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| **Software Requirement Specifications**  Development of 3D Application for Learning Chemistry through Mobile Phones.  Version: [1.0]   |  |  | | --- | --- | | Project Code |  | | Internal Supervisor |  | | External Supervisor |  | | Project Manager |  | | Project Team |  | | Submission Date |  | |

Document History

[Revision history will be maintained to keep a track of changes done by anyone in the document.]

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| **Version** | **Name of Person** | **Date** | **Description of change** |
|  |  |  | [e.g. Document Created] |
|  |  |  | [Added Non-functional requirements] |
|  |  |  | [Added UseCase x.x.xx] |
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Distribution List

[Following table will contain list of people whom the document will be distributed after every sign-off]

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| **Name** | **Role** | |
|  | | External Supervisor |
|  | | Project Manager |
|  | |  |

Document Sign-Off

[Following table will contain sign-off details of document. Once the document is prepared and revised, this should be signed-off by the sign-off authority.

Any subsequent changes in the document after the first sign-off should again get a formal sign-off by the authorities.]

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| **Version** | **Sign-off Authority** | **Project Role** | **Sign-off Date** |
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1. Introduction

* 1. Purpose of Document

The document's purpose is to collect and evaluate all of the many concepts that have surfaced in order to describe the system and its needs in terms of customers. Also, in order to obtain a better grasp of the project, we will forecast and sort out how we expect this product will be used, sketch concepts that may be created later, and document ideas that are being explored but may be eliminated as the product evolves.

In a nutshell, the purpose of this SRS document is to offer a comprehensive overview of our software product, including its specifications and objectives. The target audience for the project, as well as the user interface, hardware, and software requirements, are described in this paper. It defines our client's, team's, and audience's perceptions of the product and its capabilities. It does, however, aid any designer or developer in the software delivery lifecycle (SDLC) procedures.

* 1. Intended Audience

This document is intended primarily for developers, and it defines the product's capabilities in technical terms. There are both technical and non-technical users for whom this document is concerned with. When both technical and non-technical audiences comprehend the SRS document, it is genuinely successful. It will be easy to read for both the developer and the user (the client). Developers, testers, and project managers will also get benefit from this document. Other departments' stakeholders, including as leadership teams, sales, and marketing, might be included.

* 1. Document Convention

**Font:** The font is used in this SRS – Document is “Times New Roman”

**Standard Font Size:** For Paragraphs the size is set to be 11 and headings are of 12 size.

1. Overall System Description
   1. Project Background

Chemistry affects practically every element of life and plays a crucial influence in everyone's life. It covers a wide range of topics in domains including medical, engineering, pharmacy, and chemical engineering. All students who want to pursue jobs in specific domains must learn and comprehend the fundamental building blocks of chemistry related with a periodic table. Due to the restricted representations of chemical elements, ionic valence, configuration, and atomic weight, students always struggle to grasp, memorize, and operationalize the periodic table's core ideas. Existing technological technologies allow students to understand chemical principles in 2D/3D on intelligent displays with high visuals. As a result, in this FYP project, the Design and Development of a 3D Interactive Application for Learning Chemistry via Mobile Phone using Android methodologies and technology is proposed. Through suitable content design and an interactive user interface employing smartphones, the suggested 3D application will assist students in learning and developing a complete grasp of the Periodic table and its related elements. It can boost student interest in chemical subjects and improve the overall user experience by leveraging mobile technology.

* 1. Project Scope

1. **Why the project was initiated.**

The project was initiated to meet specific goals under the umbrella of chemistry to support and facilitate the students and teachers. The work that must be done using our Application will solve difficulties in understanding the critical concepts of periodic table elements and their configurations from the static learning environment to learning using 3D Application for learning chemistry – periodic table.

1. **Key objectives of the Project**

• The key objectives of our project will be to enhance the learning of students.

• Advancement of teaching methodologies.

• Learning chemistry by using electronic gadgets.

• Facilitating teachers.

* 1. Not in Scope

The system will only be responsible for covering basic properties of periodic table and showing elements in 3D view.

* 1. Project Objectives

We learned about the problem when we noticed in our community that our brothers and sisters and other primary students, who work in the field of chemistry or wish to study it, are having difficulty grasping the fundamentals of the subject. We went to schools and talked to students about their issues. After speaking with those students, we discovered that standard chemistry teaching techniques are unsuccessful, with pupils memorizing theoretical knowledge rather than grasping the elements' key characteristics and atomic structures seen in the periodic table. As a result, we came up with the idea of creating an Android application through which kids may learn all of the main ideas of chemistry, especially the periodic table and the atomic structures of elements, as well as all of their characteristics, efficiently and effectively.

By the end of this project it would benefit education by allowing students and instructors to understand chemistry and visualize each topic quickly. By selecting this project as our FYP, we will learn new emerging technologies such as 3D modeling, unity Photoshop, and many others, as well as apply previously known technologies such as C- Sharp programming, visual programming, software engineering, Object-Oriented Design, Human-Computer Interaction, project management, research methodology, and many others.

* 1. Stakeholders

There are two Stakeholders of this system. The system will purely be facilitating the faculty members of chemistry field and the students who want to pursue their career or they are studying chemistry.

* 1. Operating Environment

[Describe the environment in which the software will operate, including the hardware platform, operating system, network environment and other software components or applications with which it must coexist.]

* 1. System Constraints

[Describe the constraints imposed on the system by the external environment. External environment may be caused by the stakeholders, business conditions, technical issues, academic requirements etc and may include the following:

* Software constraints
* Hardware constraints
* Cultural constraints (includes language etc.)
* Legal constraints
* Environmental constraints (e.g., the environment where the software will be installed, It could be a noisy environment, which may require that there is no sound event in the project).
* User constraints (e.g., the project is developed for children, so it may be required that the project has more graphic controls rather than textual controls).
* Off the shelf components that might be used in the project may have their constraints that are consequently transferred to the project.]
  1. Assumptions & Dependencies

[This section will identify:

* Any assumptions taken regarding the system or environment
* Any dependency of system on any external factor.]

1. External Interface Requirements

[This section is intended to specify any requirements that ensure that the new system will connect properly to external components. Place a context diagram showing the external interfaces at a high level of abstraction.]

* 1. Hardware Interfaces

[Describe the characteristics of each interface between the software and hardware components of the system. This description might include the supported device types, the nature of the data and control interactions between the software and the hardware.]

* 1. Software Interfaces

[Describe the connections between this system and other external software components (identified by name and version), including databases, operating systems, tools, libraries, and integrated commercial components. Identify and describe the purpose of the data items or messages exchanged among the software components. Describe the services needed and the nature of the inter-component communications. Identify data that will be shared across software components. ]

* 1. Communications Interfaces

[Describe the requirements associated with any communication functions the system will use, including e-mail, web browser, network communications standards or protocols, electronic forms, and so on. Define any pertinent message formatting. Specify communication security or encryption issues, data transfer rates, and synchronization mechanisms.]

1. Functional Requirements
   1. Functional Hierarchy

[This section will give a big picture of overall system functionality. The main modules/features of system and their sub-functions will be described here in the form of a functional hierarchy so that, before getting into the use case, audience could grab the idea of overall system functions.]

* 1. Use Cases
     1. [Title of use case]

[Use Case Diagram]

[Use Case Description]

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **<Use case Id: name>** | | | | |
| **Use case Id:** | | Write use case reference number. | | |
| **Actors:**  <List of actors (external agents), indicating who initiated the use case> | | | | |
| **Feature:** <Feature from which the use case is driven> | | | | |
| **Pre-condition:** | | <List the assumptions required before this Use Case can be executed. > | | |
| **Scenarios** | | | | |
| **Step#** | **Action** | | | **Software Reaction** |
| **1.** | Numbered actions of the actors | | | Numbered description of system responses |
| **2.** |  | | |  |
|  |  | | |  |
| **Alternate Scenarios:** Write additional, optional, branching or iterative steps. Refer to specific action number to ensure understandability. | | | | |
| **1a:**    **2a:** | | | | |
| **Post Conditions** | | | | |
| **Step#** | **Description** | | | |
|  | Sequentially list conditions expected at the completion of the use case. | | | |
|  |  | | | |
|  |  | | | |
| **Use Case Cross referenced** | | | <Related use cases, which use or are used by this use case> | |

1. Non-functional Requirements
   1. Performance Requirements

[The performance characteristics of the system that are required by the business should be outlined in this section. Performance characteristics include the speed, precision, concurrency, capacity, safety, and reliability of the software. These characteristics define the performance of the project.]

* 1. Safety Requirements

[Specify the requirements that are concerned with possible loss, damage, or harm that could result from the use of the system. Define any safeguards or actions that must be taken, as well as potentially dangerous actions that must be prevented. Identify any safety certifications, policies, or regulations to which the system must conform.]

* 1. Security Requirements

[Specify any requirements regarding security, integrity, or privacy issues that affect the use of the system and protection of the data used or created by the system. Define all user authentication or authorization requirements, if any. Identify any security or privacy policies or certifications the system must satisfy.]

* 1. User Documentation

[List the user documentation components that will be delivered along with the software, such as user manuals, online help, context-sensitive help and tutorials.]

1. References

[This section should provide a complete list of all documents referenced at specific point in time. Each document should be identified by title, report number (if applicable), date, and publishing organization. Specify the sources from which the references can be obtained. (This section is like the bibliography in a published book).]

1. Appendices

[This section should include supporting detail that would be too distracting to include in the main body of the document.]