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University Center of the Valles



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**Contend**

[1. Definition of Baseline 3](#_Toc161958166)

[2. The configuration elements of the Baseline 4](#_Toc161958167)

[2.1 Software Requirements Specification 4](#_Toc161958168)

[2.1.1 System features 4](#_Toc161958169)

[2.1.2 Functional Requirements 4](#_Toc161958170)

[2.1.3 Non-Functional Requirements 7](#_Toc161958171)

[2.2 System Design 8](#_Toc161958172)

[2.2.1 Prototypes 8](#_Toc161958173)

[2.2.2 The architectural aspects 12](#_Toc161958174)

[2.3 Database 12](#_Toc161958175)

[2.3.1 Entity-Relationship Diagram 12](#_Toc161958176)

[2.4 Source Code 12](#_Toc161958177)

[2.5 Acceptance Testing Design 13](#_Toc161958178)

[3. Configuration Control 14](#_Toc161958179)

[3.1 Decision Making Policy 14](#_Toc161958180)

[3.1.1 Authority and Responsibilities 14](#_Toc161958181)

[3.1.2 Decision Making Process 15](#_Toc161958182)

[3.1.3 Decision making criteria 16](#_Toc161958183)

[3.1.4 Evaluation of Change Request 18](#_Toc161958184)

[3.1.5 Process for the Implementation of the Change Request 19](#_Toc161958185)

[3.1.6 Evaluation variables to measure the behavior of the implemented change 20](#_Toc161958186)

[4. Change Requests 22](#_Toc161958187)

[4.1 Change request #1 22](#_Toc161958188)

[4.1.1 Strategic Evaluation 22](#_Toc161958189)

[4.1.2 Technical Evaluation 23](#_Toc161958190)

[4.1.3 Evaluation of Change Request 25](#_Toc161958191)

1. Definition of Baseline

A baseline provides a logical basis for comparison. A specific version of a single work product by itself, or a set of work products together can be established as a baseline. During the course of product development, a series of baselines is established, enabling assessment of the evolving product’s maturity at different points in time.

The baseline is established for the development project "Information Management System for the Laboratory of Psychological Attention and Intervention (LPAI) in the University Centers ".

The development of the management system is done using the Extreme Programming (XP) methodology. The configuration elements that form the baseline are defined in accordance with the artifacts proposed by this methodology.

* **Software Requirements Specification**
  + Functional Requirements and Non-Functional Requirements)

The software to be developed is described based on an understanding of the business context and analysis of the main characteristics.

* **System Design** (Prototypes and Architectural Aspects).
  + Prototypes are created for a better understanding of functional requirements.
  + The architectural aspects of the system are described according to the framework to be used.
* **Database**.
  + Entity-Relationship Diagram is performed to design and understand the architecture of the database.
* **Source Code**.

Source code obtained as a result of the implementation process.

* **Acceptance Testing Design**.

It includes the test cases and acceptance criteria that will be used to validate whether the system meets the requirements and expectations of the customer.

2. The configuration elements of the Baseline

2.1 Software Requirements Specification

2.1.1 System features

To contribute to the management and control of the information generated in the LPAI, a computer system will be developed for its information management. This system will allow standardized management of the information, contributing to its integrity, availability, and redundancy.

The modules defined for the system are:

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| --- | --- |
| **Module** | **Description** |
| Security | It will include functions for user management and user permission. |
| Management of Nomenclatures | It includes options to define standardized information in the system (nomenclatures). |
| Management of Laboratories LPAI | This module will allow the management of LPAI laboratories located in various universities, providing functions to list, add, modify and delete information from the laboratories. |
| Psychological Assessment and Follow-up | It will conduct psychological assessments and will allow for the recording of the follow-up on the provided psychological attention. |
| Reports | It provides information about the number of patients attended and evaluated based on their academic degree and the type of care received, allowing tracking of the laboratory's activity. |

2.1.2 Functional Requirements

**Module Security:**

FR1: List users.

FR2: Add user.

FR3: View data from user.

FR4: Update user data.

FR5: Delete user.

FR6: Assign role to user.

FR7: Authenticate user.

FR8: Modify user password.

**Module Management of Nomenclatures:**

FR1: List Bachelor's Degree.

FR2: Add Bachelor's Degree.

FR3: View data from Bachelor's Degree.

FR4: Update Bachelor's Degree.

FR5: Delete Bachelor's Degree.

FR6: List Degree.

FR7: Add Degree.

FR8: View data from Degree.

FR9: Update Degree.

FR10: Delete Degree.

FR11: List Family Income.

FR12: Add Family Income.

FR13: View data from Family Income.

FR14: Update Family Income.

FR15: Delete Family Income.

FR16: List Institutions of Psychological Attention.

FR17: Add Institutions of Psychological Attention.

FR18: View data from Institutions of Psychological Attention.

