

SUDTE

Supporting Universities in the
Digital Transformation in Erasmus+

How to Achieve Digital Transformation IMPLEMENTATION REPORT Intellectual Output 3 (Best practice guidelines)

IMPLEMENTATION REPORT

How to Achieve Digital Transformation



SUDTE –Supporting Universities in the Digital Transformation in Erasmus+
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A hand holding a smartphone with a futuristic digital interface overlay. The interface features glowing blue hexagons, a fingerprint scanner, and various data patterns. A solid blue rectangular box is overlaid on the center of the image, containing the word 'INTRODUCTION' in white, bold, uppercase letters.

INTRODUCTION

1. INTRODUCTION

Digital transformation of the Higher Educational Institutions (HEIs) is at the core of organizations to re-think their operational and behavioral models. The European Union (EU) tried for a long time to boost this transformation in HEIs, pointing out the necessity to explode such goal through the internalization and the interconnection between students across all Europe. The Council of the European Union aims to a *"participation of at least 20% of the graduates in a period of studies or training abroad by 2020"*. However, this goal is still far from being achieved. In 2020, the SUDTE (Supporting Universities in the Digital Transformation in Erasmus+) project, started thanks to a consortium of five partners from Italy (Università degli Studi di Napoli "Federico II"), Spain (University of Vigo), Turkey (Selçuk University and Izmir Institute of Technology) and the European University Foundation (EUF), aiming to help together the digitalization process, the modernization of HEIs and EU standardization of mobility management. Hence, the present project aims to improve in the long-term the quality of European university services, the skills of staff of HEIs, aiming to the adoption of the ESCI (Erasmus Student Card Initiative) throughout Europe. The project activities lead to achieve expected results and outcomes through the achievement of "Intellectual Outputs" (IOs) that represent, step by step, the mandatory stages for the whole project implementation. The whole project the SUDTE project is expected to play an important role in contributing the roadmap of the ESCI with the following goals:

- Determination of the needs of HEIs and National Agencies (NAs) in the integration process through a systematic mapping;
- Assessing and comparing the available digital tools to address the challenging infrastructural transformation;
- Assisting HEIs in design and execute their implementation strategies based on evidence-based decision-making and policy formulation - Measuring efficiency gains and impact assessment regarding workload reduction;
- Equipping students and staff with the knowledge and skills with a view to ensures readiness for next Erasmus program;
- Developing software modules to expand available IT services.

1.1. AIM AND OBJECTIVES OF THE REPORT

Given the project's development objectives, the IOs to achieve these objectives and indicators related to these *outputs* are outlined as follows:

- O1) *Mapping Current Status of Digitization*
- O2) *Comparative Analysis of Functionalities of Digital Tools*
- O3) *Implementation Report - How To Achieve Digital Transformation*
- O4) *Efficiency Gains and Impact Assessment*
- O5) *Training Materials for Student and Staffs*
- O6) *Software Development (Common Student Information Database)*

In the context of abovementioned outputs, the present implementation report, under the IO3, wants to shed light on critical points of this project, the main progresses done and the next coming achievements. Finally, it wants to provide helpful guidelines for all project stakeholders, such as NAs and HEIs across Europe.

The main objective of O3 is to help HEIs informed of the work carried out by the partner universities in achieving EWP standards that is aiming to address the diversity of needs of every institution. Hence, the present report also represents a recommendation report, in which are included the highlights, best practices and barriers of the following topics:

- a) Internal communication and commitment from the top management
- b) Data privacy and legal issues
- c) Technical infrastructure and digital tools
- d) Trainings office staff, coordinators, and students.

The above issues are explored in all SUDTE partners' countries, in order to better assess the state critical points of the different systems (i.e., dashboard, in-house, 3rd party provider) of Erasmus mobility management.

Digital transformation in Erasmus+ would likely be successful as long as designers, users, and rule makers enrich their knowledge mutually. Such Intellectual Output, under the responsibility of UNINA has been produced through three different activities, as follows:

Activity 1 (O3/A1) – Describing and conducting research: a desk research to gain a broad understanding and to state the conceptual framework regarding to the above-mentioned headings.

Activity 2 (O3/A2) – Qualifying Alternatives: This activity will seek to find out what participating institution think about the topic and what actions they may be taking based on their own experiences through the data collected from O1

and O2. In such activity, main good practices interventions and results of the implementation and application phases are displayed.

Activity 3 (O3/A3) – Summarizing Findings: Such crucial activity, allowed us in the present report to consolidate and summarize findings helpful for the readers to interpret the recommendations and draw their own conclusions.

