American International University-Bangladesh (AIUB)

Department of Computer Science

Faculty of Science & Technology (FST)

Online Learning Platform (Info Strainer)

A Software Requirement Engineering Project Submitted
By

Semester: Spring 2022-23		**Section: H**	**Group Number: 08**	
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Evaluation Criteria	Total Marks (50)	
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System Overall Description & Functional Requirements	[10 Marks]	
System Quality Attributes and Project Requirements	[10 Marks]	
UML and E-R Diagram with Data Dictionary	[10 Marks]	
UI/UX Prototyping	[10 Marks]	

Software Requirements Specification

for

Online Learning Platform (Info Strainer)

Version 2.2 approved

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Revision History

Name	Date	Reason for Changes	Version
Tamimul Alam	22/04/23	Activity Diagram updated	1.1
Tamimul Alam	28/04/23	Document Conventions	1.2
Md. Hasibur Rahman	30/04/23	System Requirements	2.0
Md. Hasibur Rahman	01/05/23	Overall Description	2.1
Badhan Akter	01/05/23	ER Diagram, Class Diagram	2.2

1. Introduction

1.1 Purpose

The product whose software requirements are specified in this document is an online learning system. The revision or release number will be determined by the development team. This SRS describes the entire system of the online learning platform, including its different components and features.
The purpose of the software is to offer a range of features and functionalities to help students improve their academic performance. The software will provide a flexible and convenient way for students to access study materials, connect with tutors and instructors, and receive personalized academic support. The goals of the software are to:

- Provide a platform for students to learn, study, and improve their academic performance.
- Offer a range of services such as homework help, online tutoring, course materials, and more.
- Cater to the needs of a diverse user base, including students, instructors, and administrators.
- Ensure that the system is user-friendly, scalable, and secure, capable of handling a large number of users and providing a seamless user experience.
- Enhance the overall learning experience of the students.

A separate vision and scope document is not available for this project.

The business requirements of the product are elaborated as follows:

- The product must be user-friendly and easy to navigate.
- The product must be available 24/7 to provide students with access to resources whenever they need them.
- The product must provide reliable and accurate information to students, instructors, and administrators.
- The product must be scalable and able to handle a large number of users.
- The product must provide a secure environment for users to access and store their information.
- The product must be developed and maintained within the project budget and timeline.
- The product must meet all legal and regulatory requirements.

1.2 Document Conventions

1. Standards and Typographical Conventions:

- This SRS document follows the IEEE Std 830-1998 standard for software
- requirements specifications.
- All text is written in Time New Roman, size 12, Space: 1.0 and Alignment:
- Justify.
- Use case descriptions are presented in the form of tables.

- Bold text is used to highlight important information, such as requirements or
- headings.
- Italicized text is used for emphasis, such as for key terms or definitions.
- All acronyms and abbreviations are defined in the glossary section of the
- document.

2. Prioritization:

- Requirements are prioritized based on their importance and criticality to the
- system.
- Each requirement statement is assigned a priority level of either High,
- Medium, or Low based on its impact on the system and the business goals.
- The priority of a higher-level requirement is assumed to be inherited by the
- detailed requirements underneath it, unless otherwise specified.
- The priority level of each requirement statement is indicated in the table or
- text block in which it is presented.

1.3 Intended Audience and Reading Suggestions

1. The intended audience for this document includes:
    - Developers who will be responsible for designing, developing, and testing the online learning system.
    - Project managers who will oversee the development process and ensure that the project is completed within the budget and timeline.
    - Marketing staff who will be responsible for promoting and advertising the online learning system.
    - Users, including students, instructors, and administrators, who will use the system to access study materials, connect with tutors and instructors, and receive personalized academic support.
    - Testers who will ensure that the system meets all the specified requirements and is free of defects.
    - Documentation writers who will use this document as a reference to create user manuals, help files, and other documentation.
2. The suggested sequence for reading this document is as follows:
    - Developers should begin with the overview sections, including the introduction, purpose, and scope of the project. They should then focus on the functional and non-functional requirements sections to understand what needs to be developed and how the system should perform.
    - Project managers should begin with the overview sections, including the introduction, purpose, and scope of the project. They should then focus on the project timeline and budget, as well as the project management and reporting requirements.

- Marketing staff should begin with the overview sections, including the introduction, purpose, and scope of the project. They should then focus on the user requirements section to understand the target audience and their needs.
- Users, including students, instructors, and administrators, should begin with the overview sections, including the introduction, purpose, and scope of the project. They should then focus on the user requirements section to understand how the system will benefit them.
- Testers should begin with the overview sections, including the introduction, purpose, and scope of the project. They should then focus on the functional and non-functional requirements sections to understand what needs to be tested and how the system should perform.
- Documentation writers should begin with the overview sections, including the introduction, purpose, and scope of the project. They should then focus on the user requirements and system architecture sections to understand how the system works and what documentation is required.

2. Overall Description

2.1 Product Perspective

The Online Learning Platform "Info Strainer" is a new, self-contained product aimed at providing high-quality educational resources to students of all ages and levels. It is not a follow-on member of a product family, nor is it intended to replace any existing systems. The product's origin stems from the growing demand for online learning and the need for a platform that provides comprehensive and personalized educational resources. The platform aims to provide students with access to a wide range of educational materials, including textbooks, video lectures, and interactive quizzes.

While the platform is self-contained, it is designed to integrate with other educational systems, such as Learning Management Systems (LMS), Student Information Systems (SIS), and other educational tools. The system should be able to import and export data from these systems to provide a seamless experience for users.

Overall, the goal of "Info Strainer" is to provide a robust and user-friendly online learning platform that meets the needs of students and educators alike. The SRS document will outline the specific requirements and functionality of the system to ensure that it meets these goals.

The major components of the "Info Strainer" system include:

1. User Interface: This component includes the web application that users interact with to access educational resources, communicate with others, and manage their accounts.

