# University Online Registration
## Requirements Specification

## 1. The Purpose of the Project

### 1a. Background

The Unseen University does not provide an internet system that allows the students to reserve the classes for an incoming semester.

The existing system only allows users (students and faculty staff) to browse course schedules and create a mock-up of their proposed schedule. Users can currently view course sections, times and professors. The current system identifies conflicts within the schedule and alerts the user to these conflicts. It does not submit this mock schedule to an advisor for approval. The schedule created on the current system must be taken to the registrar's office and the classes must be manually scheduled by hand.

The only advantage currently given by the internet is the process of browsing the classes, but it does not provide an official registration. It only displays the possible options that the student can have according to the classes offered in the chosen semester. As a consequence, at the end and the beginning of every single semester the registrar's office is invaded by students who need to obtain the official approval for the classes that they picked on the Internet and then transcribed manually on paper. Furthermore, surprisingly often the requested classes are full, or there is some sort of a conflict in the schedule. Therefore, the student needs to redo the whole schedule once again, until the latter is not approved by the registrar. Each and every student must see his/her personal advisor before scheduling classes. Once this meeting is completed, the student must go to another office and have a meeting with another member of the administration. This member of the registrar's office must manually transcribe the student's printed schedule into the registrar system which is different from any system the student has access to. Also, the drop-add process is extremely laborious and it creates unacceptable queues.

The goal of the system we are designing is to automatically all the necessary information to register students for the coming semester. It will be connected to the University database and it will instantaneously refuse all the unfeasible requests, saving many ours of waiting and work to students, faculty, and staff. Furthermore, subject to agreement with the appropriate stakeholders, the system might provide many useful services such as:

- An efficient and detailed description of the classes under many aspects;
- The notification of the most overloaded class to the registrar;
- The possibility of creating a waiting list for the students who want to have access to some classes;
- A more efficient classification of the hierarchy according to which the students can register.

If the program turns out to be successful, the faculty will gain in time, work and money and the students will gain in time, work, energies and satisfaction regarding the classes that they are going to attend. The program will be one of many tools used by the university to help students manage their university career. Users will be full time and part time students of University as well as faculty and administrators (registrar's office etc).

The reasons why the University needs such a program are several and heterogeneous. The system:

- Would save a massive amount of work to the registrar's office, with directly consequent economical gain as well as conservation of time;
- It would provide a more efficient and satisfactory schedule for the client (students);
- It would provide clear and precise statistical information (such as the students' interest and the most requested classes) that would probably be useful for future reference. Furthermore, the program would also provide a great service to the students:
- It would provide a better chance to obtain the desired classes, which would directly influence the scholastic career and, therefore, the working career;
- It would make it possible to register for the coming semesters without physically being at the University;
- It would take less time to conclude the registration process;
- It would spare the enormous amount of time wasted on the stares of the Bosquet building waiting for their turn during the drop-add period. The students are particularly discontent about the registration process proposed by University. It is at least reprehensible to think that in 2017 the registration to one of the most important American Universities in Europe still offers a service that obliges the student to handwrite all the classes on a paper that will later have red "registered" stamp over it once the process is over.

## 1b. Goals

The product envisages ameliorating the registration process under several points of view. The most important are:

- An explanatory file that clarifies how the program works the very first time that a student logs in;
- A log-in process to guarantee security of the recognition of every single student;
- The creation of a link between the registration program and a university's database of student accounts, offered courses, and all the related data;
- The display of a detailed list of courses that the university proposed in the considered semester;
- The possibility of creating a virtual schedule before the registration is made official;
- The possibility of guaranteeing the official registration of every student that goes through the program;
- The registrar must have the possibility to monitor all the affluence to the classes and be notified anytime there is any sort of issue;
- The fast movements of students into classes according to the drop-add indications given by the students.

The first advantage will be measured by the students. Registration is a process that takes a long time and that cannot be undertaken outside of the university. With this program, the students will be able to register from any place that has an Internet connection without needing any sort of information and signature, thanks to the log-in identification. Furthermore, they will not have to worry about registering in a class, because the waiting list will spare them hours and hours of queue in the registration office without any guarantee whatsoever that they will be able to obtain the desired class. With this program, if there is the practical chance that a student can be registered in a class, she/he will have 100% of guarantee of the registration thanks to the fast and practical changes in the classes that this service can provide.

