Barcelona School of Informatics

PORTFOLIO FOR EXCHANGE STUDENTS

7th Delivery: Final document

Project Management

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1. Introduction

1.1 Context

This project is a Final Project Degree at Barcelona School of Informatics and is directed by Miss. Maria Teresa Abad. The project has been created by the director and the author must develop an appropriated solution, achieving all requirements. Thereupon, we can considerate this project as a personal project guided and helped by its director.

1.2 Brief project desctiption

This project consists on a virtual portfolio destined to university students in mobility programs. It will consist of a application for personal use, where the student has a synchronized calendar, schedule, email, and widgets in order to improve his organization during the mobility program. Every user will have the possibility of being reminded about deliverables, create new events, tasks to do, store his important documents and other features.

1.3 Brief state of art

In this section I am going to briefly introduce some hints about the state of art of the applications destined for mobility students.

We can describe a portfolio as an application composed by some widgets that is used to organize people's daily life. A portfolio can be designed for work, study or any aspects that could require a high level of organization. These applications are not very popular yet, but considering the rise of mobility students and the possibilities offered by new technologies, in a few years these kind of applications will be very used. Please see the Google Now ™ site to understand better what a virtual assistant is. [CHECK no. 1]

1.4 Purpose

The main purpose of this application is to improve the exchange students' organization during their mobility period in order to give them a better experience in their new university.

2. Project scope

The project consists on the development of a new application. Therefore, the code will be implemented from zero, not taking part of previous developed software. Nonetheless, different frameworks will be used to develop this application.

Considering the different circumstances, the project will be divided in three phases.

1. In the first phase, there will be necessary a large study of the different procedures employed by universities when an exchange student arrives. The purpose of this study is to find the similarities between both universities in order to define a generic application that could satisfy the largest number of universities possible.

2. Once this application is defined, the second phase will start. This stage will consist in developing this application using the most appropriate frameworks in order to implement the most important features. That is to say the student validation, register, login/logout, calendar synchronization, tasks creation, important reminds, and so on.

3. Finally, in the third phase will be the customization of the application. It is important to say that in the 2nd phase we will obtain a generic application. Therefore, it will be necessary to allow the users to select the order of the different tasks (depending on their host university) and changing different settings in order to adapt this application to the process used in each university.

2.1 Objectives and requirements

2.1.1 Main objective

"Design and develop an application to help exchange students during his mobility period."

2.1.2 General objectives

- To offer a usable and useful application.
- To make easier the exchange experience of the users of our application.
- To develop a quality software considering the resources given.
- To improve the university-student relationships.

2.1.3 Requeriments

- The response and syncronization of the application will be fast.
- All software will be developed with open-source tools and open-source frameworks.
- The application will be usable.
- The application will be compatible with all Android devices (Tablets and Smartphones).
- The application could be configured by the user depending on the university preferences.
- The application will have at least the next features:
    - User management: User registration, login, logout, profile information.
    - Calendar management: Create and update events, syncronization…
    - Schedule management: Create and update tasks, set warnings and alarms.
    - Document management: Store and send important documents.
    - Settings: Language, process configuration and other preferences.

2.2 Risks

Considering this project as greenfield, we must bear in mind some important risks.

- Unknown frameworks.

It is important to know what kind of framework we will use to implement our software. It is necessary to consider all available frameworks and other developing tools in order to choose the best way to develop our application. Otherwise, we could find configuration problems, unkown bugs, incompatibilities, etc. To ensure the quality of our development, we must select proven tools.

- Bad scheduling.

Another point we must consideer is the time we have to develop our project. A good and realistic scheduling plan is key to achive all objectives respecting the initial requeriments. If we do not make a realistic scheduling or we do not understand the time we will need for each stage of our project, the result will probably be an unorganized development. The consequences could be wasting more time than needed and having more unecessary problems derived from a bad scheduling plan.

  - Incomplete application.

    The worst consequence, and the most common derived from a bad scheduling plan, is to delivere an incomplete sourcecode. In consequence, our project will have less value and the stakeholders could consideer that the application is not enough to satisfy the objectives.

- Experience in software projects.

The low experience of the author developing software projects like this could be another important risk. In consequence, the experience of the project's director will be very important to guide this project to success.

2.3 Methodology

The methodology we must follow to our development will be an agile methodology. Currently, the use of this kind of methodologies is rising due to all possibilities that they offer. Agile methodologies provide us with flexibility, fast development and results in less time than any other ordinary methodologies. It is early to decide exactly what methodology we will use, but using agile methodologies we will ensure avoiding some risks previously described.

