobile application that integrates various data sources, including IoT devices, for continuous mental health monitoring.  **Integration of Emerging Technologies**: Utilize information technologies to develop solutions that combine physiological and emotional data, enabling faster and more personalized interventions in patient well-being.  **Data Security and Protection**: Implement high-quality security measures to safeguard patient privacy and confidentiality, ensuring compliance with data protection regulations.  **Data Analysis and Visualization**: Develop skills in managing and analyzing large volumes of data to provide valuable insights for both patients and psychologists, improving therapeutic decision-making.  **Technological Project Management**: Lead and manage the project using agile methodologies like Scrum, ensuring deadlines and project goals are met while fostering collaboration and adaptability to change. |

| **3. Fundamentación Proyecto APT** |
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| The following are various fields that you need to complete with the requested information. This section aims for you to describe your project in detail and justify its relevance and significance. |

| **Relevance of the APT Project** | **Problem Addressed by the Project**  The APT Project, through the PsyWell application, aims to solve the issue of the lack of continuous and effective monitoring in mental health management. Currently, many individuals facing mental health challenges, such as anxiety and depression, do not have access to constant tracking of their emotional well-being, which can lead to delayed intervention and less effective treatment. Additionally, psychologists often lack the tools to objectively assess their patients' progress between sessions, limiting their ability to personalize interventions in a timely manner.  **Relevance to the Career Field**  This issue is highly relevant to the field of computer science, as it focuses on developing innovative technological solutions for mental health, a growing global concern. The integration of technologies such as IoT, data analytics, and mobile applications is essential to offer solutions that are accessible, effective, and secure. By addressing mental health problems through technology, the project not only contributes to individual well-being but also opens new opportunities in the digital health market, a field with significant growth potential and demand.  **Problem Context**  The problem that PsyWell seeks to address has a global scope but can initially be implemented in a local context, such as mental health centers, hospitals, and clinics in a specific city or region. For example, in a large city with a high population density and an increasing number of anxiety and depression cases, like Santiago, Chile, there is an urgent need for effective solutions for mental health monitoring and treatment. These cities often have limited access to quality mental health services, emphasizing the need for tools that can extend care beyond in-person sessions.  **Impact on Specific Groups**  PsyWell is designed to impact several key groups:   * **Patients with mental health issues**: Allows users to monitor their mood and receive early alerts in case of possible crisis episodes, empowering them to actively manage their emotional well-being. * **Psychologists and health professionals**: Provides tools for more accurate and continuous monitoring of patients' emotional state, improving therapeutic decision-making. * **Family members and caregivers**: Facilitates better communication and understanding of the patients' condition, potentially improving the emotional and practical support they provide.   **Value Contribution to the Labor and Social Context**  The APT Project offers significant value in both the labor and social contexts. In the professional realm, it represents an opportunity to innovate in software development by integrating IoT solutions and ensuring the protection of sensitive data. This not only enhances the skills of IT professionals but also contributes to the creation of products that can be commercialized and scaled, generating new business opportunities.  Socially, PsyWell contributes to improving mental well-being, a fundamental aspect of quality of life. By providing an accessible and effective tool for mental health monitoring, the project can help reduce the stigma associated with emotional issues and promote a proactive approach to mental health management. In the long term, this could positively impact healthcare systems by reducing the strain on resources and improving the lives of individuals within the community. |