The practical advantages to the university will also be enormous. One of the major concern of the registrar office is the drop add period, which is an infernal week already because it takes place at the beginning of the semester where everybody starts posing problems and asking questions. The Internet drop-add will propose an alternative and will massively lighten the faculty and administration from the major trouble of having to do it manually. The whole faculty and administration will instead be concerned elsewhere, working on the several different issues that the beginning of the semester can present. Furthermore, the program will be able to answer many of the questions that are asked daily to the registrar.

## 2. The Client, Customer and Other Stakeholders

### 2a. The Client

The client needs this product because the current registration process and relative drop-add tears apart the whole image that the university has. The registration is the very first official step that a new student has to undertake in the University experience. It is therefore extremely important that the first impression obtained by the costumer reflects the identity of the university. Moreover, the part of the administration that is concerned with the registration program wastes a massive amount of time dealing with processes that ought to be computerized.

### 2b. The Customer

The registrar's office at the University is one of the customers, the other is students or prospective students.

### 2c. Other Stakeholders

The different stakeholders for this product are:

**Students**:

- They are the clients of the product.
- They need to know details about the registration in itself, either through papers or the system.
- They do not need to know the technical parts of the system.
- They are directly involved in the system as one of the three main stakeholders.
- Their knowledge influences directly the system, for the latter needs to be changed according to the students' knowledge.

**Registrar**:

- She is at the same time client and costumer of the product.
- She has a complete knowledge of what services the system should provide. She does not need to know the technical parts of the system;
- She is directly involved in the system because she makes the registration effective.
- The database that the system uses is kept by the registrar.

**ICT**:

- We need their approval and advice on the technical part of the project. They can help us figure out for example what parts of the system are doable, or what parts are too much of a trouble for the advantage that we might draw from it.
- Their knowledge is more focused on the technical part of the system, even though they still need to understand the process to provide a satisfactory service;

- Their knowledge of the registration process is still high, but they need to know how to design the system so that it appropriately serves the user and the processes involved;
- They are directly involved, in the design, and in the effective concretization of the design into an effective program.

**Student advisors**:
- They can provide invaluable suggestions on how to guide a student through registration.
- They have no need to know how the system works, but they are the ones who probably know the best the interests of the students;
- Their knowledge of the registration process is high, they will not need to know the technical details of the system;
- They can provide important insights in the design of the system about the processes used by students to build their schedules (questions asked, frequent difficulties, constraints, desires, etc.).

# 3. Users of the product

## 3a. The Hands-On Users of the Product
The users of the product will be:
- Students: the students may use the registration system to register for the incoming semester. The program will compensate any lack of knowledge of the courses, the schedule and even of the system itself (with a help file)
- Faculty and administration: the faculty and administration will have to know how to access the system and the database connected to it, in order to straighten possible mistakes in the data or in the description of the classes, or just to update the database according to possible changes.

## 3b. Priorities Assigned to Users
Even though the system is thought for the students, there is not a hierarchy for the users, in that the administration is as important as the students.

## 3c. Maintenance Users and Service Technicians
Systems maintenance users are a special type of hands-on users who have requirements that are specific to maintaining, configuring and updating the product. The maintenance users will be the ICT staff, the Dean's office, and the registrar. The ICT staff will have to deal with any kind of operating discrepancy in the code. Most likely, even though it should not happen, there will be a problem in the process. Therefore, the ICT must have the capability to have access to the system.

The Registrar must have access to the system. However, he/she might need to change the priority criteria of the waiting list or of the suggested schedules for the incoming semester. In general, the registrar and possible other "special" users will have the right to override any system decision.

# 4. Mandated Constraints

There are many constraints for the system we are currently attempting to design. Most of these constraints will probably be social and budgetary as opposed to technical constraints. Although we assume that these constraints will occur, we currently have no direct knowledge of them. The system will run on technology that has already been created, tested and is being widely used in many systems and industries. There would be no need to invent new technology for this system. The system can be purchased as an out-of-the-box system, a turnkey system with modifications, or a complete in house custom creation.

