SMART DEGREE CHOICE

GUIDELINE FOR STUDENTS

A work submitted in partial fulfillment of the requirements for the degree of
Bachelor of Science in Software Engineering

By:

Ehtisham Bashir

BSE-F18-E018

Shahtaj Amjad

BSE-F18-E014

Laiba Shahid

BSE-F18-E049

UNIVERSITY *of* SARGODHA

FACULTY OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

University of Sargodha

December 2021

Software Requirement Specification

<Smart Degree Choice>

Project Code:

SU18-SES22-CP01

Internal Advisor:

Mr. Hussam Ali

Project Manager:

Dr Muhammad Ilyas

Project Team:

Name	Roll No:	Role
Ehtisham Bashir	BSEF18E018	Team Leader
Shahtaj Amjad	BSEF18E014	Team Member
Laiba Shahid	BSEF18E049	Team Member

Submission Date:

17-Dec-2021

_____

Project Manager's Signature

Certificate of Approval

It is certified that the work presented in this titled

SMART DEGREE CHOICE

Was conducted by
Ehtisham Bashir *(*BSEF18E018*),*
Shahtaj Amjad *(*BSEF18E014*),*
Laiba Shahid *(*BSEF18E049*)*
under my supervision and that in my opinion, is fully adequate, in scope and quality, for the degree of BS in Software Engineering.

Supervisor:

Mr. Hussam Ali
Lecturer
Department of Computer Science
University of Sargodha

Project Manager:

Dr. Muhammad Ilyas
Asst. Professor
Department of Computer Science
University of Sargodha

External Examiner:

Dr. / Mr. _____
Designation: _____
Department: _____

Internal Examiner:

Dr. / Mr. _____
Designation: _____
Department of Computer Science
University of Sargodha

Document Information

Category	Information
Customer	University of Sargodha
Project	Smart Degree Choice
Document	Requirement Specifications
Document Version	1.0
Identifier	SU18-SES22-CP01
Status	Draft
Author(s)	Ehtisham Bashir BSEF18E018 Shahtaj Amjad BSEF18E014 Laiba Shahid BSEF18E049
Approver(s)	Dr Muhammad Ilyas (Project Manager)
Issue Date	17 Dec 2021
Document Location	D:\7th Semester\CP\SRS
Distribution	1. Mr. Hussam Ali (Advisor) 2. Dr Muhammad Ilyas (PM) 3. Project Office

Definition of Terms, Acronyms and Abbreviations

Term	Description
SRS	Software Requirement Specifications
GUI	Graphical User Interface
IE	Internet Explorer
HTTP/HTTPS	Hyper Text Transfer Protocols/ Secure
API	Application Programming Interface
IDE	Integrated Development Environment
DFD	Data Flow Diagram

Table of Contents

1. Introduction

1.1 Purpose of Document

This document provides an overview of the degree choice software. The application deals with the scenario in which allow students to do choice degree wisely. It describes both functional and performance requirements, and identifies the feature attributes of this product. Serve as a means to clearly outline the project features. The intended audience for the SRS includes the users, developers and testers documentation writers. It also serves the purpose of making the functionality clear to end users.

1.2 Project Overview

Degree choice systems have been deployed for many years in our country. However, in many parts of our country students cannot make choice because of several reasons. To illustrate, sometimes people may not be in their own region and due to this fact, they cannot continue their education based on their interests. Especially needed in order to get youth motivated to continue their studies. It would also help in rural areas where students don't have anyone to provide them guidance in this regard. There are also many students who intend to study, but they don't get enough guidance to choose the field of their interest. This web-based application will help the students to wisely make decisions and opt for their universities which will best suit them.

1.3 Scope

The software produced will be an online smart degree choice. This software is being developed for use by students with a simple and self-explanatory GUI. This software that can be used by the students to choose the field which suits them according to their interest will help them choose the best possible university.

- The software will be used by the students to pursue a degree which will be the best according to their mindset.
- The main objective of this software is to help the students who face difficult in opting for their higher-level degrees after getting an intermediate degree.
- It will maintain the database of all the universities providing all courses.

2. Overall System Description

The Smart Degree Choice is a web-based system so fundamental features related with web-based technologies such as client-server and database properties determine the software requirements of project. This section of SRS should describe the general factors that affect the product and its requirements. This section does not state specific requirements. Provides

a background requirement, include such items as product perspective, product functions, user characteristics, constraints, assumptions and dependencies, and operating environment. A context level **[1]** (0 Level) data flow diagram is given below to show initial workflow of application.