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| **APT Project Description** | **Project Objective** The primary objective of the APT Project is to develop a technological application called PsyWell, which will facilitate the continuous and personalized monitoring of users' mental health by providing tools for both patients and psychologists. PsyWell is expected to improve the effectiveness of mental health treatments by empowering users to actively manage their emotional well-being and providing healthcare professionals with valuable data to adjust therapeutic interventions in a timely manner.  **General Project Description** PsyWell is an application designed for mobile and desktop devices that allows users to record their mood and other significant emotional events daily. The application integrates with IoT devices, such as heart rate monitors, to collect physiological data in real time, complementing users' subjective records. This combination of data provides a more comprehensive and accurate picture of patients' mental health.  **How the Problem Will Be Addressed** To address the lack of continuous monitoring in mental health management, the APT Project will implement the following strategies:   * **Daily and Continuous Monitoring**: PsyWell will allow users to regularly record their mood and emotional experiences. This continuous monitoring is essential to identify patterns and changes in users' emotional state, facilitating the early detection of potential issues. * **IoT Technology Integration**: The application will connect with heart rate monitoring devices to collect real-time physiological data, such as heart rate and sleep patterns. This additional layer of objective information can help identify episodes of anxiety or stress, providing an alert for both patients and healthcare professionals. * **Data Analysis and Visualization**: PsyWell will include analytical tools that enable psychologists to visualize trends and patterns in their patients' data. Through charts and reports, professionals will be able to make informed decisions about treatments, adjusting them according to each patient's specific needs. * **Personalized Notifications and Alerts**: The application will send users daily reminders to record their mood. In addition, it will automatically trigger alerts when unusual physiological data or significant changes in emotional records are detected, suggesting that the user take self-care actions or contact their support network. * **Data Security and Privacy**: Given the sensitive nature of the information managed, PsyWell will implement high standards of security and privacy to protect user data. This includes data encryption, controlled access, and compliance with data protection regulations. |
| **Relevance of the Project to the Graduation Profile** | **Relationship of the APT Project with the Graduation Profile**  The APT Project aligns closely with the graduation profile of the Computer Engineering program, which emphasizes the ability to develop innovative and efficient technological solutions for complex problems. This project combines the use of advanced technologies such as IoT, mobile and desktop application development, and data security, which are fundamental in modern computer science. Through PsyWell, students not only apply advanced technical knowledge but also develop skills in project management, data analysis, and effective communication—competencies essential to the profile of a computer engineer.  **Selected Competencies and Their Relationship to the Problem**   * **Software Solutions Development**: One of the key competencies in the graduation profile is the ability to develop software solutions using techniques that systematize the development and maintenance process. This competence is essential for the APT Project, as it involves creating a robust and scalable application that can integrate with multiple devices and handle large volumes of data. The development of PsyWell requires a methodical and structured approach to ensure that the solution is reliable, efficient, and easy to maintain. * **Information Technology Integration**: The competence of implementing comprehensive system solutions to automate and optimize business processes is highly relevant to PsyWell. The integration of IoT technologies for real-time monitoring of physiological data and its combination with users' subjective records requires a deep understanding of how to integrate different systems and technologies to create a cohesive and functional solution. * **Information Security and Privacy**: Resolving system vulnerabilities to ensure that the software complies with industry security standards is another key competence. Since PsyWell handles sensitive mental health data, it is crucial to implement robust security measures to protect users' privacy. This competence is fundamental to ensuring that the application meets data protection standards and builds trust among users. * **Data Analysis and Management**: The competence to develop the transformation of large volumes of data to obtain information and knowledge is vital to PsyWell's success. The application must be able to analyze both physiological and emotional data to provide valuable insights to psychologists. This involves not only data collection but also its analysis and presentation in a way that is useful and understandable to healthcare professionals. * **Project Management**: The ability to manage IT projects, offering alternatives for decision-making, is essential in the development of PsyWell. This project requires effective management of time, resources, and the team to ensure that all stages of the project are completed on time and meet the required quality standards. Using agile methodologies such as Scrum allows the team to adapt to changes and ensure continuous delivery of value. |