2. Application Server: This component includes the server-side application logic that handles requests from the user interface and interacts with the database.
3. Database: This component includes the database that stores all educational resources, user information, payment information, and other data related to the system.
4. Payment Gateway: This component includes the payment processing system that handles all payment-related transactions.

The subsystem interconnections are as follows:

1. The User Interface communicates with the Application Server through REST APIs to request and receive data.
2. The Application Server interacts with the Database to retrieve and store data.
3. The Payment Gateway communicates with the Application Server to process payments.

External interfaces include:

1. Learning Management System (LMS): This external system allows the "Info Strainer" system to import and export data related to student performance, assignment tracking, and progress tracking.
2. Student Information System (SIS): This external system allows the "Info Strainer" system to import and export student data such as name, email, and course enrollment.
3. Content Delivery Networks (CDN): This external system allows the "Info Strainer" system to cache and deliver content efficiently to users.

2.2 Product Functions

The major functions that "Info Strainer" must perform or let the user perform are:

- User management: Register, log in, edit profile, and manage account settings.
- Search and browse: Search for and browse educational resources, including textbooks, video lectures, and interactive quizzes.
- Content creation and management: Create and manage educational content, including textbooks, lectures, and quizzes.
- Learning management: Track progress, manage assignments, and provide feedback to users.
- Communication and collaboration: Provide communication and collaboration tools for users, such as forums, chat, and video conferencing.
- Payment and subscription management: Manage payments and subscriptions for users.
- Analytics and reporting: Provide analytics and reporting features to track usage, user performance, and other metrics.
- Integration: Integrate with other educational systems, such as Learning Management Systems (LMS) and Student Information Systems (SIS).
- Security and privacy: Ensure the security and privacy of user data and transactions.
- Customer support: Provide customer support to users, including technical support and user assistance.

Functional Decomposition:

1. User Management
    - Registration
    - Login
    - Profile Management
    - Account Settings
2. Content Management
    - Resource Creation
    - Resource Editing
    - Resource Deletion
    - Resource Viewing
3. Learning Management
    - Progress Tracking
    - Assignment Management
    - Feedback
4. Communication and Collaboration
    - Forums
    - Chat
    - Video Conferencing
5. Payment and Subscription Management
    - Subscription Plans
    - Payment Processing
    - Payment History
6. Search and Browse
    - Resource Search
    - Resource Filtering
    - Resource Ranking
7. Analytics and Reporting
    - Usage Tracking
    - User Performance Metrics
    - Reporting Tools
8. Integration
    - Integration with LMS and SIS
9. Security and Privacy
    - Data Security
    - Transaction Security
    - User Privacy
10. Customer Support
    - Technical Support
    - User Assistance

2.3 User Classes and Characteristics

The anticipated user classes for the "Info Strainer" product are:

1. Admin: This user class will have the highest level of privilege and will be responsible for managing the overall system, including user management, content management, and system configuration. They will have access to all features of the product and will use the system on a frequent basis.
2. Expert: This user class will consist of educators, tutors, and other subject matter experts who will create and manage educational content on the platform. They will have access to features related to content creation, editing, and management, and will use the system on a frequent basis.
3. Customer: This user class will consist of students and other learners who will use the platform to access educational resources, communicate with experts, and track their progress. They will have access to features related to resource search, browsing, and learning management, and will use the system on a regular basis. They may have varying levels of technical expertise and educational backgrounds.

The user classes are differentiated based on their technical expertise, security or privilege levels, subset of product functions used, and frequency of use. The admin and expert user classes will have a higher level of technical expertise and will be responsible for managing the system, while the customer user class will have varying levels of technical expertise and will primarily use the system for learning and communication purposes. The admin user class will have the highest privilege level and will be responsible for managing the entire system, while the expert and customer user classes will have more limited access to system functions based on their specific roles and responsibilities.

The pertinent characteristics of each user class for the "Info Strainer" product:

1. Admin:

- Technical Expertise: High
- Educational Level: Varies
- Frequency of Use: Frequent
- Security or Privilege Levels: High
- Subset of Product Functions Used: All
- Responsibilities: Manage the overall system, including user management, content management, and system configuration.

2. Expert:

- Technical Expertise: High
- Educational Level: Advanced
- Frequency of Use: Frequent
- Security or Privilege Levels: Moderate
- Subset of Product Functions Used: Content creation, editing, and management.
- Responsibilities: Create and manage educational content on the platform, interact with students, and provide expert guidance.

3. Customer:
- Technical Expertise: Varies
- Educational Level: Varies
- Frequency of Use: Regular
- Security or Privilege Levels: Low
- Subset of Product Functions Used: Resource search, browsing, and learning management.
- Responsibilities: Access educational resources, communicate with experts, and track their progress.

Certain requirements may pertain only to certain user classes. For example, requirements related to content creation and management will only be relevant to the expert user class. Requirements related to user management and system configuration will only be relevant to the admin user class. Requirements related to resource search, browsing, and learning management will be relevant to all user classes, but may have different levels of priority and functionality based on the user's specific needs and preferences.

All user classes of the "Info Strainer" product are important to satisfy, as each class plays a critical role in the success of the platform. However, based on the scope and purpose of the product, the customer user class may be considered the most important to satisfy, followed by the expert user class and the admin user class.

The customer user class is the primary target audience for the product, as they will be using the platform to access educational resources and track their progress. Their satisfaction with the product will be crucial to the success of the platform, as they will be the ones using it most frequently.

The expert user class is also important to satisfy, as they will be responsible for creating and managing the educational content on the platform. Their satisfaction with the product will be critical to ensuring high-quality content and maintaining the platform's reputation.

While the admin user class is important to satisfy for managing the overall system, they may be considered less important than the customer and expert user classes in terms of direct impact on the success of the platform. However, their satisfaction is still important to ensure smooth functioning of the system and to maintain security and privacy of user data.

