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FACULTY OF BUSINESS ECONOMICS
Master of Management: Management Information Systems

Masterproef

The international collaboration among universities: The development of
E-learning applications in an international environment

Promotor :
Prof. dr. Koenraad VANHOOF

Supervisor :
De heer Wouter FAES

Mohamad Mahmud

*Master Thesis nominated to obtain the degree of Master of Management , specialization
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UNIVERSITEIT HASSELT

THE INTERNATIONAL COLLABORATION AMONG
UNIVERSITIES

THE DEVELOPMENT OF AN E-LEARNING
APPLICATION IN AN INTERNATIONAL
ENVIRONMENT

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September, 2013

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Abstract: The purpose of this thesis was to encourage the collaboration between universities in international education, the second purpose was to invest the international collaboration between universities in multiple areas, the last aim was to provide recommendations in order to improve and develop this international collaboration. It was noted that the international collaboration between universities needs some improvements and developments such as adding unique technologies to develop or all improvements that this international collaboration between universities need it.

Preface

The Thesis topic is “ The collaboration between universities in international education”. It is submitted by Mohamad Mahmud as a partial requirements of master degree of Management in MIS (Management Information System) specialization. It includes the work done from March to September 2013. It was performed under the supervision of Dr. Koen Vanhoof and Wouter Faes.

In October 2012, Dr. Koen Vanhoof sent me list of thesis topics, one of these topics was “Collaboration” so, I think more in this topic and how to frame and formulate especially before the sleeping even complete the idea and reach to choose thesis topic.

In November 2012, I was confirmed that Wouter faes will be as a co-promoter on my thesis topic, Wouter Faes accept to supervise on my thesis and encourage me to continue through confirming me that he will be ready in any time and his suggestions regarding thesis topic.

I think that I have learned a lot regarding the international collaboration between universities, gotten some experiences and gotten broad perspective of that topic.

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I would like to thank a lot my great family.

I would like to thank my promoter Prof. Dr. Koen Vanhoof and my co-promoter Dr. Wouter Faes, who was ready in any time. I thank them great thanks because of their greatest ideas and my useful meetings with them.

I would like to thank all the people who supported me in my thesis.

Mohamad Mahmod

September 2013

EXECUTIVE SUMMARY

This thesis provides a study of the international collaboration among universities and developing in this type of collaboration which serves the whole education process. Methods of research include two main cases, the first is literature review which discusses the developing the international collaboration among universities in many countries such as, Europe countries, Japan, U.S.A, UK, Korea and others and the importance of e-learning, and the second is case study which talks about the international collaboration between PSUT and its partners and improving the facilities to the international students by using the unique technologies and its advantages and disadvantages in order to exploit it for proposed implementation by introducing the sharing information services to the international collaboration among universities.

The findings of the thesis show that the international collaboration among universities is necessary in order to develop the education process in international universities and cross cultures to the students and the staff. This collaboration can be enhanced by creating new programs such as Erasmus, Tempus and so on and by offering more facilities to the international students and the staff. It shows the effective success of this collaboration and its effects on the education side, economic side, and business side.

The thesis shows the success of international collaboration between PSUT and Lancaster university in hand, and the success of international collaboration between PSUT and Hasselt university in other hand and it suggests standardizing the collaborated PSUT group and collaborated Hasselt university group and make sharing among them and applying the proposed facilities as example through electronic study card and electronic teach card and finally, this collaboration return more benefits and profits to the collaborated international universities and more advances in ranking comparing with other universities around the world.

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LIST OF ABBREVIATIONS

PSUT	Princess Sumaya University for Technology
MIS	Management Information System
IMS	Information Marketing System
MBA	Master of Business Administration
IRO	International Relations Office
RCO	Research Coordination Office
SMS	Short Message Service
DAAD	<i>Deutscher Akademischer Austauschdienst</i>
E-learning	Electronic learning
E-Marketing	Electronic Marketing
UHASSELT	Universitiet Hasselt (Hasselt University)

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CHAPTER 1: INTRODUCTION

In this introductory chapter we will briefly outline the background of this study, its objectives and methodology and its structure. We will clearly indicate the logic of our research and the contents of each of the different chapters.

1.1. Background

Nowadays, the evolution in science and technology is so rapid that in order to follow this evolution closely and even lead it in some instances, universities cannot face it alone. They have to collaborate with each other rather and on a global scale.

The international collaboration between universities is, by nature of their performance alone, necessary in order to have access to and create universal knowledge. Other authors state this as well and stress the importance of programs thought in English at university level to become truly international (Mc Callum and Beatty, 2010).

Collaboration among universities has become a necessity to be capable of developing the national scientific level (micro-environment) and be recognized on international scientific level (macro-environment). Advances in world ranking can only be made if the education process at university level becomes more efficient and effective.

Yet the collaboration between universities must also be seen as a competitive process where partners and groups of partners are constantly trying to outmaneuver each other and go faster than others in developing an interesting offer for students and scholars based on the scientific expertise they possess and acquire. Coordination and partnerships are key to staying competitive with an up to date academic calendar and be capable of satisfying larger numbers of students and innovating quickly by developing unique technologies on world level.

A problem encountered however, certainly when different continents are involved is that many students lack the necessary funds to study abroad, that exchange support systems are limited and that not necessarily all the best teaching material reaches the students of partners. E-learning might offer a partial solution to these problems.

1.2. Objectives of this dissertation

The main objectives of this thesis are threefold. We want to:

1. encourage the international collaboration program between universities;
2. investigate this collaboration in multiple areas; and
3. give recommendations to develop an effective collaboration process using IT-technology and in the field of IT-technology.

1.3. Thesis methodology

In order to achieve these thesis objectives, our methodology builds on two approaches: a theoretical one and a practical one. A combination of both should lead to conclusions and recommendations about the collaboration process between universities. Figure 1.1 depicts this process in detail.

The theoretical part of the dissertation uses existing information and knowledge on university collaboration and its results and is checked in the practical part whether it is largely correct when applied in reality. In this practical part we will thus look at data about previous experiences of universities in international collaboration between universities. We will look at the development of staff using collaboration, the exchange of students and the use of several collaboration methods in doing so.

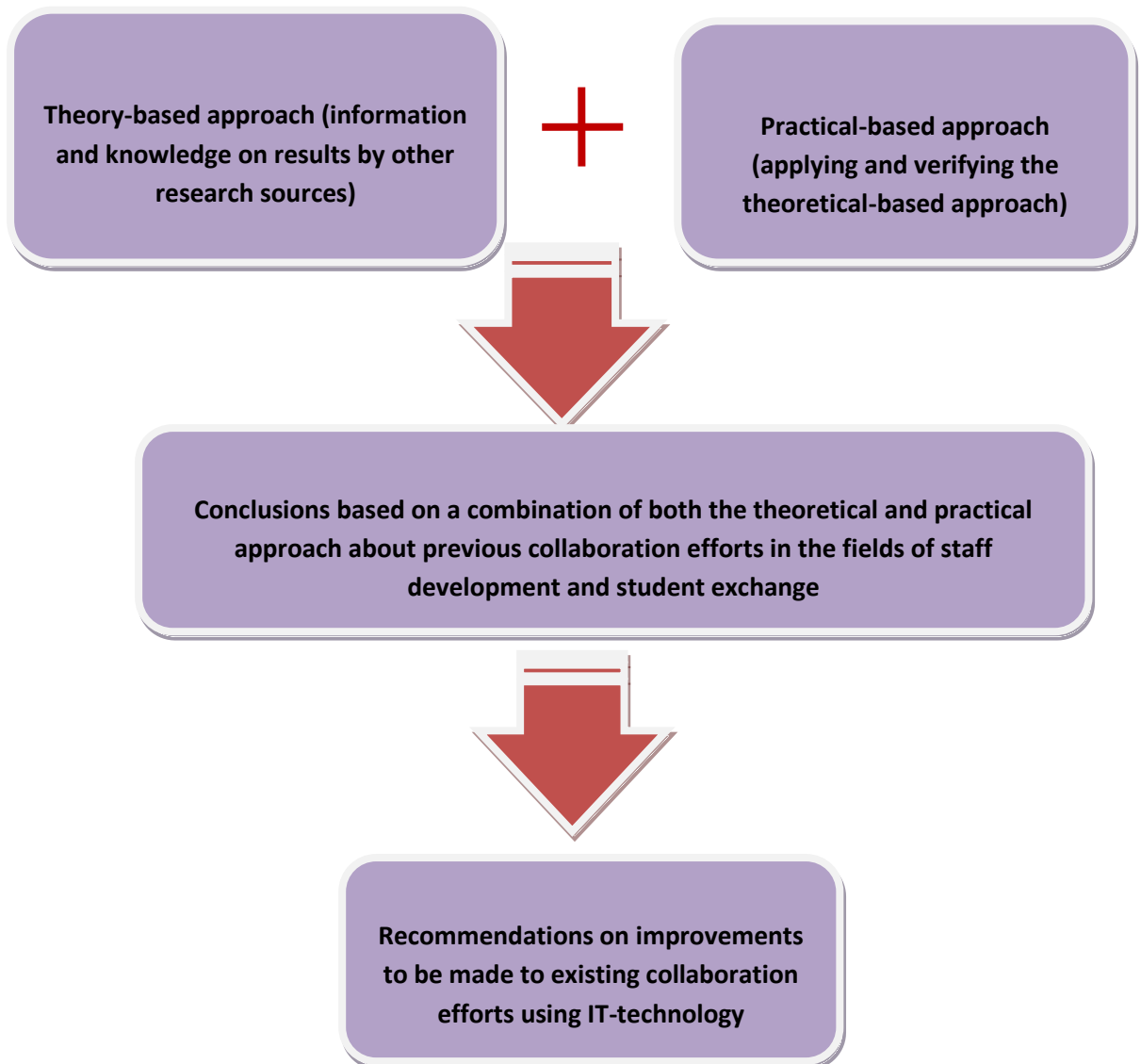


Figure 1.1 Schematic representation of the study (Source: own development)

The research methodology of the thesis is thus split into two separate parts. The first one is a literature review, the second one a practical case study.

In the literature review and desk research section, we try to identify the objectives, benefits, challenges, advantages and disadvantages and drivers and barriers of collaboration between universities. We consult books, journals and research reports via Google, Emerald and Proquest about these topics to this end. The final objective is to depict recent developments in international cooperation and collaboration between universities at world level and to draw conclusions and recommendations from it.

In the case study part we collected information considering the collaboration among universities in particular, PSUT and Hasselt University, which have a long standing and developing relationship. We gathered information regarding the practical experiences about education and exchange through meetings with some lecturers of both universities and use these experiences in order to employ them in further collaboration recommendations. For PSUT, information was gathered on site during the first semester of our academic year. For Hasselt University, E-mailing and meetings with Dr. Wouter Faes were used. The objective was to collect information on the interviewees' experiences. Their orientation and collaboration enable us further to detail our recommendations.

Since our research is about how to improve university collaboration using IT-technology and in this field particularly, more information will also be given about the protocols used and technology applied at both universities in our study.

1.4. Organization and Outline of thesis

This thesis is organized as shown as Figure 1.2.

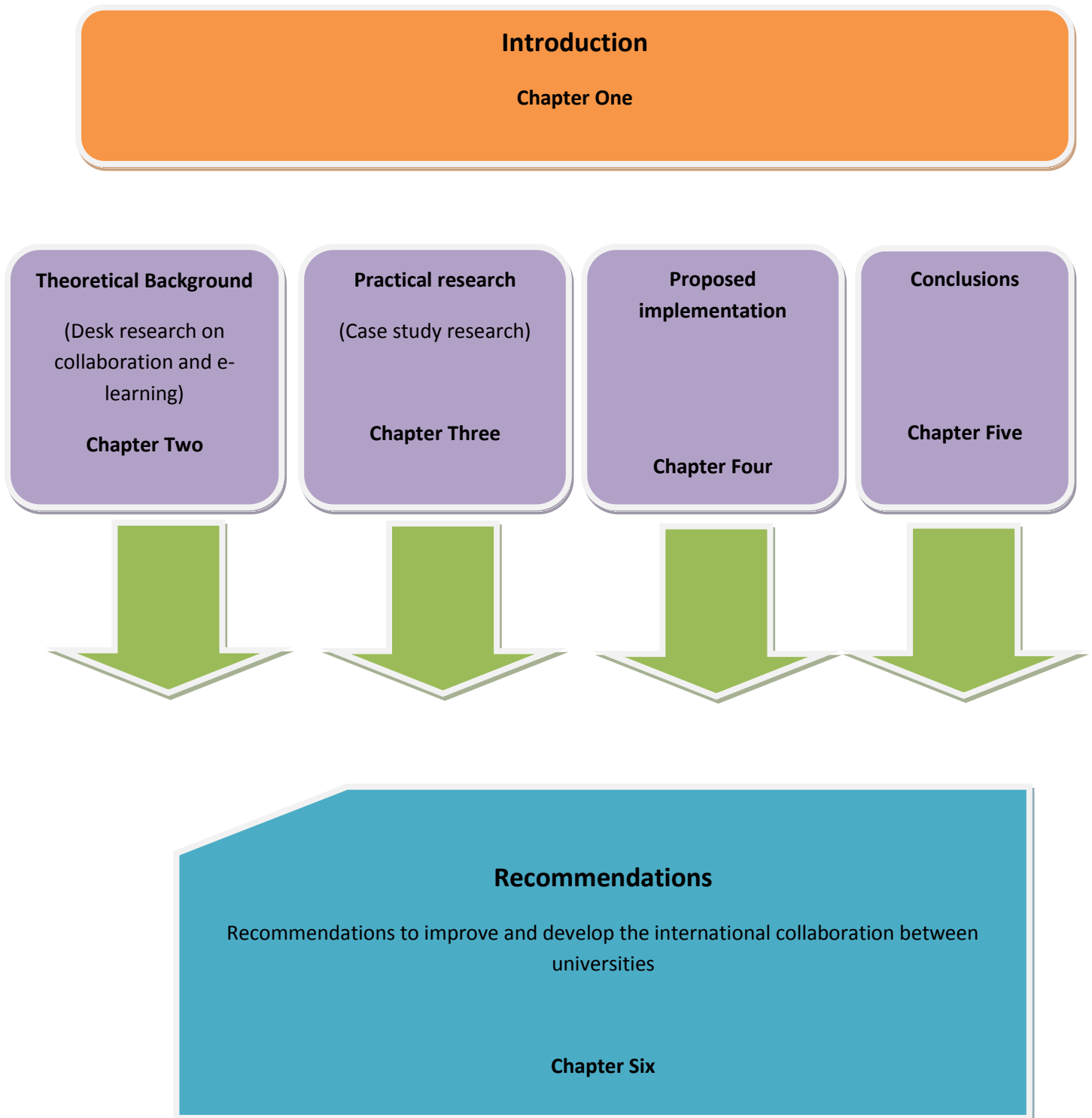


Figure 1.2 Organizing the thesis: contents and chapters. (Source: own development)

The outline of thesis gives a brief description of each chapter and indicates the subjects treated and main problems tackled in the chapter.

Chapter Two provides an overview on the concepts of the collaboration between universities in international education, types and cover more details about that, the significance of the collaboration between universities in international education and on e-learning.

Chapter Three talks about the case study which regard the collaboration between PSUT (Princess Sumaya University for Technology) and its partners. It represents the facilities used, the advantages and disadvantages experienced and the prospect of further developing this collaboration.

Chapter Four gives the proposed implementation by introducing the sharing of information services to the international collaboration partners within a university network such as developing (iremind)services between the staff, the coordinator on one hand and the international students on the other hand, (icollab) services which are only between the staff, coordinators and experts in collaborating universities and (Ipresent) services to all staff and students that is peer to peer services and finally the development of an e-study card. The applications are just an example of what e-learning and IT-technology could represent to internationally collaborating universities using the most advanced technology.

Chapter Five puts forward the most important conclusions about the collaboration among universities in international education and the use of e-learning tools.

Chapter Six finally proposes recommendations to improve the collaboration among universities in international education using e-technology.

CHAPTER 2: THEORETICAL BACKGROUND ON INTERNATIONAL UNIVERSITY COLLABORATION AND ON E-LEARNING

The aim of this chapter is to provide an overview of all the concepts used in this dissertation. These concepts are: collaboration between universities in international education and the advantages and disadvantages of e-learning.

The chapter is built as follows. Section 2.1. gives an overview of this and covers the different types in it in more detail, whereas section 2.2. tackles the international collaboration between universities and shows its significance in general and in particular in Europe and Japan. Section 2.3. depicts the collaboration and previous experiences of the collaboration between PSUT and Hasselt University. Section 2.4. speaks about the types of international collaboration between universities. Section 2.5. talks about the importance of e-learning in higher education and the benefits and disadvantages of it. Section 2.6. tackles the significance of the study, benefits and facilities, while Section 2.7 finally tries to briefly draw some conclusions.

2.1. Introduction: concepts and importance

Collaboration in general is defined as “working together to achieve a common goal” (Wikipedia.com from CollinsDictionary.com September 18, 2012). **The collaboration between universities** depends on coordination of different types of coordinated efforts. First there is simple cooperation between universities in several fields, mainly education. Further there is the development of partnerships. This type of cooperation depends on the development of deeper mutual trust and the realization of common benefits and efficiencies through exchanges of students, teachers and researchers and the common generation of new knowledge (Australian government, 2004 ,p. 1). **The international education system finally** will eventually depend on the offering of common degrees programs in foreign countries (Krista L. McCallum Beatty June 2010). We call this collaboration.

The collaboration between universities in the international education field is mutually beneficial: it gives the universities involved benefits and makes a “win-win” situation possible by achieving more than one could do in this field alone. It draws on the experience and expertise available in different fields and places and thus creates a better educational offer on the international level that is also more competitive. It thus achieves for the partners worthwhile results that are more effective, better and larger than when a university would do this on its own alone.

Figure 2.1. shows the synergy that exists between these three types of cooperation between university institutions, eventually and gradually leading to “an international university”.

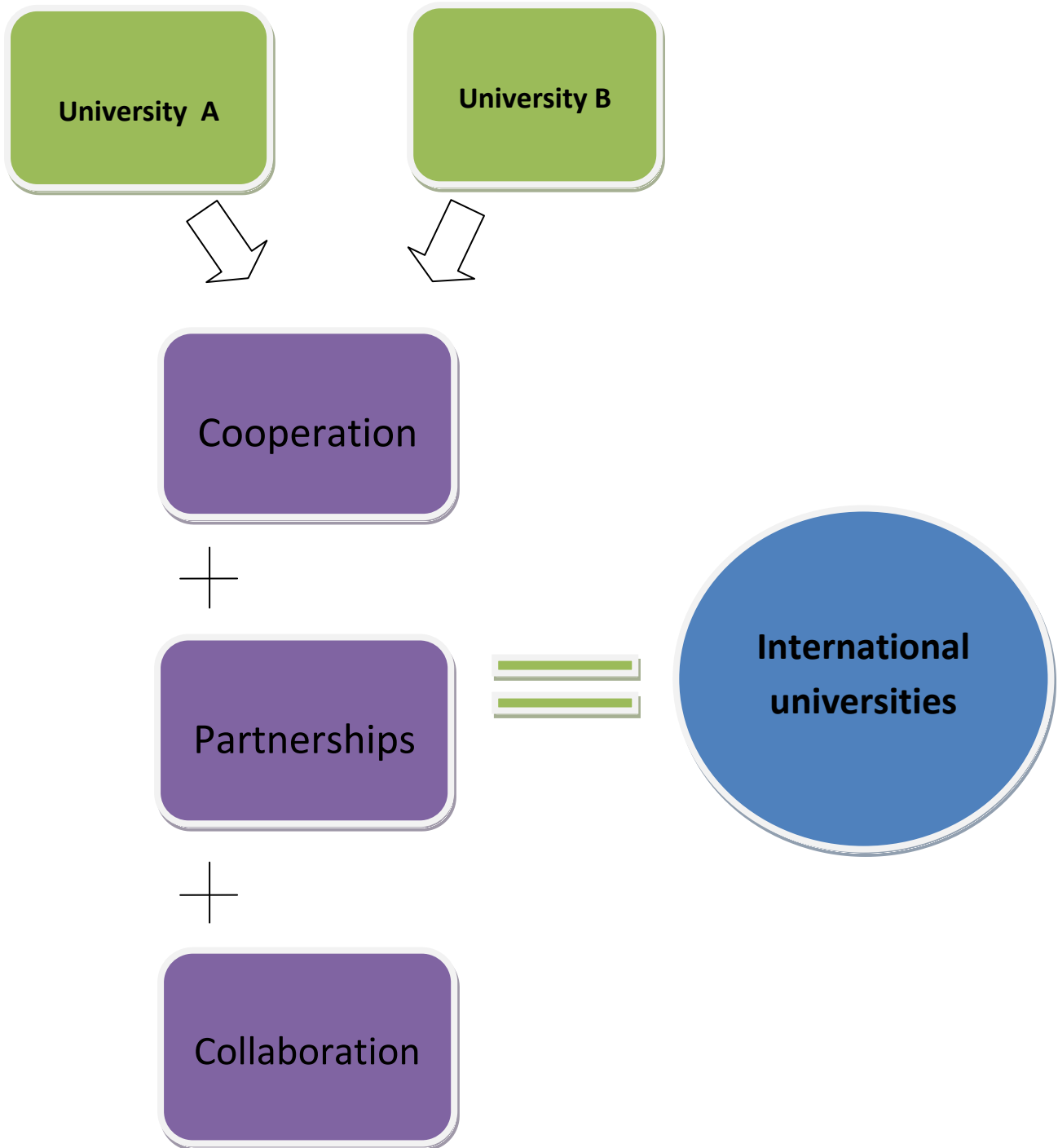


Figure 2.1. The sum of Cooperation , Partnerships and Collaboration gradually leads to the development of international universities

Success of the collaboration between universities in the international education automatically leads to an increased orientation towards this collaboration program. One of the important factors of success this program is indeed the gaining of satisfaction of the students and their families and the staff of both universities. Excellent program performance is key to this. It will lead to a good reputation of the exchange efforts on all levels and consequently to a certain group of “loyal customers”, both external to the universities (the parents of the students) and internal (students and staff). The message that education by serving all people around the world through innovation, development of technologies will be accepted more readily and go hand in hand with further scientific development based on the creation of mutual cultural respect. This in turn will create the ideal circumstances for the participating universities to gain in reputation compared to their competitors and become one of the leading centers of higher education exchange. The satisfaction of the different groups involved also leads to increased attractiveness of the program, which leads to an increase in student numbers and encourages the involved university partners to make even more efforts for collaboration. Finally, international collaboration creates efficiency by creating new methods to innovation and innovation in education and in developing unique technologies based on multiple expertise and specialization in different areas of the world. This is shown in Figure 2.2.

This evolution is largely based on the recognition that education and innovation are services and that satisfaction of customers and staff leads to better results in all service businesses (Sasser and Reichheld, 2000).

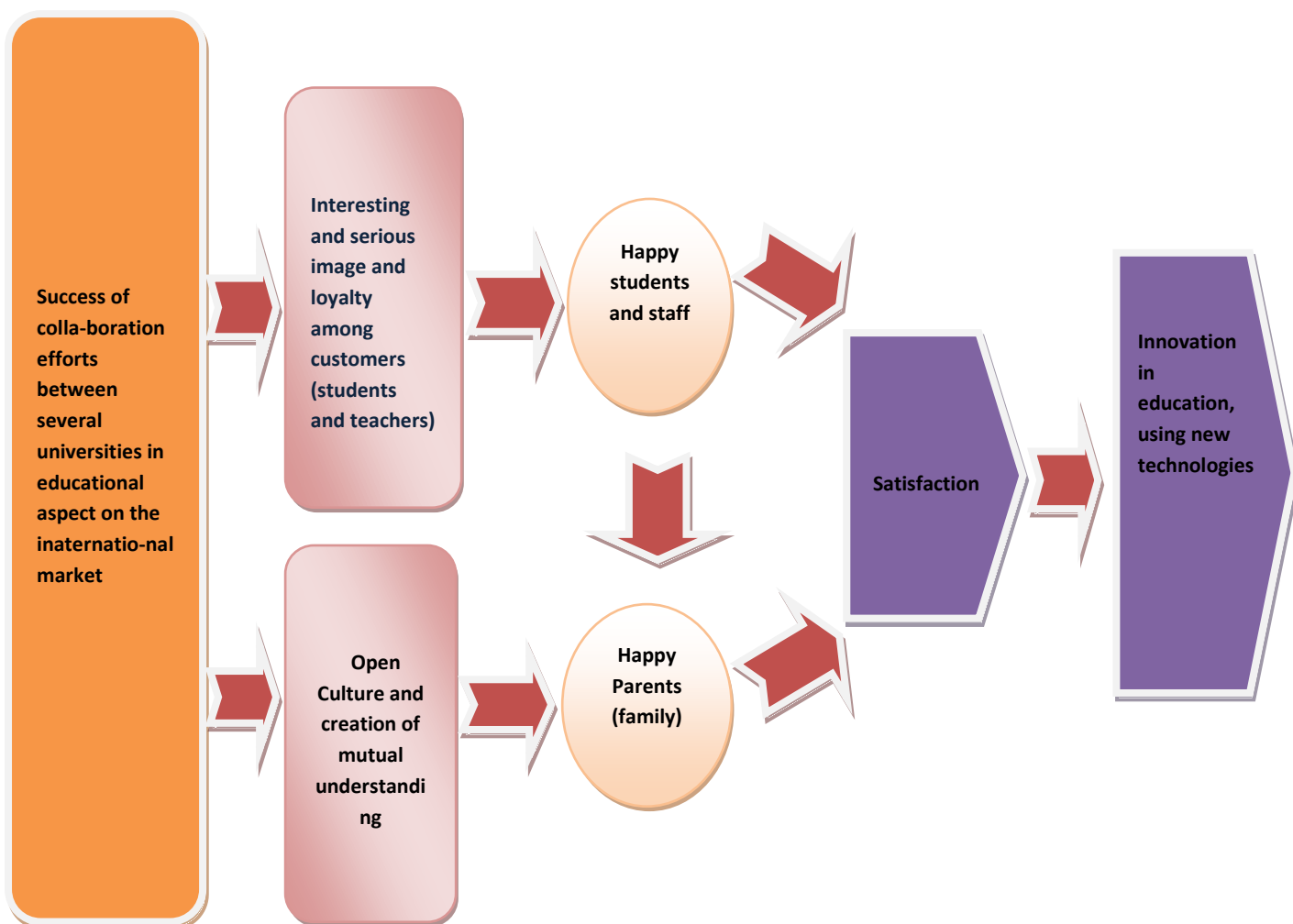


Figure 2.2. Success of the international collaboration and innovation largely depends on the satisfaction of the internal and external “customers” (Source: own development)

This international collaboration has important economic consequences: it creates the circumstances for increased employment considering that both the staff and more specifically all alumni of the involved universities will be considered as better equipped for the labor market, having participated in innovative education of good international education and having created an international line in their curriculum even before arriving on this labor market. Moreover their language capabilities will be extended, something that is considered to be an important employability skill. This has also macro-economic consequences on the level of fiscal income and helps fighting unemployment, certainly in times of economic crisis and in developing countries.

Nevertheless, the advantages of international collaboration between universities are not necessarily observed by all participants directly and unequivocally. According to Hasslens (2001) and Kurbatovs (2008), there are drivers and barriers to this collaboration. In the next paragraphs we sum them up (Valentyna Kushnarenko, 2010)

These authors have indicated 10 drivers of international collaboration among universities. They are:

1. The communications and contacts among universities (Coordinators, Teachers, and the staff) of them should be continued and successful in order to lead to successful international relationships.
2. Better investment should be made in time and human capital to support the efforts.
3. Constantly respectful conversations and openness to new ideas are needed to share expertise and culture.
4. Open communication among all participants will lead to growing understanding, mutual confidence and flexibility.” (Lambert, 1991).
5. The coordination among the participants on the principal curriculum philosophy, the development and evolution of joint coordination of curricula and practices is essential.
6. Demonstration of roles and responsibilities in the partnership is needed to include a clear purpose that brings partners together and creates a shared value of the tasks ahead.
7. An obvious decision making process should exist: it should include shared research studies on the joint effort to enable better decisions.
8. Positive feedback from the international collaboration among them, each partner then has a larger stake in the success.
9. Mutuality: partners gain professional expertise from each other during the collaboration.
10. Planning for a long-term strategy goes hand in hand with the expected developments.

They also indicate 10 barriers that may inhibit success of international educational collaboration. They are:

1. Absence of strong communications and contacts among collaborated universities.
2. Insufficient investment in time and human capacity.
3. Problems may arise when partners do not fully trust each other.
4. Differences in the culture between the two universities may sometimes not be overcome or too little effort is done to overcome them.
5. Unobvious instructions and communication.

6. Differences in philosophy of the cooperation, contents and methodologies of teaching and learning are insufficiently tackled and keep existing leading to poor results.
7. Misunderstanding of the main roles and responsibilities of the participants.
8. Individuality in decision making without taking other opinions.
9. Negative feedback: each partner does not have an equal perspective on the success of the program and one believes to be benefiting less.
10. Not planning for a long-term strategy that goes hand in hand with the expected developments also leads to poor results (Valentyna Kushnarenko, 2010).

In general however, one can state that, given that the barriers can be overcome, international collaboration at university level leads to improved quality of the study material used at the sites of the partners. This goes hand in hand with the worldwide adoption of standardized high quality teaching material and with improved innovation in teaching methods and materials, as well as with the improvement of innovation in general and in education in particular. The reason is that the developed teaching methods and materials are more in line with international developments, also in the economic and technological field and more feasible to be adopted.

2.2. The growth of international exchange between universities and of collaborative research on world level.

In this paragraph we will try to cite some facts and figures about international exchange of students and staff in three parts of the world, namely Europe, the USA and Japan. They will prove that more and more educational instances are participating in it and that it recently became ever larger phenomenon. This proves that not participating is clearly not an option as a higher educational organization not participating clearly loses credibility on the international scene. Most of the figures will refer to student exchange totals, but they are a parameter that often goes hand in hand with teacher and research collaboration.

2.2.1. Student exchanges towards the USA.

Each year about 800.000 students study in the USA on all higher education levels. The figures for 2010 and 2011 are shown in Figure 2.3. 195.000 of them are PhD students and 470.000 university students. Others mainly follow language courses or are secondary school exchanges.

COUNTRY	2010	2011	CHANGE OF 2011/2010
All	799,581	858,180	7.33%
China	153,312	196,857	28.40%
South Korea	105,696	104,908	-0.75%
India	103,760	99,316	-4.28%
Canada	30,803	30,779	-0.08%
Saudi Arabia	29,391	43,910	49.40%
Japan	28,805	27,188	-5.61%
Taiwan	27,046	25,918	-4.17%
Vietnam	17,116	18,044	5.42%
Mexico	15,660	16,777	7.13%
Nepal	13,353	*	NA
Brazil	*	14,378	NA

Source: SEVIS Quarterly Review December 2011 * Data not reported in that year.

Figure 2.3. Total active incoming students in the USA (Source: Chouhada and Chang, 2012, Trends in international student mobility, WES, World Education Series)

2.2.2. Student exchanges inside Europe

Within Europe since 1987 the Erasmus and Socrates or LLP (lifelong learning program) plans have created a widespread student mobility inside Europe. At the end of 2012 the European Union hopes that about 3 million students will have studied at least one semester abroad (mainly inside Europe). The evolution is shown in Figure 2.4.