| **Relation to Professional Interests** | **Team’s Professional Interests** As a team, we share a strong interest in software development, particularly in areas related to the integration of emerging technologies such as IoT, data analysis, and the creation of solutions that improve people’s quality of life. Each team member is motivated by the desire to use technology to address real-world problems and generate a positive impact on society. Additionally, we have a common interest in strengthening our skills in project management, information security, and delivering software solutions that are both innovative and secure.  **Reflection of Professional Interests in the APT Project** The APT Project aligns perfectly with our professional interests for several reasons:   * **Software Development and Front-End**: PsyWell requires a comprehensive approach to software development, from the user interface to the backend infrastructure. This project allows us to apply and enhance our skills in front-end development and interface design, ensuring that the application is intuitive and meets the needs of the end-users—patients and psychologists. * **Integration of IoT Technologies**: One of the most challenging and exciting aspects of PsyWell is the integration with IoT devices for real-time monitoring of physiological data. This project gives us the opportunity to work with cutting-edge technologies, explore new ways to collect and analyze data, and learn how to effectively integrate these technologies to provide innovative health solutions. * **Social Impact and Improving People’s Lives**: Our entire team is motivated by the possibility of developing a solution that makes a real difference in people’s mental health. PsyWell is not only an opportunity to apply our technical skills but also to contribute to a significant societal issue. We strongly believe in the potential of technology to improve people’s lives, and this project reflects that commitment. * **Information Security and Privacy**: Given that we will handle sensitive data, we are committed to ensuring that the highest security standards are applied. This project allows us to apply knowledge in cybersecurity and data protection, ensuring that users' personal information is safeguarded and that privacy regulations are met. * **Project Management and Teamwork**: PsyWell offers an opportunity to apply agile methodologies and enhance our project management skills. Working together on a project of this magnitude allows us to develop communication, coordination, and decision-making skills, all of which are essential for success in any professional environment. |
| **Feasibility of APT Project Development** | **Feasibility Justification** The development of the APT Project is feasible within the framework of the course for several key reasons. Below, the main factors that justify the possibility of carrying out this project are detailed, considering time, material resources, and external factors that may influence its development.  **Semester Duration and Assigned Hours**: The project is designed to be completed over the course of one academic semester, which provides approximately 15 weeks for its development. Each team member has dedicated weekly hours for the course, allowing for a sustained and structured approach to each phase of the project, from initial planning to implementation and final testing.  **Required Materials**: The development of PsyWell primarily requires development software (such as integrated development environments, project management tools, and databases), IoT devices for testing (such as heart rate monitors), and access to cloud resources for data storage and processing. All these materials are available to the team, as the university provides access to well-equipped computer labs and software resources. Additionally, many of the necessary IoT devices are available through institutional agreements or can be acquired with a reasonable budget.  **External Factors Facilitating Development**:   * **Academic and Technical Support**: We have the support of professors and experts in software development, IoT, and information security. This academic backing provides access to specialized knowledge and guidance in the event of technical challenges. * **Collaboration and Teamwork**: The team has a collaborative work dynamic and effective communication, which facilitates task coordination and management. The adoption of agile methodologies, such as Scrum, also supports incremental development and quick adaptation to changes or unforeseen challenges. * **Access to Digital Resources**: The university provides access to digital libraries, research databases, and development software, which is essential for obtaining updated information and tools necessary for the project.   **External Factors Hindering Development and Potential Solutions**:   * **Time Limitations**: The academic semester has a limited duration, which may restrict the time available for the testing and adjustment phases of the application. To mitigate this risk, a detailed timeline has been created, including time margins for potential delays, and the delivery of critical features has been prioritized in the early phases of development. * **Availability of IoT Devices**: The availability of sufficient IoT devices for testing may pose a challenge. To address this, the team plans to use data simulators in the early stages and ensure a limited number of physical devices for testing, optimizing their use among team members. * **Data Security and Privacy**: As the project handles sensitive health data, the implementation of robust security measures is crucial. To address this challenge, the team is committed to following best practices in cybersecurity and consulting with data protection experts to ensure compliance with relevant regulations. |