FR19: Update Institutions of Psychological Attention.

FR20: Delete Institutions of Psychological Attention.

**Module Management of Laboratories LPAI:**

FR1: List Laboratories LPAI.

FR2: Add Laboratories LPAI.

FR3: View data from Laboratories LPAI.

FR4: Update Laboratories LPAI.

FR5: Delete Laboratories LPAI.

**Module Psychological Assessment and Follow-up:**

FR1: List Psychological Attention.

FR2: Add a Psychological Attention.

FR3: View data from Psychological Attention.

FR4: Update Psychological Attention data.

FR5: Register Psychological Instruments “Measures of Transversal Symptoms (MST)” applied to the patient.

FR6: Generate patient assessment based on the psychological instrument applied.

FR7: View data from Psychological Instruments MST.

FR8: Update Psychological Instruments MST.

FR9: Register Type of Attention indicated to the patient (Refer, Workshops, Consultations).

FR10: Register Patient Attention Status (Follow-up, Discharge, Discontinuation).

**Module Reports:**

FR1: Generate a report with the total number of patients attended per Bachelor of a University Center.

FR2: Generate reports with the total number of patients attended by Specialists at a University Center.

FR3: Generate a report with the total number of patients evaluated by Type of Attention of all University Centers.

FR4: Generate a report with the total number of patients by their Attention Status of all University Centers.

2.1.3 Non-Functional Requirements

**Security:**

* + A two-factor authentication system must be implemented to access the system.
  + All confidential data must be stored using encryption techniques.
  + Users of each Laboratory should only see the information of the patients associated with it.

**Graphic Design:**

* + The user interface must follow responsive design guidelines to adapt to different devices and screen sizes.
  + A color palette based on light blues should be used.

**Availability:**

* + An automated backup system must be implemented to perform daily backups.
  + Planned maintenance must be carried out during low-demand hours.

**Portability:**

* + The system must be compatible with web browsers such as Chrome, Firefox, Safari, and Internet Explorer.
  + The system must be compatible with multiple operating systems, such as Windows, MacOS, and Linux.