1.2. TARGET GROUPS

Universities obliged to carry out mobility through digital platforms are looking for guidance on evaluation, review, and analysis for a more efficient way of adaptation. For this reason, the first target category of this implementation report is precisely the HEIs. In this regard, the report provides useful information in terms of good practices deriving from the direct experiences of the partners involved in the SUDTE project. Every university in Europe, by reading the report, will be able to learn from the practices and behaviors that the partners have followed firsthand. Such self-training is indispensable in reaching the EWP standards first. Furthermore, this report highlights direct evidence concerning all the technical methods through which digital transformation can be achieved (i.e., in-house systems, EWP dashboards, the systems of 3rd party providers).

More importantly, the second target group of this report are the National Agencies (NAs), which from the main findings of the implementation report should be able to assume their responsibilities more effectively and energetically in favor of the objectives of the SUDTE project. Therefore, the O3 will be aimed at NAs facing internal and external difficulties in terms of duration, scope, resources, and activities. Therefore, this report is also aimed at ensuring a better connection and a prompter communication between the HEIs and the NAs.

1.3. ELEMENTS OF INNOVATION

The implementation report is unique in many respects, both for higher education institutions and for national agencies. On the one hand, partner universities will collectively respond to the challenges of digital transformation in their institution, including effective internal dialogue, seeking commitment to paperless mobility from institutional leaders, in particular by implementing EWP standards fully in the management of Erasmus mobility. On the other hand, going through the implementation phases by the partner institution would provide a diversified set of reforms aimed at making the management of Erasmus+ mobility more efficient and effective. It will then serve as documentation for the NAs to address problems, to prevent or at least mitigate contingencies. Furthermore, what is important is for the readers of

the report to see how each activity brings the organization closer to the completion of the ESCI and realization of its objectives in terms of duration, scope, resources, and activities.

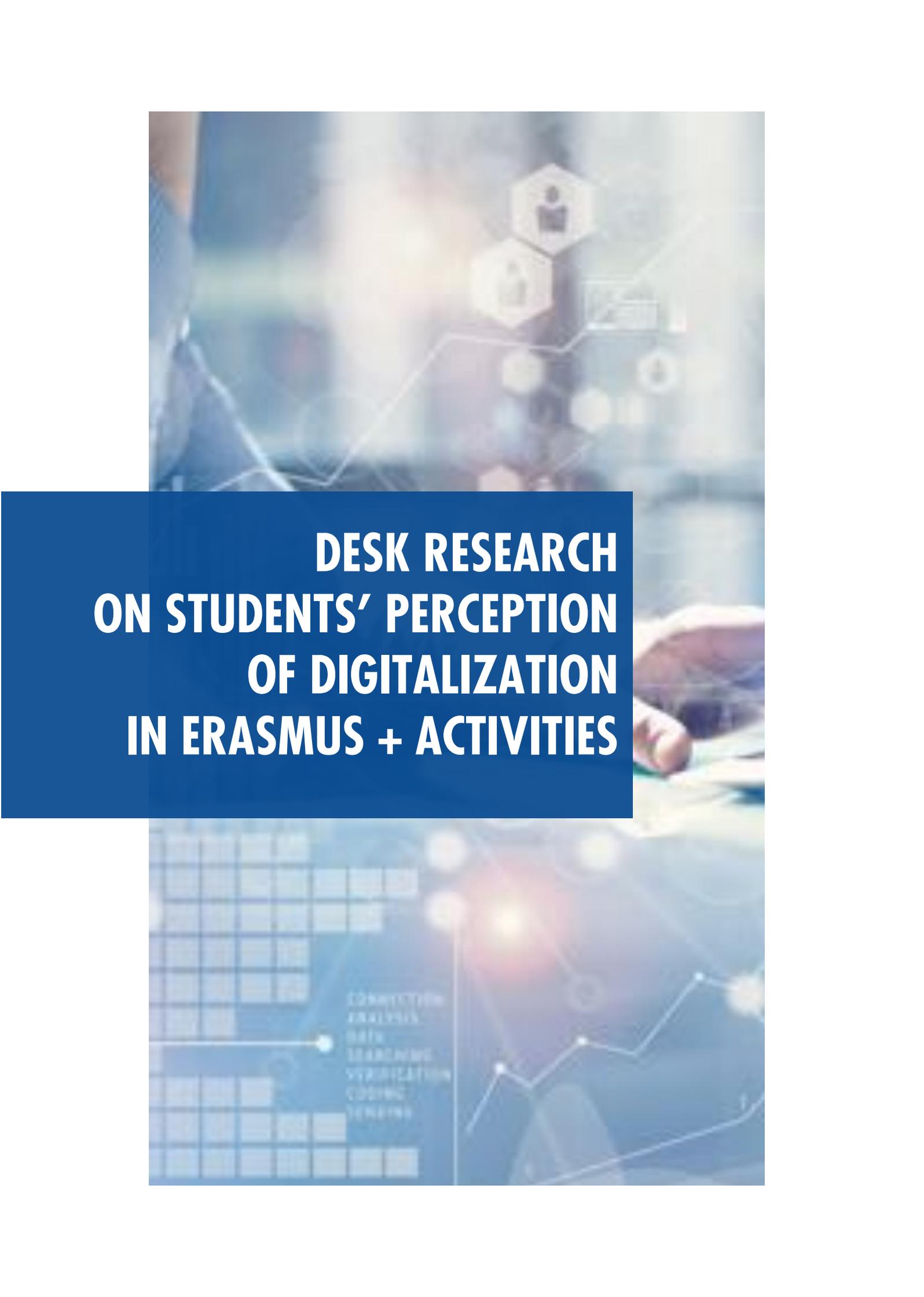
1.4. EXPECTED IMPACT

The implementation report it has been developed in a collaborative manner with the partner institution as a tool for improved evidence-based decision-making and policy formulation. A special attention will be paid the highlights of program implementation, including developments regarding technical infrastructure, data security and privacy policies. Furthermore, for each partner's experience a brief description of the digital starting point of that partner was reported before the implementation of the whole SUDTE project. The highest expected impact of such recommendation report is for HEIs, NAs and organizations that will be working on digitizing their Erasmus procedure in the future, and it makes sense to learn as many lessons as possible, so that mistakes are not repeated in future projects. Therefore, all interested universities would more effectively design and execute their implementation strategies based on the report which will be serving as a pilot with all relevant aspects.

The general impacts of project implementation are also related to increased digitalisation, modernization of HEIs and EU standardization of mobility management. This strategic partnership enabled a meaningful, project-oriented, and policy-relevant exchange of know-how between the participating institutions. Moreover, it spreads that knowledge to other individuals and institutions through a series of project outputs in which new content can be developed for the interested stakeholders.

1.5. TRANSFERABILITY POTENTIAL

The main goal of this report is to develop recommendations that can be used by the HEIs at program countries and the National Agencies to work together to implement the ESCI successfully and make information on Erasmus without Paper procedures broadly available. Documenting practices and procedures that led to implementation successes, and making recommendations ensures that the lessons learned during the implementation phases are not forgotten. The report aims also to serve as a guide for any organization who are thinking of modernization the way they handle the management of their processes to cope up with digital era.



**DESK RESEARCH
ON STUDENTS' PERCEPTION
OF DIGITALIZATION
IN ERASMUS + ACTIVITIES**

2. DESK RESEARCH ON STUDENTS' PERCEPTION OF DIGITALIZATION IN ERASMUS+ ACTIVITIES

2.1 BENEFICIARY EXPERIENCES: EVIDENCE FROM ITALY, SPAIN, AND TURKEY

This research arises from the idea that digitalization has potential to disruptively change the Higher Educational Institutions. For this reason, the present study, prompted by SUDTE project' Intellectual Output 3, aimed to map the degree of acceptance and perceived usefulness of technological tools related to Erasmus+ tasks, from students' perspective. These crucial issues have been overlooked by European Union and National Agencies for a long time, and such condition hindered the implementation of smart technologies across universities environment. Into the twofold purpose to boost ESCI realization and to achieve Erasmus Without Paper (EWP) standards, we wanted to give an early evidence on the willingness of European students to integrate, use and standardize technologies when they face the wasteful procedures about all the Erasmus+ processes. Overall, our desk research on European students "Students' early intentions to implement digitalization for Erasmus+ activities: evidence from Italy, Spain, and Turkey" shed light on the necessity for Italian students, in average, to be more confident and skilled with digital tools, despite a good digital background that also has been improved starting from COVID-19 pandemic period.

Considering the complexity of the topic, we integrated two important theoretical frameworks. First, we rely on Technology Acceptance Model 3 (TAM3) as implemented by Davis et al. (1989) which offers theoretical basis to interpret the level of technology acceptance by users, understanding at an earlier stage the propensity to change information systems, and allowing to organizations' top management to intervene at an embryonic implementation stage. TAM 3 indicates as relevant dimensions to interpret technology acceptance the *perceived usefulness* (PU) and the *perceived ease of use* (PEOU). As for *perceived usefulness*, it represents the expected degree of increasing efficiency in internal administrative workflows when organizing Erasmus+ mobilities both by the European Commission and HEIs, thanks to the introduction of a new technology. It is therefore possible to understand the benefits in terms of improving the quality of the working environment and the routines as perceived by the end-users (Davis, 1989). As for the *perceived ease of use*, it can be understood as the level of difficulty perceived by the student in relation to using new digital tools.

Evenly, we rely on the Unified Theory of Acceptance and Use of Technologies (UTAUT) to give a wider perspective and to mitigate the chance of not observe the hidden dynamics of digitalization processes.

UTAUT is based on eight theoretical models of IT adoption (i.e., *perception of external control, computer self-efficacy, job relevance, output quality, results demonstrability, effort expectancy, performance expectancy, social influence*) and is acknowledged as one of the predominant and most comprehensive models addressing the understanding of innovative technologies adoption (Dwivedi et al., 2019; Salloum and Shaalan, 2018; Ooi et al., 2018). Literature shows that UTAUT explains up to 70% of the variance of the behavioral intention to accept a new technology (Teo et al., 2015).

We used a Likert-based questionnaire (Likert, 1932) based on such theories to gather data across students from Italy, Spain and Turkey. Such nations have been involved in this analysis since they are country-constituents of SUDTE partnership. The questionnaire was composed by 26 questions related to the above-mentioned theoretical constructs. Further 16 questions are included in the survey to collect information about age, gender, previous Erasmus+ experience, nationality and HEI belonging as well as further required questions related to SUDTE project (i.e., question on technical infrastructure, on data privacy, and legal issues). Hence, overall, A total of 42 questions have been asked via our questionnaire. [Appendix A](#) provides the full questionnaire utilized in this study. The questionnaire was disseminated among European students at HEIs of SUDTE partners countries (i.e., Italy, Spain, Turkey). They have been contacted via their personal emails and thematic groups on social media (e.g., Facebook). We also reached students exploiting lectures and didactics activities. For such circumstance and also for the nature of the very “open” questionnaire, we were not able to calculate an exact response rate. However, a total of 320 students received the questionnaire and coherently with previous studies (Kim, 2016; He and Freeman, 2019), we reasonably rely on such overall number of interviewee. [Appendix B](#) explains main features of our sample composition.

Overall, our results demonstrated that students in Italy, Spain and Turkey are strongly prone and intentioned to substitute paperwork with digital tools. This early evidence holds homogeneously in the three analyzed country making our analysis reliable. Moreover, we identify *performance and effort expectancy, social influence, and output quality* as main predictors, among others, of students’ intentions to use digitalization process. Our study made it possible to reveal on one hand interesting insights that allow us to offer a real contribution for implementation of SUDTE project, while on the other hand main findings constitute a basis for awareness of the topic among pivotal institutions (e.g., EU, HEIs, NAs). In fact, our outcomes might contribute to

operational planning aimed to technologies implementation and training strategies within institutional levels, particularly within the context of High Educational Institutions or other similar organizations. Also, HEIs can implement better-informed training schemes about digital tools in line with students' expectations. However, our analysis is not without limitations. Firstly, our model examines the readiness to full- digitalization in Erasmus+ before the final stage of the phenomena. The study, in fact, examine the perceptions of students before they start to fully using the technology. Future studies could broaden our findings using a longitudinal approach measuring students' perceptions before and after digitalization across universities. Also, our sample is limited to students from Italy, Spain, and Turkey. Thus, future studies could investigate this topic across a broader settings and more countries, as well as extend the analysis also to further categories of interviewees, such as International Relations Office (IRO) staff, teachers and trainers.



INSTITUTIONAL EXPERIENCES (HEIs)