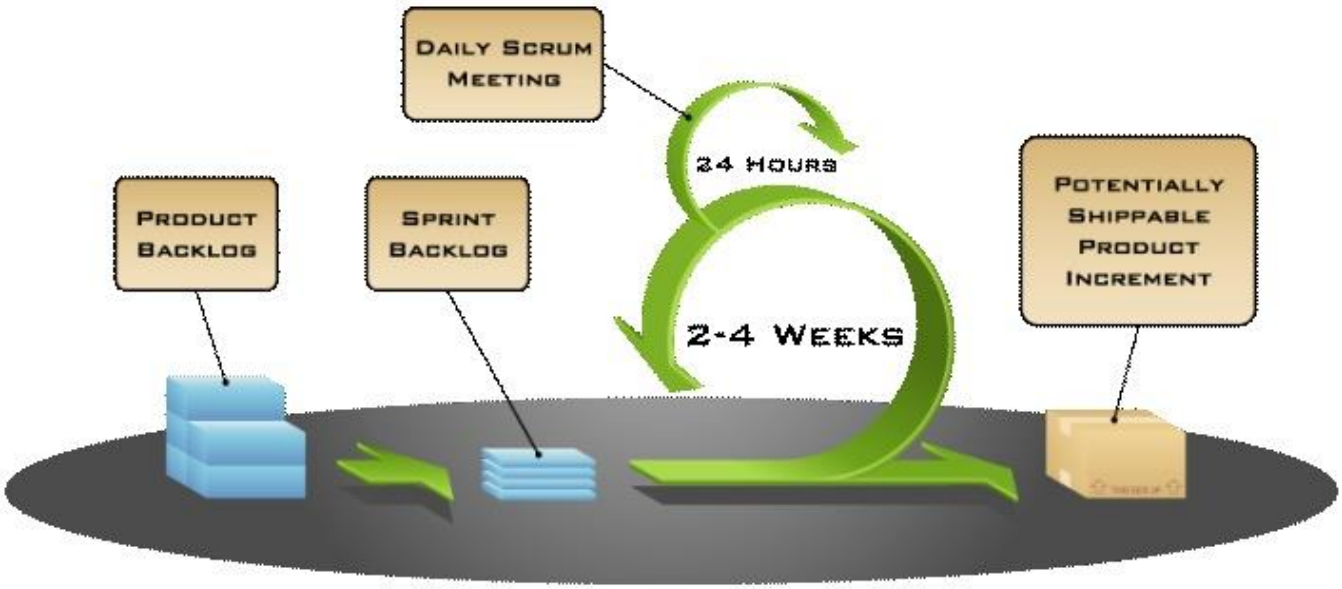


FIGURE 1: AGILE METHODOLOGY SCHEMA

http://www.refractions.net/expertise/agile/

- Initial stage.

This phase consists in developing a planning, feasibility study, analysis and design of the software. The initial stage will be previous to the first iteration in order to improve the project management.

- Iterations.

Iterations are the most important part of agile methodologies. Each iteration of our methodology will have five different phases.

1. Analysis of the sprint.

   Consists on evaluating and analysing what will be the part of the project that we must implement in the next days. It is important to bear in mind the scheduling plan in order to respect the deadlines of our project.

2. Implementation.

   In this phase we must begin to implement our software in consequence of the previous point.

3. Testing.

   Tests consists in validating that our software is correct and does not have bugs. Depending on the iteration the tests will change, being stricter in the critical features of the project.

4. Integration.

   At the end of each iteration, it will be necessary to update the project with the new changes and prove that all new features are compatible with the previous existing ones.

5. End of the iteration.

   Once the integration is successfully completed, it will be necessary to revise the scheduling plan and prepare the next iteration.

- Final deliver.

  Finally, once the software is developed, it will be necessary to deliver it to the interested part achieving all the requirements previously stipulated. Furthermore, a good manual and other documents will help to improve our project. For more information, please check the agile methodology official site. [CHECK no. 2]

3. Project planning

3.1 Estimated project duration

The estimated project duration is approximately 6 months. The project starts on June 25th, 2013 and the deadline is on January 6th, 2014.

3.2 Considerations

It is important to consider that the initial planing could be revised and updated because of the evolution of the project. Using agile methodologies implies that can appear new requirements wich can alterate the proposed planing.

Furthermore, during August 2013 the project will be stopped due to summer holidays.

3.3 Project planning and feasibility

This phase is currently running. It appertains to Project Management Course and it includes the next four stages:

i. Project scope.
ii. Project planning.
iii. Project budget.
iv. Initial state of art.