2.2 System Design

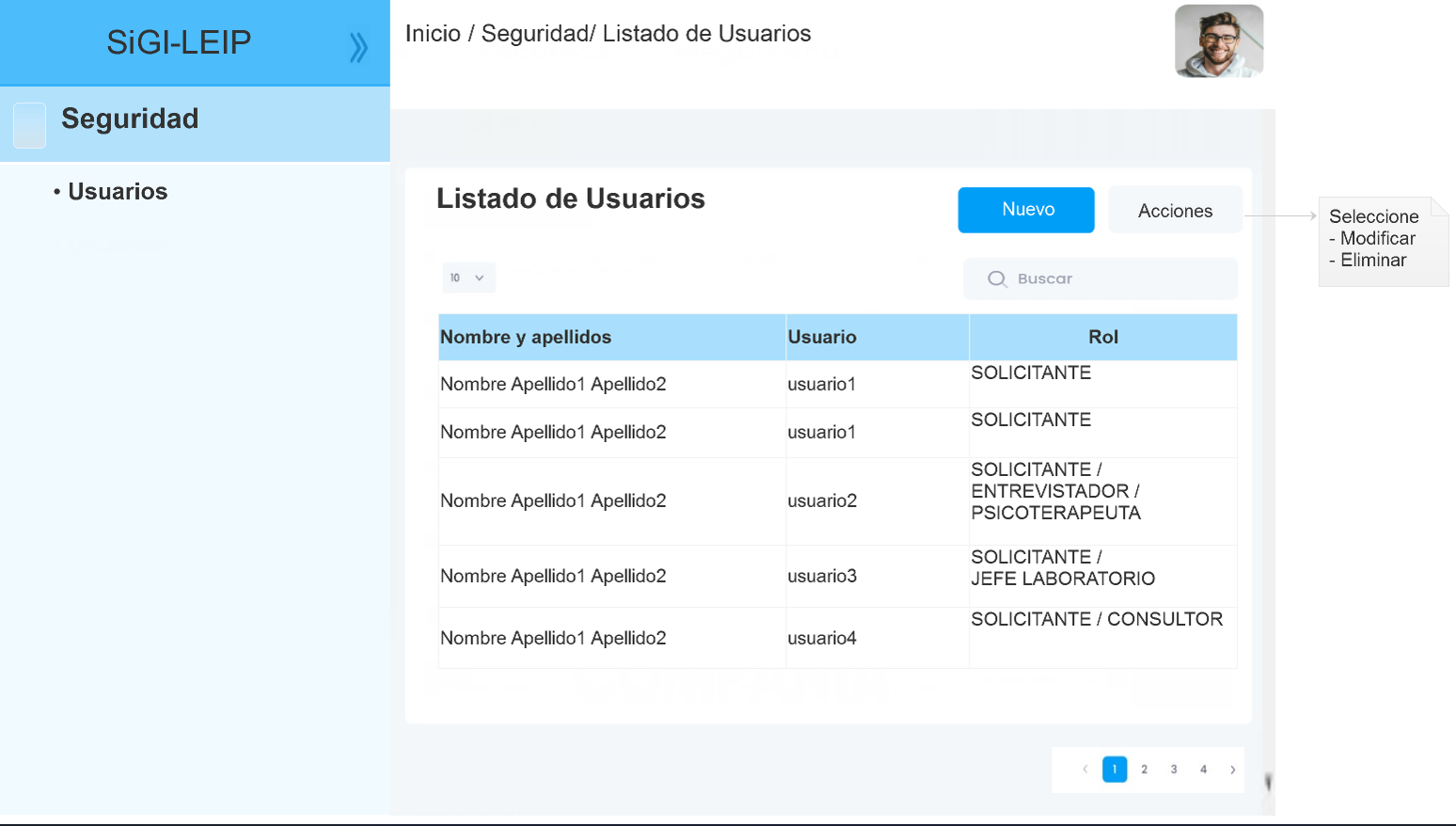
2.2.1 Prototypes

The prototypes of User Stories with High priority are presented, taking into account their complexity and importance to the clients.

The prototype information is written in Spanish, as the system will be developed for University Centers in Mexico, where the native language is Spanish.

**Module Security:**

UH1: List users.

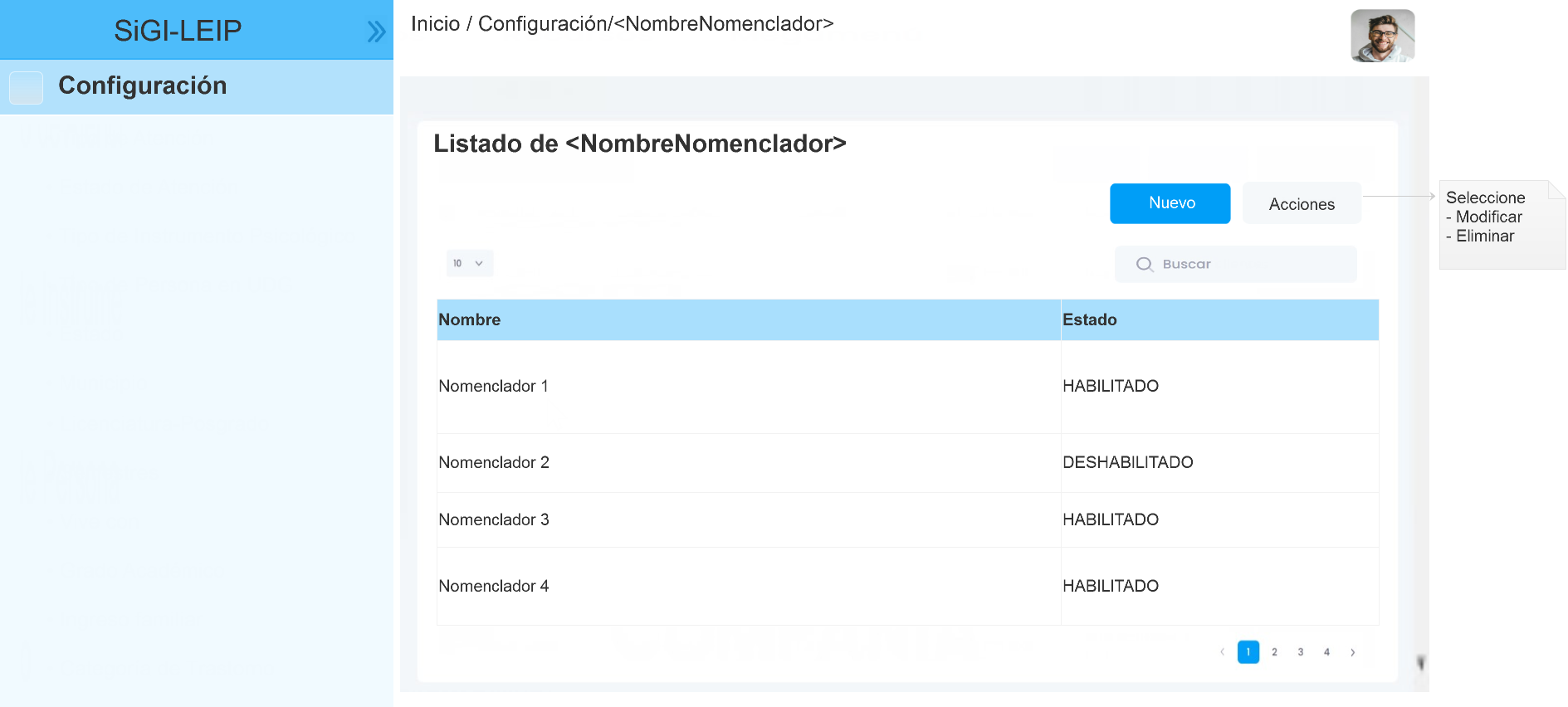


UH2: Add user.

