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SYSTEMS ENGINEERING PROGRAM

BOGOTÁ, D.C.

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UNDERGRADUATE FINAL PROJECT REPORT PERFORMED IN ORDER TO ACCOMPLISH ONE OF THE REQUIREMENTS FOR THE SYSTEMS ENGINEERING DEGREE

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SYSTEMS ENGINEERING PROGRAM

BOGOTÁ, D.C.

<Month>,<Year>

**PONTIFICIA UNIVERSIDAD JAVERIANA**

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**Artículo 23 de la Resolución No. 1 de Junio de 1946**

“La Universidad no se hace responsable de los conceptos emitidos por sus alumnos en sus proyectos de grado. Sólo velará porque no se publique nada contrario al dogma y la moral católica y porque no contengan ataques o polémicas puramente personales. Antes bien, que se vean en ellos el anhelo de buscar la verdad y la Justicia”

**GRATITUDE**

*Write a message if you feel gratitude for someone who has supported the development of the project. Your family, your partner, your friends, your principal, teachers, etc.*

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**ABSTRACT**

*Write a paragraph in English in which a reader could understand what the problem was and what you have done to solve it. Maximum 100 words. You can support this activity by reading the information that you can find in the following hyperlinks:* <http://www.galaxygoo.org/resources/abstract_writing.html>

<http://www.lightbluetouchpaper.org/2007/03/14/how-not-to-write-an-abstract/>

1. INTRODUCTION

*The introduction is a guide for the reader, where it is presented what he/she will find while reading the document.*

*From this section (included the introduction in the total page count) begins the count of the pages for a maximum of 60 pages in the document.*

1. GENERAL DESCRIPTION

*Although similar to the proposal, it should not be equal, it is supposed to be updated with new references. Additionally, it should be written in past tense, describing what the problem was and how it was solved.*

## Opportunity, Problem

*Maximum 3 pages.*

*Presents the characteristics, context, situation or aspects of interest from the selected opportunity or problem. Students can begin from a global and multidisciplinary problem (e.g. one of the issues raised in the mission of the Pontificia Universidad Javeriana), and continue with the problem solved or the opportunity that was leveraged with the project.*

*Items that could be developed in this paragraph are similar to those of the proposal. (Remember to write in past tense as it refers to the project already completed):*

### Problem Context

*Describe the characteristics, context, situation, or interesting aspect of the problem. It is recommended to explain from the most general concepts down to the more specific ones. The writing must be coherent.*

### Problem Formulation

*Based on the information of the previous section, this section details the specific problem of this proposal and justifies its relevance.*

### Solution Proposal

*This section must include a general description of the proposed solution to the above problem. This section also must indicate the area of the proposal (e.g. software development, systems engineering, etc.)*

### Solution Justification

*In this section students explain why the solution is adequate to address the problem*

## Project Description

This section presents the general description of the project. Cover the most important aspects for the reader to understand what was intended to do.

### General Objective

*Write here the general objective that was approved for the project.*

### Specific Objectives

Specify specific objectives, which together help meet the general objective.

### Deliverables, Standards, and Justification

Describe documents and other artifacts that are delivered in this undergraduate final project. The information must be summarized in the following table:

|  |  |  |
| --- | --- | --- |
| **Deliverable** | **Associated standards** | **Justification** |
|  |  |  |

1. PROJECT CONTEXT

## Background

*The main concepts necessary for the reader to understand the solution. It should not be structured as a glossary.*

## Context Analysis

It should provide a brief description of related solutions on a global level. It is important that such solutions are properly referenced.

The solutions refer to applications, frameworks, or other results similar to what was developed in this project. The strengths of the solution proposed in this project must be compared with the weaknesses of the other solutions. The goal is to convince the reader that the proposed solution has added value over the existing ones.

1. PROBLEM ANALYSIS

This chapter summarizes the requirements, constraints, functional specification, and any other items described in the requirements specification.

The analysis should include at least the following sections:

## Requirements

Summarize the main requirements of the problem and detail the most important ones.

## Constraints

Explain the constraints of the problem, as they were detailed in the requirements specification.

## Functional specification

Describe the high-level functional specification of the system. The artifacts utilized depend on the specific problem: use cases, BPMN, etc.

1. DESIGN OF THE SOLUTION

*It must present the architecture of the solution and the main artifacts of the detailed design, together with the description of tools and technologies that were selected to solve the problem. It is recommended to justify the selection of tools based on multiple criteria (established during analysis phase) through the use of comparative tables.*

*For more details, we recommend to reference attached documents that explain every aspect of design (e.g. SDD).*

1. SOLUTION DEVELOPMENT

This chapter must describe the process utilized to create the solution and relate it to the methodology that was specified in the proposal. Additionally, this chapter must also show the final product. For instance, showing screenshots and describing their functions.

1. RESULTS

Must present the results of the quality control process, according to what was defined in the methodology. For instance, in a software development project, this section should include the results from standard software testing (unit, functional, system, acceptance, etc.). It is important for them to be consistent with the objective of the project and the methodology used for its development.

This chapter must include an analysis of the results obtained, and conclusions from this analysis.

1. CONCLUSIONS

## Impact Analysis of the Project

Explain the impact of the results of this project in the short, medium, and long term. It should explain the impact in all of the relevant stakeholders.

* 1. Impact analysis in systems engineering
  2. Impact analysis in global, economic, environmental, and societal contexts

## Conclusions and Future Work

*Explain whether the goals were accomplished and why. Future work that should be explained based on the project results.*

1. REFERENCES

This section provides references and literature used for the development of the project. Follow a standard that can be chosen from APA, IEEE, ACM, Michigan or Springer. Once you make the choice, you must use the same standard throughout the document. This section does not count within the 80 pages that are counted for this report.

1. APPENDICES

*Place in this section of the document a list of all appendices related to the project. Appendices must be downloadable from the website and should be the same as specified in the proposal.*