3.4 Project analysis and design

The main objective of this phase is to make an accurate analysis of the project and develop the consequent design.

On the one hand, in the project analysis it will be necessary to define and set the objectives, requirements, features and the use cases of our application. Furthermore, the state of art will be expanded and it is provided an analysis and evaluation of the different technologies used to the development.

On the other hand, project design consists on creating the architecture of the software, i.e. sequence diagrams, database design, etc. That implies using all the knowledge acquired during the Bachelor Degree in Computer Engineering in order to make a high quality software.

3.5 Project iterations

As we have seen in the previous document, we can divide each iteration in analysis, implementation, test, integration and preparation for the next iteration. Hence, the project will have the following iterations bearing in mind different resources for each one.

0. Initial set up.

   This iteration is oriented to prepare the environment and install the necessary frameworks to develop correctly the application. Once all frameworks are installed, it will be necessary to configure them in order to start the next iteration.

   Resources needed:

   Hardware:

   - Hp EliteBook 8440p
   - Samsung Galaxy S III

   Software:

   - Microsoft Windows 8 Professional
   - Eclipse
   - Android SDK

1. Portfolio development.

   In this iteration we are going to analyse and study the best solution to develop our portfolio. In addition, the main features like users' management, calendar management, agenda management, document storing and so on will be developed.

2. Customization.

   This iteration is destined to allow the exchange students to configure its application attending to the different needs of their host university. The functionalities implemented will be mainly about settings and system configuration.

3. Integration of different modules.

   The last iteration consists on linking the different modules created and integrating them into a single application.

   For all these developing iterations the next software will be needed, in addition of the previously named.

   - Microsoft Project 2013
   - Microsoft Visio 2013

3.6 Final stage

The final stage consists on closing the project development definitively. A user manual and the final report will be provided and finally I will proceed with the final presentation.

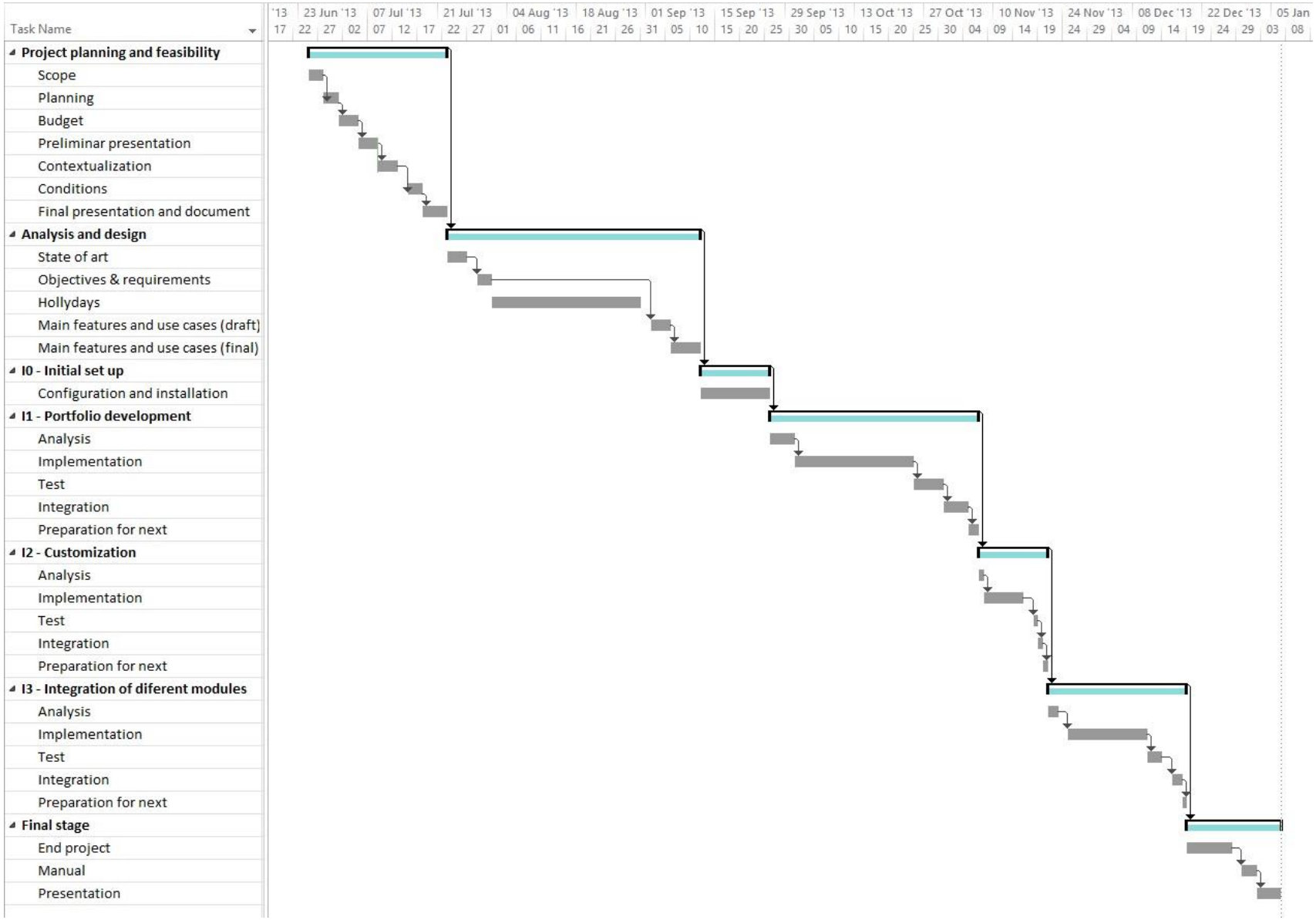
To close this project and give a good documentation, the next software will be needed