### 4a. Solution Constraints
The only constraint we are currently aware of is the interface and/or interaction between the system and the existing university database.

### 4b. Implementation Environment of the Current System
The environment in which this system will be hosted at the University. This environment guarantees at the moment a fairly organized ambience composed mostly by humans whose task is to follow personally the students, especially in the registration process. However, the whole process of registration is almost completely hand-made, with the exception of the possibility of screening the following semester's schedule through the course browser. However, there is already a database that provides many of the information that the system needs.

### 4c. Partner or Collaborative Applications
Description: The system shall integrate with the university database.
Rationale: Input is required from the database and registration information will be stored in the database. Fit criterion: Input/output to DB works.

### 4d. Off-the-Shelf Software

### 4d.1 Reusable Components

We are not aware of reusable components that could support the development of the product. Currently the "course browser" and the "Amis" systems are the two components that most closely resemble parts of the product we plan to design. These two systems however, could not be reused "as it is" as components of the envisaged system.

### 4e. Anticipated Workplace Environment

The system we envisage has a Web based interface and therefore it may be used in any environment. Specific interfaces for:

- Mobile devices
- Users with disabilities
    - Vocal output and input for blind users
    - Interface facilitations for users with motion disabilities
- Students with poor English skills (other languages interface)
- The interface must be simple and flexible so to accommodate different levels computer skills

### 4f. Schedule Constraints

Schedule constraints are yet to be defined

### 4g. Budget Constraints

The budget constraints are yet to be defined

## 5. Naming Conventions and Definitions

### 5a. Data Dictionary for Any Included Models

Advisor: member of the faculty who personally follows the student and closely helps her/him to choose her/his courses as adequately as possible.

Approval for non-taken prerequisites: some classes need some previous prerequisites.

Advising session: a meeting that every student has with her/his academic advisor before the official registration for the classes.

Confirmation email: an email that would confirm to the student that a system action has been taken (e.g. a change of courses has officially taken place).

Course browser: currently existing system that allows the students to choose their courses and the teachers to follow what their students are planning for their future.

Drop-Add: the operation through which the students joins or leaves a class after the official registration took place, and before the drop-add period ends.

Enrolment in classes: a student is enrolled in a class when s/he is officially registered in the course. Facility for registrar and ICT to overwrite and over-read the changes: these two stakeholders need to be able to interfere with the system to straighten the possible mistakes or simple changes. They also need to be able to screen the changes operated.

Faculty: the teaching staff of the University.

Generation of report for overloaded classes: a report that will notify the registrar for the classes undergoing requests that pass some pre-established limits.

Guest Tour: in case someone who is not currently enrolled in University wants to visit the system and/or the classes offered during the semester.

ICT (Information Communication Technology): technical staff for anything that concerns computers and Internet in the University.

Lost/forgot password: in case the student no longer has access to her/his University password.

Proposition of schedules: the system several possible schedules that fit with the personal case of the students according to her/his requests and needs.

Registrar: member of the administration responsible of the official enrolment of the students as a member of the university.

Registration: enrolment of a student in the university program for the subsequent semester.

Students: people currently enrolled in the undergraduate or graduate program of the University.

Tutorial: an explanation of how the system works (the form still has to be defined: video? Step by step presentation?).

<u>Waiting list</u>: a list of students that are asking to be enrolled in a class. The priority is given according to several criteria (such as class standing and major) that still need to be better defined.

# 6. Relevant Facts and Assumptions

### 6a. Facts
- About 10000 students.
- About 500 professors.
- About 240 courses scheduled per semester.
- Classes may have different sizes varying from 8, to 30.
- Students can register for at most 4 classes.
- A 5$^{th}$ class can be added if the student has University approval.

### 6b. Assumptions
- We assume that the users have Internet access whenever they want to use the product.
- We assume that every semester there are enough classes offered by the administration
- We assume that the students have some minimal knowledge:
o of the English language;
o of his/her current state: the student needs to know what his ID number and his password are;
o of the University website: the student needs to know how to reach the system within the University website;
o of the University email account: everything will be notified through the University email; therefore, the student must know how to access his email account;
o of the catalogue, that they are required to read as soon as they are accepted in the college.
- Students should have the choice to register in person not using the online registration system
- During the staggered registration period the online registration system should be available only during office hours (to avoid unfair disadvantage to students that do not have Internet access)
- Students should have the choice to want the advisor's help or not.