- **DFD (Context Level)**

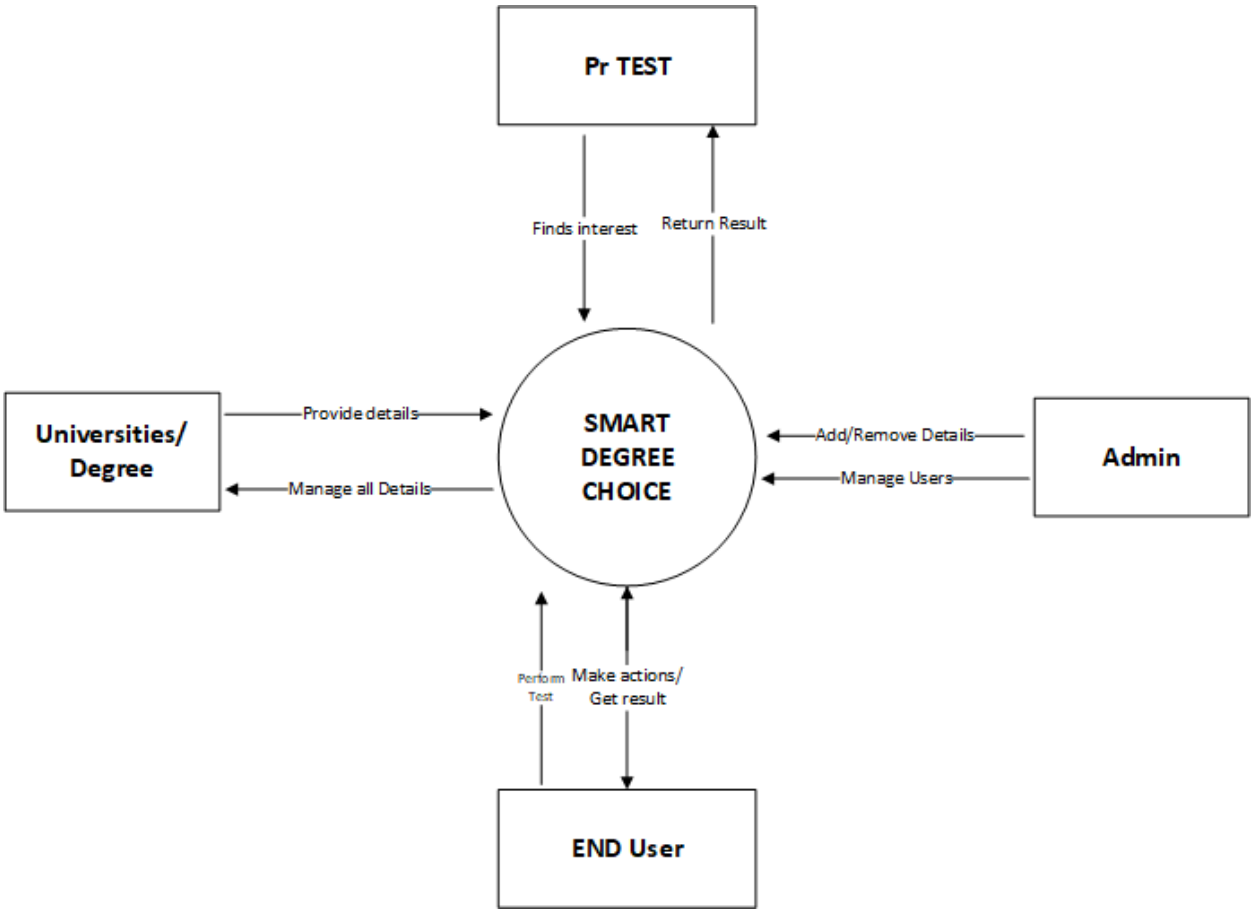


Fig: DFD (Context Level)

2.1 User characteristics

Users are considered to be technically novices. The minimum requirement of being able to use a computer is expected.

- The user has to click against the favorable Option/Choice on the GUI.
- Every user should be comfortable of working with computer and net browsing.
- Every user must have basic knowledge of English too.

2.2 Operating environment

- The web application operates on any client web browser like IE, Firefox and Netscape, Google

- Python framework
- MySQL server database

2.3 System constraints

Constraints and limitations on the online Smart Degree Choice System. Constraints may include the following:

- ***Software constraints:***
  - Working internet connection
  - User ID and password is used for identification
  - There is no facility for guests

- ***Hardware constraints:***
  - This system is working for single server.
  - Limited to HTTP/HTTPS.