- Microsoft Office 2013
- Adobe Reader X

3.7 Estimated time

Stage	Estimated dedication (hours)
Planning and feasibility	80
Analysis and design	70
I0 – initial set up	50
I1 – portfolio development	150
I2 – customization	50
I3 – integration of different modules	100
Final stage	50
Total	550 hours

3.8 Gantt chart



3.9 Action plan

As we have seen in the previous delivery, the agile methodology will allow us to revise and adapt dynamically the initial planning. Hence, if the stages referred in the previous points have different duration than expected, the planning will be modified. For example, if the stage has less duration than expected, it will start immediately the next one. Nonetheless, if the task lasts more than expected, it will delay the following tasks.

At the end of each stage a meeting with the director of the project will take place in order to analyse the project and confirm that the author is following a good process.

In conclusion, it will be approximately seven meetings and the estimation of the dedicated hours per week is 35 hrs. /week. Hence, the project planning is attainable.

4. Project budget

4.1 Considerations

It is important to consider that the resources we will need to develop this project have an important cost. These resources are divided into human and non-human resources. For the human resources, the amount will be proportional to the time inverted by the software developer.

Considering these medium salaries:

- Project Manager: 40€/hour
- Software Developer engineer: 25€/hour
- Software Developer testing: 20€/hour

However, for the non-human resources, it will be necessary to bear in mind its amortization.

4.2 Project budget

4.2.1 Budget monitoring

Project monitoring will be very important to verify whether the real cost is similar to the estimated budget. To achieve this, at the end of each iteration we will analyse and calculate the real cost in hours. In the case both budgets will be very different, it will be necessary to understand why. In conclusion, the final cost of the project will be the real cost, calculated at the end of each iteration.

4.2.2 Human resources

The next table shows the relationship between each stage and its budget.

Stage	Estimated dedication (hours)			Estimated cost (Euro)
	Project Manager	Software Developer	Software Developer in Test	
Planning and feasibility	80	0	0	3.200
Analysis and design	70	0	0	2.800
I0 – initial set up	15	35	0	1.475

I1 – portfolio development	10	130	10	3.850
I2 – customization	10	30	10	1.350
I3 – integration of different modules	10	80	10	2.600
Final stage	20	10	20	1.450
Total	550 hours			16.725 €

TABLE 1: HUMAN RESOURCES BUDGET

4.2.3 Non-human resources

- Software licences.

Considering the useful life of the software is four years, the final cost of the software will be the next.

Product	Cost (Euro)	Units	Amortization (Euro)
Windows 8 Professional	279,99	1	34,99
Microsoft Office 2013	119	1	14,86
Microsoft Project 2013	769	1	96,13
Microsoft Visio 2013	399	1	49,88
Adobe Reader X	0	1	0
Eclipse license	0	1	0
Android SDK	0	1	0
Total	1.566,99 €	7	195,87 €

TABLE 2: SOFTWARE LICENSES BUDGET

- Hardware.

Considering the useful life of the hardware is five years, the final cost of the hardware will be the next.