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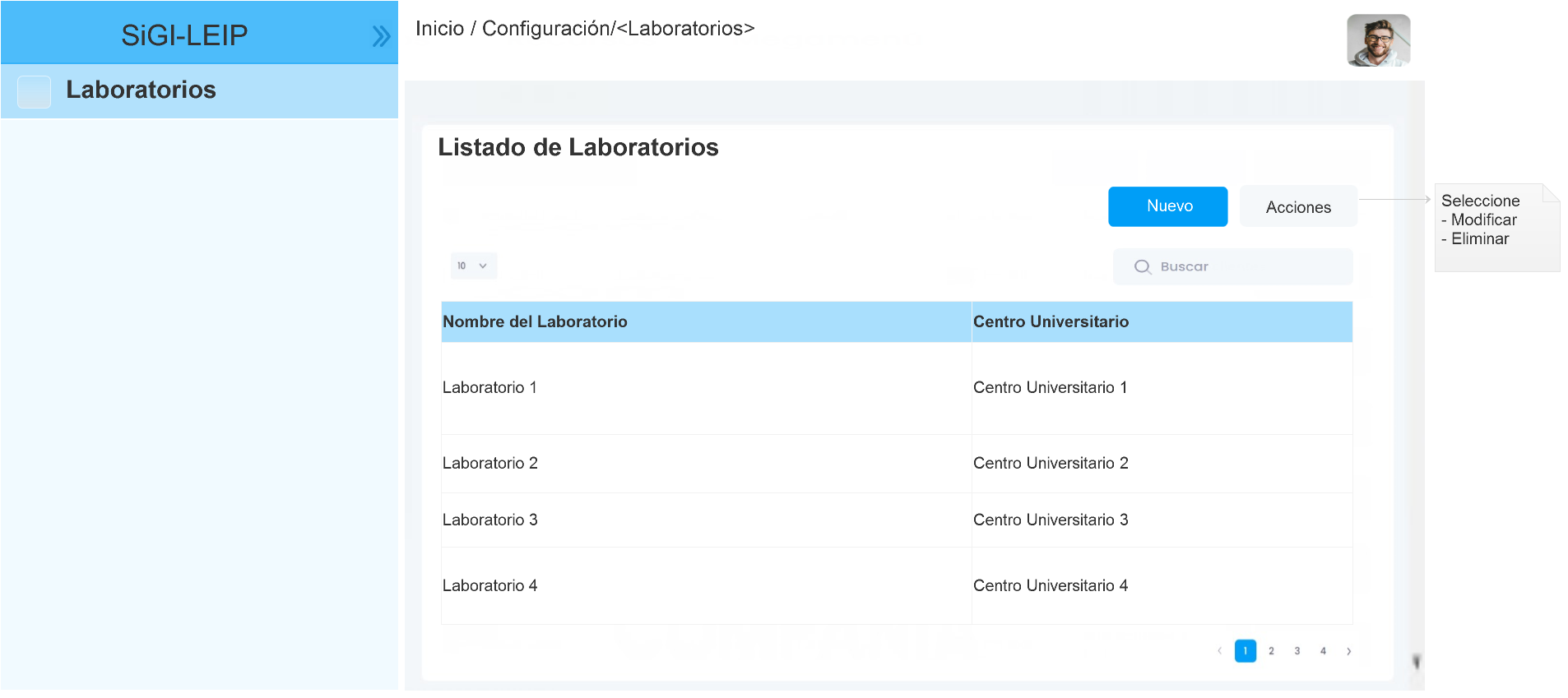
**Module Management of Nomenclatures:**

UH1: List Nomenclatures (Bachelor's Degree, Degree, Family Income, Institutions of Psychological Attention).



**Module Management of Laboratories LPAI:**

FR1: List Laboratories LPAI.



**Module Psychological Assessment and Follow-up:**

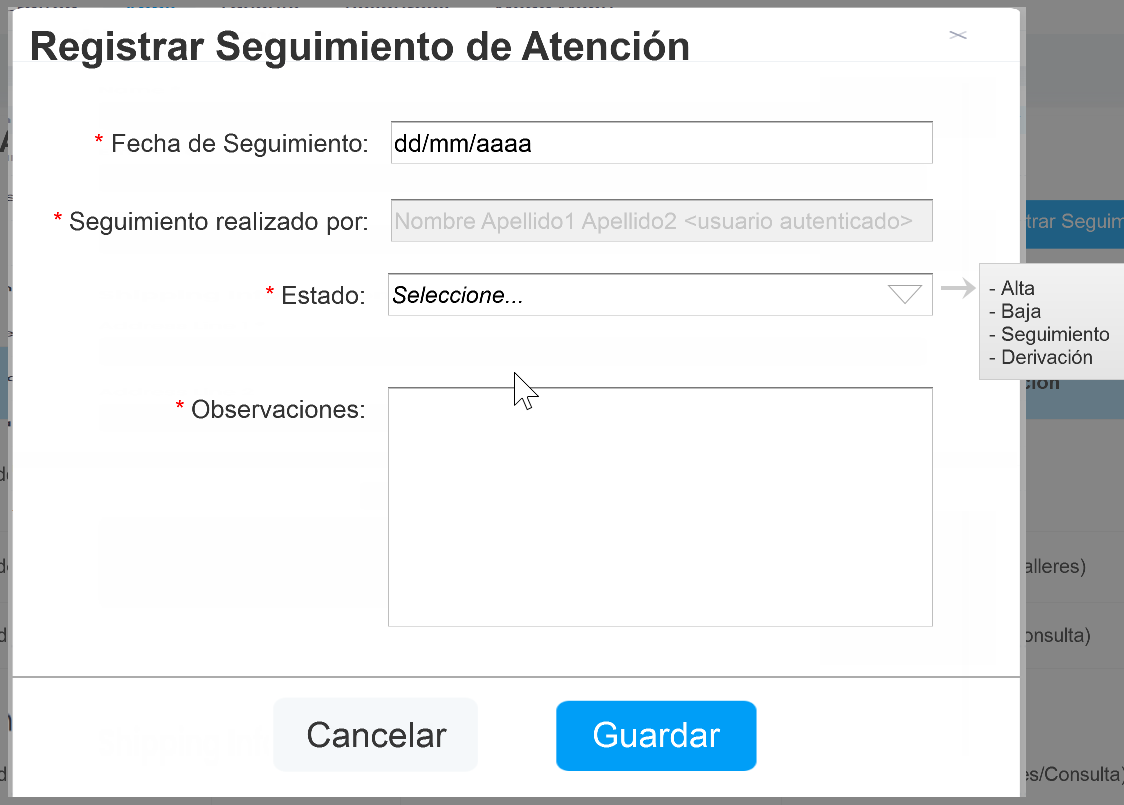
UH1: List Psychological Attention.



UH2: Register Type of Attention indicated to the patient (Refer, Workshops, Consultations).



UH3: Register Patient Attention Status (Follow-up, Discharge, Discontinuation).



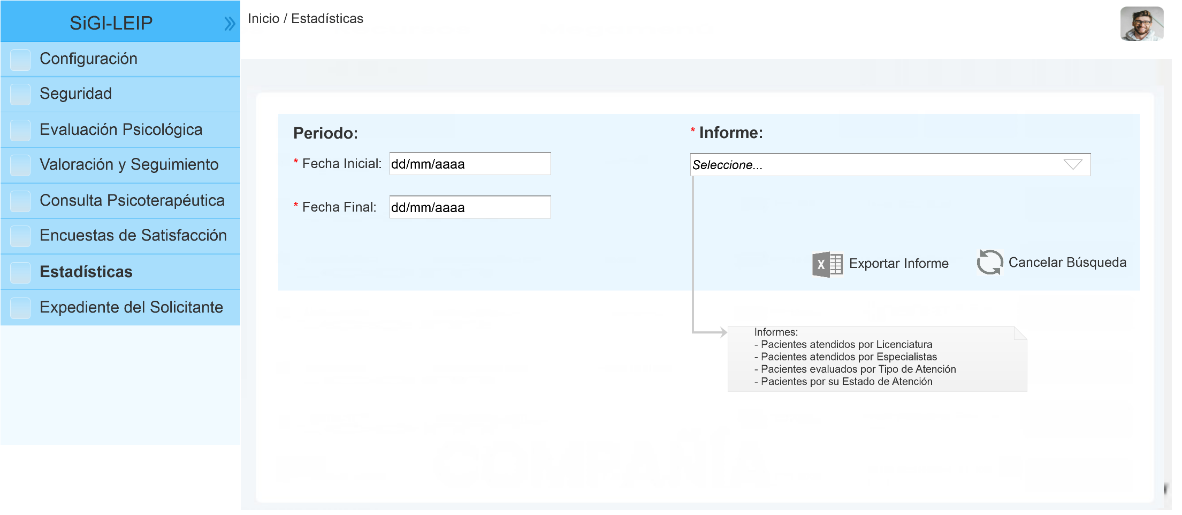
**Module Reports:**

UH1: Generate a report with the total number of patients attended per Bachelor of a University Center.

UH2: Generate reports with the total number of patients attended by Specialists at a University Center.

UH3: Generate a report with the total number of patients evaluated by Type of Attention of all University Centers.

UH4: Generate a report with the total number of patients by their Attention Status of all University Centers.



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2.2.2 The architectural aspects

2.3 Database

2.3.1 Entity-Relationship Diagram

2.4 Source Code

2.5 Acceptance Testing Design

3. Configuration Control

This section describes the process for managing changes in the configuration and deviations from the defined baseline. Procedures are established to control and track the implementation of these changes.

3.1 Decision Making Policy

The decision-making policy in configuration control of a project is fundamental to establish a framework for decision-making related to change requests. This policy defines who has the authority to approve or reject changes, how proposed changes are evaluated, and what criteria are used for decision making.

3.1.1 Authority and Responsibilities

* Define who has the authority to approve or reject changes in the system configuration.
* Assign clear responsibilities to each team member regarding the submission and evaluation of changes.

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| **Committee Change Control** | |
| **Rols** | **Responsibilities** |
| Manager | Coordinate committee meetings and ensure that established objectives are met. |
| Project Manager | Responsible for presenting and coordinating the evaluation of changes. |
| Technical Leader | Provides technical advice on the feasibility and impact of proposed changes on system functionalities, architecture, and quality assurance. |
| Human Resources Manager | Assess the impact of changes on personnel and organizational structure.  Provide recommendations on how to manage any impact on the project's human team (e.g., new staff hiring or management of staff overtime hours). |
| Finance Manager | Assess the impact of changes on monetary cost and determine their financial feasibility. |

3.1.2 Decision Making Process

Below is detailed how the decision-making process for change requests is carried out. The responsibilities of each member of the change control board in decision-making are included.

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| --- | --- | --- |
| **Activities** | | **Rol** |
| 1 | * Submit Request | * Client * Project Team |
| 2 | * Review the request and decide whether to record it as a change request * Register the request, if you decided it is a change request. | * Project Manager |
| 3 | * Initially assess the change request to determine its feasibility and relevance, ensuring understanding of its scope and potential impact. | * Project Manager |
| 4 | * Present the change request to the committee for to start your evaluation. | * Project Manager |
| 5 | Strategic Evaluation:   * Develop the SWOT Matrix corresponding to the change request. * Evaluate the strategic impact of the change in terms of business objectives, budget, necessary personnel, and deadlines for fulfilling the change request. | * Manager * Project Manager * Human Resources Manager * Finance Manager |
| 6 | Technical Evaluation:   * Assess the technical feasibility of the change and its impact on the existing architecture and design. * Determine if new tools or technologies are needed to implement the proposed change. | * Technical Leader |
| 7 | Review and Discussion of Change Requests in the Committee:   * Review and discuss the change request in detail, considering the technical and strategic analyses previously conducted. | * Committee Change Control |
| 8 | Decision Making:   * Make a decision regarding the change request, considering the recommendations and opinions gathered. | * Committee Change Control |
| 9 | Documentation and Communication of Decisions:   * Document the decision made during the committee meeting. * Communicate the decision to all relevant stakeholders. | * Project Manager |
| 10 | Follow-up and Implementation Supervision:   * Supervise the implementation of the change (if approved), ensuring it is carried out as planned and objectives are achieved. | * Manager * Project Manager |

3.1.3 Decision making criteria

The decision-making process in a project is based on key criteria that guide the evaluation of proposed changes. These aspects are fundamental to ensure that the decisions made are aligned with the project's objectives.

1. **Impact on the business**:
   * High: If the proposed change has a significant impact on the business's objectives and goals, such as improving process efficiency, increasing revenue, or meeting customer needs. For example: The change involves adding a new feature that will significantly enhance the customer experience and increase customer retention.
   * Medium: If the change has a moderate impact on the business, such as improving internal processes or increasing team productivity. For example: The addition of a functionality that allows better process management and resource allocation to improve productivity, but does not introduce changes in the execution of business processes.
   * Low: If the change has a limited impact on the business and only affects minor aspects of the processes. For example: Changing graphic design elements (iconography, colors, informative texts) in the user interface that do not have a significant impact on the final business outcomes.
2. **Urgency of change:**
   * High: If the change involves complex modifications to the architecture or design of the system, requires the development of new complex functionalities, or affects critical areas of the system. For example, the change involves integrating a new complex technology that requires significant changes to the system's architecture.
   * Medium: If the change is important but not critical, and can wait for a reasonable period before being implemented.
   * Low: If the change is desirable but not urgent, and can be addressed in the future without causing immediate problems.
3. **Technical Complexity:**
   * High: If the change involves complex modifications to the architecture or design of the system, requires the development of new complex functionalities, or affects critical areas of the system. For example, the change involves integrating a new complex technology that requires significant changes to the system's architecture.
   * Medium: If the change involves some technical complexity but can be addressed with resources and technical skills available within the team.
   * Low: If the change is relatively simple and does not require significant modifications to the existing infrastructure or design.
4. **Cost Associated:**
   * High: If the change entails a high direct and indirect cost, which may include significant expenses for human resources, materials, and time. For example: Acquiring new software licenses and hiring additional staff for its implementation are required.
     + Additional Cost: Greater than or equal to 50% of the initial cost.
     + Additional time: Greater than or equal to 50% of the initial time.
   * Medium: If the change has a moderate cost and can be financed within the allocated project budget. For example: It involves updating existing hardware and software to ensure compatibility with new technology, which will incur a moderate but manageable cost within the assigned budget.
     + Additional Cost: Greater than or equal to 25% and less than or equal to 49% of the initial cost.
     + Additional Time: Greater than or equal to 25% and less than or equal to 49% of the initial Time.
   * Low: If the change has a low cost and can be implemented without requiring significant financial investment. For example, updating minor text elements in the user interface, which can be easily done with existing resources and tools, without incurring additional expenses.
     + Additional Cost: Less than 25% of the initial cost.
     + Additional Time: Less than 25% of the initial time.

3.1.4 Evaluation of Change Request

For the evaluation of the change, a scale based on an ordinal structure is used, where numerical values are sequentially assigned (preferably odd numbers) to reflect the relative order of the levels of each criterion. The evaluation considers different levels of impact on the business, urgency of change, technical complexity, and associated cost.

|  |  |  |  |
| --- | --- | --- | --- |
| **Criteria** | **Levels** | | |
| **High** | **Medium** | **Low** |
| Impact on the business | 5 | 3 | 1 |
| The more positive impact it has on the business, the higher the score it receives. | | |
| Urgency of change | 5 | 3 | 1 |
| The more urgency for implementation it has, the higher the score it receives. | | |
| Technical Complexity | 1 | 3 | 5 |
| The more technical complexity the implementation of the change has, the lower the score it receives. | | |
| Cost Associated | 1 | 3 | 5 |
| The more costs the implementation of the change has, the lower the score it receives. | | |

If the sum of the scores is:

* Greater than or equal to 15: The change can be **approved**.
* Between 8 and 14: **Additional review** is required before making a decision.
* Less than or equal to 7: The change must be **rejected**.

Note: Lower scores are assigned to changes with higher technical impact and associated costs, better reflecting their high risk and the need for a more detailed review or even rejection of the change if the sum of the scores is sufficiently low.

3.1.5 Process for the Implementation of the Change Request

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| **Activities** | | **Rol** |
| 1 | Analysis and Planning of Change Implementation. | |
| * Analyze the change request in detail to understand its requirements and the impact on the system. | * Analysts of Requirements. * Architect |
| * Establish a detailed plan for change implementation, including the necessary human, material, and technological resources, as well as the corresponding schedule of activities. | * Project Manager |
| 2 | Implementation of Corresponding Modifications. | |
| * Implement the specific tasks planned to carry out the modifications corresponding to the change request. | * Developers |
| 3 | Validation Testing. | |
| * Perform tests to verify the integrity and functionality of the system with the newly implemented modifications. | * Testers |
| * Conduct integration tests to ensure that the new functionalities integrate seamlessly with the existing system. |
| 4 | Communication of Implemented Change. | |
| * Inform affected users about the implemented change through meetings or other communication channels. | * Project Manager |
| 5 | Training and Preparedness for the Implemented Change.   * Note: This activity is carried out if the system is already being used by users. | |
| * Plan training sessions for users who will utilize the new system functionalities. | * Training Team |
| * Develop training materials to assist users in understanding the change. |
| 6 | Closure of Change Request. | |
| * Inform all stakeholders that the change request is officially closed. | * Project Manager |
| * Conduct a final evaluation of the implemented change to gather feedback from end users and other stakeholders (e.g., Satisfaction surveys). |

3.1.6 Evaluation variables to measure the behavior of the implemented change

1. **Adherence to Schedule.**
   * It evaluates whether the implementation of the change is carried out within the planned time frame. It is measured by comparing the actual start and end dates of each activity with the planned dates.
2. **Cost Efficiency.**
   * It evaluates how the implementation of the change affects the project budget. It is measured by comparing the actual costs with the budgeted costs for implementing the change.
3. **Impact on System Quality.**
   * It evaluates how the implementation of the change affects the system's performance in terms of functionality and stability. It is measured through technical tests that assess the system before and after the change implementation. The correctness and completeness of functionalities and the error rate before and after the change request are analyzed.

4. Change Requests

4.1 Change request #1

The client wants to make profit from the system you are developing. He requested that the system should have a module that retrieves the statistics from a series of branches across the country.

4.1.1 Strategic Evaluation

The SWOT matrix is used to identify and assess the Strengths, Weaknesses, Opportunities, and Threats associated with the change request. The matrix provides a comprehensive view of the internal and external factors that may influence the success of the change request implementation.

|  |  |
| --- | --- |
| STRENGTHS (+)   * Team experience in report module development. * The system allows for the addition of new modules, as the Django Framework architecture makes it flexible and scalable. * Statistics in the psychological care sector have a growing demand and are necessary for research purposes. | WEAKNESSES (-)   * Increased project cost and duration due to the change. * Introduction of errors in already implemented modules due to the addition of new functionalities that involve changes in them. |
| OPPORTUNITIES (+)   * Contribute to decision-making for laboratory management, improving the effectiveness of psychological services provided to the university community | THREATS (-)   * Regulatory changes in psychological care and intervention that could affect the information associated with the generation of statistics. |

4.1.2 Technical Evaluation

The change request affects the following configuration items:

1. The Requirements Specification Document: new functionalities will be added (Obtaining statistics associated with types of attention and patient follow-up).
   * + A module was added: “Management of Laboratories LPAI”. This module contains 5 functional requirements (list, add, modify and delete information from the laboratories).
     + The "Reports" module was modified. The scope of the functional requirement "FR3" was modified (the quantity must be obtained for all University Centers) and a new functional requirement "FR4" was added (the total number of patients by their Attention Status of all University Centers).
2. The System Design Document: new classes must be created for subsequent implementation.
3. Source code: New classes with their methods must be implemented.
4. Database: New tables and their relationships. Implement new procedures to obtain the new reports.
5. Acceptance Testing Document: New test cases must be designed to validate the new functionalities.

This change impacts the baseline, causing an impact on the duration and final cost of the project.

* The duration of the project will be extended by 1 month (20 Work days).
  + Initial duration of the project: 4 months (80 Work days).
  + Additional time: 58920 MXN (Represents **25%** of the initial duration).
  + Current project duration: 4 months + 1 month = **5 months (100 Work days).**

The following table details the calculation of the time necessary to develop Change Request #1.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Functionalities** | **Requirements Specification Document** | **System Design Document** | **Database** | **Source code** | **Acceptance Testing Document** |
| **Time (Days)** | | | | |
| Module Management of Laboratories LPAI  (Add 5 functional requirement) | 1 | 2 | 1 | 4 | 2 |
| Module Reports  (Modified FR3) | 1 | 1 | 2 |
| Module Reports  (Add FR4) | 1 | 1 | 4 |
| **Change request #1** | 1 | 4 | 3 | 10 | 2 |
| **20 Days**  **(1 month)** | | | | |

* The cost of the project will increase, it is necessary to pay 1 more month of work to the team.
  + Initial project cost: 235680 MXN.
  + Additional cost: 58920 MXN (Represents **25%** of the initial cost).
  + Current project cost: 235680 MXN + 58920 MXN = **294600 MXN**.

The following tables detail the additional cost calculation associated with Change Request #1.

|  |  |  |  |
| --- | --- | --- | --- |
| **Roles** | **Configuration items** | **Daily Salary  (Mexican coin)** | **Change request #1 (Days - Salary)** |
| Analyst | Requirements Specification Document | 2000 MXN | 1 Day  2000 MXN |
| Architect | System Design Document | 2700 MXN | 4 Days  10800 MXN |
| Developer | Database, Source code | 2500 MXN | 13 Days  32500 MXN |
| Tester | Acceptance Testing Document | 1900 MXN | 2 Days  3800 MXN |
| Total Salary | | | 49100 MXN |
| 20 %  Other expenses (Electricity, Rent, Office Supplies and other expenses) | | | 9820 MXN |
| **Total Additional Cost** | | | **58920 MXN** |

4.1.3 Evaluation of Change Request

|  |  |  |
| --- | --- | --- |
| **Criteria** | **Levels** | **Evaluation** |
| Impact on the business | High (5) | Sum: 16  **Approved** |
| The requested change request could assist the client in making strategic decisions regarding the performance of all laboratories, thereby enhancing the efficiency of psychological care and having a greater impact on the university community. |
| Urgency of change | High (5) |
| The requested change must be implemented as soon as possible since the system needs to be adapted to accommodate multiple configured laboratories. Additionally, these statistics are crucial in the decision-making process for the management team. |
| Technical Complexity | Medium (3) |
| The change will be addressed with the current human resources of the team, and there is no need to purchase or learn new technologies to implement it, only more development time is required.  The change request involves adding a new module for laboratory management, which causes moderate changes in some system modules and modifications to the database. Additionally, two new statistics associated with the change request need to be implemented. The changes do not make modifications to the defined architecture or significant changes to existing modules. |
| Cost Associated | Medium (3) |
| Represents 25% of the initial cost.   * Initial project cost: 235680 MXN * Additional cost: 58920 MXN   Represents 25% of the initial duration.   * Initial project duration: 5 months * Additional time: 1 month |