2.4 Operating Environment

The "Info Strainer" software will operate in a web-based environment, where users will access the platform through a web browser on their respective devices. The software will be designed to work seamlessly with a variety of hardware platforms, operating systems, and web browsers, including:

1. Hardware Platforms:
- Desktops and Laptops (Windows, Mac, Linux)
- Tablets (iPad, Android)

- Smartphones (iPhone, Android)

2. Operating Systems and Versions:
- Windows (10, 8, 7)
- macOS (Big Sur, Catalina, Mojave)
- Linux (Ubuntu, Debian, Fedora)
- iOS (14, 13)
- Android (11, 10)

3. Web Browsers:
- Google Chrome (Latest version)
- Mozilla Firefox (Latest version)
- Apple Safari (Latest version)
- Microsoft Edge (Latest version)

In addition to the above, the software will require a web server and database server for hosting the platform and storing user data, respectively. The web server will need to support the latest web technologies and frameworks, such as HTML5, CSS3, JavaScript, and ReactJS, while the database server will need to support SQL databases, such as MySQL or PostgreSQL.

Finally, the software will need to coexist with various third-party software components and applications, such as payment gateways, content delivery networks (CDNs), and email service providers. The platform will be designed to integrate seamlessly with these components and applications, without compromising on security or performance.

2.5 Design and Implementation Constraints

There are several items and issues that may limit the options available to the developers of the "Info Strainer" software, including:

1. Corporate and Regulatory Policies: The developers must adhere to the corporate policies and regulations set by the client organization, which may include restrictions on data privacy, security, and accessibility.

2. Hardware Limitations: The software must be designed to operate within the limitations of the hardware platforms it will run on. This may include specific timing and memory requirements for certain hardware configurations.

3. Interfaces to Other Applications: The software may need to interface with other applications, such as payment gateways, content delivery networks (CDNs), and email service providers. The developers must ensure that these interfaces are secure and reliable, and adhere to the standards and protocols set by the third-party providers.

4. Specific Technologies, Tools, and Databases: The client organization may have specific requirements for the technologies, tools, and databases used in the development of the

software. The developers must ensure that they use only approved technologies, tools, and databases.

5. Parallel Operations: The software may need to support parallel operations, such as multiple users accessing the platform simultaneously. The developers must ensure that the software is designed to handle these operations efficiently and securely.

6. Language Requirements: The software may need to support multiple languages, and the developers must ensure that the software is designed to handle multilingual content and user interfaces.

7. Communications Protocols: The software may need to support specific communications protocols, such as HTTPS, to ensure secure communication between the user's browser and the platform's web server.

8. Security Considerations: The software must be designed with security in mind, and must include features such as user authentication, access controls, and encryption to ensure the security of user data.

9. Design Conventions or Programming Standards: If the customer's organization will be responsible for maintaining the delivered software, the developers must ensure that they adhere to the design conventions and programming standards set by the organization to ensure maintainability and ease of future updates.

2.6 User Documentation

The following user documentation components will be delivered along with the "Info Strainer" software:

1. User Manual: A detailed user manual will be provided, which will include step-by-step instructions on how to use the various features of the platform, along with screenshots and examples.

2. On-line Help: An on-line help system will be provided, which will allow users to quickly access information on how to perform specific tasks within the platform. The on-line help system will be context-sensitive, meaning that it will provide relevant information based on the user's current location within the platform.

3. Tutorials: Tutorials will be provided to help users learn how to use the platform. These tutorials may include videos, interactive demos, or other multimedia content to help users understand how to use specific features of the platform.

4. FAQs: Frequently Asked Questions (FAQs) will be provided to address common questions and issues that users may encounter while using the platform. The FAQs will be regularly updated to reflect changes to the platform and user feedback.

5. Release Notes: Release notes will be provided to inform users of new features, bug fixes, and other changes included in each software release. The release notes will be written in a clear and concise manner, and will be accessible from within the platform.

3. System Requirements

3.1 System Features

Feature: Ability to search for and filter study materials by subject and topic

Priority: High

Priority component ratings:

- Benefit: 9 - This feature will significantly enhance the usability and usefulness of the platform for all users by allowing them to quickly and easily find study materials relevant to their needs.
- Penalty: 2 - There is a minor penalty for not having this feature, as users can still browse through the available study materials manually. However, this can be time-consuming and frustrating.
- Cost: 5 - Implementing this feature will require some development effort, but it is not overly complex or difficult.
- Risk: 4 - There is a moderate risk of this feature not working as expected, leading to user frustration and potentially decreased platform usage. However, this can be mitigated through thorough testing and user feedback.

Overall, the high priority rating reflects the significant benefits that this feature will provide to users, and the relatively low penalty and risk associated with implementing it.

Feature: Integration with popular third-party study tools (e.g. Quizlet, Khan Academy)

Priority: Low

Priority component ratings:

- Benefit: 7 - This feature will provide users with a more seamless and integrated learning experience by allowing them to easily access and use their favorite study tools alongside the Info Strainer platform.
- Penalty: 3 - There is a minor penalty for not having this feature, as users can still access these study tools separately. However, this can be slightly inconvenient and may result in some users being less likely to use the platform.
- Cost: 6 - Integrating with third-party study tools will require some additional development effort, as well as potential costs associated with licensing and API access.

- Risk: 5 - There is a moderate risk of technical issues or compatibility problems arising with third-party study tools. However, this can be mitigated through thorough testing and close collaboration with the tool providers.

Overall, the low priority rating reflects the significant benefits of this feature, but also acknowledges the additional costs and risks associated with implementing it.

1. Software Login

Functional Requirements

1.1 The software shall allow users to login with their given username and password.
1.2 The login credentials (username and password) will be verified with database records.
1.3 If the login successful, the home page of the user account will be displayed.
1.4 If the username and/or password has been inserted wrong, the random verification code will be generated and sent to the user's email address by the system to retry login.
1.5 If the number of login attempt exceed its limit (3 times), the system shall block the user account login for one hour *[optional function]*

Priority Level: High
Precondition: User have valid e-mail address.
Cross-references: N/A

2. Registration

Functional Requirements

2.1 The platform will have an option to go through a verification or registration process for users.
2.2 Three types of users will be available on this platform. Which is General user (information seeker), Expert (the person who will provide information or answer), and Admin/Auditor.
2.3 Experts will need to have a valid e-mail address, phone number, and other necessary information for the verification process.
2.4 Before achieving the authority as an "Expert" that individual would have to go through a process of providing his/her field experience, work, name, contact, and other necessary information in a different submission forum.
2.5 Verification team will arrange an online screening, subject, and guidelines test for the users who have registered for becoming an "Expert". Other than that, the team will verify all the credentials including documents.
2.6 Customer would need to pay a minimal amount for a higher level of Research or Answer to the queries that they have asked. Also, Experts will be paid online on how many queries they have answered.

Priority Level: High
Precondition: User must have a valid e-mail address, phone number, and Certifications

related to job experience and field expertise.
Cross-reference: N/A

3. Posting Queries and Solutions

Functional Requirements

3.1 A registered general user can post queries regarding the problem and experts would be able to answer those questions in the comment section. General users would have to use "Tags" to simplify the category of their query.

3.2 Experts who are from the related field of the tagged query will be notified and be able to give proper solutions and if the user is not satisfied with the answers provided in the comments or he/she can interact with the experts personally to know more of it. Also, experts will be paid online on how many queries they have answered and detailed answers or research would require to be paid a fair amount.

3.3 General users can rate the Expert's solution and Experts can receive a "Popularity Star" for providing an accurate answer that the user wanted.

3.4 Besides posting queries, general users can search their question in the search box and related solutions or information or possible hyperlinks will be shown.

Priority Level: High

Precondition: Users must be registered and payment method must be added.

Cross-reference: QA -1, QA -2

3.2 Non-Functional/Quality Requirements

QA1: Usability: The interface will be easy to use, rather than intimidating, demanding, and frustrating, buttons, headings, help/error messages, and other necessary options will be simple to understand. Also, the UI/UX will be simple, ergonomic, and up to modern standards.

Priority Level: Medium
Precondition: N/A
Cross-references: N/A

QA2: Robustness: In the system, there are two kinds of users. One is the General User and another is the Expert. If the user considers any changes to be necessary after posting the query, our system will provide a 5 second review period before the post is publicly available for other experts and users to see. The same facility will be given to the experts after they have provided an answer in the query comment section.