- ***Cultural constraints:***
  - GUI is only English.
- ***Legal constraints:***
  - Each state can have unique specification for selecting their choice of interest, needing many different administrative interfaces.
  - All Questionnaire is done in both open and closed ended to gather the data.

- ***Environmental constraints:***
  - Questionnaire is carried out from many consoles on the internet.
  - Many interfaces exist including Windows Explorer, Netscape, and Mozilla browsers.
- ***User constraints:***
  - User should have basic knowledge of computer.
  - User should know English

3. External Interface Requirements

3.1 Hardware Interfaces

Hardware interface include following

- Personnel Computer

- A web host server
- Any smart device (Like smart phones, tablets, laptops)

3.2 Software Interfaces

Software Name	Description
Operating System	We have chosen Windows operating system for its best support and user-friendliness.
Programming Language	To make it applicable we will use C sharp (C#) [2] as our main programming language as it provides best support in behavior of our application. As well it has a large number of libraries which support our different kind of development work.
Frameworks and Libraries	To implement the project, we have chosen ASP.net [3] framework to make our development dynamic. And ML.net [4] for machine learning.
Database	To save the questions, universities and degrees lists in MYSQL+ database [5].
Software Tools	We will use Visual Studio IDE for developing and testing the code. And MS Visio to develop detail level design. MS Project to create high level project plans and MS office for documentation.

3.3 Communications Interfaces

This project supports all types of web browsers. We will use different kind of APIs to transfer data and information between softwires. Client on internet side will use HTTP/HTTPS protocols for accessing the web-based application.

4. Functional Requirements

Functional requirements consist of one or more logically related system capabilities that provide value to a user and are described by a set of features.

- **Response Sequence**
  - End user visit the application and creates an account
  - Then he provides Log-In information
  - Now (s)he can select the module according to his requirements
  - If Degree recommendation module is selected

- (S)he will provide his/her intermediates degree marks
- Then he will be referred to Question Answer mode
- A small test will begin, to find his/her interest
- Then Application will match his suggested degree with his intermediate results to find his capability in that particular subject
- If (s)he is not capable to continue with suggested result
- Application will alert him that your marks in that particular subject is not enough to carry suggested degree
- He will be asked to continue to find more appropriate suggestion by answering some more question.
- If he has selected University module
- (S)he will be asked to enter his preferable location, fee range and degree name
- Then application will search according to given data and proceed next by providing details of suitable university for that particular degree.

Other Required Features:

1. **Personality Test** [6]
   It is a test that will be performed by the user using SMART DEGREE CHOICE. This test will be based on questionnaire across the fields of life. It will a judgmental behavior for us to know about students' real-life interests. So that we can suggest him a degree which will match to his interest and his/her capabilities.

2. **Pinpoint Accuracy**
   Exact precision or pinpoint accuracy is one of the most core and fundamental requirement for our application. As after getting data from user, we will try our best to provide most relatable results to our end-user. We cannot afford to make wrong suggestion to our visitors as it's the matter of their future and application's performance. So that's why we'll try to provide pinpoint accuracy to make exact suggestion related to his/her interest and capability level.

3. **Database Storage**
   We have a lot of data that is needed to manage precisely and efficiently. We need to manage a repository of Questions that will be asked to end-user to find his interest. Moreover, the lists of universities, their fee structures and degrees offered by them is also need to be stored and manage in a database. Data received by user such as marks of intermediate will be stored temporarily in the database.

4. **Sequence of Questions**
   Sequence of questions matter the most when we talk about pinpoint accuracy. Because it is directly related to making a suggestion. All question should appear in a meaningful sequence, that each previous question should act as

predecessor for the next one. It's the only way that we can get closer to the exact interest of the students.

5. **Secure Control**
   We will provide secure control to our users. User always will find himself in control while using the application. It is related to navigation and moving from page to another or from module to another. A dialog box or alert message will appear if user commit any mistake. User will be allowed to roll back to previous stage or can continue the same stage from the start after refresh. A proper navigation will be provided for moving across the application directly. Alert messages will appear before submitting any kind of data or information. User will get an easy interface to interact with application.

6. **Independency**
   Independent module is also one of the most important functional requirements for this application. By making all modules independent from each other we can keep user safe from unnecessary efforts. Because he can select the relevant module directly. Moreover, error propagation is reduced if any error exists. Moreover, we can get an appropriate level of detail by exploring each individual module. More level of details ultimately reduced complexity.

5. Non-functional Requirements

5.1 Performance Requirements

The application must be interactive, and the delays involved must be less. So, in every action-response of the application, there are no immediate delays. All modules of this application will confirm their duties effective immediately after receiving the command from end user. All modules will be well integrated and Process will run in an adequate flow.

5.2 Scalability

Scalability is directly related to performance by enlarging operational and business scope of the application. This application will be scalable as it's enhanced its functionality after completing its original task allocated by the user. If user ask to suggest a degree based on his/her interest, at the end of suggestion application will ask to search universities that match best to his degree and fee structure or location etc. It could suggest some career choices available after intermediate degree like joining Armed forces as a commissioned officer (Should be noticed that it's not an actual functionality here, it could be in later version).

5.3 Security Requirements

This application will provide database security. Only the authorized person will be able to update the database values, such as stored questions, their sequences, universities and

degrees lists and their fee structures. Unauthorized person or Hackers would not be able to invoke the application. Only the registered person that has been allocated the login credentials for administrative controls would be able to Log-In and make changes in database values. The End-Users will be able to set Log-In passwords of their suitable safety requirements. He would be entering the same password that has been set before every time while logging into application. These security constraints would be applied to provide safety mechanism to it's users t build their trust level and for good will of the application.

5.4 Other Quality Attributes

A lot of other things are categorized as quality attributes to enhance performance of application and make it reliable for users. These are as follows:

5.4.1 Availability

The application will be available 24/7. There will be no single point of failure which can affect the overall performance of system immediately. Each module will carry his own functionality independently from other ones. And will continue to provide its functionality in case if other module gets a failure. Moreover, due to independent modules error propagation will be prevented.

5.4.2 Clear dialogue

Clear communication is one of the primary objectives while considering quality. If your dialogs are not clear user will get confused and offensive. We will try to use simple language as possible for users in user interface which could easily be understood by them. Clear dialog will provide very precise meanings to user for using the application as well as our questions will also reflect simplicity and clarity in their meanings. It would build a level of interest between end-users as user clearly interpreting what the application is offering, and hat the user need. Which ultimately build a level of trust between them.

5.4.3 Proximity

Most important functions and information of the application should be clearly visible on the main section of interface. User should not put more efforts to find where the required functionality is present. It acts as a good will for the application. It will enhance the predictability as well. A predictable interface is always good for new users or for non-technical persons. It means new user should be able to predict which control perform what kind of actions. Or where should I go to perform my required function.

5.4.4 Familiarity

The user interface should be smooth, means that user should be able to directly understand its core feature without any training. Complex interfaces usually offend the users and they left without performing any actions, which is not good for any application/ system. A familiar environment attracts user which is good thing indeed.

5.5 User Documentation

On first startup of website application. There will be a small description or a graphical slider will be shown in order to guide the particular customer so that he could easily navigate through the system and could make changes when or how he feels suitable or when required. User will be guided through proper guideline. Step wise understanding would be tried to facilitate the users. Any complexity would be avoided that can be cause of worry for any user.

6. Assumptions and Dependencies

- It is assumed that the user is familiar with the windows operating system.
- There is a need for the internet, it will be assumed that the users will possess strong internet connection.
- It is assumed that development will be based on information collected through questionnaire and surveys.
- It is assumed that user have basic knowledge of English language.

7. References

[1] M. Torgersen, "C# documentation," Microsoft, [Online]. Available: https://docs.microsoft.com/en-us/dotnet/csharp/. [Accessed 12 Dec 2021].

[2] O. Corporation, "MYSQL," Oracle Corporation, [Online]. Available: https://www.mysql.com/. [Accessed 15 Dec 2021].

[3] Dotnet, "ASP.NET," Microsoft, [Online]. Available: https://dotnet.microsoft.com/en-us/apps/aspnet. [Accessed 15 Dec 2021].

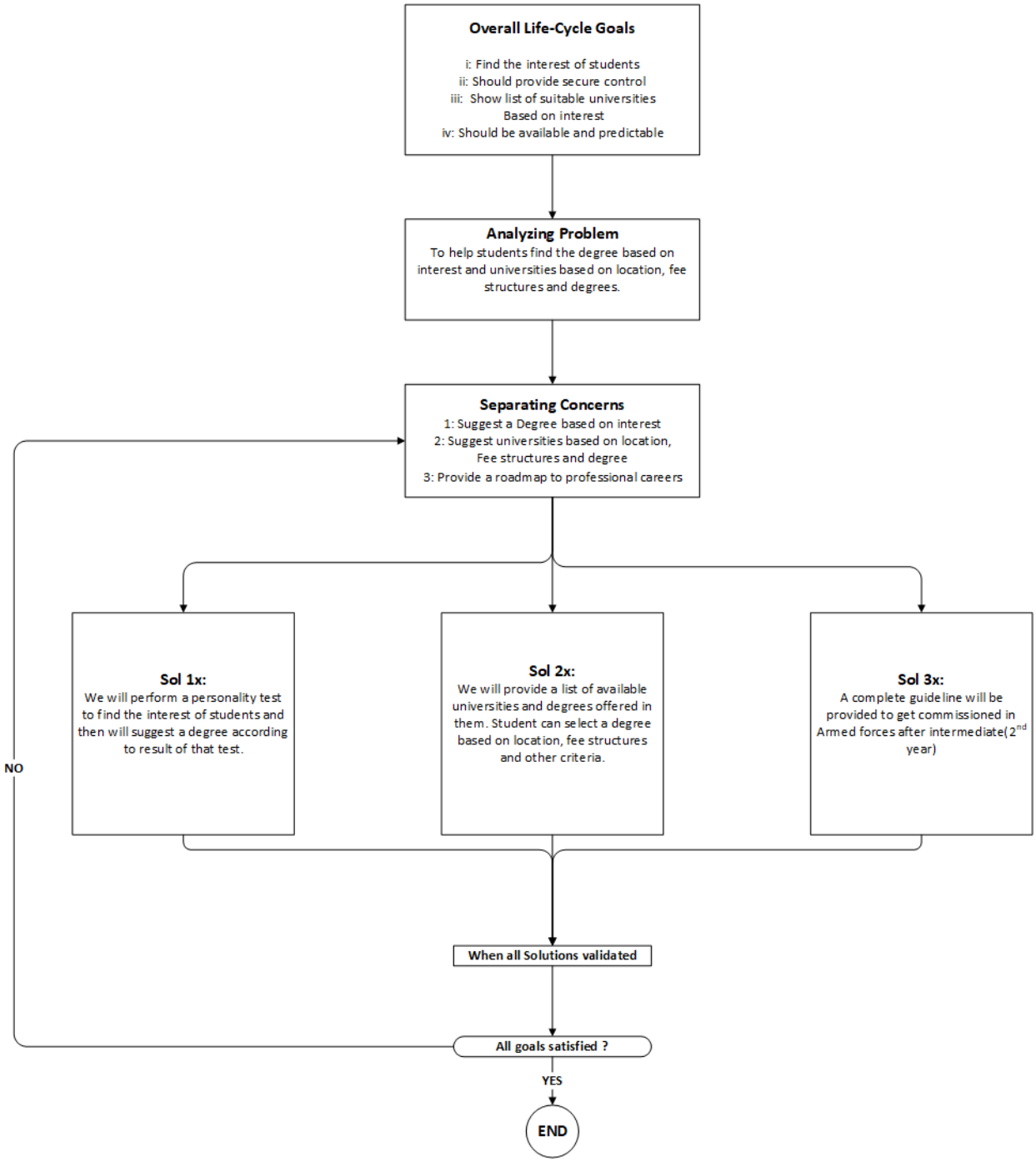
[4] Dotnet, "ML.NET," Microsoft, [Online]. Available: https://dotnet.microsoft.com/en-us/apps/machinelearning-ai/ml-dotnet. [Accessed 15 Dec 2021].

[5] GeeksforGeeks, "Levels of Data Flow Diagrams(DFD)," GeeksforGeeks, [Online]. Available: https://www.geeksforgeeks.org/levels-in-data-flow-diagrams-dfd/. [Accessed 12 Dec 2021].

[6] Verywellmind, "Personailty Test," Verywellmind, [Online]. Available: https://www.verywellmind.com/what-is-personality-testing-2795420. [Accessed 16 Dec 2021].

8. Appendices

The Design goal (Diagram) is given below as it was too lengthy to adjust in main body of document.


Overall Life-Cycle Goals
i: Find the interest of students
ii: Should provide secure control
iii: Show list of suitable universities Based on interest
iv: Should be available and predictable
Analyzing Problem
To help students find the degree based on interest and universities based on location, fee structures and degrees.
Separating Concerns
1: Suggest a Degree based on interest
2: Suggest universities based on location, Fee structures and degree
3: Provide a roadmap to professional careers
Sol 1x:
We will perform a personality test to find the interest of students and then will suggest a degree according to result of that test.
Sol 2x:
We will provide a list of available universities and degrees offered in them. Student can select a degree based on location, fee structures and other criteria.
Sol 3x:
A complete guideline will be provided to get commissioned in Armed forces after intermediate(2nd year)
NO
When all Solutions validated
All goals satisfied ?
YES
END