1. **PARTE II**

| **4. Objectives** |
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| In the following section, you should describe the methodology, specific to your discipline, that you will use to carry out the previously described APT project. This should include the stages and work methods. |

| General Objective | Develop a mobile application and a desktop version that facilitate the work of psychologists by continuously monitoring patients' mental health, integrating IoT technologies to provide accurate and up-to-date data that improve the effectiveness of treatments |
| --- | --- |
| **Specific Objectives** | * Create an intuitive and accessible platform that allows patients to easily and continuously record their emotional state and relevant data. * Integrate IoT devices for real-time collection of physiological data, complementing patients' subjective records and providing a more comprehensive view of mental well-being. * Implement robust security measures to protect sensitive patient information and ensure compliance with privacy and confidentiality standards. * Develop an interface for psychologists that enables the visualization and analysis of collected data, facilitating decision-making and the personalization of therapeutic interventions. * Conduct functionality and usability tests to ensure that the platform operates efficiently and meets the expectations of both users and mental health professionals. * Establish a feedback system to gather input from users and psychologists, allowing continuous improvements to the application and adjusting its features to better meet the needs of the clinical field. |

| **5. Methodology** |
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| In the following section, you should describe the methodology, specific to your discipline, that you will use to carry out the previously described APT project. This should include the stages and work methods. |

| **Description of the Methodology** |
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| The identified problem is the lack of an effective tool for continuous and precise monitoring of patients' mental health, which would facilitate the work of psychologists. To address this situation, we will develop a mobile application and a desktop version that allow psychologists to obtain up-to-date and relevant data about their patients. We will use the Scrum methodology to ensure an agile and iterative approach, allowing for constant adaptation based on user feedback and emerging needs.  **Sprint Planning**:   * Define specific tasks and objectives for the upcoming sprint. * Prioritize product backlog functionalities and assign tasks to the team.   **Sprint Execution**:   * Work on the defined tasks, developing and testing functionalities. * Conduct daily stand-up meetings to update progress and resolve impediments.   **Sprint Review**:   * Present the product increment developed during the sprint to stakeholders. * Gather feedback and evaluate the achievement of sprint objectives. * Adjust the product backlog based on feedback and necessary changes.   **Sprint Retrospective**:   * Reflect on the sprint process and identify areas for improvement. * Apply changes to optimize the process in the next sprint. |

| **6. Evidence** |
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| Next, describe which pieces of evidence will be evaluated in the progress report and the final report of your APT project. These pieces of evidence must be agreed upon with your instructor. Evidence refers to the products developed during the project, which aim to demonstrate or document how the work has been implemented. |

| **Type of Evidence**  **(progress or final)** | **Evidence Name** | **Description** | **Justification** |
| --- | --- | --- | --- |
| Progress | Project Charter | Document that formalizes the start of the PsyWell project. It defines the general objectives, key deliverables, estimated timeline, budget, and project responsibilities. | The project charter is essential to define the project framework, establish initial agreements, and obtain approval from key stakeholders. |
| Progress | | Requirements Gathering | | --- | | Document that compiles interviews and workshops with psychologists, patients, and key stakeholders to define the project’s functionalities and scope. It includes the project timeline and resource allocation. | This justifies the detailed project planning, ensuring that development decisions are aligned with the real needs of users and the capabilities of the development team. |
| **Progress** | | UX/UI Design Report | | --- | | Document that includes wireframes and prototypes of the application’s interface. This report must contain the initial versions of the main screens: emotional log, login, and user profile. | It allows for the evaluation of progress in creating an intuitive and accessible user experience, focused on the needs of patients and mental health professionals. |
| | Progress | | --- | | | Minimum Viable Product Development | | --- |  |  | | --- | | Minimum viable product (MVP) with basic functionalities: emotional state logging and data visualization through graphs. | It demonstrates the initial implementation of key features, allowing for the first user interaction with the system and the collection of data for analysis and feedback. |
| Final | | **Final Version of the Application** | | --- | | Delivery of the final product, with all functionalities implemented: emotional logging, IoT device integration, alerts, reports for psychologists, and self-care tools for patients. | This is the main evidence of the project, demonstrating the ability to complete development and launch a functional application with added value for users. |
| Final | | **User Manual** | | --- |  |  | | --- | | | Document that provides a detailed explanation on how to use the application, both for patients and psychologists. It includes screenshots and descriptions of all functionalities. | | --- | | | It facilitates the adoption and use of the application, ensuring that users can take full advantage of all features and understand the value of each in the context of their mental well-being. | | --- | |
| Final | **Project Closure Charter** | Formal document that records the conclusion of the project, including verification that all deliverables have been completed and delivered, a project evaluation, and final approval from stakeholders. | The project closure charter is crucial to validate the success of the project. It provides a formal overview of the project’s final status, documents lessons learned, and ensures that all objectives have been met. It serves as the final and official record of the fulfillment of project requirements and acceptance by the client or stakeholders. |

| **7. Work plan** |
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| In the following table, define the planning of your APT Project according to the requirements. |