# 7. The Scope of the Work

## 7a. The Current Situation

The current situation does not provide an internet registration process whatsoever. The only service available on the internet is the organization of the schedule of the student for the incoming semester, without any sort of official version of the schedule. The student still must go to his advisor's office, talk his schedule over with him, get it approved and signed, then take the approved schedule at the registrar's office to be officially signed in.

## 7b. The Context of the Work

The product will have to interact with a university environment. Therefore, we are interested in keeping under control the adjacent systems such as the database, the university website, the mailing system, or the computerized environment. Regarding the human environment, we have to consider the registrar above all and the indulgency for the rules of the faculty.

## 7c. Work Partitioning

**Business Event List**

| Event Name | Input and Output | Summary |
|---|---|---|
| 1. New course is added | Course details (name, syllabus, prerequisites, …) (in) | Record new course amongst those available for registration |
| 2. DB supplies student's data | Students details (name, GPA, …) (in) | Use data for processing. |
| 3. Class is full | Student applies for waiting list (out) | Creation of waiting lists for the classes |
| 4. Conflict between two classes | System searches and proposes the alternatives (in/out) | The student is given valid alternatives when there is a conflict between two classes |
| 5. Non-taken prerequisites | System asks for the Registrar's approval | The Registrar evaluates the request |
| (To be completed) | | |

# 8. The Scope of the Product

## 8a. Product Boundary
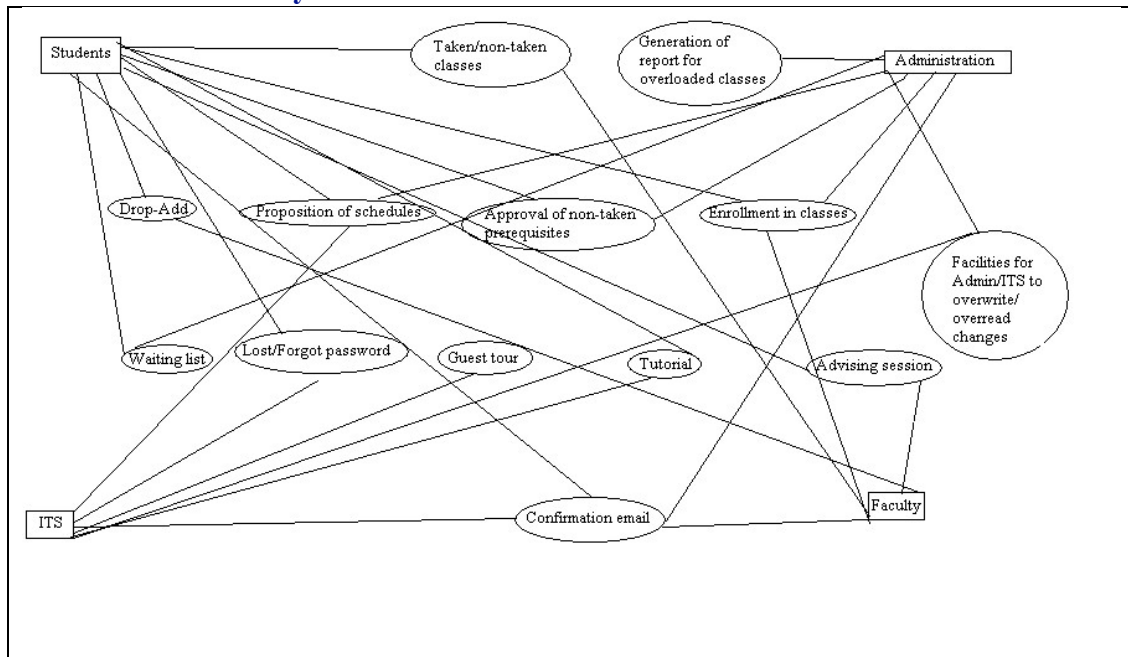


## 8b. Product Use Case List

- <u>Confirmation email</u>: whenever something changes on the schedule of the student, the latter will be notified by email with the occurred changes listed in an automated email system in the system.
- <u>Drop-Add</u>: the operation through which the students joins or leaves a class after the official registration took place
- <u>Taken / non- taken classes</u> – the student has access all the time to the list of classes s/he has taken, as well as the classes he/she should take according to: general education requirements, declared majors, and declared minors.
- <u>Generation of report for overloaded classes</u>: The system will notify the registrar with any classes that is loaded over a pre-established limit in order to make her aware of the students' need to be enrolled in determined classes.

- Proposition of schedules: The system will offer a few options that will accord to the student's parameters. The student will then be able to pick the option that he believes best suits her/his needs.
- Tutorial: an explanation of how the website works (the form still has to be defined: video? Step by step presentation?).
- Waiting list: if a student requires the enrolment in a class that is already full s/he will be offered the choice to enter a waiting list for that course. The student will be able to access and modify her/his waiting list all the time. A student may require to be automatically enrolled in a wait-listed course that becomes available. In this case, the student may have to indicate which course he/she would like to be replaced by the wait-listed course.

# 9. Functional and Data Requirements

## 9a. Functional Requirements

| | |
|---|---|
| Requirement #: | 1 F |
| Description: | The system defines and proposes one or more schedules to student |
| Rationale: | To help students select their courses |
| Originator: | ICT, us and students |
| Fit Criterion: | The system provides the user accurate acknowledgement of past and future courses needed to complete their requirement. Also propose a schedule for the incoming semester that satisfies requirements and constraints |
| Customer satisfaction: | 4 |
| Customer dissatisfaction: | 2 |
| Priority: | 4 (1 highest) |
| Supporting materials: | Ryan report of meeting with ICT |
| Conflict: | None |

| | |
|---|---|
| Requirement #: | 2 NF |
| Description: | Courses taken and courses still to be taken must be set apart in an obvious way |
| Rationale: | The student must have a clear idea of the classes s/he needs to take |
| Originator: | ICT interview |
| Fit Criterion: | User test cases of a prototype |
| Customer satisfaction: | 2 |
| Customer dissatisfaction: | 4 |
| Priority: | 3 (1 highest) |

Supporting materials:       Business SME report of meeting with ICT
Conflict:                   None

Requirement #:              3 F
Description:                Have some facility for the administrative overwrite
Rationale:                  To provide some administrative control on the system
Originator:                 ICT interview
Fit Criterion:              Overwrite applies to necessary function
Customer satisfaction:      4
Customer dissatisfaction:   5
Priority:                   1 (1 highest)
Supporting materials:       Ryan report of meeting with ICT
Conflict:                   None

Requirement #:              4 F
Description:                Facility to store overrides actions
Rationale:                  Administrator tracking
Originator:                 ICT interview
Fit Criterion:              Override actions are accessible after some time
Customer satisfaction:      4
Customer dissatisfaction:   4
Priority:                   1 (1 highest)
Supporting materials:       Business SME report of meeting with ICT
Conflict:                   None

Requirement #:  Description: 5 F
                            Override reversal
Rationale:                  Administrative control and mistake fixing
Originator:                 ICT Interview
Fit Criterion:              Observation, accessibility
Customer satisfaction:      3
Customer dissatisfaction:   1
Priority:                   1 (1 highest)
Supporting materials:       Business SME report of meeting with ICT
Conflict:                   None

Requirement #:              6 F
Description:                When courses are displayed, show the ratio of occupied over available

| | |
|---|---|
| Rationale: | Students want to how full the class is |
| Originator: | Focus Group |
| Fit Criterion: | The number of students applying needs to appear |
| Customer satisfaction: | 4 |
| Customer dissatisfaction: | 2 |
| Priority: | 3 (1 highest) |
| Supporting materials: | Consultant report from focus group |
| Conflict: | None |

| | |
|---|---|
| Requirement #: | 7 F |
| Description: | Staggered access should be implemented for registration (criteria to be defined) |
| Rationale: | Priority to classes should be given to certain students<br>Do not want to overload and crash the system |
| Originator: | focus group |
| Fit Criterion: | students who do not fit the requirement cannot register |
| Customer satisfaction: | 5 |
| Customer dissatisfaction: | 5 |
| Priority: | 1 (1 highest) |
| Supporting materials: | Consultant report from focus group |
| Conflict: | None |

| | |
|---|---|
| Requirement #: | 8 F |
| Description: | Possibility to reserve a certain percentage of the class for certain students (students majoring in the subject) |
| Rationale: | Students in the major get priority over the students not in the major |
| Originator: | Focus group |
| Fit Criterion: | Only students matching the criteria will be able to register to reserved places in the class |
| Customer satisfaction: | 5 |
| Customer dissatisfaction: | 2 |
| Priority: | 3 (1 highest) |
| Supporting materials: | Consultant report from focus group |
| Conflict: | None |

| Requirement #: | 9 F |
|---|---|
| Description: | Email confirmation to the students is sent whenever a course is added or dropped |
| Rationale: | Students are notified about what changes in the schedule (trust) |
| Originator: | Focus group |
| Fit Criterion: | Email is received whenever things change |
| Customer satisfaction: | 5 |
| Customer dissatisfaction: | 5 |
| Priority: | 1 (1 highest) |
| Supporting materials: | Consultant report from focus group |
| Conflict: | None |

| Requirement #: | 10 F |
|---|---|
| Description: | Either the online registration system is only open during office hours or a telephone registration has to be provided |
| Rationale: | Fair access for all students |
| Originator: | Focus group |
| Fit Criterion: | students who do not have internet access have equal opportunity of getting into wanted classes |
| Customer satisfaction: | 4 |
| Customer dissatisfaction: | 1 |
| Priority: | 4 (1 highest) |
| Supporting materials: | Consultant report from focus group |
| Conflict: | None |

| Requirement #: | 11 F |
|---|---|
| Description: | Search should be allowed based on time professor and major |
| Rationale: | More precise choice of the courses |
| Originator: | Focus group / Advisors' meeting |
| Fit Criterion: | Easy browsing and choice of the courses from catalogue |
| Customer satisfaction: | 5 |
| Customer dissatisfaction: | 5 |
| Priority: | 1 (1 highest) |
| Supporting materials: | Consultant report from focus group |
| Conflict: | None |

Requirement #: 12 F
Description: Emailing system for prerequisite in case a requested prerequisite is not met
Rationale: Faster requests of possibility of skipping prerequisites
Originator: Focus group
Fit Criterion: Send email when the prerequisite is not taken
Customer satisfaction: 3
Customer dissatisfaction: 5
Priority: 1 (1 highest)
Supporting materials: Consultant report from focus group
Conflict: None

Requirement #: Description: 13 F
Emailing system to contact advisor about a class
Rationale: Solving doubts about the course
Originator: Focus group
Fit Criterion: the student gets suggestions from the advisor
Customer satisfaction: 4
Customer dissatisfaction: 3
Priority: 3 (1 highest)
Supporting materials: Consultant report from focus group
Conflict: None

Requirement #: 14 F
Description: Final schedule emailed to students when registration is over
Rationale: Gives a concrete image of all the classes together.
Originator: Focus group
Fit Criterion: The student receives the definite schedule for the semester
Customer satisfaction: 5
Customer dissatisfaction: 3
Priority: 3 (1 highest)
Supporting materials: Consultant report from focus group
Conflict: None

Requirement #: 15 F
Description: A report should be generated for the registrar indicating when waiting lists for courses become very long
Rationale: Notifies the registrar with possible new sections that need to be created

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|---|---|
| Originator: | Focus group |
| Fit Criterion: | Whenever there is a massive waiting list the registrar gets notified about it |
| Customer satisfaction: | 5 |
| Customer dissatisfaction: | 3 |
| Priority: | 2 (1 highest) |
| Supporting materials: | Consultant report from focus group |
| Conflict: | None |

| | |
|---|---|
| Requirement #: | 16 F |
| Description: | Associated with course information a syllabus with list of books |
| Rationale: | The students can check the syllabus from the system |
| Originator: | Focus group |
| Fit Criterion: | The student downloads the syllabus with any information needed |
| Customer satisfaction: | 5 |
| Customer dissatisfaction: | 4 |
| Priority: | 2 (1 highest) |
| Supporting materials: | Consultant report from focus group |
| Conflict: | None |

| | |
|---|---|
| Requirement #:  Description: | 17 F |
| | Selection of classes on the basis of personal criteria: |
| | Taking the same classes as someone else |
| | Having classes only in the afternoon |
| Rationale: | The students choose the classes according to his "needs" |
| Originator: | Focus group |
| Fit Criterion: | The student who wants only afternoon classes can browse only those according to this criterion |
| Customer satisfaction: | 5 |
| Customer dissatisfaction: | 1 |
| Priority: | 4 (1 highest) |
| Supporting materials: | Consultant report from focus group |
| Conflict: | None |

| | |
|---|---|
| Requirement #: | 18 Integration |
| Description: | The system shall integrate with the university database. |
| Rationale: | Input is required from the database and registration information will be stored in the database. |

| | |
|---|---|
| Originator: | our analysis |
| Fit Criterion: | Input/output to DB works |
| Customer satisfaction: | 2 |
| Customer dissatisfaction: | 5 |
| Priority: | 1 (1 highest) |
| Supporting materials: | None |
| Conflict: | None |

| | |
|---|---|
| Requirement #: | 19 F |
| Description: | The system shall allow for suggestions by users (e.g. notes on missing or unclear information). |
| Rationale: | Given the dynamicity, size, and complexity of the information on course schedules it is possible that mistakes or inconsistency are present in database, or in the presentation. Allowing users to report on such problems, and taking timely actions to correct them can significantly improve the reliability of the data. |
| Originator: | our analysis |
| Fit Criterion: | availability of a "suggestion form" which reaches the appropriate person who may take care of any problem |
| Customer satisfaction: | 4 |
| Customer dissatisfaction: | 3 |
| Priority: | 3 (1 highest) |
| Supporting materials: | None |
| Conflict: | None |

## 10. Look and Feel Requirements

### 10a. Appearance Requirements
The Unseen University logo and the current basic design of University registration system should be displayed. The system should be attractive according to the university-level students. The design and the colour should make users feel comfortable when using the system instead of flashing useless colours on the screen. The design should also reflect the seriousness of the University environment.

### 10b. Style Requirements
The overall style should be built up easily in order for users to use it easily and efficiently. After accessing the system, the users should feel comfortable while looking at it and browsing through it. The design should not be too colourful to maintain a certain

seriousness of the web design of the college but at the same time it should not be too boring for the eye, so that it can appear pleasant to use.

# 11. Usability and Humanity Requirements

### 11a. Ease of Use Requirements

The system should have an easily understandable design in order for users to use it. It should provide the necessary information when the user commits possible errors. It should indicate the several possibilities that the user has to go on in using the system. The user will be allowed to undo any of the operation computed or, for irreversible operation, will always be asked to double-check their choice in case they misunderstood the option or clicked on a button by accident. The system will have easy access to help centre whenever the user needs any kind of assistance. The system will also provide a tutorial page where it will explain the functionalities provided by the system.

### 11b. Personalization and Internationalization Requirements

The registration system will provide be presented as a part of the University website, which is only offered in English and French. However, the system is thought as registration tool for students who are already enrolled in the University. Therefore, since the system is being thought for an American educational institute, the system will be provided in English. Perhaps, only the guest tour, that will be available to all the visitors, should be offered also in French as the rest of the website is.

### 11c. Learning Requirements

It should not require a massive amount of time learning how to use the system. In fact, our goal is to create a self-explanatory system that does not ideally need any tutorial section. However, we are conscious of the different levels of confidence that the University students might have with the media tools. We will therefore provide a "tutorial" section that will concretely solve any possible problem concerning the use of the system.

### 11d. Understandability and Politeness Requirements

The system will not use any term that is not specified in the University catalogue. The whole dictionary utilized by the system is supposed to be at least familiar if not completely acknowledged by the user. However, all the vocabulary and metaphors might be further explained in the "tutorial" section.

### 11e. Accessibility Requirements

The system should also consider people with common disabilities and should make possible access to registration system. For example, since approximately 20% of males are red-green colour-blind, the system should be designed in different colours avoiding red and green. Also, all the buttons that need to be clicked should be big enough to be clearly distinguished also by people who have sight issues.