Product	Cost (Euro)	Units	Amortization (Euro)
Hp EliteBook 8440p	1299,99	1	129,99
Samsung Galaxy S III	499	1	49,9
Total	1.798,99 €	2	179,89 €

TABLE 3: HARDWARE BUDGET

4.2.4 Total

Concept	Cost (Euro)
Human resources	16.725 €
Non-human resources	375,76
Software licenses	195,87
Hardware	179,89
Total	17.101 €

TABLE 4: TOTAL BUDGET

5. Project context

5.1 The Erasmus program

The Erasmus program (EuRopean Community Action Scheme for the Mobility of University Students) is an educational European mobility program, where more than 30 European countries participate. Its purpose is promoting the learning of languages, promoting students' mobility and innovation. There are currently more than 4,000 higher institutions participating in Erasmus across the 33 countries involved in the Erasmus program and over 2.2 million students have already taken part. For more knowledge, please see Wikipedia. [CHECK no. 3]

FIGURE 2: ERASMUS LOGO

https://en.wikipedia.org/wiki/File:Erasmus_logo.svg

5.2 Associated problems

In this section I am going to explain the three main problems that all Erasmus students will have to overcome. To achieve this point I have been consulting the official Erasmus Forum, where students from all countries explain its own experiences. [CHECK no. 4]

5.2.1 Bureaucratic process

The first problem, and probably the most critical, is the bureaucratic process. There are a lot of rules and processes we must follow to make a correct application. We can divide this process in two parts: before departure and after arrival.

On the one hand, once the application is accepted, the bureaucratic process will start. In this process the student has to complete, sign and send a large quantity of documents in order to make a correct exchange. This process is the most critical because, if the student forgot any document, he could lose his place in the host country.

At the moment the student arrives to their destination, he will have to overcome the second part of the bureaucratic process. This part is less critical, but is more difficult because the student is in a different country.

5.2.2 Housing

Secondly, the accommodation is another important point that all Erasmus students must bear in mind before traveling. There exists a lot of different kinds of housing, but the most common are the student residences and the student houses. These buildings are specially oriented to students and also exist exclusively for exchange students. Nonetheless, sometimes it is complicated for the students to know these kinds of housing because not all universities allows enough information to their incoming students.

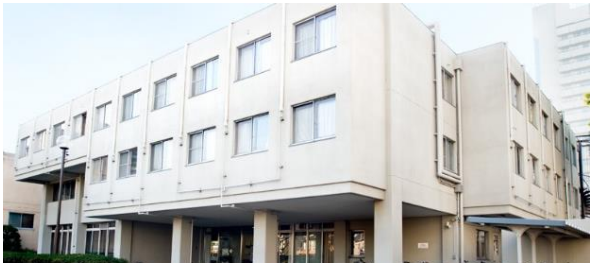


FIGURE 3: NAGOYA UNIVERSITY HOUSING

http://www.nagoya-u.ac.jp/en/academics/daily-life/housing/

5.2.3 Organization and communication

The third important problem is the student organization during his stage. The duration stages are from 3 months until one year. Hence, during this period, it is very important to be well organized and do not

forget the real purpose of the Erasmus program. It is true that the student has to know the new country, the most interesting places and the new culture, but he cannot forget going to classes and making all university tasks. Furthermore, for a good integration of our student, it will be necessary to provide him the possibility of taking language lessons and met new people.

In conclusion, if the student overcomes the difficulties presented above, he will have a great experience and it is sure that he will recommend it to all his friends. It is very important to know other countries and other people in order to grow and improve our culture.

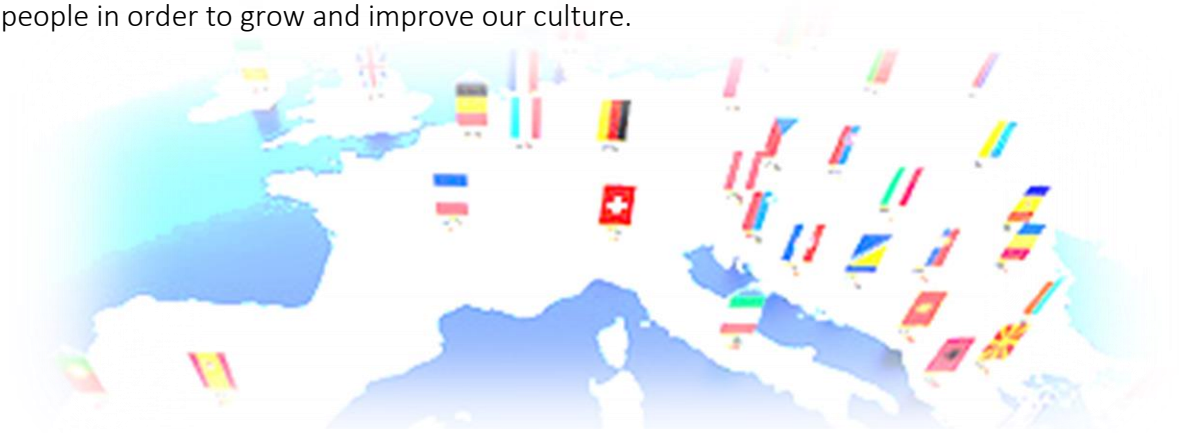


FIGURE 4: ERASMUS COUNTRIES

http://www.stic.de/en/news/erasmus-for-young-entrepreneurs.htm

5.3 State of art

5.3.1 Exchange process

Depending on the university, the exchange process can change. It is true that the Erasmus program is based in a unified process that all universities follow, nonetheless, some differences could appear. These process are very long and also it have to respect the national and international legislation.

In this section I am going to analyse some exchange process in order to understand the current problems.

- Barcelona School of Informatics

In my university, the student incoming process is completely explained on the website. For more information, please see the official website. [CHECK no. 5]

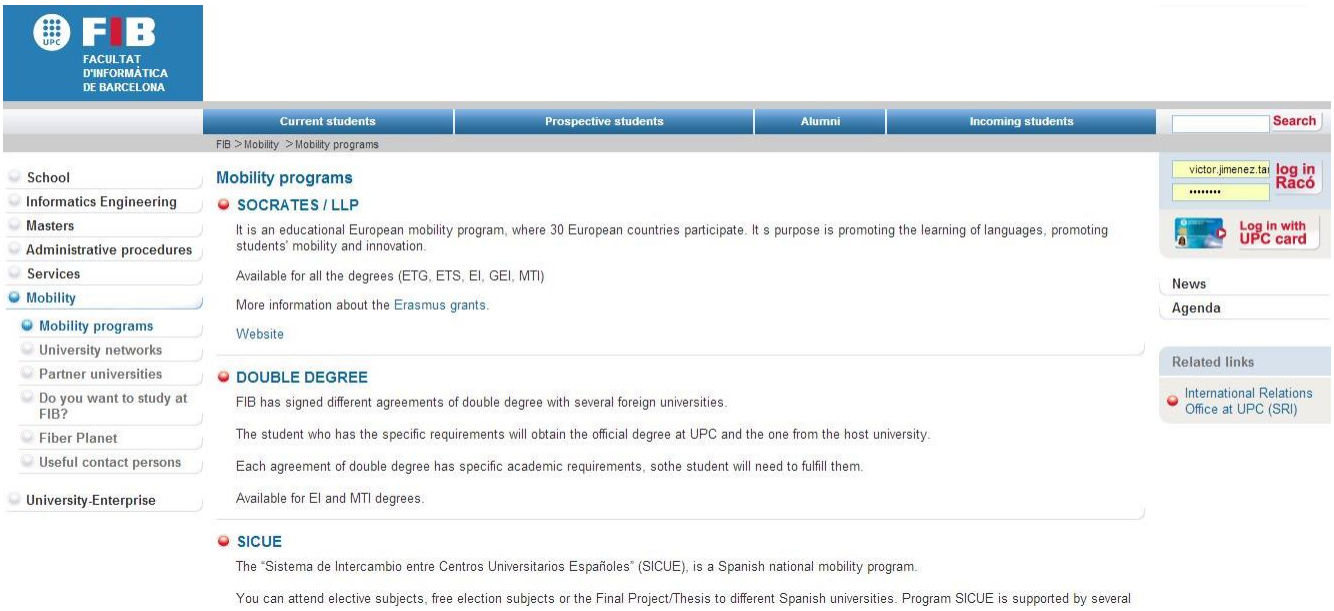


FIGURE 5: ERASMUS ON FIB OFFICIAL WEBSITE
HTTP://WWW.FIB.UPC.EDU

The necessary documentation before depart is the following.

- Application Form (on-line process).
- Official Transcript of records (official document issued by your home university with all the courses done with the marks).
- Curriculum Vitae.
- VISA and Insurance.
- List of courses enrolled at present semester.
- Learning Agreement signed by the student and the student's university.

Once the student arrives, he will have to complete his process following the next steps.

- UPC registration.
- Registration to the Orientation week.
- Learning Agreement signed by all parts.
- Arrival certificate.

- Linnaeus University

In this section I am going to explain the process followed in Linnaeus University (my host university in September) in order to see the most important differences. For more information, please see the official website. [CHECK no. 6]

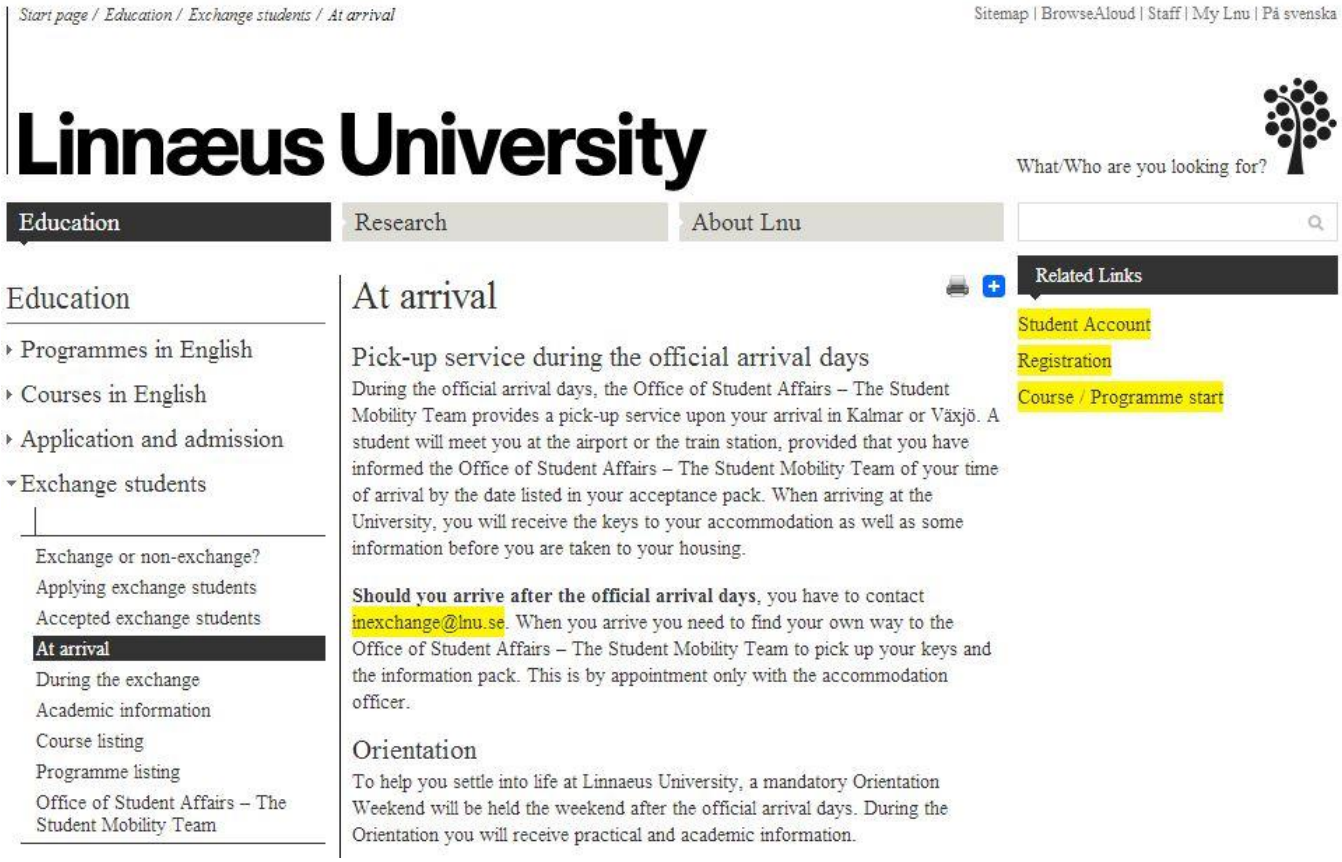


FIGURE 6: ERASMUS ON LINNEAUS OFFICIAL SITE

WWW.LNU.SE

The necessary documentation before depart is the following.

- Application Form (on-line process).
- Official Transcript of records.
- Insurance.
- Learning Agreement signed by the student and the student's university.

Once the student arrives, he will have to complete his process following the next steps.

- Having a student account.
- Learning Agreement signed by all parts.

