**Vision and Scope D**o**cument**

**for**

University Information System 4.0

**Version 1.0 approved**

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**Revision History**

| **Name** | **Date** | **Reason For Changes** | **Version** |
| --- | --- | --- | --- |
| Eren Kumru | 12.03.2021 | Elaborate on headings 1 - 2 and fix grammar issues | 1.0 |
| Eren Kumru | 16.03.2021 | Elaborate on headings 3 - 4, add effort record and schedule, fix grammar issues | 1.0 |

# **Business Requirements**

## **Background**

Time management is one of the most valuable things in the modern world. People should be able to catch the news, manage their activities and communicate in an efficient way. In today’s world, communication between students and academics spread over many different platforms. This problem can be resolved by combining the functionalities provided by these platforms. Our team has set itself the goal to rearrange and ease that communication between universities and students in one application.

## **Business Opportunity**

Solutions offered by existing platforms alone are insufficient, and not time and cost-efficient. Our goal is to develop a mobile application and a website that every student and academic can use with ease on a smartphone or browser, meets the needs of important topics such as communication, management, information and announcement, and solves these inefficiency problems elegantly.

## **Business Objectives and Success Criteria**

The main business goal of UIS 4.0 is to collect systems offered by existing platforms and merge them with a quick configuration. This means that the platform can objectively reduce the students’ and academics’ time and cost loss as well as communication issues. The project's success will be determined by three factors: deliverables, work quality, and deployment. The requirements mentioned in the Software Requirements Specification document are referred to as deliverables. For their allocated release dates, requirements are expected to be completed. For each software release, the project teams strive for 100 percent compliance with release requirements. The project team's success will be determined by how well they adhere to this guideline. The term "quality" refers to the whole system's compliance with software development standards. With a high-quality implementation and good design, this system should be viable for years to come with minimum modifications. The performance of the team's work at the conclusion of releases will be used to determine success. The ease with which project knowledge and artifacts are transferred to users at the end of the project is referred to as deployment.

## **Customer or Market Needs**

Students and academicians who are still in school would be the primary users of the portal. The inadequacies of present systems are explored in order to suit the needs of these users. It has been observed that students and academics face challenges in terms of time, complexity, ease of access, ease of use, expense, and application. The major goal is to fulfill and solve these issues in one application, as the market and existing systems do not respond to all needs at once, but rather respond to each one separately. The final product will be released in the form of a website and a mobile application. Users must have internet connectivity on their phones, tablets, or PCs in order to utilize the program. In addition to the hardware and software utilized to access current systems, no additional environment is required.

## **Business Risks**

The mass use of existing market systems, and the fact that combining all of these systems’ functionalities in one complete system specifically designed for our product, may cause massive delays in its distribution. Connecting many customers to a single server may make it impossible for the product to function properly. Mentioned problems may cause a decline in gaining market popularity. These dangers could be mitigated with proper documentation and analysis before the development process. During the product development process, the system can be tested properly and frequently to address any unwanted casualties.

# **Vision of the Solution**

## **Vision Statement**

This application will be developed for university students, academics and staff who need a handy tool to monitor their educational process and communicate with each other. In today’s world, managing and monitoring university life and education are spread over many different applications that provide very little and do not meet most of the users’ requirements. Our product collects functionalities provided by many systems in one place that will speed up, lower the cost and ease the load of catching up with university life and education that will meet most if not all of the users’ needs. University life for students and academics will be much simpler, calm and collected and the quality of life will rise exceedingly fast.

## **Major Features**

For Students;

- Making course registration

- Add-delete course

- Attending classes

- See assignment details

- Submit assignment

- Taking exam

- See exam result

- Note-taking

- Contacting course instructors

- Filling out a survey about the course

- Accessing course documents

- Changing/downloading personal documents(student document, transcript, etc)

- Communicating with in-class students

- Getting Notifications about the school

- Entering a patient report and permission document

- Community management

For Academics;

- Giving assignment and checking assignment

- Taking and concluding exam

- Add notes

- Student assessment

- Making class online

- Creating a course survey

- Providing course information

- Making a complaint about the student

- Curriculum editing

- Access student contact information

- Making announcement

## **Assumptions and Dependencies**

Since UIS 4.0 must access the personal and academic data, a request to access databases owned by the schools and departments will be required. Therefore, API requests shall be made from the schools to access the data of students and academics. Also, data requests may be made by the Civil Registry Office as it may be required for the users registered in the system to access the population information. In addition, a separate link may be required for the Council of Higher Education to request academic data of students and academics.