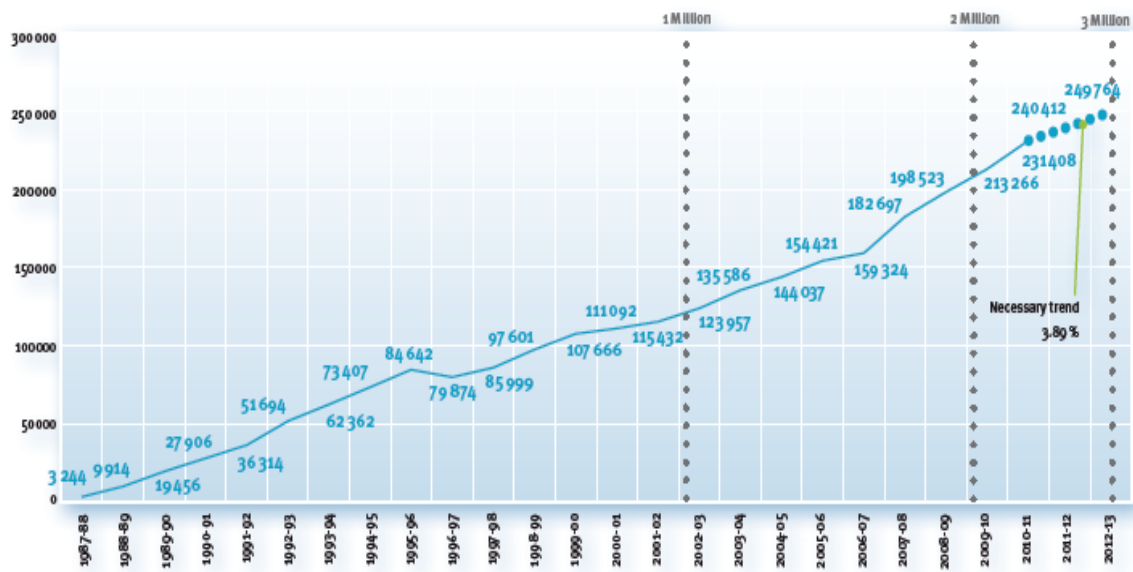


Figure 2.4. Evolution of the number of exchange students in Europe according to the LLP program (Source: European Commission, 2012, Erasmus: trends, facts and figures).

The growth rates have increased significantly after 2006-2007, when the LLP program was created. Per country, growth rates are shown in Figure 2.5. Yet, the average number of students studying abroad is still far below 10 % (see Figure 2.6.)

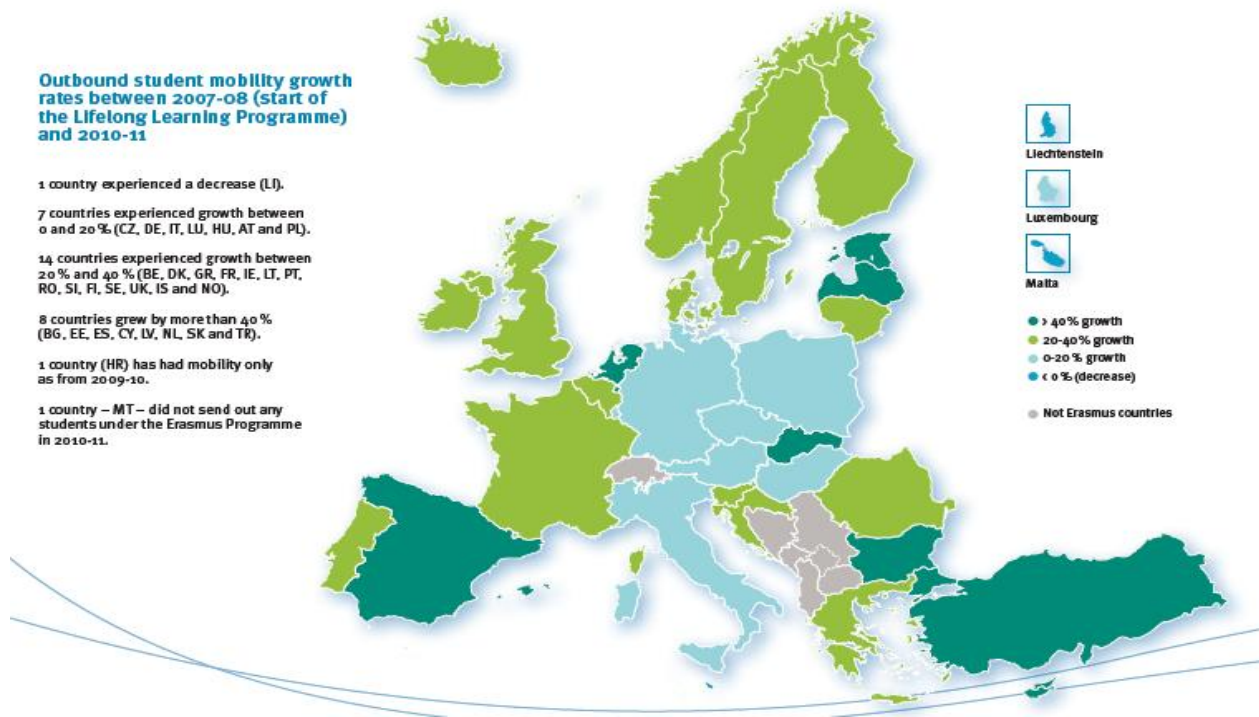


Figure 2.5. Outbound student mobility growth rates in Europe, 2006-2011, per country. (Source: see Figure 2.4.)

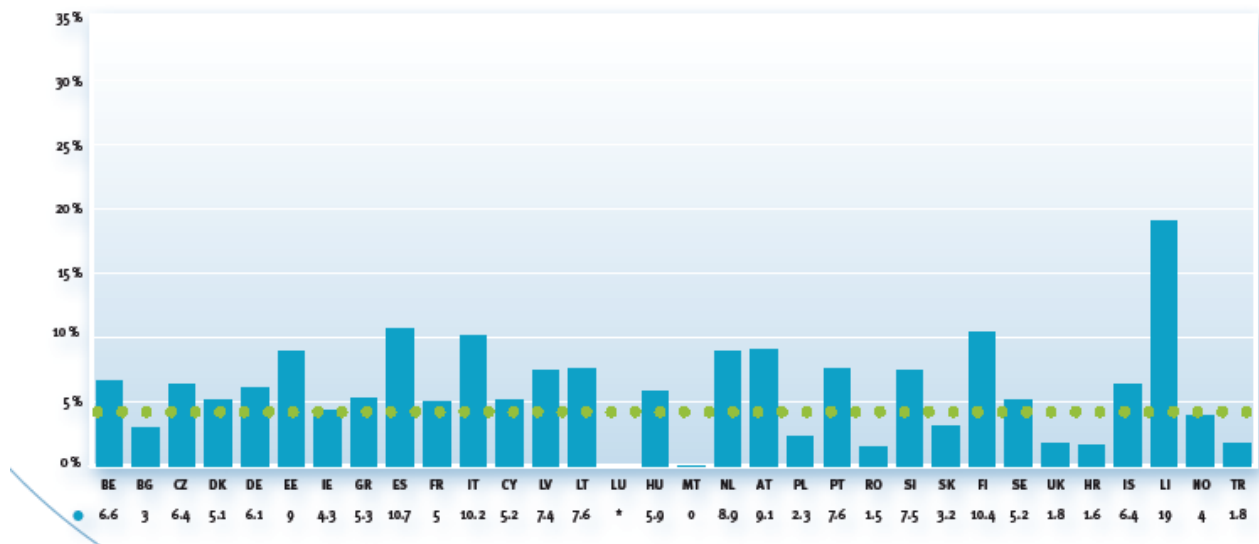
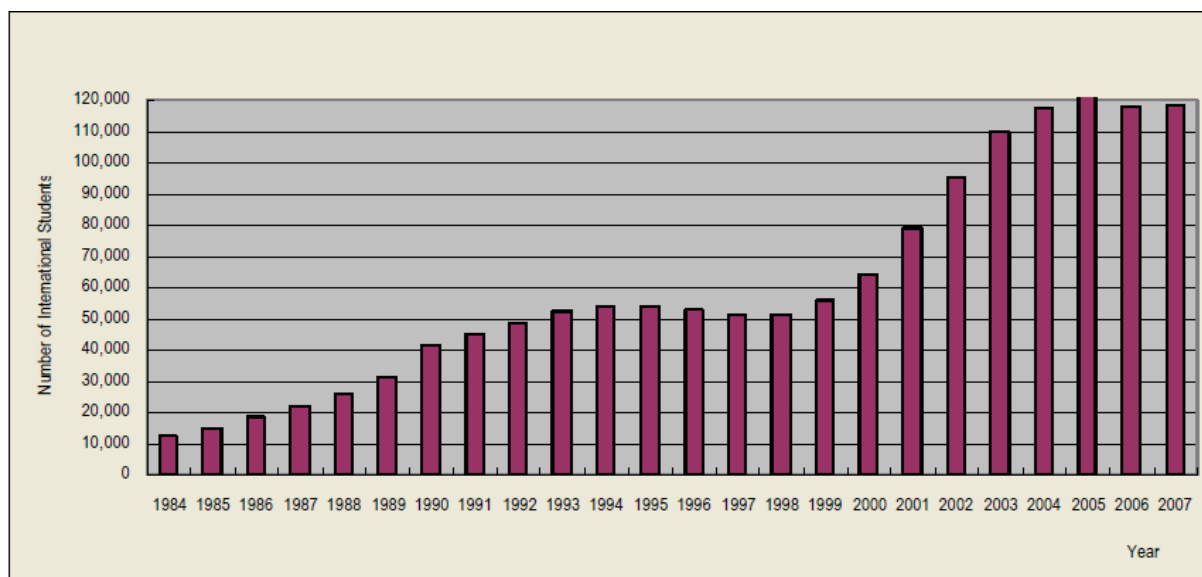


Figure 2.6 Average percentage of students participating in the student mobility programs of the EU (Source: see Figure 2.4.)

2.2.3. Student Exchanges in Japan.

Regarding the development of international studies in Japan, the first two international students from Korea came to Tokyo in 1881. In 1906, Japan had already more than 10,000 international students from its neighboring countries, indicating that the success in gaining international students by Japanese universities. This success in attracting the international students in order to study in Japan continued ever since and from 1984 to 2007 figures are impressive (see Figure 2.7) (Hiroshi Ota March 6, 2008, p. 42-44):



Year	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
No.	10,428	12,410	15,009	18,631	22,154	25,643	31,251	41,347	45,066	48,561	52,405	53,787
Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006,2007
No.	53,847	52,921	51,047	51,298	55,755	64,011	78,812	95,550	109,508	117,302	121,812	117,927 118,498

Figure 2.7: Number of International Students in Japan, Source: Bureau of Policy and External Relations, Japan Student Services Organization, Summary Report of Accepting International Students 2007 (Tokyo: MEXT, 2007)

Although Japan is considered one of the countries which successes in attracting large numbers of international students who studied in it but, the number of international students in Japan, as a percentage compared to other industrialized countries, such as the U.S., France, Germany, and the U.K. is still low[133] Hiroshi Ota March 6, 2008):

2.2.4. Growth of collaborative research on world level.

In economic terms, table 2.1. shows the International collaborative research output by country and partner country for 1996-2000 and 2001-2005 (articles). The growth over the two periods is also shown in percentages.

1996-2000	Total	UK	USA	CAN	FRA	GER	JAP	AUS	CHINA	INDIA	ROW
UK	97,592		30,874	6,138	11,114	13,490	4,988	6,039	2,838	1,369	20,742
USA	244,911	30,874		28,754	20,744	32,095	23,711	10,679	9,226	4,555	84,273
CANADA	55,429	6,138	28,754		4,791	4,136	3,069	2,433	1,801	627	3,680
FRANCE	82,076	11,114	20,744	4,791		11,863	3,119	1,772	1,351	1,036	26,286
GERMANY	106,821	13,490	32,095	4,136	11,863		5,485	2,729	2,754	1,713	32,556
JAPAN	54,346	4,988	23,711	3,069	3,119	5,485		1,986	3,915	1,076	6,997
AUSTRALIA	30,743	6,039	10,679	2,433	1,772	2,729	1,986		1,463	391	3,251
CHINA	25,836	2,838	9,226	1,801	1,351	2,754	3,915	1,463		404	2,084

2001-2005	Total	UK	USA	CAN	FRA	GER	JAP	AUS	CHINA	INDIA	ROW
UK	144,457		43,337	9,248	15,502	20,235	6,658	9,573	5,505	2,253	32,146
USA	334,662	43,337		38,913	27,135	43,921	31,148	15,999	20,542	7,021	106,646
CANADA	75,659	9,248	38,913		6,423	6,464	3,933	3,672	3,688	981	2,337
FRANCE	107,729	15,502	27,135	6,423		16,609	4,646	2,753	2,774	1,530	30,357
GERMANY	146,615	20,235	43,921	6,464	16,609		7,464	4,388	5,401	3,101	39,032
JAPAN	77,197	6,658	31,148	3,933	4,646	7,464		2,964	8,631	2,262	9,491
AUSTRALIA	46,502	9,573	15,999	3,672	2,753	4,388	2,964		3,663	776	2,714
CHINA	54,529	5,505	20,542	3,688	2,774	5,401	8,631	3,663		1,127	3,198

Growth	Average	UK	USA	CAN	FRA	GER	JAP	AUS	CHINA	INDIA	ROW
UK	154%		140%	151%	139%	150%	133%	159%	194%	165%	155%
USA	148%			135%	131%	137%	131%	150%	223%	154%	127%
CANADA	142%				134%	156%	128%	151%	205%	156%	64%
FRANCE	146%					140%	149%	155%	205%	148%	115%
GERMANY	153%						136%	161%	196%	181%	120%
JAPAN	155%							149%	220%	210%	136%
AUSTRALIA	162%								250%	198%	83%
CHINA	214%									279%	153%

Source: Adams (2007), based on Thomson ISI publications data

Table 2.1. Growth of collaborative research on world level. (Source: Adams(2007), based on Thomson ISI publications data. The International collaborative research output by country and partner country, 1996-2000 and 2001-2005 (articles) and for growth across the two periods in percentages (research report, international research collaboration : opportunities for the UK higher education sector,2008)

2.3. The collaboration between PSUT and Hasselt University as an example.

In fact the collaboration between PSUT and Hasselt University is the first stepping stone for collaboration between the networks of both universities. This is depicted in Figure 2.8.

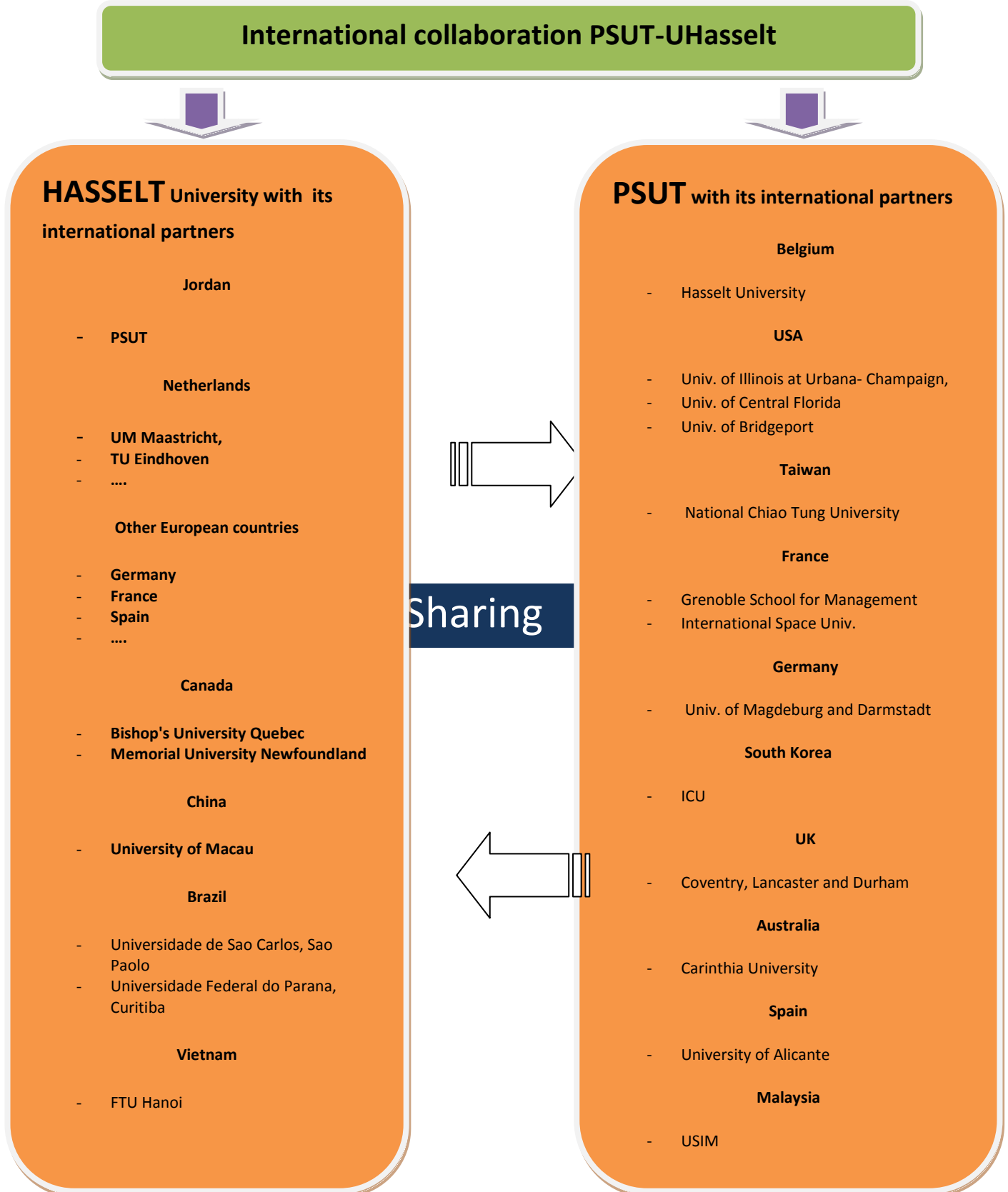


Figure 2.8: The sharing process between PSUT with its partners and Hasselt University with its partners

The collaboration between universities is achieved across the coordination among the International Relations Office (IRO) of each international university in general and the specific IRO of each faculty in these universities. In what follows, I describe the situation at PSUT.

Expanding the international relations of PSUT with the international universities in the world became as one of its important strategies and at the top of its priorities. These relations are achieved by the coordination of its IRO with the IROs of other international universities in the world which they collaborate each other in developing an internationalization culture and institutional capacity through the transfer of know-how and good practices.

Strong IRO contributes in developing the research and exchange partnerships among these universities, and provide strong access to successful resources and knowledge around the world.

The IRO extends overseas and manages Memoranda of Understanding and agreements among these universities and looks for new international partnerships.

This office organizes the joint conferences, workshops and seminar, so the strong IRO is considered as a key driver of successful partnerships, and plays the important role in raising the world ranks to these universities around the world, and represents one of the important strategies of these universities.

The IRO Functions in PSUT are described as follows:

- Developing an internationalization culture through cooperating joint regional actions and successful partnership
- Gaining appropriate knowledge, resources, tools, and ways to improve internationalization actions of the partners.
- Establishing a successful regional network for good practice and transfer know-how.
- Managing external projects for the university.
- Follow-up of all agreements and Memoranda of Understanding (MOU).
- Making open communications and strong contacts with the university's international.
- Supervising and counseling guest researchers and lecturers and international students who plan to carry out their studies or research at PSUT.
- Advising PSUT students who wish to study or join internship programs abroad. (<http://psut.edu.jo/site/en/2013-03-05-11-36-23/gssr-about.html>)

In addition to that, there is another office concerning the research (national/international) which is called Research Coordination office (RCO). The RCO in UHASSELT achieves the implementation of the research policy of the University. It makes different advisory tasks concerning the organization of the scientific research (national/international). <http://www.uhasselt.be/UH/research/Research-Coordination-Office/Objectives.html>

The RCO coordinates its work together with the IRO, where the RCO funds the international research cooperation developments at different authorities, it supports the joint current and future research, and administrates research international agreements.

2.4. Types of international collaboration between universities.

The international collaboration between universities can indeed be classified into many types. We limit ourselves here to what exists not only inside Europe, but for the collaboration between European and non-European universities.

2.4.1. Exchange of students/staff

(<http://www.uhasselt.be/UH/International/International-European-programmes.html>)

1- Erasmus Mundus

Erasmus Mundus (EM) is a worldwide cooperation for higher education through exchange in students and the staff to all universities which apply this program of the international collaboration. This program aims to enhance quality in higher education and promote intercultural understanding. This program provides financial support for institutions and scholarships for individuals. Funding is available for 3 actions:

- a- European joint masters and doctoral programs (including scholarships)
- b- Partnerships with non-European higher education universities such as PSUT and scholarships for exchanging students and academics,
- c- Projects to enhance higher education systems worldwide.

The Erasmus can be classified into types, the first is called Erasmus student mobility which is considered the most successful exchange of students program in the world, it began between 1987 and 1988, this program has provided more than 2.5 million European students with the opportunity to go abroad and study at a higher education institution and train in a company.

The second which is called the Erasmus staff mobility in exchanging the staff among international universities for teaching, which has become a very popular action, which it

began in 1997. Since, that time arriving to 2010-2011, over 300 000 staff exchanges for teaching and training have been supported.

(http://ec.europa.eu/education/pub/pdf/higher/erasmus1011_en.pdf)

2- Lifelong Learning program - Erasmus

Erasmus is a part of the LLP-Programme (Life Learning Program) of the European Commission. One of the main objectives of Erasmus is to motivate exchanging of the student and the staff within higher education among the international collaborated universities.

(<http://www.uhasselt.be/UH/International/International-European-programmes.html>)

3- Atlantis

Atlantis is an agreement between the EU and the US to cooperate with each other in higher education among international collaborated EU-US universities. The main objective of it is to enhance the international collaboration among European Union and United States universities and implementing joint or dual transatlantic undergraduate degrees, and improving the quality of their human resource development by developing the training among them. To achieve these objectives, the program supports the following main actions (http://eacea.ec.europa.eu/bilateral_cooperation/eu_us/):

- a- Transatlantic Degree action (TD), providing support to many-sided partnerships of EU and US international universities in order to create joint study programs including joint/dual degrees - and transatlantic exchanges of students.
- b- Excellence Mobility Projects (EIM), providing follow-up financial support for student mobility to joint programs that have an excellence role in transatlantic cooperation.
- c- Policy-oriented measures (POM), addressing comparative higher education and vocational training issues, and enhancing dialogue on recognition of qualifications and accreditations.
- d- Schuman-Fulbright action providing scholarships to highly qualified professionals for studies or training on the opposite side of the Atlantic, in areas of specific relevance to the EU/US relations. (<http://www.uhasselt.be/UH/International/International-European-programmes.html>).

4- EU Canada

The main objective of the EU-Canada program is to promote cooperation and exchanges of students and academic staff among international collaborated universities of Canada and

Europe, and development of curricula, joint study programs and international training.
<http://www.uhasselt.be/UH/International/International-European-programmes.html>

This program began in 1995, from that time arriving to 9 July 2013, 107 transatlantic consortia have been funded, including 765 EU and Canadian higher education and training, and more than 5600 student exchanges among them. http://ec.europa.eu/education/eu-canada/canada_en.htm

5- EU-Industrialized Countries Instrument (Australia, New Zealand, Japan, Korea)

This is a cooperation program for higher education among the international collaborated universities of the EU and Australia, New-Zealand, Japan and Korea. The main objective of it is the promotion of student- and staff exchanges and curricula development among them.
<http://www.uhasselt.be/UH/International/International-European-programmes.html>

6- Tempus

Tempus (Trans-European Mobility Scheme for University Studies) is a program that pursues to develop higher education and creates cooperation in the surrounding countries of the EU.

Tempus finances in the first place many-sided partnerships among international collaborated universities in the EU and fellow countries such as Eastern Europe, Central Asia, the Western Balkans, and the Mediterranean region (<http://eacea.ec.europa.eu/tempus/>) and develop the curricula of these countries in order to promote their quality and human resource through training them. (<http://www.uhasselt.be/UH/International/International-European-programmes.html>)

7- ALFA

ALFA (**A**mérica **L**atina - **F**ormación **A**cadémica) also is the cooperation between European-Latin-American among international collaborated universities. The main objectives of this program are: enhancing the higher education in Latin America through creating joint higher education area and improve the quality of the curricula in this region and enhance the economic and social development of this region.

(http://ec.europa.eu/europeaid/where/latin-america/regional-cooperation/alfa/index_en.htm)

8- EDULINK

EDULINK funds cooperative projects between higher education institutions (HEI) in the ACP Group of States (African, Caribbean and Pacific). The main objective of it, is to promote capacity building and regional integration in higher education in ACP States and Regions, in order to reduce poverty. EDULINK only supports networks of higher education institutes such as universities. It does not give grants or scholarships to individuals. (<http://www.uhasselt.be/UH/International/International-European-programmes.html>)

2.4.2. Dual Degree Programs: (such as the international collaboration between PSUT and Lancaster University)

Dual Degree Programs enable students to have two degrees in a relatively short time and at a lower cost than completing two degrees separately which it takes longer time and more costly . This type of program is increasing in popularity worldwide. Having two degrees enables students to differentiate themselves in an increasingly competitive global employment market, especially if those degrees come from the international collaboration between two universities from different countries such as the international collaboration between PSUT in Jordan and Lancaster University in UK in the MBA specialization. (Lancaster University)

2.4.3. Scholarships

These scholarships encourage the students toward increasing their efforts and delight the competencies between them. These are offered in the country of origin and in other collaborating international universities with which the University of the Student has an agreement. Different types of scholarships exist. These are:

- The study scholarship, which is mainly granted for the financing of university training of the 2nd cycle. In general, these scholarships last 1 or 2 academic years.
- Mixed doctorate scholarships are mainly awarded to doctorate/PhD students. This kind of scholarship covers a stay of 16 months in Belgium, which the scholarship student will use for his research (16 months to be divided in 4 stays over a duration of maximum four years).
- The internships, with an average stay in Belgium of 1 to 6 months, are usually awarded to experts working in the cooperation field.
- Study visits is to enable partners working in the cooperation field to discover a relevant Belgian branch of activity or public sector (UHasselt)

Belgium is not unique in doing so. Germany is a much better example in case.

An example of the institutions which support the scholarships in the world is the German Academic Exchange Service or **DAAD** (German: *Deutscher Akademischer Austauschdienst*) is the largest German support organization in the field of international academic co-operation. The DAAD grants are available to students of all academic disciplines and at each academic degree level, including undergraduates, graduating undergraduates and recent graduates with a BA (Bachelor of Arts), Masters degree students, doctoral students, PhD candidates and postdoctoral scholars, and faculty.

(http://en.wikipedia.org/wiki/German_Academic_Exchange_Service)

2.5. The significance of e-learning within coordination

2.5.1. E-learning in higher education

E-learning involves the use of technology somewhere during the learning process. The following types of learning delivery could be regarded as e-Learning:

- Accessing or downloading a course from the internet, or working through it online
- Accessing or downloading a course on a University intranet
- Communicating with a tutor via e-mail
- Working through an interactive CD-ROM

E-learning is changing the way people learn. Web-based training and education give the world access to continuing education from their home. Many colleges and universities offer distance learning and degree programs online. (Dr. Arafat's interview, 2012)

By 2006, 3.5 million students were participating in on-line learning at institutions of higher education in the United States According to the Sloan Foundation reports, there has been an increase of around 12–14 percent per year on average in enrollments for fully online learning over the five years 2004–2009 in the US post-secondary system, compared with an average of approximately 2 per cent increase per year in enrollments overall. Allen and Seaman (2009) claim that almost a quarter of all students in post-secondary education were taking fully online courses in 2008, and a report by Ambient Insight Research claims that in 2009, 44 percent of post-secondary students in the USA were taking some or all of their courses online, and projected that this figure would rise to 81 percent by 2014 (<https://en.wikipedia.org/wiki/E-learning>)

2.5.2. Benefits and disadvantages of e-learning in an international setting

E-learning has many advantages and disadvantages. We try to apply them to international university collaboration.

2.5.2.1. Advantages of e- learning in an international setting.

International collaboration among universities and studying at higher education level can benefit from e-learning in many ways. First, it can help the student in studying at his own pace. The students can take quizzes and tests included in the course and know where he or she stands at any moment. But secondly and more importantly, students can limit time use and distant travels, certainly in long distance studying when the student lives far away from the university or enrolls in an international course. The students then indeed does not need to spend travel time and other associated costs of attending a course. Thus an e-Learning course takes less time than a classroom course and is less costly. Thirdly, e-courses are interactive which aids learning retention. Fourthly, e-Learning courses can be easily updated when necessary and thus have a shorter development cycle.

In summary, the collaborated e-learning among (national/international) universities improves the education process and enhances the awareness of the collaborated universities on many aspects such as materials of study, using the best method in the learn. The collaborated e-learning among international universities gives the students opportunity to get the international certificate while they are in their house.

The success of the collaborated e-learning among international universities should advance it in the ranking on the world scale and leads to the satisfaction to the students and staff, increases the orientation toward these universities and that give these universities the better value in education process.

Korea and the USA provide stunning examples of the success of higher education e-learning based on these advantages.

In Korea, the percentage of implementing of the e-learning was high percentage in national and public universities is very high. Table 2.2 Shows that:

Type	Size	No. of universities responded	No. of universities implementing e-learning	%
National/ public	Large*	17	16	94.1
	Mid or small**	4	4	100.0
	Total	21	20	95.2
Private	Large*	38	37	97.4
	Mid or small**	28	19	67.9
	Total	66	56	84.8
National Universities of education	Mid or small**	5	2	40.0
Total		92	78	84.8

* Large = enrollments of more than 10,000 students

** Mid or Small = enrollments of less than 10,000 students

Table 2.2 Percentage of using e-learning in national and private universities (source: Junghoon Leem and Byungro Lim, March, 2007, <http://www.irrodl.org/index.php/irrodl/article/view/380/763>)

Collaboration with other universities in Korea in e-learning was high: 51 percent of the universities reported that they had formed a consortium to share e-learning systems with other universities. There were no differences found in universities in terms of type or geographic location, however. In sum, 58 percent of the universities with more than 10,000 students and 40 percent of the universities with less than 10,000 students reported in engaging in such consortiums, again showing some difference according to the size (Junghoon Leem and Byungro Lim, March, 2007)

In USA, It is about 18.7 % of all educational institutions in it that do not offer some of their study programs via e-learning and roughly 2.4 % of state educational institutions in the USA have not included this kind of knowledge acquisition in their educational models and have continued to the traditional forms without going to E-learning environment. E-learning has assisted in creating an environment of higher degree of interactivity among students and the Professors and easier covering the studying materials in this kind of knowledge acquisition to both undergraduate and graduate students. Furthermore, professors and assistants have developed their patterns in creating students' critical thinking and mutual exchanges of ideas and information and expand their knowledge. (MIRJANA RADOVIĆ-MARKOVIĆ, 2010).

2.5.2.2. Disadvantages of e-learning

The disadvantages of e-learning can be represented by disabling the students to share their ideas with other students and with teachers alike. The e-learning situation creates isolation and loss of human contact. The e-learning process may also show too many interruptions and distractions, and difficulty to supervise the progressing of students (Dr. Arafat's interview, 2012).

Thorpe and Goodwin (2006) talk about participation and practical disadvantages of e-learning. They relate to interpersonal interaction and to the vulnerability of technical situations in education.

On the level of interpersonal interaction, disadvantages are:

- Not enough discussion online. Where the discussion between tutor and the student is less, the realization of understanding is less deep.
- Waiting for replies to the website, where the software may be slow which leads to slow loading the questions and answers. This can also be due to the slowness of some computer systems. But it will frustrate the interaction very much.
- The overall course website is both not amusing and annoying. The same people are constantly moaning. Have they nothing better to do?.
- Students' arrogance about their scores can cause ill feeling. Because students study at different speeds, messages can be posted about parts of the course that aren't even scheduled to be started yet. This can lead to the insecurity for slower students.
- Online tutorials often get a poor response. If there is a point which the students don't understand it is sometimes hard to express their thoughts in writing and tutorials are often stretched over too long a period.
- Too much 'chat', too much panic, not enough considered analysis (Mary Thorpe* and Steve Godwin, 2006)

Thus students are isolated from their instructors. The best explanations are not always available to help the students. So meeting the teachers face-to-face is inevitably matter to get the detailed explain, because the learners sometimes cant know exactly where the error in the question was.

<http://peoplelearn.homestead.com/ELearning/Introduction/Disadvantages.html>).

There are also many practical disadvantages to e-learning.

The components of these courses depend on the use of computers which are inevitably vulnerable to interruptions and breakdowns because of problems and errors or incompatible equipment. These problems distract the student's from his or her own learning place (Goodyear, 2002) by creating obstacles to advance and feelings of frustration and exasperation (Thorpe* and Godwin, 2006)

The disadvantage of e-learning is also that students need to have computer skills with programs such as word processing, internet browsers, i-pads and e-mail. Without these skills and without the necessary software it is not possible for the student to benefit from e-learning. Slow internet connections or slow speeds of some computers or incompatible equipment may make the access process to the course materials difficult, and this leads to making the E-learning process is boring.