5.3.2 Current applications

- ESN Roma ASE

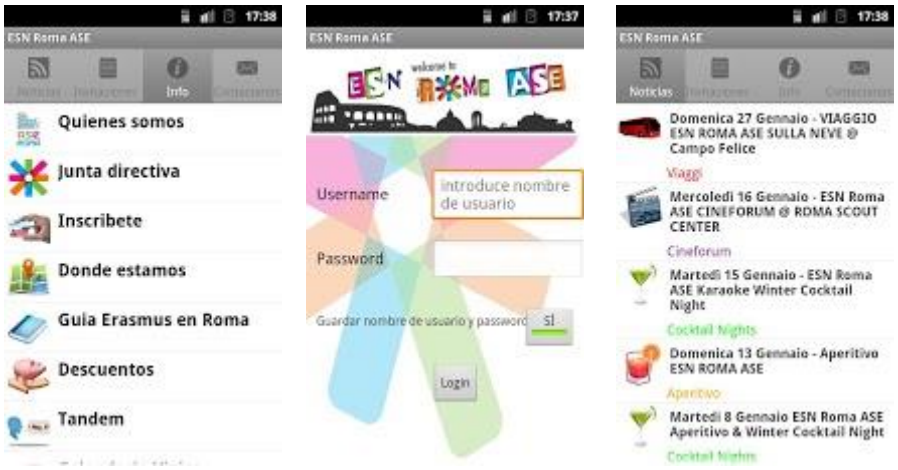


FIGURE 7: ESN ROMA ASE SCREENSHOTS

https://play.google.com

This application has been developed for the Erasmus Association of Rome (Italy). It is one of the largest Student Associations in Europe and it is a reference for the other existing associations.

This application is oriented to the Erasmus students in Rome, but it is not linked to any concrete university. Hence, it is not oriented to help students in his university life, but is oriented to socialize people in Rome and organize events. For more details, please see app information in Google Play Store [CHECK no. 7]

- ESN Sea Battle

FIGURE 8: ESN SEA BATTLE SCREENSHOTS

https://play.google.com

ESN Sea Battle is a student cruise that occurs twice a year, usually in November and April. Approximately 2,000 students from Sweden, Denmark, Norway, Latvia, Estonia and Lithuania participate in the cruise. During the cruise organized all sorts of activities.

These are the main functionalities of the application:

- The program of the upcoming event.
- Information about and maps of Stockholm and Tallinn.
- Gallery with photos and videos of past events.
- The Official Facebook event and update your status.
- Information about the ESN Sea Battle.

For more details, please see app information in ESN Sea Battle official site. [CHECK no. 8]

5.3.3 Conclusions

To sum up, I am going to analyse the different conclusions I have deduced.

Talking about the exchange processes, as expected, we can find a lot of similarities between both universities. That imples our application could be compatible with all universities in the Erasmus program. Nonetheless, in some cases it will be necessary to make modifications depending on the host university.

On the other hand, looking at the current applications destined to Erasmus programs, we can see that none of them are oriented to help students in their university tasks.

Hence, for these reasons I think our application could have great acceptance.

5.4 Technical analysis

In this section I am going to talk about the different techniques I will use to develop the application.

5.4.1 Developing language

The portfolio for exchange students will be compatible for Android devices. Hence, it will be developed in Java, because it is the primary android development language. In addition, it allows programming in C++ (NDK for libraries) and other languages like Python, bash or et (via the Scripting Environment).

FIGURE 9: ANDROID LOGO

http://thetechblock.com/state-of-android-development-2013/

5.4.2 Technologycal requirements

For a well performance of this application, the smartphone or tablet will need to achieve the following requirements.

- Android operating system: The device must be based in Android technology, otherwise it will be impossible to execute.

- Internet connection: An internet connection will be necessary to execute an important part of the functionalities like register, login, calendar synchronization, etc.

- Global Positioning System: A positioning via GPS will help our application to help the user to find some interesting places in their new country.

5.5 Social impact

The virtual portfolio for exchange students will be a very useful application and it will have a big social impact, above all for the students' daily life. Thanks to this project, the students and universities will have the following benefits.

- Improve the mobility experience:
  Making easier the student's departure, arrival and the entire staying, the Erasmus experience will be most interesting and will be more recommended for all students. Hence, it will help to increase the number of exchanges per year, promoting the mix of students and its internationalization.

- Improve the relationship between students and the universities:
  Thanks to the customization of the portfolio, the student will have a personalized application, perfectly adapted to the host university requirements. It will have interesting contacts, interesting places, needed documents, and so on. Therefore, the relationship between students and administrations will be more fluid.

- Increase the possibilities of having great academic results:
  Finally, thanks to calendar synchronization, reminds of exams and deliverables, etc. the students will be more organized. Thus, they will be able to use the time better and profit its available hours in order to improve its academic results.

To sum up, the social impact of this application will be bigger than we can expect at first look. Students, universities and the main society will be benefited from this application improving organization, relationships and the academic results.

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