| **APT Project Work Plan** | | | | | | |
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| **Competency or Units of Competencies** | **Name of Activities/Tasks** | **Description of Activities/Tasks** | **Resources** | **Duration of Activity** | **Responsible** | **Observations** |
| Project Management | Project Charter | Formalization of the project’s initiation, role assignments, definition of objectives, initial timeline, and budget. | *Charter document, initial meeting* | *1 week* | Entire team | Validate with all stakeholders before signing. |
| Requirements Gathering | Requirements Collection | Collection of requirements through interviews and workshops with psychologists, patients, and key stakeholders to define functionalities. | Interviews, workshops, forms | 2 weeks | Entire team | Record all technical and functional requirements in detail. |
| *Software Solutions Development* | *User Interface Design* | *Creation of wireframes and prototypes for mobile and desktop applications, ensuring an intuitive and functional interface.* | *Design tools (Balsamiq, Canva)* | *2 weeks* | Entire team | *Conduct early usability testing with users to validate the design.* |
| ***Emerging Technologies Integration*** | ***IoT Integration (Initial Testing)*** | *Implementation and testing of integration with IoT devices (heart rate monitors) for real-time capture of physiological data.* | *IoT devices, integration API* | *3 weeks* | Entire team | *Ensure compatibility with devices from different brands and conduct thorough testing.* |
| ***Software Solutions Development*** | ***Mobile Application Development*** | *Implementation of basic and advanced functionalities of the mobile application, including emotional state logging and IoT integration.* | *Ionic, Angular, IoT API* | *4 weeks* | Entire team | *Ensure correct synchronization with IoT devices.* |
| *Software Solutions Development* | *Web Application Development* | *Development of the desktop application, with complete functionalities for psychologists, including report visualization and data analysis.* | *HTML, CSS, Angular* | *4 weeks* | Entire team | *Ensure compatibility of reports between the mobile and web platforms.* |
| ***Data Security and Protection*** | ***Security Measures Implementation*** | *Development of encryption systems and protection of sensitive data, ensuring compliance with health data protection regulations.* | *Encryption libraries, PostgreSQL* | *3 weeks* | Entire team | *Ensure end-to-end encryption and conduct security audits.* |
| ***Functionality and Usability Testing*** | ***Usability and Functionality Testing*** | *Conduct comprehensive testing of the mobile and web platforms with users to ensure all functionalities are intuitive and fully operational.* | *Mobile devices, testers, surveys* | *3 weeks* | Entire team | *Implement user-suggested improvements before the official launch.* |
| ***Project Management*** | ***Application Review and Adjustments*** | *Review the results of usability and functionality tests, making adjustments to the code and interface based on user feedback.* | *Test reports, user feedback* | *2 weeks* | Entire team | *Prioritize the most critical adjustments before the final deployment.* |
| ***Project Management*** | ***Test Environment Deployment*** | *Implementation of the mobile and desktop applications in a controlled test environment to validate platform performance and stability.* | *Cloud servers, monitoring tools* | *2 weeks* | Entire team | *Ensure stability before production deployment.* |
| ***Project Management / Continuous Improvement*** | ***User Feedback and Improvements*** | *Collect feedback from users and psychologists after the initial deployment to implement continuous improvements in the application.* | *Surveys, interviews* | *1 week* | Entire team | *Implement necessary improvements based on feedback to enhance user satisfaction.* |

| **Activity** | **Fase 1** | | | | **Fase 2** | | | | | | | | | | | | **Fase 3** | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S 1** | **S 2** | **S 3** | **S 4** | **S 5** | **S 6** | **S 7** | **S 8** | **S 9** | **S 10** | **S 11** | **S 12** | **S 13** | **S 14** | **S 15** | **S 16** | | **S 17** | **S 18** |
| **Project Charter** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **Requirements Gathering** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **User Interface Design** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **Mobile Application Development** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **Web Page Development** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **IoT Integration (Initial Testing)** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **Security Measures Implementation** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **Usability and Functionality Testing** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **Application Review and Adjustments** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **Test Environment Deployment** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **User Feedback and Improvements** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **Project Launch** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| **Project Closure Charter** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |