Department of <u>Software Engineering</u>
SE-312 Third Year Design Project
Proposal for the Third Year Design Project

Title	SAFWAAT

Domain	Domain 1 Web Application	Domain 2 -	Domain 3 -	Domain 4 -	Domain 5 -	Domain 6 -

1. Nature of Project [Tick all that applicable]

☑ New Project OR ☐ Extension of Existing Project	☐ Industrial Collaboration	☐ Funded
☐ Other Department Collaboration (If yes) Department Name_____	☐ Other Academic Institution Collaboration (If yes) Institution Name_____	

2. Brief Outline (*Problem Identification and Significance*)

A vast majority of the Muslim population lacks knowledge of fundamental Tajweed norms therefore they struggle with Arabic pronunciation which not only jeopardizes the intended meaning of the words but may also change the essence of Quranic verses. This mispronunciation problem stems from the unawareness of the proper articulation of Arabic letters. Hence, this accentuates the need for an all-encompassing approach to deal with and resolve these Tajweed inadequacies. This brings us to **Safwaat**, an innovative educational application engineered to improve the Tajweed skills of individuals by providing a plethora of features. This platform is tailored to meet the needs of the individuals by teaching them Tajweed rules in an easy and interactive manner through the Learning Unit feature which seamlessly combines learning and practice. The animated and interactive 3D model facilitates improved comprehension, while real-time conversations through ChatSpace and Taqraar features enable structured discussions. The Consistency Companion encourages consistent learning practice, while features like Leaderboard, Analytics, Quest Arena rewards and Daily Challenges add excitement, enthusiasm and healthy competition inclining users to advance in their learning journey which they can visualize through the Level Map. Moreover, personal User Profiles along with Friendship Hub and SocialMedia Sharing amplify the recognition of

accomplishment. Finally, the FlashCraft feature provides the ability to efficiently organize learning material. In short, Safwaat caters to users of all intellectual levels by providing a rich and engaging learning experience for Tajweed mastery.

3. Objectives

The objectives of the system are as follows:

- Teaching users fundamental Tajweed rules through effective learning techniques and personalized experience so that users can grasp the knowledge easily.
- Educating users about Arabic pronunciation and articulation points through interactive and animated 3D model.
- To establish itself as the leading platform for effective Tajweed learning.
- Promoting friendly competition among users for productive learning.
- Encouraging collaboration among individuals and a sense of community and peer support.
- Keeping users engaged through collaborative learning, group discussions and real-time interactions.
- Allowing users to track their progress effectively.
- Applying techniques and developing features that enhance long term retention of users.
- Ensuring inclusivity in learning for an enjoyable learning experience.
- Provide a user friendly interface for easy navigation such that there is little to no learning curve to navigate the platform.
- Design the course content to cater users with diverse needs.
- Ensure a secure platform that provides data protection.

4. Scope

The target audience and the domain in which the project can be applied are as follows:

- **Individual learners:** Anyone who is interested in learning and improving Arabic pronunciation and Tajweed skills. This may include school/university-going students enrolled in Arabic language courses, those involved in religious studies, language enthusiasts, or self-learners.
- **Education Sector:** Educational institutions or language learning centers focused on Arabic pronunciation.
- **Religious Sector:** Islamic schools and institutions seeking to improve Tajweed skills for Quranic recitation.

5. Proposed Methodology

The proposed methodology for development is as follows:

- Conduct extensive research for the market trends in order to comprehend the requirements and preferences of the users and how the features of the application fulfill them in a peculiar manner.
- Develop UML diagrams to outline the specific use cases and scenarios for each functionality to highlight how the user interacts with the system and how the system shall respond to them.
- Creating and designing exquisite mockups to portray the User Interface (UI) of the application, while considering the users' affinities.
- Constructing the backend of the application through the creation of an elaborative database schema, APIs, and authentication mechanisms to facilitate secure transactions.
- Develop and verify the course outline for the learning units by a specialized field expert to ensure the delivery of authentic lessons.
- Implement the User Interface design and system functionalities through effective frontend technologies, while separating the concerns of the system to achieve modularity.
- Develop the components of the system in a parallel manner.
- Verify and validate the components developed by a domain expert for precise achievement of the requirements.
- Conduct regular meetings with the stakeholders to evaluate the features and receive valuable feedback.
- Organize daily meetings with the development team to track daily progress.
- Usage of collaborative tools to follow an organized method of development.
- Integration of the features developed into the application's architecture while ensuring seamless communication and synchronization between the features.
- Implement comprehensive testing techniques to tackle bugs and errors in order to ascertain optimal operational efficiency.
- Craft a descriptive user manual to guide the users in using the application.

6. Resources Involved

Hardware Resources:
- **Minimum Specifications**
  - RAM: 4 GB
  - Processor: Intel CoreTM2 Duo or equivalent AMD Processor
- **Supported Operating Systems on User's Devices:** Windows**,** MacOS**,** Linux Distributions Android**,** iOS
- **Supported Browsers on User's Devices:** Chrome, Microsoft Edge, Firefox, Safari.
- **Internet Connection:**

o   Bandwidth: At least 1 Mbps.

Software Resources:

- **Frontend Framework:** React.js
- **Backend Framework:** Node.js with Express
- **Additional Web Technologies:** HTML**,** CSS**,** JavaScript
- **Database:** MongoDB
- **Analytics Libraries:** Chart.js**,** react-chartjs-2
- **3D Rendering Libraries:** Three.js**,** react-three-fiber**,** react-three-drei
- **Email and Task Scheduling:** nodemailer**,** node-cron
- **Chatroom:** socket.io
- **MongoDB Driver:** mongoDB@6.2
- **App Wide State Management:** Redux
- **Dependency Management:** NPM (Node Package Manager)

7. Description of Industrial Support (If any)

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8. SDGs (If Applicable)

☐ No Poverty	☐ Zero Hunger
☐ Good Health and Well-Being	☑ Quality Education
☐ Gender Equality	☐ Clean water and Sanitation
☐ Affordable and Clean Energy	☐ Decent Work and Economic growth
☑ Industry, Innovations and Infrastructure	☐ Reduced Inequalities
☐ Sustainable Cities and Communities	☐ Responsible Consumption and Production
☐ Climate action	☐ Life Below Water
☐ Life on Land	☐ Peace, Justice and Strong Institutions
☐ Partnerships	

9. Gantt Chart

ID	Name	Resources	Oct, 23			Nov, 23				Dec, 23					Jan, 24	
			10	15	22	29	05	12	19	26	03	10	17	24	31	07
1	▼ Requirement Gathering Phase															
2	Define Project Objectives	Ahmed														
3	Identify Stakeholders	Ahmed														
4	Feasibility Study	Whole Team														
5	Build Important Prototypes	Khawar,Zain														
6	Review Research Papers	Ahmed														
7	Define Functional Requirements	Ahmed,Arsalan,Khawar,Zain														
8	Specify Non-Functional Requirements	Zubair,Zain														
9	Requirement Refinement	Ahmed,Arsalan,Khawar,Zain														
10	Requirement Verification and Validation	Ahmed,Arsalan														
11	Documentation in Latex	Arsalan,Zubair														
12	SRS Document															
13	▼ Project Planning Phase															
14	Stakeholder Management	Ahmed														
15	Learning Plan	Ahmed,Zain														
16	Documentation of Standards	Arsalan,Ahmed,Zain														
17	Risk Management	Zain,Zubair														
18	Resource Planning	Khawar,Zubair														
19	Task Estimation	Arsalan														
20	Communication Plan	Arsalan														
21	Scheduling	Ahmed,Zain														
22	Documentation of Project Plan	Ahmed,Khawar,Zain														
23	Review of the Document	Ahmed,Arsalan														
24	Project Plan Document															
25	▼ Learning Phase															
26	MongoDB	Arsalan,Khawar														
27	Figma	Ahmed														
28	Blender	Zain														
29	React-Three-Fiber	Zubair,Zain														
30	Adobe AfterEffects	Zubair														
31	Learning Phase Completed															
32	▼ Design Phase															
33	▼ Frontend Design															
34	Research on Best Design Practices	Ahmed,Zain														
35	Formation of Style Library	Ahmed,Zain														
36	Component Design	Zain														
37	UI Design	Ahmed,Zain														
38	Responsive Design	Ahmed														
39	Navigation Design	Zain														

#	Task	Resource
40	▼ Backend Design	
41	Research on Best Backend Design Practices	Arsalan
42	Document Structure Design	Khawar
43	Schemaless Design	Khawar,Arsalan
44	Research on Embedding vs Referencing	Arsalan
45	Apply Indexing Strategy	Arsalan,Khawar
46	UML Diagram Construction	Whole Team
47	Design Documentation	Khawar,Zubair
48	Review Design Document	Ahmed,Arsalan
49	Design Document	
50	▼ Development Phase	
51	Registration Development	Zubair,Khawar
52	Login Development	Khawar,Zubair
53	LevelMap Development	Ahmed,Zain,Arsalan
54	Learning Unit Development	Whole Team
55	User Profile Development	Arsalan,Zubair
56	Taqraar Development	Ahmed,Zain,Arsalan
57	Consistency Companion Development	Khawar,Zain
58	Notification System Development	Khawar,Zubair
59	Quest Arena Development	Ahmed,Zain,Arsalan
60	FlashCraft Development	Zubair,Zain,Khawar,Arsalan
61	SocialMedia Sharing Development	Khawar,Zubair
62	Leaderboard Development	Khawar,Ahmed,Zain
63	Friendship Hub Development	Khawar,Arsalan,Zubair
64	ChatSpace Development	Arsalan,Ahmed
65	3D Model Development	Zain,Arsalan
66	Analytics Development	Zain,Khawar
67	Version Control	Whole Team
68	Code Refactoring	Whole Team
69	Code Review	Whole Team
70	Development Phase Completed	
71	▼ User Manual Phase	
72	Content Planning	Ahmed,Zain,Arsalan
73	Writing and Content Creation	Zubair,Arsalan
74	Review and Editing	Ahmed,Arsalan
75	User Manual	

76	▼ Testing Phase		
77	Registration Testing	Arsalan	
78	Login Testing	Arsalan	
79	LevelMap Testing	Ahmed,Zain	
80	Learning Unit Testing	Ahmed,Arsalan,Zain	
81	User Profile Testing	Zubair,Khawar	
82	Taqraar Testing	Ahmed,Arsalan	
83	Consistency Companion Testing	Zain,Arsalan	
84	Notification System Testing	Arsalan,Zain	
85	Quest Arena Testing	Ahmed	
86	FlashCraft Testing	Ahmed,Zain,Arsalan	
87	Social Media Sharing Testing	Khawar,Zain	
88	Leaderboard Testing	Zubair,Arsalan	
89	Friendship Hub Testing	Arsalan	
90	ChatSpace Testing	Khawar,Zain,Zubair	
91	3D Model Testing	Zubair,Ahmed	
92	Analytics Testing	Khawar,Zain	
93	Test Report	Zubair,Ahmed,Arsalan	
94	Testing Completed		

10. Details of Project Team

i. Students

No.	Name	Seat No.	Signature (s)
1	Ahmed Gala	SE-21077	
2	Muhammad Zain ul Abedin	SE-21081	
3	Syed Arsalan	SE-21084	
4	Khawar Khan	SE-21093	

5	Muhammad Zubair	SE-21094	*(signature)*

ii. Supervisors / Advisors

	Name	Designation & Department	Address & Contact	Signature(s)
Supervisor	Miss Sana Fatima	Lecturer at Software Engineering Department	Ned University 021-99261261	
Co-Supervisor (If any)				
Industrial Advisor (If any)				

For Office Use Only		
Project Serial No.: _____ Dated: _____	Signature Convener Steering Committee	Signature FYP Coordinator

☐ Proposal Approved	☐ Not Approved	☐ Returned for Clarification / Modification
Comments: (if any)		

_____
(Signature of Chairperson)

Date: _____

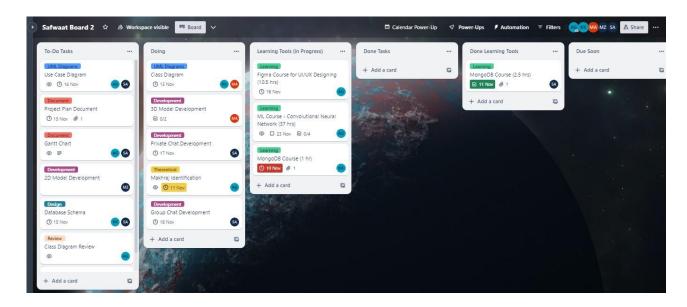**Trello Board of Safwaat:**

Figure 1: Trello Board (Project Plan Week1)
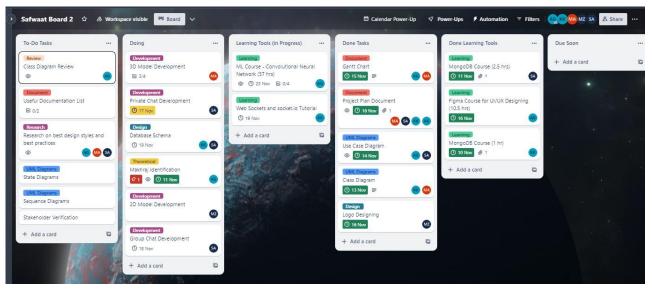

Figure 2: Trello Board Calendar View (Project Plan Week1)

Figure 3: Trello Board (Project Plan Week 2)