Another disadvantage of e-learning is managing computer files and online learning software. The students who have humble computer skills will suffer in keeping their computer files organized. Without good computer organizational skills students may lose or misplace necessary files and reports causing them to be late in submitting assignments. Some of the students also may face difficulty in installing software that is required for the class.

E-learning moreover entails just as much time as any traditional classroom courses. This means that students have to be highly stimulated and responsible because all the work they do is on their own. Learners with low stimulation or bad study habits may fall behind.

Another disadvantage of e-learning is that without the routine structures of a traditional class, the students may be confused which leads them to fail or do poorly.

The disadvantages of E-learning can be summarized as follows:

- **Technology dependent:** students must access to the course materials on the internet in rapid speed, so the students need a provider of a service with a high bandwidth in order to transfer the materials of a course in a given time. So, the E-learning efficiency depends on using the right provider and compatible equipment.
- **Material Incompatibility:** some materials of courses are designed for specific systems and will not work when using other systems (for example, the Apple Macintosh and the Windows PC).
- **Unsuitable for Certain Types of Learners:** e-learning requires high skills and experience. E-Learners need to be highly self-stimulated to take full advantage of the E-learning. Working through 'packaged' programs can be more complex.
- **Reliant of the Quality of the Content:** depending on older notes and lectures handouts will not be enough. Course providers need to innovate and develop new patterns in making the understanding fit the E-learning system and objectives.
- **Expensive:** start-up costs of an e-learning service are high, specifically also in training the users. Teachers must be sure that the costs are acceptable compared to the delivered value and benefits. The website with E-learning moreover needs constant monitoring and maintenance (checking links, updating course content etc.).

- **Social/economic disadvantage:** can diminish or prevent access by some student groups (for example, cost of tools, online access and printing).
- **No Match for Face-to-Face Teaching:** Although that the Electronic communication of E-learning is beneficial, it does not match face-to-face discussions.
- **Too Reliant on IT Skills:** Students and teachers may have limited IT skills, so they need to learn how to use the medium effectively.

<http://www.le.ac.uk/users/rjm1/etutor/elearning/disadvoflearning.html>

2.5.3. Solving these problems and trying to overcome the disadvantages of e-learning

E-learning is constantly expanding. The percentage of courses and institutions depending on E-learning is also constantly increasing and gradually the means to fit its main objectives in terms of competing with traditional classes are being developed. <https://en.wikipedia.org/wiki/E-learning>

This does not mean that E-learning will fully compensate traditional learning. It will only partially attract those students who prefer classical learning by partially trying to satisfy them. For this aim e-systems will try to change the environment of learning in accordance with the needs and requirements of recent education. (Mirjana Radovic-Markovic, 2010).

Combining the useful aspects of both E-learning and traditional learning by integrating the environment of both E-learning and traditional learning is possible. This integration will benefit from the flexibility of E-learning and from the efficacy of it that cannot be found in the traditional learning, but also from the face-to-face learning environment provided by the social interaction needed for learning in a more traditional environment. So, the solution can be described as by combining a face-to-face and a web-based environment. (Akkoyunlu, B., & Soyly, M. Y. 2008).

This combination process between e-learning and the traditional learning can be achieved through depending on the traditional learning (face-to-face and attendances of the lectures) and combining that with the e-learning through putting journal articles, previous exercises and theses and textbooks and so on in an e-learning environment. This would combine both the advantages of combining theory with practice and the fact that some students can get more information and textbooks at lower costs as the fees for getting access to electronic means of study are not necessarily so, high as the fees for buying the handheld books and journals.

Improving the awareness of the students and the staff is another improvement area of improvement. The main solution is to design a computer program (smart program which should be faster), which corrects the answers and gives hints under any answer and explains in detail all the answers while indicating to students where exactly their errors were, correcting them and explaining the right answers in detail. Moreover this system should take the different experience and intelligence levels of students (weak to strong) into account and give him other examples with solutions in order to let them recognize the problem. That will create more flexibility and be more easy to make once the course is underway.

The costs of e-learning being high, collaboration among universities will have the benefit of sharing these costs between different universities. It will also improve the level of cooperation between these universities as the commitment shown will be in the long run by amongst other jointly designing these computer programs and creating continuity in developing them further.

2.5.4. The platforms at PSUT and UHasselt as examples

PSUT university has an e-learning platform including all e-materials, in the context of developing its solution to develop the e-learning and facilitate it. PSUT signed a Memorandum of Understanding (MoU) with Doseyeh for E-learning portals. The company provides contemporary technologies in the e-learning through a social academic network. Through these services students and professors can exploit the opportunity for E-learning and exchange of information and courses materials. These services will mitigate the load of carrying heavy books and hard copies and save the expenses of buying them. Through these services students will access and benefit from a number of academic books and research services as well as they will be able to upload their research online, obtain high quality educational material and gain access to recent publications. Through this agreement, PSUT can make these services available to its international partner's network to develop the e-learning platform and databases.

(<http://psut.edu.jo/site/en/faculties/engineering/electrical-engineering/power-energy-engineering-b-sc.html?id=337>)

UHASSELT has Blackboard which is considered as an E-learning platform to improve the students skills, update their materials and make a constantly contact with their teachers. (UHASSELT Blackboard)

The development in e-learning among international collaborated universities can be achieved by sharing the network of e-learning platforms among collaborated universities, which would enable these universities to share knowledge, standardize materials, create expertise in managing e-learning and standardize databases. This development of this collaboration moreover enables the students to share knowledge and enter standardized databases, for example the student of Hasselt University can enter the databases of PSUT University or (i.e.) and vice versa. On other hand, this collaboration between UHASSELT and PSUT would enable UHASSELT to offering more databases to its students without paying any subscription fees and vice versa.

2.6. The significance of this study

University collaboration has relevant advantages in three fields: education, economy and business.

In the educational field, the international collaboration among universities through sharing in material, inventions and experts and through the planning and depending the best and developed pattern in education and through the mutuality across exchange of students and gaining the cross culture according to serve the education process. This study expands the awareness to the universities in order to encourage the collaboration among them whether locally represented in microenvironment or internationally represented in macro environment. The success of this collaboration leads to the satisfaction of the students and their family and the staff of both universities and getting the best ranking which leads to enhance the reputation comparing with others.

In the economic field, the success of international collaboration among universities leads to that the increased purchasing power to the international students which leads to improve the markets and grow in economic through growing in tourism field and increasing in hard currencies in countries which universities are in it. This international collaboration has an important economic consequence: it creates the circumstances for increased employment considering that both the staff and more specifically all alumni of the involved universities will be considered as better equipped for the labor market, having participated in innovative education of good international education and having created an international line in their curriculum even before arriving on this labor market. Moreover their language capabilities will be extended, something that is considered to be an important employability skill. This has also macro-economic consequences on the level of fiscal income and helps fighting unemployment, certainly in times of economic crisis and in developing countries.

In the business field, the success of international collaboration among universities leads to improve the investment through developing and inventions across introducing and facilitates displaying it in another market which the second collaborated university are in it through putting the strategies which can be represented in marketing and competing or may be selling whether being locally represented in microenvironment or internationally represented in macro environment.

Since we will try to see in how far e-learning can be combined between PSUT and its partners, this would lower costs in developing materials and for students to study. Thus the access to university and research results and the creation of both of them would benefit. This would increase the advantages of collaboration in each of the three fields described above.

2.7. Summary and conclusion

It is possible to create new programs by using international collaboration among universities which can be efficient, effective and developed in addition to Erasmus, Tempus, DAAD... Careful selection of partner sis needed however.

Success of the international collaboration and innovation largely depends on the satisfaction of the internal and external “customers” Through creating the circumstances for increased employment considering that both the staff and more specifically all alumni of the involved universities will be considered as better equipped for the labor market, applying the facilities, scholarships and improve the investment in this scope in many fields such as education field, economic field, business field.....etc which lead to real benefits and capitalizes on the scope of the collaboration. This success of such programs can be seen in many parts of the world such as the UK, USA, CANADA, FRANCE, GERMANY, JAPAN, AUSTRALIA, CHINA, etc....

The depth of the collaboration can be improved by incorporating joint use of e-learning modules, thus decreasing the investment cost and creating a shared bases for better costs for students and better collaboration of staff of the involved universities. Combining e-learning tools with traditional ones seems to present the best option of doing so.

CHAPTER 3: DEVELOPMENT OF A CASE STUDY. THE SITUATION OF COLLABORATION BETWEEN PSUT AND ITS PARTNERS

The aim of this chapter is investigating the international collaboration between PSUT and its international collaborated partners, by describing amongst others benefits and facilities in sections 3.1.1 and 3.1.2, and showing the advantages and disadvantages and how to overcome them in sections from 3.1.3 through to 3.1.7. In addition to that section 3.2 will talk about the development of this type of collaboration. This case study will discuss a questionnaire in section 3.3 about the reactions of students to the collaboration and in section 3.4. some conclusions will be presented.

3.1 The international collaboration between PSUT and its international collaborated partners

3.1.1. The advantages and details of creating a vast network.

PSUT has over time developed a vast network of partners all over the world. It expands overseas. In Europe, international universities such as Hasselt University in Belgium, Coventry, Lancaster and Durham Universities in England, the Grenoble School for Management and the International Space University in France, the Universities of Magdeburg and Darmstadt in Germany, Carinthia University in Austria; and the University of Alicante in Spain are partners. In Asia, the National Chiao Tung University in Taiwan and the ICU in South Korea and In the USA, the University of Illinois at Urbana- Champaign and the University of Central Florida and the University of Bridgeport have a cooperation agreement with PSUT. (<http://psut.edu.jo/site/en/about/university-information.html>)

It takes many forms. Examples are:

- **Multilateral or bilateral collaboration:** PSUT University made an agreement with the University in the Taiwan and according to this agreement the University in Taiwan provides the PSUT's laboratories with all its requirements and they also made joint laboratories.
- **Collaboration in coursework teaching programs** , such as the dual degrees, that are certificated by different international universities from different countries such as the program of PSUT with Lancaster university, with students spending part of their degree program in one university and part at the other is an example in case. PSUT's master student in MIS also spend one semester in PSUT and the second semester in Hasselt University, although this is not legally speaking a dual degree program.
- **Visiting scholar programs**, including faculty exchange programs, both for research and teaching purposes. For example, both PSUT and UHASSELT teachers (professors) participate in writing many articles, and according to its agreement with Hasselt

university, PSUT university grants for PHD applicant students can be shared 50% - 50 %.

According to Prof. Don Maxwell of the University of Western Australia that the major benefit is the **sharing of ideas**. This includes exchanges of information and ideas among collaborated universities. PSUT University benefits from exchanging staff with the Lancaster university. In addition to that, the collaboration will contribute in develop and improve the curricula in all collaborated universities which leads to getting a better reputation about the performance of the university and more satisfaction of the students about that performance.

3.1.2 Benefits (drivers): increased participation

Both with Hasselt University and Lancaster University the exchange of students is increasing.

The success of international collaboration between Hasselt University and PSUT leads to increase in students number (PSUT students) gradually in this year comparing to the Four past years as show as table 2.3.

The Year	No. of students in MIS	No. of students in IMS
2009-2010	11	—
2010-2011	—	—
2011-2012	12	4
2012-2013	11	6

Table 2.3: PSUT students numbers who studied in HASSELT University during 4 years ago source(PSUT coordination office)

This table shows the continuity increasing in PSUT students who studies in Hasselt University that can be noted in 2012-2013, the number of students in MIS (Management Information System) was 11 students in addition to 4 students who withdrew and will enroll in next year 2013-2014, so if the 4 students be added to the 2012-2013 that the number of students will be 15 students.

Another type of success of collaboration between PSUT (Princess Sumaya University for technology) in Jordan and Lancaster University in England in Global MBA specialization which leads to increase in students numbers as show as table 2.4.

The year	PSUT students no.
2010-2011	14
2011-2012	15
2012-2013	17

Table 2.4: PSUT student's numbers who studied in Lancaster University during Three years ago (source: PSUT coordination office).

It can be noted that in the year 2012-2013, Four students withdrew and will enroll in next year 2013-2014, so if the 4 students be added to the 2012-2013 that the number of students will be 21 students.

This program leads to intercultural to the international students and the staff through knowing more about the foreign cultures.

3.1.3 Facilities and costs

This international collaboration gives the facilities to the students by reducing costs of study and making a discount considering the accommodation of the students as example. The international collaboration between PSUT (Princess Sumaya University for Technology) and UHasselt make the PSUT students pays costs of study in HASSELT University less than expatriate student as show as table 2.5 and 2.6; this collaboration gives the facilities in getting the Visa in order to study in international university.

Master of Management	PSUT student	Expatriate international student
Cost of study	Around 4000 Euro (In 2013-14: exceptionally only 600 Euro)	non-EEA: €6000

Table 2.5: The international collaboration between universities is less costly in the study (Source: PSUT and international master programs in Hasselt)

The Accommodation	PSUT student	Expatriate student
Cost of accommodation/month	260-310 Euro	350 Euro

Table 2.6: The international collaboration between universities is less costly in the accommodation (Source: www.gregorius.be and cooperation office in UHasselt)

The facilities at UHASSELT gave the students free bus rides from the University to the city and vice versa, so this eases their transportation and reductions for some entrances through the health insurance they have to subscribe to. The facilities in this program lead to facilitate Visa procedures to the international students and the staff through this international cooperation program. Yet the costs remain of course relatively high.

The international collaborated facilities between universities include many other fields as well. As practical example applied in Jordan one may consider that the international student is allowed him to buy cars from free market without customs fees, which are very high in Jordan. This facility is only available to international students who study during their studies, after that the international student should sell his or her car. This facility leads to an increase in buying cars from free market which lead to growing the free market which leads to increase in hard currency in countries which universities are in it. This type of facility can be applied among international universities by making agreements between ministries of higher education and the free market. For Belgian students PSUT offers a very valuable and not costly possibility of following a summer course of three weeks in July for only 600 Euros in total, including a tourist program (and access to tourist facilities at Jordanian prices given their student card), which is unique. That is another example in case.

3.1.4. The disadvantages of the international collaboration between PSUT University and other international universities (UHASSELT case)

In 2010-2011, some circumstances took place which led to unregistered students from PSUT in UHASSELT in that year. The reasons for this problem are attributed to some problems considering files of this coordination in the Ministry of higher Education in Jordan and are solved now. But it proves that constant monitoring of the authorities look on this collaboration is need. Visa problems for Jordanian students when entering Belgium are not always easy to solve as well.

The international collaboration between PSUT and UHASSELT is further not in equilibrium. Whereas the Master students of PSUT spend half of their study in HASSELT in the MIS specialization, they have to spend their entire master study program in UHASSELT in the IMS specialization. The students of UHASSELT spend roughly one month in their summer school at PSUT and they just take two courses on the other hand. The reasons are attributed to the families of students of UHASSELT in Jordan and to (unfounded) safety worries about Jordan, which is not comparable to other neighboring states in the Middle East and the world.

This collaboration is however still recent and limited by the faculty of management (two specializations MIS and IMS only), so it needs expanding and developing. For example, until now there is no joint staff (professors) program to give the study materials between in both universities. For example, there is no Prof. from UHASSELT giving a specific material in PSUT and vice versa.

In addition to that, there is not the standardized network between PSUT and its partners and UHASSELT and its partners on other hand. There is no direct collaboration between PSUT

and its partners and UHASSELT and its partners and that is probably the worst negative aspect of them all.

3.1.5. Solving these disadvantages

In general, investing more is needed to achieve success.

Solutions to some problems can certainly be found. Some suggestions are.

Unregistered students as in the year 2010-2011 can be solved by improving the coordination by taking proactive successful steps to overcome this problem.

The international collaboration between PSUT and UHASSELT can be made more equilibrated by handling the reasons of the disequilibrium. These reasons are attributed to the families of students of UHASSELT who they argued that the position in Jordan is not safe, although Jordan is considered one of the more safe states in the Middle East and the world. Better information can increase the awareness of this to the families of students of UHASSELT and the many students coming this year must become ambassadors of Jordan for their peers in the next years. This can be done through reassuring the families and proving on safety position in Jordan by a small marketing campaign about the program and by putting the real beautiful and safety picture about Jordan in general and PSUT in private. The coordinator in Hasselt is working on it.

This collaboration is still recent and certainly also needs expanding and developing a joint staff (profs) to provide and exchange the study materials between the two universities. For example, Prof. from UHASSELT give as example e-business and e-commerce material (one of the required material to students of master of MIS) in PSUT, and in the same way Prof. from PSUT could give as an example innovation and value chain management material (one of the required material to students of master of MIS) at UHASSELT. Other exchanges are of course also possible.

This collaboration should be developed and expanded with respect to one specific scope however. It should be developed in multisided program. For example, it has not to depending on this specific type of collaboration between PSUT and UHASSELT in the management specialization. It should include multisided programs and more specializations in the future.

In addition to that, this type of collaboration should include other partners to both universities and working as a one complete network through sharing in benefits, knowledge, cultures, innovations, rankings and constantly enhancing and improving to all these sharing activities.

Now, there is a new agreement between PSUT and UHASSELT which allow to PSUT master students in management completing the PHD in UHASSELT with more facilities.

3.1.6. Some problems/obstacles facing PSUTs students in UHASSELT

These problems in the international collaboration between PSUT and UHASSELT can be illustrated as follows. Some of these problems however are not due to the collaboration and will only with great difficulty be solved by both universities as authorities also play a role in solving them.

- 1- Delay in the giving the residence to the PSUTs students, where the period of giving his residence card take roughly 45 days after his arriving to UHASSELT.
- 2- There is not integral coordination in booking the accommodation, because some students did not make any booking before arriving. In addition to that, there is no standardized accommodation (it is not inside the university), so the students are in different places.
- 3- The booking process of the airplane tickets is also not integral, leading to a separated arrival. In addition to that, students who arrived to the airport of Brussels are sometimes submitted to delayed procedures in stamping of their passports
- 4- There was not organized transportation from Brussels airport to the accommodation. The students who reached the Airport in the night faced the difficulty of finding out how to get from Brussels to Diepenbeek. This may generate confused positions through unavailable buses from Hasselt to Diepenbeek in the night after 23:00 (one student had his laptop stolen moreover).
- 5- The international students do not know about the details of some materials such as titles of book, no. of edition, name of editor, journals, articles, etc....
- 6- The emails between international professors and staff between PSUT and UHASSELT may be not enough, it should require calls specifically when student problems are involved.

3.1.7 Solving the problems in this type of collaboration by IT-means

Improving the facilities to the international students, for example (PSUTs students in UHASSELT) can be done through coming proposed services in the next chapter, involving an IT-application.

The problems from 2, 3 to 4 can be solved through innovating proposed e-study card in next chapter.

The problem 5 can be solved in innovating proposed Iremind service in the next chapter.

The problem 7 can be solved in innovating proposed Icollab service in the next chapter.

This is the purpose of this dissertation and the core of it. Chapter 4 will develop the details.

3.2. Developing the international collaboration between PSUT and its partners

PSUT University develop its international collaboration with its partners through expanding its international network and giving its students high opportunities depending on this network. PSUT sees opportunities in developing its collaboration with its international partners because its international collaboration with its partners was successful until now.

PSUT endeavors to develop its coordination with the U.S and Canadian universities through the ABET program. ABET is the Accreditation Board for Engineering and Technology. It is the main body that accredits engineering programs in the US and Canada and, increasingly, internationally. PSUT university will benefit from this accredited ABET program in order to invest in partnerships and collaboration with U.S and Canada universities and giving its students high opportunities to complete their study abroad.

(<http://psut.edu.jo/site/en/faculties/engineering/accreditations/engineering-abet.html>)

PSUT is developing the international collaboration with its partners in Europe. In Jordan, PSUT University wants to become the first top university in the MBA specialization through its international coordination and collaboration with Lancaster university which is considered the Third university in this specialization in the world. PSUT is developing its e-learning platform through making agreement with Doseyeh, through this development; PSUT can make sharing with its international collaboration network.

It would also like to expand the collaboration with Hasselt University in Belgium adding to its succeeded collaboration in MIS and IMS specialization in master of management. The survey in a later paragraph of this chapter shows namely that the Jordanian students describe the international collaboration between PSUT and Hasselt University by the advancing success, in the same way as they described the international collaboration between PSUT and Lancaster University.

This development process can be achieved through:

- 1- Developing the current international collaboration with its partners through new agreements such as coordination into new specializations, introducing more facilities to the students and constantly exchanging students and sharing experience and advantages which serve the collaboration process.
- 2- Expanding in new collaboration with other international universities through ERASMUS (student exchange) after deeply studying and analysing the opportunities.
- 3- Getting accreditation and funding from the international organizations such as ABET (accredited in USA and Canada), Tempus and DAAD to giving grants and scholarships to students who want to complete their studies abroad. For example, Synopsys, Inc., a world leader in software and IP used in the design, verification and manufacture of electronic components and systems today announced that PSUT is the first university in the MENA region to receive the Charles Babbage Grant from Synopsys. <http://psut.edu.jo/site/en/news-events/news.html?start=40>
- 4- Monitoring the results from all these international collaboration and making a constantly improving to it across the international coordination office (IRO).

- 5- Creating new programs of coordination and collaboration with international universities through new agreements which serve the strategic policy of the university and the education process and getting PSUT as such ranked higher in the world ranking of universities.
- 6- Expanding this collaboration in many fields and in many degrees including Bachelor, M.sc and PHD reaching to granting D.sc in the future.
- 7- Competing with other universities around the world through introducing many inventions and advanced services which serves the world and generate the new advanced generation, on other hand getting the best reputation over the world universities through a strong competition.
- 8- Putting the inclusive plan to each collaboration and specifying the advantages, disadvantages, profits, loss, risks, benefits, position of correctness, position of the fault.
- 9- Making agreements with Banks, Accommodation, Restaurant, sports halls, tourist companies and even air travel companies, such as making agreements with specific travel company in order to make discounts in the costs of travel to its visiting international students. All these should be achieved in order to give more facilities in the international student life who want to study in Jordan.
- 10- Improving the marketing process in order to attract international students and keeping them and then enhancing the collaboration by using them as alumni.

Making marketing through advertising on desired channels of TV, after studying which are the preferred channels on TV is in the country which the international collaborated universities (PSUTs international partners) are maybe part of it. E-marketing processes can be achieved through coordinating with its international partners depending on sending e-mails to the students of the international partners. For example, PSUT can send e-mails to each students of Hasselt University who have emails on (@uhasselt.be).

3.3. Sample questionnaire on the satisfaction with the collaboration of students and staff at PSUT

3.3.1. The form of questionnaire

The sample questionnaire was built on Google forms. It consisted of questions to be answered by PSUT students, professors and registration department employees. This questionnaire was classified into two categories, the first was specifically directed to the students and the second specifically to the professors and registration department employees.

The theme of this questionnaire was simply “how to develop the international collaboration among universities in education?” The individual had to rate himself/herself from 1-7, where

seven confirm that he/she knew more about it, and one confirmed that he/she did not know about it.

The questionnaire analyzes the views of the students, professors and registration department employees prepare and ability of them considering the development of international collaboration among universities. The questionnaire included 50 students, 5 professors and 5 employees of registration department. This is not enough to be statistically valid, but gives a nice overview of the prevailing ideas. Averages are not mentioned below because of the low number of respondents, only trends are mentioned.

The questionnaire can be found in annex

3.3.2 The results of the sample questionnaire

3.3.2.1. Students' views

The survey results show that the students have a positive attitude towards international collaboration among universities and would like it to be encouraged through expanded coordination and partnerships. They express their satisfaction about all partnerships and joint programs of PSUT, but specifically the international collaboration between PSUT and Lancaster University and UHASSELT are mentioned in this respect.

They think that this type of collaboration will contribute to raising the international ranking of PSUT and to the creation of new jobs for both students and teachers. They believe that many scholarships will finally be granted and like the idea of cross cultural exchange and getting to know more cultures through these partnerships. They expect that the exchange programs such as Erasmus, Tempus and the efforts of institutions granting scholarships like DAAD can be expanded by creating and developing new programs.

In addition to that, students hope that international collaboration among universities will help them in giving more facilities and benefits. They expect that the advantages of these international collaboration among universities are bigger than the disadvantages.

They do not prefer depending E-learning instead of learning in general but they prefer using e-learning applications in addition to the traditional learning situation and they expressed positive ideas about the important role which the e-learning plays in serving the educational process in universities. Most of the students have simple and little information about Android open source systems. They all prefer using smart mobiles.

3.3.2.2. Professors' views

The survey results illustrate that the professors strongly support the international collaboration among universities, confirming that the international partnerships of PSUT and its joint programs are pioneer in Jordan.

They did not prefer depending on the new technology to personal contact with their students after the lecturing, apart from free SMS reminders. The professors prefer depending the new technology however to contact with other professors within the network through free calls and SMS.

The professors did not prefer E-learning instead of learning in general but, they confirmed that using the combination of e-learning and traditional learning can play an important role in the learning process and in improving it because of its flexibility and agility.

3.3.2.3. The employees of registration department views

The survey results demonstrate that the employees of registration department encourage the international collaboration among universities.

Concerning the skills in using new technology for the registration system instead of existing systems, they expressed their interests in using IT. The registration department advocate depending on smart mobile technology to contact both students and professors.

3.4. Summary and conclusions

The international collaboration, coordination and partnership among universities become a must as a result of the advantages and facilities they present to the staff and students. Reducing tuition fees to the international students, as well as the sharing of objectives, cultures, programs, aims are important to them. A better ranking could result from it and advance international collaboration. International collaboration in that respect is very similar to alliances among business. Getting a better ranking and international reputation as international brands are advantages of both university collaborations and alliances between companies. It improves the position against competitors in the world. This type of collaboration will help in introducing jobs, it will increase employment and open new prospects for the international staff and students.

The survey showed that the PSUTs students encourage this type of collaboration and that they were satisfied about the international collaboration between PSUT and its international partners. They pinpointed to this success through increasing numbers of students studying abroad and the constant development of new ideas in their university, especially since it the

collaboration with Lancaster university gives PSUT in Jordan the image of top MBA ranking because Lancaster is considered one of the three best universities in the world for the MBA specialization in the world.

Some of the deficiencies and problems of collaboration can be solved by IT-solutions and platforms, mainly through using android technology. In general costs could be addressed and exchange improved. This is the view of students and to a lesser degree also of professor and staff at PSUT.

CHAPTER 4: AN IT-SOLUTION: PROPOSED IMPLEMENTATION OF FREE E-CALLS, E-MESSAGES AND E-STUDENT CARDS

The aim of this chapter is using the unique technology which is applied in smart phone applications (open source and free services) to the collaboration between international partners at university level. To the options presented belong: introducing the sharing of information services (called I collab) between the staff, coordinators and experts in both internationally collaborating universities, introducing the sharing information services between the staff, coordinator on one hand and the international students on the other hand (called I remind) and introducing live international lectures to across (called I present) on large screen. This is a peer to peer service. Section 4.1. reviews the objectives, section 4.2 gives the description of Iremind, Icollab, Ipresent and suggests an e-study card. Section 4.3 gives the implementation methods of these services. Section 4.4 summarizes the conclusions about these services.

4.1. Objectives

The objectives of the services I will present as applications are making a constant contact and coordination between t international students of the collaborating universities and its staff, registration departments and the libraries in these universities more possible and accessible. All these proposed services will serve the educational process through introducing facilities to international students, such as introducing registration services at any time and preventing any lateness in them.

In the next paragraphs the objectives of the three applications: Iremind, Icollab and Ipresent are separately introduced indicating also the flowcharts needed in the development of the application.

4.1.1. Objectives and flowchart of applying the (I remind) service

This service will be between the staff, coordinator on the one hand and the international students on the other hand and depends on free calls and messages. The main purpose is together the international students' email, Blackboard and student files in one service, instead of being separated.

Other purposes can be described as follows:

- Reminding students of considering their registration position whether regular or not;
- Studying detailed information about the registration such as providing names of his registered materials as messages on form documents in PDF, JPEG or other form, costs and number of hours left before the last time for payment of study fees,

- Giving information on names of books in the study material, names of its editors and number of the edition used before the beginning of the study,
- Easing other requirements by the registration department to the students
- Information about the host country: climate, jobs, trends, cultures, activities,
- Providing reciprocal access to the e-bookshop to both international collaborating universities (access or borrowing of e-books, journals and articles in order to preparing more reader generation and encouraging editing and publishing books for example) PSUTs library gives its international students like Hasselt's students extra necessary databases such as proquest, emerald and so on, through sending free messages.
- Reminding the students of the lecturers considering the deadline for tasks and research,
- Giving the students hints by the lecturers about their research or any required work.
- Reminding the students who bought or rented cars in date of re-registration (each year) or returning it.
- Providing the news considering the success of collaboration, rewards, achievements, contributing in unique developments, ranking advanced, e-marketing in order to attract future students, new employments whether in the home country or second country, scholarships for students, conferences dates, exhibitions places and dates.

The procedures of this service are easy and can be described as:

- 1- On the smart phone, there is an icon called (I remind), just press/touch it.
- 2- This service will be opened and give the students three choices (e-library, Teachers, Registration).
- 3- Press/touch the (Teachers) icon, it will be opened, this icon will be separated in two parts, the first regards the Professors (Teachers) and the second regards the students. Both students and professors should enter their user name and passwords and name of their university in order to log in, and then, they can contact by messages (see their inboxes, send documents, save in folders, upload and download).
- 4- Press/touch the (e-library) icon, it will be opened, this icon will be separated in two parts, the first regards the library and the second regards the students. Both students and the library should enter their user name and passwords and name of their university in order to log in, and then, they can contact by messages (see their inboxes, send documents, databases such as articles, save in folders, upload and download).
- 5- Press/touch the (Registration) icon, it will be opened, this icon will be separated in three parts include the registration department, professors and students, each one of them should enter his user name, password and the name of university ,and then they can contact by messages (see their inboxes, send documents, databases , save in folders, upload and download). The other parts include news such as the news of collaborating universities and advances in our

university, calendars, announcements such as these about scholarships, jobs, cultures and tourism guide/navigation about the countries,...

The implementation of this service requires the coordination between the networks of international universities either in-house among universities or outsourced by making agreements with a third party to achieve the service offer free calls between the international/national students and registration department, library in the foreign university and free SMS between the international/national student and the staff and professors in all these universities. In addition to that, these agreements can be improved by the group of international students in computer science in order to develop the Iremind service and finally arriving to achieve the objectives above.

These following figures 4.1 and 4.2 show the flow chart to this objective.

