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1. **PART I**

| **1. Personal Background** |
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| The following table presents the required personal information. |

| Student Name | **Marcelo Andrés Darras Téllez, Jesús Andres Delgado Alvarez** |
| --- | --- |
| Rut | **20.959.469-2, 25.777.977-7** |
| Degree Program | **Computer Engineering** |
| Campus | **San Joaquin** |

| **2. APT Project Description** |
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| In this section, you must briefly state the name of your APT project and the competencies from the graduate profile that you will apply. If your program has defined performance areas, also mention which areas the project is related to. |

| Project Name | *PedidosCD* |
| --- | --- |
| Performance Area(s): | *Software Development, IT Project Management, Software Quality Assurance, Analysis and Evaluation of IT Solutions.* |
| Competencies | * *Conduct certification tests for both products and processes using industry-defined best practices.* * *Manage IT projects, offering alternatives for decision-making according to organizational requirements.* * *Develop a software solution using techniques that systematize the development and maintenance process, ensuring the achievement of objectives.* * *Implement comprehensive systematic solutions to automate or optimize business processes according to the organization’s needs.* * *Implementar soluciones sistemáticas integrales para automatizar u optimizar procesos de negocio de acuerdo a las necesidades de la organización.* |

| **3. APT Project Justification** |
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| Below are different fields that you must complete with the requested information. This section aims for you to describe your project in detail and justify its relevance and appropriateness. |

| Relevance of the APT Project | *Our project is oriented toward the Chilean company “Carnes Darras,” an organization with years of experience that currently has outdated administrative systems for key processes such as client invoicing and goods reception. The proposal seeks to address this issue by modernizing these processes, making them faster, more efficient, and reliable.*  *Since this is an administrative system, the impact is directly on the company’s internal management, especially in billing times, sales control, and operations records. This will significantly reduce the operational workload and improve information traceability.*  *The main value this project will provide is the optimization of administrative processes, allowing them to be carried out in approximately half the current time, while ensuring that information is always accessible to all involved areas. This guarantees that every sale is properly recorded and available, representing a real contribution to both business management and the strengthening of IT in digitization and automation processes.* |
| --- | --- |
| Description of the APT Project | *Our project will consist of developing a mobile application that integrates the following company processes:*   * ***Order registration****: When received by phone or WhatsApp, orders can be immediately entered into the app. They will be stored in a centralized database and visible to all authorized users, eliminating the need for calls to the manager and the use of paper.* * ***Preparation management****: Orders can be prepared directly in the app, recording the weights of individual boxes and automatically calculating product totals.* * ***Automatic invoicing****: Using the NUBOX API, orders can be sent in a single request to generate invoices automatically and register them in the SII (Chilean Internal Revenue Service).* * ***Daily reports****: An Excel file with daily sales data will be generated automatically and stored in the company’s shared folder.*   *Currently, all these processes are done manually with pen and paper, and orders are distributed among several people within the company, who then must deliver them to the manager for processing. Therefore, it is necessary to ensure that information is accessible at the time orders are recorded.* |
| Project relevance with graduate profile | *The project meets several competencies from the graduate profile, since the solution includes not only mobile app development but also requires a database, as well as a server for data storage. Therefore, project management is also needed, both in terms of resources and risks. The selected competencies align very well with these aspects as they involve multiple parts of the project process.* |
| Relation to professional interests | *My professional interests are directly related to software development, including coding in different programming languages and data management in databases.*  *This project contributes to my professional growth since it covers all the areas that make up my professional interests.* |
| Feasibility of developing the APT Project | *The project is feasible since it involves digitizing a simple manual process: assigning orders (boxes of products) to clients, calculating total product weights, and ending with invoicing, which can connect to the company’s existing billing software.*  *In terms of duration and materials, it is very likely that the project will be completed within the established timeframe, not only considering the subject’s allocated hours (around 4), but also working on additional days during the week. Regarding materials, we only need a code editor (such as Visual Studio Code), GitHub, and a shared Drive folder. Both team members already own computers capable of development.*  *Some external factors that facilitate development include proximity to the company, since I am part of the management area, which provides me with in-depth knowledge of processes.*  *A main challenge is connecting our application to “NUBOX” via an API, which we have never done before. We do not yet know the connection requirements, but since the API exists, we will research and document how to integrate it.* |

