**Guide 3. APT Project Final Report**

**Capstone Subject**

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| **1. APT Project Final Report** |
| The objective of this report is for you to describe the most relevant aspects of your APT Project. It is important that you justify the decisions you had to make throughout the process.  Below, you will find different fields that you must complete with the requested information, which will give a summary of your APT project and its main results. |

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| **Contents of the final report** | |
| 1. Relevance of the APT project | Our client is in the Vista Parque 1 and 2 condominium, which is located in the commune of San Bernardo, at Almirante Riveros #630. The condominium has 570 apartments and 30 houses, with a total of 600 homes. The condominium has two major problems, which are described below.   1. Due to the large number of vehicles on the premises and the manual work done by the concierges on a daily basis, traffic jams are generated both at the entrance to the condominium and on the avenue on which it is located. 2. Due to the high crime rates, the administration needs a system that restricts vehicle access, ensuring exclusive access to residents and authorized personnel, with the intention of preventing theft and "portonazos", which have recently affected the condominium.   At TechApps we put the quality of life and work of people as our main focus, so faced with the problem posed by the condominium, we decided to propose a complete and efficient solution that solves their vehicular access management problem, since as a company we believe that a project of this magnitude could apply all the knowledge acquired during the training process at Duoc, from project management and product quality, to software development and implementation. |
| 2. Goals | Project Objectives  General Objective: Develop a comprehensive vehicle access control system that improves security and streamlines the entry and exit of vehicles in the Vista Parque condominium, ensuring exclusive control by residents and authorized personnel.  Specific Objectives:   1. Implement an automatic vehicle license plate reader using Python. 2. Develop a mobile application in Flutter so that residents can register visits in advance. 3. Create a REST API in Spring Boot for managing vehicle access permits and integration with the external API. 4. Design a database in SQL Server that supports the management of residents, visitors and commercial vehicles. 5. Generate vehicle access reports and real-time monitoring. 6. 6. Ensure that the system complies with computer security standards. |
| 3. Methodology | The methodology followed is Scrum, with 9 sprints of two weeks. Activities include requirements planning, modular development (patent reader, API, mobile application, database), integration testing, and future implementation of the system. |
| 4. Development | |  |  |  |  |  | | --- | --- | --- | --- | --- | | Activity | Status | Difficulties | Materials/Physical Resources | Languages/Environment | | Patent Reader | Completed | Difficulties in doing live testing with the camera on the street due to weather conditions and traffic | Video camera, PC | Python, OpenCV | | Database Design | Completed | N/A | PC, SQL Server SQL | SQL Server | | API REST | In progress | N/A | PC, server for Java API | Java, Spring Boot | | Mobile Application in Flutter | In progress | N/A | PC, smartphone for Flutter, Dart testing | Flutter, Dart | | Integration Testing | Not started | Coordination for real-time camera testing in a controlled | environment Video camera, PC, local network for integration | Python, Java, SQL, Flutter |   Future Activities   * Finalize the development of the REST API and mobile application. * Perform integration tests between modules. * Prepare the system for launch and training of end users.   Factors that have facilitated the development of the work plan:   * Team coordination: The implementation of daily meetings using the Scrum methodology has allowed for better communication and quick problem resolution. * Adequate technological tools: We have a well-configured development environment, including Python, SQL Server, and Spring Boot, which has facilitated the work of the developers. * Early functional prototype: The patent reader was completed in the early stages of the project, which allowed for rapid progress in the integration with other modules. Factors that have hindered the development of the work plan:  1. Change in the structure of the applications:    * Difficulty: Initially, a single application was developed for residents and administration, which complicated management and increased the workload.    * Action taken: The development was divided into two applications: one administrative and one for residents, prioritizing at this time the administrative one. 2. Error in the application of the Scrum methodology:    * Difficulty: Although it was planned to work with Scrum, in the first few weeks a traditional approach was mistakenly adopted, affecting planning and deliverables.    * Action taken: An immediate correction was made to resume the Scrum methodology, establishing 2-week sprints with daily meetings and incremental deliverables. 3. Adjustment in the sprint schedule:    * Difficulty: The initial planning of the sprints did not allocate enough time for some key modules, such as the application in Flutter.    * Action taken: Tasks were redistributed into 9 sprints, giving 2 full sprints for development in Flutter and adjusting the dates of the rest of the modules.  Adjusted or deleted activities Adjustments made:   1. Division of applications into two versions (Administrative and Resident):    * Reason: It was originally planned to develop a single application that will integrate both administrative and resident functions. However, during development we identified that this configuration increased the complexity of the system and affected usability.    * Adjustment: It was decided to separate the applications into two independent versions: one administrative and one for residents. This division allows you to optimize functionalities and improve the user experience.    * Impact: Currently, we are focused on administrative application, since this is a priority for the efficient management of the system. 2. Adjustment in the sprint schedule:    * Reason: The initial planning allocated one sprint per module, which did not provide adequate time for the development of some more complex components, such as the mobile app in Flutter.    * Adjustment: A redistribution of the schedule was made, increasing the time for the development of the application in Flutter to two sprints and maintaining one sprint for the simplest modules. This new structure ensures better planning and avoids delays.   Deleted activities: At the moment, no activities have been deleted, as all the initially defined phases are still relevant to achieve the project objectives. |
| 5. Evidence | Patent Reader Module  REST API Module    Flutter Module      MER    Architecture diagram |
| 6. Professional interests and projections | * + Within the team we have diverse interests, some focused on project management, as well as others on software development. For the reason mentioned above, we believe that the project suits our team and their professional interests, as it covers all areas. |