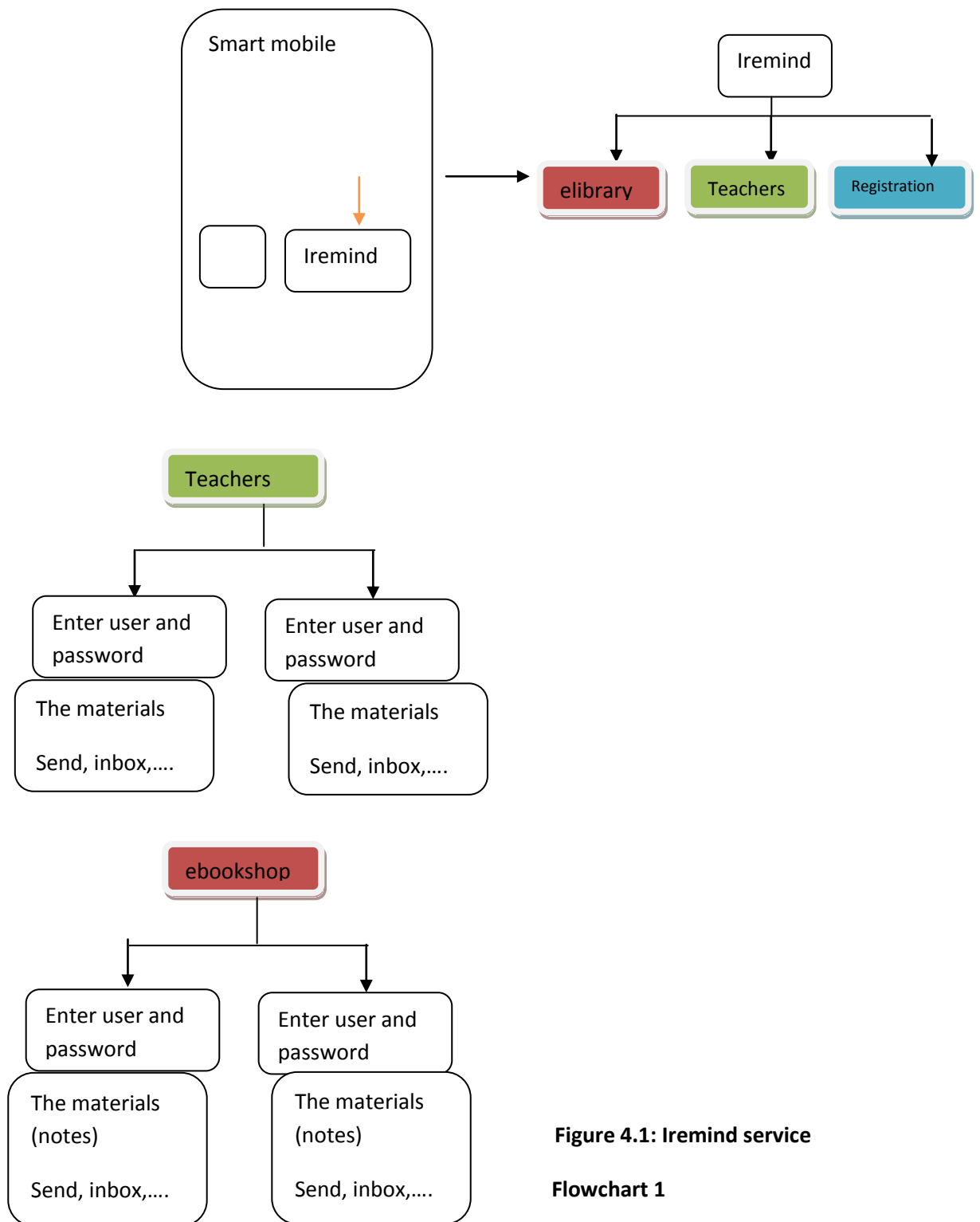


Figure 4.1: Iremind service

Flowchart 1

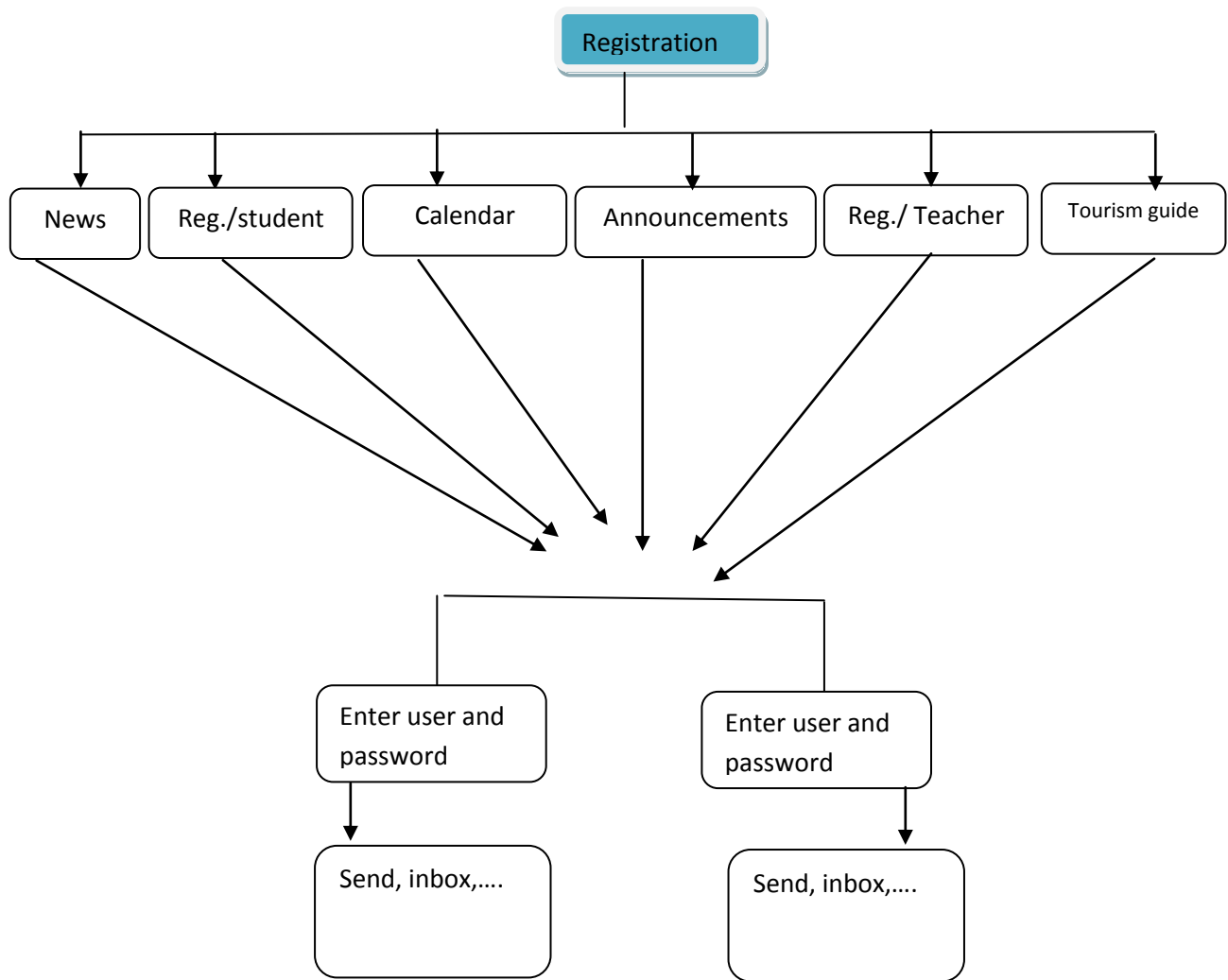


Figure 4.2: Iremind service flowchart 2

4.1.2. Objective and flowcharts of applying the (Icollab) service

This service will be only between the staff, coordinators and experts in both international universities and depends on free calls and messages. Improving the studying materials through continued collaboration in line with the scientific development in the world in order to prepare new efficiently in education and research is its main objective.

Other purposes can be described as follows:

- Reminding them of the lectures' schedules and lectures times,
- Introducing travel facilities by making recommendation message in order to facilitate the visa,
- Introducing travel info such as a tourism guide, the current exchange rate, info about the climate and current temperature,

- Informing about the second country, jobs, trends, cultures,
- Informing about conferences and presentations times, free calls and messages among universities, free calls and messages between the staff, coordinators and experts.
- Introducing the sharing of information services between universities staff on a time.
- Editing books by staff members and publishing this service in order to encourage the editing of books and preparation of the environment to compete better on the international market and maybe adopting and depending it for future study materials.

The procedures of this service can be described as steps as follows:

- 1- On the smart phone, there is an icon called (Icollab), just press/touch it.
- 2- This service will be opened and give all the staff two services: free calls and SMS, these are offered to the coordinator, staff, experts and registration officers of all collaborating universities.
- 3- Each one of them should enter their name, password and name of university.
- 4- Press/touch the (free call) icon to make a free call, or press/touch the (free SMS) to send free SMS.
- 5- Each one of them should enter a specific number or he should choose one of the saved names.
- 6- Press on the call to make a free call, or press send to send free SMS

The implementation of this service requires imply either 1 or 2 as following:

- 1- the coordination between the international collaborated universities and a third party (outsorce) for free calls and free SMS though making agreements between this network of collaborated universities and the third party in order to offer free calls and SMS to the staff in all these universities. In addition to that, these agreements can be improved by the group of international students in computer science in order to develop Icollab service and finally arriving to achieve the objectives above.
- 2- by a group of international students in computer science departments in all collaborated universities (in-house).

Figure 4.3 will illustrate the flowchart of this service

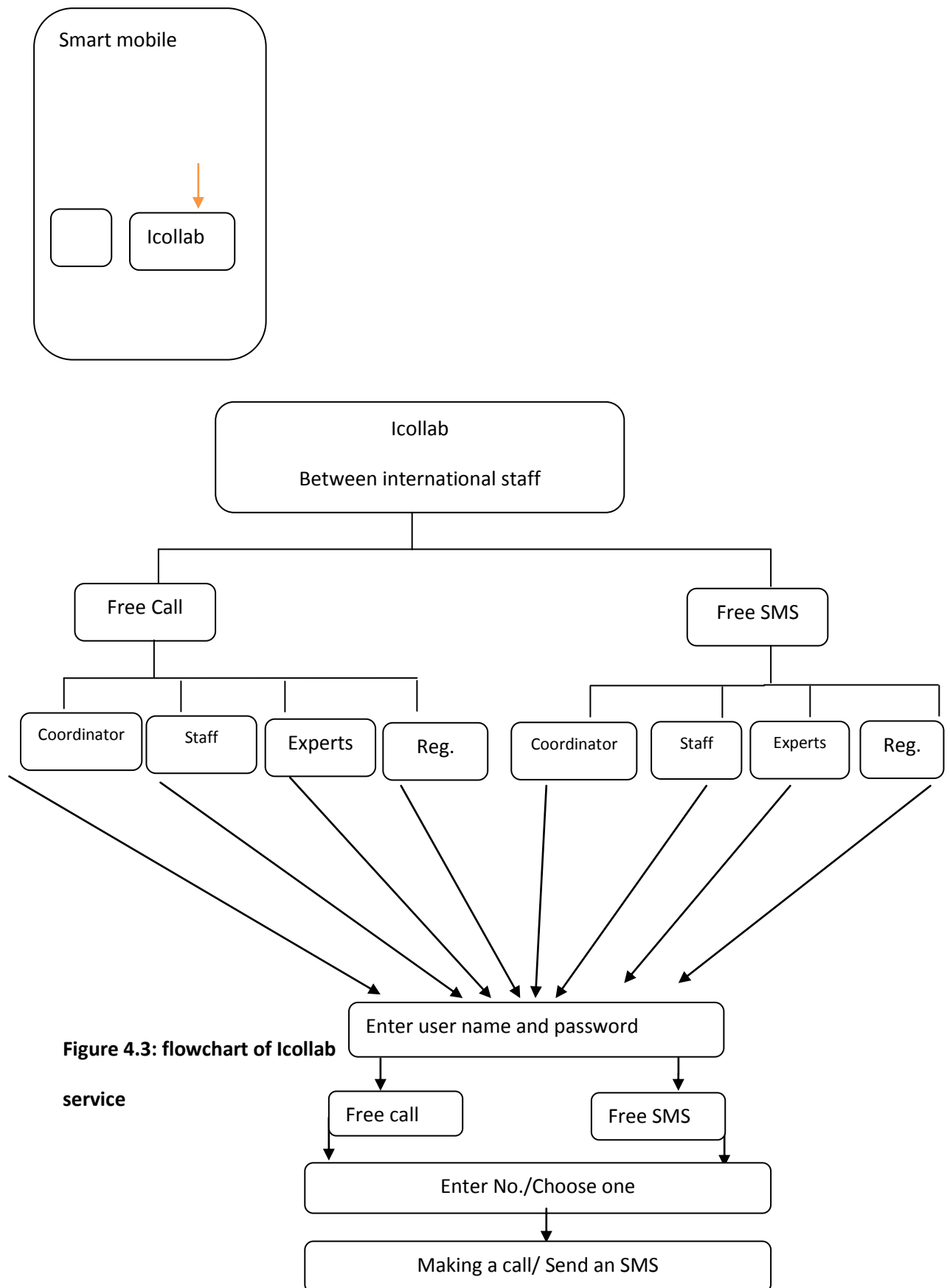


Figure 4.3: flowchart of Icollab service

4.1.3. Objective and flowchart of applying (Ipresent) service

This service represents a live watching service from peer to peer by

- 1- Displaying live international lectures and conferences between universities.
- 2- All the staff, students, registration office members and library staff could receive messages (announcements and news, specific activities and so on...) in this live service.

The procedures of this service can be described as:

- 1- On the smart phone, there is an icon called (Icollab), just press/touch it.
- 2- This service will be opened; two icons will appear (Live conferencing/Lectures, /Announcements).
- 3- Press on any one of three icons, it will be opened and showing the live happen.
- 4- Press on the Download, to make downloading.
- 5- Press Share/send to friends, to make sharing videos.

Developing of this service should be followed by the coordination with other parties through either one of the following options:

- Making agreements between international collaborated universities and third party (outsourced) in order to get peer-to-peer services and improve this service to be capable of applying Ipresent. This can be done by a group of international students in computer science departments in those universities.
- Develop all this service and with the coordination internally by a group of international students in computer science departments in all collaborated universities (in-house).

The figure 4.4 will illustrate the flowchart of this service

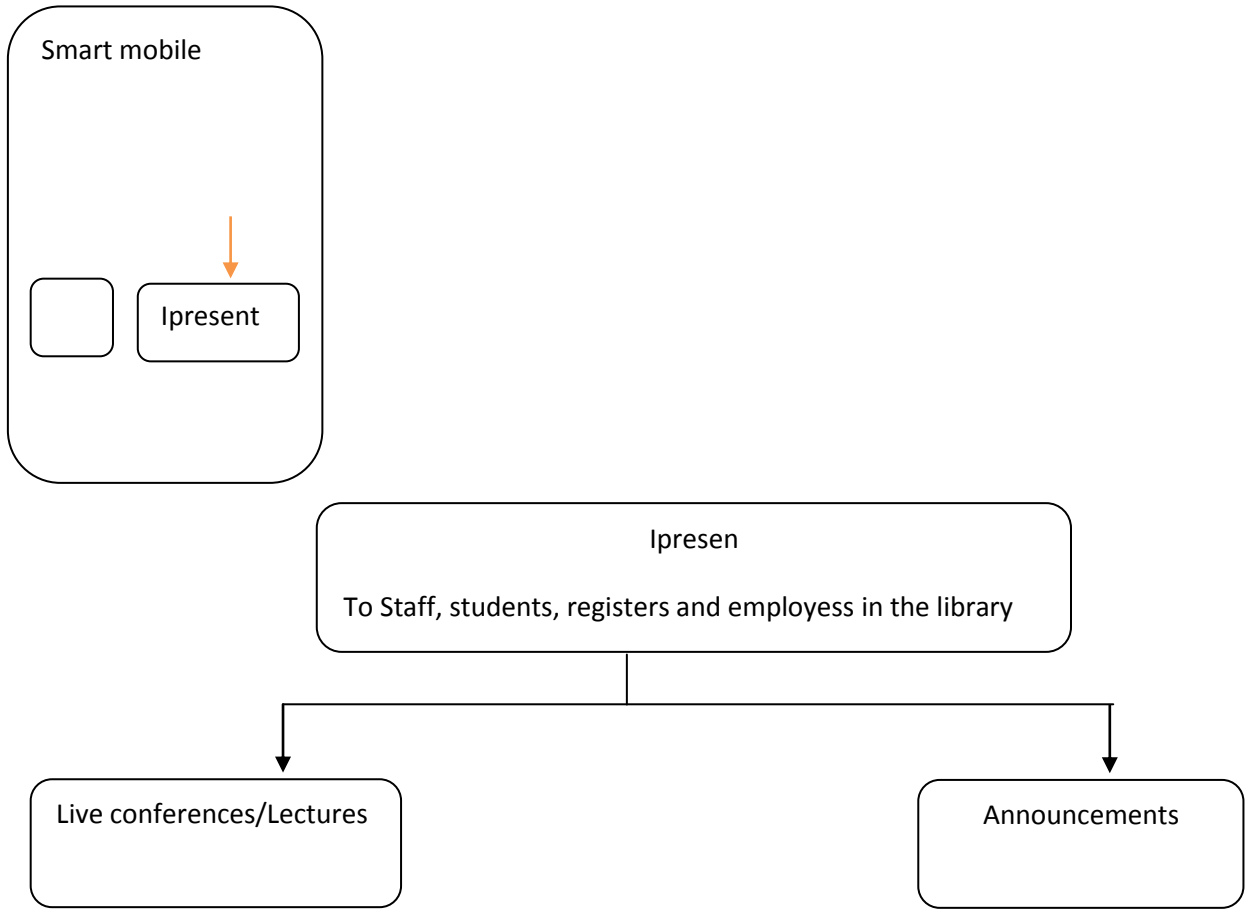


Figure 4.4: flowchart of Ipresent service

4.1.4. Objective and flowchart of developing an international student e-card.

Developing an electronic international student card (e-study card) through the international collaboration among universities is the main purpose of this.

The procedural steps that the international student should be followed are as follows:

- 1- Enter the website of your university or use the proposed Iremind service and ask for this card.
- 2- On the website, go to the "International students service".
- 3- Book an accommodation (address, from-to, fees,... etc)
- 4- Choose the type of student insurance health, as example (SIP card integral).
- 5- Book a flight in details (from-to, date, single way/return, desired temp., preferred channel tv, preferred program/film,)
- 6- Book other transports such as bus/train or another airplane (vehicle no.,... etc).
- 7- Go to your university with your documents and e-study card to complete procedures (Thumbprint).

The international universities should follow this up by coordination with other parties as follows:

- 1- Making agreements between universities in order to coordinate between the e-study card applications.
- 2- Making agreements through series of coordination agreements between the universities and the accommodation, transport means (bus/train) to the accommodation (from the airport to the accommodation) and the town hall in order to facilitate residence procedures to the international students and giving special offers to these students
- 3- Making agreements with a network of strong security companies in order to protect these international collaborated universities and its students, and implement the thumbprint.
- 4- Issuing e-study card is achieved after all these series of coordination and collaboration with all parties by the hosted university (foreign university).
- 5- Issuing the residence card is given to the international student after a short period from his arrival to the study country from the town hall.
- 6- Issuing e-study card is achieved after all these series of coordination and collaboration with all parties by the hosted university (foreign university)
- 7- Making agreements with travel companies and universities.

The following figure illustrates the flowchart of this service.

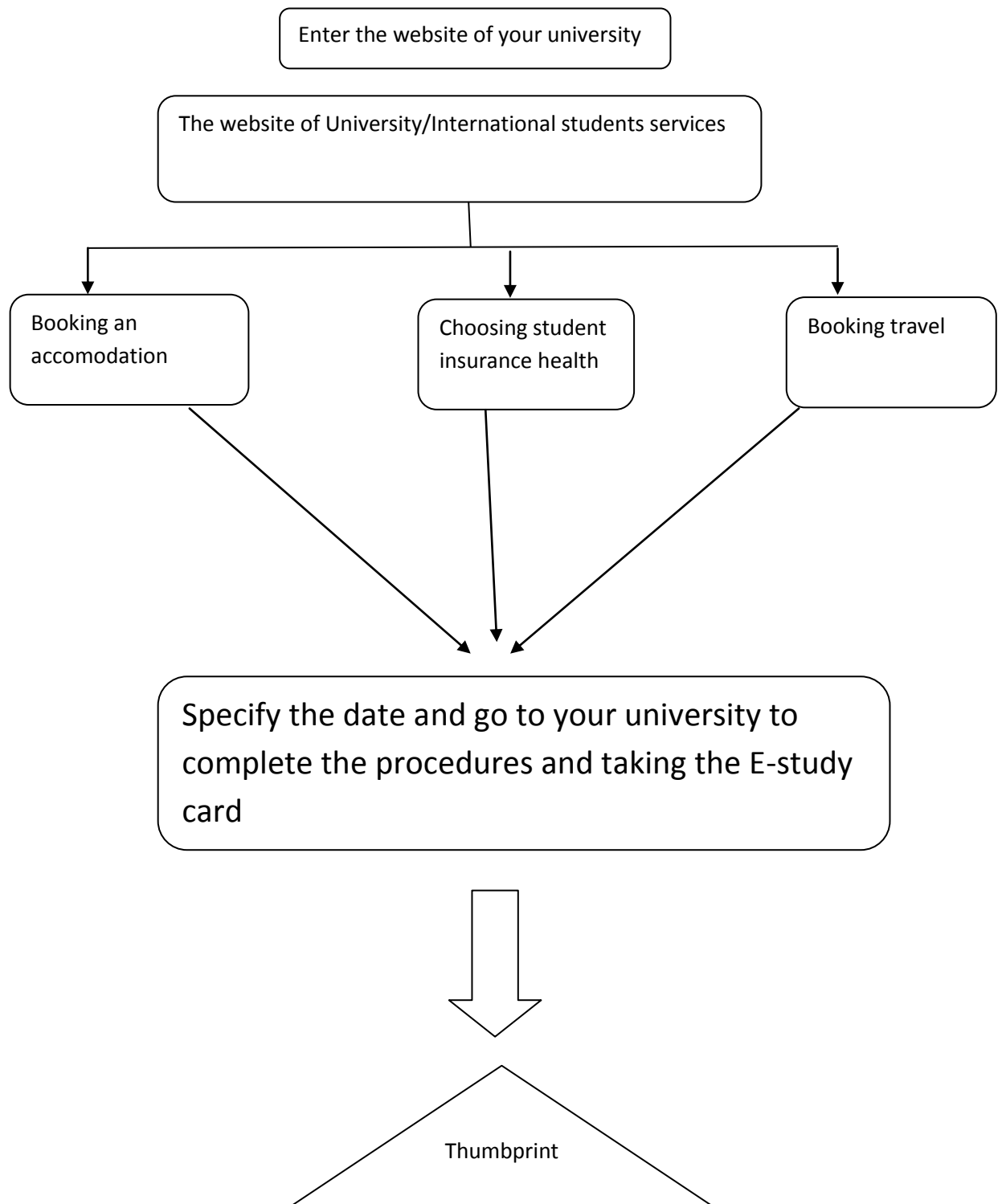
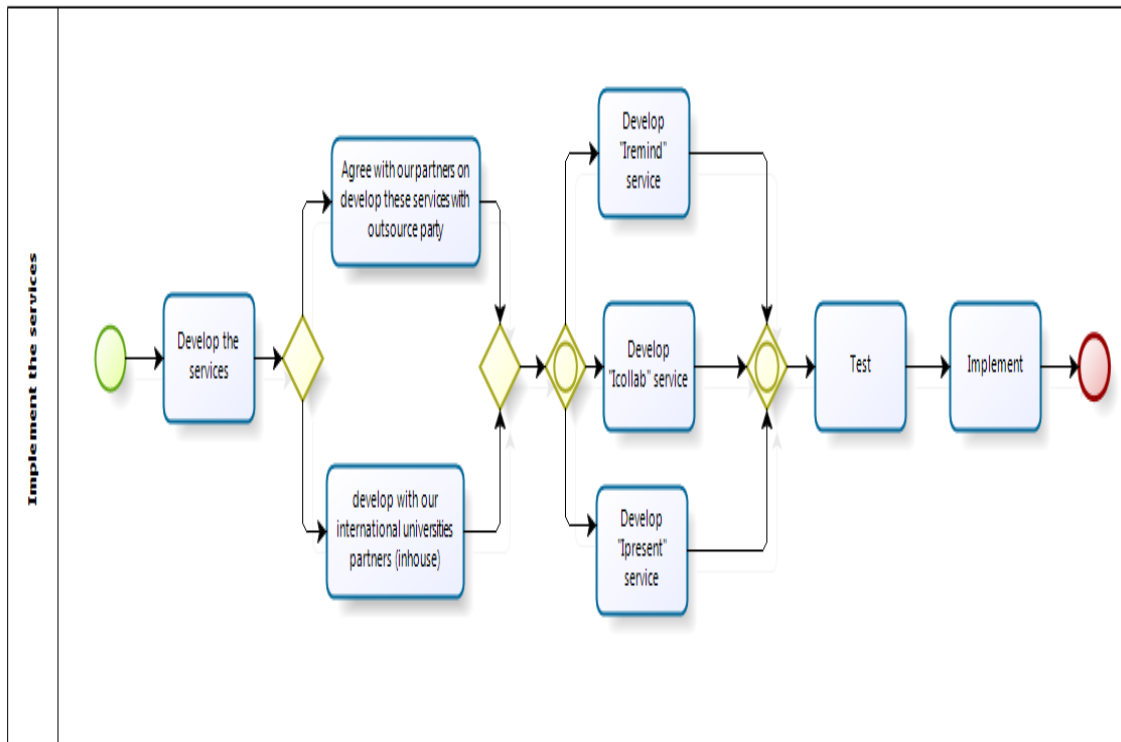


Figure 4.5: The flow chart of getting e-study card

4.2. Implementation of the proposed services

The tactical level of implementing all these three services can be described as the figure 4.6, which illustrates developing these first three services either in house or outsource



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Modeler

Figure 4.6: Tactical level to implement the three services (iremind ,icollab and ipresent), source: (own development)



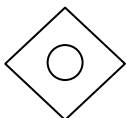
Task:



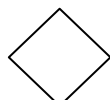
Start event



End event



Inclusive gateway: allow at least one path (token) to pass



Exclusive gateway: allow to just one path to pass

4.2.1 Objective One: Iremind service

Step 1: In using the smart mobile, we just press/touch the orange icon which is called (Iremind) as show as figure 4.7

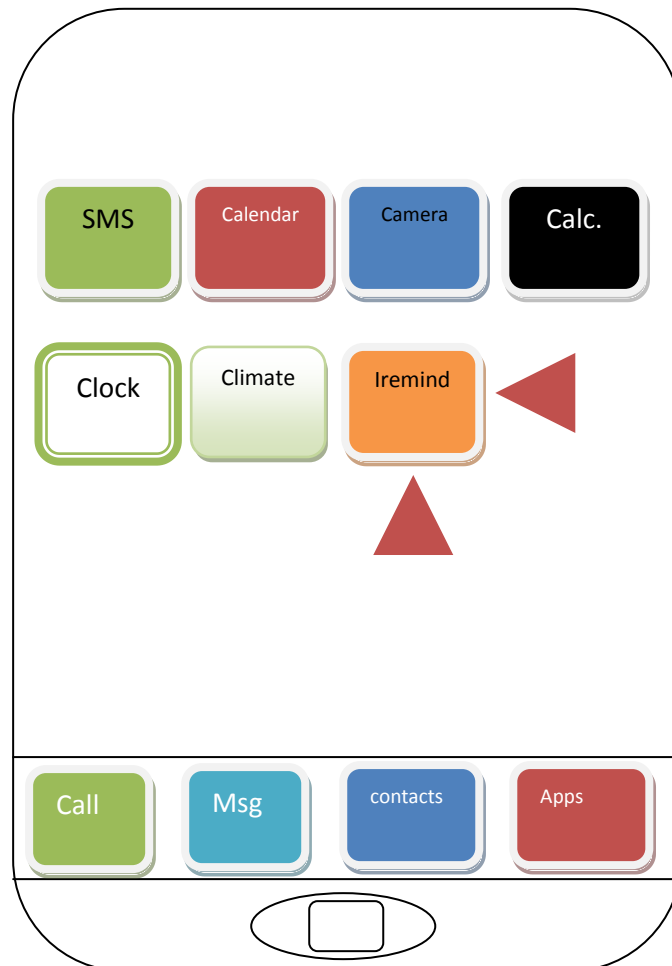


Figure 4.7: The smart mobile and Pressing Iremind icon (source: own development)

Step 2: Iremind service will operate and display three choices:

- e-bookshop/students
- Teachers/students
- Registration Notes

When choosing the second choice by press/touch it as show as figure 4.8

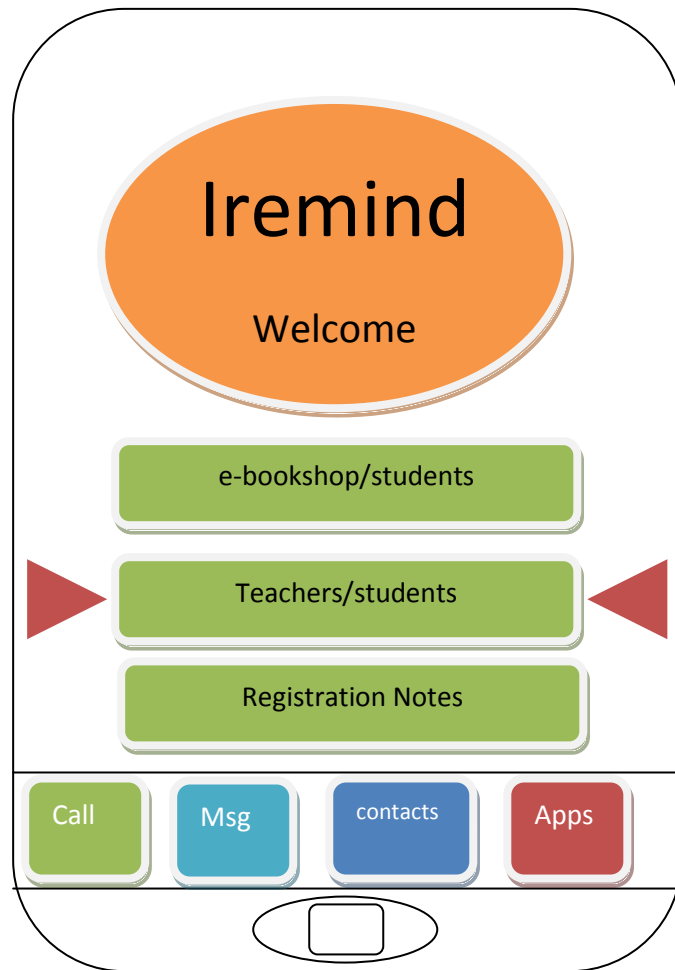


Figure 4.8 illustration of step 2 (source: own development)

Step 3: The second choice will appear and below it two choices as show as figure

Teachers

Students

If the user is Teacher, he will press/touch Teachers choice.

If the user is Students, he will press/touch Students choice as show as figure 4.9

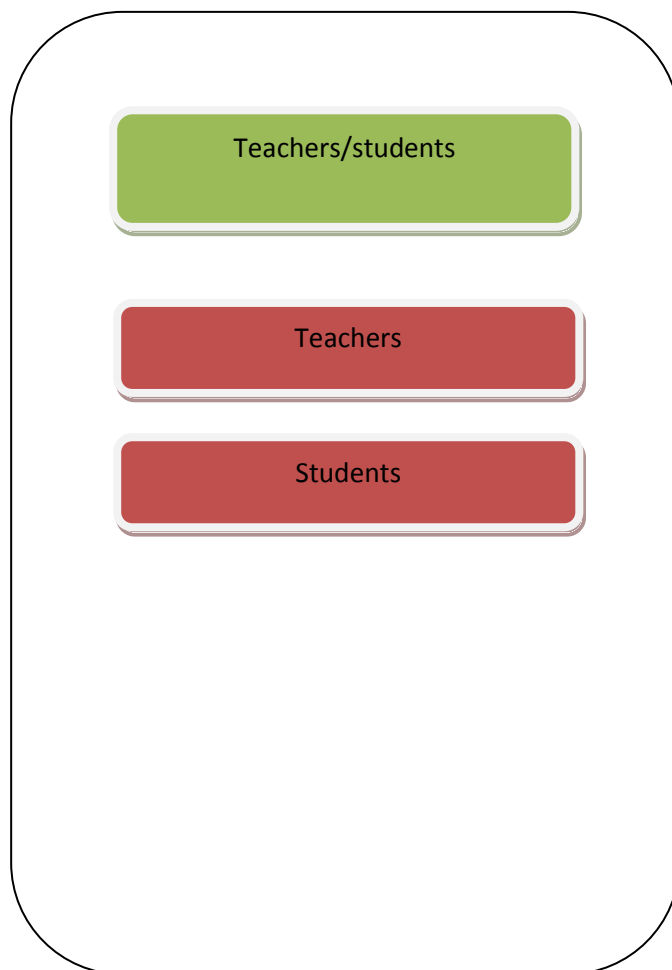


Figure 4.9 illustration of step 3 (source: own development)

Step 4: The teacher will enter his name and his password and the Student will enter his name and his

Password and both logging in as show as figure, all the next figures will show that in separate (Students, Teachers) as show as figure 4.10

The figure illustrates two separate login interfaces. The left interface is for Teachers, featuring a green title box, a red name input field, a red password input field, and a white Log in button. The right interface is for Students, featuring a green title box, a red name input field, a red password input field, and a white Log in button.