1. **PART II**

| **4. Objectives** |
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| In this section, you must define general and specific objectives of the APT Project. It is important to note that objectives must be written clearly and concisely, without further explanation, so that they are self-explanatory. It is recommended to phrase them using an infinitive verb, as this ensures concrete actions are specified. |

| General Objective | *Develop a mobile application for the company Carnes Darras to modernize and optimize the processes of order management, preparation, invoicing, and report generation, ensuring greater efficiency, traceability, and accessibility of information.* |
| --- | --- |
| Specific Objectives | 1. *Implement an order registration module that centralizes information in a database accessible to users.* 2. *Develop a preparation management module to record box weights, automatically calculate totals, and facilitate order organization.* 3. *Integrate the system with the NUBOX API for automatic invoicing and registration in the SII.* 4. *Generate daily Excel reports of sales and store them in the company’s shared folder.* 5. *Ensure software quality through validation and certification testing of the implemented processes.* 6. *Manage the project according to the available time and resources, applying IT project management best practices.* |

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

| Description of the Methodology |
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| *We will approach the problem using the agile methodology* ***SCRUM****, as in the context of our project it is much more effective to involve the client constantly in development. This is particularly important since the client consists mainly of adults not deeply accustomed to technology, which implies a high resistance to change.*  *For the project, roles and tasks will be defined between both team members:*   * ***Jesús Delgado****: Documentation Lead, Front-end Programming, QA* * ***Marcelo Darras****: Project Manager, Back-end Programming, Documentation* |

| **6. Evidence** |
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| Below, describe which evidence will be evaluated in the progress report and in the final report of your APT project. Evidence refers to the products developed during the project that serve to document or make visible how the work has been implemented. |

| **Type of Evidence (progress or final)** | | **Name of Evidence** | | --- | | **Description** | **Justification** |
| --- | --- | --- | --- | --- |
| **Progress** | **Product Backlog** | Document listing all requirements and prioritized functionalities of the mobile app, defined together with the client. | Shows whether business needs were properly gathered to apply the Scrum methodology. |
| **Progress** | **Sprint Backlog** | Set of tasks selected from the Product Backlog to be developed in each sprint. | Distributes team effort and details planning of each work cycle. |
| **Progress** | **Tablero de Tareas** | Visual tool organizing the status of tasks. | Facilitates project tracking and provides transparency of team progress. |
| **Progress** | **Facts Definition** | List of criteria each functionality must meet to be considered completed. | Ensures deliverable quality and consistency, avoiding ambiguities when validating progress. |
| **Progress** | **Sprint Deliverables** | Partial versions of the mobile app with specific functionalities completed in each sprint. | Demonstrates progress with frequent functional deliveries, aligned with Scrum. |
| **Progress** | **Meeting Minutes** | Records of planning, review, or retrospective sprint meetings. | Shows client feedback based on sprint deliverables. |
| **Progress** | **Mockups** | Visual prototypes of the mobile app (screens, navigation flows). | Helps validate the proposal with the client before actual development, reducing rejection risk. |
| **Progress** | **Database Design** | Logical model of the database. | Shows the flow and structure of the database. |
| **Final** | **Functional Mobile Application** | Final implemented product including order registration, preparation, and automatic invoicing. | Main evidence of the project, demonstrating the concrete solution to the company’s problem. |
| **Final** | **Automatic Excel Report** | Automatically generated file with daily sales details, stored in the company’s shared folder. | A specified functionality within the Product Backlog, adding direct value to administrative management. |
| **Final** | **QA Test Results** | Report with test cases, obtained results, detected and corrected errors. | Ensures software quality and compliance with requirements. |
| **Final** | **Technical Documentation** | Manual with system architecture, Nubox integration, database design, and code explanation. | Ensures maintainability and scalability, serving as a guide for future developers. |
| **Final** | **Sprint Review** | Final presentation/demo with the client, showing implemented functionalities. | Validates that deliverables meet user expectations and project goals. |
| **Final** | **Final Retrospective** | Record of lessons learned, identified improvements, and conclusions regarding Scrum application. | Shows critical reflection of the team, enabling process improvement for future projects. |

