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**Guide1. APT Project Definition**

**Capstone Course**

1. **PART I**

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| **1. Personal Background** |
| Below is a table where you must complete the requested information. |

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| Student Name | Mauricio Andrés Piña Valenzuela |
| National ID (RUT) | 19.239.498-8 |
| Degree Program | Computer Engineering |
| Campus | Maipú |

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| **2. APT Project Description** |
| In this section, you must briefly indicate the name of your APT project and the graduation profile competencies you will put into practice. If performance areas are defined in your degree program, also mention which areas the project is linked to. |

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| Project Name | Territorial Unit System |
| Performance Area(s) | * Analysis and Evaluation of IT Solutions * Software Development |
| Competencies | * Develop a software solution using techniques that systematize 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 testing of both products and processes using industry-defined best practices. |

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| **3. APT Project Rationale** |
| 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. |

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| Relevance of the APT Project | I chose this topic because many neighborhood councils in Chile lack technological tools to organize their activities, projects, and documents. This affects communication and community management, creating problems of organization and participation.  The situation takes place in the context of neighborhood councils at the national level, but it can also be applied to specific municipalities or neighborhoods. It directly impacts residents and council boards that need a simpler and more structured way to manage information.  The value contribution of the project is that it provides a practical solution that improves communication, project organization, and community participation. In addition, it is a case applicable to the professional field of my career, as it allows me to develop competencies in analysis, software development, and IT solution management. |
| APT Project Description | The project consists of building a system that improves the management of the territorial unit. At a high level, the system is expected to meet the following functions:  For internal use by the neighborhood council:   * Management of resident registration in the neighborhood council. * Management of requests and issuance of certificates of residence. * Management of applications for neighborhood projects. (That is, the submitted requests must be reviewed and either approved or rejected by the board or authorized personnel, and applicants must receive the resolution via email). * Sending notifications and announcements to the inhabitants of the territorial unit through posters, email, and/or WhatsApp. * Publication of news.   For public use:   * Registration of residents in the neighborhood council. * Request and issuance of certificates of residence. * Application for neighborhood projects (only members of the neighborhood council may apply). * Requests from the inhabitants of the territorial unit (e.g., for sports fields, meeting rooms, plazas, etc.), managed through a calendar. * Registration of residents for neighborhood activities or others, depending on availability. * Reception of notifications and announcements through posters, email, and/or WhatsApp. * Viewing of news.   The system may be a responsive website and/or a mobile application, connected to a database. It must include usability features so that the board or assigned personnel can manage the system without requiring technical IT knowledge.  It is suggested to visit a neighborhood council if further information is needed. |
| Relevance of the Project to the Graduation Profile | This project is related to the graduation profile of my degree because it allows me to apply competencies such as software development, data modeling, and quality testing. All of these are necessary to address the management issues in neighborhood councils, as the system requires proper planning, design, and validation in order to function correctly. |
| Relation to Professional Interests | My professional interests are in software development, data analysis, and artificial intelligence. This APT Project is related because it allows me to practice building a real system, work with databases, and apply good development practices. In addition, it will contribute to my professional growth by giving me experience in designing solutions that address the concrete needs of an organization. |
| Feasibility of Developing the APT Project | It is feasible to develop the project because there are 18 weeks in the semester, assigned working hours, and sufficient free tools available. Factors that facilitate the process include online resources and open-source software. A potential difficulty could be accessing real information from neighborhood councils, but this can be addressed through interviews or simulations. |

1. **PART II**

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| **4. Objectives** |
| In this section, you must define the general and specific objectives of the APT Project. It is important to note that the objectives must be stated clearly and concisely, without further explanation—that is, they should be understandable on their own. It is suggested to write them using an infinitive verb, as this requires specifying concrete actions. |

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| General Objective | To improve the management of the territorial unit of a neighborhood council. |
| Specific Objectives | 1. To design and implement a responsive web system that allows resident registration and management. 2. To develop a module for the request and issuance of certificates of residence. 3. To implement a system for the application and management of neighborhood projects. 4. To incorporate a calendar for booking community spaces and activities. 5. To develop notification and communication functions (email, WhatsApp, digital posters). 6. To test and validate the system by applying good software quality practices. |

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

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| Description of the Methodology |
| The project will be developed using the agile methodology XP (Extreme Programming). The stages of planning, simple design, coding, testing, and feedback will be applied in each iteration. Working individually, I will take on all functions, repeating the cycle until the system objectives are achieved. The application of XP is appropriate because it allows for functional progress in each iteration, maintains a simple design, ensures quality through continuous testing, and progressively improves the system until reaching the final version.  Note: In XP, each iteration includes the entire development cycle. What changes in each cycle are the functionalities or user stories being worked on, which allows for incremental deliveries, continuous feedback, and avoids a waterfall approach. |

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| **6. Evidence** |
| Below, describe what evidence will be evaluated in the progress report and in the final report of your APT Project. This evidence must be agreed upon with your instructor. Evidence will be understood as the products developed during the project, whose purpose is to make visible or document how the work has been implemented. |

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| **Type of Evidence (Progress or Final)** | **Name of the Evidence** | **Description** | **Justification** |
| Progress | Planning and Design Documents (Architecture, GUI, and DB) | Contains the project planning, proposed architecture, graphical user interface design, and database model. | Demonstrates that the system structure was defined and properly planned before its construction. |
| Progress | Control and Testing Documents | Includes the records of tests carried out during the iterations and project progress controls. | Ensures development quality and validates that each functionality meets the requirements. |
| Final | Closing Documents | Contains the final project report, conclusions, and lessons learned. | Reflects the complete outcome of the work and provides evidence of the methodology applied. |
| Final | |  | | --- | |  |  |  | | --- | | System (Web and/or App, DB) | | Delivers the developed system, including the website/app and functional database. | Serves as the main evidence, as it materializes the proposed solution to the identified problem. |

Note: The evidence described here corresponds to the requirements established by the educational institution for the Capstone Portfolio course. Therefore, they do not necessarily follow the logic of an agile methodology such as XP but are presented as evaluation products requested by the school. However, each piece of evidence is generated from the iterative work carried out in the different phases of the project.

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

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| **Work Plan – APT Project** | | | | | | |
| Competency or Units of Competencies | Name of Activities/Tasks | Description of Activities/Tasks | Resources | Duration of the Activity | Responsible[[1]](#footnote-1) | Observations |
| Build data models to support organizational requirements. | Iteration 1 | * Planning: define user stories (login/registration). * Simple Design: initial database schema, GUI mockups. * Coding: user CRUD, login/registration. * Database Adjustments: user tables. * XP Testing: unit tests (login and registration functions) + integration tests (complete authentication flow). * Feedback: improvements to the workflow. | PC, VS Code, PostgreSQL, dbdiagram.io, draw.io, Trello | 3 weeks | Mauricio Piña | Initial system baseline. |
| Develop a software solution using programming techniques. | Iteration 2 | * Planning: certificate user stories. * Simple Design: certificate database, interfaces. * Coding: issuance, approval/rejection. * Database Adjustments: add certificate tables. * XP Testing: unit tests (certificate data validation) + acceptance tests (issuance and approval/rejection flow). * Feedback: improvements. | PC, VS Code, PostgreSQL, dbdiagram.io, draw.io, Trello | 3 weeks | Mauricio Piña | First functional release. |
| Perform certification testing. | Iteration 3 | * Planning: calendar and notification user stories. * Simple Design: events/notifications database. * Coding: events CRUD, notifications. * Database Adjustments: events/notifications tables. * XP Testing: unit tests (CRUD events and alerts) + integration tests (calendar notifications). * Feedback: adjustments. | PC, VS Code, PostgreSQL, dbdiagram.io, draw.io, Trello | 3 weeks | Mauricio Piña | Product in progress. |
| Develop a software solution using agile development techniques. | Iteration 4 | * Planning: neighborhood project user stories. * Simple Design: project database. * Coding: project registration and tracking. * Database Adjustments: project tables. * XP Testing: unit tests (project fields) + functional tests (registration and tracking flow). * Feedback: improvements. | PC, VS Code, PostgreSQL, dbdiagram.io, draw.io, Trello | 3 weeks | Mauricio Piña | Functional increment. |
| Develop a software solution using programming techniques. | Iteration 5 | * Planning: news/announcements user stories. * Simple Design: news database. * Coding: news CRUD. * Database Adjustments: news tables. * XP Testing: unit tests (create/edit news) + regression tests (verify that previous functionalities are not affected). * Feedback: adjustments. | PC, VS Code, PostgreSQL, dbdiagram.io, draw.io, Trello | 3 weeks | Mauricio Piña | Near-final versión. |
| Develop documentation and final products. | Iteration 6 | * Planning: define final deliverables. * Simple Design: report structure. * Coding: compilation of evidence. * Database Adjustments: verification of complete schema. * XP Testing: system tests (global software validation) + acceptance tests (requirements compliance review). * Feedback: final adjustments to the system or report. * Final documentation: project final report, conclusions and lessons learned + application (Web/App) + functional database. | Word, PDF, PostgreSQL, dbdiagram.io, draw.io | 3 weeks | Mauricio Piña | Consolidation iteration. |

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| **Activity** | **Phase 1** | | | | **Phase 2** | | | | | | | | | | | | **Phase 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** |
| Iteration 1 (planning, simple design, coding, testing, feedback) | **X** | **X** | **X** |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |
| Iteration 2 (planning, simple design, coding, testing, feedback) |  |  |  | **X** | **X** | **X** |  |  |  |  |  |  |  |  |  |  | |  |  |
| Iteration 3 (planning, simple design, coding, testing, feedback) |  |  |  |  |  |  | **X** | **X** | **X** |  |  |  |  |  |  |  | |  |  |
| Iteration 4 (planning, simple design, coding, testing, feedback) |  |  |  |  |  |  |  |  |  | **X** | **X** | **X** |  |  |  |  | |  |  |
| Iteration 5 (planning, simple design, coding, testing, feedback) |  |  |  |  |  |  |  |  |  |  |  |  | **X** | **X** | **X** |  | |  |  |
| Iteration 6 (planning, simple design, coding, testing, feedback) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **X** | | **X** | **X** |

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| **8. Gantt Chart** |
| Find a Gantt Chart format that suits you and use it to organize the activities planned in the previous section, considering the period assigned for the development of your APT Project. You must maintain the academic term’s timeline throughout the development of the three phases included in the Capstone Portfolio course. |

1. En In the case that the APT Project is a group project, this column must indicate the name of the persons responsible for each task or activity. This will later allow the evaluation of each member to be differentiated. [↑](#footnote-ref-1)