Priority Level: Medium

Precondition: N/A

Cross-reference: N/A

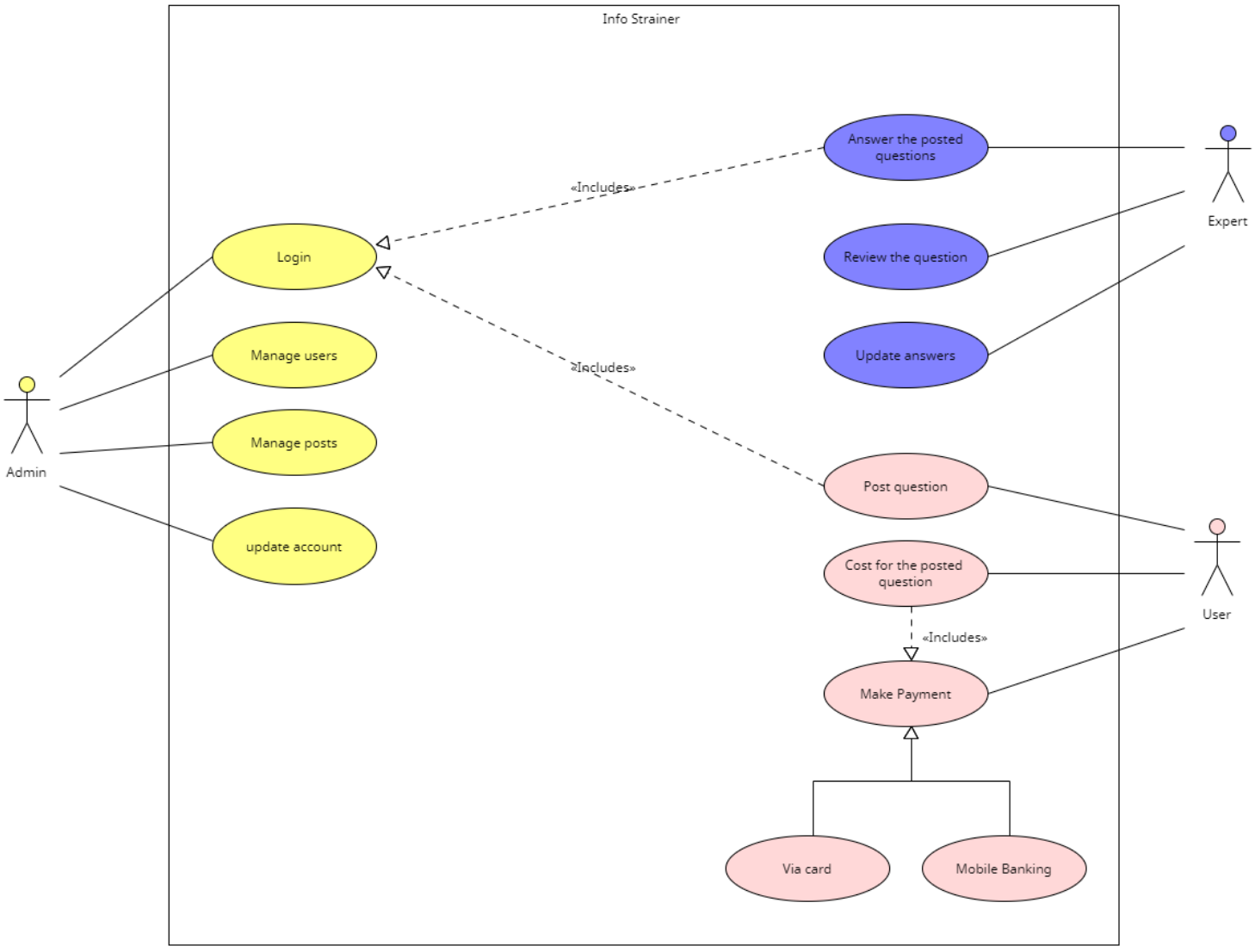
3.3 Project Requirements

Project Activity	Duration	Prerequisite
Preliminary Project/Thesis Plan	4 weeks	a. Power Budget. b. Top Level scheduling. c. Constrains of this project. d. Resource / expertise needs.
Requirements Specification	1 week	a. Requirements Analysis. b. Analysis the necessity and uses of Info Strainer. c. Develop Idea Generation. d. Budgeting planning.
Analysis [Object model, User interface]	2 weeks	a. Improve the data. b. User Interface evaluation. c. Consider user Expectations (UI/UX). d. Control Specification.
Source Code	3 weeks	a. Identifying the suitable coding platform.
Test Plan	1 week	b. Unit testing c. Integration testing and Regression testing d. Security testing e. System testing
Final Product / Demo	4 weeks	a. Pre-construction b. Construction start date c. Re-present the Documentation

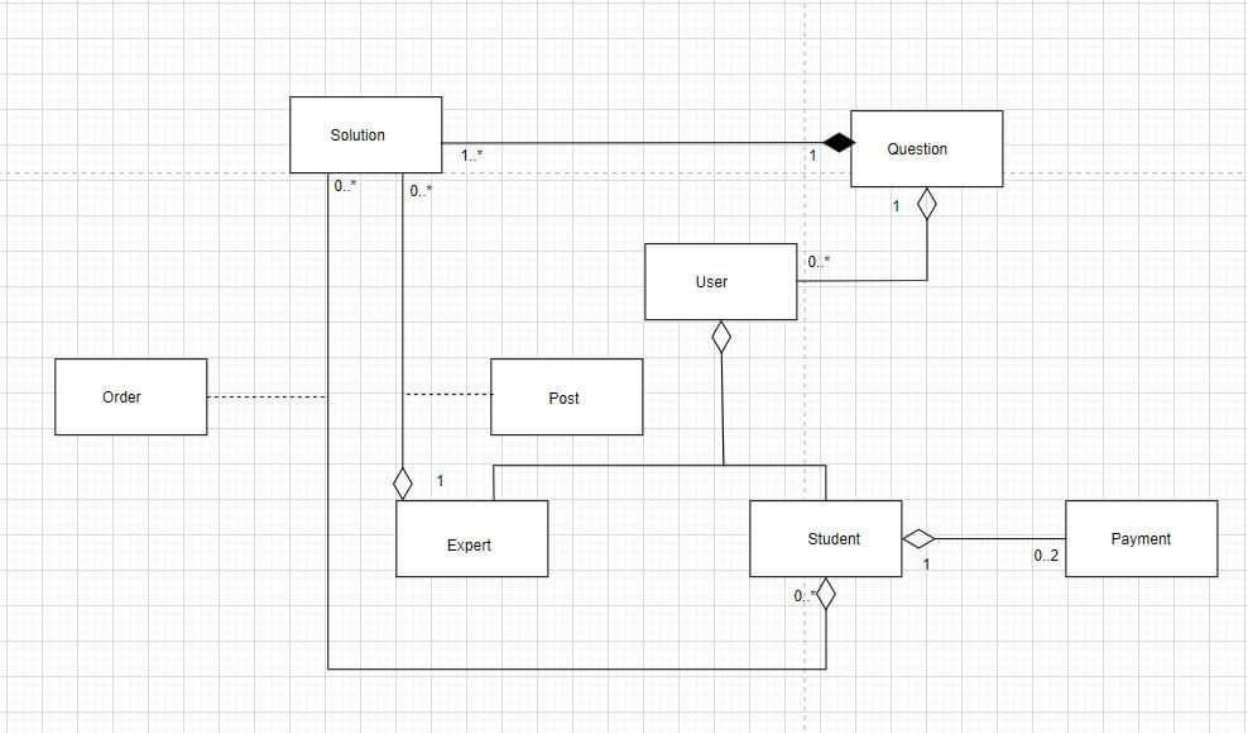
4. Design and Interface Requirements

4.1 UML Diagrams

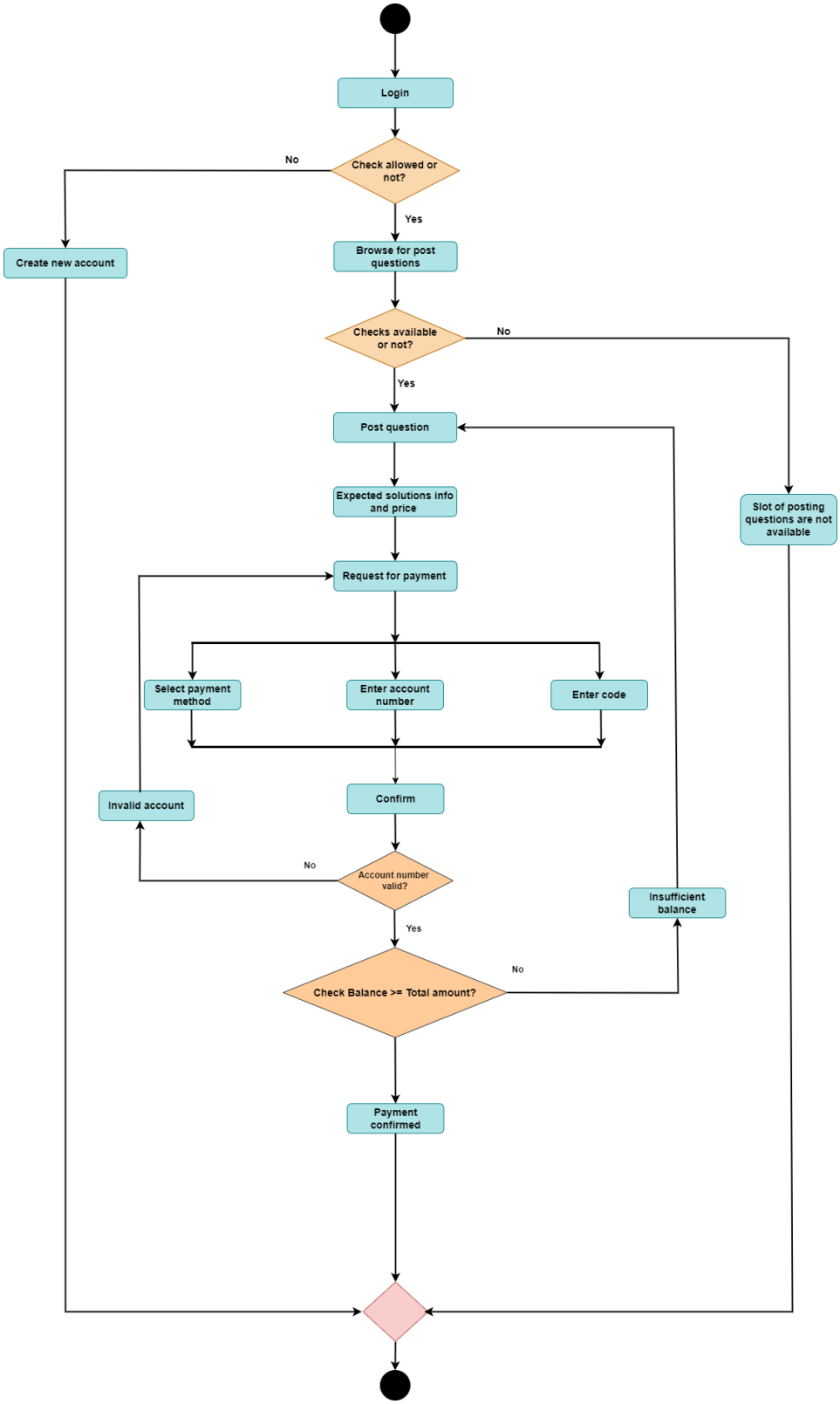
4.1.1 Use Case Diagram



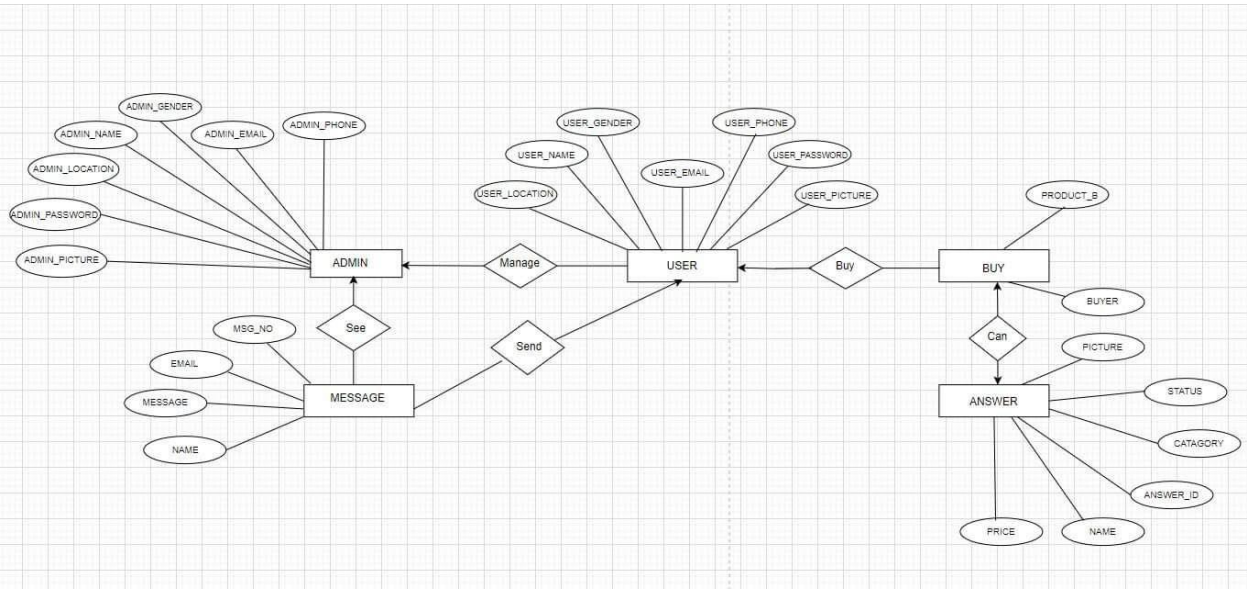
4.1.2 Class Diagram



4.1.3 Activity Diagram



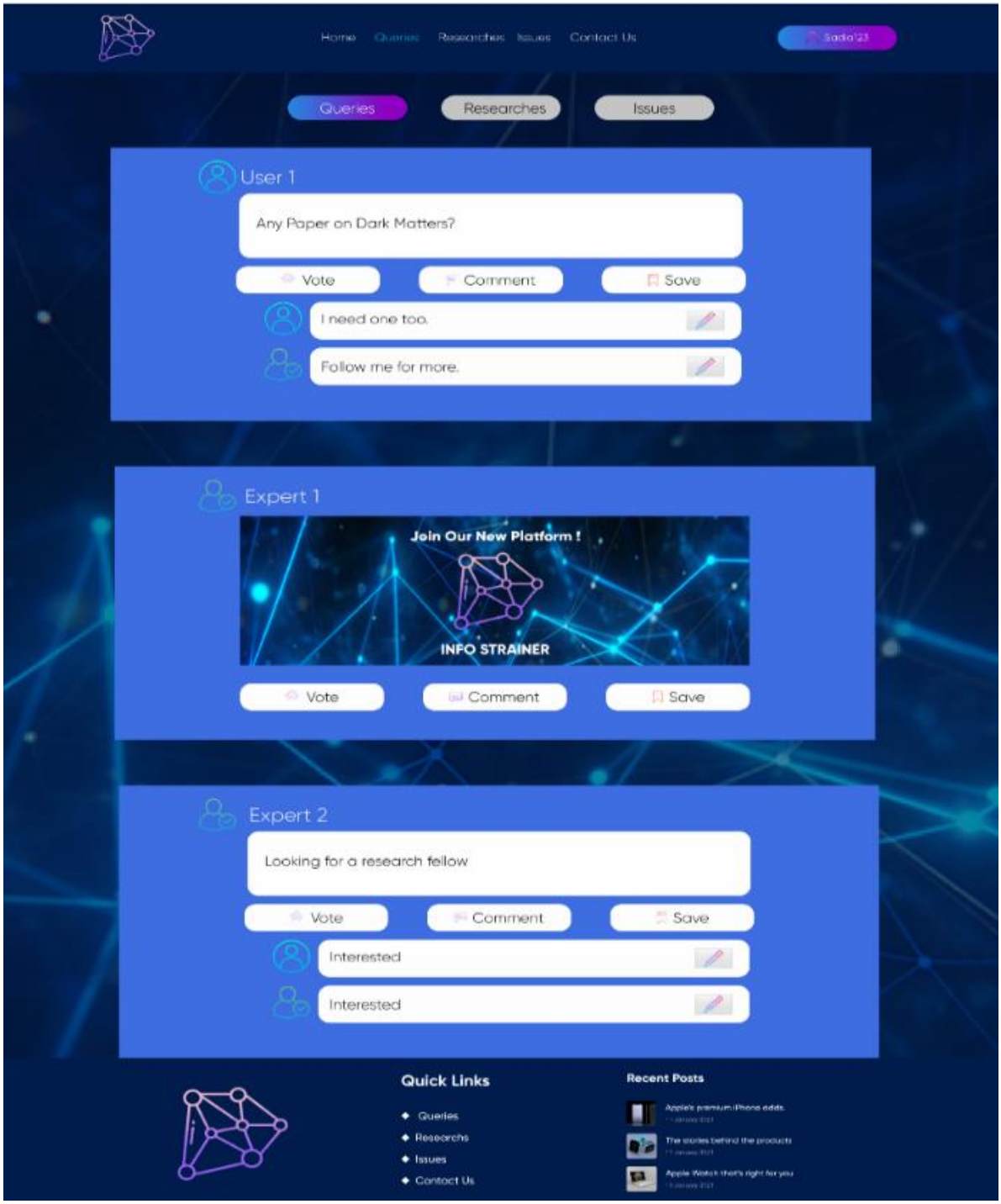
4.1.4 ER Diagram



4.2 Data Dictionary

Entity	Attribute	Type/Size	Validation	Key
Customer	CustomerID	Number (10)	1000-9999	Primary
Customer	FristName	Text (15)	Required	
Customer	LastName	Text (15)	Required	
Customer	Date of Birth	Date (8)	Valid Date	
Admin	AdminID	Number (10)	1000-9999	Primary
Admin	FristName	Text (15)	Required	
Admin	LastName	Text (15)	Required	
Admin	Phone Number	Number (11)	0-9	
Expert	ExpertID	Number (10)	1000-9999	Primary
Expert	FristName	Text (15)	Required	
Expert	LastName	Text (15)	Required	
Expert	Subject	Text (20)		

4.3 UI/UX Design Specification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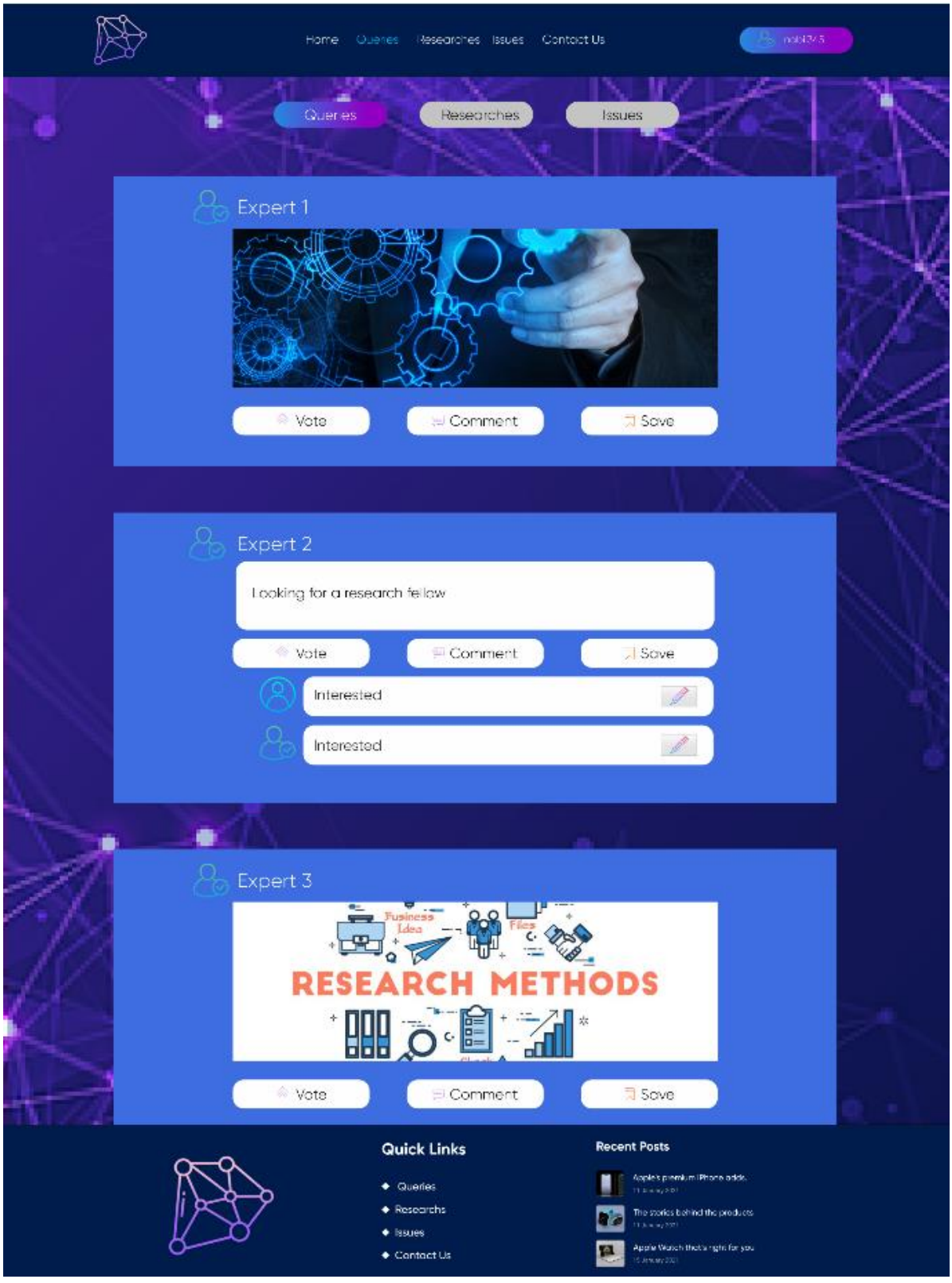
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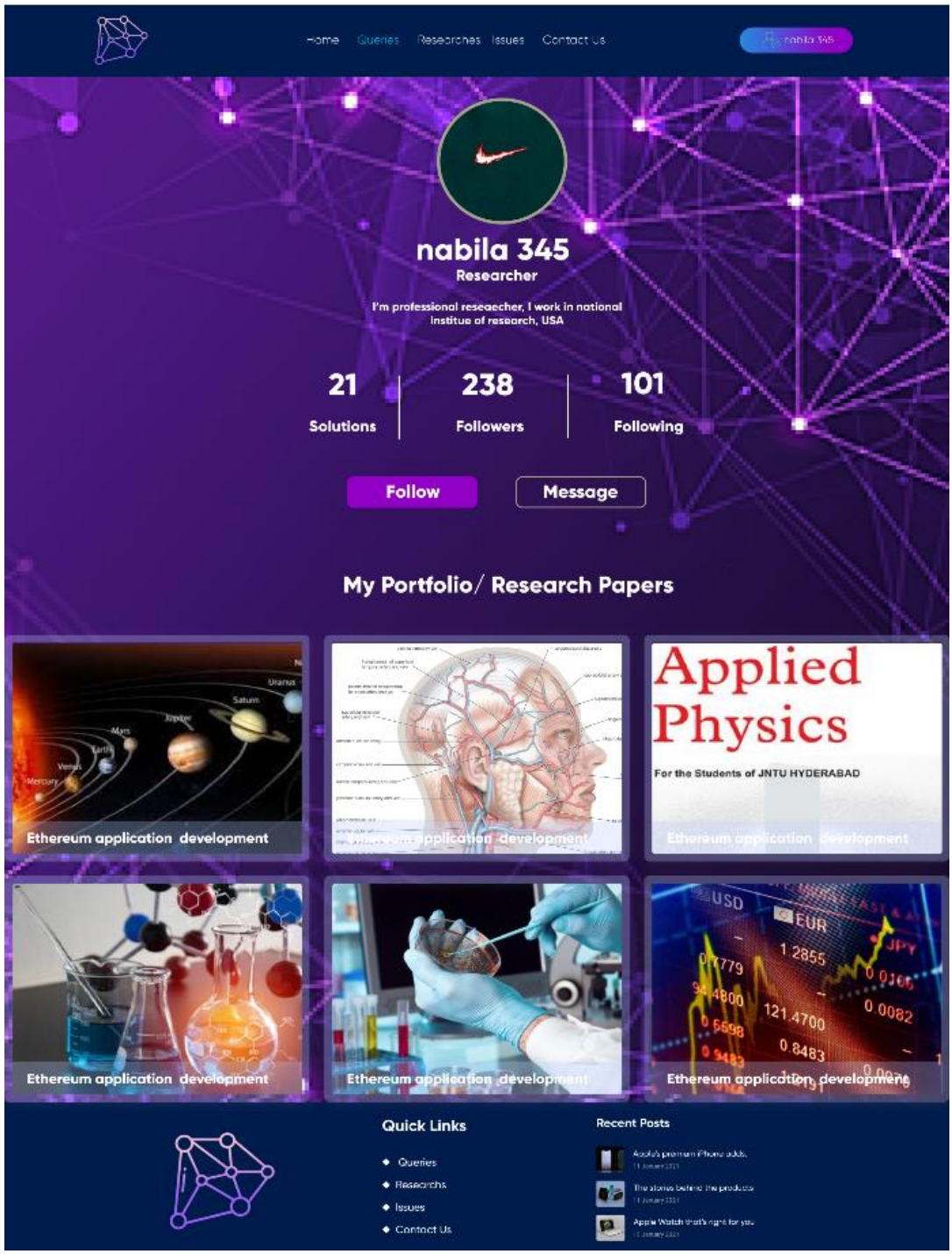
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5. References

[1] Software Engineering Course Slides
[2] Software Requirement and Engineering Course Slides
[3] Object Oriented Analysis Design (OOAD) Course Slides
[4] https://www.perforce.com/blog/alm/how-write-software-requirements-specification-srs-document
[5] https://codesigningstore.com/how-to-create-software-marketing-plan
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