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

| **Work Plan for APT Project** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| Competency / Units of Competencies | **Activity/Task Name** | **Description** | Resources | Duration | Responsible | Notes |
| *OFFER IT SOLUTION PROPOSALS BY ANALYZING PROCESSES COMPREHENSIVELY ACCORDING TO ORGANIZATIONAL REQUIREMENTS (Disciplinary).*  *MANAGE IT PROJECTS, OFFERING ALTERNATIVES FOR DECISION-MAKING ACCORDING TO ORGANIZATIONAL REQUIREMENTS (Disciplinary).* | *Requirements gathering (mockups, client meetings, product backlog).* | Meetings with the client to identify initial requirements. Once validated, preliminary mockups are prepared, and the Product Backlog is built to serve as the basis for sprint planning. | *Prototyping tools, Google Meet, Trello.* | *1 week.* | *Jesús Delgado, Marcelo Darras* | *Risk*: Difficulties in clearly defining requirements.  *Facilitator*: Direct communication and early validation. |
| *BUILD THE ARCHITECTURAL MODEL OF A SYSTEMIC SOLUTION THAT SUPPORTS BUSINESS PROCESSES ACCORDING TO ORGANIZATIONAL REQUIREMENTS AND INDUSTRY STANDARDS (Disciplinary).*  *BUILD DATA MODELS TO SUPPORT ORGANIZATIONAL REQUIREMENTS BASED ON A DEFINED AND SCALABLE DESIGN (Disciplinary).* | Database design and application architecture. | Define the data model using entity-relationship diagrams and table normalization. In parallel, define the application architecture to ensure scalability, maintainability, and compliance with requirements. | *MySQL, Draw.io.* | *1 week.* | *Jesús Delgado, Marcelo Darras* | *Risk: Requirement changes affecting the defined design.*  *Facilitator: Clear documentation and scalable design.* |
| *DEVELOP A SOFTWARE SOLUTION USING TECHNIQUES THAT SYSTEMATIZE DEVELOPMENT AND MAINTENANCE PROCESSES, ENSURING THE ACHIEVEMENT OF OBJECTIVES (Disciplinary).*  *BUILD PROGRAMS AND ROUTINES OF VARIED COMPLEXITY TO SOLVE ORGANIZATIONAL REQUIREMENTS USING MARKET TECHNOLOGIES AND CODING BEST PRACTICES (Disciplinary).* | Mobile interface design (validated mockups). | Build high-fidelity user interfaces from validated mockups, ensuring an intuitive user experience aligned with client needs. | *Canva.* | *1 week.* | *Jesús Delgado, Marcelo Darras* | *Risk: May require additional iterations based on client feedback.*  *Facilitator: Early usability improvement opportunities.* |
| *IMPLEMENT COMPREHENSIVE SYSTEMIC SOLUTIONS TO AUTOMATE OR OPTIMIZE BUSINESS PROCESSES ACCORDING TO ORGANIZATIONAL NEEDS (Disciplinary).*  *PROGRAM QUERIES OR ROUTINES TO MANIPULATE DATA IN A DATABASE ACCORDING TO ORGANIZATIONAL REQUIREMENTS (Disciplinary).* | Environment setup (repository, frameworks, dependencies). | Prepare the development environment by configuring repositories, frameworks, and dependencies to ensure an organized collaborative workflow. | *GitHub/GitLab.* | *1 week.* | *Jesús Delgado, Marcelo Darras* | *Risk: Library or framework incompatibilities.*  *Facilitator: Prior team experience and best practices.* |
| *CONDUCT CERTIFICATION TESTS FOR BOTH PRODUCTS AND PROCESSES USING INDUSTRY-DEFINED BEST PRACTICES (Disciplinary).*  *RESOLVE SYSTEMIC VULNERABILITIES TO ENSURE SOFTWARE COMPLIES WITH INDUSTRY SECURITY STANDARDS (Disciplinary).* | Sprint 1 | Initial implementation of the system’s access core. Includes login and user registration screens, RUT and password validation, database connection, password recovery via email, and recovery code validation. This sprint establishes the security and user management foundation for subsequent modules. | *Repository, IDE, frameworks* | *2 week.* | *Jesús Delgado, Marcelo Darras* | *Risk: Errors in validation or database connection can delay progress.*  *Facilitator: Clear rules and continuous testing.* |
| *DEVELOP THE TRANSFORMATION OF LARGE DATA VOLUMES INTO INFORMATION AND KNOWLEDGE TO SUPPORT DECISION-MAKING AND BUSINESS PROCESS IMPROVEMENT (Disciplinary).*  *IMPLEMENT COMPREHENSIVE SYSTEMIC SOLUTIONS TO AUTOMATE OR OPTIMIZE BUSINESS PROCESSES (Disciplinary).* | Sprint 2 | Develop main functionalities for order management, including order registration form with centralized storage, order editing and deletion, and a search tool filtering by client or ID. Ensures efficient management of the full order cycle. | *Repository, IDE, frameworks* | *3 week.* | *Jesús Delgado, Marcelo Darras* | *Risk: Maintaining data consistency during edits or deletions.*  *Facilitator: Frontend and backend validations.* |