## 12. Performance Requirements

### 12a. Speed and Latency Requirements

The system is required a fair amount of speed especially while browsing through the catalogue and presenting different possibilities for the schedule. The outcomes of the product are not directly influenced by its speed, because all the operations are linked to each other and one operation cannot be computed before the one causing it.

### 12b. Reliability and Availability Requirements

The reliability of the system is directly linked to the level of update of the documents to which it is correlated, such as the catalogue or the students' database. The system and the external documents must be updated constantly according to the necessities of the stakeholders. Both catalogue and database will have to be available to students 24/7. The official registration, however, should be allowed only during office hours, in order to prevent those students who do not have Internet at home to be disadvantaged with regard to those who instead do.

### 12c. Robustness or Fault-Tolerance Requirements

When the system is disconnected or frozen due to over access at the same time, it should save all the process of the users have made up to the point of abnormal happenings. When the users log in with the same id, all the work should be provided.

### 12d. Capacity Requirements

The system should be able to manage all the information incoming from the database and the catalogue.

## 13. Operational and Environmental Requirements

### 13a. Expected Physical Environment

The product is Web based therefore it will be used in any environment that allows Web access.

### 13b. Requirements for Interfacing with Adjacent Systems

For the system to successfully operate the registration system should be integrated with other IT services and the University portal.

## 14. Maintainability and Support Requirements

### 14a. Maintenance Requirements

To ensure the functionality for the maximum period of time, the database and the catalogue must be updated at least every semester. Also, the system should timely integrate modification suggested by stakeholders.

### 14b. Supportability Requirements

The system should need to be entirely self-supporting since the users would be using it only to register courses.

### 14c. Adaptability Requirements

The Web interface should be compatible with standards in order to be usable via all major Web browsers in a wide variety of environments.

## 15. Security Requirements

### 15a. Access Requirements

Everyone (stakeholders and guests) can have access to the system and the catalogue. Every student must have secure and private access to his/her data. The ICT and the registrar can have access to every part of the system. All these accesses (except the "guest tour" access) require identification through ID and password.

### 15b. Integrity Requirements

Data integrity should be assured by limiting access to the database and by appropriate synchronization, and back-up functionalities.

### 15c. Privacy Requirements

The system will provide a protection of the database such as the one that the university already provides. However, the system will have to increment this level of protection

because of the personal data made available on the system, and the larger share of people that will be having access to it through the online registration.

The users' privacy will be granted by the limited access that the log-in process is going to give to the database. Also, the system does not grant direct access to the database itself. Stakeholders who need to access the database will have to access it from a source independent from the registration system.

### 15d. Immunity Requirements

The system will develop a security system that will reduce to the minimum the possibility of corruption from systems and/or humans.

# 16. Cultural and Political Requirements

### 16a. Cultural Requirements

The system should use as little icons and cultural interpretation of figures as possible. University has a multicultural community. Therefore, the system cannot give for granted nor use cultural knowledge such as iconography or symbols that are not internationally recognized, or some of the clients of the system might have some difficulties when using it.

### 16a. Political Requirements

There are no political involvements in this system design.

# 17. Migration to the New System

We suggest that the migration to the online registration system will overlap, at least for the first times that will be used, with the currently available paper-based system. The registrar office will have to at least verify the operations that are being computed on the registration system to detect every unforeseen issue that might come up. Once the system had been successfully used and proved efficient, it will be possible to migrate to the new product.

# 18. Project Risks

The risks that might arise in the implementation of such a system are few; especially if we consider that the system will be constantly monitored in the first years of its effective application, anything that might be wrong will be almost instantly corrected by one of the stakeholders, be it the registrar or the ICT for example. On a general level, however the main risks that this system is facing are:

- The possible overload of the system in the critical days during registration.
- The need of the stakeholders to update the catalogue.

# 19. User Documentation and Training

### 23a. User Documentation Requirements
All user documentation should be supplied online. Different documentation should be foreseen for different stakeholders (students, administration, ICT) with contextual help and easy to understand examples of the use of the system.

### 23b. Training Requirements
No training should be necessary to be able to use the system by students or university staff (online help will be provided).

Some training may be necessary for those managing the back-end interface (Registrar, Dean's office) and training will be provided by ICT operations

The system will need configuration documentation, operational documentation, training material, and tutorials.