Instituto Politécnico de Coimbra
Instituto Superior de Contabilidade
e Administração de Coimbra

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Management control tool for outgoing students' application in International Relations Office at Faculty of Economics and Business, University of Maribor

Coimbra, July 2021

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ISCAC | 2021

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Project work submitted to the Institute of Accounting and Administration of Coimbra in partial fulfilment of the requirements for the Master's Degree in Management Control, held under the guidance of Professor Dr. António Trigo and supervision of Mag. Sanja Kocijan.

Coimbra, 30 of July of 2021

STATEMENT OF RESPONSIBILITY

I declare that I am the author of this project, which is an original and unpublished work, that has never been submitted to another HEI for obtaining an academic degree or other qualification. I also attest that all citations are properly identified and that I am aware that plagiarism is a serious lack of ethics, which may result in the cancellation of this project.

"After climbing a great hill, one only finds that there are many more hills to climb." – Nelson Mandela

ACKNOWLEDGMENTS

First, I wish to thank the Professor Doctor António Trigo for the guidance, patience, knowledge and help during the entire project.

I would also like to thank my supervisor at IRO-FEB, Mag. Sanja Kocijan, for the work and learning opportunity, as well as for all the support given during my stay at the IRO-FEB.

To my traineeship colleague, Mariam Tlashadze, I would like to thank for the friendship, help and for embracing so many adventures with me during the seven-month traineeship in Maribor.

A special thanks to my parents and sister for supporting me during the many challenges and adventures I have faced, no matter where I was.

Lastly, I wish to thank Rui Queiroz for the all the motivation and support during this journey and for always being by my side.

ABSTRACT

In an increasingly global and competitive world, it is crucial for any organisation to have efficient processes. To achieve this, organisations need to change and improve their work processes. To be more efficient and competitive, information must be always clear and accessible, which is not compatible with paperwork and manual tasks.

This project came from a seven-month traineeship in International Relations Office (IRO) at Faculty of Economics and Business (FEB) at University of Maribor (UM). In traineeship, one of the main duties is to manage the tasks about outgoing students' applications in a real international environment. This outgoing students' application are done and controlled by sending e-mails, add information in an Excel file manually, printed out files and archived them in fascicles. Nevertheless, this control and monitoring process presents some limitations and problems, such as enabling information to be lost and deadlines to be missed, as well as making it difficult to get data for statistics.

The main motivation of this project was to turn the outgoing students' application more simple, trackable, and efficient and the end goal is to create a management tool to monitor and control the whole process daily and it will provide the dematerialization and digitalization of the current process.

The prototype was implemented in a Business Process Management Suite (BPMS). For the analytical treatment of the data and the creation of dashboards to control and monitor the process implemented in the prototype, Microsoft Power BI was used with real data from the international relations office.

The management control tool for outgoing students' application contributes to the optimization of the process through the digitalization and dematerialization of it, the data access easily and gives dashboards and reports to visualize the information in a more appealing way and get an overview of the process.

Keywords: Management Control Tool, Information System, Business Process Management, Key Performance Indicators, Student Exchange Programmes, Outgoing Applications, ERASMUS

RESUMO

Num mundo cada vez mais global e competitivo, é crucial para qualquer organização ter processos eficientes. Para isso, as organizações precisam de mudar e melhorar os seus processos de trabalho. Para serem mais eficientes e competitivas, a informação deve ser clara e acessível a qualquer momento o que não é compatível com documentação em papel e tarefas manuais.

Este projeto tem por base um estágio de 7 meses no gabinete de relações internacionais da Faculdade de Economia e Negócios da Universidade de Maribor. No estágio, uma das tarefas principais é a gestão das candidaturas dos estudantes para o exterior em ambiente internacional. Estas candidaturas são feitas e controladas através de e-mails, adição de informação a ficheiros de Excel, impressão de documentos e o arquivo destes em dossiers. No entanto, este processo de controlo e monitorização apresenta algumas limitações e problemas, como a perda de informação e de prazo de entrega, além de dificultar a obtenção de dados para estatística.

A principal motivação para este projeto foi tornar o processo de candidaturas de estudantes ao exterior mais simples, rastreável e eficiente, e como meta final a criação de uma ferramenta de controlo de gestão para monitorizar e controlar todo o processo diariamente proporcionando a desmaterialização e digitalização do atual processo.

O protótipo foi implementado numa Business Process Management Suite (BPMS). Para o tratamento analítico dos dados e criação dos *dashboards*, para controlo e monitorização do processo implementado no protótipo, utilizou-se o Microsoft Power BI com dados reais do gabinete de relações internacionais.

A ferramenta de controlo de gestão para as candidaturas de estudantes ao exterior contribui para a otimização do processo através da digitalização e desmaterialização do mesmo, obtenção de dados facilmente acessíveis e de *dashboards* e relatórios para a visualizar a informação de forma mais apelativa e geral do processo.

Palavras-chave: Ferramenta de Controlo de Gestão, Sistema de Informação, Gestão por Processos, Indicadores Chave de Desempenho, Programas de Intercâmbio de Estudantes, Outgoing Applications, ERASMUS

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Abbreviations and acronyms

BI	Business Intelligence
BP	Business Process
BPM	Business Process Management
BPMS	Business Process Management Suites
CEEPUS	Central European Exchange Program for University Studies
DSR	Design Science Research
FEB	Faculty of Economics and Business
HEI	Higher Education Institution
HIRO-FEB	Head of International Relations Office at Faculty of Economics and Business
IRO	International Relations Office
IRO-FEB	International Relations Office at Faculty of Economics and Business
IS	Information System
KPI	Key Performance Indicator
LA	Learning Agreement
PU	Partner University
SWA	Signavio Workflow Accelerator
UM	University of Maribor

1 INTRODUCTION

In an increasingly global and competitive world, it is crucial for any organisation to be efficient in their processes. For this, organisations need to change and improve their work process. To be more efficient and competitive, the information must be clear and accessible at any moment which is not compatible with paperwork and manual tasks.

To make this information accessible, it is necessary to dematerialise the existing processes in organisations, avoiding the use of paper, from handwritten notes to information filed in dossiers. The dematerialisation of processes can be done through the digitalisation of organisational processes supported by information systems that collect, process and make available the information that is crucial not only for decision making but also for the survival of the organisation itself (Gonzálvez-Gallego et al., 2015; Varajão et al., 2009).

The dematerialisation of processes and consequent digitalization allows the automatization of information gathering to feed performance indicators of the organisation's processes and of the organisation itself, which help to measure the goals and objectives of the organisation. As renowned software engineer, Tom DeMarco, once famously put it: "You cannot control what you cannot measure". In accordance with this line of thought, any organisation needs firstly the data collected (digitised information), secondly the KPI's and only then can it control and define (or redefine) the strategy (new KPI's).

One of the methodologies to dematerialise processes is the Business Process Methodology (BPM) and its life cycle, which guides the whole development process from the characterisation of the way work is done in the organisation to its monitoring and control (Dumas et al., 2013), supported by Information Technology (IT) tools such as Business Process Management Systems, which allow modelling, execution and control of organisational processes (Trigo & Belfo, 2013).

Once the organisation has digitised the information it needs to be processed and made available to the organisation's collaborators, as this information is vital for decision making. It is in this undertaking that Business Intelligence systems are applied.

Business Intelligence (BI) is a technology that allows to convert the massive data produced by the digitalisation of processes into graphical information such as dashboards and reports that allow one to follow, in real time (Trigo et al., 2014), the performance of

the process and of the organisation itself, permitting the organisations to visualise the previously defined KPI's in an intuitive way.

1.1 Background

This project emerged from a seven-month traineeship in the International Relations Office (IRO) at the Faculty of Economics and Business (FEB), at the University of Maribor. During this year, one of the trainee's main duties is to manage the tasks about outgoing students' applications in a real international environment. In the IRO-FEB work three people, the Head of the International Relations Office (HIRO-FEB) and two trainees, who remain in office for a periods of six months. Only HIRO-FEB is a permanent employee of the institution and remains in office for longer periods of time. Currently, the biggest programme for exchange studies is ERASMUS + and the numbers of FEB students who go abroad have been growing. This outgoing students' application are done and controlled by sending e-mails, adding information to Excel files manually, printing out files and archiving them in fascicles. Nevertheless, this control and monitoring process presents some limitations and problems, such as enabling information to be lost and deadlines to be missed, as well as making it difficult to get data for statistics, for example for when one needs to compare the numbers of different academic years. Adding to these, IRO-FEB needs to transfer the knowledge between trainees. This means that a new trainee needs to learn and start to work at the same point as the previous trainee.

These limitations presented an opportunity for the development of a management control tool which would allow a more efficient control and monitoring of outgoing students' applications.

1.2 Motivations and goals

The main motivation for this project was to make the outgoing students' application more simple, trackable, and efficient. For that, four goals were defined:

- analysis of the outgoing process;
- modelling and optimization of the outgoing process;
- definition of the KPI's for the outgoing process;
- creation of outgoing process dashboards.

In the end the goal of the project was to create a management tool to monitor and control the whole process, at the same time making it easier to manage daily and it will provide the dematerialization and digitalization of the current process.

1.3 Methodology

The development of this project implied the definition of a methodology which enabled the redefinition of processes and approaches to the data gathered in outgoing students' applications. The development of artifacts in the organisation context proved itself to be needed.

1.3.1 Design Science Research

The research methodology used was the Design Science Research (DSR) methodology. The DSR methodology is an empiric method (evidence based) for systemic creation of innovating solutions (Horita et al., 2015). The artifacts are the proof of solutions created which have the knowledge for all process involved. Therefore, the artifacts are target results for this methodology. In Figure 1.1 a scheme is presented to explain how the methodology DSR works.

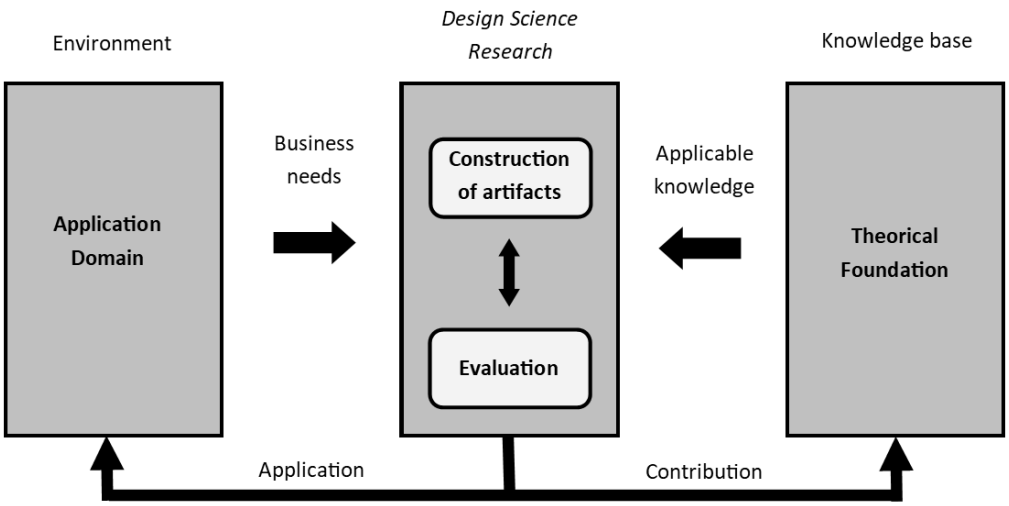


Figure 1.1. DSR Conceptual structure

Adapted from (Horita et al., 2015)

The centre of DSR conceptual structure is place where everything is connected, and it is base of DSR. The construction of artifacts and evaluation are dynamics as a cycle, since the feedback from artifacts is used for the construction of new artifacts, and those will then be evaluated, and the cycle never ends. As to allow this, the DSR has to be strongly

based in scientific theories and methods, and it contributes to theorical foundation creating new knowledge which is applicable in new DSR. To develop artifacts, DSR considers the application domain, which provides the requirements as inputs from the environment context such as people, organisations, technologies, objectives, and activities. These are the business needs.

Table 1.1 shows 7 principle-guides (Horita et al., 2015) of DSR methodology. It is based in what this methodology can do with quality, accuracy, and scientific and practical relevance.

Table 1.1. Principle-guides for DSR

#	Principles	Description
1	Project as an artifact	DSR should produce an artifact
2	Problem relevance	The research goal should be justified in problems that were identified in practice.
3	Project evaluation	The artifact quality and utility should be evaluated with strict methods along interested phenomenon related scenes
4	Research contribution	DSR should be provided relevant contributions to help artifacts elaboration
5	Research rigor	Strict methods should be used in artifacts elaboration and evaluation
6	Project as a process improvement	The artifact project represents an interactive process in artifact elaboration for problem solving
7	Research communication	DSR results must be shared with both literature and practice

Adapted from Horita et al. (2015)

1.3.2 Business Process Management

The Business Process Management (BPM) is a method used by many and different organisation across the world to manage and improve the business processes (BP) through an information system (IS). BP is the base of many software tools which are named Business Process Management Suites (BPMS). The BPMS helps the implementation of BPM in organisations, and it can collect the information needed directly from the source and validate the data for management.

According to Dumas et al., 2013 the "*BPM is the art and science of overseeing how work is performed in an organization to ensure consistent outcomes and to take advantage of improvement opportunities".* He also mentioned that *"the key idea of BPM is to focus on processes when organizing and managing work in an organization."*

To develop a BPM in organisation, we need to follow several steps that he described as a *"BPM lifecycle"*. As Figure 1.2. shows the lifecycle of BPM starts with identification process and through the process architecture we have the process discovery. Here we design an as-is model process for analysing. After considering the process, we can

improve and redesign the process getting a to-be model process. The following step is the process implementation and through the executable process model we can start to monitor and control the process. From the process monitoring and controlling we will get several data and see new ways to improve, so the cycle starts again from the beginning as process discovery.

According to (Dumas et al., 2013) *"the BPM lifecycle helps to understand the role of technology in BPM. Technology in general, and especially Information Technology (IT), is a key instrument to improve business processes".*

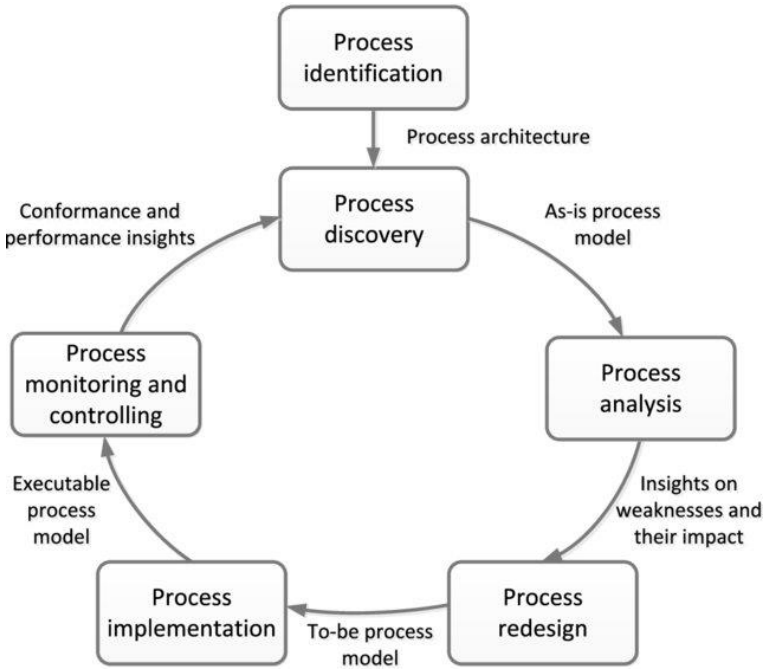


Figure 1.2. BPM lifecycle

Source: (Dumas et al., 2013)

To understand all the steps of BPM lifecycle, the author, described each one (Dumas et al., 2013):

- *Process identification: In this phase, a business problem is posed, processes relevant to the problem being addressed are identified, delimited and related to each other. The outcome of process identification is a new or updated process architecture that provides an overall view of the processes in an organization and their relationships.*
- *Process discovery (also called as-is process modelling): here, the current state of each of the relevant processes is documented, typically in the form of one or several as-is process models.*

- *Process analysis: issues associated to the as-is process are identified, documented and whenever possible quantified using performance measures. The output of this phase is a structured collection of issues. These issues are typically prioritized in terms of their impact, and sometimes also in terms of the estimated effort required to resolve them.*
- *Process redesign (also called process improvement): The goal of this phase is to identify changes to the process that would help to address the issues identified in the previous phase and allow the organization to meet its performance objectives. To this end, multiple change options are analysed and compared in terms of the chosen performance measures (…). The output of this phase is typically a to-be process model, which serves as a basis for the next phase.*
- *Process implementation. In this phase, the changes required to move from the as-is process to the to-be process are prepared and performed. Process implementation covers two aspects: organizational change management and process automation. Organizational change management refers to the set of activities required to change the way of working of all participants involved in the process. Process automation on the other hand refers to the development and deployment of IT systems (or enhanced versions of existing IT systems) that support the to-be process.*
- *Process monitoring and controlling. Once the redesigned process is running, relevant data are collected and analysed to determine how well is the process performing with respect to its performance measures and performance objectives.*

1.3.3 Business Process Management and Management Control

According (Pereira et al., 2020) *"despite the BPMS offering a wide variety of functionalities, its fundamental feature lies in the ability to automate business processes, and among its main components are: execution engine, modelling process tools, worksheets management, monitoring and controlling tools".*

As explained in the BPM life cycle, the monitoring and control of the process is done with the collection of data from the execution of the process, data that is essential for management, because it feeds the KPIs defined to follow the prosecution of the strategic objectives defined, not only for the process in question but also for the organisation, specifically the IRO-FEB and FEB itself.

1.4 Report Outline

This thesis comprises seven chapters. In chapter one, the background, motivations, and goals of the project are described. This chapter also addresses the methodology used (DSR and BPM). In chapter two, the literature review provides the current state of the art on key performance indicators (KPI) and the information systems (IS) in use in International Relation Officers (IRO) of other higher education institutions (HEI). Chapter three, presents the characterisation of the project, describes the environment and the history of the institution where the project was developed, giving a framework of exchange programmes and their statistics in the last five years. In chapter four the current outgoing student application process is analysed, identifying opportunities for improvement, and identifying KPIs for future process monitoring and control. After this analysis, the process is redesigned, that is, a new architecture for the process is proposed, to be implemented in a future information system, commonly referred to as the to-be process. In chapter five a prototype of the implementation of the project in a Business Process Management Suite (BPMS) is presented and the execution of the process in this tool is exemplified. In chapter six, the process control and monitoring phase is presented, using two tools: the analytical part of BPMS (in which the process prototype was implemented) and Microsoft Power BI (which allows a more appealing and intuitive graphic visualisation). Finally, chapter seven, concludes with final considerations, presenting a summary of the work developed, its main contributions, its limitations and the difficulties experienced during its execution, proposals for future work.

2 LITERATURE REVIEW

This literature review is about internationalization in higher education, the key performance indicators for assessing internationalization in higher education and information systems used in the context of international relations offices.

2.1 Internationalization in higher education

When talking about internationalization, the first that should be clarified is the difference between internationalization and globalization. According to Altbach & Knight (2007) the concept of internationalization and globalization are confused several times, actually they are related but not the same thing. In the context of 21st century higher education, the globalization can drive the higher education to international level through the economic, political, and social forces. The internationalization are the HEI practices and politics in global perspective. Ellingboe et al. (1998, p.199) goes further than Knight's definition, in her point of view, the internationalization is a process to integrate in HEI or university system in an international perspective. This process needs continued leadership focus on future orientation, multi-dimensional and interdisciplinary that included the stakeholders to work on it. With that, the institutions can improve its internal dynamics according to external environment and its changes.

The internationalization in higher education is often related XX and XXI century, however, as Altinay et al. (2019) mentioned, since the middle-ages students from different regions who exchange information between universities.

After this clarification is important to know the motivations for HEI to align. As Altbach & Knight (2007) refer, in a perspective of students mobility and the international programmes in higher education, the internationalization is an opportunity for universities and stakeholders to grow though the international market of academic and scientific staff, rankings and recognised programmes, and for-profit higher education sector.

From an European perspective, Huisman & Wende (2005), mentioned how it started. The European Union (EU) through the economic and political integration, helps more than two decades the internationalization in HEI. EU created and financed programmes, as ERASMUS, which allows the university students to get EU academic experiences abroad. Also, Bologna process provides a uniform academic system and the transferable credits – European Credit Transfer and Accumulation System (ECTS) – for degree structures

and qualifications compatible for all EU-students in higher education. As Altinay et al. (2019) mentioned, in their study about a new pedagogy for an evaluation of strategy and policies in higher education management in internationalization process, the numbers of students who go abroad are growing. The reason is that nowadays students are looking for more than university value or prestige, they are also going on a programme for social exchange social. With that European internalization expanded. The growth of these numbers affected the education systems and institutions, since HEIs might not be prepared for this increased in the number of external students. The author proposes that the HEI should evaluate the grounds of the internationalization and develop strategies and policies. This is the way to get the sustainability and success of the internationalization processes. In the study conclusions there is an important point of view of the internationalization process: when the internationalization process has a balance between quality and quantity considering the quality improvements, the HEI can deal with high number of foreigner students. The HEI also can draw a strategy to improve the quality instead to accept a lot of students. Therefore, a strategy based in quality and sustainability give to HEI attractive view for foreigner students.

Following the quality-oriented idea of previous authors, Van Damme (2001) refer that despite the quality assurance was not a concern for HEI, there were *"specific measures have been taken and quality assessment instruments developed for the field of internationalisation"* and *"gradually, specific quality assurance procedures and instruments in the field of international education have been developed".* Through this, the quality issue has been considered and relevant in last twenty-years.

2.2 Key Performance Indicators for assessing internationalization in higher education

The internationalization in higher education needs a process assessment to monitoring and control for stake holders, accreditations, and internal quality systems. The assessment process consists to (as cited by Paige, 2005) "*defining, selecting, designing, collecting, analyzing, interpreting, and using information...*" and "*enables the institution to determine what kind of progress it is making toward the achievement of those goals and objectives*".

2.3 Key Performance Indicators

The key performance indicators (KPI's) help to measure these goals and objectives. According to Wang & He (2012) the "*key performance indicator (KPI) is a key driving factor which implements the strategic objectives of enterprises and it is an evaluation index of the core events, it formulates around the enterprise strategies, and it is a form of expression for the quantified strategy*".

On a context of higher education, performance indicators are " *a policy relevant statistic, number or qualitative description that provides a measure of whether the university, some aspect of it, or the university system is performing as it should*." (Association of Universities and Colleges of Canada, 1995, p.3).

To select the key performance indicators Kaganski et al. (2014) present a KPI selecting model (see Figure 2.1), where the Enterprise Analyse Model (EAM) is the initial phase in KPI selection. But first, it is important to understand and clarify how the authors categorize KPI's. The KPI's have a categorization in two types from chronological perspective: leading indicators and lagging indicators. The leading indicators "*are activity or task-based metrics that are measured early and can be influenced to affect future outcomes. They are measured today to determine if goals will be met tomorrow, and they are measured early and often enough to allow for changes that can impact the predicted outcomes.*". The lagging indicators *"are historical measurements that look back to determine if success was achieved."* But they also include the last categorization in another way, to classify the KPIs according two main questions: *"How they (KPIs) should be used"* and *"What exactly should they (KPIs) show".* Here, is important to highlight only one type (Kaganski et al., 2014): strategic/operational KPIs (strategic KPI as longer-term facilities and operational KPI shorter-term activity).

According to (Kaganski et al., 2014) the EAM has three aims: get common information about organisation, evidence the weak points and what data needs to be collected and the reason to do that. As is shown in Figure 2.1 the EAM is just the first phase of KPI selecting. So then, the second phase is measurement, which got the objectives from KPIs on first fase and select all the fields of measuring. There are two paths to collect the information: manually and automatically. Here, they also advice to prioritize the automatically to avoid the probability to get a mistake. The third phase is analysing. It

means that after getting the numerical values, it is needed to understand them for management perspective.

This process is also cyclical, because it includes continuous improvement, and may change according to the organization goals.

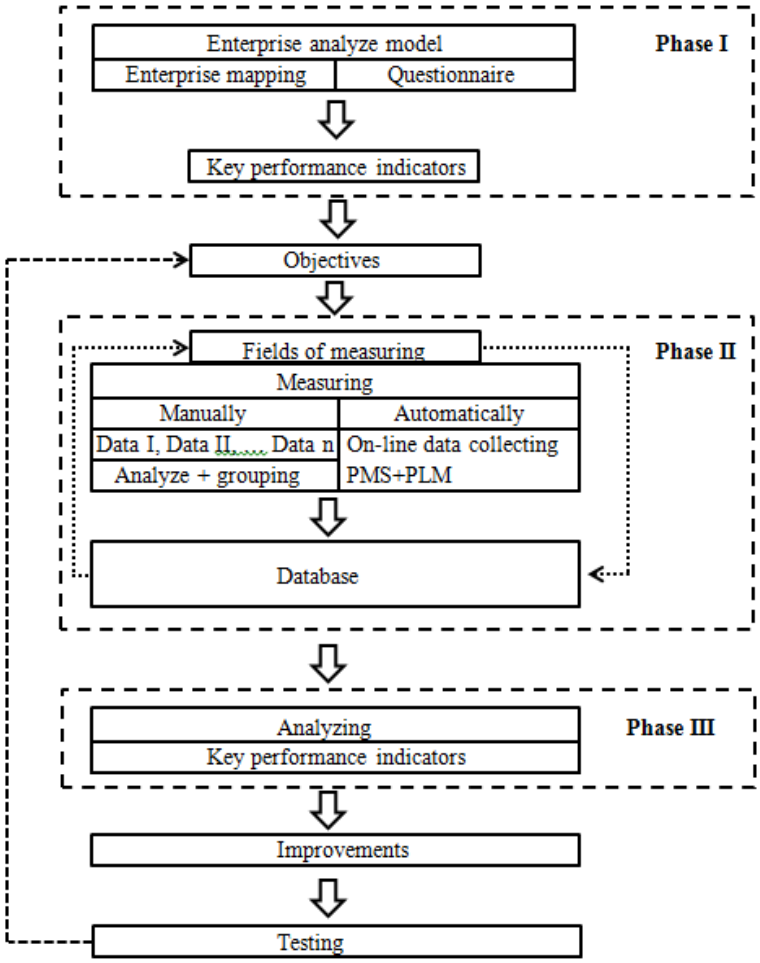


Figure 2.1. KPI selecting model

Source: (Kaganski et al., 2014)

To build the KPIs, (Caldeira, 2012) shows a practical way to think and develop them. The indicator model file is presented as a seven fields table:

1. "What is it for?" – it is the functions of indicator and explains the utility for management
2. "How is it calculated?" – presents the calculation formula to get the result and the unit (days, currency, %, etc)
3. "How to get the information?" – it is the source of the information
4. "When should do it?" – presents the better frequency to get the results (daily, weekly, monthly, etc)

5. "What is the polarity?" – polarity of the indicator clarifies how the indicator should be read when its result increases or decreases.
6. Additional notes – it is the complementary information could be needed to read the results
7. Visualization – presents an example about chart that could be used to show the results.

2.4 Key Perfomance Indicators in HEI

Paige (2005) identifies 10 key performance categories for assessing process in higher education, as showed in Figure 2.2.

Figure1. Internationalization Model: Key Performance Categories

1. University Leadership for Internationalization
2. Internationalization Strategic Plan
3. Institutionalization of International Education
4. Infrastructure—Professional International Education Units and Staff
5. Internationalized Curriculum
6. International Students and Scholars
7. Study Abroad
8. Faculty Involvement in International Activities
9. Campus Life—Co—Curricular Programs
10. Monitoring the Process

Figure 2.2. Internationalization Model – Key Performance Categories

Source: Paige (2005)

For this project is important to focus on two categories: the second and the tenth ones. In "Internationalization Strategic Plan", the author identified the importance to define a plan to follow the internationalization process and he specified and subcategorized by goals, objectives, inputs, activities, and timelines and targets, as able to see in Figure 2.3.

Performance Indicators: 2. Internationalization Strategic Plan

A. Goals
- The plan sets international education goals for the university.
- The plan set international education goals for faculties and departments.

B. Objectives
- The plan sets objectives for the university.
- The plan sets objectives for faculties and departments.

C. Inputs
- The plan provides budget resources for international activities.
- The plan provides staff resources for international activities.