| *BUILD PROGRAMS AND ROUTINES OF VARIED COMPLEXITY TO SOLVE ORGANIZATIONAL REQUIREMENTS USING MARKET TECHNOLOGIES AND CODING BEST PRACTICES (Disciplinary).*  *RESOLVE SYSTEMIC VULNERABILITIES TO ENSURE SOFTWARE COMPLIES WITH INDUSTRY SECURITY STANDARDS (Disciplinary).* | Sprint 3 | Integrate invoicing processes. Includes recording box weights, calculating totals, invoicing orders with database updates, and integration with the Nubox API for SII validation. Also includes invoice data visualization, driver assignment, and confirmation messages. Ensures traceability and formalization of business transactions. | *Repository, IDE, frameworks* | *3 week.* | *Jesús Delgado, Marcelo Darras* | *Risk: Dependency on external system (Nubox) may cause delays.*  *Facilitator: Controlled testing and proper documentation.* |
| *DEVELOP THE TRANSFORMATION OF LARGE DATA VOLUMES INTO INFORMATION AND KNOWLEDGE TO SUPPORT DECISION-MAKING AND BUSINESS PROCESS IMPROVEMENT (Disciplinary).*  *BUILD THE ARCHITECTURAL MODEL OF A SYSTEMIC SOLUTION THAT SUPPORTS BUSINESS PROCESSES (Disciplinary).* | Sprint 4 | Final stage focused on data analysis and visualization tools. Includes automatic daily sales reports, Excel export, centralized storage, and email distribution. Adds push notifications, a quick-access dashboard with order/sales charts, advanced filters, real-time statistics updates, and user profile options. Delivers value-added decision-making tools and improved user experience. | *Repository, IDE, frameworks* | *2 week.* | *Jesús Delgado, Marcelo Darras* | *Risk: Real-time data synchronization.*  *Facilitator: Modular design and monitoring tools.* |
| *CONDUCT CERTIFICATION TESTS FOR PRODUCTS AND PROCESSES USING INDUSTRY BEST PRACTICES (Disciplinary).* | QA Testing | Verification stage consisting of unit tests, integration tests, and end-user tests to ensure software quality, detect errors, and confirm requirement compliance. | *Postman, Selenium, JUnit/PyTest* | *1 week.* | *Jesús Delgado, Marcelo Darras* | *Risk: Unexpected bugs requiring adjustments.*  *Facilitator: Well-defined testing plan.* |
| *RRESOLVE SYSTEMIC VULNERABILITIES TO ENSURE SOFTWARE COMPLIES WITH INDUSTRY SECURITY STANDARDS (Disciplinary).*  *DEVELOP A SOFTWARE SOLUTION USING DEVELOPMENT AND MAINTENANCE TECHNIQUES (Disciplinary).* | Final adjustments and optimization (based on feedback). | Fix errors detected during QA, improve security and performance, and implement client-requested adjustments before final delivery. | *IDE, monitoring tools.* | *1 week.* | *Jesús Delgado, Marcelo Darras* | *Risk: Limited time for detailed fixes.*  *Facilitator: Prioritization of most relevant adjustments.* |
| *MANAGE IT PROJECTS, OFFERING DECISION-MAKING ALTERNATIVES (Disciplinary).*  *COMMUNICATE ORALLY AND IN WRITING IN ENGLISH IN SOCIO-WORK CONTEXTS AT A BASIC LEVEL (Generic).* | Technical documentation and user manual | Prepare technical documentation and user manual to facilitate system understanding for developers and end users. | *Word, GitHub.* | *1 week.* | *Jesús Delgado, Marcelo Darras* | *Risk: Poorly estimated timing may delay this phase.*  *Facilitator: Split documentation between team members* |
| *MANAGE IT PROJECTS, OFFERING DECISION-MAKING ALTERNATIVES (Disciplinary).*  *IMPLEMENT COMPREHENSIVE SYSTEMIC SOLUTIONS TO AUTOMATE OR OPTIMIZE BUSINESS PROCESSES (Disciplinary).* | Final Delivery | Project closure including formal presentation to the client, documentation delivery, final deployment, and feedback to evaluate compliance with project goals. | *Final report, demo, repository.* | *1 week.* | *Jesús Delgado, Marcelo Darras* | *Risk: Depends directly on prior phases.*  *Facilitator: Good planning and client communication.* |

| **8. Gantt Chart** |
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| Find a Gantt Chart format that works for you and organize the planned activities from the previous section according to the academic period assigned for your APT Project development. You must maintain the academic period timeline across the three phases of the Capstone subject. |

| **Activities** | **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** |
| *Requirements gathering (mockups, client meetings, product backlog).* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| Database design and application architecture.. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| Mobile interface design (validated mockups). |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| Environment setup (repository, frameworks, dependencies). |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| Sprint 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| Sprint 2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| Sprint 3 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| Sprint 4 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| QA Testing |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| Final adjustments and optimization (based on feedback) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| Technical documentation and user manual |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| Final Delivery |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |