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Project Title: Analysis and Design of Software Requirements for Center of laboratories, Technical Inspection in Power Industry (ABA Niroo)

Department:	IT	Employer:	NRI
Project/Program Manager:	Elahe Habibi	Executor:	Seyed Alireza Marjanmehr
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Project Staff: Mehrnoosh Hoor, Azam Bajgholi, Davar Rezakhani, Elahe Habibi, Maryam Afif, Kiara Etesam

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Project Necessity: Software development process is a set of software engineering activities that is designed and planned with the aim of managing the life cycle of a software product. The purpose of software development processes is to organize, standardize and document the set of activities in a specific framework in order to improve the speed and quality of software production. The life cycle of a software product includes the requirements extraction, analysis, design, implementation, testing, and maintenance steps.

The first and most important step in the software development process, is the documentation of requirements and its analysis, which describes and explains what a software system does (description of functions). This description is used during software development to be an indicator of what the system is doing or should do. It also serves as a stakeholder agreement. Completing and updating the document is one of the most important functions in documenting requirements and analysis. According to the documentation in the next step, the initial design of the software is done for better implementation and development.

Project Goals: The internal software development approach was the first solution used by organizations to meet the needs of businesses. But in recent years, the software outsourcing approach has been welcomed by organizations for reasons such as saving financial and time costs as well as utilizing specialized knowledge in the field of information and communication technology to produce and develop better quality software. By definition, software outsourcing is a contract for hiring a software development intermediary by an organization. The outsourcing approach is divided into different levels according to the division of software development process activities. In recent years, this approach has been used in researches to take advantage of its benefits.

The goal of the present project is to analyze and design the executive processes of the Test, Inspection and Standards Center (ABANiroo) to extract the requirements, analyze, design and develop the software required by this center.

Abstract: Requirements documentation describes what a software system does, in other words, describes functions. This description is used during software development to be an indicator of what the system is doing or should do. This documentation is also used as an agreement between the stakeholders. In general, requirements are used by all those involved in software development. Completing and updating the document is one of the most important functions in documenting requirements.

This project analyzes and designs the system required by ABANiroo Center. Niroo Test, Inspection and Standardization Center (ABANiroo) is one of the independent centers of Niroo Research Institute, which aims to guide, integrate testing, inspection and standardization activities with the goal of creating quality assurance processes for goods and equipment used in the electricity and energy industry. Centralized policies and development of domestic manufacturing capabilities, quality improvement of goods, especially domestic products, and development of target markets, including international, regional and domestic, integration and reliability of information on items, goods, equipment and quality control in the electricity and energy industry are other goals. These are considered centers.

ABANiroo Center has three departments with the titles of 1) planning and certification of laboratories in the electricity and energy industry, 2) inspection and supervision of the implementation of electricity and energy industry standards, and 3) development, promotion and compilation of industry standards Electricity and energy. In order to achieve these goals, the center needs an integrated system to manage its internal activities and processes. For this purpose, this project has been pursued with the aim of analyzing and designing the software and process requirements of this center. In this project, first, the ABANiroo Center is identified and the extraction of executive processes and procedures is done, and then, based on these processes, the information forms required for design and software requirements are examined and analyzed.

Steps and Methodologies: This project has been done to analyze and extract the requirements of the Test, Inspection and Standards center (ABANiroo) processes. In order to extract the requirements, 29 sessions have been held with all three managements of this center during 4 months. In addition to designing the processes, the required databases and software requirements documents along with the relevant information forms have been prepared as a report including four chapters with attachments in a compressed file.

In this report, at the beginning, the introduction and structure of ABANiroo Center, the purpose and scope of functionality are given. Then the diagrams and lines assigned to each role in the system are introduced in tables. The processes developed for all three areas of Test, Inspection and Standards plotted with the BPMN2 standard. A summary of the processes in each of the three domains, the required databases, and the information forms in each process can be seen in the tables, respectively. In the second to fourth chapters, which are dedicated to the processes of planning management and certification of laboratories of electricity and energy industry, inspection and supervision of implementation of standards of electricity and energy industry and development management, promotion and development of standards of electricity and energy industry. It is necessary to explain that the software requirements for each process are aggregated in the form of separate files and as a compressed file and will be attached to this report. It is noteworthy that after the implementation of the software updating this document is necessary.

Main Results (technical outputs, patents, papers, books, reports, etc.): The report contains software requirements based on the processes of ABANiroo Center and the basis for achieving the following general goals:

- Identify the center and extract internal organizational processes and executive procedures

- Analyze, model and improve the extracted processes
- Analyze information and design the information forms needed to circulate the modeled processes
- Software requirements analysis based on modeled processes and designed forms

1- Planning management processes and certification of laboratories of electricity and energy industry

- ✓ Construction or Development
- ✓ Temporary Membership
- ✓ Labs Evaluation and Ranking
- ✓ Membership Extention
- ✓ Product Certificate (QC plan + Type Test)
- ✓ Product Certificate (Type Test _ Prototype)
- ✓ Sample Test
- ✓ Certificate Extention
- ✓ Technical AsIdentification, Prioritization and Design
- ✓ Testing
- ✓ Test Inquiresessment

2- Inspection management processes and monitoring the implementation of electricity and energy industry standards

- ✓ Inspection Level 1
- ✓ Inspection Level 2
- ✓ Inspection Level 3
- ✓ Periodical-Random Inspection
- ✓ Inspectors Membership
- ✓ Periodical Evaluation of Inspectores
- ✓ Evaluation of Providers
- ✓ Inspection Inquire

3- Management processes Development, promotion and development of standards for the electricity and energy industry

- ✓ Needs Assessment and Prioritization of Standards/ Instructions
- ✓ Researcher Call
- ✓ Compilation, Revision, Supplementation of Standards
- ✓ Compilation, Revision, Supplementation of Instructions