Figure 4.10: illustration of step 4 (source: own development)

Step 5: All the materials of study will appear to both Teachers and Students as show as figure 4.11

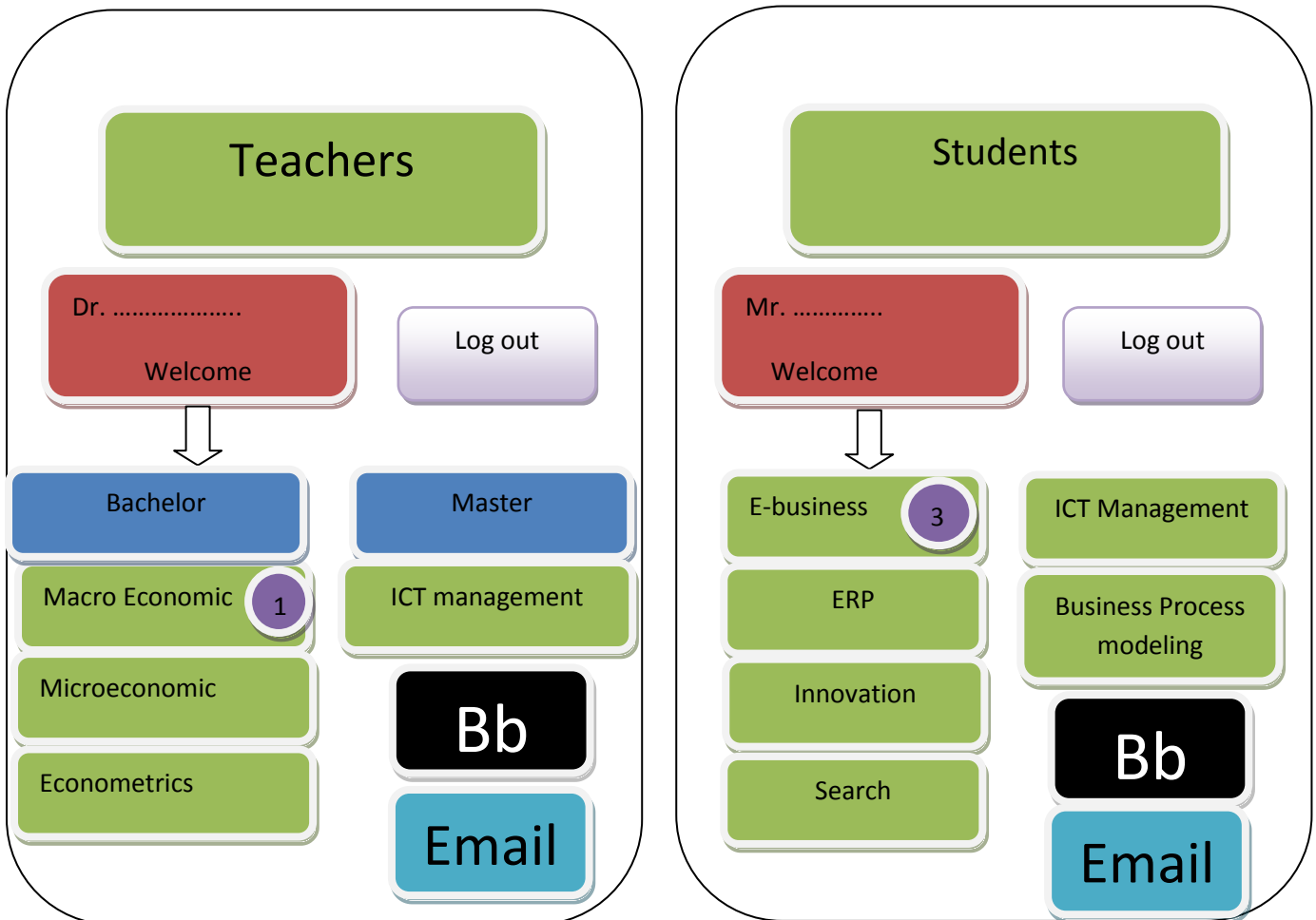


Figure 4.11: illustration of step 5 (source: own development)

Step 6: The Teacher will enable to enter as example Room no.301-303 each alone or all rooms to put the grades and send it to the registration department through (Go to Reg.) icon or send a free text message to the students through (Send) icon or save it through (folders) or (Drafts) icon, the teacher can see the received messages from students or registration departments through (inbox) icon, the teacher can send information to the Dean or his departments, the teacher can edit his new book and make announcements about it (e-marketing). Here the teacher press/touch (Send) icon as show as figure

Here the student can send as example, his answers to the assignment to his teacher through (Send) icon, he can receive some notes through free message from his teacher through (Inbox) icon and he can reply, forward and save in folder, he can save his work on the folders

or drafts through (Folders) and (Drafts) icons, the student press/touch the inbox icon as show as figure 4.12

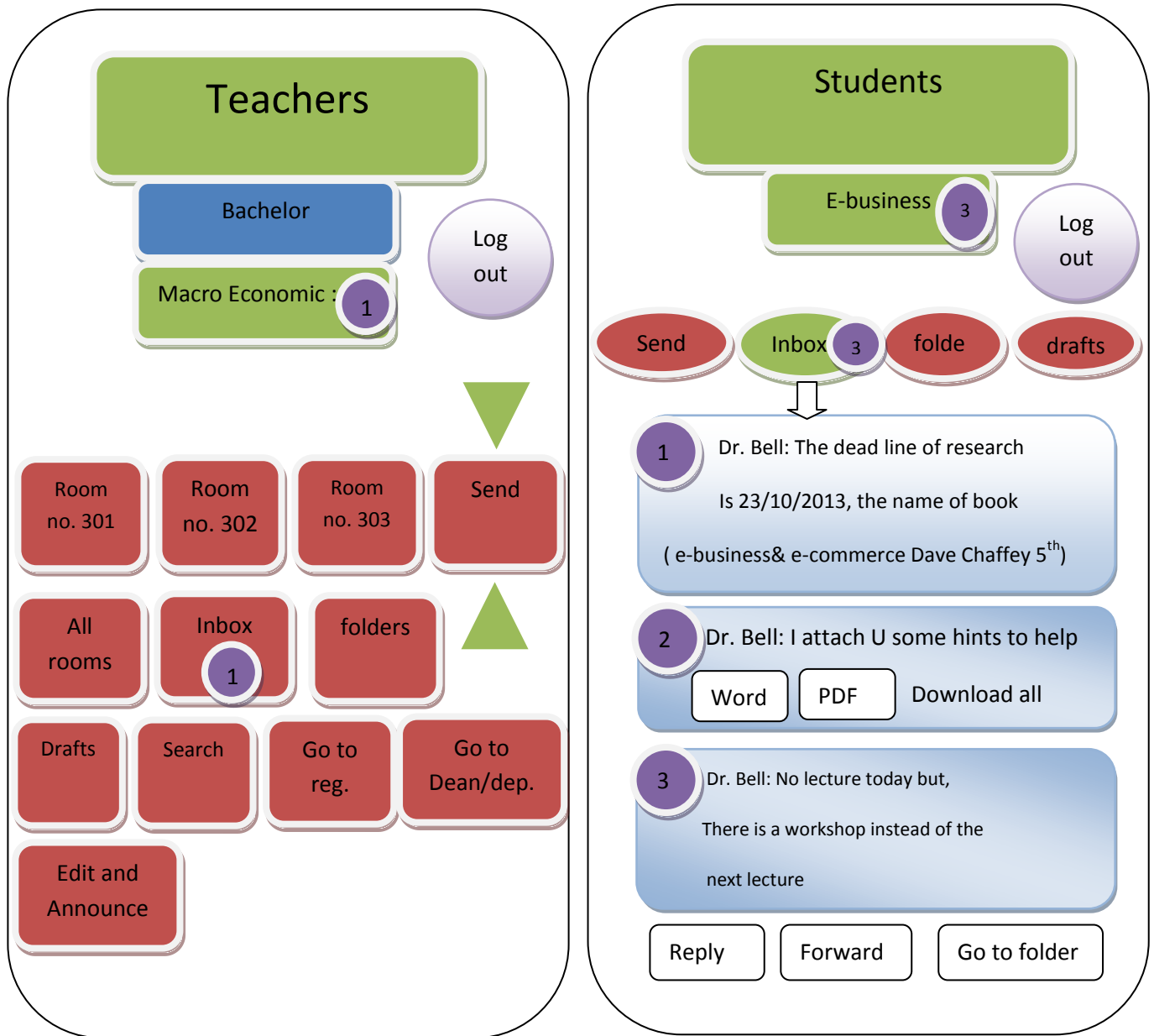


Figure 4.12: illustration of step 6 (source: own development)

Step 7: Here, the teacher will write a text free message to the student (notes). The student will send a free SMS to his teacher, so he must specify name of the teacher as example, Dr. Bell as show as figure 4.13

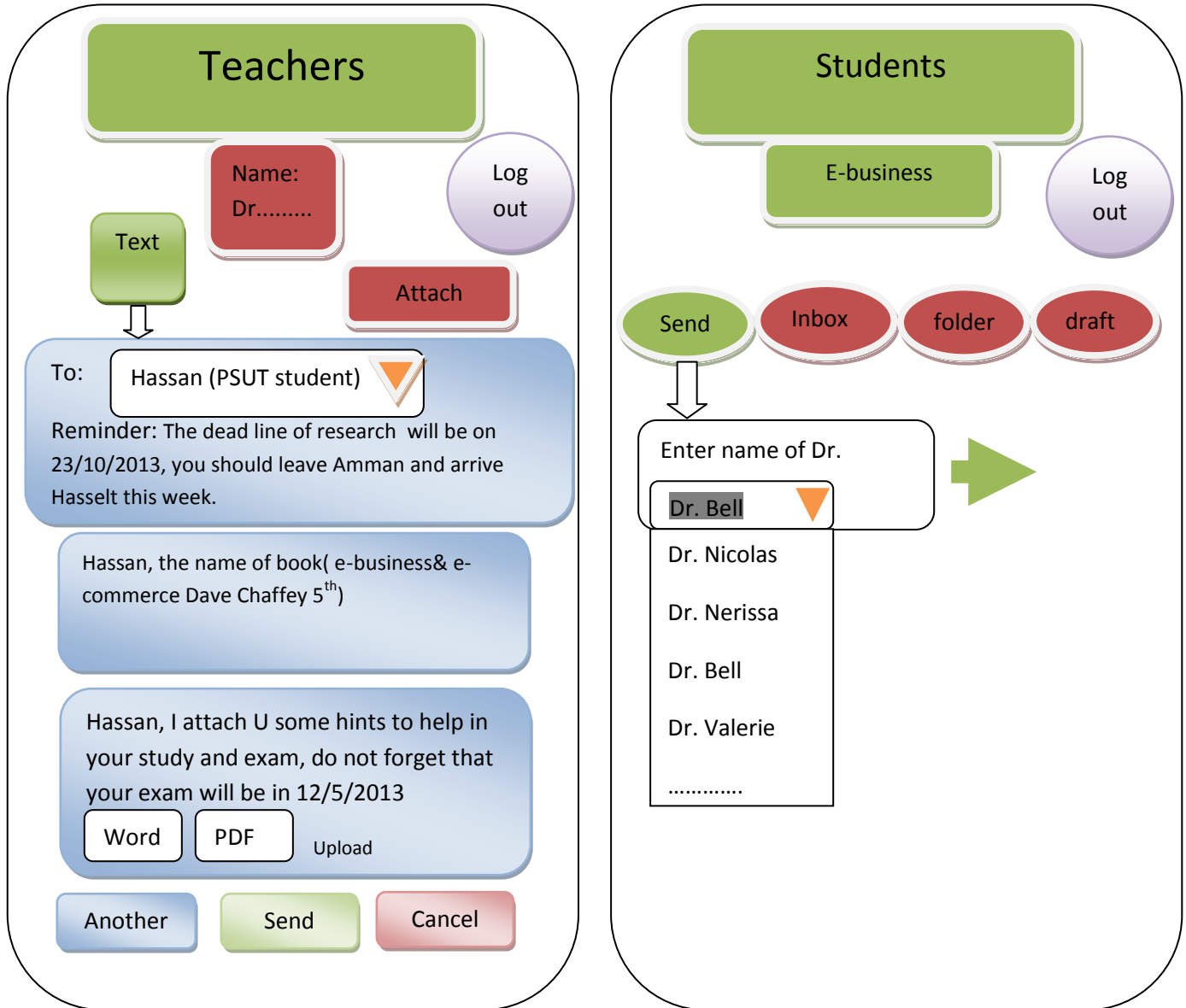


Figure 4.13: illustration of step 7 (source: own development)

Step 8: Here, the teacher will press/touch (inbox) icon. The student will send free SMS to his teacher Dr. Bell and attach him his assignment as show as figures 4.14

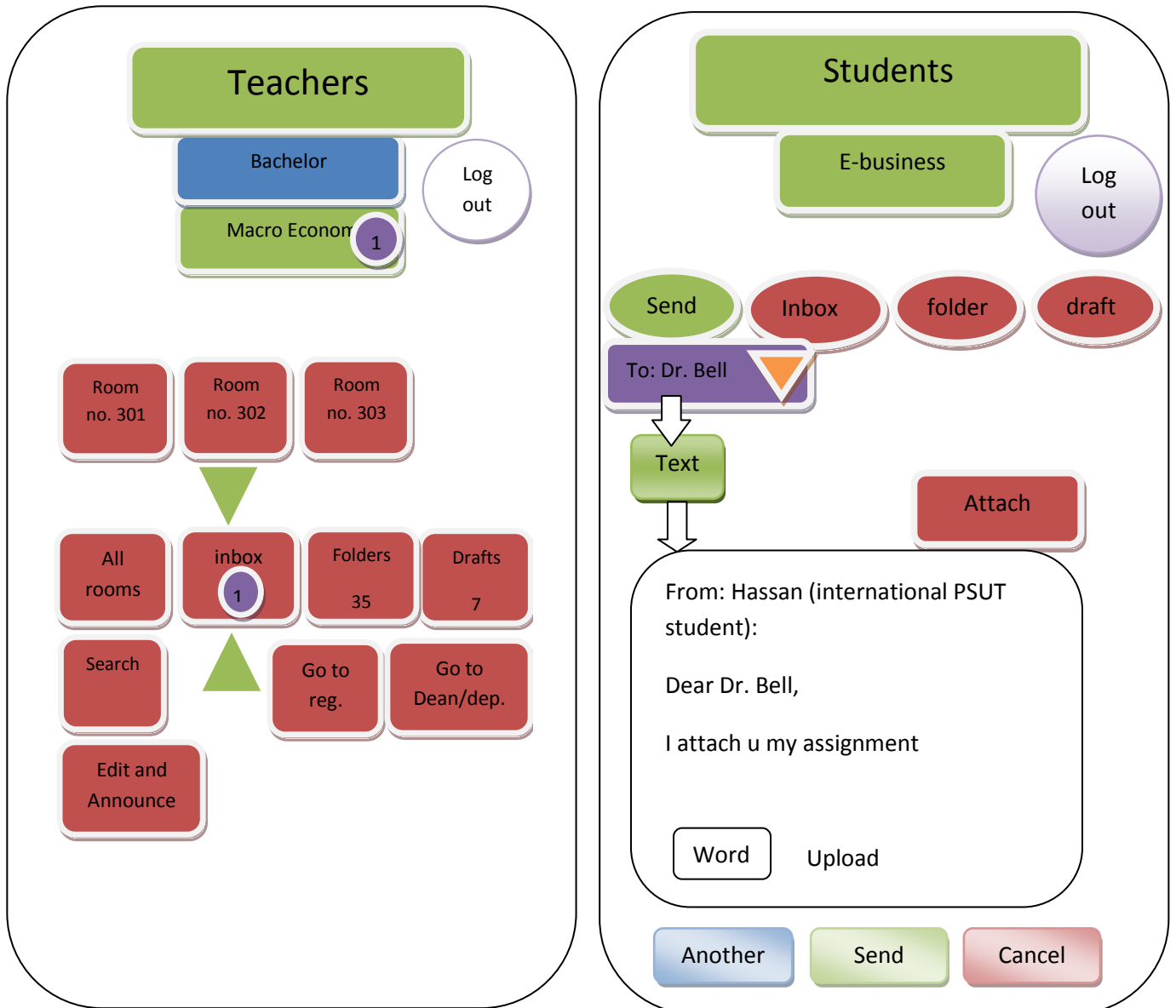


Figure 4.14: illustration of step 8 (source: own development)

Step 9: The teacher will receive free SMS from his international PSUT student Hassan, the teacher can reply, forward and go to folder as show as figure 4.15 .

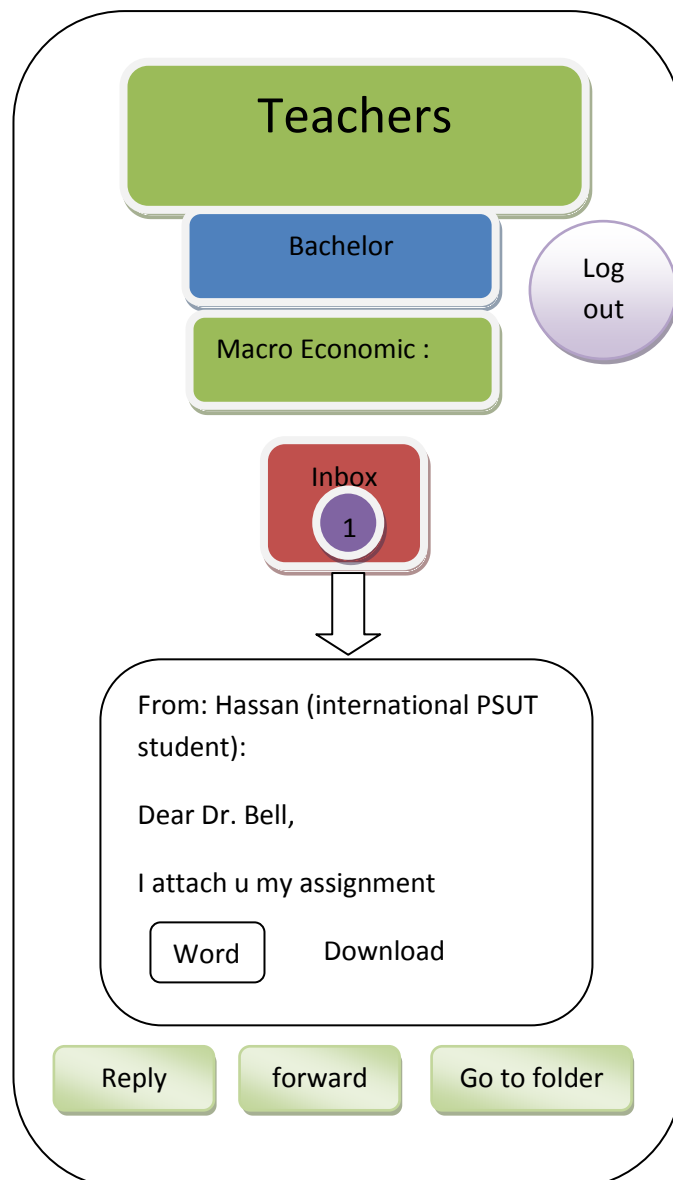


Figure 4.15: illustration of step 9 (source: own development)

Step 10: The teacher will press/touch (All rooms) icon to send a free SMS to all students as show as figures 4.16, in addition to that the register can press (Search) button if he wants showing all details on specific student.

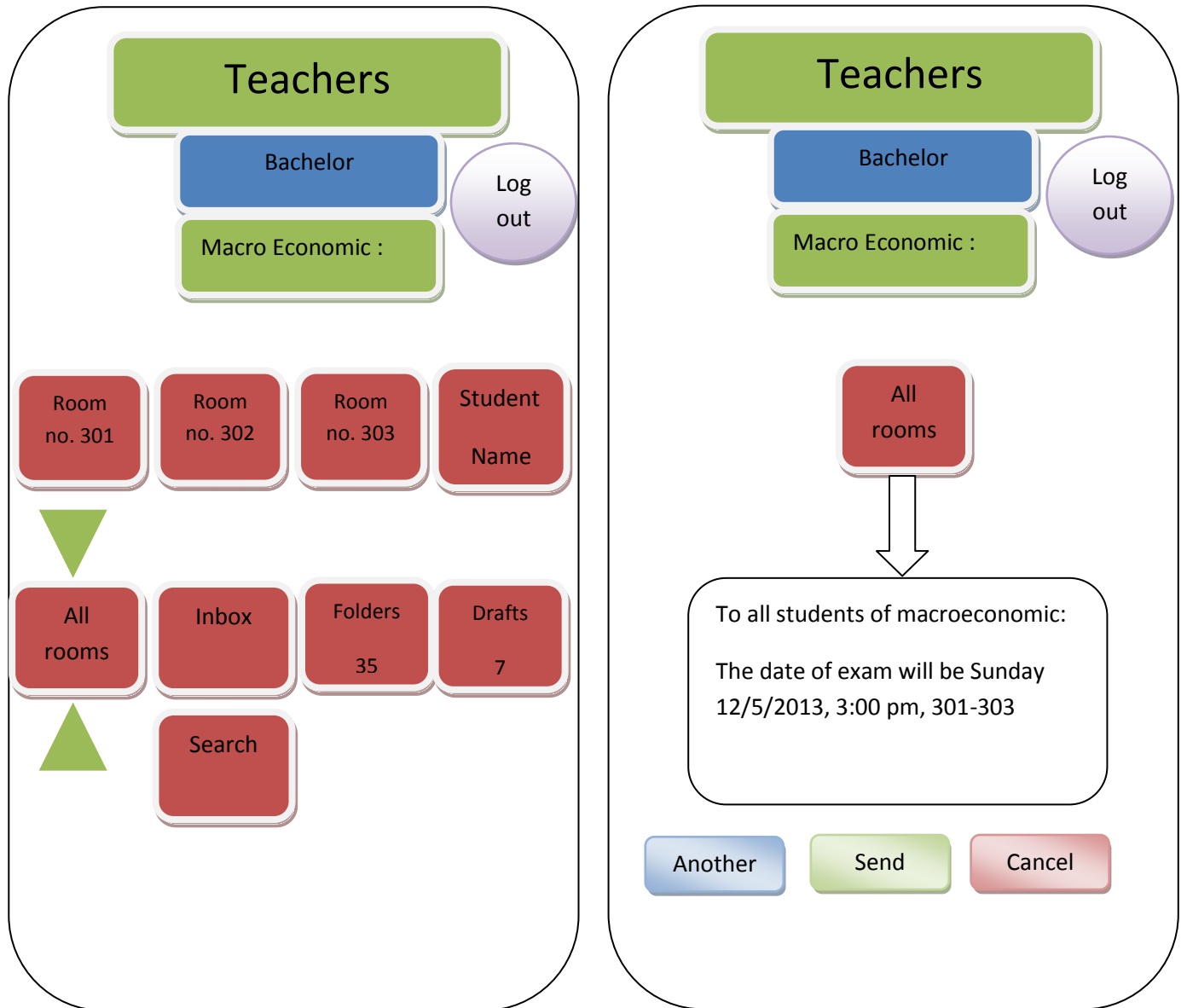


Figure 4.16: illustration of step 10 (source: own development)

Step 11: Return to the main menu which consists of: e-bookshop/students, Teachers/students and Registration Notes, when pressing/touching (Registration Notes), Five icons will be displayed: News, Registration/student, Academic Calendar, Announcements and Registration/teacher, pressing/touching (Registration/student) icon as show as figure 4.17

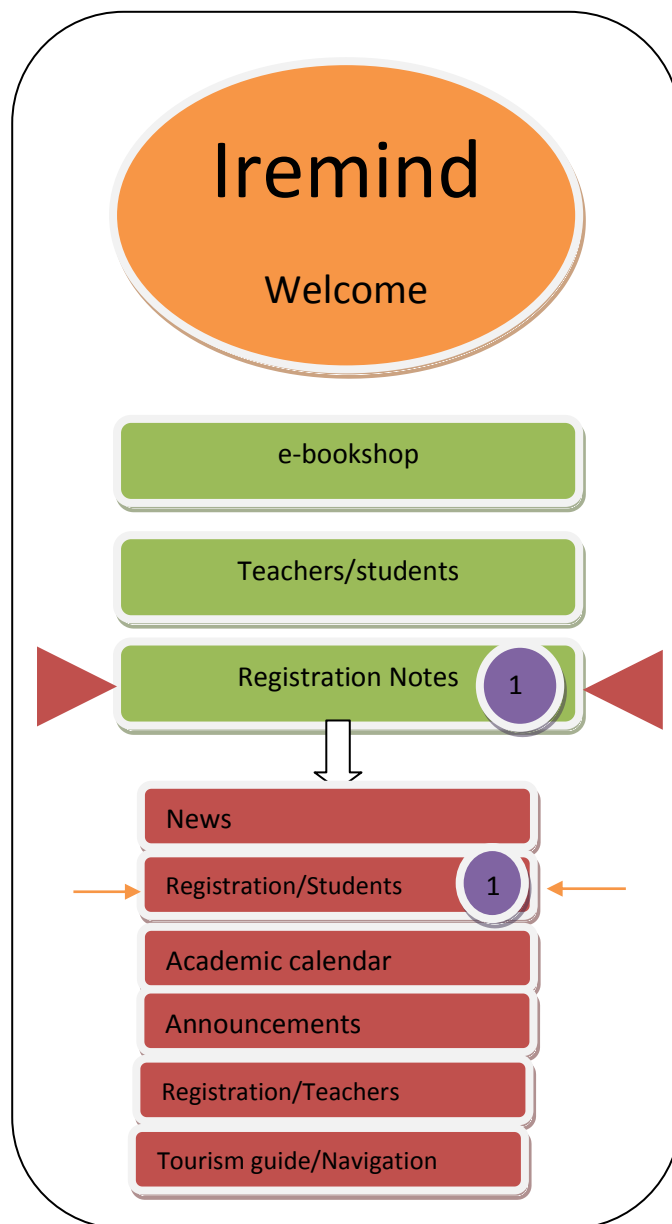


Figure 4.17: illustration of step 11 (source: own development)

Step 12: Here, both the register and student will enter his name and password in order to log in as show as figure 4.18.

The figure shows two side-by-side login forms, each enclosed in a rounded rectangular border. The left form is for 'Registration' and the right form is for 'Students'. Both forms have a green header bar with the text 'Registration Notes' and a small purple circle containing the number '1' on the right side. Below the header bar is a red button with the text 'Registration' (left) or 'Students' (right). Underneath the button are two red input fields: 'Name of Register:' (left) or 'Name of Student:' (right), and 'Password:' (left) or 'Password:' (right). At the bottom of each form is a white button with the text 'Log in'.

Figure 4.18: illustration of step 12 (source: own development)

Step 13: Both the Register and Student have many options as show as figures 4.19

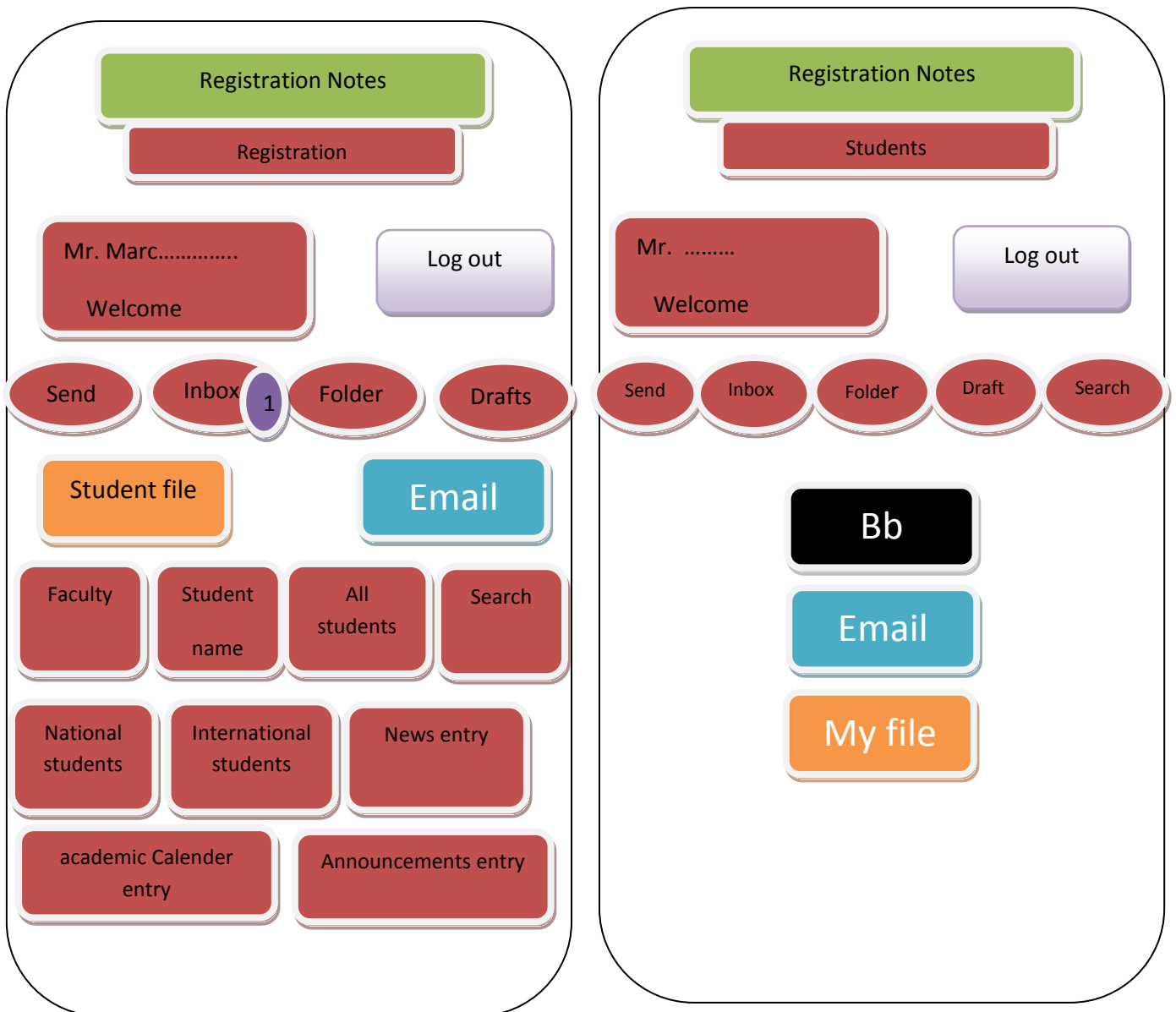


Figure 4.19: illustration of step 13 (source: own development)

Step 14: Both the register and the student can send a free SMS with each other as show as figures 4.20

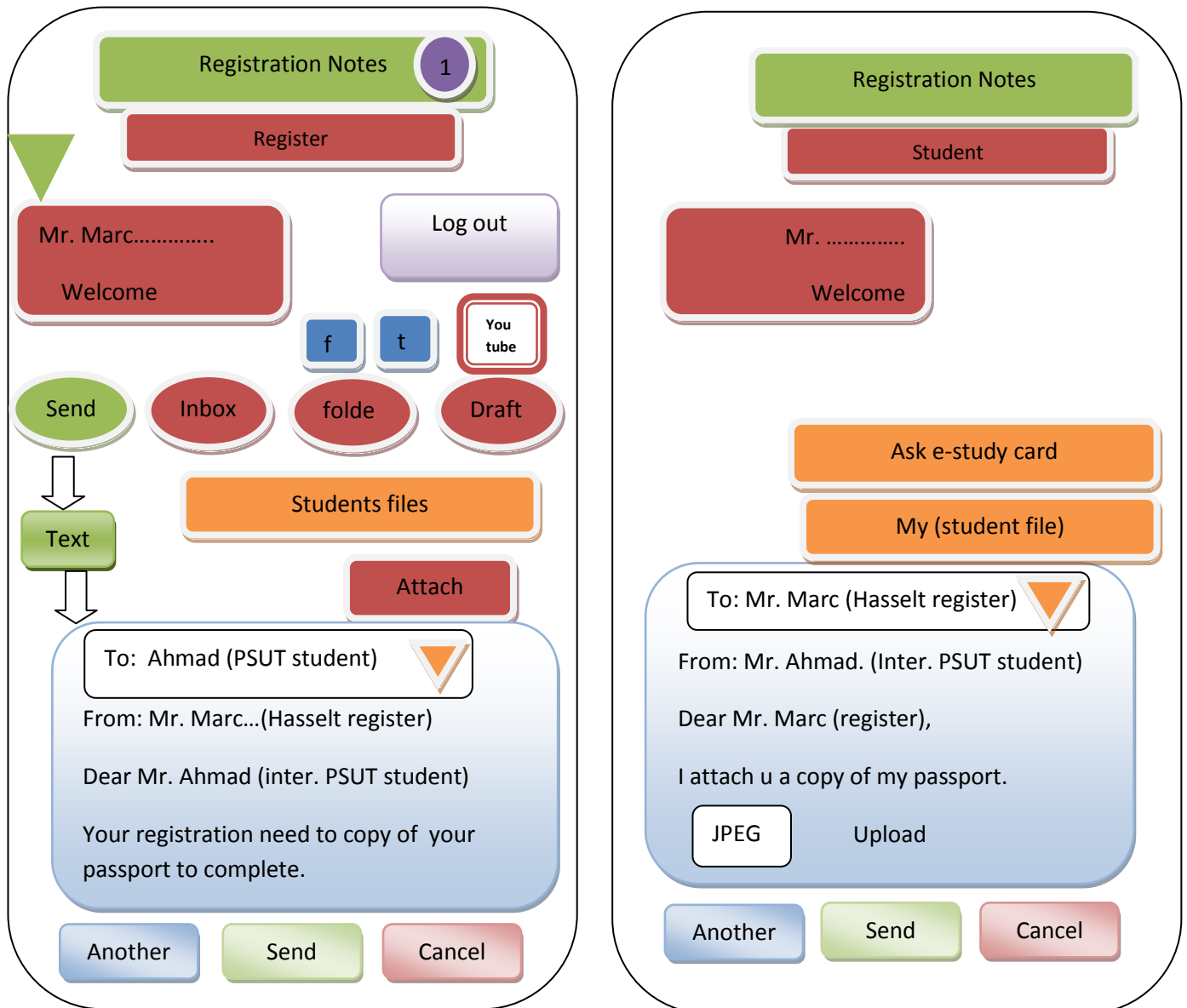


Figure 4.20: illustration of step 14 (source: own development)