Assuming that this data will be huge (perhaps at the PB level), the server on which the system is deployed should have a network speed of 400+ Mbps, a latency of less than 5 ms, and storage space to carry PBs of data. In addition to that, backup servers will be needed for continuous backup of data.

It may be necessary to create a separate security layer on the system to prevent unwanted data access and system casualties. In this layer, security technologies such as JWT or Auth0 may be integrated into the system.

# **Scope and Limitations**

## **Scope of Initial Release**

The scope of the initial development cycle is characterized by the functionality list below. A detailed Software Requirements Specification (SRS) will be developed to capture the specific requirements for this project.

The major features that will be implemented in the UIS 4.0 are:

* Release **1.0**;
  + For Students

1. Making course registration
2. Add-delete course
3. Attending classes
4. See assignment details
5. Submit assignment
6. Contacting course instructors
7. Accessing course documents

* + For Academics

1. Providing course information
2. Making class online
3. Giving assignment and checking assignment

## **Scope of Subsequent Releases**

The scope of subsequent development cycles are characterized below.

* Release **1.1**;
  + For Students

1. Taking exam
2. See exam result
3. Note-taking
4. Filling out a survey about the course
5. Community management

* + For Academics

1. Creating a course survey
2. Making and concluding exam
3. Add notes
4. Student assessment

* Release **1.2**;
  + For Students

1. Changing/downloading personal documents(student document, transcript, etc.)
2. Communicating with in-class students
3. Getting Notifications about the school
4. Entering a patient report and permission document

* + For Academics

1. Making a complaint about student
2. Curriculum editing
3. Access student contact information
4. Making an announcement

## **Limitations and Exclusions**

UIS 4.0 has lots of features that can be added, but it is planned to focus on students’ and academics communication which has some known problems waiting to be solved with an optimal budget. According to its success, the new features that can immediately be considered are mentioned below.

May be made available to University Staff and below features may be added;

1. Can see and investigate exams and homework
2. Can collect documents related to complaints and discipline
3. Can access student data
4. Can access academic person data
5. Can investigate lecture surveys
6. Can register academic persons and students
7. Can access students' parent contact information
8. Can make corrections on lecture grading
9. Making announcements

# **Business Context**

## **Stakeholder Profiles**

| **Stakeholder** | **Major Value** | **Attitudes** | **Major Interests** | **Constraints** |
| --- | --- | --- | --- | --- |
| Students | Want to manage time in their university life and education efficiently and effectively | Optimistic about how UIS 4.0 could reduce the time spent and look forward to using the system | Richer feature set and want to easily manage all the process by using one application | Must not have access to other users’ personal data |
| Academics | Want to manage lectures easily and efficiently, also want the system to be integrated by variety of desired application | Look forward to seeing the ready to use version of UIS 4.0 and will consider using it | Easily manage the process of giving, collecting and evaluating homeworks, projects, assignments, tests and examination by using one application | Must not have access to other users’ personal data |
| Maintenance Team | Maintain the system, ensure the system security and release updates | Happy to work on the UIS 4.0  Thinks they will have a hard time | Access to product repositories, data, API’s, test results and requirements and design related documentations | Must not have access to users’ personal data, and business and management related documentations |

## **Project Priorities**

| **Dimension** | **Driver (state objective)** | **Constraint (state limits)** | **Degree of Freedom (state allowable range)** |
| --- | --- | --- | --- |
| Schedule | release 1.0 to be available by 12/2022  release 1.1 to be available by 03/2023  release 1.2 to be available by 06/2023 |  |  |
| Features |  | In order for release 1.0 to be successful, 95% of high-priority features must be included. | Version 1.1 must include remaining unincluded parts, if any, from the high-priority features as well as %95 of the new features stated in item 3.2. subheading Release 1.1.  Version 1.2 must include remaining unincluded parts, if any, as well as %95 of the new features stated in item 3.2. subheading Release 1.2. |
| Quality |  | Release 1.1, must pass all security tests as the application will start gathering sensitive data. | Release 1.0, must pass 90-95% of user acceptance tests in order to be deployed and released.  Version 1.1 must pass 95-98% of user acceptance tests in order to be released.  Version 1.2 must pass 99-100% of user acceptance tests in order to be released. |
| Staff |  | 8 developers + 5 testers | With more features by every new release the need of testers may increase by 5-7 more |
| Cost |  |  | budget overrun up to 10% acceptable without executive review for further release. |

## **Operating Environment**

The students and academics should be in the same city and located close to the university but those kinds of pre-acceptance can be wrong in some scenarios such as the pandemic period of coronavirus which shows us education also can be done online. Therefore we need to consider timezone and server locations.

Data that we process and store are sensitive and this kind of data pushes us to consider the GDPR laws of the country on which the universities are based. Also, we need to have high-level security for this data.

UIS 4.0 s target area could have critical operations such as registering to a lecture therefore the system must be awake at all times and must respond within a minute in demanding periods such as the lecture registration period, therefore we need to choose one of the modern development operations platforms which give the option to upgrade and downgrade application servers’ properties without any issue.

APPENDICES

# Requirements Engineering Risks

## Risk Identification

#### Engineering Team Risks

* Engineers' risk of illness and accident.
* Risk of engineers quitting.
* Insufficient experience of engineers.
* Impaired performance due to low earnings.
* Communication problems with each other.

#### Stakeholders and Client risks

* Unrealistic expectations.
* Ambiguous needs.
* Communication problems.

#### Schedule Risk

* Time is not estimated perfectly.
* Scope creep risk.
* Risks in collecting resources and scheduling system functions.

#### Design Risks

* Design changes in schedule.
* Insufficient level of detail design.
* Wrong or defective design.
* Security design risks.
* Test cases and samples cost risks.

#### Quality Risks

* Performance risks.
* Customer complaints.
* Less use of future technologies.
* High complexity in implementation.

#### Project Management Risks

* Failure to address priority conflicts.
* Insufficient resource management.
* Failing to interact properly with stakeholders and engineers.
* Incorrectly specifying or missing project dependencies.
* Improper management of tasks.
* Lack of interviews with stakeholders.

#### External Risks

* Hardware issues.
* University IT department interacting risks.
* Civil Registry Office communication problems.
* Change laws by the government.

| **I**  **M**  **P**  **A**  **C**  **T** | **HIGH** | * Insufficient experience of engineers * Communication problems with stakeholders and clients * Scope creep risk * Risks in collecting resources and scheduling system functions * Wrong or defective design. * Insufficient resource management * Improper management of tasks | * Engineers' risk of illness and accident. * Risk of engineers quitting * Unrealistic expectations from stakeholders and clients * Ambiguous needs from stakeholders and clients * Time is not estimated perfectly * Security design risks * Performance risks * Failure to address priority conflicts. * University IT department interacting risks * Civil Registry Office interacting problems. | * Incorrectly or missing specifying project dependencies. |
| --- | --- | --- | --- | --- |
| **MEDIUM** | * Communication problems with engineers. * Impaired performance due to low earnings for engineers. * High complexity in implementation * Hardware issues. * Change laws by the government | * Customer complaints * Design changes in schedule * Insufficient level of detail design * Test cases and samples cost risks |  |
| **LOW** | * Less use of future technologies * Failing to interact properly with stakeholders and engineers |  | * Lack of interview with stakeholders |
|  | **LOW** | **MEDIUM** | **HIGH** |
|  | **PROBABILITY** | | | |

## Risk Mitigation and Risk Contingency

| Risk Description | Severity | Action |
| --- | --- | --- |
| Insufficient experience of engineers. | **MEDIUM** | Before project development begins, the project manager can provide training for inexperienced engineers with the help of senior engineers in the company. |
| Communication problems with stakeholders | **MEDIUM** | Try to make feedback sessions with developers and users. Get more interaction between them. Avoid potential miscommunications |
| Scope creep risk | **MEDIUM** | Careful filing of documents and constricting processes areas may be the main solutions. In addition, solutions such as careful monitoring of project progress, separate tracking of changes within the project, and verification of requirements by stakeholders. |
| Risks in collecting resources and scheduling system functions | **MEDIUM** | For this risk, while determining the project requirements, additional documents should be created for resource usage and system functions scheduling, and the resources to be used for the system should be selected up-to-date. |
| Wrong or defective design | **MEDIUM** | If it is earlier in development, consider re-developing the design. If you realize design has flaws in mid-development consider root cause analysis. If development is at an ending process, stick to the main design and think more about changing the structure of some parts only. |
| Insufficient resource management | **MEDIUM** | In the project management requirements section, the calculation of the resources to be used while making the budget planning should be done in a detailed and predictable way. If necessary, the project owner should be contacted to increase the budget. |
| Improper management of tasks | **MEDIUM** | The project manager can assign software lead engineers to facilitate management while managing the project. In addition, it will be beneficial to manage the project with advanced project management tools (such as Microsoft Project, Fibery). |
| Engineers' risk of illness and accident. | **HIGH** | Keep additional members to keep as an alternative, provide employees health covers. As an alternative process, provide an environment for them to work from home. |
| Risk of engineers quitting | **HIGH** | Internal encourages, motivational approaches. Keep employees more motivated about the project. Consider increasing their salaries. If they are still considering quitting, hire a qualified team member that can adapt to current progress. |
| Unrealistic expectations from stakeholders and clients | **HIGH** | In this risk avoidance, effective communication should be established with the client and stakeholders. The business analytics and project manager should keep the process up to date, carefully planning requirements and expectations, and milestones. |
| Ambiguous needs from stakeholders | **HIGH** | Do regular research and surveys about it. Keep team members dedicated to understanding ambiguity problems. Find alternative resources. |
| Time is not estimated perfectly | **HIGH** | Monitor most time usage on which part of the project and advise project members to use the rest of the time with care for those parts. Consider changing milestones depending on that |
| Security design risks | **HIGH** | As this will be one of the most important risks, Hire an additional workforce that has a specialty in this area. If the problem has been found after release, consider shutting down the servers until it is fixed. |
| Performance risks | **HIGH** | Try to find what causes a performance problem by separating projects into parts, Look one by one, if necessary appoint staff members to solve the issue. |
| Failure to address priority conflicts. | **HIGH** | To avoid this risk, the project manager should classify the tasks and requirements in order of priority, document them, and perform the project management in this order. |
| University IT department interacting risks | **HIGH** | While determining the project requirements, necessary studies should be formed and teams should be established to be in contact with the university administration. In addition, obtaining permissions from the necessary authorities in this process is a mitigating method for this risk. |
| Civil Registry Office interacting problems. | **HIGH** | Before this risk occurs, it is necessary to ensure that the necessary permits are obtained from the authorized units of the country and that the necessary infrastructure components are provided by the provider. |
| Incorrectly or missing specifying project dependencies. | **HIGH** | Review project plan, stick to the main road but specify the dependencies again. Consider daily reviews and plan ahead carefully. Act immediately but not in a hurry. |
| Customer complaints | **MEDIUM** | Clarifying expectations, updating the technologies used, constantly communicating with customers, and determining their requirements in advance, minimize this risk. |
| Design changes in schedule | **MEDIUM** | Approach with Agile, maintain the main project while changing the necessary parts of the schedule. Make sure those design changes do not cause another latency. |
| Insufficient level of detail design | **MEDIUM** | While determining the project requirements, software architects and software designers who will design can also accompany this process. In addition, after the requirements are determined, a large design requirements document can be created. |
| Test cases and samples cost risks | **MEDIUM** | During testing, it is possible that some new defects may be identified and may become a big issue that will take time to resolve. These defects can yield an issue that will need time to be resolved. Consider finding more testers and reducing sample sizes |
| Lack of interviews with stakeholders | **MEDIUM** | More meetings should be held between the business analyst and stakeholders. If necessary, multiple business analysts should support the project. |

### **Overall Timeline of Project Activities and Deliverables**

• Form teams **– Week 1, 2, 3**

• Discuss team structure **– Week 4**

#### • Increment 1 (Inception Phase)

o Vision & Scope Document

o Requirements engineering risks & risk management plan

o Schedule (including tasks, assignments, deliverables, dates)

o Size of the software: The number of functions **should not be less than 50**

o Presentation of Vision and Scope of the Project, Review & approval **– Week 6**

#### • Increment 2 (Inception Phase)

o Have identified 70% of use cases, with brief descriptions

o Prototypes, as necessary

o Have detailed 30% of use cases (most risky)

- Normal flow of events and significant alternate flows of events

- Reviewed by key stakeholders

o **Detailed** class diagram(s)

o Results organized in the initial draft of the SRS package

- Status report (progress, open and resolved issues, updated schedule and risks)

- No presentation is required for this step which should be ended at **– Week 9**

#### • Increment 3 (Elaboration Phase)

o Have identified 100% of use cases, the normal flow of events, and significant alternate flows of events

o Prototypes, as necessary

o Have detailed 80% of use cases (most risky), Normal flow of events, and significant alternate flows of events

o Data Dictionary

o **Detailed** class diagram(s), and sequence diagrams of high priority tasks

o Have SRS package for stakeholder review

o Full SRS package reviewed with stakeholders

o Status report (progress, open and resolved issues, updated schedule and risks)

o Plans for next steps (were you or others to proceed with the project)

o Project Presentation including Lessons Learned Report **– Week 14**

### **Workload/Effort Record**

* All Members
  + Discussing team structure and work environment
  + Ideation and deciding the project
  + Deciding the project scope, priorities, features and risks
  + Filling and revising the Scope & Vision Document