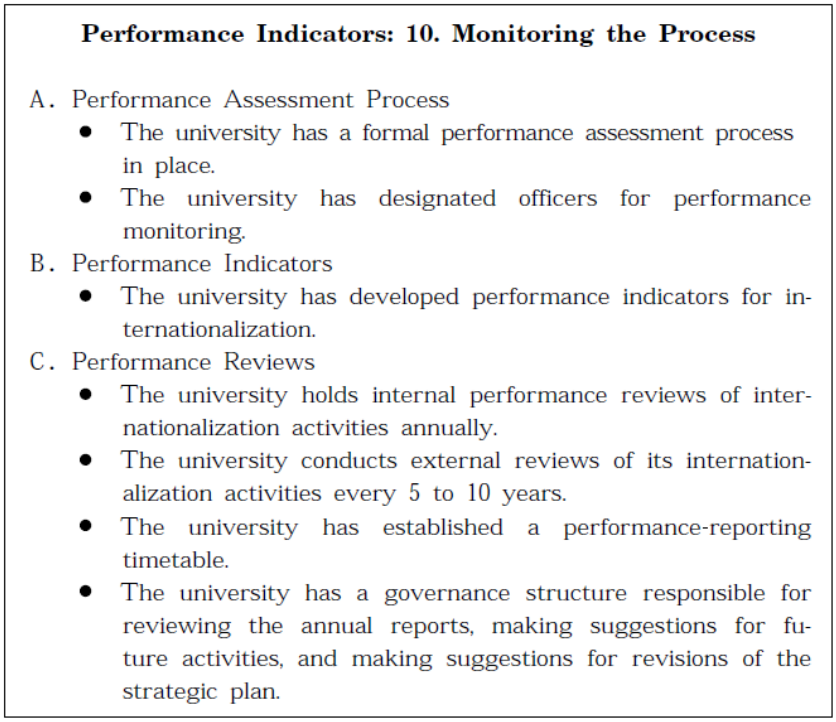
D. Activities
- The plan lists specific internationalization activities for the university.
- The plan lists specific internationalization activities for faculties and departments.

E. Timelines and Targets
- The plans establish timelines and targets for internationalization.

Figure 2.3. Performance Indicators: Internationalization Strategic Plan

Source: Paige (2005)

Therefore, when the strategy is defined, the monitoring is crucial to stay on correct way and improve the process. For tenth category, the author considers the "Monitoring the Process" and mentioned that the monitoring system is important to follow the progress of internationalization. This category is divided in three sections. First, the performance assessment process is about the formal performance assessment process and who is the responsible for performance monitoring. Second, the performance indicators are about developing specific indicators for internationalization. Lastly, the performance reviews are about the reviews for internationalization activities, performance reporting timetable and the governance structure responsible for reviewing processes and making suggestions for improvement (see Figure 2.4).



Performance Indicators: 10. Monitoring the Process

A. Performance Assessment Process
- The university has a formal performance assessment process in place.
- The university has designated officers for performance monitoring.

B. Performance Indicators
- The university has developed performance indicators for internationalization.

C. Performance Reviews
- The university holds internal performance reviews of internationalization activities annually.
- The university conducts external reviews of its internationalization activities every 5 to 10 years.
- The university has established a performance-reporting timetable.
- The university has a governance structure responsible for reviewing the annual reports, making suggestions for future activities, and making suggestions for revisions of the strategic plan.

Figure 2.4. Performance Indicators: Monitoring the Process

Source: (Paige, 2005)

2.5 Information Systems used in the context of International Relations Office

The student outgoing process in International Relations Office (IRO) is mostly in paper and the communications are by e-mail. As Endes (2015) described the process in Selcuk University (Turkey), the process starts with an e-mail sent by Erasmus Coordinator Office inform that student is able to go abroad through the Erasmus Student Mobility for studies. Then the student, as nominated, has to search the schools through them websites to get the information needed to apply for studies. The Erasmus Coordination office can help the student with an orientation programme. After the orientation programme and choose of the partner university, student has to fill the application and accommodation forms. When the documents are filled, they need to be signed by the departmental coordinator and institutional coordinator and send by post to partner university. The receiving institution (or partner university) verifies the documents and sends the acceptance letter to student. Then the student needs to fill out and send the learning agreement.

One of the conclusion from Endes (2015) research was: "*some of our students evaluated the document preparation process was very difficult and troublesome and stated that the departmental coordinators were insufficient in terms of knowledge about erasmus*

exchange programme in process of the document preparation process and signature process of the documents and students pointed out that they could not reach the departmental coordinators and waited for a long time for signature process and they lost time in application process."

This conclusion shows the difficulty and complexity of dealing with the XXX process using paperwork documentation. Another example of this situation is that reported by Van Damme (2001) *"in the ERASMUS / SOCRATES programs, as with most EU-programs, project promoters disapprove the exaggerated paperwork and very long application procedures. There is a general need for simple and clear application procedures and transparent evaluation procedures."*

An example of a HEI that tried to address these issues was the University of Warsaw that started to develop a "*software to assist daily activities of university international Relations office*" in 2005. One of the main tasks for this system is to manage the mobility as such outgoing and incoming students and staff, recruitment, registration, etc (Mincer-daszkiewicz, 2005).

In outgoing process for intern nomination, when student is accepted the coordinator of the program open a position. The author (Mincer-daszkiewicz, 2005) described the main steps of the process:

- *"At the first step the student is found in the student's catalog* (see Figure 2.5*) – student's personal data and information on his/her academic career is already available in the system and need not be entered (this allows to avoid a lot of potential mistakes)."*

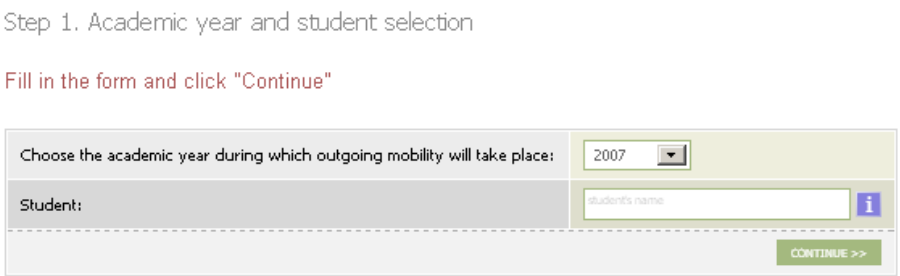


Figure 2.5. Step 1 for outgoing application

Source: (Mincer-daszkiewicz, 2005)

- *"At the second step the agreement and the specific conditions of cooperation are chosen and assigned to a nominated student"*

- *"At step three either the student or the coordinator fills the details of the application, like period of stay, preferred method of communication. Entered data is verified on the fly"*
- *"After approval - which is the final step - the application should be printed, signed by the coordinator and the student, and finally delivered to IRO, with the list of all applications (also printed from the system)".*

It is relevant to refer this software is integrated with central information system, so the data of approved applications are transferred automatically. At this moment of the procedure, the data cannot be cancelled nor modified, only viewed, or printed as it is possible to see in last column of Figure 2.6. Here the author shows the list of students nominated for outgoing mobility and the coordinator has accessed to entire process.

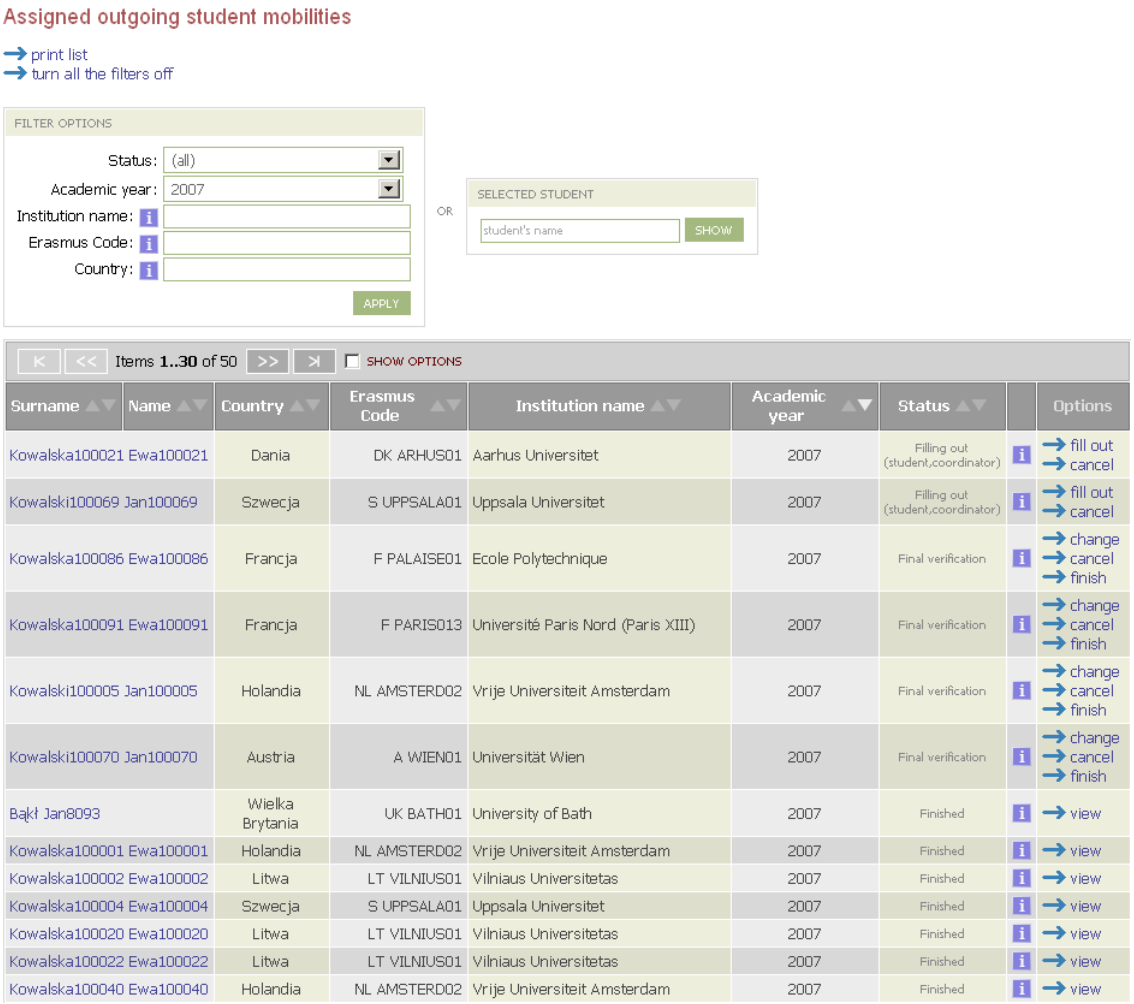


Figure 2.6. Assigned outgoing student mobilities

Source: (Mincer-daszkiewicz, 2005)

The author just explain the process till here, when the student is ready to apply to partner university. Mincer-daszkiewicz (2005) mentioned the important plans: *"the process of negotiating learning agreement between a student and coordinators from both universities is the most painful part of the whole procedure. We want to automate is as much as possible. (...) the ambitious plan would be to get rid of all papers along the process. In the era of electronic signature elimination of paper documents seems possible. Student paper folders might be totally replaced by electronic folders"*

The reality demonstrated in the previous HEIs shows that there is still a lot to do in digitalization of these processes.

3 PROJECT CHARACTERIZATION

This chapter provides a broad background of the project and the environment in which it was developed. It starts with important facts about Slovenia, Maribor city, the University of Maribor, and its Faculty of Economics and Business (FEB). Then, the International Relations Office (IRO) of FEB, is presented the place where the project was developed. After presenting the physical environment of the project the main student exchange programmes and their statistics (between 2014 and 2020) are presented. Finally, a brief description is given of the outgoing student process, in the International Relations Office of the Faculty of Economics and Business (IRO-FEB), which is the focus of this project.

3.1 Slovenia

Slovenia, the green heart of Europe, lies in Central of Europe, has borders with Austria, Croatia, Italy, Hungary, and the Adriatic Sea. It was a part of Yugoslavia for most of the 20th century. According to (Barker, 2021), "*with the dissolution of the Yugoslav federation in 1991, a multiparty democratic political system emerged. Slovenia's economic prosperity in the late 20th century attracted hundreds of thousands of migrants from elsewhere in the Balkans"*.

In the beginning of the century XXI, Slovenia allied the North Atlantic Treaty Organization in an economic and political approach. Then, in 2004, Slovenia joined to European Union. Ljubljana is the capital and the most important city in Slovenia.

As a green country, Slovenia has a huge pure and beautiful forests with valleys, waterfalls, and lakes. There are still special places as UNESCO's heritage Škocjan Caves and Portorož Riviera in seaside.

Table 3.1. General information – Slovenia

Official name	Republic of Slovenia
Area	20 273 km^2
Forest	10 124 km^2
Length of coast	46.6 km
Population	2,066 million
Capital	Ljubljana
Inhabitants	Ljubljana: ~280 000
	Maribor: ~95 000
Climate	Alpine, Continental, Mediterranean
Time zone	Central European time (GMT+1)
Political system	Multiparty parliamentary democracy
Currency	Euro

Source: FEB (2019b)

Maribor is the second largest city in Slovenia and represents the centre of Slovenian Styria (Štajerska) region.

3.2 University of Maribor

Founded in 1975, the University of Maribor (UM) is the second largest and the second oldest Slovene university. In 2016, UM had approximately 15.000 students, 17 faculties (see Table 2.2) and 185 study programmes. The Faculty of Economics and Business (FEB) is one of the faculties of the University of Maribor.

Table 3.2. Faculties of University of Maribor

Faculty of Economics and Business	Faculty of Organizational Sciences
Faculty of Electrical Engineering and Computer Science	Faculty of Mechanical Engineering
Faculty of Energy Technology	Faculty of Tourism
Faculty of Civil Engineering, Transportation Engineering and Architecture	Faculty of Criminal Justice and Security
Faculty of Chemistry and Chemical Engineering	Faculty of Health Sciences
Faculty of Agriculture and Life Sciences	Faculty of Arts
Faculty of Logistics	Faculty of Medicine
Faculty of Natural Sciences and Mathematics	Faculty of Education
Faculty of Law	

UM is an important institution in the development of the region of Maribor as an economic and knowledge centre. These aspects are shown in the UM mission and vision (UM, 2016).

"Mission: The mission of the University of Maribor is based on honesty, curiosity, creativity, freedom of spirit, cooperation, and knowledge transfer in the field of science, art and education. Concerned with mankind and sustainable development, the University of Maribor expands knowledge, raises awareness, and promotes humanistic values as well as the culture of dialogue, quality of life and global justice.

Vision: The University of Maribor shall become a globally recognized innovation ecosystem, inspiring the creativity of both employees and students.

The University of Maribor is proud to be ranked in the top 600 best universities in the world which also means the highest score among Slovene universities.

3.3 Faculty of Economics and Business of the University of Maribor

The Faculty of Economics and Business (FEB) started even before the University of Maribor, as the two-year post-secondary School of Commerce, in 1959. In 1963, it was renamed to School of Economics and Business and also VEKŠ (the Slovenian acronym). The following years, the quality of school increased, and it became the first HEI in Maribor. In 1975, the University of Maribor was founded and only in 1989 VEKŠ was integrated and named Faculty of Economics and Business (FEB). Since then, the faculty introduced its undergraduate and postgraduate programmes and gained international recognition.

The mission, vision, core values and strategic of FEB are defined (FEB, 2019a):

- *Mission: The Faculty of Economics and Business contributes to the holistic development of individuals and participates in the development of the economy and community at both the national and wider European levels through its synthesis of economics and business research and education;*
- *Vision: Academic freedom; Knowledge; Cooperation; Personal and social responsibility; Equality and democracy; Credibility and ethical action; Dialogue and interpersonal respect; Innovation; Critical thinking; Entrepreneurship;*
- *Core Values: FEB will be recognized nationality and throughout the wider European Region as an excellent research-oriented and globally-connected school of economics and business;*
- *Strategic orientation: The following strategic objectives support the mission statement: meaningful and impactful research:*
    - *Continuous support for faculty and staff development;*
    - *Ongoing cooperation with the business community;*
    - *Current and effective undergraduate and postgraduate study programmes and life-long education in the field of economics and business;*
    - *Increased internationalization in all operational areas;*

- *Encouragement of socially responsible behaviour and morally and ethically principled action;*
- *Assurance of interdisciplinary knowledge and spreading awareness for sustainable development.*

International Accreditations

FEB is recognized by three international accreditations:

- In 2008, FEB was awarded accreditation by the European Council of Business Education (ECBE) (see first picture in Figure 2.1). Since then, FEB has already got two reaccreditations from same agency.
- In 2009, FEB was accredited by the American accreditation agency, the Accreditation Council of Business School and Programs (see second picture in Figure 2.1).
- In year 2018, FEB was accredited by AACSB (Association to Advance Collegiate Schools of Business) (see third picture in Figure 2.1)

Figure 3.1. FEB International Accreditations

3.4 International Relations Office of Faculty of Economics and Business

The International Relations Office of Faculty of Economics and Business (IRO-FEB) was established in 1999, when the faculty adhered to the SOCRATES programme. IRO-FEB is responsible for the administration of exchange programmes for the mobility of students and teaching staff.

IRO-FEB has a commitment to (FEB, 2019b):

- *inform students about the possibilities of student exchange and other types of international cooperation (seminars, congresses, conferences, summer schools, etc.);*
- *promote studies abroad;*

- *deal with and assisting students with the exchange related formalities;*
- *communicate with partner universities;*
- *carry out all stages of the exchange process (introductory seminars, integration of foreign students and reintegration of Slovene students);*
- *carry out various development projects (preparation of promotional materials – brochures, web pages, CD-ROM; surveying students, research, establishment of new partnerships);*
- *counsel and helping both outgoing and incoming students solve their problems;*
- *organize field trips and social events for foreign students.*

3.5 Internationalisation support programmes

The Faculty of Economics and Business has three internationalisation support programmes.

3.5.1 ERASMUS

Erasmus+ is the EU's programme created for higher education students to support education, training, youth and sport in Europe.

Eleven European countries joined in the ERASMUS programme at its beginning, in 1987: Belgium, Denmark, Germany, Greece, France, Ireland, Italy, Netherlands, Portugal, Spain, and United Kingdom. Nowadays, there are more countries in this programme, which means more opportunities and options in higher education, vocational education and training, school education, adult education, youth, and sport.

In 2017 and after 30 years, 9 million people have benefit from this project, having studied, trained, volunteered or acquired professional experience in multiple foreign countries. In regard to its predecessors, Erasmus+ has proven to have a more direct connection to the working world, allowing students to have labour and civic experiences in organisations and companies so as to be better prepared for the job market (European Commission, 2018).

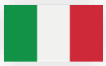
In 2020/2021 the European Commission opened a new call for application, with specific issues in the programme (EEAS, 2020):

- reducing unemployment, especially among young people;

- promoting adult learning, especially for new skills and skills required by the labour market;
- encouraging young people to take part in European democracy;
- supporting innovation, cooperation, and reform;
- reducing early school leaving;
- promoting cooperation and mobility with the EU's partner countries.

IRO-FEB has an agreement with several universities through the ERASMUS+ (KA103) programme as shown in Table 3.3.

Table 3.3. Erasmus KA 103 Partner Universities

	Austria		France
	5 Universities		19 Universities
	Belgium		Greece
	3 Universities		4 Universities
	Bulgaria		Hungary
	1 University		8 Universities
	Croatia		Italy
	8 Universities		6 Universities
	Czech Republic		Lithuania
	10 Universities		2 Universities
	Cyprus		Macedonia
	2 Universities		4 Universities
	Denmark		Netherlands
	1 University		4 Universities
	Estonia		Portugal
	1 University		14 Universities
	Finland		Poland
	8 Universities		15 Universities
	Romania		Slovakia
	4 Universities		6 Universities
	Spain		Sweden

	17 Universities		1 University
	Turkey		
	16 Universities		

Withing, the ERASMUS programme, there is another program called KA107 or International Credit Mobility. This programme provides identical opportunities toKA103, but the mobility periods may be undertaken in almost every country in the world Table 3.4 shows the FEB partner countries for this programme.

Table 3.4. ERASMUS KA107 Partner Universities

	Bosnia and Herzegovina		Albania
	4 Universities		1 University
	China		Russia
	1 University		1 University
	Belarus		Lebanon
	2 Universities		1 University
	Ukraine		Bangladesh
	1 University		1 University
	Kazakhstan		Israel
	1 University		1 University
	Argentina		
	1 University		

3.5.2 CEEPUS

CEEPUS is the short form of Central European Exchange Program for University Studies. This multilateral University exchange program is founded on an international agreement and is implemented in the extended Danube region.

It started in 1995 with six countries. Nowadays, it has 15 members countries who joined the current CEEPUS III agreement, having had approximately 75.000 mobility applications since its beginning. The roles of CEEPUS are to support knowledge exchange and to establish a network of universities eligible for mobility programmes for students and teachers.

"Each country has a National CEEPUS Office (NCO) in charge of the national implementation of the Program. The Central CEEPUS Office in Vienna is responsible for the overall coordination of the program."(*CEEPUS*, 2021)

Table 3.5. CEEPUS Partner Universities

	Croatia		Czech Republic
	2 Universities		1 University
	Austria		Bosnia and Herzegovina
	1 University		2 Universities
	Poland		Albania
	2 University		1 University
	Serbia		Bulgaria
	1 University		1 University
	Hungary		Montenegro
	1 University		1 University
	Romania		Slovakia
	1 University		1 University

3.5.3 Bilateral agreements

Another option for study exchange is a short-term mobility based on bilateral agreements that Slovenia has signed with many countries with the aim to support student exchange for a period of up to 10 months.

Bilateral agreements that address cooperation and mobility reciprocity in the field of higher education have been signed with the following countries: Bosnia and Herzegovina, Bulgaria, Greece, Hungary, India, Israel, Italy, Japan, Mexico, Montenegro, Poland, People's Republic of China, North Macedonia, Russian Federation, Serbia, Slovakia, Switzerland, and Turkey.

The Faculty of Economics and Business has Bilateral agreement with some European universities, as can be seen in Table 3.6.

Table 3.6. Bilateral European Partner Universities

	Croatia		Czech Republic
	3 Universities		1 University
	Finland		France
	1 University		1 University
	Poland		Portugal
	1 University		1 University
	Serbia		United Kingdom
	3 Universities		2 Universities

FEB also has some partners universities outside Europe, as can be seen in Table 3.7.

Table 3.7. Bilateral Non-European Partner Universities

	China		India
	5 Universities		9 Universities
	Malaysia		Russia
	1 University		2 Universities
	Taiwan		
	1 University		

3.6 Students exchange statistics

As mentioned in the last section, FEB-UM has three internationalisation support programmes being the most relevant the ERASMUS+ programme because it is the one with most students. The charts below show the numbers between 2014-2020.

In ERASMUS KA107, Ukraine and India were the countries with more exchange students. The total number of students between 2014 and 2020 was 47 students and all of them were incoming. The outgoing exchange by this programme is not expressive at all.

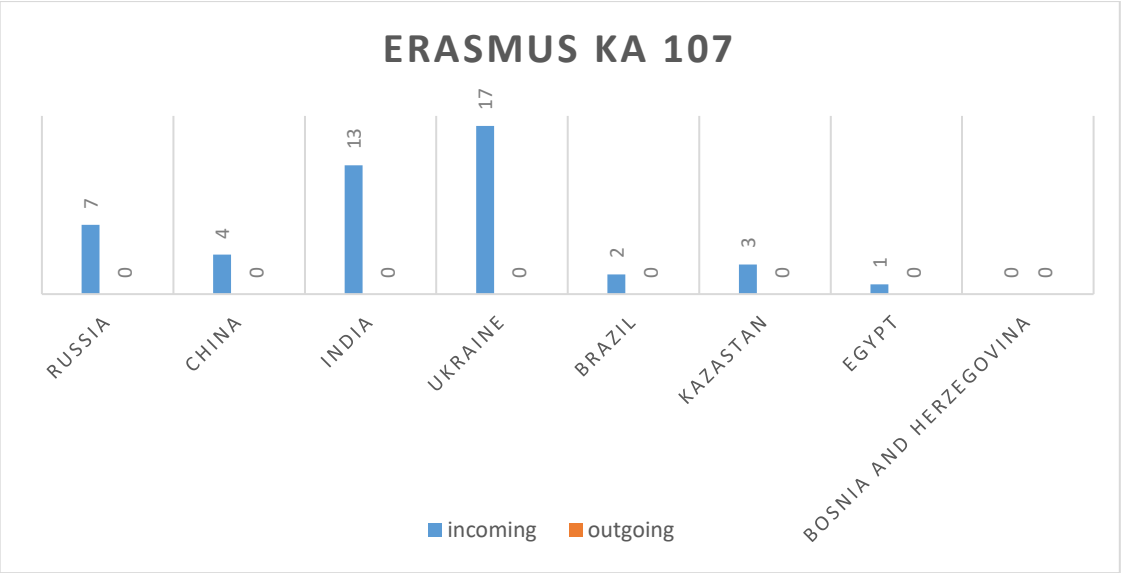


Figure 3.2. ERASMUS KA 107 Programme – FEB total number 2014-2020

The Bilateral programme, inside and outside Europe, has more exchange students than ERASMUS KA107, but only 9 outgoing students went to this program between 2014-2019.

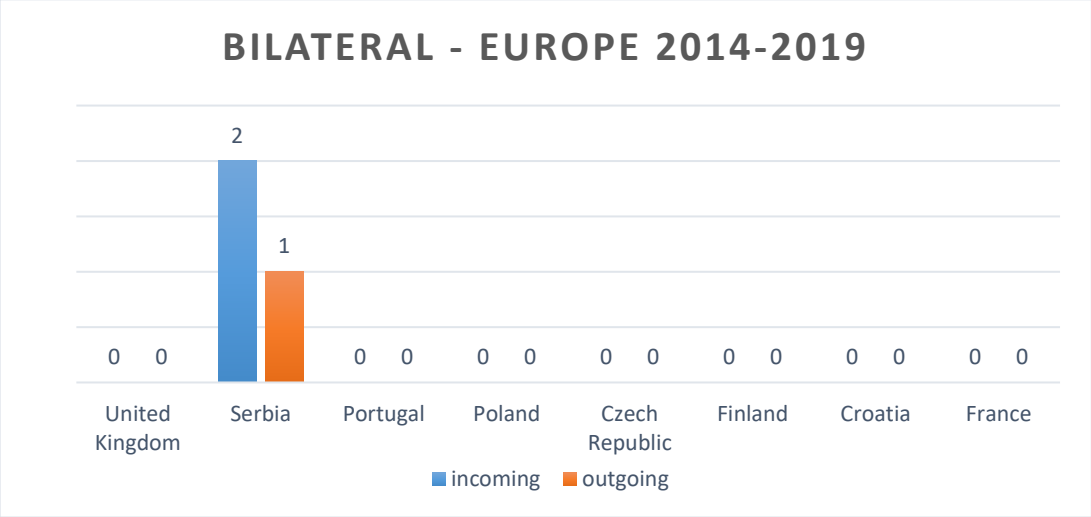


Figure 3.3. Bilateral in Europe – FEB total numbers 2014-2019

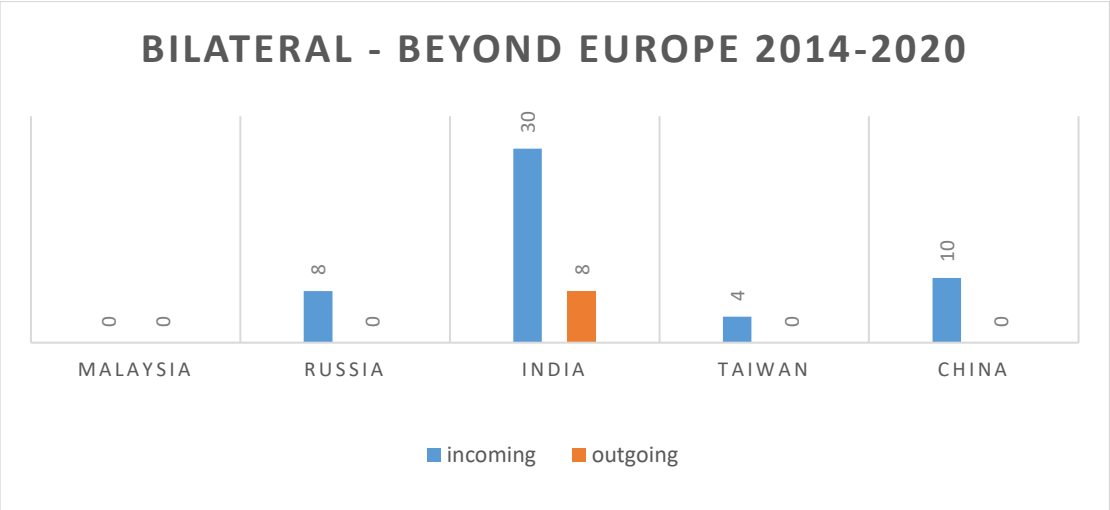


Figure 3.4. Bilateral Beyond Europe – FEB total numbers 2014-2020

The CEEPUS programme has the same issue than previous programmes, since the numbers of outgoing students are so low that they are not relevant for this project.