Step 15: Both the register and the student can receive a free SMS from each other as show as figures 4.21

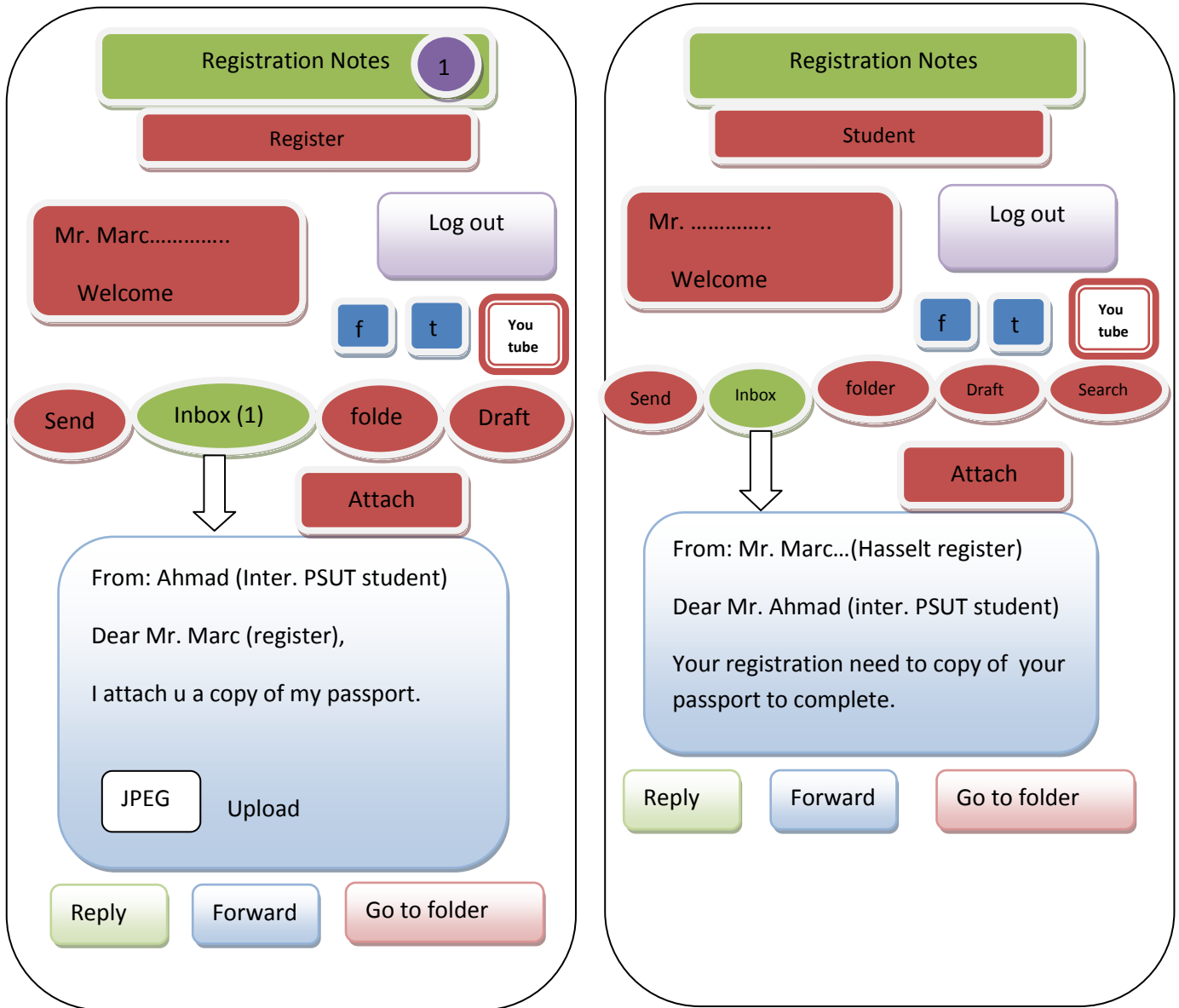


Figure 4.21: illustration of step 15 (source: own development)

Step 16: The students can see the updated announcements and news at any time as show as figures 4.22

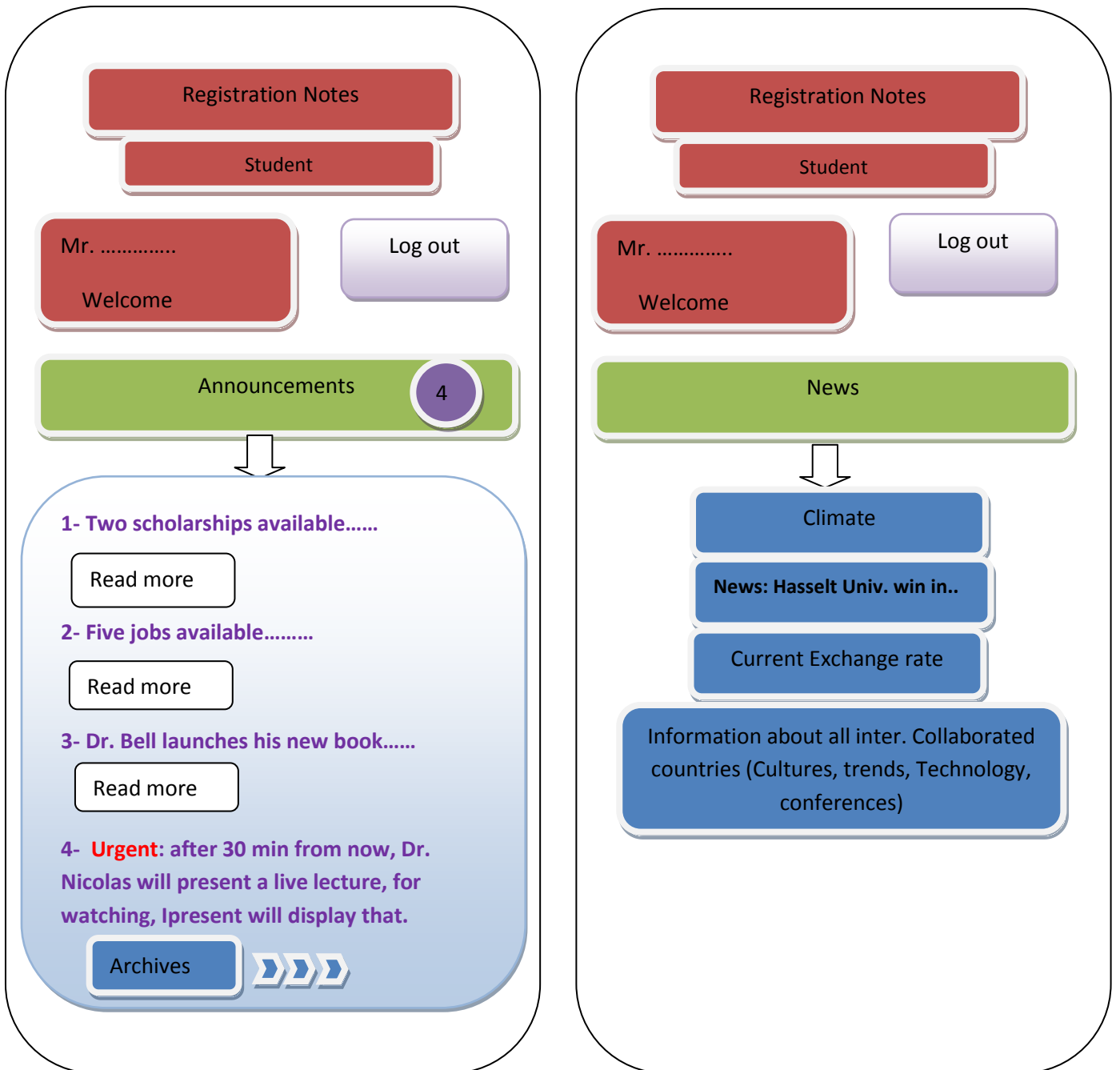


Figure 4.22: illustration of step 16 (source: own development)

Step 17: Here, both the Register and Teacher will enter his name and password in order to log in as show as figure 4.23

The figure illustrates two login screens side-by-side. Each screen is enclosed in a rounded rectangular border. The left screen is for a 'Register' user, and the right screen is for a 'Teacher/coordinator' user. Both screens feature a green header box with the text 'Registration Notes'. Below the header is a red box with the role name: 'Registration' on the left and 'Teacher/coordinator' on the right. Underneath are two red input fields for 'Name of Register:' and 'Password:'. At the bottom of each screen is a white 'Log in' button.

figure 4.23:illustration of step 17 (source: own development)

Step 18: Both the Register and the Teacher can contact with each other through free call and free SMS as show as figures 4.24

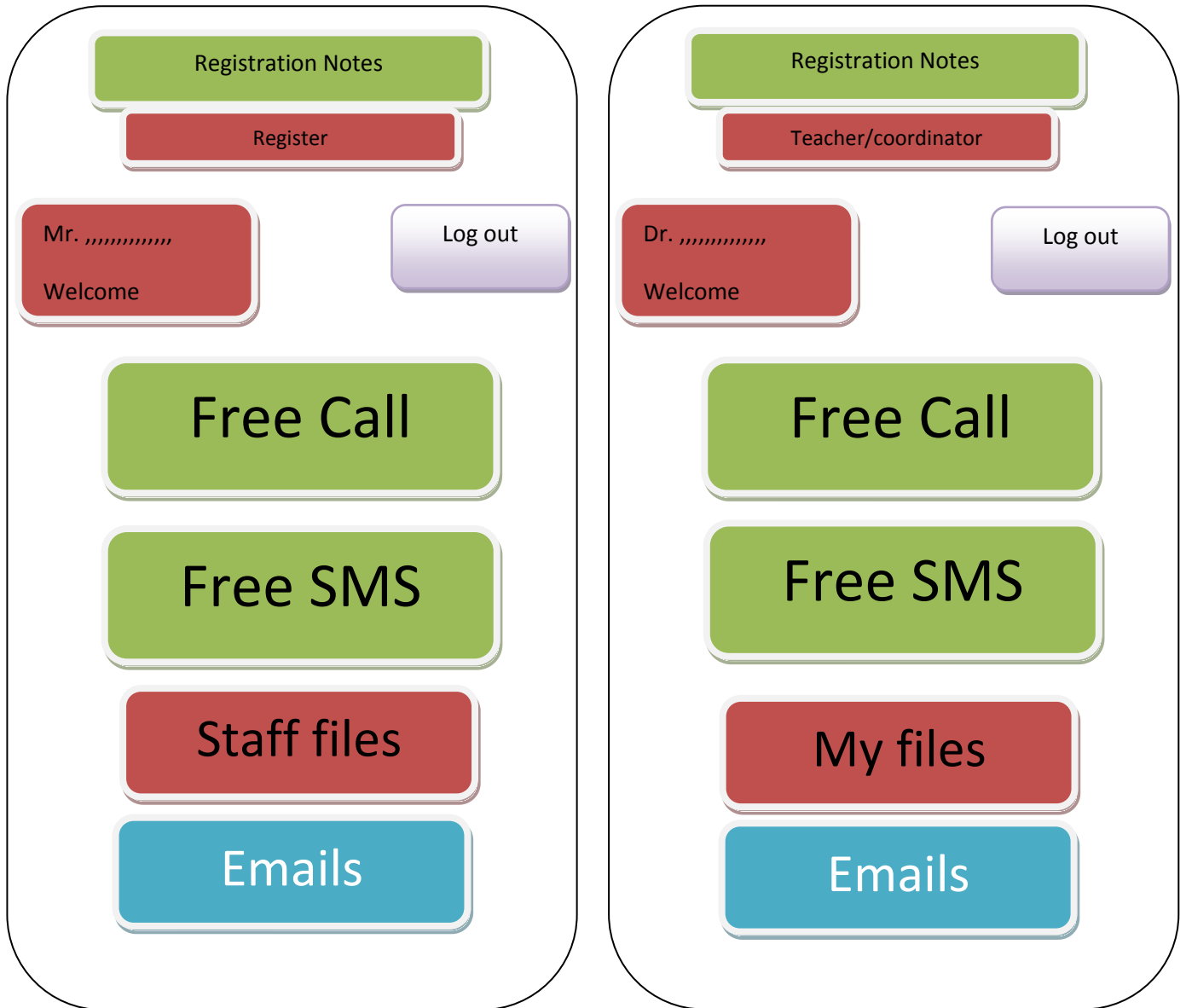


Figure 4.24: illustration of step 18 (source: own development)

Step 19: Return to the main menu which consists of: e-bookshop/students, Teachers/students and Registration Notes, pressing/touching (e-bookshop/students). Here, both the library user and student will enter his name and password in order to log in as show as figure 4.25



Figure 4.25: illustration of step 19 (source: own development)

Step 20: Both the library and the student can send a free SMS with each other as show as figures 4.26

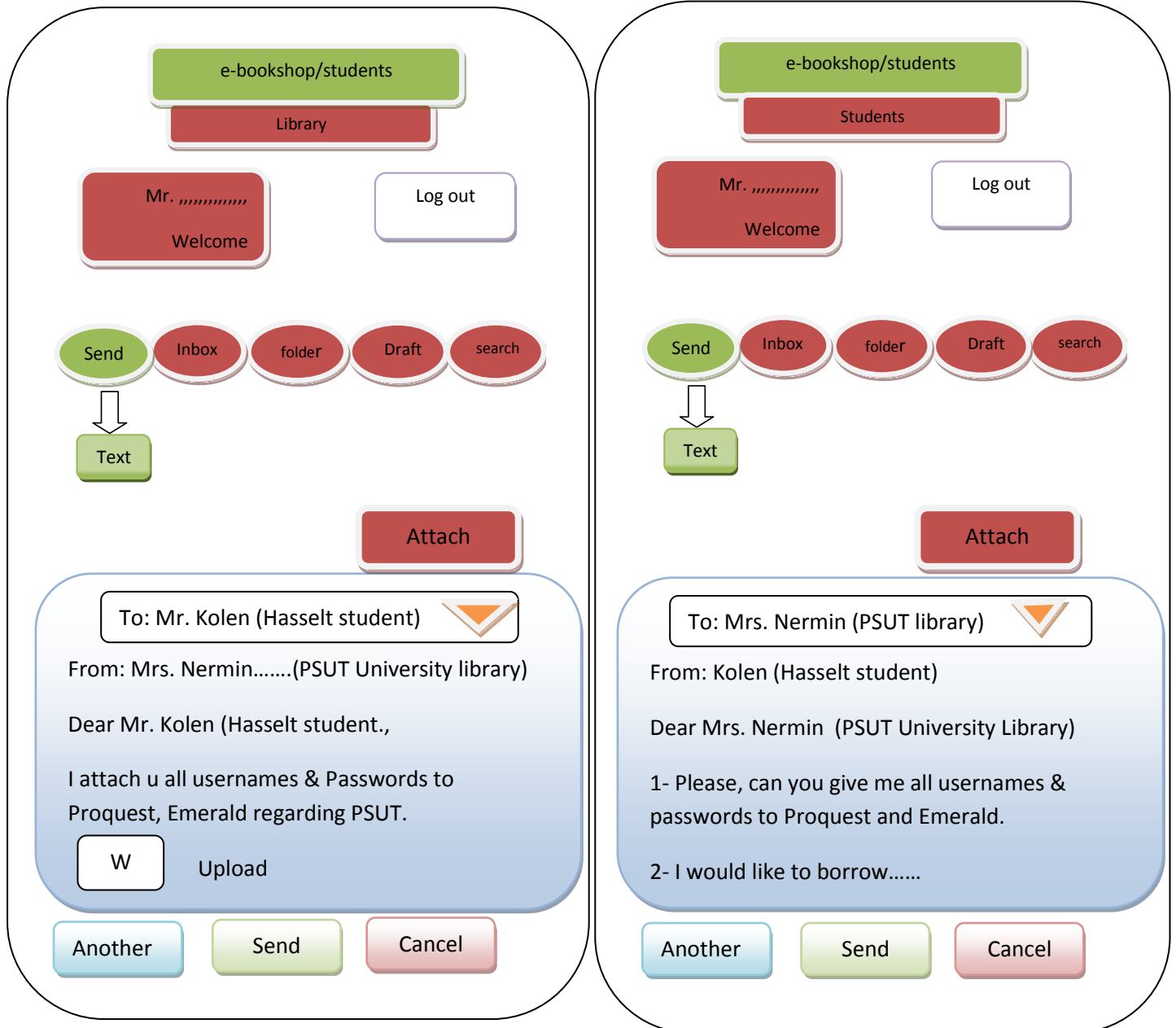


Figure 4.26: illustration of step 20 (source: own development)

Step 21: Both the register and the student can receive a free SMS from each other as show as figures 4.27

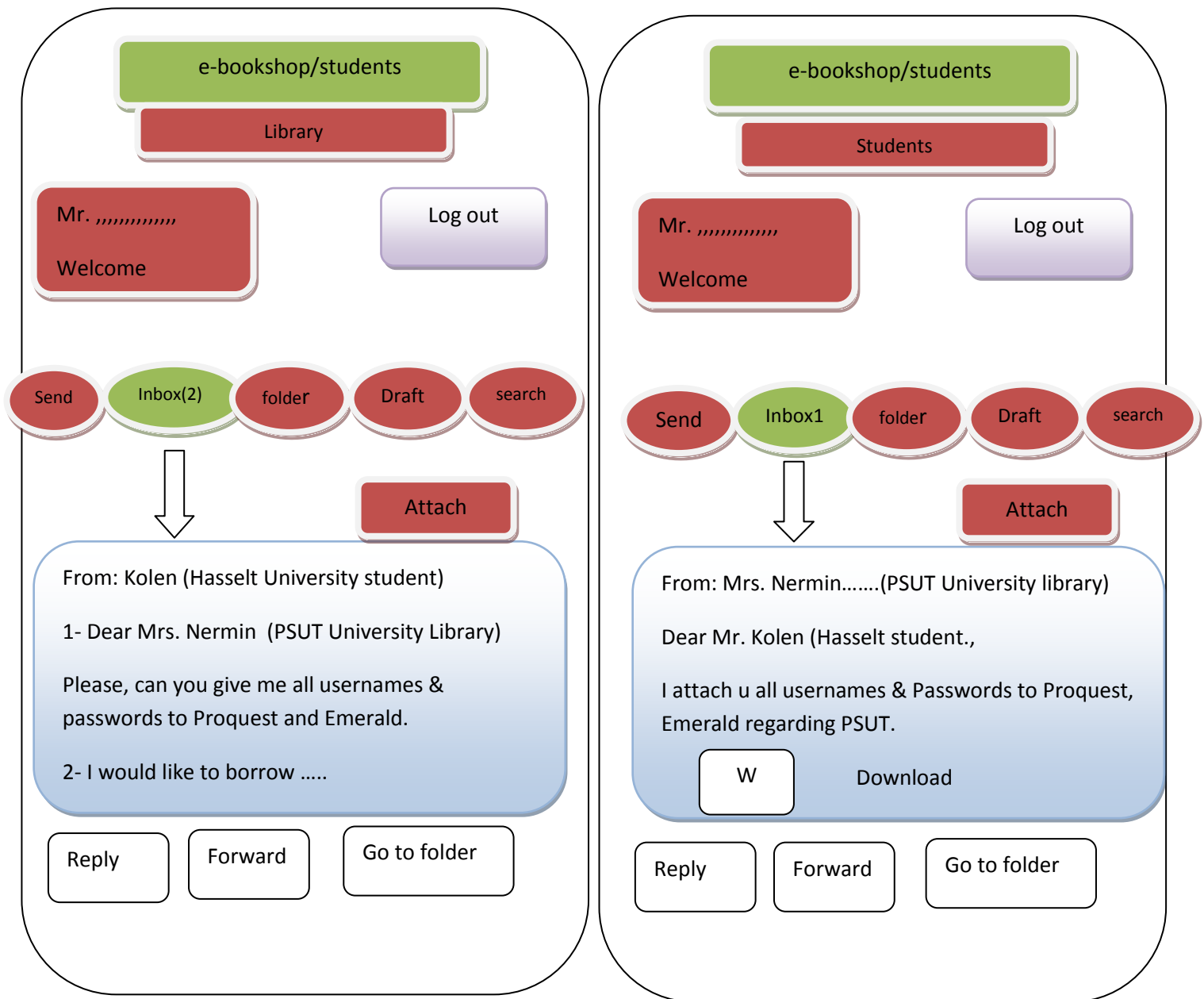


Figure 4.27: illustration of step 21 (source: own development)

4.2.2 Objective Two: Icollab service

Step 1: In using the smart mobile, we just press/touch the icon which is called (Icollab), Icollab service will operate and display two choices: Free Calls and Free SMS as show as figures 4.28

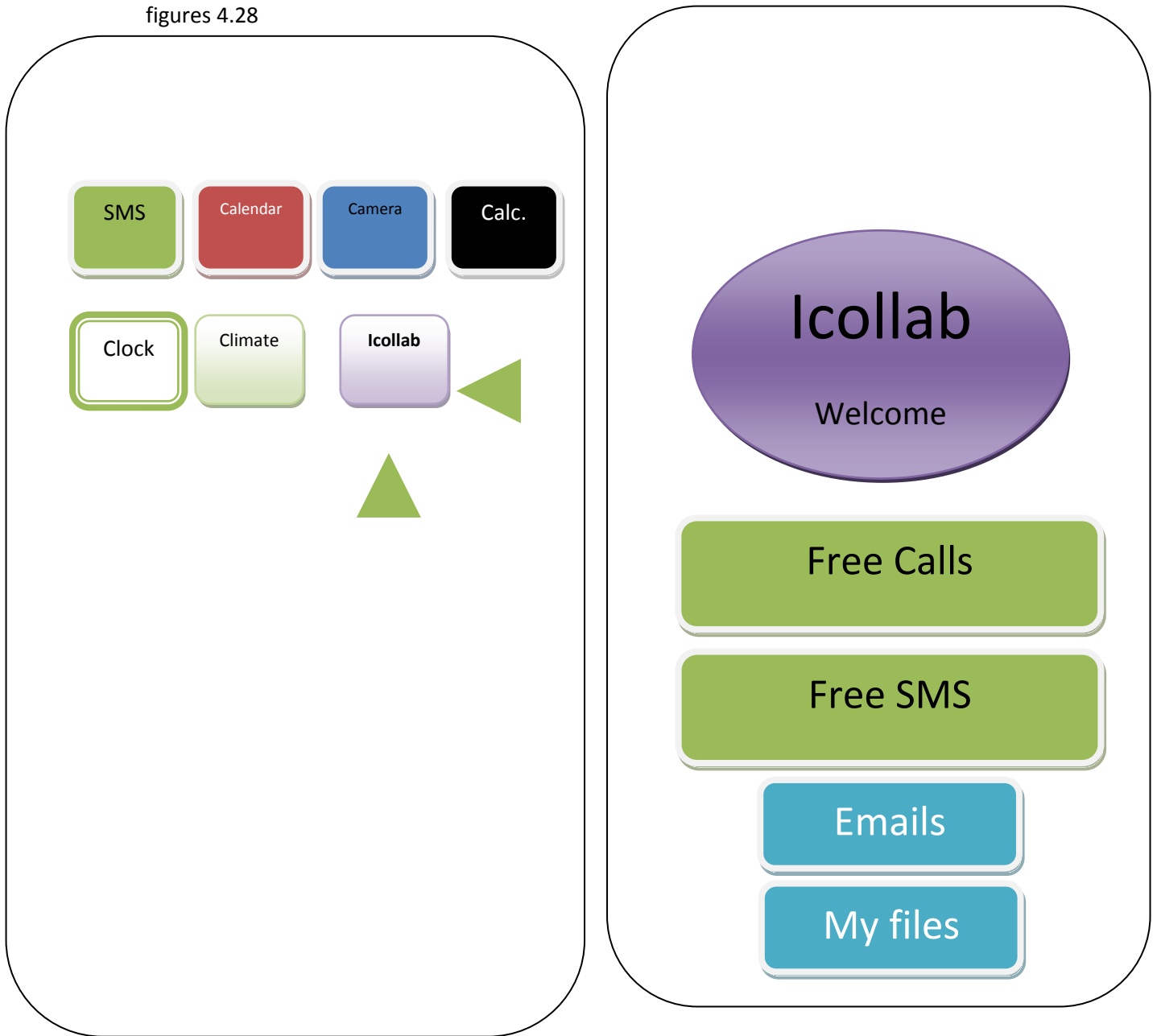


Figure 4.28: illustration of step 1 (source: own development)

Step 2: Five choices be displayed when pressing/touching both icons (Free Calls) and (Free SMS) as show as figure 4.29

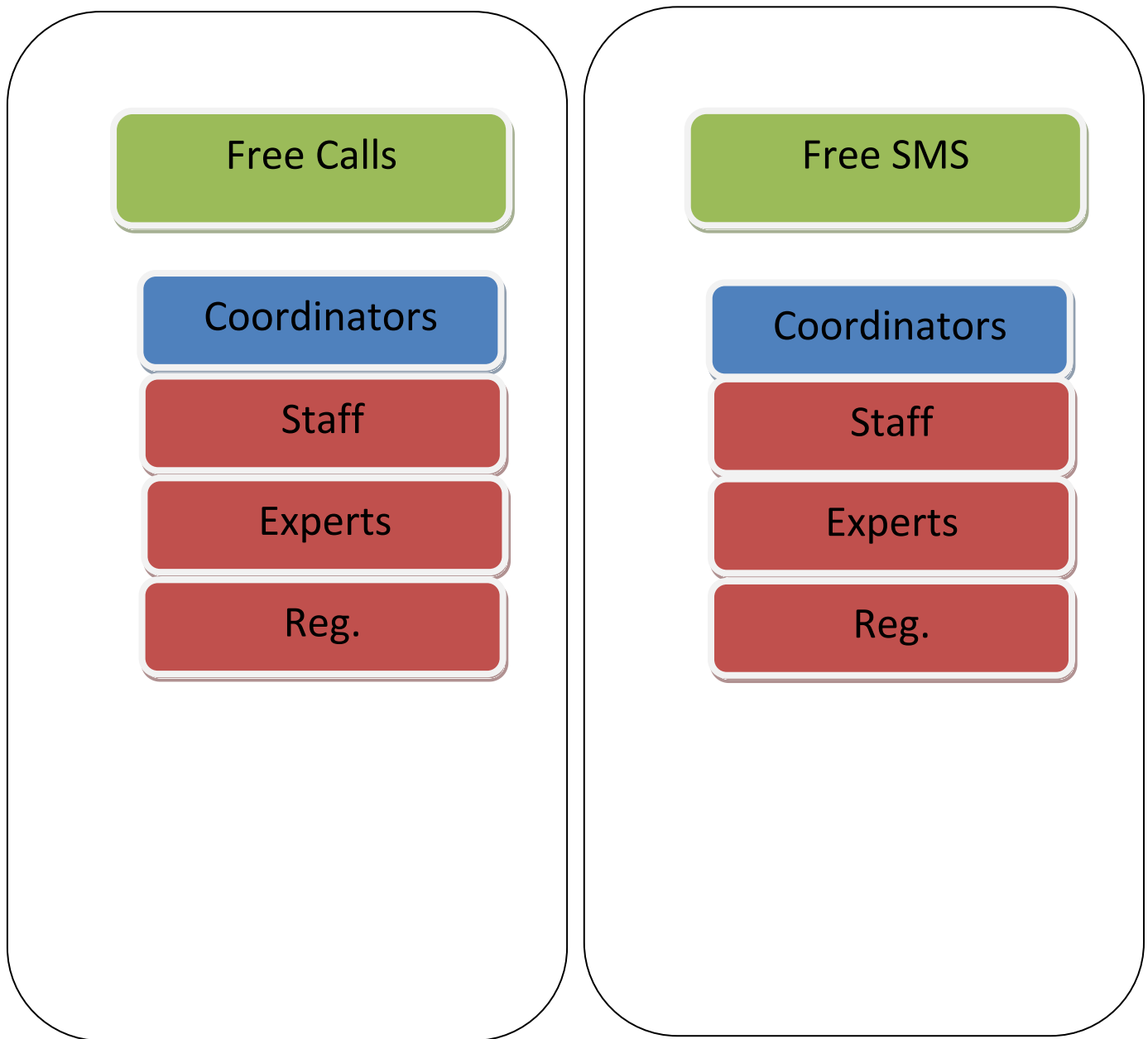


Figure 4.29: illustration of step 2 (source: own development)

Step 3: The coordinator should enter his name, Password and name of his University as show as figures 4.30

The figure illustrates two login screens for coordinators. The left screen is for 'Free Calls' and the right screen is for 'Free SMS'. Both screens have a green header with the service name and a purple circle with the number '1'. Below the header is a blue button labeled 'Coordinators'. The main area contains three red input fields: 'Name of Coordinator:', 'Password:', and 'University:'. At the bottom of each screen is a white 'Log in' button.

Figure 4.30: illustration of step 3 (source: own development)

Step 4: Dr. John can call/receive calls and send/receive SMS as free services as shown in figure 4.31

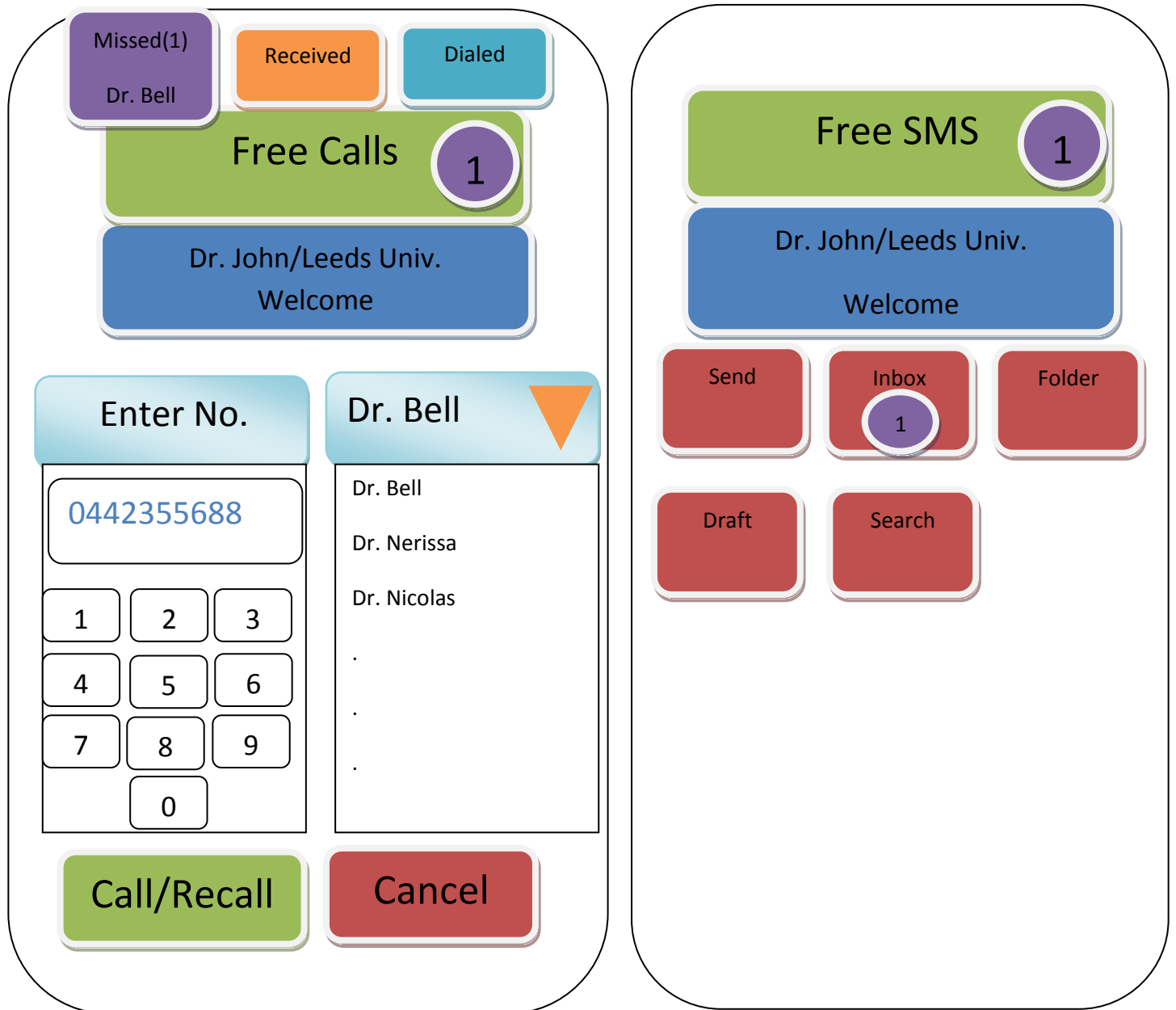


Figure 4.31: illustration of step 4 (source: own development)

Step 5: Dr. John Pressing/touching (Missed(1)) as show as figures 4.32

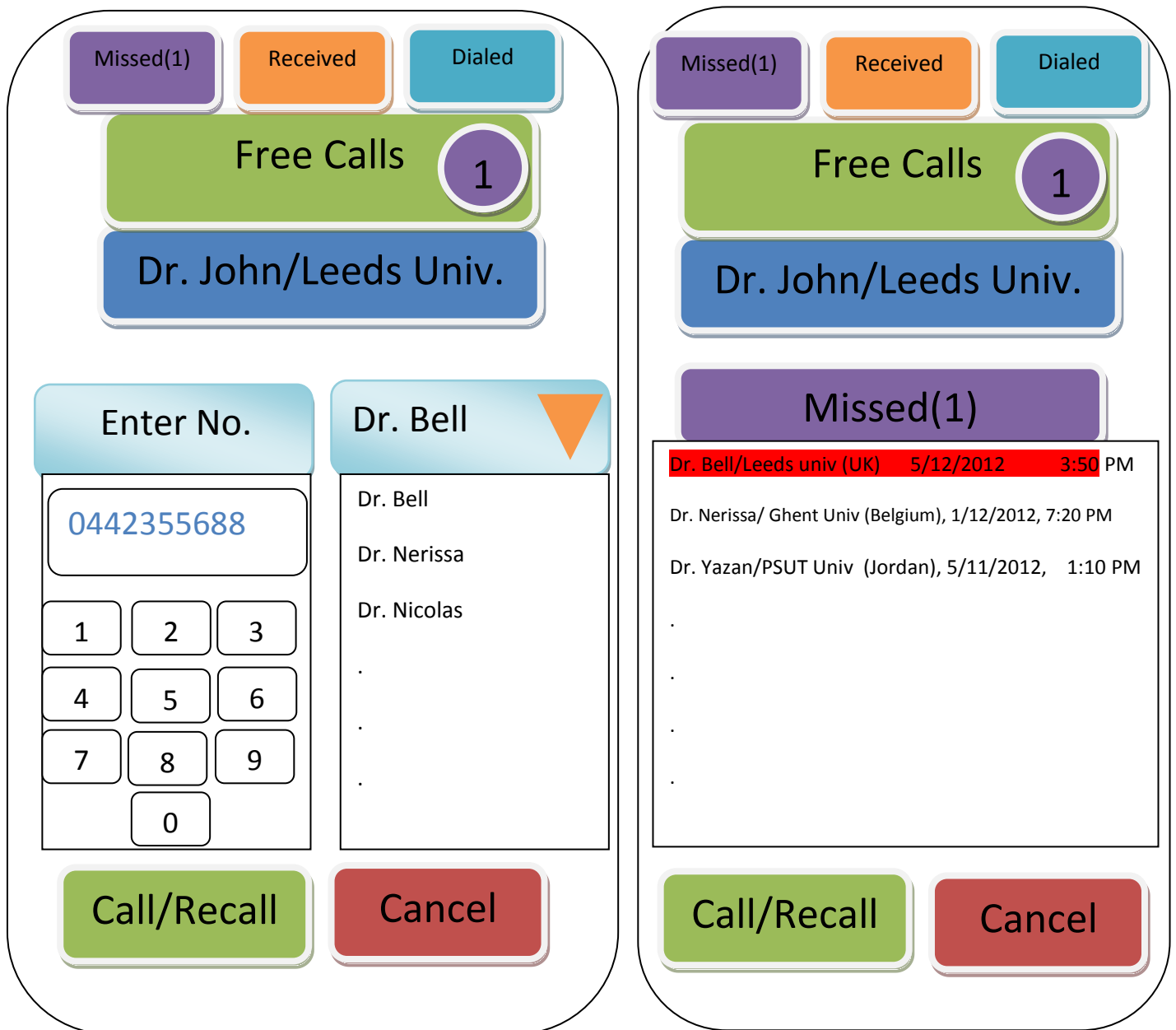


Figure 4.32: illustration of step 5 (source: own development)

4.2.3 Objective Three: Ipresent service

Step 1: In using the smart mobile, we just press/touch the icon which is called (I present), Ipresent service will operate and display two choices: Live conferencing/lectures and Announcements as shown in figure 4.33

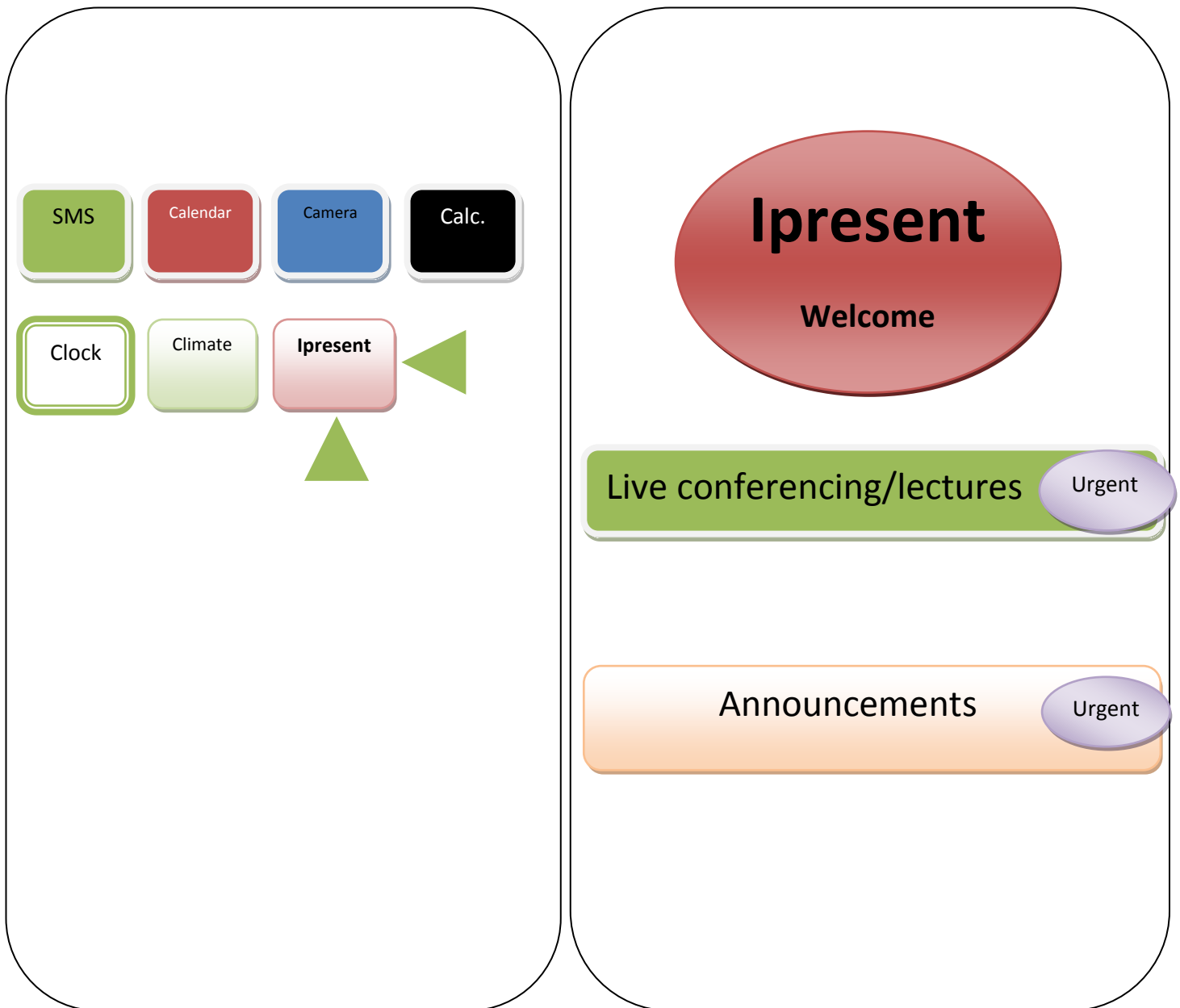


Figure 4:33: illustration of step 1 (source: own development)

Step 2: Displaying live conferencing/lectures and announcements after filling name and password as shown in figure 4.34

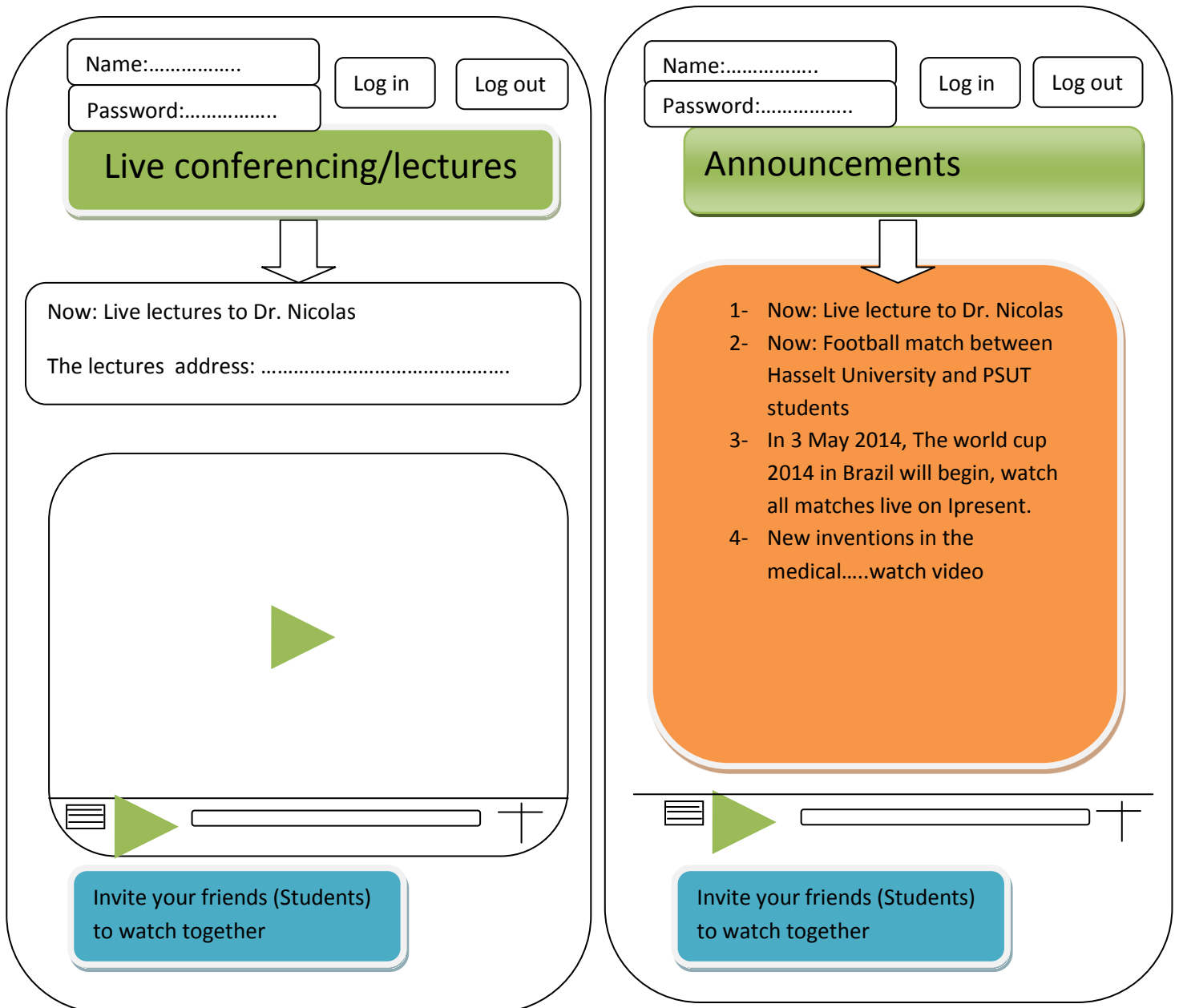


Figure 4.34: illustration of step 2 (source: own development)

4.2.4. Objective Four: developing an e- study card

Develop the electronic international student card (e-study card) for international students in different collaborating universities are the major objective of this section. Through the e-card, the student can get access to all facilities in the new environment, such as booking accommodation, opening lockers at universities; booking all kinds of travel and so on...It is mainly a comfort feature of our application. This electronic card also makes the residence procedures of the international student faster through ensuring the accommodation contract during his study period, so that the town hall should accredit this electronic card and with the contract papers of the rented accommodation and give the international student the residence card after one day of his arrival to his studio without any late waiting.

The proposed changes of any booking process can be represented in developing a booking process for electronic tickets and services for instance as follows (several options are mentioned):

- 1- Electronic ticket includes the flight booking (No. of flight, No. of seat, the type of reserved ticket, list of the travelers' (international student) bags).
- 2- Electronic ticket contains bus/train booking from the airport to the accommodation of the university details (Name of Own, No. of bus, Name of Driver, the price, the distance of driving, the source and destination of the bus (from and to) or train booking (No. of train, the price, No. of seat, the distance of driving, the source and destination of train (from and to).
- 3- Electronic ticket includes students preferences in the booked accommodation such as: Name of his preferred film, Name of his preferred program, Name of his preferred TV channel, smoking place or far smoking place.
- 4- The electronic tickets can be made in order to exchange money when needed, such as (ping.ping service).
- 5- The Electronic ticket should be offered at low costs in order to attract, enhance and improve the situation of international students.
- 6- The Electronic ticket must contain the thumbprint for the purpose of security but, the thumbprint should not be electronically because of probability of the steal and the hacking.

This can be described as a smart ticket.

The implementation requirements to online flight booking services through using electronic tickets include the cooperation between the university, accommodation owners, the town hall and third party providers in order to cater for all the needs and performances of travelers (international students), off course with the cooperation among ministries of education.

This implementation can include unique technology such as enabling electronic tickets opening the accommodation of the university ports for purpose of security, opening the preferred program, TV channel, by just putting this card near to door of the accommodation or TV in the studio. This ticket should contain thumbprint and Iris (imprint of eye) for the purpose of security. The information on e-study should be hidden for the purpose of security, and just appear by pressing of the thumbprint.

Figure 4.35 is the suggested form of the e-study card while figure 4.36 will explain the operational level of applying the E-study card. The student can ask the e-study card through

the previously proposed service (Iremind), just by filling in the required data. It should be issued to the international students by the host university (foreign university) across the PO-box of his/her university in his/here country.

The issuing of this card also requires agreements between the ministries of the education in the countries which the international universities are situated. In addition to that, it requires coordinating with companies and third party providers such as airline or travel agents and banks (for instance for the ping ping service).

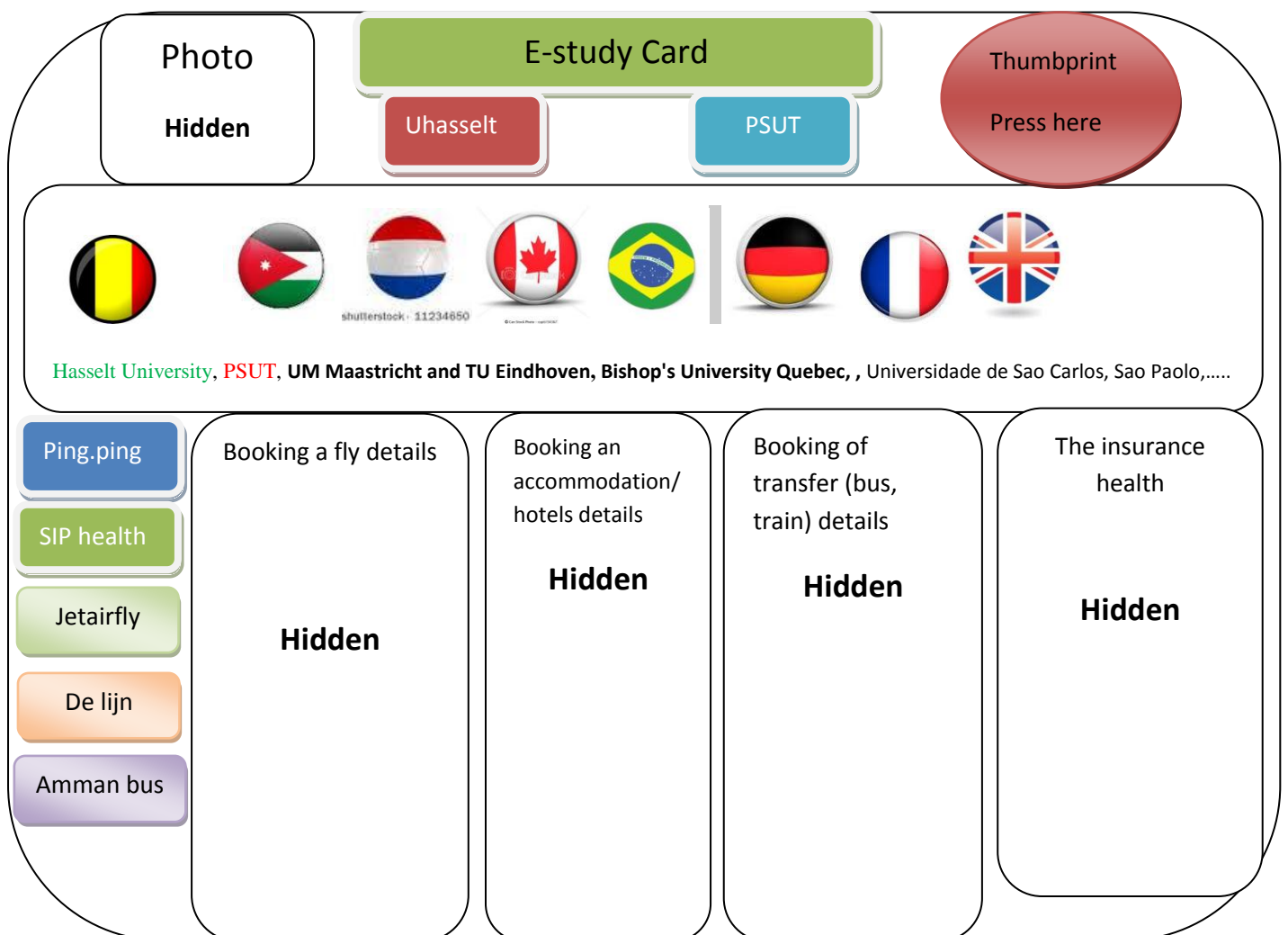


Figure 4.35: e-study card proposed (source: own development)

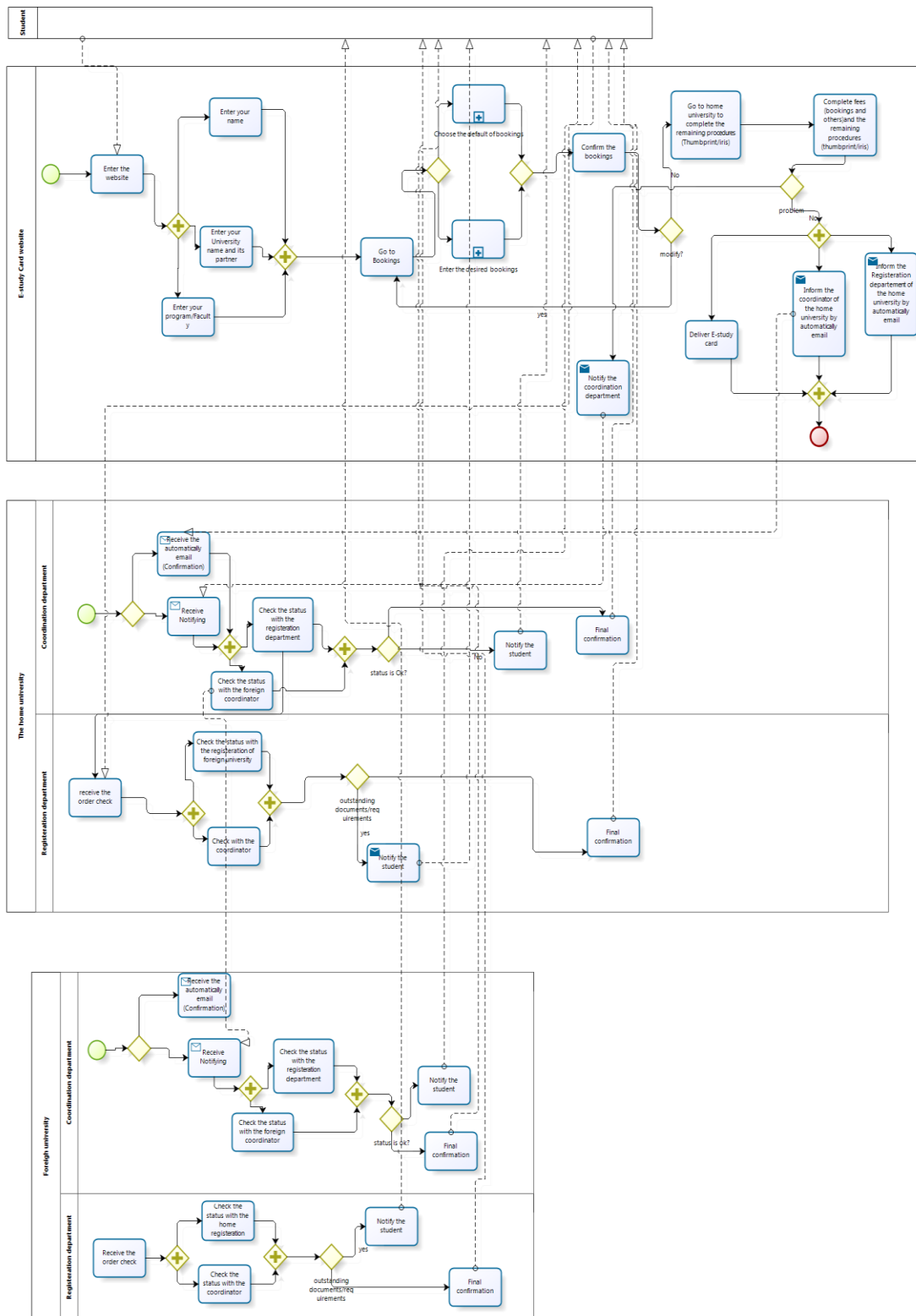


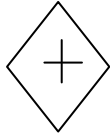
Figure 4.36: operational level of applying E-study card, source : (own development)



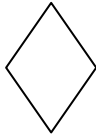
Start event



End event



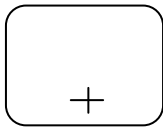
Parallel gateway: all paths must pass at the same time



Exclusive gateway (only one path will pass)



Task



Sub-process: it contain inside it more details

The legend of the figure 4.36

Figure 4.36 indicates on the operational level of applying the E-study card. It foresees that universities coordinate their efforts in order to organize this process and make the registration in both universities more easy for international students.

It first demonstrates which procedures have to be followed in this process, whenever the international student enters the website of one of the universities involved. It then foresees that after entering the website, the student must enter his name, his university name and its partner (foreign university) and also enter the name of the faculty/program he or she wants to enroll in and then only the student can go to the booking processes. The default of booking is determined by both universities or otherwise the student will choose his desired bookings. In both cases, he must confirm the booking but, if he wants to modify it, he must go back to the booking process and repeat all the steps. After that, he must go to the home university again to complete the remaining procedures (thumbprint, iris) and complete the whole process by paying the fees. In doing so, there might be a problem or not. The flow foresees that if there is no problem, the student will receive the required E-study card and inform the coordinator of the home university and the registration department of the home university by automatically e-mailing them. Then the process will end. If there is a problem then the system foresees notifying the coordination department of the home university.

In both cases the coordination departments and registration departments in both universities will be in contact with the students. The coordination department in the home university will either receive automatically an e-mail or will receive notification of a problem. In both cases, the coordination department of the home university will check the status with the registration department of home university and the coordination department of the foreign university. If the status then ok, it will send a final confirmation to the student. If not ok and there are still outstanding documents it will notify to the student. The process can be repeated until finally everything is on order.

4.3. Summary and conclusions

The proposed IT- systems and applications can be described as creative, because most of them are situated within the area of the trends young people like and are about to use and develop new and future technology to their benefit. Many people in this youth segment indeed are using the viber, whatsapp and skype service in order to get free calls and free SMS and thus more specifically to reduce the costs. We thus believe that the proposed services and IT-applications will attract them. These will be of course people using the internet, but the problem is the very few people who do not have internet services, cannot get access to these services and IT-applications.

Regular checks of the results and intensive comparison with the expected results and objectives are needed as well. In this way, corrections can be made, both to the IT-solutions and/or to the expected objectives. Such feedback loops have to be installed absolutely.

The applications have unique advantages. They are presenting unique technology in order to become the pioneer in this field. No actual competitor exists.

The systems provides teachers and students with easy to use and cost effective communication means and fast and reliable information on a broad field of study and research, thus increases the likelihood of generating scientific knowledge. The systems may in the future become a factor increasing the likelihood of better ranking of the involved universities on world level and thus provide them with a competitive advantage. The E-study card finally facilitates and organizes important aspects of the life of international students. Another proposed card could for example be an E-teach card to give some facilitates to international professors.

We are convinced that the IT-application can be a leader in its field due to the unique technology with which more and new features can be added or omitted. It can provide facilities to the international students and staffs such as coordinators considering both international universities and e-learning and research support announcements better than any system now. This is an e-marketing idea that will work better than e-mails and more flexibly than other channels. The attraction of international students can also be more successful with this marketing tool than with campaigns through more traditional means.

The proposed applications however also present a number of problems that we did not investigate in depth in this dissertation.

Firstly, it is obvious that the development of the system will be costly, even when students of MIS disciplines would be involved in the actual realization of the applications. We cannot foresee the exact price yet as the costs of making free calls and SMS are unavailable. The application cost of all these systems may be a bit limited if universities decide to work and develop in house. Through the efficient international collaboration among universities the encouragement of their students to participate in the IT-work might be stimulated, by means of incorporating it in courses, graduation projects and so on, certainly for computer science students. Yet even then it will remain very costly indeed.

Moreover the expected benefits are not calculable in money either, nor for the students, nor for the professors and universities involved. Thus we did not present a real cost/benefit analysis. Before developing the IT-applications, at least an estimate should be made to know what the payback time might be.

Moreover, this cost/benefit analysis should take into account the constant flow of supplementary costs related to this solution. All these services will indeed need an efficient security system, continued updating and constant maintenance. A strong, streamlined and constantly updated security system is required against all threats of penetrating the privacy by hackers and thus the potential stealing of information, personal data and the threat of spying...etc. They have to be updated in order to stay competitive against other proposed applications. They also need constant maintenance in order to avoid breakdowns or extra development of solutions in the short run should the service suddenly stop. The costs of a service center have not been calculated, whether it is internal to some universities or external and provided by a third party, but it is large.

Secondly, it might well be that the existing island solutions to some of the problems addressed by the proposed applications, are so much less costly, that the willingness to invest in new technology by the involved universities will be very low indeed.

Thirdly, in order to be fully applicable, the involvement of many third parties is needed. They have to agree with the universities participating in the project to link their systems to the proposed IT-application. This is valid for mobile phone companies, third party providers such as town halls, authorities, banks and eventually travels service providers. Their involvement does not only have to be negotiated, but also rewarded, either in money, either in extra income through increased customer numbers or a free advertising. Since this is a multinational venture, it might be difficult to find enough partners and the right ones as they need to be linked to customers in all those countries.

Perhaps the most sobering thought is that this application cannot and should not be limited to two universities (PSUT and UHasselt in the example) or even their two networks. In order to have a positive cost/benefit result, we believe that larger consortia of universities have to be involved.

Finally, as technology advances rapidly, what is now the best available solution might soon become obsolete. In that case, the updating of the systems and applications might be also equal to the development of completely new systems, that are more performing. This of course would make things even more costly.

CHAPTER 5: CONCLUSIONS

The aim of this chapter is to display the conclusions from this dissertation. Section 5.1 talks about the thesis as a whole, while section 5.2. summarizes the framework of variables that should be taken into account when reading this dissertation such as validity, limitations and importance.

5.1. General conclusion

International collaboration, coordination and partnerships among universities are a must. They prepare the new generations of students with new, creative and constantly developing capabilities in many scientific areas.

There are many programs in the international collaboration field among universities such as ERASMUS which leads to the exchange of international students and many others. Moreover, institutions have been created that support this collaboration with scholarships to students such as DAAD and so on. Collaboration is constantly advancing and expanding, both in scope and in the offering of new programs, joint facilities and study outlets to the satisfaction of the involved partners.

It offers the facilities to both staff and students such as reducing the tuition fees to the international students, as well as benefits in sharing objectives, cultures and programs. Involved universities will be ranked higher over the world. It is similar to alliances among businesses and increases competitiveness and enhances their brand name in the university market. It will also help in introducing jobs, so it will increase employment and also open up new prospects for both the international staff and students.

This type of collaboration finally has the potential of supporting businesses in innovating or developing new ideas and products or the future. This is due to the fact that the brightest students from different areas of the world are capable of collaborating in their research, based on the fact that they started learning each other and each other's cultures better.

This study encourages this type of collaboration by suggesting new facilities for both international staff and students due to the introduction of a new IT-application that can better serve their education process, the exchange of research and courses and the creation of easy to use means of getting access to the international university world.

The proposed system of course still has to be developed, will be costly and may eventually not be profitable. But it is a creative way of improving the collaboration among universities using MIS technology and knowledge.

5.2. Thesis quality control

For each dissertation a number of characteristics has to be checked, such as validity, limitations and importance.

5.2.1. Validity

This thesis depends on the multiple types of information sources from Asia (i.e. Japan) to Europe (i.e. UK) to North America (i.e. USA). They are mentioned in Chapter Two. The foundation is thus sound, although there is no validation of the necessity to develop the proposed applications as our questionnaire did not ask specifics about it and was limited in scope.

5.2.2. Limitations

The limitations of this thesis thus lie in the collection of views and opinions through distributing a survey/questionnaire to many students, teachers and registration departments at PSUT only and not getting more than the actual number of respondents. Before putting this into reality a check is needed, that is much more thorough and encompasses more universities and more in depth views. Moreover also the popularity and use of the used programs should be checked then in more depth. At the moment, we can only suppose that such a system might be popular enough among students and teachers, although their needs are more clearly expressed in the sample questionnaire.

Moreover, as indicated in the conclusions of chapter 4, the proposed system does not necessarily present a positive cost/benefit balance due to the necessity of constant monitoring, adaptation and expansion of the proposed solutions. They have to be developed, agreements with third parties have to be made and thus, the future of it is uncertain. Moreover, since technology advances rapidly, better solutions may be available in the future. Thus the proposed solution is the nucleus of a potentially interesting and long lasting development.

5.2.3. Importance

Collaborating universities can capitalize on this thesis by implementing the case study proposals that propose benefits to the students and teachers of all involved universities based on unique technology. In addition to that this thesis proposes a design which depends on open source systems (Android system): this means that all three systems can constantly be developed.

It is however a costly venture and although it is creative and has the potential to improve university life a lot, it remains to be seen whether it will be applied. We believe that the application due to its costs needs the positive approval of not only two universities or their

networks, but of a larger consortium of involved partners in order to spread costs more intelligently.