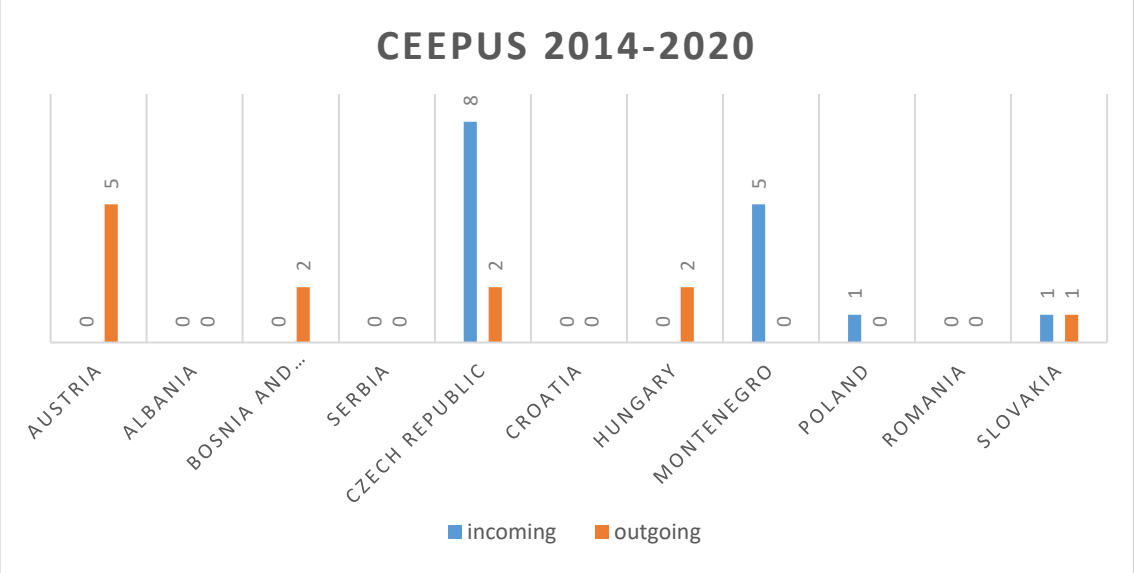


Figure 3.5. CEEPUS Programme – FEB total number 2014-2020

3.6.1 ERASMUS+ statistics

The ERAMUS+ Annual Report 19 from European Union has numbers about incoming and outgoing students in Slovenia (Figure 3.6). In this report, the University of Maribor is the second University in Slovenia with a higher number of students being sent to other institutions. Figure 3.7 presents the numbers of FEB exchange students, incoming and outgoing, per year between 2014-2020.

In 2019/2020 academic year, FEB had the highest number of outgoing students in the last 6 years.

The majority of these students went to Germany, Slovakia, Portugal, Spain and Austria with more than 20 students per country (Figure 3.8).

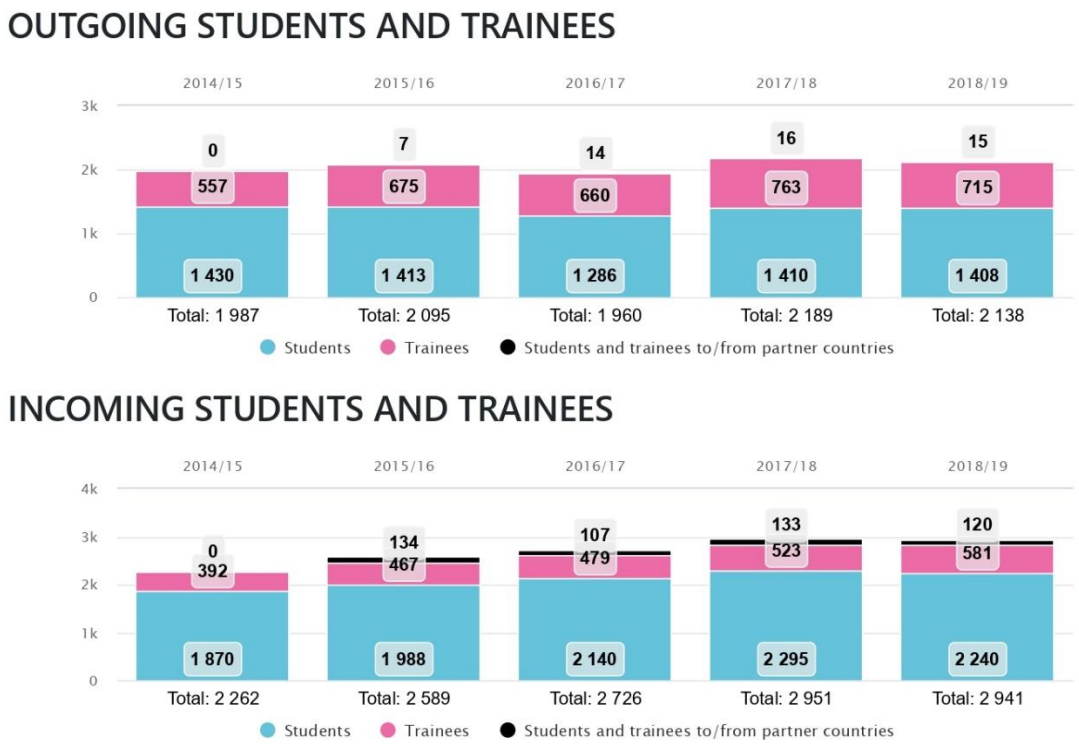


Figure 3.6. Slovenia numbers from The ERASMUS + Annual Report 2019

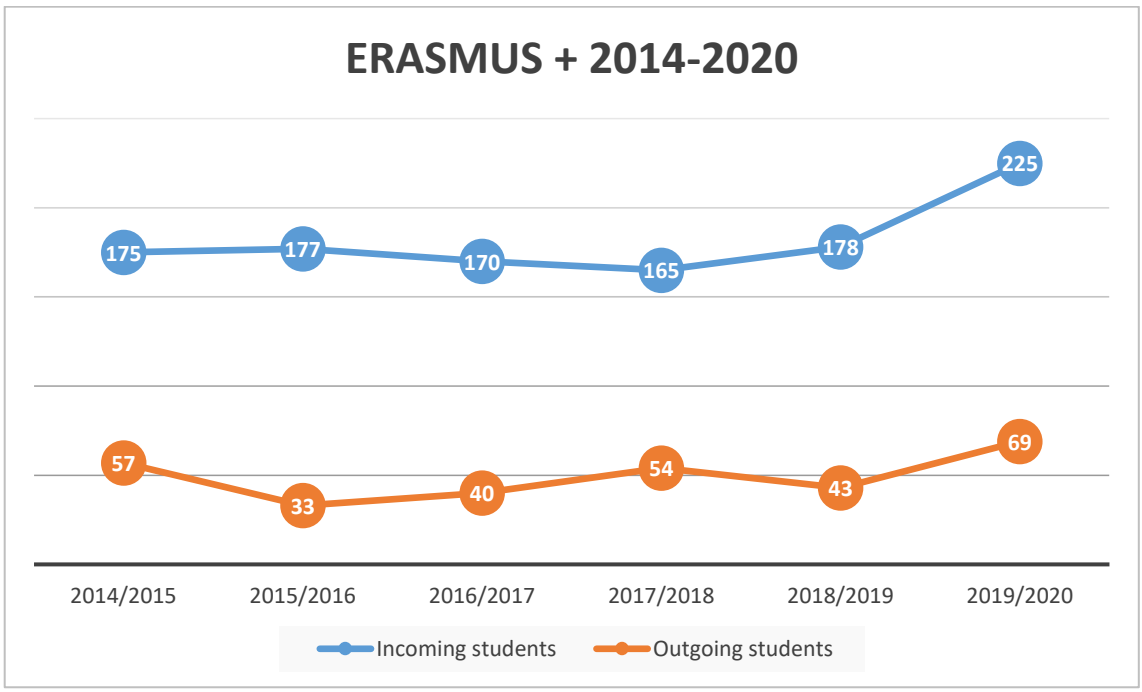


Figure 3.7. FEB Total number of ERASMUS+ (KA103) students per academic year

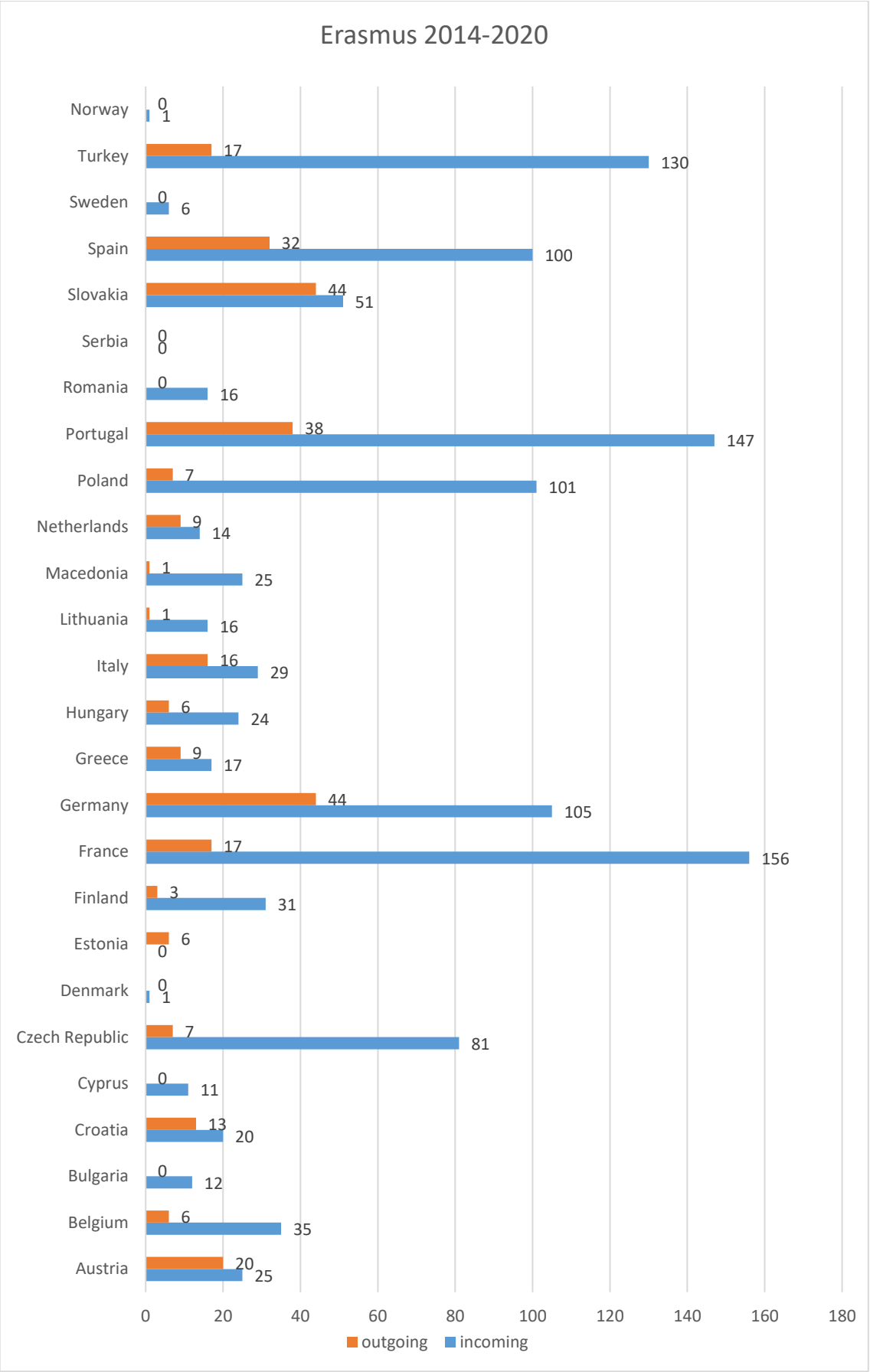


Figure 3.8. FEB total number of ERASMUS+ students per country

3.7 FEB Outgoing Students

FEB outgoing student means a student who wants to go abroad during one semester or whole academic year. In IRO-FEB the student should be Slovenian or full-time student (foreigner).

The outgoing process has three phases: firstly, the student submits the application form at UM main office; secondly, students undergo a selection; and thirdly, students are nominated and the application to a Partner Universities (PU) is made.

The first step requires students to apply for the programme at the International Relations Office at University of Maribor. Then the main office sends the file with student data (appendix A) to the IRO-FEB.

In the second phase, the IRO-FEB collects the provided information about the student and inserts it in an Excel file. According to the student's academic average and the PU chosen, the IRO-FEB needs to define only one PU place, since IRO-FEB has a limited number of places for each PU. This phase is called to student selection.

Finally, IRO-FEB sends the nomination to the PU. If the student is accepted, the next steps concern the student's application. The student's application is a procedure which consist in filling in forms and submitting documents regarding student exchange. The application procedure is not the same for all PUs. So, before sending the application, IRO-FEB needs to assess everything needed for the student's application and monitor all the process up to the end of the student's exchange. In this phase it is extremely important to be careful with deadlines, as they differ from PU to PU. Usually, for application the student must fill-out some forms (depending on PU) and Learning agreement (appendix B). The learning agreement is a signed contract between PUs, which is common to all universities.

4 PROCESS ANALISYS AND RE-DESIGN

This chapter presents the analysis and redesign of the third phase of students' outgoing application process, described in section 3.6, considering the identified improvements.

The analysis and redesign process implies three phases: a first phase, consisting of the description and explanation of the current process, including all participants, departments, tasks and relationships; a second phase where process improvements are identified; finally, a third phase where a new process architecture is proposed. The process redesign includes some information collection points that will feed the Key Performance Indicators (KPIs), which in turn will allow the process to be controlled. The main objective of this project is the dematerialization and control of the student's outgoing application process.

BPM Academic Initiative version of the Signavio Workflow Accelerator (SWA) application was used to draw the process workflow. According to (Weske, 2007) *"workflow is the automation of a business process, in whole or in part, during which documents, information, or tasks are passed from one participant to another for action, according to a set of procedural rules"*.

4.1 Characterization of student's outgoing application process

The third phase of students' outgoing application process starts when IRO-FEB informs the student by e-mail that the candidate was selected to apply to the Erasmus Program. IRO-FEB waits for student confirmation by e-mail (see Figure 4.1).

If the student accepts the nomination, IRO-FEB sends the student nomination to the PU. To send this nomination the IRO-FEB needs to check the nomination procedure. To do that, the IRO-FEB either consults the official PU website for the procedure or asks for current Fact Sheet [1] by e-mail. Typically, the nomination is sent by e-mail with information in body or with some type of form or file attached.

Otherwise, the process is cancelled (see Figure 4.1).

[1] a paper giving useful information about ERASMUS exchange programme and PU. E.g Deadlines for nomination and application, PU ERAMUS Code, contact person from international relations office, accommodation and living costs, etc.

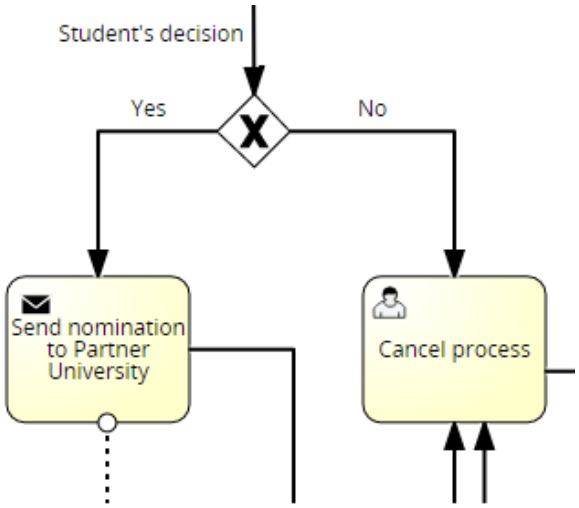


Figure 4.1. Student's outgoing application process – Student's nomination decision

After sending the nomination, IRO-FEB waits for the PU's decision (Figure 4.2). If the PU accepts it, the application procedure is sent.

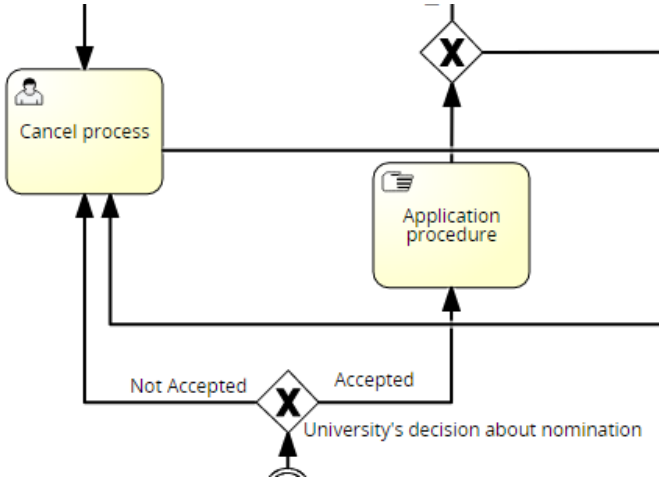


Figure 4.2. Student's outgoing application process – University's decision about student nomination

The IRO-FEB checks the application procedure (Figure 4.3) and verifies meticulously what is needed to do and who is required to do it (either if the IRO-FEB or the student), once this is not equal for all PUs.

In case the application has to be sent by the IRO-FEB, firstly one must acknowledge all the documents that are needed for student application and monitor the process until the end of the student's exchange programme. During the process, the IRO-FEB is required to ask for documentation from the students or the academic department.

On the other hand, if the application is to be submitted by the student, IRO-FEB has to send an e-mail with all steps needed, as well as the deadlines and requests the student to send an e-mail to the IRO-FEB informing that the application has been sent. This is a

critical phase of the process because the deadlines and procedures for submitting the application vary greatly from one university to another, and sometimes errors occur which can compromise the placement of the student.

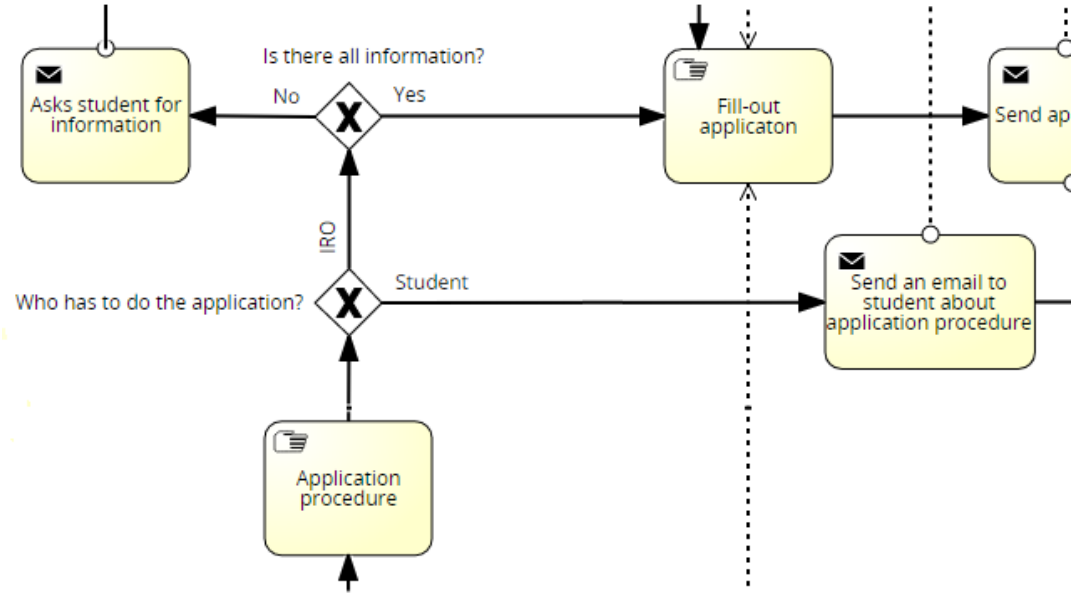


Figure 4.3. Student's outgoing application process – Application submission

After all the application steps are done, the application is sent, and the IRO-FEB registers the send date.

The PU should reply with an official confirmation of the student acceptance. In case of a negative answer, the process ends here. Otherwise, the PU asks the student to choose the courses and fill-out the Learning Agreement (LA) (see annex B). The LA is an official contract used in ERAMUS+ programme. As defined by the (European Commission, 2021) this document establishes the parameters in which the student will participate in the program and, hence; needs to be approved by the student beforehand. In the document it is defined the programme of the studies or the traineeship, the identification of both sending and receiving institutions, organisations or enterprises . Furthermore, it should comprise the learning goals which the participant is expected to attain throughout the exchange. In this case, the LA should be signed by the three parties, student, IRO-FEB and PU. Only when IRO-FEB has the LA with all signatures, is this process finished, and can the student go abroad.

There are three situations in which the process can be cancelled (Figure 4.4), if:

1. the student does not accept the nomination;
2. the PU does not accept the student nomination;
3. the PU does not accept the student application.

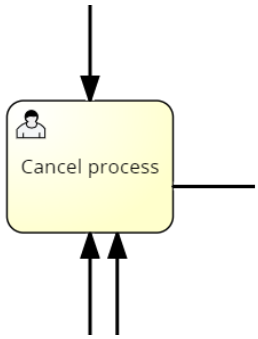


Figure 4.4 Student's outgoing application process – cancellation task

4.1.1 Monitoring of student's outgoing application process

To monitor the status of the student's outgoing application process, the IRO-FEB uses an Excel file where all the associated information is recorded (see Table 4.1). This Excel is filled-out with student data at the beginning of the process when the student is informed about the nomination by the IRO-FEB. When the student accepts the nomination, the IRO-FEB highlights the name of university in green colour and fills-out the information about semester dates and deadlines (no. 8, 10, 11 of Table 4.1). During the process, the IRO-FEB fills-out some notes and important information in "Notes/observations", the nomination day and finishes the application date fields.

Table 4.1. Current information in Excel file

No.	Information	Type of information
1	First name	Text
2	Surname/family name	Text
3	Level of studies (Bachelor/ master)	Text
4	Erasmus Code of Partner University (University 1/ 2/ 3)	Text
5	Mark	Number between 0-10
6	Name of colleague who wants to go together	Text
7	E-mail	Text
8	Dates of semester exchange	Date
9	Nomination day	Date
10	Deadline for nomination	Date
11	Deadline for application	Date
12	Link for online application (if applicable)	Text (link)
13	Students matricula number	Number
14	Student phone number	Number
15	Gender	Text
16	Date of birthday	Date
17	Notes/observations	Text
18	Finished application date	Date

This Excel file is also divided by sheet concerning the type of exchange: summer semester, winter semester and winter + summer (W+S) semester. It also has two more sheets, one with the PU (Partners) and another one with the cancellations (see Figure 4.5).

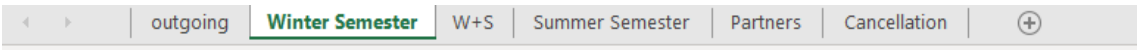
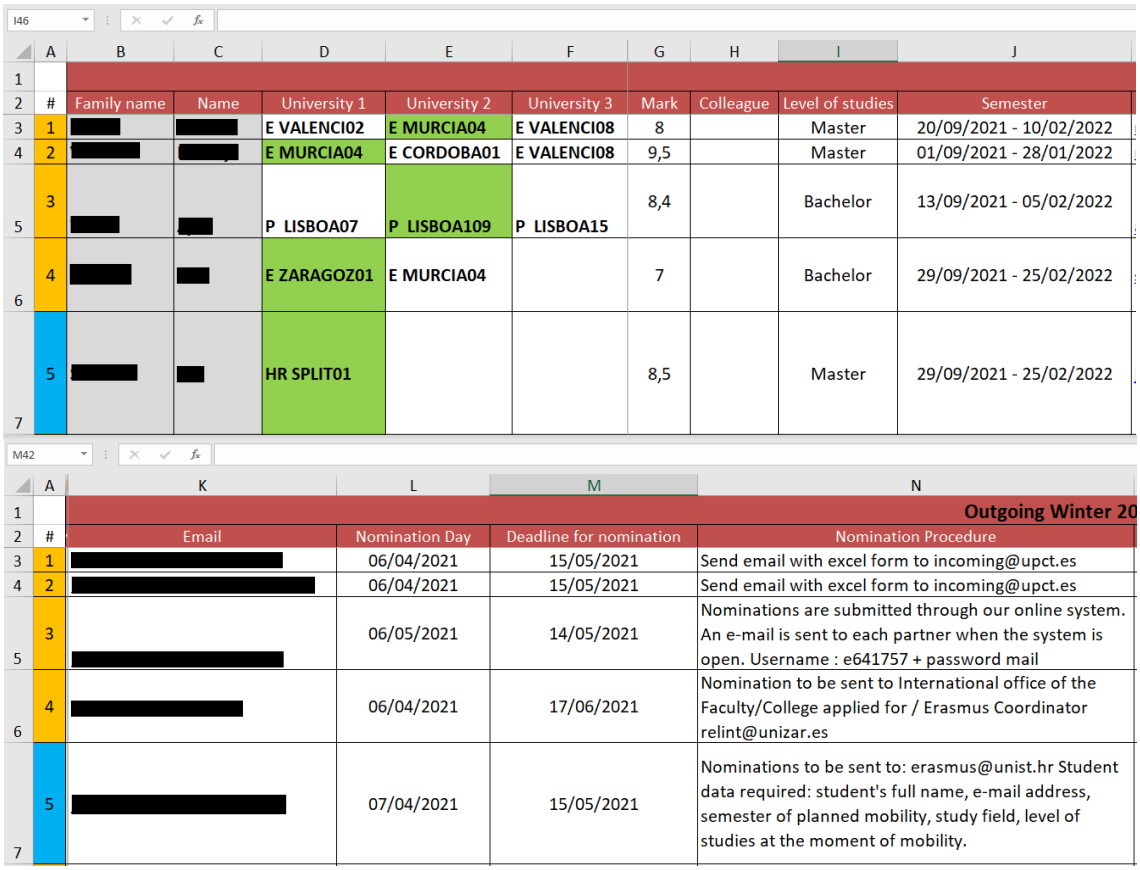


Figure 4.5. Names of Excel sheets

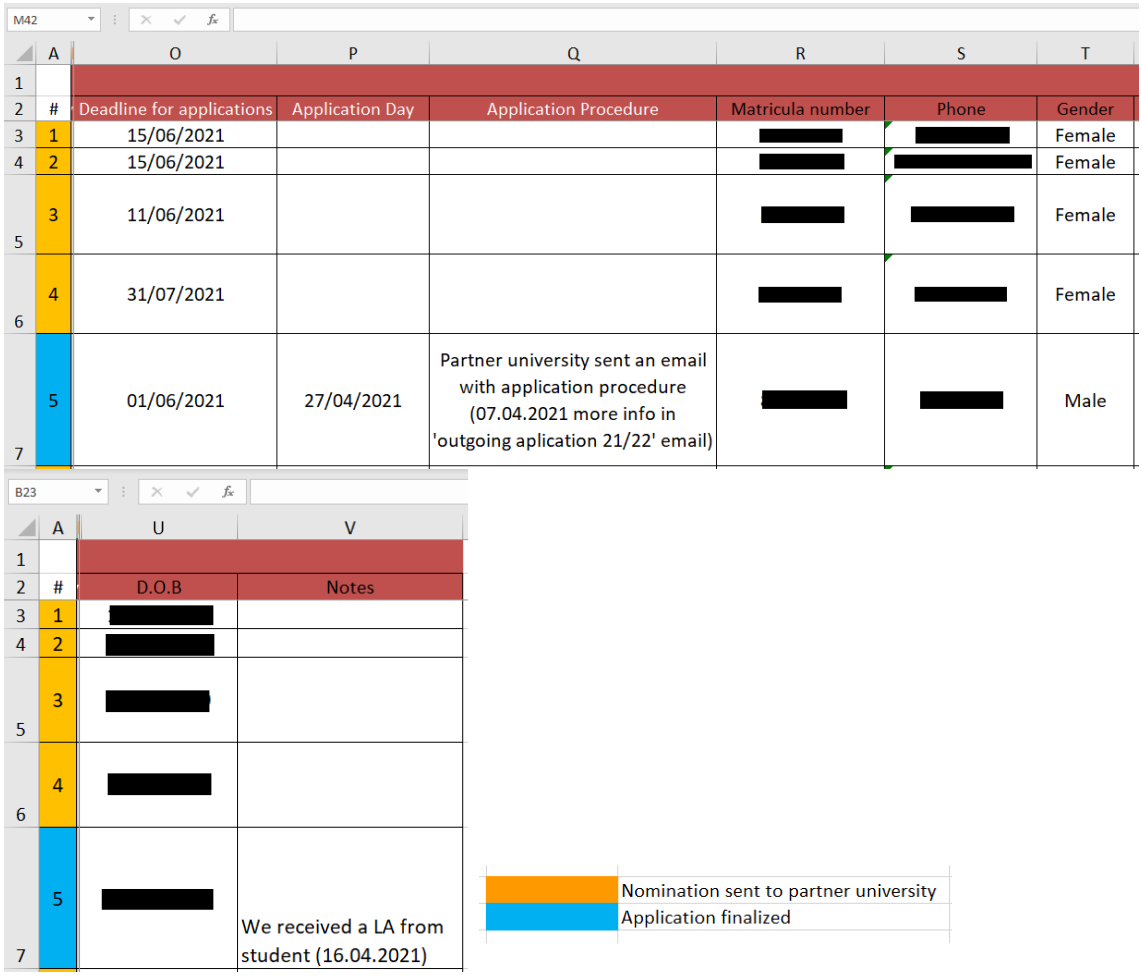
Figure 4.6 and Figure 4.7 show an extract of the Excel file used at IRO-FEB with the fields defined in Table 4.1 filled out for five Erasmus students. As it is possible to observe in the figures (Figure 4.6 and Figure 4.7) only student number five finished his application process.



#	Family name	Name	University 1	University 2	University 3	Mark	Colleague	Level of studies	Semester
1	[redacted]	[redacted]	E VALENCI02	E MURCIA04	E VALENCI08	8		Master	20/09/2021 - 10/02/2022
2	[redacted]	[redacted]	E MURCIA04	E CORDOBA01	E VALENCI08	9,5		Master	01/09/2021 - 28/01/2022
3	[redacted]	[redacted]	P LISBOA07	P LISBOA109	P LISBOA15	8,4		Bachelor	13/09/2021 - 05/02/2022
4	[redacted]	[redacted]	E ZARAGOZ01	E MURCIA04		7		Bachelor	29/09/2021 - 25/02/2022
5	[redacted]	[redacted]	HR SPLIT01			8,5		Master	29/09/2021 - 25/02/2022

#	Email	Nomination Day	Deadline for nomination	Nomination Procedure
1	[redacted]	06/04/2021	15/05/2021	Send email with excel form to incoming@upct.es
2	[redacted]	06/04/2021	15/05/2021	Send email with excel form to incoming@upct.es
3	[redacted]	06/05/2021	14/05/2021	Nominations are submitted through our online system. An e-mail is sent to each partner when the system is open. Username : e641757 + password mail
4	[redacted]	06/04/2021	17/06/2021	Nomination to be sent to International office of the Faculty/College applied for / Erasmus Coordinator relint@unizar.es
5	[redacted]	07/04/2021	15/05/2021	Nominations to be sent to: erasmus@unist.hr Student data required: student's full name, e-mail address, semester of planned mobility, study field, level of studies at the moment of mobility.

Figure 4.6. Excel file for current process monitorization



#	Deadline for applications	Application Day	Application Procedure	Matricula number	Phone	Gender
1	15/06/2021			[redacted]	[redacted]	Female
2	15/06/2021			[redacted]	[redacted]	Female
3	11/06/2021			[redacted]	[redacted]	Female
4	31/07/2021			[redacted]	[redacted]	Female
5	01/06/2021	27/04/2021	Partner university sent an email with application procedure (07.04.2021 more info in 'outgoing aplication 21/22' email)	[redacted]	[redacted]	Male

#	D.O.B	Notes
1	[redacted]	
2	[redacted]	
3	[redacted]	
4	[redacted]	
5	[redacted]	We received a LA from student (16.04.2021)

Nomination sent to partner university
Application finalized

Figure 4.7. Excel file for current process monitorization

The diagram in Figure 4.8 describes the current students' outgoing process application. A readable version of it is available in Appendix A.

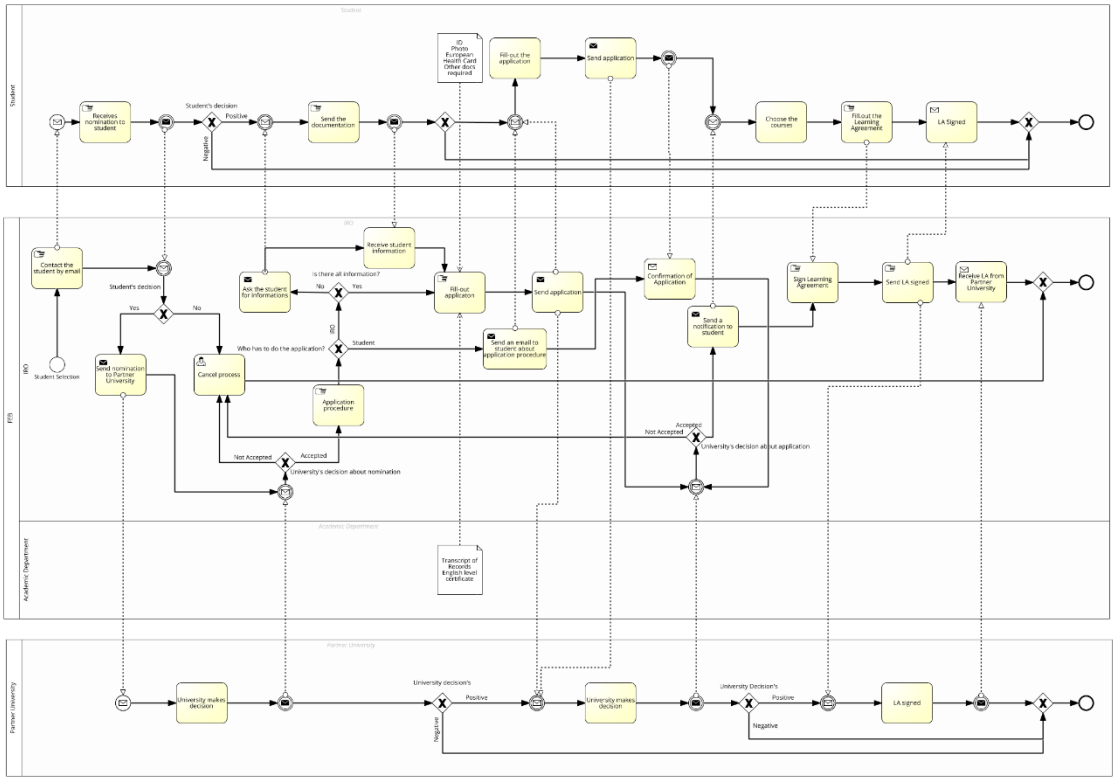


Figure 4.8. Students' outgoing application process diagram (as-is)

4.2 Improvement opportunities

After characterizing the process, we move to the second phase which is the analysis of the existing process to identify opportunities for improvement with the objective of improving the process and, consequently, its redesign. The following improvement types were identified:

1) to eliminate tasks performed manually;
2) to record all tasks performed;
3) to define in the tasks information collection points that will feed the process Key Performance Indicators (KPIs) defined in the next section (4.3).

For the first improvement opportunity, the manual tasks to be eliminated are:

- contact the student by e-mail;
- university's decision about nomination;
- receive student's information;
- send an e-mail to the student about application procedure(s);

- confirmation of application;
- university's decision about application;
- receive the LA from partner university.

For these tasks, the IRO-FEB usually needs to send e-mails, print files and documents, and then take some notes and put them in specific folders, as explained in the previous chapter. So, regarding the second opportunity for improvement, the new system to be implemented will register all the information about the process, which starts right when the application form is filled out. All this information is registered and can be accessed at any time for monitoring and control purposes. Another important aspect regarding the monitorization and control of the process is the recording of the information about the people involved in the process, i.e., with the new system it will be possible to know which users interacted with the process, what they did and when, thus avoiding the loss of relevant information about the process, which is something which currently occurs.

Finally, regarding the third improvement opportunity, the tasks will contain information collection points which will feed the KPIs, as is the case of the task "Cancel Process" which will allow feeding, for instance, the KPI "percentage of cancelled processes". In the section regarding process redesign (section 4.4) all the information collection points are identified in the tasks.

4.3 Key Performance Indicators

USAID's Center for Development Information and Evaluation (1996, p.1) states that *"performance indicators (...) define the data to be collected to measure progress and enable actual results achieved over time to be compared to be compared with planned results."* Performance indicators are operational units of analysis, ways of discretely in the performance of the institution.

As explained in the literature review (section 2.2), the KPIs are a way to measure and follow a strategy or goal in an organisation. Thus, given that KPIs are important and crucial to the success of the current business process, their definition and information gathering needs should be taken into account from the beginning of the process redesign phase. According to (Wang & He, 2012), "*This should be attributed to two striking features of KPI: 1) KPI emphasizes on the performance indicators that must be configured with the organizational development strategy; 2) KPI concerns the problems*

which the organization is most in need of attention and urgent to resolve in specific period."

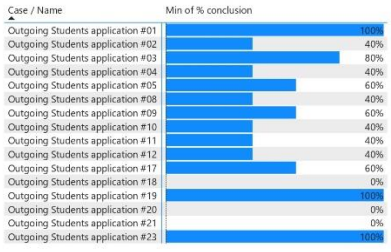
The KPIs are also crucial for the monitoring and control of the process. Therefore, it is necessary to include them in the redesign of the process. As M. Weske (2007, p.46) mentions, "*each business process contributes to one or more business goals. To gain information on how efficient the business processes are actually conducted and whether the business goals are actually met by the business processes, controlling activities are conducted. Key performance indicators of business processes are determined, for instance technical indicators, such as average response time and throughput, but also domain-specific aspects, such as, for instance, reduction of error rate, and cost savings.*"

These KPI's were defined in an operational perspective to control and monitor the process of outgoing student's application. The analysis of the KPIs gives us an overview of the outgoing students' application process, allowing us to identify its strengths and weaknesses, which in turn may be used to improve the results of the process and consequently of the IRO-FEB. The outgoing student's application has fourteen KPIs, which are presented in tables according to indicator model file by Caldeira, 2012. Each KPI was defined for a specific function and to be monitored and controlled by a specific person or department.

The first KPI (Table 4.2) shows the percentage of state of application for each student and it can help establish the number of steps required to finish the application. This KPI could be monitored by the head of the IRO-FEB, if needed, but it is more useful for employees/trainees inside the IRO-FEB who are in direct contact with the applications.

This KPI is a KPI related to each case (instance of the process) in execution, that is, to each student application process, so it is not really a KPI in the sense of controlling the process itself but rather of each specific case.

Table 4.2 KPI no.1 – State of the application

KPI no.1	**State of a specific application**
What is it for?	This indicator shows the percentage (%) of execution of the student's application in order to understand if the application is at the beginning, in the middle or finalised. If the value is 100% it means that the application process is finalised, and that the student has everything necessary to go abroad.
How is it calculated?	This indicator does not require a formula for calculation because the percentages of the progress of the application process are assigned as the application passes through the different activities. In the cell below it is possible to see the percentages associated with the different steps. Unit %
How to get the information?	Step 1: 20% – Task "Send the nomination to partner university" Step 2: 40% – Task "Application procedure" Step 3: 60% – Task "Application submitted" Step 4: 80% – Task "Sign LA" Step 5: 100% – Task "Upload the final documents"
When should do it?	Daily/weekly
What is the polarity?	Positive (The higher the value, the better)
Additional notes	--
Visualization	

The next four KPI's (Table 4.3, Table 4.4, Table 4.5 and Table 4.6) are about the status of all applications. They allow us to know the percentage of applications that are in a certain state (the states are the same as in KPI nº1), permitting us to have an holistic view of the state of all applications. These KPI's are monitored by the head of the IRO-FEB.

Table 4.3 KPI no.2 – Percentage of applications in step 1

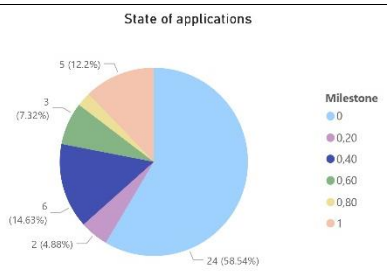
KPI no.2	**Percentage of applications in step 1**
What is it for?	This indicator identifies the percentage (%) of all applications in step 1 which task is "Send the nomination to partner university".
How is it calculated?	$Percentage\ of\ applications\ in\ step\ 1\ = \frac{number\ of\ applications\ in\ step\ 1}{number\ of\ total\ applications} \times 100$ Unit %
How to get the information?	Step 1 from state of application
When should do it?	Daily/Weekly
What is the polarity?	Positive (The higher the value, the better)
Additional notes	--
Visualization	

Table 4.4 KPI no.3 – Percentage of applications in step 2

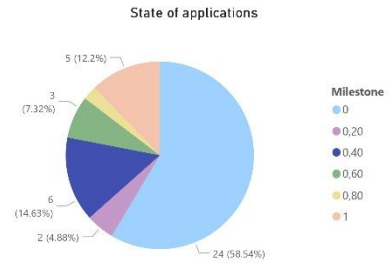
KPI no.3	**Percentage of applications in step 2**
What is it for?	This indicator identifies the percentage (%) of all applications in step 2 which task is "Application procedure"
How is it calculated?	$Percentage\ of\ applications\ in\ step\ 2 = \frac{number\ of\ applications\ in\ step\ 2}{number\ of\ total\ applications} \times 100$ Unit %
How to get the information?	Step 2 from state of application
When should do it?	Daily/Weekly
What is the polarity?	Positive (The higher the value, the better)
Additional notes	--
Visualization	

Table 4.5 KPI no.4 – Percentage of application in step 3

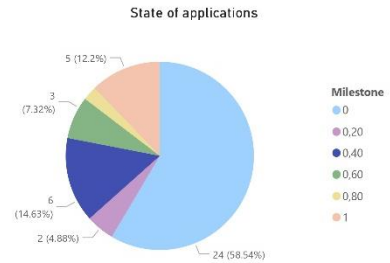
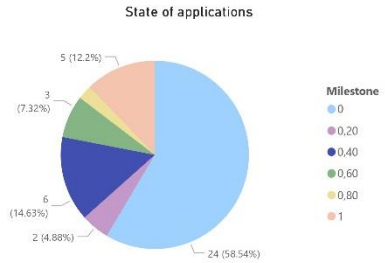
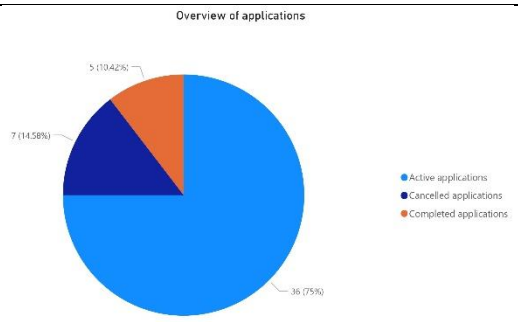
KPI no.4	**Percentage of applications in step 3**
What is it for?	This indicator identifies the percentage (%) of all applications in step 3 which task is "Application submitted".
How is it calculated?	$Percentage\ of\ applications\ in\ step\ 3 = \frac{number\ of\ applications\ in\ step\ 3}{number\ of\ total\ applications} \times 100$ Unit %
How to get the information?	Step 3 from state of application
When should do it?	Daily/Weekly
What is the polarity?	Positive (The higher the value, the better)
Additional notes	--
Visualization	

Table 4.6 KPI no.5 – Percentage of application in step 4

KPI no.5	**Percentage of applications in step 4**
What is it for?	This indicator identifies the percentage (%) of all applications in step 4 which task is "Sign LA".
How is it calculated?	$Percentage\ of\ applications\ in\ step\ 4 = \frac{number\ of\ applications\ in\ step\ 4}{number\ of\ total\ applications} \times 100$ Unit %
How to get the information?	Step 4 from state of application
When should do it?	Daily/Weekly
What is the polarity?	Positive (The higher the value, the better)
Additional notes	--
Visualization	

The KPI no.6 (Table 4.7) indicates the number of active applications to date, i.e., the number of applications that have been started and not yet completed. This KPI shall be monitored by the head of the IRO-FEB.

Table 4.7. KPI no.6 – Percentage of active applications

KPI no.6	**Percentage of active applications**
What is it for?	This indicator shows the percentage of total applications which are not yet complete, i.e., the percentage of applications where the state of application is less than 100%
How is it calculated?	$Percentage\ of\ active\ applications = \frac{sum\ (state\ of\ application\ in\ step\ 1,2,3\ and\ 4)}{number\ of\ total\ of\ application} \times 100$ Unit: %
How to get the information?	Signavio Workflow Accelerator - Milestone
When should do it?	Daily/Weekly
What is the polarity?	Negative (The lower the value, the better)
Additional notes	--
Visualization	

KPIs no.7 and no.8 concern the number of completed applications. KPI no.7 is in percentage and KPI no.8 is in number. They are controlled by the head of IRO-FEB.

Table 4.8. KPI no.7 – Percentage of completed applications

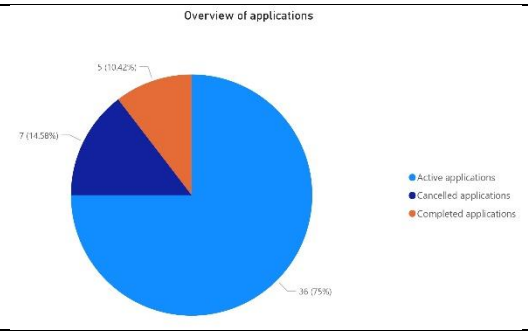
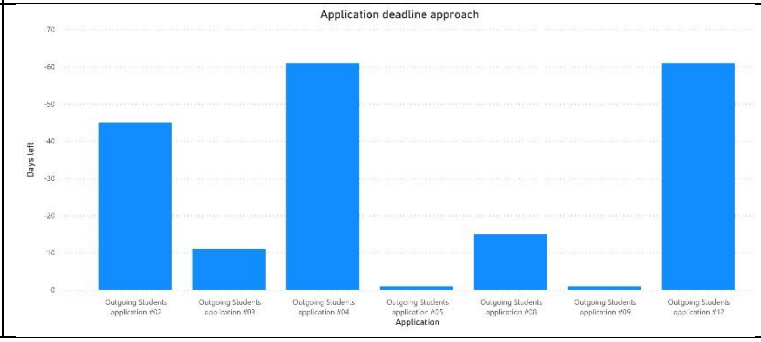
KPI no.7	**Percentage of completed applications**
What is it for?	This indicator shows the percentage of completed applications, i.e., when the stage of application is 100% (after the execution of task "Upload the final documents").
How is it calculated?	$$Percentage\ of\ completed\ applications = \frac{number\ of\ completed\ applications}{number\ of\ total\ applications} \times 100$$ Unit: %
How to get the information?	Signavio Workflow Accelerator - Milestone
When should do it?	Daily/Weekly
What is the polarity?	Positive (The higher the value, the better)
Additional notes	--
Visualization	

Table 4.9. KPI no.8 – Number of completed applications

KPI no.8	**Number of completed applications**
What is it for?	This KPI shows the number of completed applications, i.e., the number of applications where the state is 100%, (after the execution of task "Upload the final documents").
How is it calculated?	$$Number\ of\ completed\ applications = number\ of\ completed\ applications\ (with\ step\ 5)$$ Unit: number
How to get the information?	Signavio Workflow Accelerator - Milestone
When should do it?	Daily/Weekly
What is the polarity?	Depends on indicator
Additional notes	--
Visualization	--

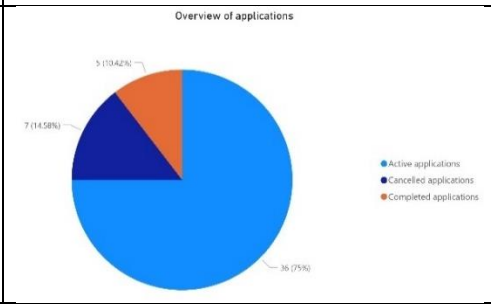
The KPI no.9 shows the number of days left for the application's deadline. This indicator is controlled by the person who works daily with outgoing applications in IRO-FEB, since it helps to prioritize everyday tasks. This KPI, similarly to KPI no. 1, is a KPI relating to each instance of the process (case) and not the process itself.

Table 4.10. KPI no.9 – Deadline approach for each application

KPI no.9	**Deadline approach for each application**
What is it for?	This indicator shows the number of days left to deadline.
How is it calculated?	$Number\ of\ days\ left\ to\ deadline\ = current\ date - deadline\ date$ Unit: number
How to get the information?	--
When should do it?	Daily
What is the polarity?	Positive (The higher the value, the better)
Additional notes	--
Visualization	

The KPI no.10 presents the percentage of total cancelled applications. This indicator should be controlled by the head of IRO-FEB.

Table 4.11. KPI no.10 – Percentage of cancelled application

KPI no.10	**Percentage of cancelled applications**
What is it for?	This indicator identifies the percentage (%) of cancelled applications. If KPI is 0% it means all students accepted the nomination and the PU also accepted their nomination and application.
How is it calculated?	$Percentage\ of\ cancelled\ application = \frac{number\ of\ cancelled\ applications}{number\ of\ total\ applications} \times 100$ Unit %
How to get the information?	Signavio Workflow Accelerator - Milestone
When should do it?	Daily/Weekly
What is the polarity?	Negative (The lower value, is the better)
Additional notes	--
Visualization	

The last three KPI (Table 4.12, Table 4.13 and Table 4.14) can show us the reason of the cancellation of the application. It can help the IRO-FEB to understand the percentage of cancellation and also to design a new strategy to decrease these number if they are too high.

Table 4.12. KPI no.11 – Percentage of cancelled application by student

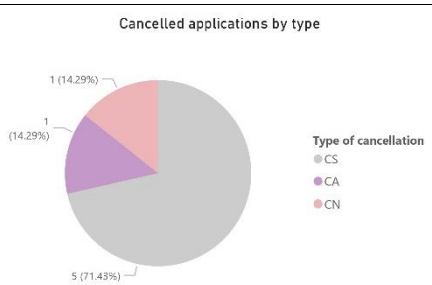
KPI no.11	**Percentage of cancelled applications by student**
What is it for?	This indicator identifies the percentage (%) of cancelled applications by type. It can show reason of the cancellation, in this case, the reason is the student did not accept the nomination.
How is it calculated?	$$Percentage\ of\ cancelled\ applications\ by\ student = \frac{number\ of\ applications\ cancelled\ by\ student}{number\ of\ total\ applications\ cancelled} \times 100$$ Unit %
How to get the information?	Signavio Workflow Accelerator - Milestone
When should do it?	Daily/ weekly
What is the polarity?	Negative (The lower value, is the better)
Additional notes	--
Visualization	

Table 4.13 KPI no.12 – Percentage of cancelled application by PU in nomination

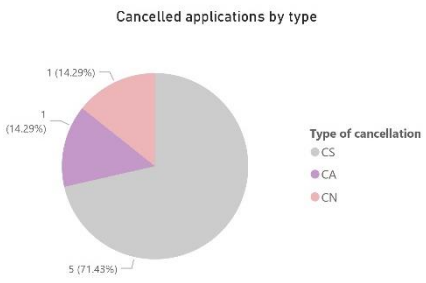
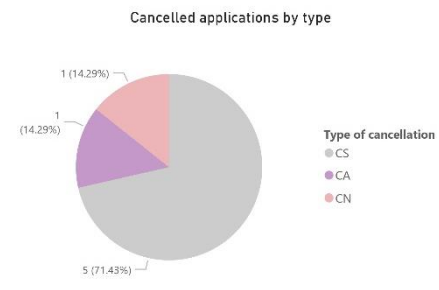
KPI no.12	**Percentage of cancelled application by PU in nomination**
What is it for?	This indicator identifies the percentage (%) of cancelled applications by type. It can show reason of the cancellation, in this case the reason is the PU did not accept the student nomination.
How is it calculated?	$$Percentage\ of\ cancelled\ applications\ by\ PU\ in\ nomination = \frac{number\ of\ applications\ cancelled\ by\ PU\ in\ nomination}{number\ of\ total\ applications\ cancelled} \times 100$$ Unit %
How to get the information?	Signavio Workflow Accelerator - Milestone
When should do it?	Daily/ weekly
What is the polarity?	Negative (The lower value, is the better)
Additional notes	--
Visualization	

Table 4.14. KPI no. 13 – Percentage of cancelled application by PU in application

KPI no.13	**Percentage of cancelled application by PU in application**
What is it for?	This indicator identifies the percentage (%) of cancelled applications by type. It can show reason of the cancellation, in this case the reason is the PU did not accept the student application.
How is it calculated?	$Percentage\ of\ cancelled\ applications\ by\ PU\ in\ application = \frac{number\ of\ applications\ cancelled\ by\ PU\ in\ application}{number\ of\ total\ applications\ cancelled} \times 100$ Unit %
How to get the information?	Signavio Workflow Accelerator - Milestone
When should do it?	Daily/ weekly
What is the polarity?	Negative (The lower value, is the better)
Additional notes	--
Visualization	

The KPI no.14 presents the number of total applications. This indicator should be controlled by the head of IRO-FEB.

Table 4.15. KPI no.14 – Number of total applications

KPI no.15	**Number of total applications**
What is it for?	This indicator shows the number of total applications.
How is it calculated?	$Number\ of\ total\ applications$ Unit: number
How to get the information?	Signavio Workflow Accelerator
When should do it?	Daily/ weekly
What is the polarity?	--
Additional notes	--
Visualization	--

4.3.1 KPI goals

When talking about KPI, one must obviously mention its goals. However, in this project, the management tool was developed for the first time, therefore not having enough results to draw the goals. Despite that, this KPI's can feed others KPI's about the strategy of IRO-FEB, IRO (main office) or FEB.

4.4 Process redesign

After process analysis with the characterization of students' outgoing application process, identification of improvement opportunities, and definition of KPIs, we have all the necessary information to redesign the existing process.

The first step is to eliminate the task "contact with student by e-mail" and start directly in the system by filling-out the form. This has been one of the weak points of the current process because it is easy to lose the information or contact with the student. So, when the student is selected, the IRO-FEB can introduce the information in the system, which will then automatically send a message to the student.

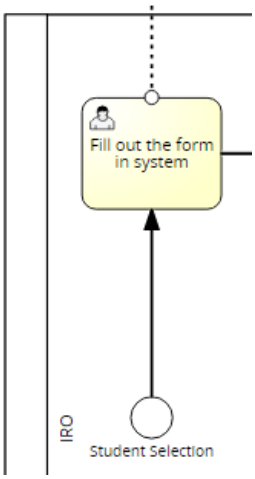


Figure 4.9. Students' outgoing application process redesign – Filling-out the form in system

In the redesign of the process the student submits the decision of acceptance or refusal of the nomination through the system and, this way, the answer is automatically registered, avoiding the loss of information. The IRO-FEB is notified by the system of the student's decision. If the student accepts the appointment, the following task to be performed by the IRO-FEB in the system is "Send the nomination to the partner university". Otherwise, the "Cancel Process" task is executed and the process finishes. In both cases it is necessary to collect information to feed the KPIs by registering that the case as gone through these tasks.

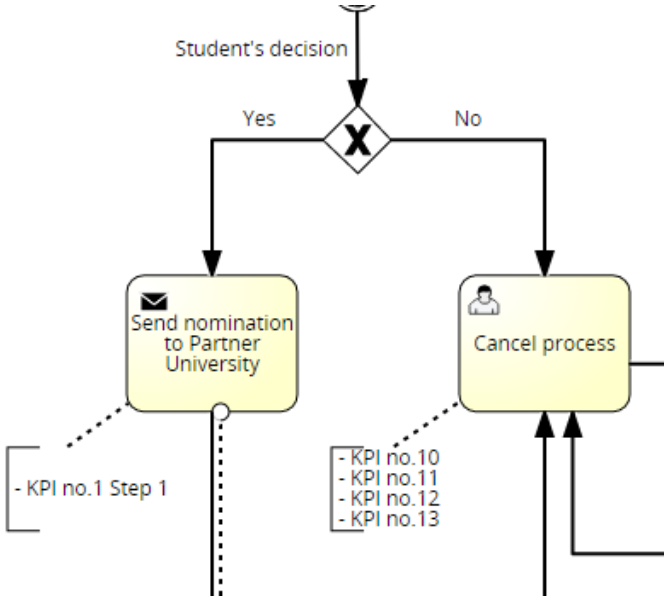


Figure 4.10. Outgoing students' application process redesign – KPIs after student's decision

When the PU accepts the student's nomination, it sends an application procedure. Here there is another step to feed KPI no.1 (see Figure 4.11).

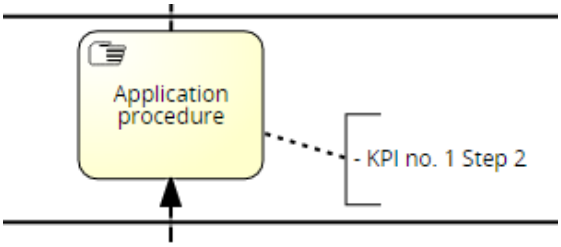


Figure 4.11. Student's outgoing application redesign – KPI in Application procedure

When the application is sent to the PU, the system is updated, and a notification is sent to the student/IRO-FEB, depending on who filled-out the application. If the application was filled-out by student, the system will notify the IRO-FEB. If the application was filled-out by IRO-FEB, the system will notify the student. Here the information is collected to feed the KPI no. 1 (state of application) and KPI no. 4 (percentage of applications in step 4), as it possible to see in Figure 4.12.

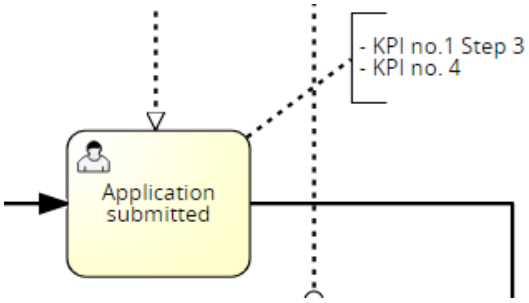


Figure 4.12. Students' outgoing application process redesign – KPIs in confirmation of application

The last change in the process status is in the task "Received LA from the Partner University". After the completion of this task, the process is considered finished, and its execution status becomes 100%. In this activity the IRO-FEB besides receiving the LA from the PU confirms its reception in the system, so this task in particular is a user task and not only a receive message task (see Figure 4.13).

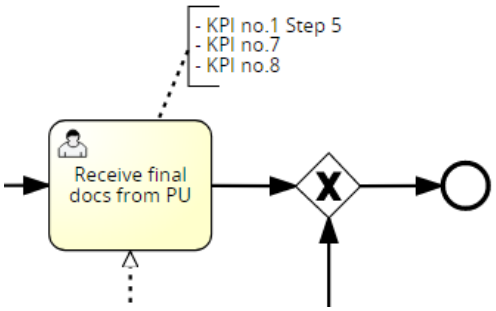


Figure 4.13. Students' outgoing application process redesign – Received LA from Partner University

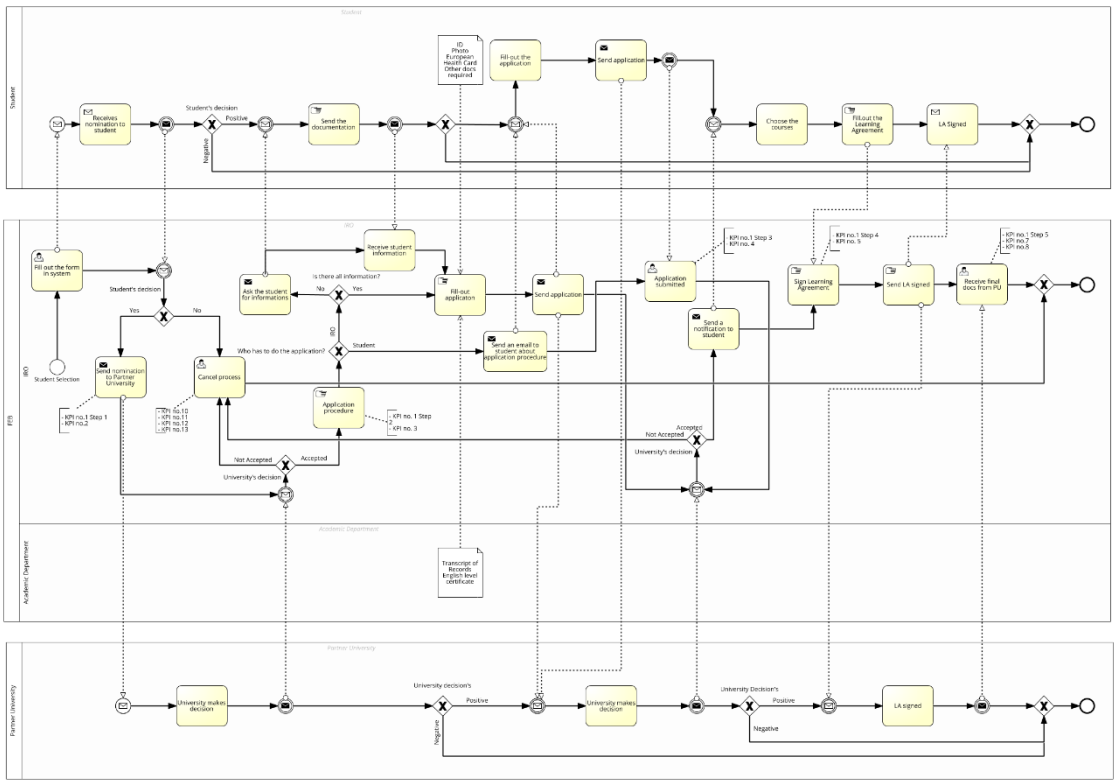


Figure 4.14. Students' outgoing application process redesign (to-be) diagram

The diagram in Figure 4.14 describes the current student's outgoing process application. A readable version of it is available in Appendix B. Student's outgoing application process TO-BE diagram.

5 PROCESS IMPLEMENTATION

This chapter presents the prototype of the implementation of the to-be process of the "outgoing student's application" in a Business Process Management Studio (BPMS), the next step, in the BPM life cycle (Trigo & Belfo, 2013), to the process redesign presented in the previous chapter.

According to Weske (2007), *"the implementation provides a representation of the operational business process in the specification language provided by the selected platform. The activities in the operational business process are mapped to activities at the workflow level. Execution constraints are represented to facilitate fulfilling the requirements introduced by the business process."*

5.1 Signavio Workflow Accelerator

The *Signavio Workflow Accelerator* (SWA) is a web-based workflow modelling and execution platform. In SWA Documentation (2021) the main benefits are: "*control where you need it; flexibility; fewer delays (with automatic triggers, actions and timers)*; *no more miscommunications during handovers*; *traceability – data on who did what*; *clarity – visibility of who has to do what*; *agility – because you can change Workflow Accelerator process models more easily than custom software".*

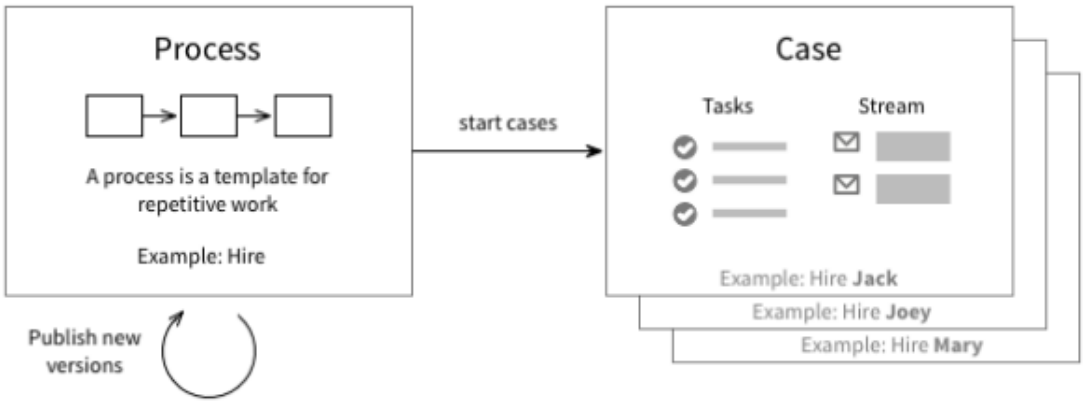


Figure 5.1. How SWA works

Source: Signavio Documentation (2021)

To implement a process in SWA it is necessary to first model the process with all its activities and permissions, in the process creation and design area, and then publish it. Once published, the process moves to the executable state, being initiated each time a new execution of the process is made (case), which in this specific case corresponds to a

new student's outgoing application process. In this state and according to the progress of the process, the different participants in it will receive notifications to perform the activities/tasks assigned to them.

5.2 Redesign process implementation

As explained in section 4.4, after the student's selection, the process starts with a form submitted by IRO-FEB, with the student's personal data and exchange process data (see Figure 5.3). Then the system sends a notification to the student and waits for the student's confirmation (see Figure 5.2).

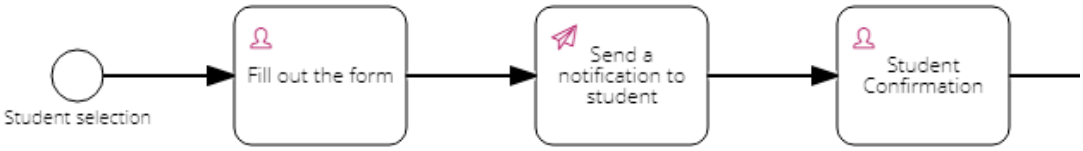


Figure 5.2. Redesign process Implementation – the opening process

Figure 5.3 presents the student's selection form, which is filled out in the task "Fill out the form".

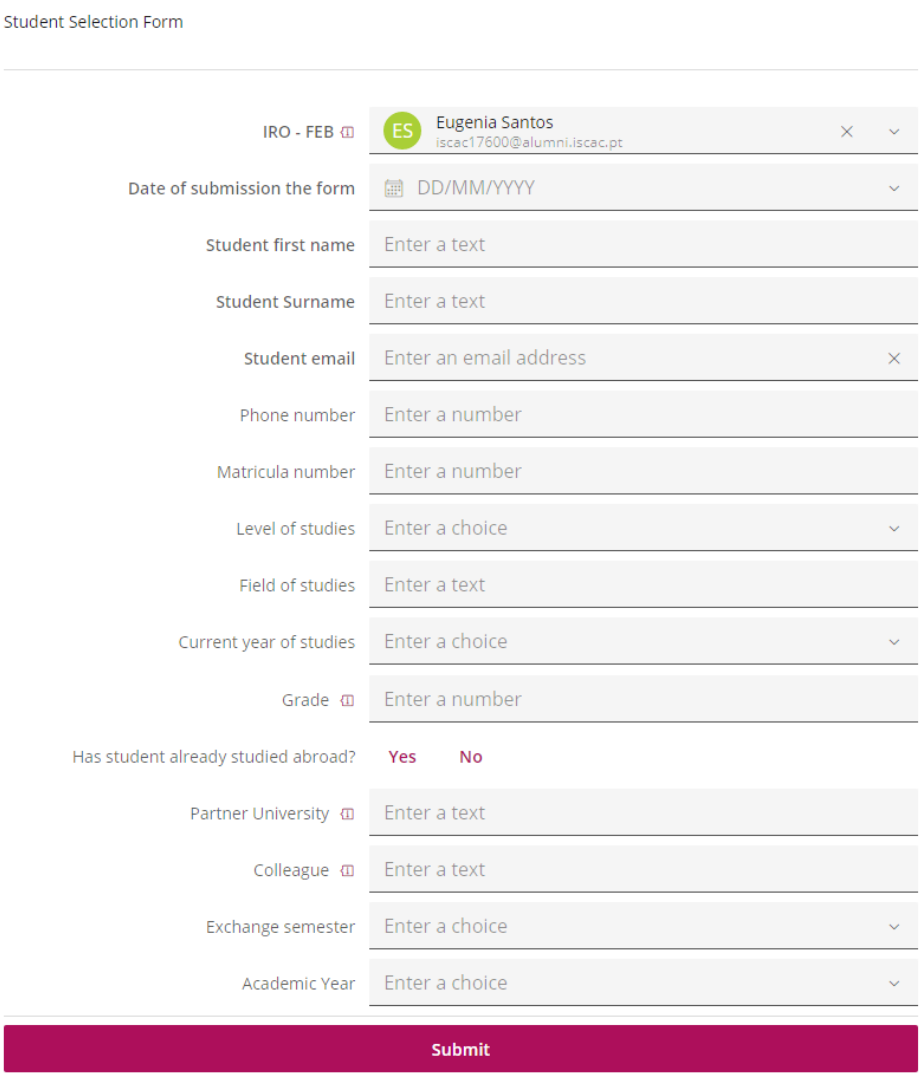


Figure 5.3. Redesign process implementation – Student Selection Form

After the submission of the student's selection form, the system sends an automatic e-mail to student. The e-mail is sent with the name and exchange data of the student personalized as it is possible to verify in Figure 5.4.

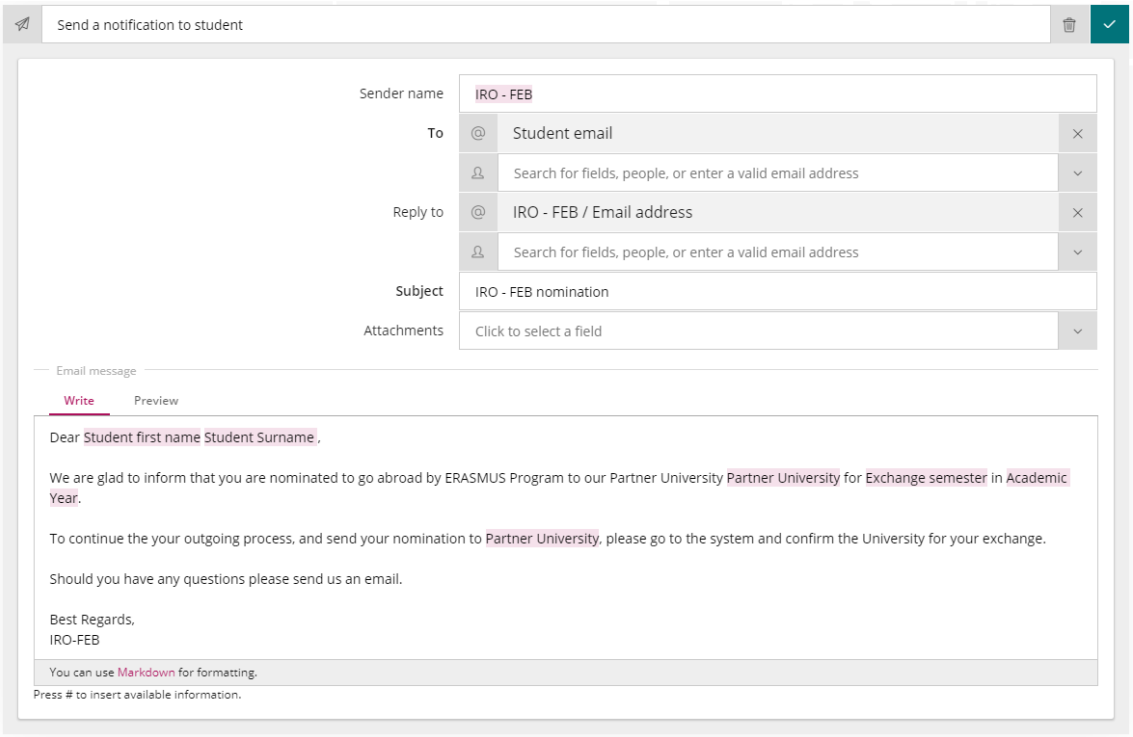


Figure 5.4. Redesign process implementation – Send notification to student

After receiving the e-mail, the student needs to go to the platform/system to fill out a form to validate the decision about Outgoing Process (see Figure 5.5 and Figure 5.6).

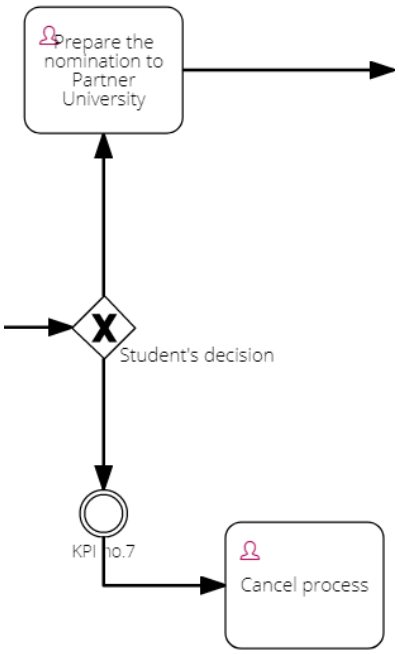


Figure 5.5. Redesign process implementation – Workflow of Student's decision

In the form, the student will be presented with the same personalised form received via e-mail with the description of the exchange programme.

On this form, if the student accepts the nomination, additional fields will appear to fill in with the student's personal details (see Figure 5.6 Figure 5.6). Otherwise, the process ends here.

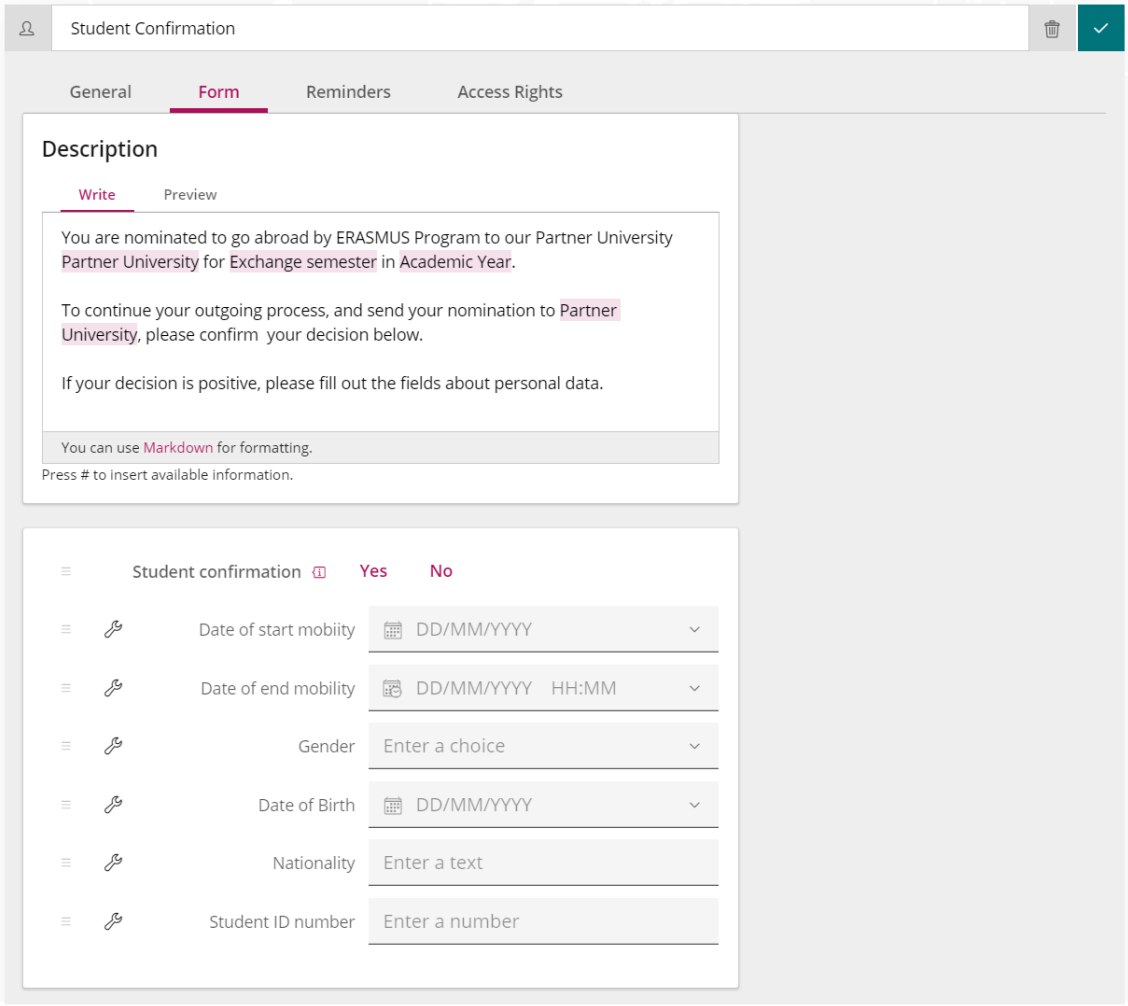


Figure 5.6. Redesign process implementation – Student confirmation

The remaining steps of the process are based on similar activities, such as sending notifications or filling in forms. Figure 5.7 shows the diagram of the process implementation in BPMS. A readable version of it is available in two parts in Appendix C.

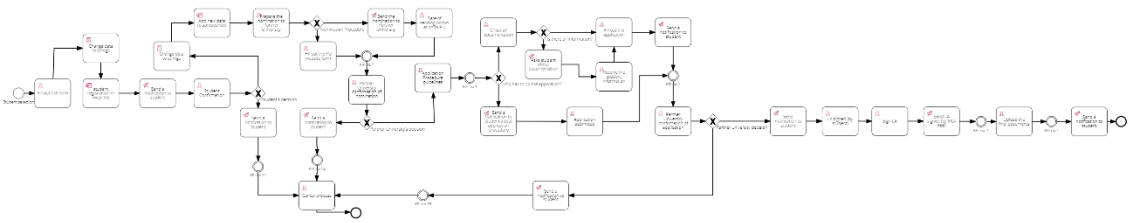


Figure 5.7. Redesign process implementation diagram

5.2.1 Limitations on implementation

The SWA has a component to work directly with Google Drive spreadsheet. During the project development, in process implementation there was opportunity to use it. The Google Drive spreadsheet can be filled directly with the data submiteed in form fields (see task "student registration in excel file" in Figure 5.8). This is important because it is easier to integrate Google Drive spreadsheet with Power BI than SWA where information must be manually exported to an Excel file. So, the tasks in workflow were created but there were two problems. First, the Google Drive spreadsheet can only receive data from text fields, no other type of data can be written in spreadsheet. To solve this problem it was added another task (see task "Change data to strings" in Figure 5.8), JavaScript, only to converter all "no text" fields such as dates, numbers, and options to text fields. The second problem is that SWA writes one line per form in the Google Drive spreadsheet, which means that when you need to fill more than one form for the same case SWA writes the information in another row. The information becomes disorganized, making it difficult to further use in Power BI.

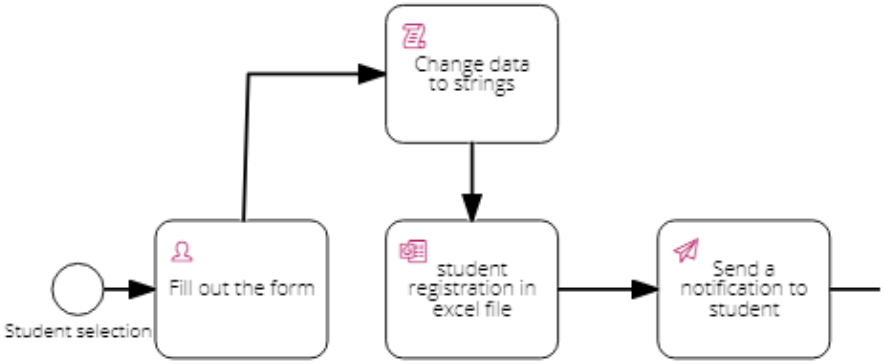


Figure 5.8. Implementation Process Workflow - limitation of Google Drive spreadsheet

5.3 Exemplifying the execution of the implemented process

This section presents two examples of the execution of the implemented process for a better understanding of it. In the first example the process is started but is cancelled by the student. In the second example, the process goes through all the steps defined until the student is placed in the PU.

5.3.1 The case where the student did not accept the nomination

This case starts by the filling of the initial form (see Figure 5.3) after which an e-mail is sent to the student (see Figure 5.8).

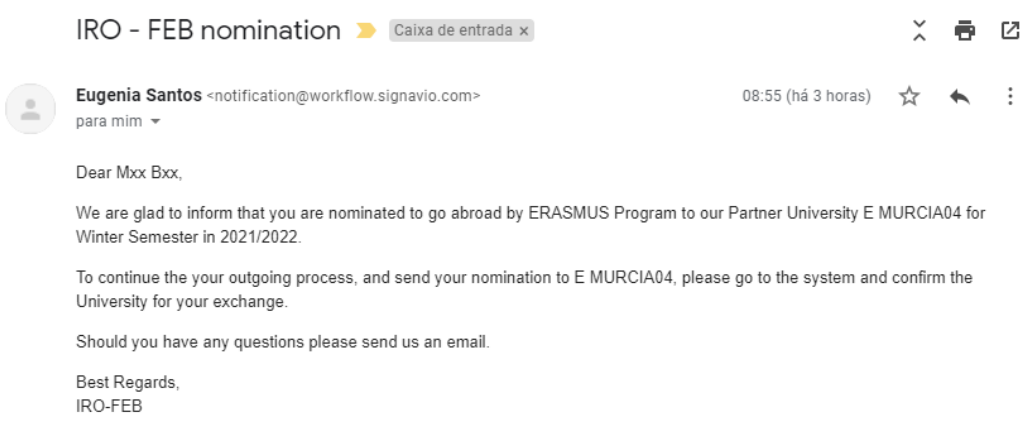


Figure 5.9. Student nomination e-mail – example

Then the student has to login in the system and confirm the nomination. In this case the student declined the nomination by answering "No" (see Figure 5.9).

After the student's answer the IRO-FEB must acknowledge the cancellation (see Figure 5.10). In this activity, the system (BPMS) registers the information of this cancellation, information that will feed KPI no. 11. Afterwards, the student is notified by e-mail about the confirmation of the cancelled outgoing application (see Figure 5.11).

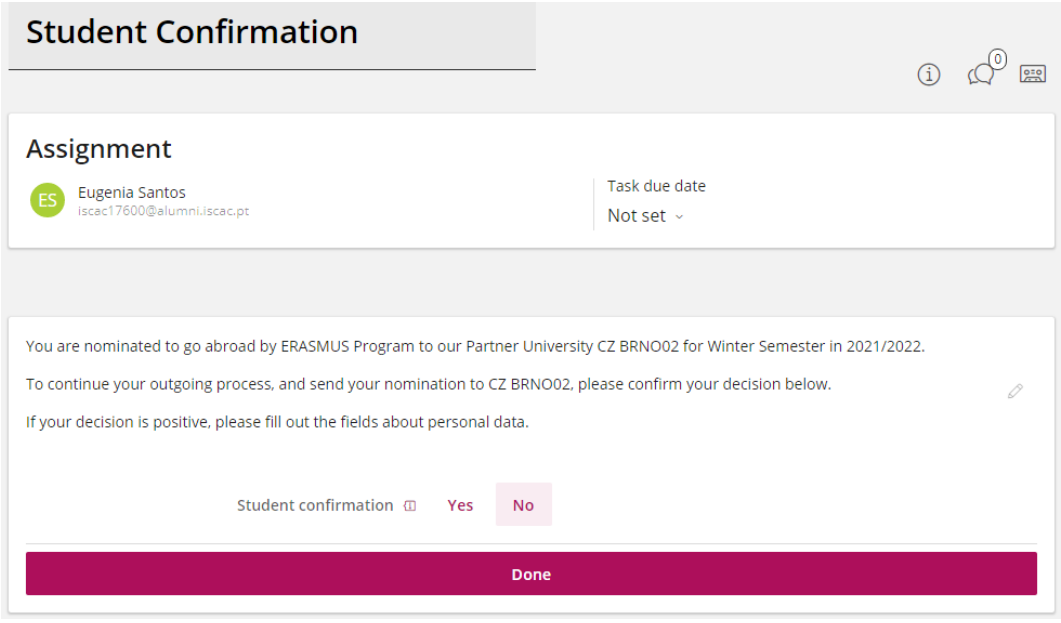


Figure 5.10. Student confirmation of nomination – No answer

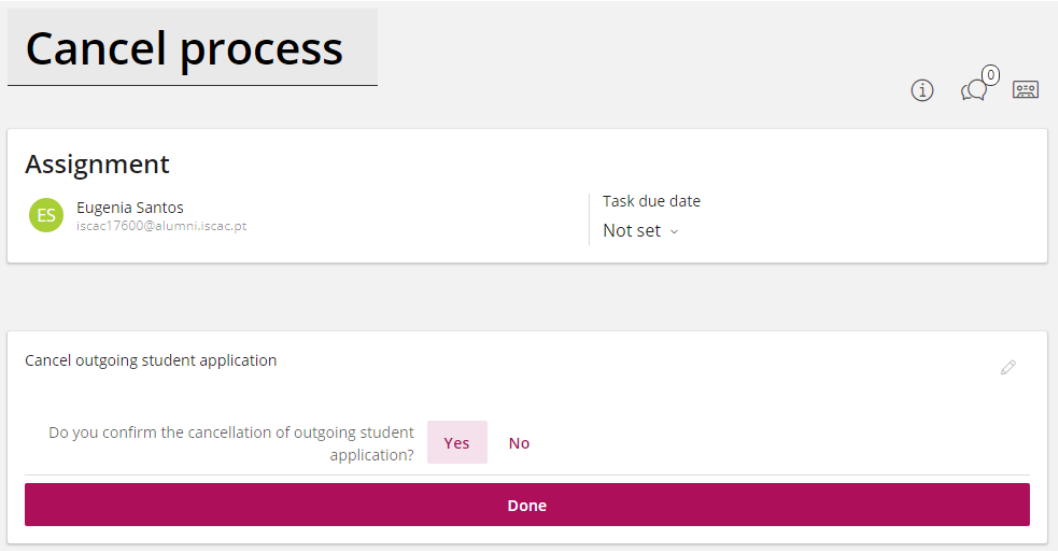


Figure 5.11. Cancel process – IRO-FEB acknowledgment

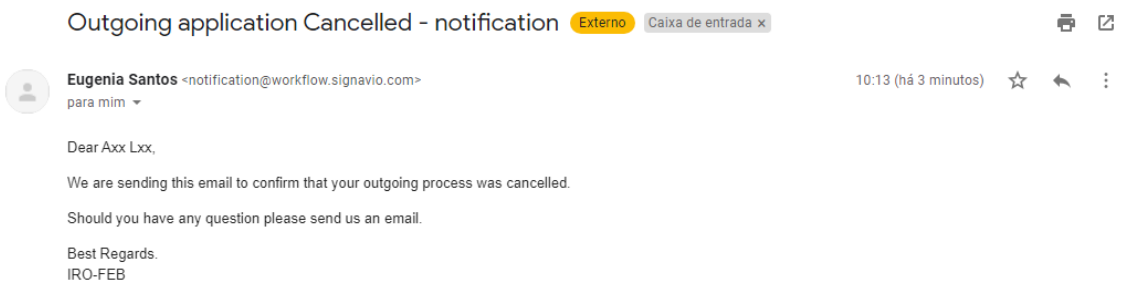


Figure 5.12. Cancel process – Student notification by e-mail

5.3.2 The case where the application finalizes

This case starts, as in the previous example, by filling out the initial form (see Figure 5.3) after which an e-mail is sent to the student (see Figure 5.8). Unlike the previous one, in this case, the student accepts the nomination. After accepting the nomination, the student is required to fill out additional fields about personal data (see Figure 5.11).

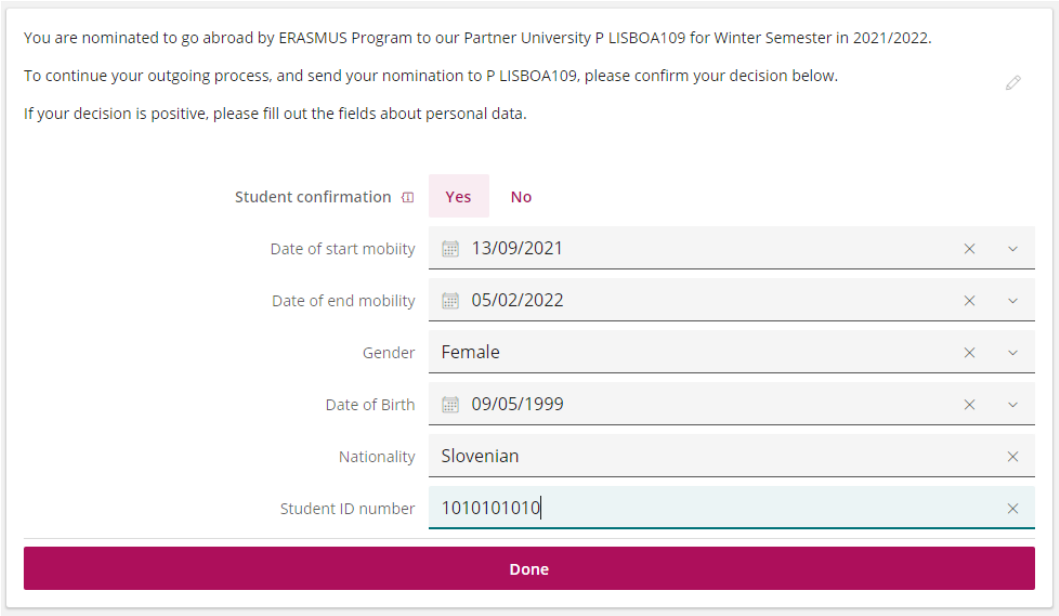


Figure 5.13. Student nomination – Yes answer

The IRO-FEB receives the confirmation and more data from the student and verifies the nomination procedure for the PU (in this case is P LISBOA109). There are two type of nomination procedures: sending an e-mail to the PU or filling-out a form in the PU website (see Figure 5.13).

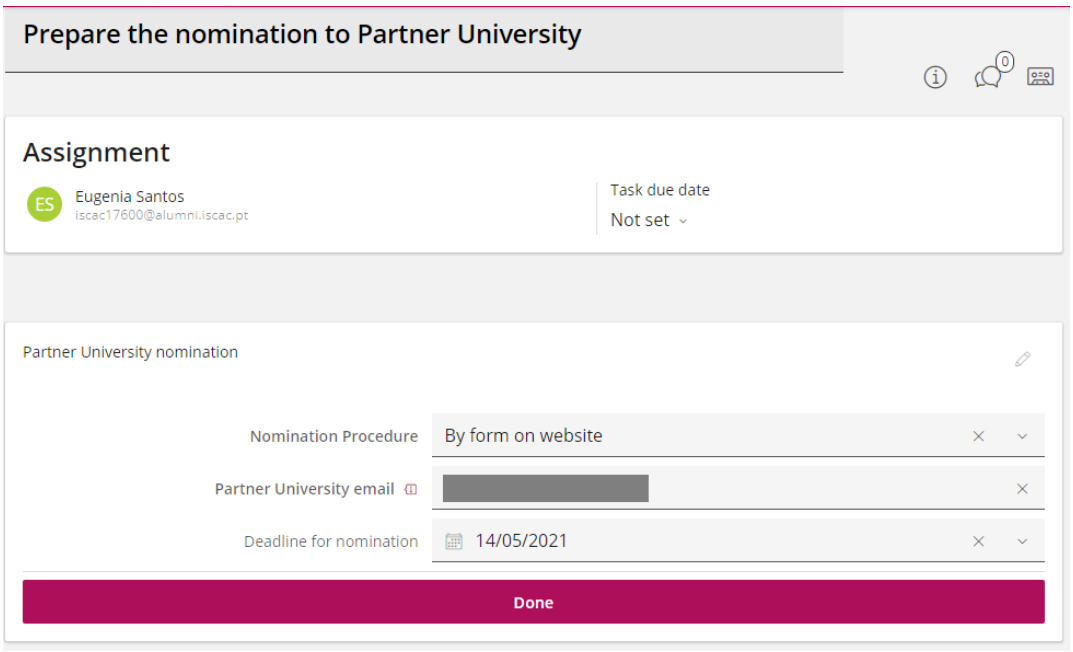


Figure 5.14. Prepare the nomination to PU – form on website

After filling the PU website form, there is an activity to complete on the system to record the date of nomination done (see Figure 5.14).

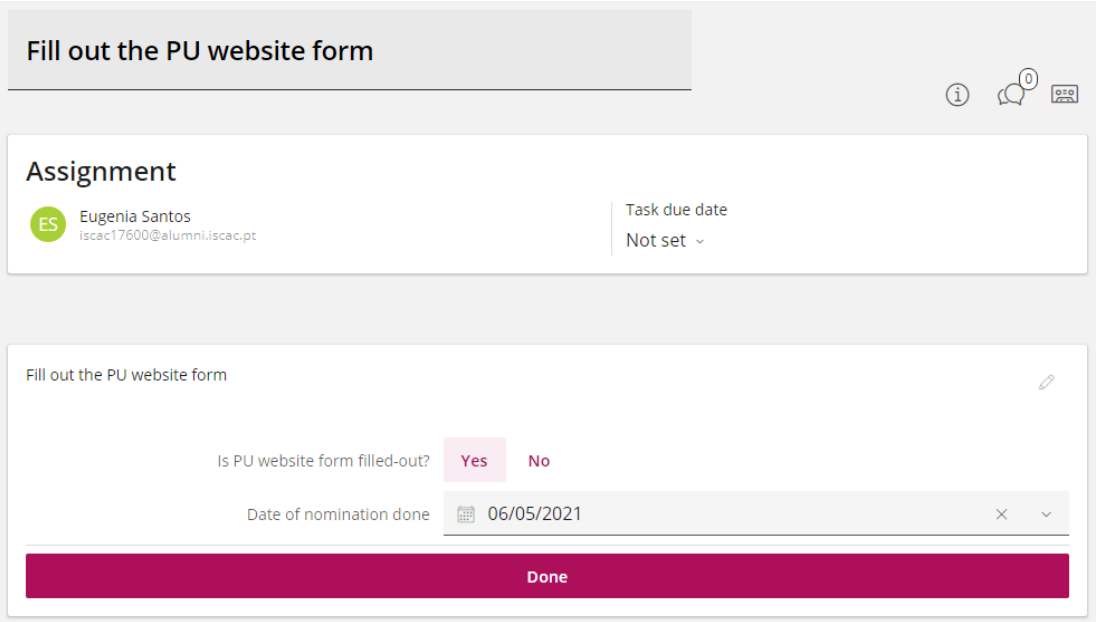


Figure 5.15. The date of nomination done on PU website

At this moment, the next step is on the PU side. It must confirm the student's nomination in the system. If the PU accepts, the outgoing student's application will continue. Otherwise, it will be cancelled.

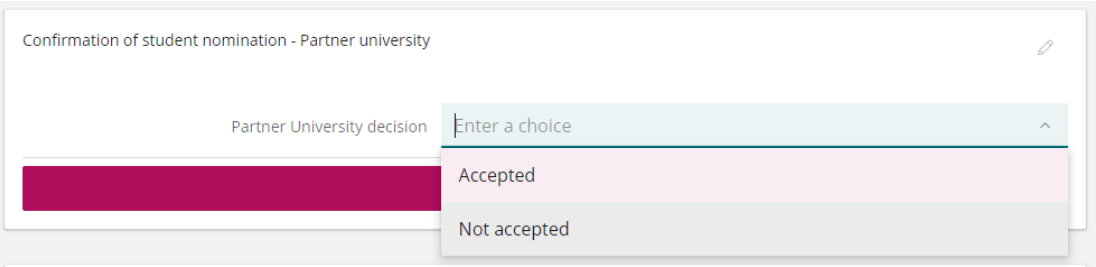


Figure 5.16. Confirmation of student nomination by PU

In this case, the student's nomination was accepted, and the PU then sends the application procedure. Here, the IRO-FEB needs to identify in the system the one responsible for the application (student or IRO-FEB) and the deadline to send it (see Figure 5.16).

In case the student makes the application, he/she will receive an e-mail notification from the IRO-FEB, with the application deadline and information about the application procedure (see Figure 5.17).

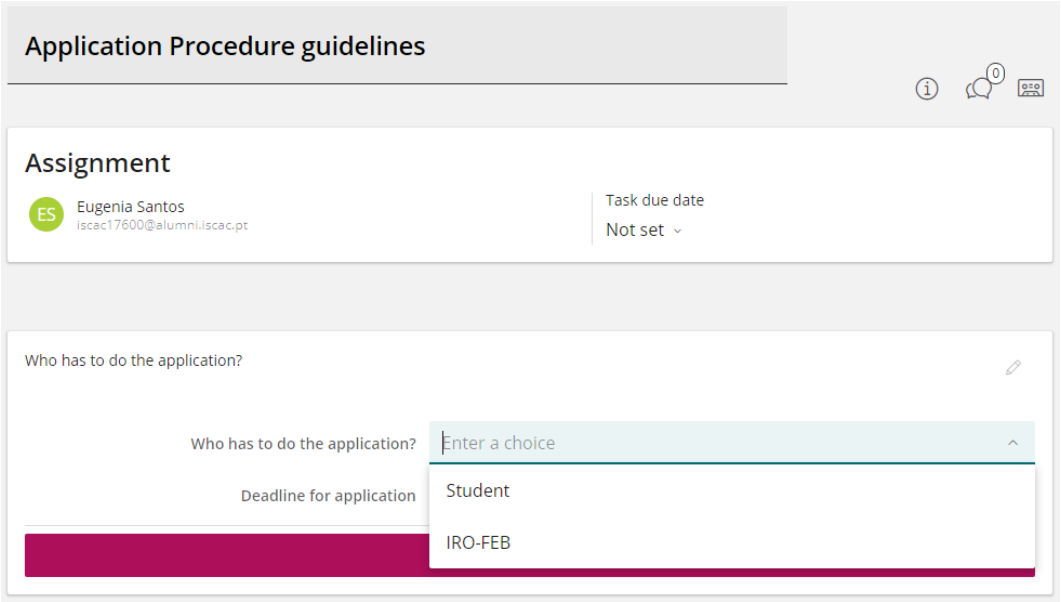


Figure 5.17. Application procedure guidelines

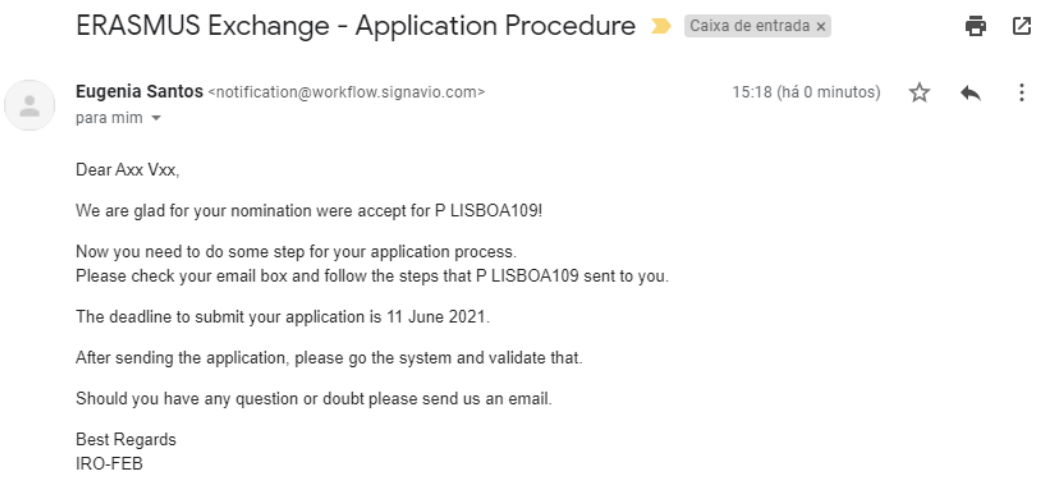


Figure 5.18. Notification about application procedure

After sending the application, the student is asked to confirm the submission in the system, so that the IRO-FEB knows that the application has been sent (see Figure 5.18).

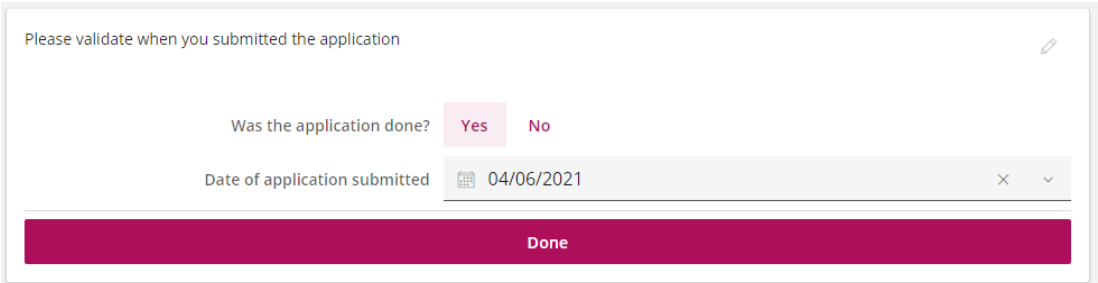


Figure 5.19. Validation of application done

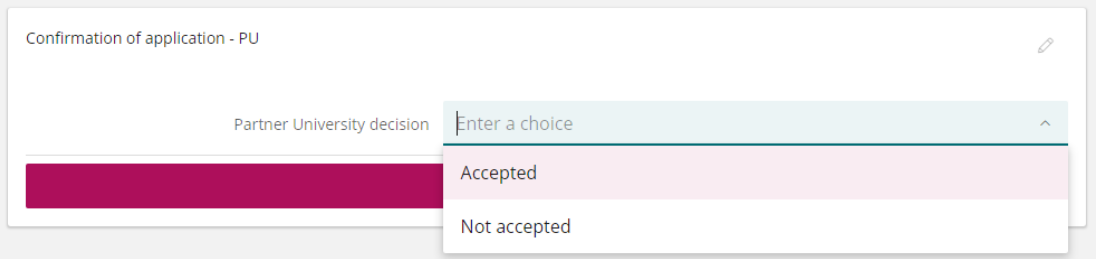


Figure 5.20. Confirmation of application – PU decision

In this case the PU chose submits the "accepted" decision (see Figure 5.19) and the student will receive a notification about it and about the need to upload the Learning Agreement (LA). The LA needs to be signed first by student (see Figure 5.20), then by the IRO-FEB and finally by PU. The last task in the application process regards the submission of documents by the PU (see Figure 5.21). These documents are the final LA and the acceptance letter. After this document's submission, the student will be notified that the outgoing student's application is completed.

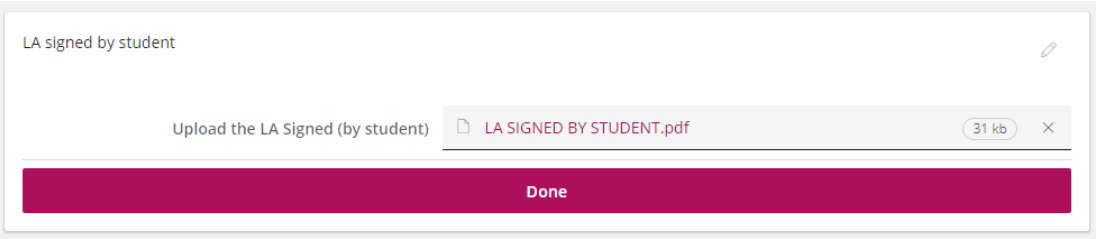


Figure 5.21. Upload the LA signed by student

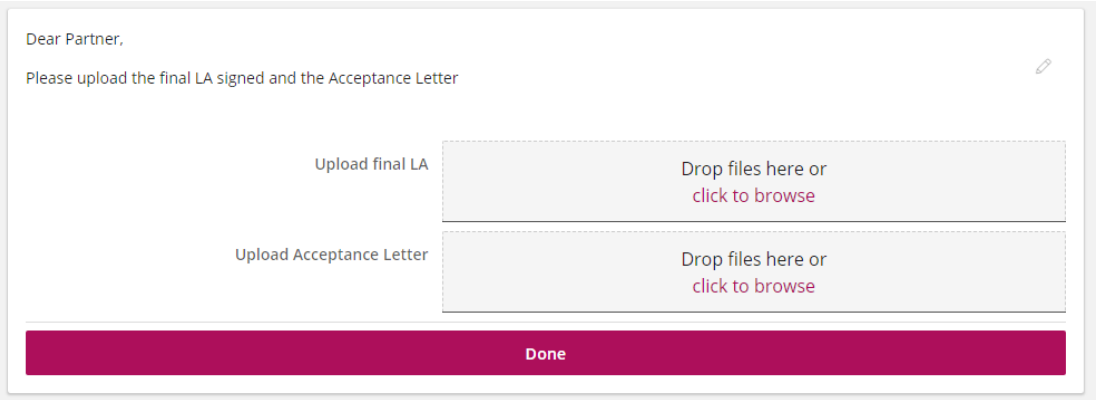


Figure 5.22. Upload the last documents by PU

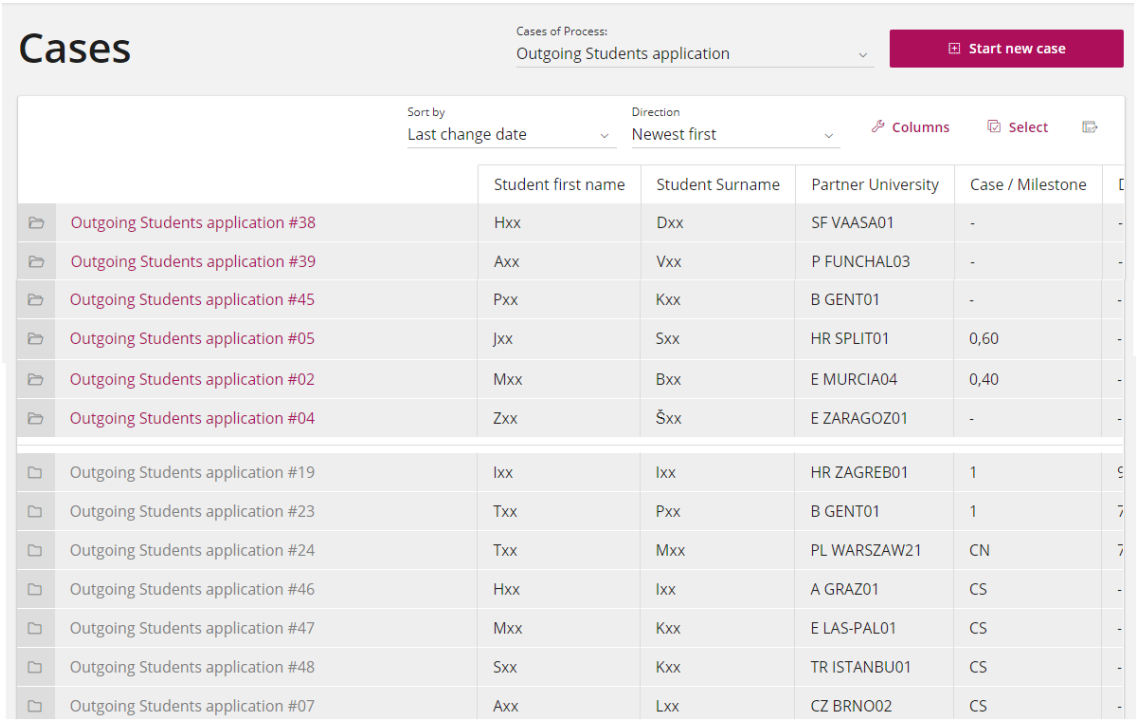
6 PROCESS CONTROL AND MONITORING

This chapter presents the control and monitoring phase of the BPM life cycle, which can be done in the BPMS or Power BI, where the KPIs defined in section 4.3 are displayed.

6.1 Control and monitoring in Signavio Workflow Accelerator

The SWA platform gives two views of the process:

- Overview of the cases, where it is possible to see all cases and the data in each column (see Figure 6.1).
- During the case, when a specific case is opened to see or add some data or information (see Figure 6.2). This is a good way to check the status in daily work.



	Student first name	Student Surname	Partner University	Case / Milestone
Outgoing Students application #38	Hxx	Dxx	SF VAASA01	-
Outgoing Students application #39	Axx	Vxx	P FUNCHAL03	-
Outgoing Students application #45	Pxx	Kxx	B GENT01	-
Outgoing Students application #05	Jxx	Sxx	HR SPLIT01	0,60
Outgoing Students application #02	Mxx	Bxx	E MURCIA04	0,40
Outgoing Students application #04	Zxx	Šxx	E ZARAGOZ01	-
Outgoing Students application #19	Ixx	Ixx	HR ZAGREB01	1
Outgoing Students application #23	Txx	Pxx	B GENT01	1
Outgoing Students application #24	Txx	Mxx	PL WARSZAW21	CN
Outgoing Students application #46	Hxx	Ixx	A GRAZ01	CS
Outgoing Students application #47	Mxx	Kxx	E LAS-PAL01	CS
Outgoing Students application #48	Sxx	Kxx	TR ISTANBU01	CS
Outgoing Students application #07	Axx	Lxx	CZ BRNO02	CS

Figure 6.1. Process control in SWA – Overview of the cases

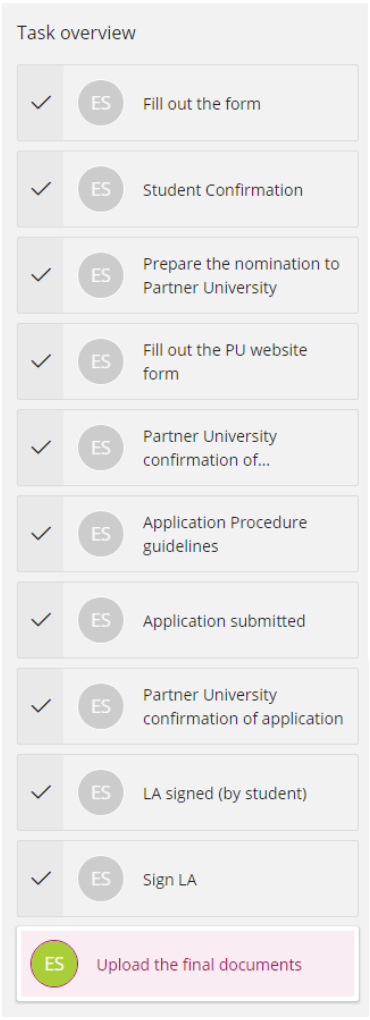


Figure 6.2. Process control in SWA – specific case

6.2 Control and Monitoring in Power BI

The Power BI is a Business Intelligence (BI) platform from Microsoft to visualize the information through the dashboards and reports in a more appealing way and get an unified overview.

6.2.1 Exporting data from analytics

The SWA has a section for analytics to export data in csv file type. In analytics section, the user IRO-FEB can create a report, filter by case status (all cases, open cases, and closed cases) and by add a condition. In results shown, it is also possible to configure the columns of data. In the end, the csv file is obtained in "download full result set as CSV. The Figure 6.3 shows the overview of exporting data from analytics.

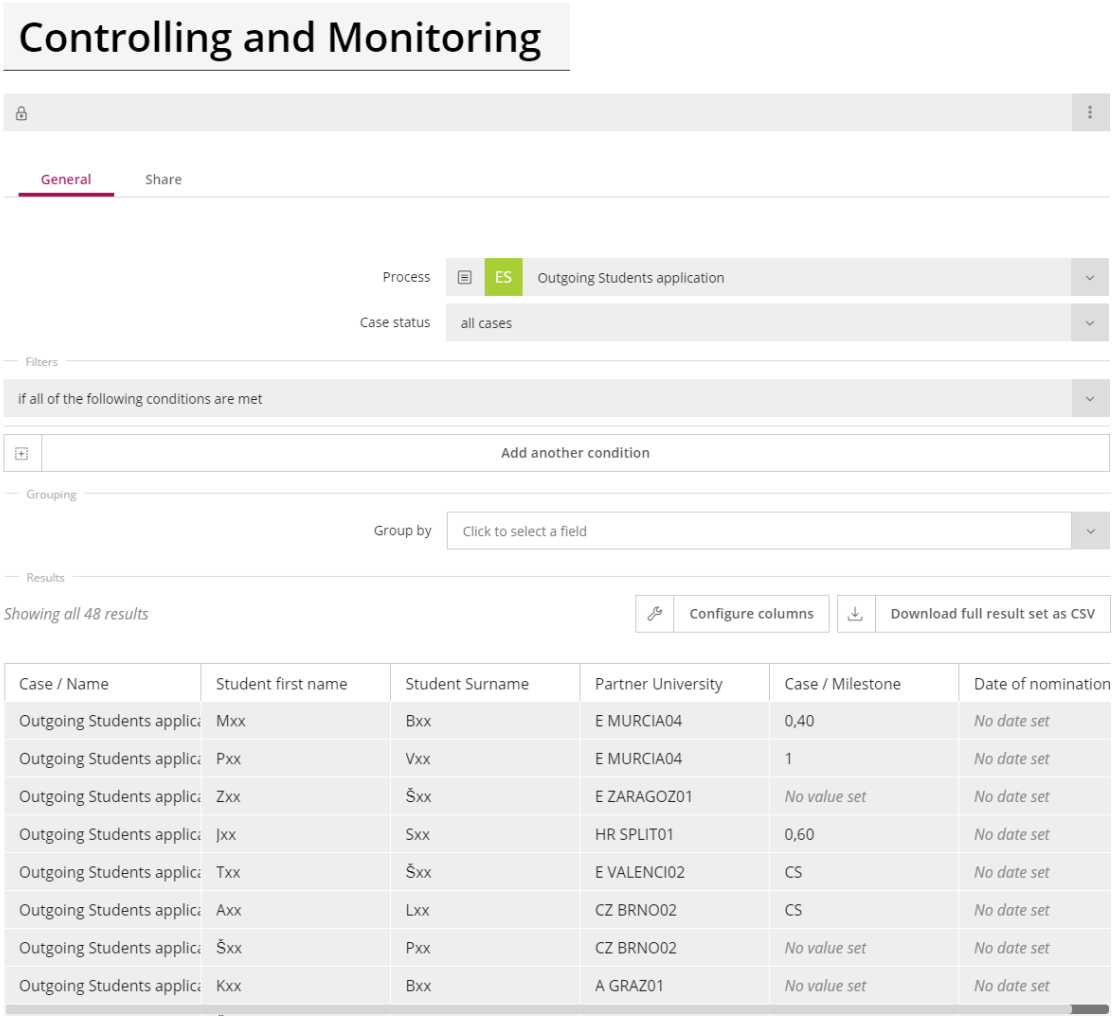


Figure 6.3. Data export overview in SWA analytics

6.2.2 Chart's visualization

The .csv files exported from SWA can be imported into Power BI to create dashboards and reports to visualize the information in a more appealing way and get an overview off the process.

For exemplification of the dashboards 48 real cases of outgoing students' processes extracted on 31/05/2021 relative to the academic year 2021/2022 were used. The first set of charts presented is for the entire academic year 2021/2022 and the second set of charts is for the winter semester, the nearest semester.

6.2.2.1 Academic year 2021/2022

Figure 6.4 shows an overview of applications with three important groups, based on KPI's described in section 4.3 the active applications (Table 4.7. KPI no.6 – Percentage of active applications), the cancelled applications (Table 4.12. KPI no.11 – Percentage of cancelled

application by student) and the completed applications (Table 4.8. KPI no.7 – Percentage of completed applications).

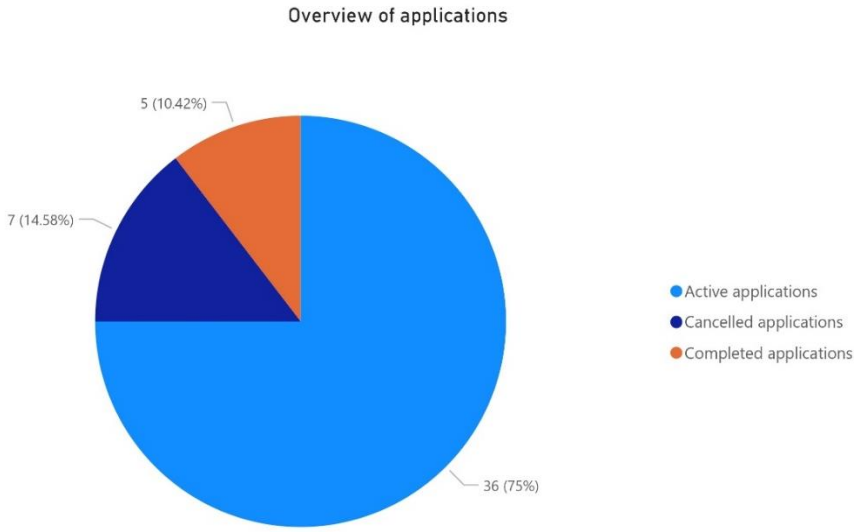


Figure 6.4. Overview of applications – Chart Academic year 21/22

Figure 6.5 shows the state of applications by milestone. The milestone has the same meaning than "step" in KPI no.1 described in section 4.3. For example, there are two applications with 20% (0,20) which represents 4.88% of the total applications.

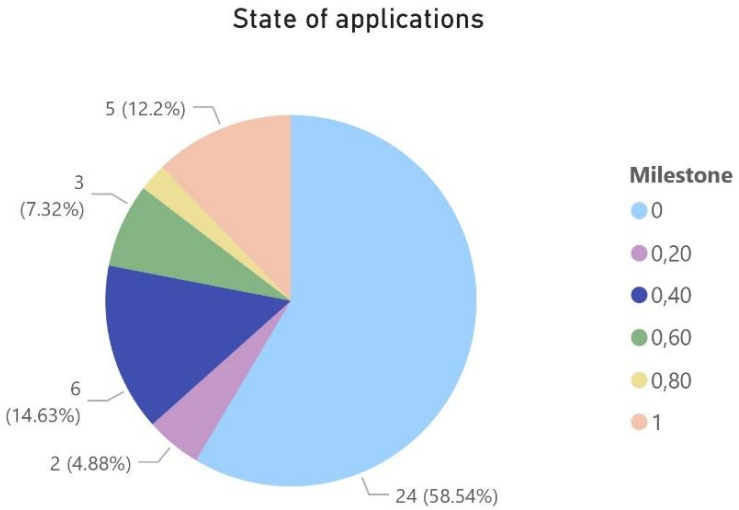


Figure 6.5. State of application – Chart Academic year 21/22

Figure 6.6 shows the cancelled applications by type according to KPI's defined in section 4.3. The "CS" is cancelled by student (Table 4.12. KPI no.11 – Percentage of cancelled application by student), the "CN" is cancelled by PU in nomination (Table 4.13 KPI no.12 – Percentage of cancelled application by PU in nomination) and the "CA" is cancelled by

PU in application (Table 4.14. KPI no. 13 – Percentage of cancelled application by PU in application).

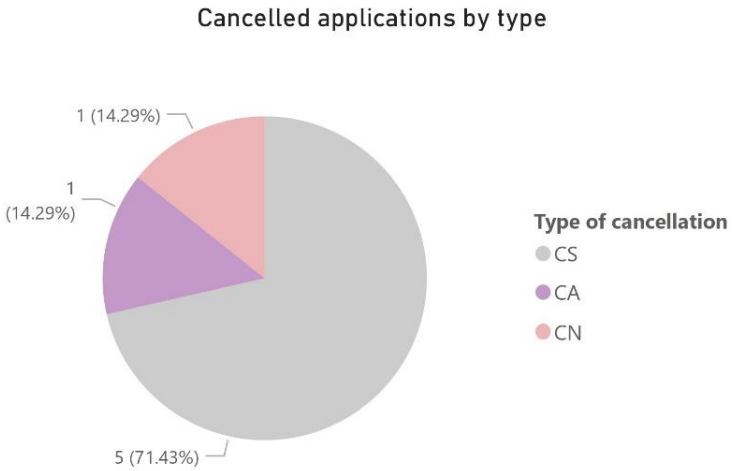


Figure 6.6. Cancelled applications by type – Chart Academic year 21/22

Figure 6.7 allows for an intuitive identification of student's distribution by destination. As shown, the outgoing students are distributed along twelve countries: Portugal, Spain, France, Germany, Netherlands, Croatia, Turkey, Sweden, Finland, Austria, Belgium, and Czech Republic.

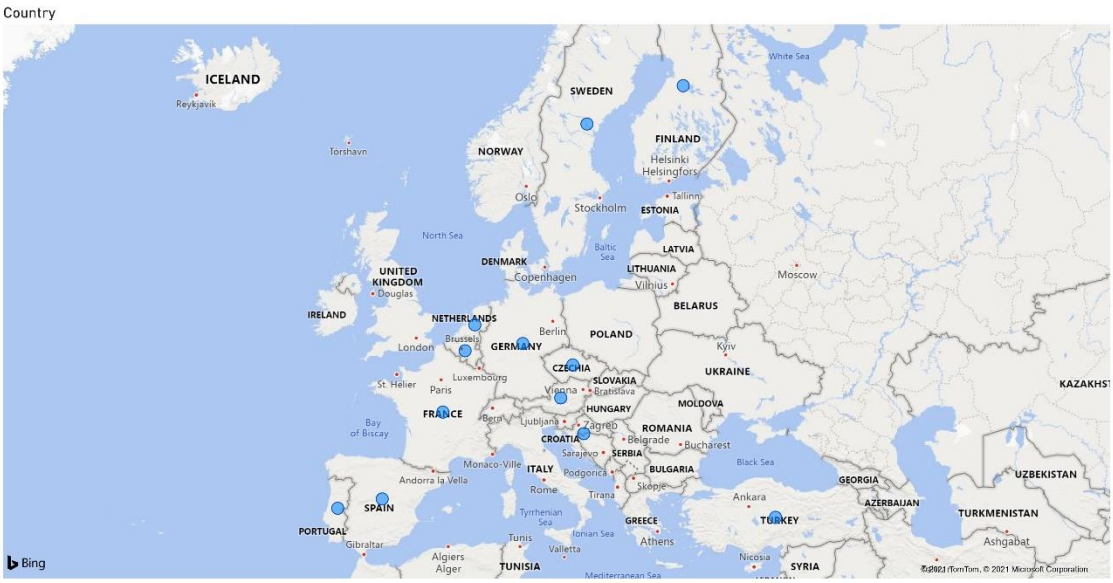


Figure 6.7. Countries of destination – Map Academic year 21/22

A readable version of the map and the overview of Power BI report about academic year 2021/2022 are available in Appendix D.

6.2.2.2 Winter semester 21/22

Figure 6.8 shows an overview of applications for winter semester applications with three important groups, based on KPI's described in section 4.3 the active applications (Table 4.7. KPI no.6 – Percentage of active applications), the cancelled applications (Table 4.11. KPI no.10 – Percentage of cancelled application) and the completed applications (Table 4.8. KPI no.7 – Percentage of completed applications).

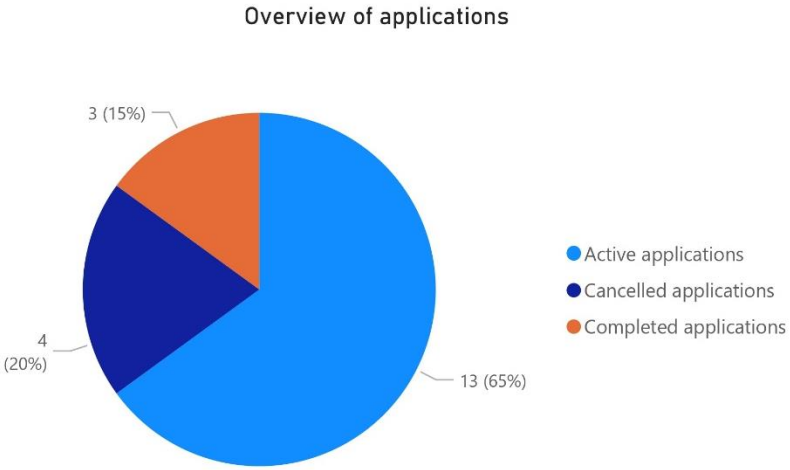


Figure 6.8. Overview of applications – Chart Winter semester 21/22

Figure 6.9 shows the state of applications by milestone for winter semester. The milestone has the same meaning than the steps defined in KPI no.1 described in section 4.3.

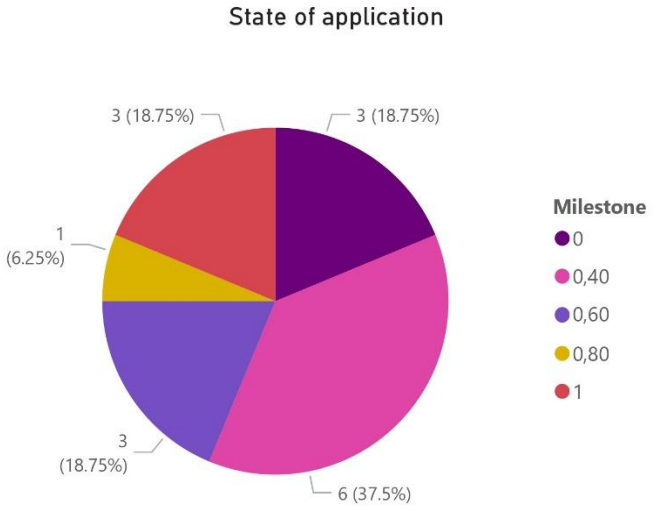


Figure 6.9. State of applications – Chart Winter semester 21/22

Figure 6.10 presents the percentage of state application of each application. This matrix represents the KPI no.1 (Table 4.2 in section 4.3). There are three applications completed, with 100% of conclusion, one application with 80% of conclusion, two applications with 60%, six applications with 40% and three applications with 0% which means the students still have not accepted the IRO-FEB nomination.

Case / Name	Min of % conclusion
Outgoing Students application #01	100%
Outgoing Students application #02	40%
Outgoing Students application #03	80%
Outgoing Students application #04	40%
Outgoing Students application #05	60%
Outgoing Students application #08	40%
Outgoing Students application #09	60%
Outgoing Students application #10	40%
Outgoing Students application #11	40%
Outgoing Students application #12	40%
Outgoing Students application #17	60%
Outgoing Students application #18	0%
Outgoing Students application #19	100%
Outgoing Students application #20	0%
Outgoing Students application #21	0%
Outgoing Students application #23	100%

Figure 6.10 State of applications by case – Matrix Winter 21/22

Figure 6.11 shows the cancelled applications by type in winter semester according to KPI's defined in section 4.3. The "CS" is cancelled by student (Table 4.12. KPI no.11 – Percentage of cancelled application by student), the "CN" is cancelled by PU in nomination (Table 4.13 KPI no.12 – Percentage of cancelled application by PU in nomination) and the "CA" is cancelled by PU in application (Table 4.14. KPI no. 13 – Percentage of cancelled application by PU in application).

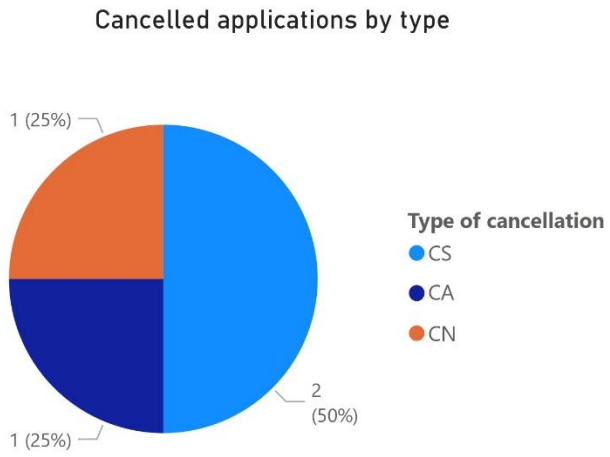


Figure 6.11. Cancelled applications by type – Chart Winter semester 21/22

Figure 6.11 presents the days lefts for application's deadlines of only about active applications. The outgoing student applications #04 and #12 have around 60 days to complete the application, the deadline is 31st of July of 2021. In other hand there are two applications, the outgoing student application #05 and #09, that only have 1 day to finish the application.

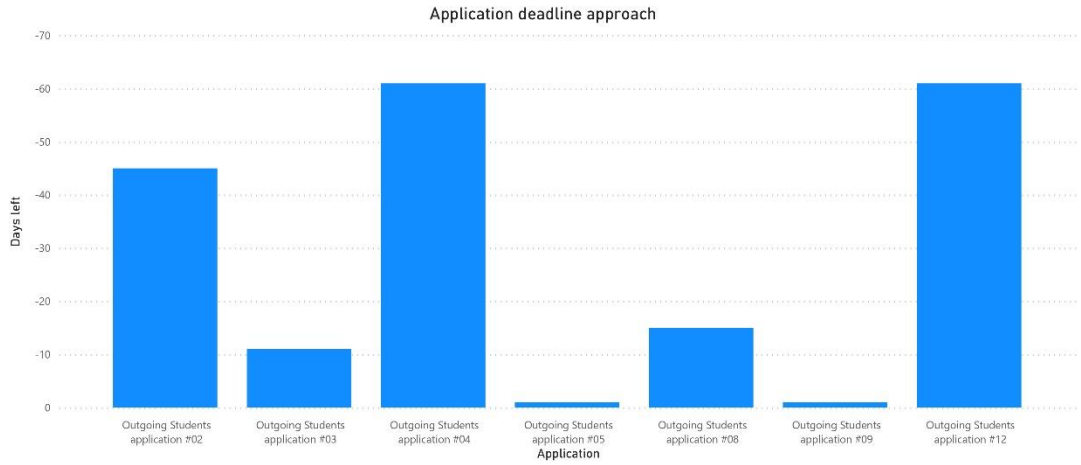


Figure 6.12. Deadline approach for applications – Chart Winter semester 21/22

Figure 6.12 allows for an intuitive identification of student's distribution by destination. In winter semester 21/22, the outgoing students go abroad to six countries: Portugal, Spain, Belgium, Czech Republic, Austria, and Croatia.

Figure 6.13. Countries of destination – Map Winter semester 21/22

A readable version of the map and the overview of Power BI report about winter semester 2021/2022 are available in Appendix E.

7 CONCLUSION

After completing the work necessary to implement a management information system to control the outgoing student's application process in IRO-FEB, which consisted in the implementation of the process in a BPMS and respective analysis in Power BI, it is possible to make some considerations regarding the work done and to propose future work.

7.1 Work summary

The end goal of this project is to create a management tool for outgoing student's application to monitor and control the whole process and make it easy to manage by the IRO-FEB collaborators.

It started with a literature review to understand how internationalization is done in HEIs, and to know which KPI's and information systems are used in this context.

Then the development of the management control tool (prototype) was carried out, which went through the following steps: analysis of the current process, identification of improvement opportunities, definition of KPIs for future process monitoring and control and redesign of the new updated process. This part of the project was reviewed and approved by the HIRO-FEB.

After the process redesign a prototype was implemented in the BPMS.

Finally, Microsoft Power BI was used to develop the analytical treatment of the data and to produce dashboards and reports to control and monitor the process.

The prototype was tested with the insertion of 48 cases and Power BI with real data from IRO-FEB.

7.2 Contributions

According to the motivations and goals defined in the beginning of the project, there are three main contributions that the developed management control tool can give to IRO-FEB.

The first contribution is optimization of the outgoing process through the digitalization and dematerialization of it. The management tool does not need the paper documents, fascicles and send e-mail as a notification. The time consuming and resources with these tasks could be decreased.

The second contribution is the easy access to data. As current pandemic situation shows work from home or in a separated office is a reality. Not have/share fascicles or not have only on computer with all information/data is crucial to keep work routine on. This management tool could be accessed for specific workers with different type of access and the process could be controlled and monitored outside the office.

The last contribution is the definition and creation of intuitive reports/dashboards for outgoing students' application process control and monitoring.

7.3 Limitations

To develop the management control tool, two different software solutions were used, with no integration between them. At this stage, data is exported from the BPMS to an Excel file which is then imported into Power BI.

To develop the management control tool there is used the different platforms and software tools and the interconnection between them is able, but they are not integrated. It means that the export data is needed to add it in Microsoft Power BI. In this phase, the data is exported from the BPMS to an Excel file which is then imported into Power BI. In the future, if the tool is used, Power BI will be integrated with the BPMS for the real-time visualisation of the different outgoing student's applications.

The other limitation found is about the amount of data. The amount of data used was sufficient for the tests, but not for the exhaustive testing of the process itself, in order to better understand it.

7.4 Future work

The management control tool for outgoing student's application is a prototype which was developed and tested with real data. The next step is the deployment of the tool and training the IRO-FEB collaborators to use it in daily work.

After deployment there are two improvements to put on plans of the future. One of them is to extend the management control tool to other exchange programmes which were mentioned in section 3.5. The CEEPUS programme, Bilateral agreements, and ERASMUS KA 107 (international credit mobility) could be integrated in outgoing student's tool.

Another improvement is to add the later applications. The current management control tool is not available for later applications, which in exceptional cases are accepted. The later applications are the applications which the deadline has passed, and which can no longer be accepted by the PU.

7.5 Final considerations

The data obtained can give more than the information for control and to feed the KPI's. Looking further and after collected two or three years of data, the information obtained can reveal facts or questions. For example, if the information shows that there is one country or group of countries where students never applied what is it mean? The cultural issues, political issues, living costs and others could be in the reason of that choice. Extrapolating this management control tool to other faculties, also University of Maribor can work with this information and obtained important answers about outgoing students' applications. More data allows more information which with BI algorithms could be detect relations or co-relations between data which are not visible be human being.

Summing up, I believe this management control tool is just start with digitalization, to got easier the controlling and monitoring process but in the future will give much more than this.

For ending all the conclusions is important to mention the importance of the project in my professional development. The overview of the tasks done to finalize this project gave me a practical skill in general and the knowledge about the whole process of creation a management tool. This project was also important because it was a bridge between the pedagogical component of the master's degree in management control and the internship.

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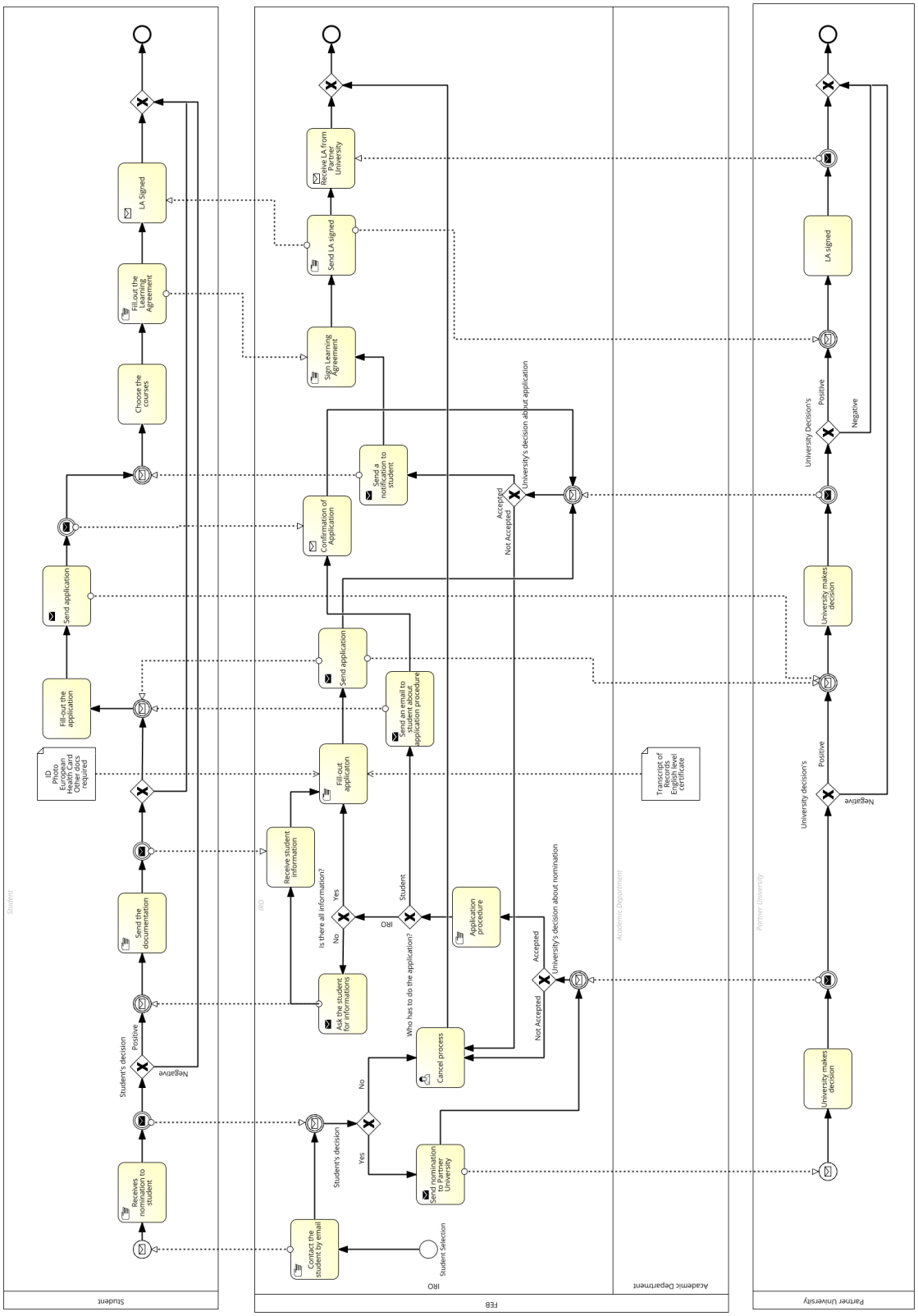
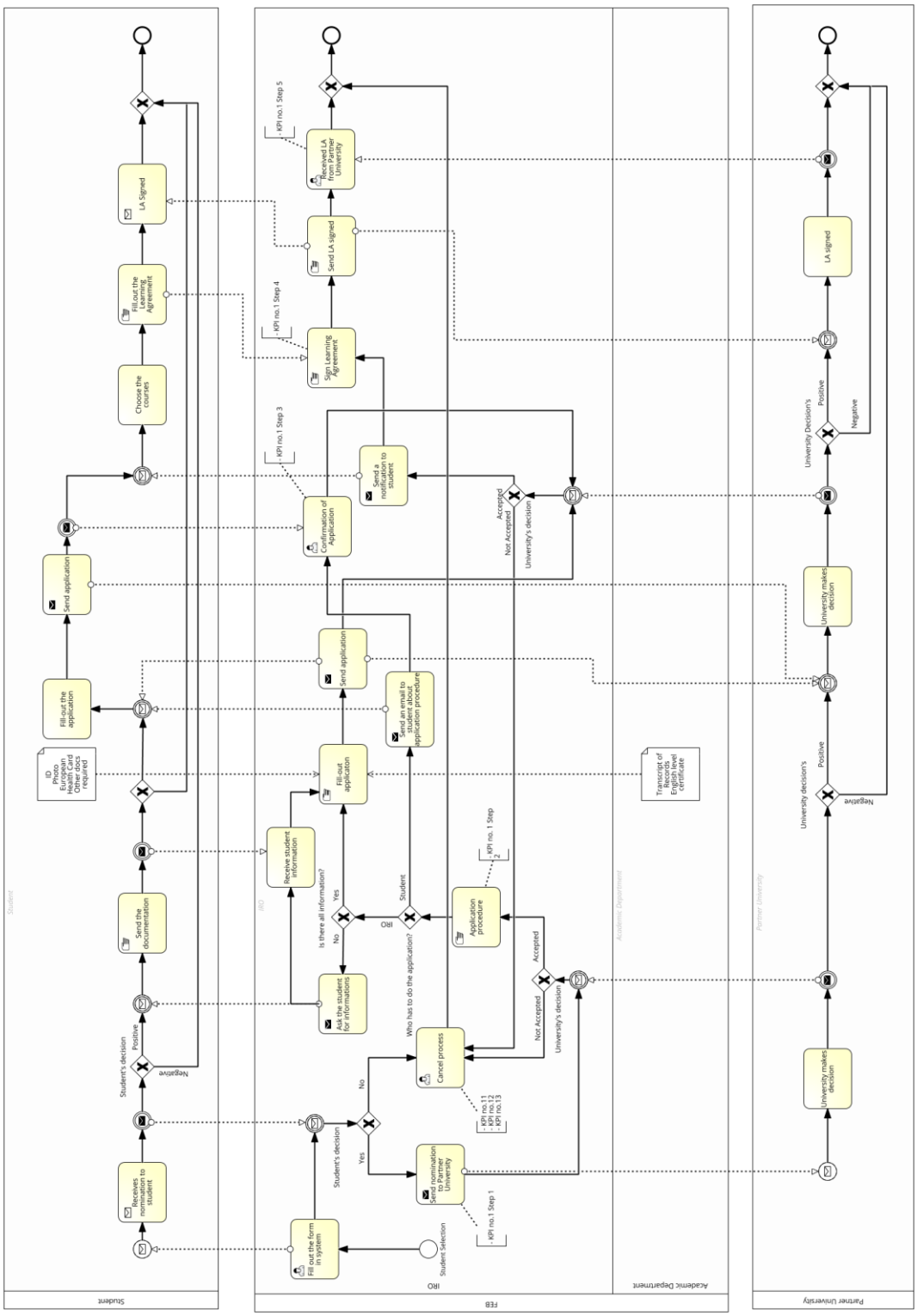
APPENDICES

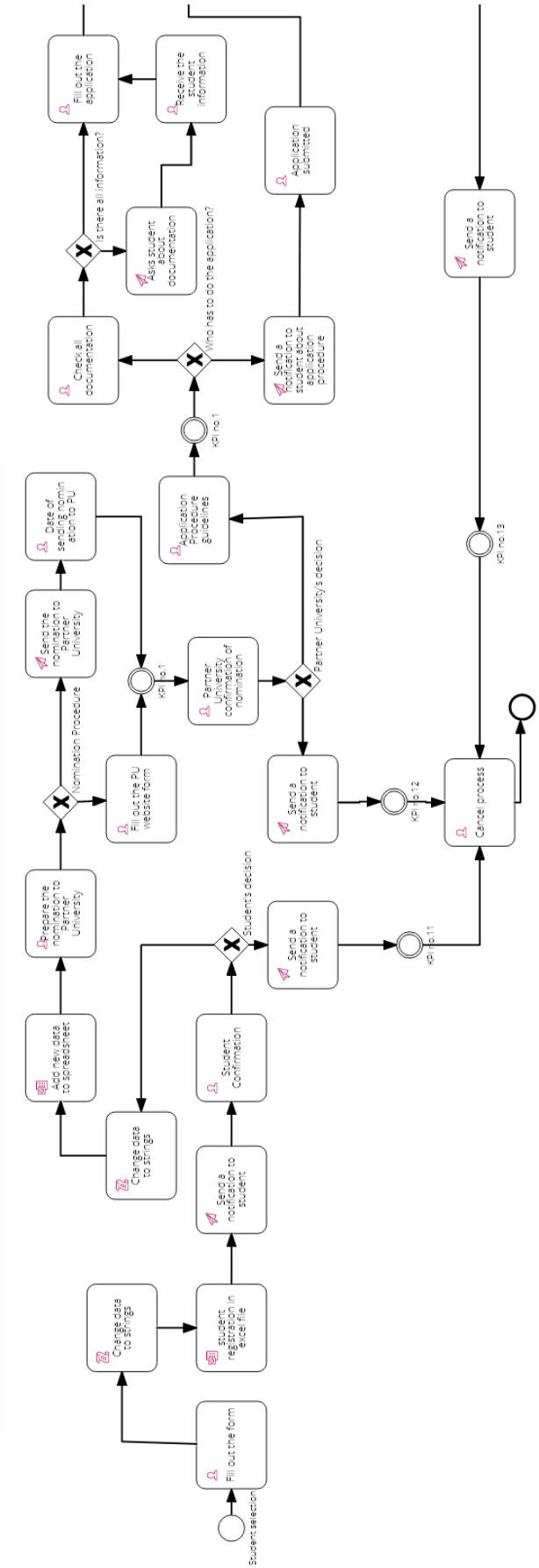
Appendix A. Student's outgoing application process AS-IS diagram.



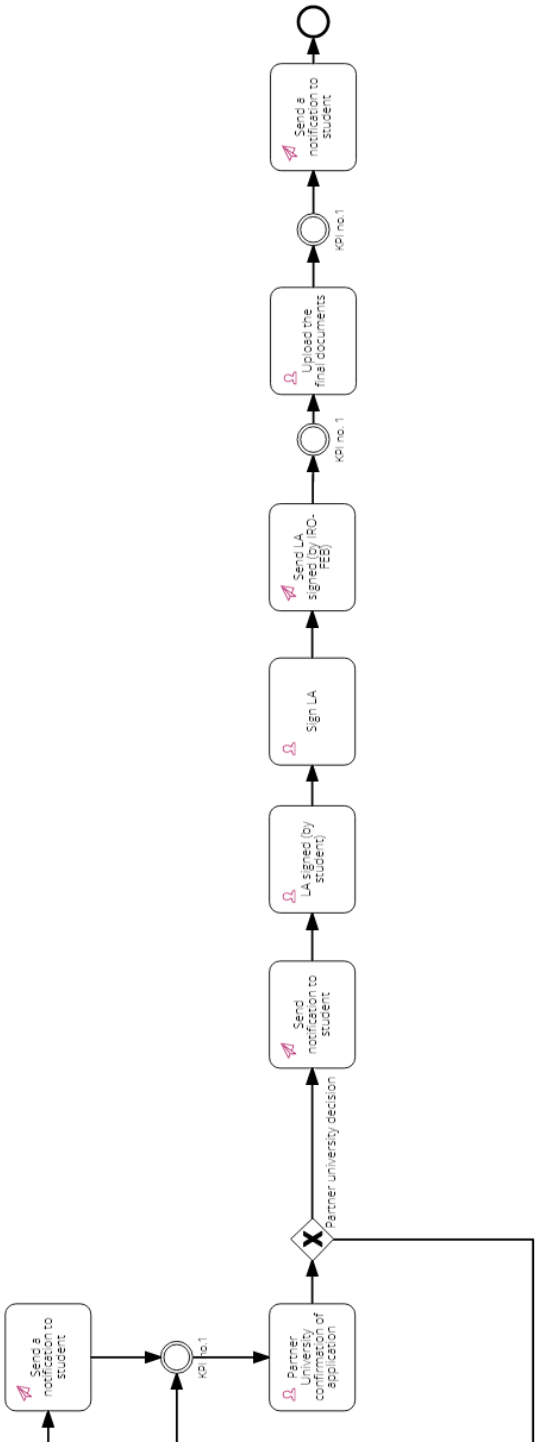
Appendix B. Student's outgoing application process TO-BE diagram



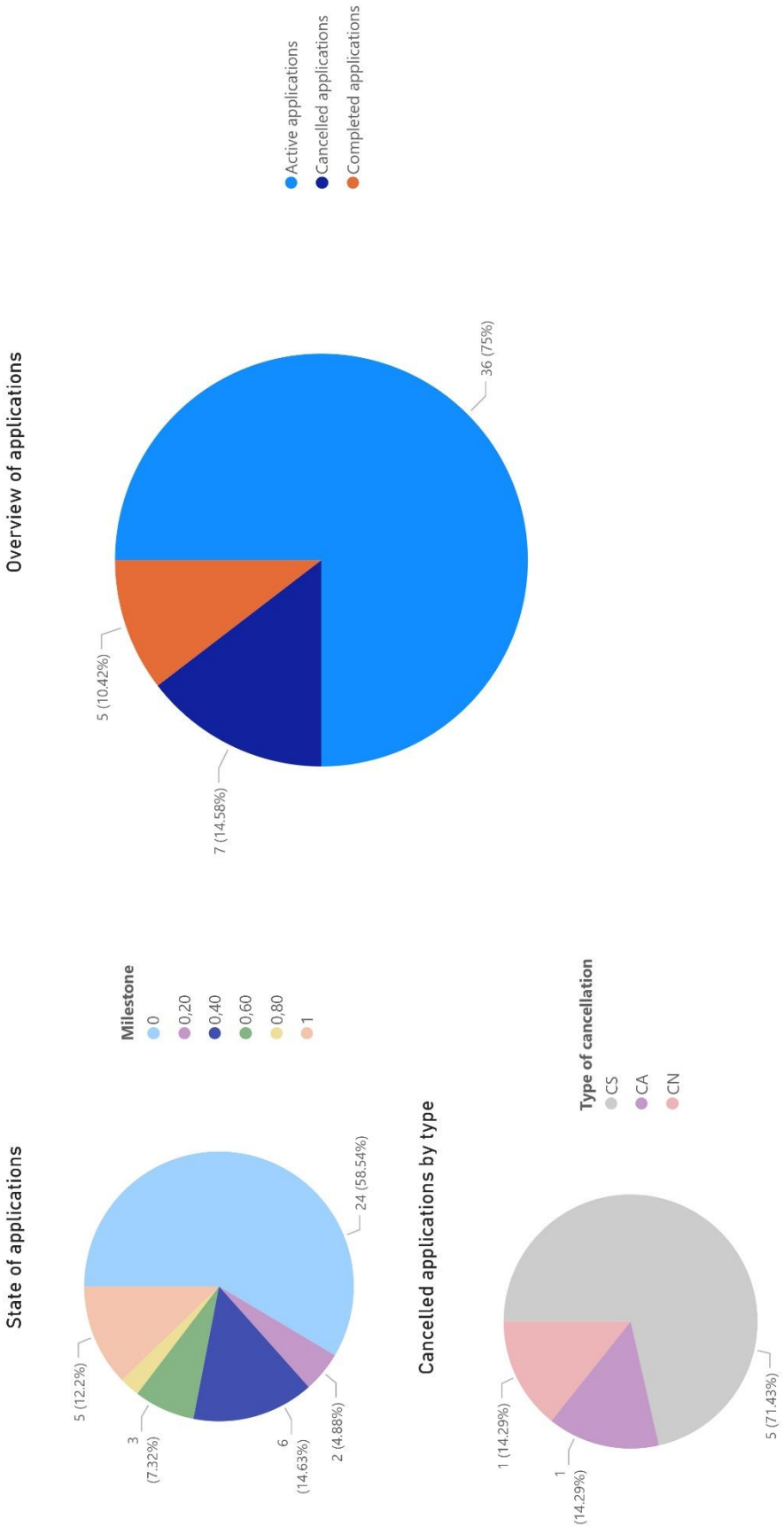
Appendix C. Re-design process implementation – 1st part

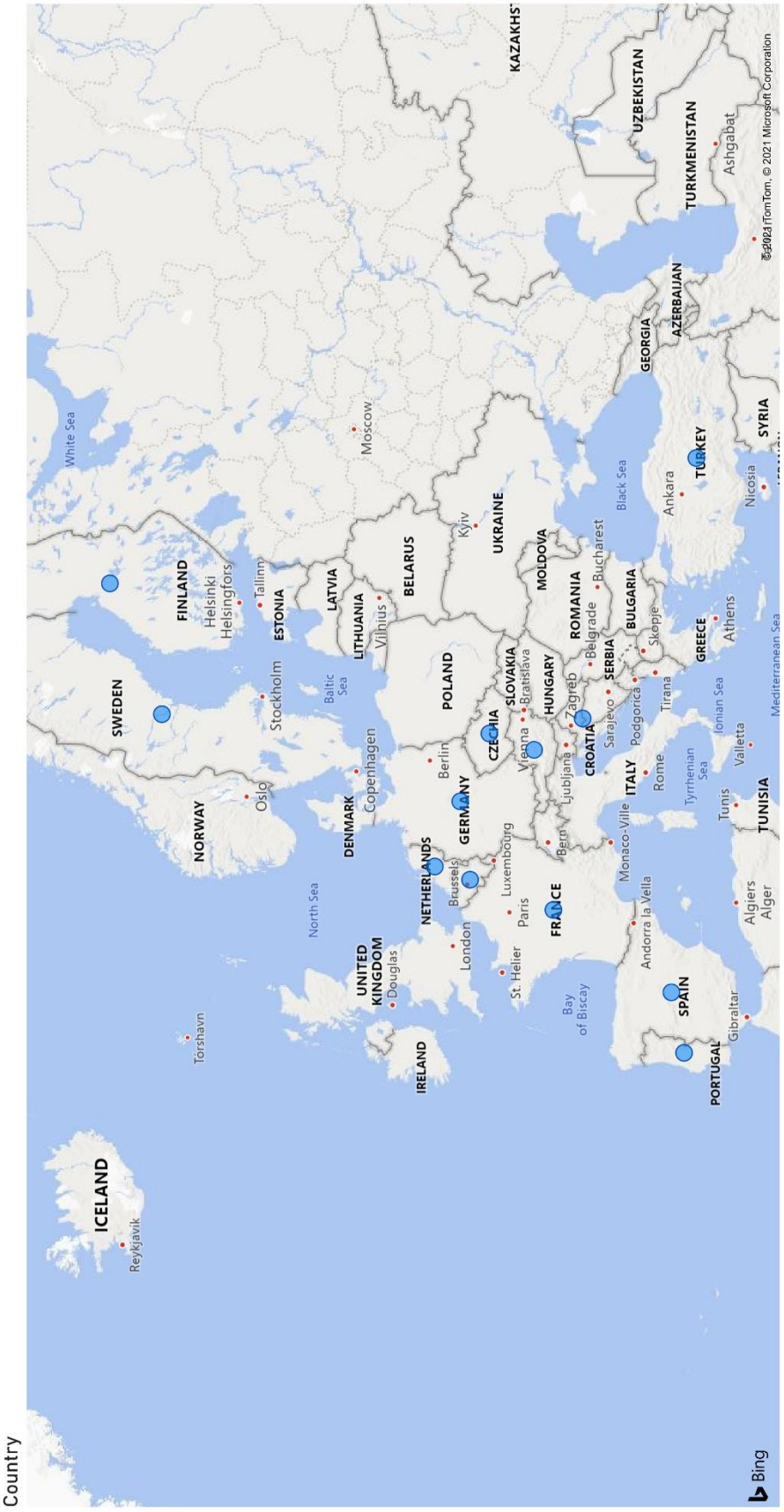


Appendix C. Re-design process implementation – 2nd Part

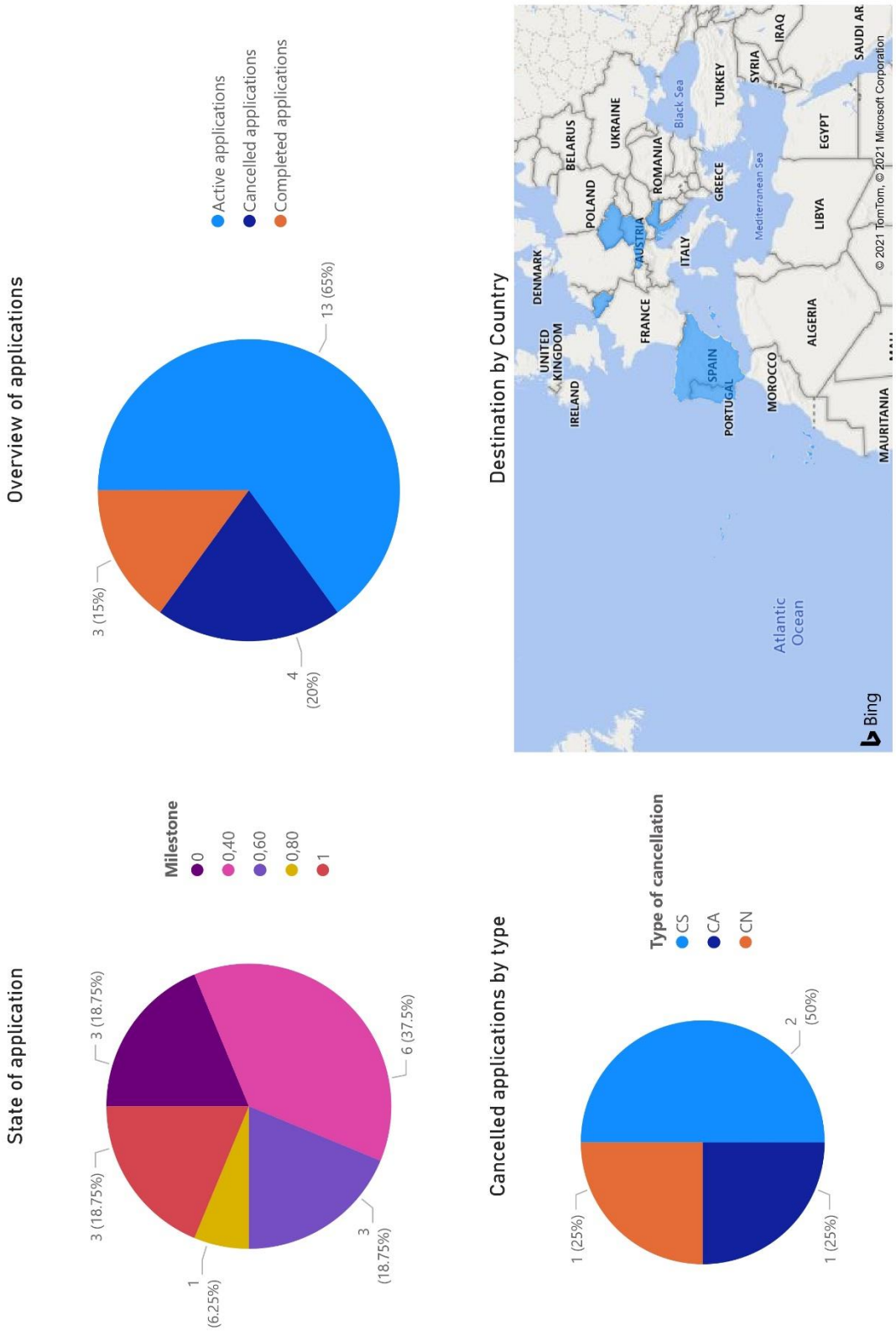


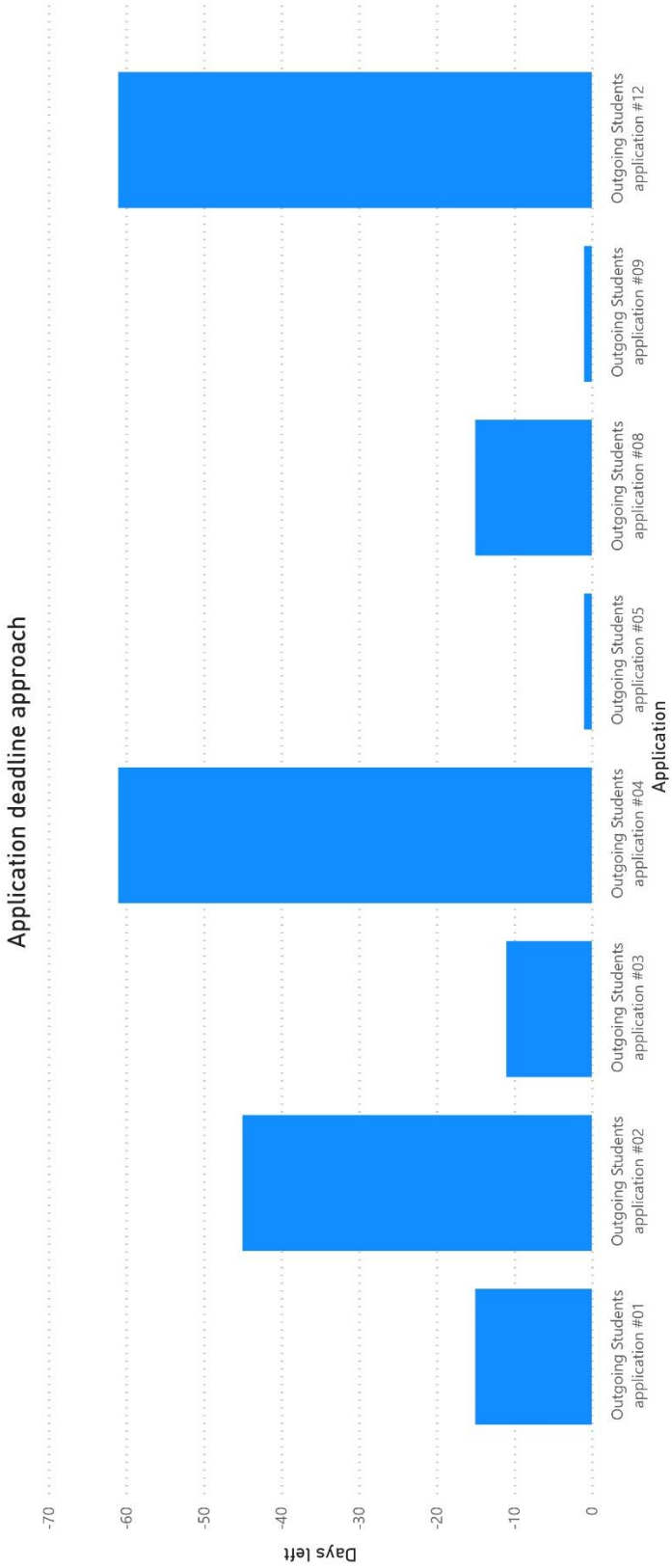
Appendix D. Power BI report – Academic year 2021/2022 in 31/05/2021




Country
ICELAND
Reykjavik
SWEDEN
FINLAND
Helsinki
Helsingfors
Tallinn
ESTONIA
LATVIA
LITHUANIA
Vilnius
BELARUS
Moscow
White Sea
Kyiv
UKRAINE
MOLDOVA
ROMANIA
Bucharest
Black Sea
KAZAKHS
UZBEKISTAN
TURKMENISTAN
Ashgabat
AZERBAIJAN
GEORGIA
TURKEY
Ankara
SYRIA
Nicosia
Athens
GREECE
BULGARIA
Skopje
SERBIA
Belgrade
Sarajevo
Podgorica
Tirana
Ionian Sea
Valletta
Mediterranean Sea
Tunis
TUNISIA
Algiers
Alger
Tyrrhenian Sea
Rome
ITALY
Monaco-Ville
Andorra la Vella
SPAIN
Gibraltar
PORTUGAL
Bay of Biscay
St. Helier
FRANCE
Paris
Luxembourg
Bern
Ljubljana
CROATIA
Zagreb
HUNGARY
Vienna
SLOVAKIA
Bratislava
CZECHIA
Prague
POLAND
Berlin
GERMANY
Brussels
NETHERLANDS
London
UNITED KINGDOM
Douglas
IRELAND
North Sea
Torshavn
Oslo
NORWAY
Copenhagen
DENMARK
Stockholm
Baltic Sea
© 2021 TomTom, © 2021 Microsoft Corporation
Bing

Appendix E. Power BI report – Winter semester 2021/2022 in 31/05/2021




Application deadline approach
Days left
-70
-60
-50
-40
-30
-20
-10
0
Application
Outgoing Students application #01
Outgoing Students application #02
Outgoing Students application #03
Outgoing Students application #04
Outgoing Students application #05
Outgoing Students application #08
Outgoing Students application #09
Outgoing Students application #12

Case / Name	Min of % conclusion
Outgoing Students application #01	100%
Outgoing Students application #02	40%
Outgoing Students application #03	80%
Outgoing Students application #04	40%
Outgoing Students application #05	60%
Outgoing Students application #08	40%
Outgoing Students application #09	60%
Outgoing Students application #10	40%
Outgoing Students application #11	40%
Outgoing Students application #12	40%
Outgoing Students application #17	60%
Outgoing Students application #18	0%
Outgoing Students application #19	100%
Outgoing Students application #20	0%
Outgoing Students application #21	0%
Outgoing Students application #23	100%

ANNEXES

ANNEX 1

ANNEX 1 Intern form for FEB student's nomination

University of Maribor
Faculty of Economics and Business

obr.1

PRIJAVA ZA ŠTUDIJ OZ. PRAKSO V TUJINI

Priimek in ime			
Naslov			
Telefon-GSM		**E-mail**	
Številka indeksa		**Letnik študija na EPF**	
Program na EPF	UN VS MAG BU BV BM	**Smer na EPF**	
Izpolnite, če ste že študirali v tujini			

	Študent(ka) naj izpolni samo ta okenca:	Točke
Povprečna ocena doslej opravljenih izpitov		
Kateri izbirni predmet na EPF ste opravili v tujem jeziku	Predmet: / Ocena:	
Kateremu tujemu študentu in kdaj ste bili spremljevalec(ka)	Ime in priimek: Kdaj (od-do):	
	SKUPAJ TOČKE	

Obkrožite piko in podčrtajte program, v okviru katerega želite študirati v tujini:

- enosemestrski študij
- celoletni študij
- posamični predmeti
- priprava zaključnega dela
- strokovna praksa

Navedite univerzo/fakulteto, na kateri želite študirati:

Prva prioriteta	Druga prioriteta	Tretja prioriteta

S podpisom zagotavljam, da sem seznanjen(a) s pravili študija v tujini in da bom izpolnil(a) vse obveznosti, ki jih zahteva študij v tujini od študenta Univerze v Mariboru oz. Ekonomsko-poslovne fakultete. Na partnerski univerzi bom tudi predstavil(a) Slovenijo in študij na EPF ter po vrnitvi domov informiral(a) slovenske študente o študiju v tujini.

Maribor, / /2021 Podpis študenta:

ANNEX 2

LEARNING AGREEMENT FORM

Erasmus+

Learning Agreement
Student Mobility for Studies

Higher Education:
Learning Agreement form
Student's name _____
Academic Year 20.../20...

Student	**Last name(s)**	**First name(s)**	**Date of birth**	**Nationality**[1]	**Gender: [Male/Female/ Undefined]**	**Study cycle**[2]	**Field of education** [3]
Sending Institution	**Name**	**Faculty/ Department**	**Erasmus code**[4] **(if applicable)**	**Address (Faculty)**	**Country**	**Contact person name**[5] **(faculty administrative); email; phone**	
Receiving Institution	**Name**	**Faculty/ Department**	**Erasmus code (if applicable)**	**Address**	**Country**	**Contact person name; email; phone**	
	UNIVERSITY OF ZAGREB		**HR ZAGREB01**		**Croatia**		

Before the mobility

Study Programme at the Receiving Institution

Planned period of the mobility: from [month/year] ..... to [month/year] .....

Table A Before the mobility	**Component**[6] **code** (if any)	**Component title at the Receiving Institution** (as indicated in the course catalogue[7])	**Semester** [e.g. winter/summer]	**Number of ECTS credits (or equivalent)**[8] **to be awarded by the Receiving Institution upon successful completion**
		If necessary please electronically insert more rows.		**Total: .....**
Web link to the course catalogue at the Receiving Institution describing the learning outcomes: [*web link to the relevant information*]				

The level of language competence[9] in _____ [*indicate here the main language of instruction*] that the student already has or agrees to acquire by the start of the study period is: *A1* ☐ *A2* ☐ *B1* ☐ *B2* ☐ *C1* ☐ *C2* ☐ *Native speaker* ☐

Recognition at the Sending Institution

Table B Before the mobility	**Component code** (if any)	**Component title at the Sending Institution** (as indicated in the course catalogue)	**Semester** [e.g. winter/summer]	**Number of ECTS credits (or equivalent) to be recognised by the Sending Institution**
		If necessary please electronically insert more rows.		**Total: .....**
Provisions applying if the student does not complete successfully some educational components: *[web link to the relevant information]*				

Commitment, signatures and stamp (stamp of the sending institution obligatory; receiving institution if applicable)

By signing this document, the student, the Sending Institution and the Receiving Institution confirm that they approve the Learning Agreement and that they will comply with all the arrangements agreed by all parties. Sending and Receiving Institutions undertake to apply all the principles of the Erasmus Charter for Higher Education relating to mobility for studies (or the principles agreed in the Inter-Institutional Agreement for institutions located in Partner Countries). The Beneficiary Institution and the student should also commit to what is set out in the Erasmus+ grant agreement. The Receiving Institution confirms that the educational components listed in Table A are in line with its course catalogue and should be available to the student. The Sending Institution commits to recognise all the credits or equivalent units gained at the Receiving Institution for the successfully completed educational components and to count them towards the student's degree as described in Table B. Any exceptions to this rule are documented in an annex of this Learning Agreement and agreed by all parties. The student and the Receiving Institution will communicate to the Sending Institution any problems or changes regarding the study programme, responsible persons and/or study period.

Commitment	**Name**	**Email**	**Position**	**Date**	**SIGNATURE, STAMP**
Student			Student		
Responsible person[10] at the Sending Institution			ECTS coordinator		
Responsible person at the Receiving Institution[11]					

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Erasmus+

Learning Agreement
Student Mobility for Studies

Higher Education:
Learning Agreement form
Student's name _____
Academic Year 20.../20...

During the Mobility

	Exceptional changes to Table A (to be approved by e-mail or signature by the student, the responsible person in the Sending Institution and the responsible person in the Receiving Institution)					
Table A2 During the mobility	**Component code** (if any)	**Component title at the Receiving Institution** (as indicated in the course catalogue)	**Deleted component** [tick if applicable]	**Added component** [tick if applicable]	**Reason for change**[12] (insert number)	**Number of ECTS credits (or equivalent)**
			☐	☐		
			☐	☐		
			☐	☐		
			☐	☐		
			☐	☐		
			☐	☐		
			☐	☐		
			☐	☐		
		If necessary please electronically insert more rows.				**Total: .....**

Commitment	**Name**	**Email**	**Position**	**Date**	**SIGNATURE, STAMP**
Student			Student		
Responsible person[13] at the Sending Institution			ECTS coordinator		
Responsible person at the Receiving Institution[14]					

	Exceptional changes to Table B (if applicable) (to be approved by e-mail or signature by the student and the responsible person in the Sending Institution)				
Table B2 During the mobility	**Component code** (if any)	**Component title at the Sending Institution** (as indicated in the course catalogue)	**Deleted component** [tick if applicable]	**Added component** [tick if applicable]	**Number of ECTS credits (or equivalent)**
			☐	☐	
			☐	☐	
			☐	☐	
			☐	☐	
			☐	☐	
		If necessary please electronically insert more rows.			**Total: .....**

Commitment	**Name**	**Email**	**Position**	**Date**	**SIGNATURE, STAMP**
Student			Student		
Responsible person[15] at the Sending Institution			ECTS coordinator		

Erasmus+

Learning Agreement
Student Mobility for Studies

Higher Education:
Learning Agreement form
Student's name _____
Academic Year 20.../20...

After the Mobility (Receiving Institution)

	Transcript of Records at the Receiving Institution **Start and end dates of the study period: from [day/month/year] ..... to [day/month/year] .....**				
Table C After the mobility	**Component code** (if any)	**Component title at the Receiving Institution** (as indicated in the course catalogue)	**Was the component successfully completed by the student?** [Yes/No]	**Number of ECTS credits** (or equivalent)	**Grades received at the Receiving Institution**
				Total:	

		Date	**SIGNATURE, STAMP**
Responsible person[16] at the Receiving Institution			

It is recommended to use this template. However, if higher education institutions already have an IT system in place to produce the Transcript of Records, they can continue using it. All the information requested in this template is to be considered as minimum requirements, meaning that further fields can be added, if needed, and the format (e.g. font size and colours) can be adapted.

Erasmus+

Learning Agreement
Student Mobility for Studies

Higher Education:
Learning Agreement form
Student's name _____
Academic Year 20.../20...

After the Mobility (Sending Institution)

	Transcript of Records and Recognition at the Sending Institution			
	Start and end dates of the study period: from [day/month/year] ..... to [day/month/year]			
Table D After the mobility	**Component code** (if any)	**Title of recognised component at the Sending Institution** (as indicated in the course catalogue)	**Number of ECTS credits (or equivalent) recognised**	**Grades registered at the Sending Institution** (if applicable)
			Total:	

		Date	**SIGNATURE, STAMP**
Responsible person[17] at the Sending Institution			

It is recommended to use this template. However, if higher education institutions already have an IT system in place to produce the Transcript of Records, they can continue using it. All the information requested in this template is to be considered as minimum requirements, meaning that further fields can be added, if needed, and the format (e.g. font size and colours) can be adapted.

Erasmus+

Learning Agreement
Student Mobility for Studies

Higher Education:
Learning Agreement form
Student's name _____
Academic Year 20.../20...

[1] **Nationality:** country to which the person belongs administratively and that issues the ID card and/or passport.

[2] **Study cycle:** Short cycle (EQF level 5) / Bachelor or equivalent first cycle (EQF level 6) / Master or equivalent second cycle (EQF level 7) / Doctorate or equivalent third cycle (EQF level 8).

[3] **Field of education:** The ISCED-F 2013 search tool available at http://ec.europa.eu/education/tools/isced-f_en.htm should be used to find the ISCED 2013 detailed field of education and training that is closest to the subject of the degree to be awarded to the student by the Sending Institution.

[4] **Erasmus code**: a unique identifier that every higher education institution that has been awarded with the Erasmus Charter for Higher Education (ECHE) receives. It is only applicable to higher education institutions located in Programme Countries.

[5] **Contact person**: person who provides a link for administrative information and who, depending on the structure of the higher education institution, may be the departmental coordinator or works at the international relations office or equivalent body within the institution.

[6] An "**educational component**" is a self-contained and formal structured learning experience that features learning outcomes, credits and forms of assessment. Examples of educational components are: a course, module, seminar, laboratory work, practical work, preparation/research for a thesis, mobility window or free electives.

[7] **Course catalogue**: detailed, user-friendly and up-to-date information on the institution's learning environment that should be available to students before the mobility period and throughout their studies to enable them to make the right choices and use their time most efficiently. The information concerns, for example, the qualifications offered, the learning, teaching and assessment procedures, the level of programmes, the individual educational components and the learning resources. The Course Catalogue should include the names of people to contact, with information about how, when and where to contact them.

[8] **ECTS credits (or equivalent)**: in countries where the "ECTS" system is not in place, in particular for institutions located in Partner Countries not participating in the Bologna process, "ECTS" needs to be replaced in the relevant tables by the name of the equivalent system that is used, and a web link to an explanation to the system should be added.

[9] **Level of language competence**: a description of the European Language Levels (CEFR) is available at: https://europass.cedefop.europa.eu/en/resources/european-language-levels-cefr

[10] **Responsible person at the Sending Institution**: an academic who has the authority to approve the Learning Agreement, to exceptionally amend it when it is needed, as well as to guarantee full recognition of such programme on behalf of the responsible academic body. The name and email of the Responsible person must be filled in only in case it differs from that of the Contact person mentioned at the top of the document.

[11] **Responsible person at the Receiving Institution**: the name and email of the Responsible person must be filled in only in case it differs from that of the Contact person mentioned at the top of the document.

[12] **Reasons for exceptional changes to study programme abroad (choose an item number from the table below):**

Reasons for deleting a component	*Reason for adding a component*
1. Previously selected educational component is not available at the Receiving Institution 2. Component is in a different language than previously specified in the course catalogue 3. Timetable conflict 4. Other (please specify)	5. Substituting a deleted component 6. Extending the mobility period 7. Other (please specify)

[13] **Responsible person at the Sending Institution**: an academic who has the authority to approve the Learning Agreement, to exceptionally amend it when it is needed, as well as to guarantee full recognition of such programme on behalf of the responsible academic body. The name and email of the Responsible person must be filled in only in case it differs from that of the Contact person mentioned at the top of the document.

[14] **Responsible person at the Receiving Institution**: the name and email of the Responsible person must be filled in only in case it differs from that of the Contact person mentioned at the top of the document.

[15] **Responsible person at the Sending Institution**: an academic who has the authority to approve the Learning Agreement, to exceptionally amend it when it is needed, as well as to guarantee full recognition of such programme on behalf of the responsible academic body. The name and email of the Responsible person must be filled in only in case it differs from that of the Contact person mentioned at the top of the document.

[16] **Responsible person at the Receiving Institution**: an academic who has the authority to approve the Learning Agreement, to exceptionally amend it when it is needed, as well as to guarantee full recognition of such programme on behalf of the responsible academic body. The name and email of the Responsible person must be filled in only in case it differs from that of the Contact person mentioned at the top of the document.

[17] **Responsible person at the Sending Institution**: an academic who has the authority to approve the Learning Agreement, to exceptionally amend it when it is needed, as well as to guarantee full recognition of such programme on behalf of the responsible academic body. The name and email of the Responsible person must be filled in only in case it differs from that of the Contact person mentioned at the top of the document.