CHAPTER 6: RECOMMENDATIONS

This chapter provides some recommendations to improve the international collaboration among universities. These recommendations depend on the information in chapter 2 (Literature review) and chapter 3 and 4 (practical case study). Section 6.1 provides recommendations based on this thesis as a whole, the other sections talk about scalability, validity, limitations, interviews, questionnaire, behavior and attitude and the project scope. Sections 6.2 and 6.3 tackle the scalability and validity. Sections 6.4 tackle the limitations. Sections 6.5 and 6.6 speak about the project scope.

6.1. Recommendations in general

The suggested recommendations can be summarized as follows:

1. Education: Developing the international education process through collaboration among international universities improves the potential to acquire knowledge and cultural awareness. Methods should be developed that serve this end. We proposed one.
2. Facilities can be proposed allowing international students to live an easier life. We offered the example of buying cars from free market or renting them without customs fees (only approximately 250-500 Euros each year) in Jordan. This facility leads to an increase in buying the cars from free market which leads to grow the free market and leads to an increase in hard currency availability in countries like Jordan. We proposed other possibilities in our application, namely the development of another facility giving to the applicant students the possibility of electronic ratification of documents and e- signatures (electronically signature) through coordination with the ministry of higher education or the embassy in order to reduce the pressure and long queues of applicants students. Better services at less costs could be the consequence.
3. Business: organizing exhibitions of developed technology and communication means such as cameras, etc... at discounted prices for the international students could be offered. This would specifically target higher income students.
4. Development: Students from the computer science departments could develop the applications (Icollab, Iremin and Ipresent) in a joint international effort, both in workshops and in end of study projects for graduation. This would enhance collaboration and mutual understanding. If a committee from the involved universities would agree to that and supervise it, it could be developed with an eye for selling it to other universities and thus get business transactions that partially can recuperate the up-front investment costs.
5. Media and marketing: the Ipresent application can be used to attract media and marketing. Encouraging teachers in editing the books through the announcements and marketing their books and organizing exhibitions is also possible. News and announcements can be displayed through (Iremin, registration/students) services.

The announcements should be a must and include new jobs, scholarships, etc...
(see 6)

6. Employment: Through finding/creating new jobs for international students whether inside the foreign country or outside it, depending on the efficient use of the announcement facilities. These jobs should not only be for the students who have highly grades but also for other students of whom teachers see that they have talent in a specific field. In addition to that, finding scholarships can be made possible.
7. E-learning: our research does not encourage E-learning, although it has high potential but students cannot share views with other students are still isolated from the teacher (human contact), interruptions and distractions are possible and the difficulty to supervise the progress of students remains
8. In interesting activities: these can be represented by organizing activities by the involved universities and call upon students to collaborate and have them connected when the event takes place via Ipresent.
9. Developing a website accessible to students and staff with a purpose of generating ideas about collaboration and solving practical problems in this field.

6.2. Scalability

This type of the collaboration should constantly be benchmarked with other universities and technologies around the world. For example, the three services (Icollab, Iremind and Ipresent) can be competing with equivalent solutions developed by other universities in the world. Choosing an Android system in order to apply all these services was done because of it being an system open source, that can use the old resource code and develop further on it (https://en.wikipedia.org/wiki/Open_source)

6.3. Validity

To enhance the validity and confidence in the system, the planning of expansions and developments and innovations should be checked constantly by a board of tutors and external specialists in the involved universities. The first development steps should be checked in this way as well. The satisfaction of the students and teachers has to be measured regularly as well as the eventual effect on the world ranking of the involved universities.

Moreover, the interviews upon which based ourselves pose a validity problem with respect to the proposed solutions. The interviews involved some professors and discussed the international collaboration among universities such as E-learning and how to invest in this type of collaboration in order to serve the educational process. They did not cover all the

proposed services in IT-form. Thus we do not know whether everything proposed can be interesting enough. Finally, we did not check whether the type of IT-application is acceptable. The attached questionnaire only tackled two examples of collaboration and was not statistically relevant moreover.

6.4. Other limitations of this kind of collaboration

Building these services may not be completely successful. That would lead to loss of belief in it and the abandoning of the project. Moreover, the cost/benefit balance may be so negative that the involved universities quickly decide not to invest in the services anymore.

6.5. Behavior and attitude

The international collaboration among universities is important: it affects the performance of universities, students and staff and the whole educational process. The success of this type of collaboration means the success of international universities, national/international students and staff and gives international universities a better reputation and ranking. The success of this collaboration can lead to building future generations of high performers. Any aid to this objective by our proposed solutions is welcome.

6.6. Project scope

The international collaboration among universities in education projects focuses on personal developing of students and teachers by adding value to the education and helping both of them to have efficient contact and communication with one another based on novel technology. This project can later be expanded through creating or updating common support systems for collaboration programs such as Erasmus, Tempus and so on. The scope of developing this for two groups of networks only is however too small.

7. REFERENCES

A- Books and articles:

(Akkoyunlu, B., & Soyly, M. Y. 2008) A Study of Student's Perceptions in a Blended Learning Environment Based on Different Learning Styles. *Educational Technology & Society*, 11 (1), 183-193.

Australian government, REVIEW OF CLOSER COLLABORATION BETWEEN UNIVERSITIES AND MAJOR PUBLICLY FUNDED RESEARCH AGENCIES Katz, J.S., and Martin, B.R., (1997). What is Research Collaboration? *Research Policy*, 26, pp1-18.

Australian government)OECD (2002). *Dynamising National Innovation Systems 2002*, OECD, Paris.

Australian government ,REVIEW OF CLOSER COLLABORATION BETWEEN UNIVERSITIES AND MAJOR PUBLICLY FUNDED RESEARCH AGENCIES, March 2004, 6 OECD (2000). *Science, Technology and Industry Outlook 2000*, OECD, Paris.

Chouhada and Chang, 2012, Trends in international student mobility, WES, World Education Series

Dr. Arafat, 2012, during an interview by the date of 20 October 2012

Goodyear, P. (2002) Psychological foundations for networked learning, in: C. Steeples & C. Jones (Eds) *Networked learning: perspectives and issues* (London, Springer).

Hiroshi Ota March 6, 2008, p. 42-44, CHANGING POLICIES AND PRACTICES OF JAPANESE NATIONAL UNIVERSITIES TOWARD INTERNATIONAL STUDENTS IN LIGHT OF FINANCIAL AND DEMOGRAPHIC CHALLENGES AND THE NEW UNIVERSITY "CORPORATIZATION

Hiroshi Ota March 6, 2008, p. 42 international education, 102

Hiroshi Ota March 6, 2008, p. 42, Ibid

Hiroshi Ota March 6, 2008, p.44, In 1983, the numbers of international students were approximately 310,000 in the U.S., 120,000 in France, 60,000 in Germany, 50,000 in the U.K., and 10,000 in Japan [Council for Foreign Student Policy, *Recommendations for Foreign Student Policy for the 21st Century* (Tokyo: Ministry of Education, 1983), 5.]

Kerr, C. (1990). The internationalization and the nationalization of the purposes of higher education: Two laws of motion in conflict? *European Journal of Education*, 25(1), 5-22.

Krista L. McCallum Beatty, June 2010, Selected Experiences of International Students Enrolled in English Taught Programs at German Universities.

Kurbatov, S. (2008a). *International joint ventures in higher education: challenges and issues, Ukraine as a case study*. Presentation at the Kyiv National Aviation University/Ukraine and the Uppsala Universitet/Sweden international conference, Kyiv, Ukraine.

Kurbatov, S. (2008b). The feeling of gratitude, *Zerkalo Nedeli*, 1(5), 11-21, Kyiv, Ukraine.

Kurbatov, S. (2008c). Where to study? A look from China, *Zerkalo Nedeli*, 8(2), Kyiv, Ukraine.

(Mary Thorpe* and Steve Godwin, 2006) Interaction and e-learning: the student experience
Mary Thorpe* and Steve Godwin Open University, UK, pages 203-219

MIRJANA RADOVIĆ-MARKOVIĆ, 2010, ADVANTAGES AND DISADVANTAGES OF E-LEARNING IN COMPARISON TO TRADITIONAL FORMS OF LEARNING, *Annals of the University of Petroșani, Economics*, 10(2), 2010, 289-298

(Universities UK, research report, international research collaboration : opportunities for the UK higher education sector, 2008)

Sasser and Reichheld, 2000, Zero Defections: Quality comes to Services, pages 105-111

Valentyna Kushnarenko, 2010: INTERNATIONAL COLLABORATION IN HIGHER EDUCATION: THE CANADIAN-UKRAINIAN CURRICULUM DEVELOPMENT PARTNERSHIP, Lambert, R. (1994). *Educational exchange and global competence*. New York: Council for International Education Exchange,

Hasslen, R., Bacharach, N., Rotto, J., & Fribey, J. (2001). Learning connections: Working towards a shared vision, in *The many faces of school-university collaboration. Characteristics of successful partnerships*, Ravid & Handler (Ed.).

(pp. 59-69), Englewood, CO: Teacher Ideas Press,

Winer, Michael and Ray, Karen "collaboration Handbbok: creating, sustaining and enjoying the journey" book 1994.

B-Websites:

Android system: to know more information, you can visit

[http://en.wikipedia.org/wiki/Android_\(operating_system\)](http://en.wikipedia.org/wiki/Android_(operating_system))

http://ec.europa.eu/education/pub/pdf/higher/erasmus1011_en.pdf), consulted on 20/7/2013

(http://eacea.ec.europa.eu/bilateral_cooperation/eu_us/), consulted on 20/7/2013

http://ec.europa.eu/education/eu-canada/canada_en.htm, consulted on 20/7/2013

<http://eacea.ec.europa.eu/tempus/>, consulted on 20/7/2013

http://ec.europa.eu/europeaid/where/latin-america/regional-cooperation/alfa/index_en.htm,
consulted on 20/7/2013

www.en.wikipedia.com, Collinsenglish dictionary-complete and unabidged 11th
edition, retrieved September 18, 2012 from CollinsDictionary.com

http://en.wikipedia.org/wiki/Open_source, ^ "FAQ | LucidWorks". Lucidimagination.com. 2012-08-08. <http://www.lucidimagination.com/solutions/value-of-open-source>. Retrieved 2012-10-25

http://en.wikipedia.org/wiki/Open_source, Randolph Metcalfe (2012-01-31). "Examples of Open Source Software". OSS Watch. <http://www.oss-watch.ac.uk/resources/softwareexamples.xml>. Retrieved 2012-10-25

<http://en.wikipedia.org/wiki/E-learning> ^ "Sloan Consortium" ' Allen, I. E. and Seaman, J. (2008) Staying the Course: Online Education in the United States, 2008 Needham MA: Sloan Consortium, Allen, I.E. and Seaman, J. (2003) Sizing the Opportunity: The Quality and Extent of Online Education in the United States, 2002 and 2003 Wellesley, MA: The Sloan Consortium, Ambient Insight Research (2009) US Self-paced e-Learning Market Monroe WA: Ambient Insight Research

(http://en.wikipedia.org/wiki/German_Academic_Exchange_Service), consulted on 5/5/2013

[gorgeous]: www.gregorius.be, consulted on 8/1/2013

Grants: <http://www.btctb.org/en/scholarships>, consulted on 13/7/2013.

Junghoon Leem and Byungro Lim, March, 2007), <http://www.irrodl.org/index.php/irrodl/article/view/380/763> , The Current Status of e-Learning and Strategies to Enhance Educational Competitiveness in Korean Higher Education, consulted on 20/7/2013

Lancaster University: <http://www.lums.lancs.ac.uk/international/jordan/>

<http://www.le.ac.uk/users/rjm1/etutor/elearning/disadvoflearning.html>, consulted on 19/7/2013

<http://peoplelearn.homestead.com/ELearning/Introduction/Disadvantages.html>
consulted on 25/3/2013

(<http://psut.edu.jo/site/en/faculties/engineering/accreditations/engineering-abet.html>),
consulted on 25/3/2013

<http://psut.edu.jo/site/en/2013-03-05-11-36-23/gssr-about.html>, consulted on 25/3/2013

<http://psut.edu.jo/site/en/faculties/engineering/electrical-engineering/power-energy-engineering-b-sc.html?id=337>, consulted on 20/7/2013

Professor Don Markwell, 2008: *Working together to become 'world class' Universities*, The University of Western Australia

http://www.uwa.edu.au/university/governance/executive/education-archive/speech_on_world_class_universities

<http://source.android.com/faqs.html>

skype: to know more information, you can visit <http://skype.en.softonic.com/>

<http://www.uhasselt.be/UH/International/International-European-programmes.html>, consulted on 11/7/2013

<http://www.uhasselt.be/UH/research/Research-Coordination-Office/Objectives.html>,
consulted on 11/7/2013

<http://www.uhasselt.be/UH/International/International-Development-cooperation.html>,
consulted on 4/5/2013

viber: to know more information, you can visit <http://viber.com/>

Whatsapp: to know more information, you can visit www.whatsapp.com/

8. APPENDICES

8.1. Appendix 1: Development cooperation at Hasselt University

<http://www.uhasselt.be/UH/International/International-Development-cooperation.html>

- [International Course Programme](#)
- [Short Training Initiatives](#)
- [Sensitisation Initiatives](#)
- [Flemish Travel Scholarships](#)
- [South Initiatives](#)
- [Own Initiatives](#)
- [Institutional University Cooperation](#)
- [Congo](#)
- [BTC scholarships](#)
- [Prize Belgian Development Cooperation](#)

International Course Programme (ICP)

Master of Statistics

The **Master of Statistics** is an English master programme that organized by Hasselt University since 1988. From the start, Hasselt University has opted for a programme with a high scientific profile with emphasis on the application-oriented aspects of statistics. From the start, a lot of students from developing countries showed interest in the programme. This stimulated the organizers to transform the existing programme, after approval by VLIR-UOS, into an International Course Programme. The programme received a very positive evaluation from the panel of experts because of the innovative character (content-wise and educational), the scientific importance and the relevance for development.

The objective of the ICP Biostatistics is to offer a professionally-oriented training. Our masters will take leading positions in medical research (medical statistics and management of medical data) and in ecological, biological or agricultural research. The programme aims at the training of scientists from the South who have, through their knowledge, an immediate scientific based impact on health care and poverty reduction. Hence, they contribute to the solution of crucial problems of developing countries.

The ICP Biostatistics is unique in Belgium; even in Europe only a few of such trainings. In November 2007 the yearly ICP Get Together Day took place in Diepenbeek.

Short training Initiatives (KOI)

KOI

In October 2008, the Transportation Research Institute (IMOB), organized the Short Training Initiative on road safety in Asia for the first time. The initiative was organized again in 2009, 2010 and 2011 with not only a focus on Asia, but also on Latin-America.

The road safety policy in Asia and Latin-America is still in its infancy, therefore the demand for expertise is increasing rapidly, because road safety policy in developing countries is a high priority. In developing countries the percentage of traffic victims is almost twice the

percentage in industrialized countries. Through this training initiative, IMOB tries to improve the traffic safety in developing countries. During the training 15 to 20 participants learn how to measure and assess road (un)safety and road situations in their own country. Moreover, they study possible solutions, specifically adapted to the needs of their country.

Sensitisation Initiatives (SI)

For some years now, Hasselt University organizes an inter-faculty course in which speakers from the North and the South are invited to go more deeply into certain development problems. Besides this, interactive seminars on development issues take place from time to time. Both the course and the seminars are open to all interested people.

A first course '*Development cooperation: Unknown? Unloved?*' was organized in 2005-2006. It was financed by Hasselt University and was meant to announce the VLIR-UOS programmes. Besides this, there was a lecture on the World Bank (J. Ritzen).

In 2006-2007, the second course took place: '*Development cooperation: multidisciplinary aspects*' (with co-financing by VLIR-UOS). Several faculties organized various lectures and debates and a variety of topics was covered. For the course of 2007-2008: '*Traffic & health: essential issues in development*', two interdisciplinary institutes were asked to organize the lectures and debates. Moreover, the debates were included in the course package of the trainings linked to the respective institutes.

In 2008-2009 the lectures and debates were organized on the themes '(traffic) safety & health' with attention to subthemes such as government approach, labour, MDGs (Millennium Development Goals), and so on.

In 2009-2010 the lectures, '[Pro- & Re-activity in the South](#)', sought to provide a rigorous interdisciplinary theoretical and applied education in sustainable development. Its aim was to encourage in-depth scientific debates on cultures, their knowledge systems and various ethical orientations.

In 2010-2011 the focus of this inter-faculty course was on the theme '[North-South: crossing borders](#)'

Given the positive feedback of the students, the course '[North-South: an interdisciplinary exploration](#)' edition 2011-2012 and [edition 2012-2013](#) will pay once more special attention to the integration of basic concepts about North-South at the start of the course. In this way a frame is offered in which the following lectures can be understood.

The playful, interactive and educational actions fit in with the long-term projects. Since 2005-2006, attention has been given to the '[Millennium Development Goals \(MDGs\)](#)' in close collaboration with 11.11.11. Limburg.

Besides this, [UHasselt has been declared "sold"](#). Obtaining this title wasn't considered an end point, but a starting point, a leverage to make new agreements in the field of

sustainable production and consumption. In order to reach this, we are working with Oxfam Hasselt, Voedselteams, WREVEL.

Flemish Travel Scholarships (REI)

[Travel](#) scholarships for REI students

VLIR-UOS, Hasselt University and the City of Hasselt offer travel scholarships for students who wish to do their internship in a developing country or for students who travel to the South for their thesis research.

Like in the rest of Flanders, this formula has increasing success in the past few years. The number of applications is nowadays much higher than the available number of scholarships. At Hasselt University, the increase in applications mainly comes from students in Medicine and in Biostatistics.

The first case can be explained by the cooperation between the Faculty of Medicine of Hasselt University and the Indian Institute for Indian Mother and Child in Kolkata. The Belgian Dr Gysen, who is heavily involved in the institute, linked the institute and the faculty. Since 2007, there are annually several students in Medicine from the third bachelor year who do an internship in this health institute for a minimum period of 4 weeks. Other projects are following fast now: Mali and recently Congo.

In the past few years, there have also been a lot of applications for travel scholarships, mainly to Cuba, within the Master in Biostatistics. The main reason for this is undoubtedly the cooperation between Hasselt University and the *Universidad Marta Abreu de Las Villas* in Havana, within the framework of the EI-project financed by VLIR-UOS. The existence of this Flemish-Cuban Training and Research programme led by Prof Molenberghs (UHasselt) makes it very attractive for the Biostatistics students to carry out research in Cuba for a couple of weeks within the framework of their thesis.

South Initiatives (ZI)

The first South Initiative at UHasselt took place in 2007. The financing of this project by VLIR-UOS can be considered “seed money”, because the possibilities for future cooperation have been explored.

Own Initiatives (EI)

We make a distinction between [ongoing projects](#) on the one hand and [finished projects](#) on the other hand.

Ongoing projects

Cuban-Flemish Training and Research Programme in Biomedical Statistics and Bio-informatics

This Own Initiative is a cooperation with the *Universidad Central Marta Abreu de Las Villas* in Havana, Cuba, in the field of biostatistics. It came into being stimulated by CenStat (Center

for Statistics) and started in 2006 for a period of five years. Prof. Molenbergs is the coordinator. The objective of this project is to organize a qualitative biostatistics training at the university of Havana, inspired by the Biostatistics Master of Hasselt University. Besides health care, [education](#) has been a priority of the Cuban government for decades. Although the country has a long tradition in the field of mathematics and statistics, the university has never offered biostatistics training before. The project of CenStat will change this through this cooperation between ten Flemish and Cuban universities.

Finished projects

1. ***Backbone*** ***project***

From 2003-2008, Mr. Marc Thoelen coordinated the Backbone project in Kinshasa. During five years, they worked hard on the improvement of internet connections and facilities at the Congolese University in Kinshasa (UNIKIN), by installing glass fibre networks, satellites, databases and computer classes. The objective of this project was to connect UNIKIN with international partners/organizations (e.g. electronic libraries). Moreover, they hoped to improve the internal management of the university through this infrastructure.

2. ***Kisangani*** ***(DR*** ***Congo)***

Kisangi vzw supports the rural development project that started at the faculty of Sciences in Kisangi. This cooperation continues and is the result of the project (1997-2003) of Prof Gevaerts that learned the people of Kinsangi how to provide food in a good way.

3. ***Medical*** ***Faculty*** ***Suriname***

The goal of this project (1996-2001) was to strengthen the education and research in the preclinical phase of the faculty of Medicine of the Anton De Kom University in Suriname. This project was coordinated by Prof. Van Zwieten.

Institutional University Cooperation (IUS)

Institutional [University](#) Cooperation takes place through partnerships with universities in the south. In order to realize the general objective, namely contributing to the institutional development of universities in developing countries, several concrete projects take place, in which several Flemish universities participate. Both a Flemish and a local project manager are at the head of each project, while the Flemish and local coordinators undertake the responsibility for the global partnership.

At the moment, there is one IUS partnership that is supported by UHasselt, and there are several project managers and teammembers within our university. Below you can find an overview of the ongoing projects for which they are responsible. For more information on the partnerships in which these projects take place, you can go to the separate [IUS website](#).

Projects at UHasselt

Institute	Country	Timing	University	Coördinator	Teamleaders	Teammembers
UNZA	Zambia	'97-'06	UGent	Prof. Van Ranst		
UMSS	Bolivia	'97-'06	KUL	Prof. Feyen		
SUA	Tanzania	'97-'06	UA	Prof. D'Haese		
UNZI	Zimbabwe	'97-06	KUL	Prof. Odeurs	G. Janssens	
HUT	Vietnam	'97-07	VUB	Prof. Steenhaut		
CTU	Vietnam	'98-07	UGent	Prof. Sorgeloos		
UoN	Kenia	'98-'07	VUB	Prof. Eisendrath		
ESPOL	Ecuador	'99-'08	UGent	Prof. Vincx		
SLU/BSU	Philippines	'99-'08	KUL	Prof. De Waele		G.Janssens, K. Vanhoof
UWC	South-Africa	'03-'12	UGent	Prof. Blommaert		
MU	Ethiopia	'03-'12	KUL	Prof. Deckers		
UCLV	Cuba	'03-'12	VUB	Prof. Van Driessche		
JU	Ethiopia	'07-'17	UGent	Prof. Duchateau	P. Janssen, M. Thoelen	N. Vanaverbeke, M. Grantizer
MU-K	Kenia	'07-'17	VUB	Prof. Manderick	M. Van Haegendooren	
UCuenca	Ecuador	'07-17	KUL	Prof. Wyseure		

ADEKUS	Suriname	'08-'18	KUL	Prof. Vervoort	G. Janssens	P. Steels, KJ. Van Zwieten, P. Janssen
UEM	Mozambique	'08-'18	UGent	Prof. Temmerman	M. Aerts	
UNALM	Peru	'09-'19	KUL	Prof. Schrevens		P. Janssen, A. Peeters
UL	South-Africa	'09-'19	UA	Prof. Colebunders	K. Vanhoof	Z. Shkedy
UB	Burundi	'10-'20	UA	Prof. Reyntjes		
UNIKIS	Congo	'10-'20	UHasselt	Prof. Gevaerts	J.M. Rigo	
UCB	Congo	'10-'20	KUL	Prof. Mubagwa		
UCC	Congo	'10-'20		Prof. De Herdt		

Prize of the Belgian Development Cooperation

The « Development Cooperation Prize » was created in 1998 on the initiative of the then Secretary of State Réginald Moreels as part of his policy of raising public awareness concerning international solidarity.

The purpose of this prize of encouragement is to invite young people from the North and the South at a decisive moment of their lives to take an interest in international cooperation, and to stay committed after completing their studies. The Prize is aimed at students and young scientists.

The Development Cooperation Prize is financed by the Belgian Development Cooperation.

The organization of the Prize is entrusted to the Royal Museum for Central Africa as part of the Cooperation Protocol with the DGDC (Directorate-General for Development Cooperation), which regulates the funding of various actions by the museum in the field of development cooperation.

8.2. Appendix 2: Open source

<http://source.android.com/faqs.html>

What is the Android Open Source Project?

We use the phrase "Android Open Source Project" or "AOSP" to refer to the people, the processes, and the source code that make up Android.

The people oversee the project and develop the actual source code. The processes refer to the tools and procedures we use to manage the development of the software. The net result is the source code that you can use to build cell phone and other devices.

Why did we open the Android source code?

Google started the Android project in response to our own experiences launching mobile apps. We wanted to make sure that there would always be an open platform available for carriers, OEMs, and developers to use to make their innovative ideas a reality. We also wanted to make sure that there was no central point of failure, so that no single industry player could restrict or control the innovations of any other. The single most important goal of the Android Open-Source Project (AOSP) is to make sure that the open-source Android software is implemented as widely and compatibly as possible, to everyone's benefit.

You can find more information on this topic at our Project Philosophy page.

What kind of open-source project is Android?

Google oversees the development of the core Android open-source platform, and works to create robust developer and user communities. For the most part the Android source code is licensed under the permissive Apache Software License 2.0, rather than a "copyleft" license. The main reason for this is because our most important goal is widespread adoption of the software, and we believe that the ASL2.0 license best achieves that goal.

You can find more information on this topic at our Project Philosophy and Licensing pages.

Why is Google in charge of Android?

Launching a software platform is complex. Openness is vital to the long-term success of a platform, since openness is required to attract investment from developers and ensure a level playing field. However, the platform itself must also be a compelling product to end users.

That's why Google has committed the professional engineering resources necessary to ensure that Android is a fully competitive software platform. Google treats the

Android project as a full-scale product development operation, and strikes the business deals necessary to make sure that great devices running Android actually make it to market.

By making sure that Android is a success with end users, we help ensure the vitality of Android as a platform, and as an open-source project. After all, who wants the source code to an unsuccessful product?

Google's goal is to ensure a successful ecosystem around Android, but no one is required to participate, of course. We opened the Android source code so anyone can modify and distribute the software to meet their own needs.

What is Google's overall strategy for Android product development?

We focus on releasing great devices into a competitive marketplace, and then incorporate the innovations and enhancements we made into the core platform, as the next version.

In practice, this means that the Android engineering team typically focuses on a small number of "flagship" devices, and develops the next version of the Android software to support those product launches. These flagship devices absorb much of the product risk and blaze a trail for the broad OEM community, who follow up with many more devices that take advantage of the [new](#) features. In this way, we make sure that the Android platform evolves according to the actual needs of real-world devices.

How is the Android software developed?

Each platform version of Android (such as 1.5, 1.6, and so on) has a corresponding branch in the open-source tree. At any given moment, the most recent such branch will be considered the "current stable" branch version. This current stable branch is the one that manufacturers port to their devices. This branch is kept suitable for release at all times.

Simultaneously, there is also a "current experimental" branch, which is where speculative contributions, such as large next-generation features, are developed. Bug fixes and other contributions can be included in the current stable branch from the experimental branch as appropriate.

Finally, Google works on the next version of the Android platform in tandem with developing a flagship device. This branch pulls in changes from the experimental and stable branches as appropriate.

You can find more information on this topic at our [Branches and Releases](#).

Why are parts of Android developed in private?

It typically takes over a year to bring a device to market, but of course device manufacturers want to ship the latest software they can. Developers, meanwhile,

don't want to have to constantly track new versions of the platform when writing apps. Both groups experience a tension between shipping products, and not wanting to fall behind.

To address this, some parts of the next version of Android including the core platform APIs are developed in a private branch. These APIs constitute the next version of Android. Our aim is to focus attention on the current stable version of the Android source code, while we create the next version of the platform as driven by flagship Android devices. This allows developers and OEMs to focus on a single version without having to track unfinished future work just to keep up. Other parts of the Android system that aren't related to application compatibility are developed in the open, however. It's our intention to move more of these parts to open development over time.

When are source code releases made?

When they are ready. Some parts of Android are developed in the open, so that source code is always available. Other parts are developed first in a private tree, and that source code is released when the next platform version is ready.

In some releases, core platform APIs will be ready far enough in advance that we can push the source code out for an early look in advance of the device's release; however in others, this isn't possible. In all cases, we release the platform source when we feel the version has stabilized enough, and when the development process permits. Releasing the source code is a fairly complex process.

What is involved in releasing the source code for a new Android version?

Releasing the source code for a new version of the Android platform is a significant process. First, the software gets built into a system image for a device, and put through various forms of certification, including government regulatory certification for the regions the phones will be deployed. It also goes through operator testing. This is an important phase of the process, since it helps shake out a lot of software bugs.

Once the release is approved by the regulators and operators, the manufacturer begins mass producing devices, and we turn to releasing the source code.

Simultaneous to mass production the Google team kicks off several efforts to prepare the open source release. These efforts include final API changes and documentation (to reflect any changes that were made during qualification testing, for example), preparing an SDK for the new version, and launching the platform compatibility information.

Also included is a final legal sign-off to release the code into open source. Just as open source contributors are required to sign a Contributors License Agreement attesting to their IP ownership of their contribution, Google too must verify that it is clear to make contributions.

Starting at the time mass production begins, the software release process usually takes around a month, which often roughly places source code releases around the same time that the devices reach users.

How does the AOSP relate to the Android Compatibility Program?

The Android Open-Source Project maintains the Android software, and develops new versions. Since it's open-source, this software can be used for any purpose, including to ship devices that are not compatible with other devices based on the same source.

The function of the Android Compatibility Program is to define a baseline implementation of Android that is compatible with third-party apps written by developers. Devices that are "Android compatible" may participate in the Android ecosystem, including Google Play; devices that don't meet the compatibility requirements exist outside that ecosystem.

In other words, the Android Compatibility Program is how we separate "Android compatible devices" from devices that merely run derivatives of the source code. We welcome all uses of the Android source code, but only Android compatible devices -- as defined and tested by the Android Compatibility Program -- may participate in the Android ecosystem.

How can I contribute to Android?

There are a number of ways you can contribute to Android. You can report bugs, write apps for Android, or contribute source code to the Android Open-Source Project.

There are some limits on the kinds of code contributions we are willing or able to accept. For instance, someone might want to contribute an alternative application API, such as a full C++-based environment. We would decline that contribution, since Android is focused on applications that run in the Dalvik VM. Alternatively, we won't accept contributions such as GPL or LGPL libraries that are incompatible with our licensing goals.

We encourage those interested in contributing source code to contact us via the AOSP Community page prior to beginning any work. You can find more information on this topic at the Getting Involved page.

8.3. Appendix 3. The questionnaire:

The questionnaire included PSUT only and was classified into two categories as following:

A- The students

Do you think that the collaboration among international universities is better than staying alone?

1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do you encourage the international collaboration among universities through coordination and partnerships?

1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do you think that the international collaboration among universities help in creating new jobs and scholarships?

1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do you think that the international collaboration among universities help in knowing more cultures?

1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do you think that the international collaboration between PSUT (Princess Sumaya University for Technology) in Jordan and HASSELT university in Belgium in MIS specialization is success?

1 2 3 4 5 6 7

Do you think that the international collaboration between PSUT (Princess Sumaya University for Technology) in Jordan and Lancaster university in UK in MBA is success?

1 2 3 4 5 6 7

Do you think that the international collaboration programs such as ERASMUS (exchanges of students), Tempus and DAAD can be expanded more through creating new programs?

1 2 3 4 5 6 7

Do you prefer depending E-learning (without the indicative/teacher) instead of the learning in general?

1 2 3 4 5 6 7

Do you think that the drivers (advantages) to this collaboration are more than the barriers (disadvantages) of it?

1 2 3 4 5 6 7

Have you information about the Android system?

1 2 3 4 5 6 7

Have you know about the open source system?

1 2 3 4 5 6 7

Have you trends to use smart mobile?

1 2 3 4 5 6 7

Have you like using the Viber and whatsapp services (free calls and SMS)?

1 2 3 4 5 6 7

A- The teachers and registers

Have you skills in using new systems instead of existing systems (to register only)?

1 2 3 4 5 6 7

Do you prefer depending smart mobile technology to contact with students and teachers (to register only)?

1 2 3 4 5 6 7

Do you prefer depending the new technology to contact with your students after the lecture across free SMS reminder as example (to teachers only)?

1 2 3 4 5 6 7

Do you prefer depending the new technology to contact with other teachers through free calls and SMS (to teachers only)?

1 2 3 4 5 6 7

Do you prefer E-learning in the international education (to teachers only)?

1 2 3 4 5 6 7

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Voor akkoord,

Mahmod, Mohamad

Datum: **23/08/2013**