3. INSTITUTIONAL EXPERIENCES (HEIs)

3.1 DASHBOARD USER: EXPERIENCE FROM UNINA

3.1.1. Starting point before SUDTE project

Since 2014 and even more after the recent crisis from COVID-19 pandemic, the University of Naples “Federico II”, as well as many other HEIs across Italy (e.g., University of Bologna, University of Rome “La Sapienza, University of Palermo, University of Marche) implemented many ICT tools for supporting the online teaching activities (i.e., Moodle and Microsoft Teams) and remote working for administrative staff. Such circumstance led to a good starting point before the implementation of SUDTE project, whereas such HEI has not suffered the disruptive change that SUDTE project goals tries to bring across Europe. More strictly related to Erasmus mobilities, the University of Naples “Federico II” tried to achieve the complete dematerialization of documents, files of procedure connected to the Erasmus+ Experience, thanks to the EWP Dashboard system, a free tool for higher education institutions which need to manage Erasmus+ mobility students but at the same time lack the capacity either to develop their own systems (e.g., in-house system) or outsource them (e.g., through 3rd Party providers - 3PPs) to integrate the Erasmus Without Paper system policies. However, such tool implies, a manual updating on excel files, that might be prone to several impeding errors. For this reason, starting from 2022, UNINA has been beginning to use a 3rd party provider, that is CINECA, to manage part of the activities related to Erasmus mobility. Since the implementation of this support is very recent, we can consider this assistance as still “experimental”. As we write, a part of international student mobility modules may not be object of the external provider and hence still exist excel files via EWP Dashboard. Thus, we can consider such management tool for Erasmus mobility as a hybrid that allows a next step to the full digital commitments about Erasmus mobilities. With the 3rd party provider, UNINA believe that it will be able to satisfy the needs that previous system required.

3.1.2. Internal communication and commitment from the top management

In 2014, when Erasmus+ program started, the top management of UNINA was intentioned to fully implement a digital tool to manage Erasmus flows, that were expected to be ever greater since the disruptive change that such program brought for student mobilities across Europe. At that historical moment, there were three options to follow this aim, that are, *in-house* system, the *EWP dashboard*, and the management through a third-party provider. The choice fell on the EWP dashboard solution, that looked the

most balanced alternative between the economically dispendious providers (i.e., 3PPs) and the *in-house* system that seemed difficult to implement since at the beginning it would have required a great time-consuming activities among IRO staff and UNINA IT teams. In fact, the EWP Dashboard is a free tool for higher education institutions that need to manage Erasmus mobile students but lack the capacity to develop their own systems to complement the Erasmus Without Paper system. For all the institutions that follow this system, the EWP Dashboard provides HEIs with the functionalities they need to manage Erasmus students flows processes and to connect with partners via Erasmus Without Paper. Also, another reason for which top management previously chose the EWP dashboard is that such tool also connects to the Erasmus+ mobile app, enabling interaction with incoming and outgoing students directly through the app alongside other services relevant to higher education institutions. However, the essential commitment of the top management it was not enough to follow this choice. This is because the EWP dashboard requires a great engagement of the whole staff by international relation office. Indeed, once a master account is validated on this platform, following the HEI appointment for EWP dashboard, many individual accounts to manage the Erasmus procedures are created as needed for the internal use, based on specific management structures. Hence, UNINA that counts for a great number of IRO members and IT team members, needed – at that moment – of a great *bottom-up* support to enter in Dashboard system. Overall, since UNINA utilizes the dashboard system, it seems to have been essential non only the commitment of the upper management but also the commitment of the IRO staff, since is ever more important for sustaining the dashboard system as changes and updates in the EWP system will require constant staff training of the software implemented. Furthermore, the top management is playing a pivotal role in the definition of Erasmus flows organization, since UNINA as whole is facing a further change given that – as earlier mentioned – starting from 2022, UNINA resort to a third party (CINECA) part of Erasmus mobility management, although such integration is still not fully achieved.

3.1.3. Data privacy and legal issues

Regarding data privacy, legal issues, and the whole safety of the network, to use the EWP Dashboard, it is necessary to create a master account for each university/higher education institution. Only institutional email addresses will be accepted, and such accounts are validated by the ESCI Service Desk. For this reason, it is much safer than sending documentation by email or post, that could be externally damaged. The EWP dashboard takes reasonable

measures to protect student information from unauthorized access or against loss, misuse, or alteration by third parties. All connections to the Erasmus Dashboard are encrypted and authenticated via a digital certificate. Encryption is also used in the links circulated through the email notifications.

The EWP Network is strictly a middle layer solution where no information exchanged among the parties is ever stored. It follows a hub-and-spoke design, where the only centralized service is a registry that contains the identification data of the various members' servers and the list of APIs (the connectors) implemented on each member's server.

A university server wishing to initiate a data transaction consults the identification data of the concerned partner in the registry and sends a data package directly to the receiving server via the relevant API. The data package is encrypted according to EWP-defined standards ensuring the communication cannot be accessed by other parties; this guarantees high levels of security and privacy. Each server takes care of the authentication and user rights of its own users.

However, the Erasmus Dashboard is a powerful tool designed to help higher education institutions manage the exchange students' documentation. Hence, it is natural that these mobility management processes entail access to personal data. However, the EWP dashboard system supports and ensures the highest level of compliance with the General Data Protection Regulation (GDPR) 2016/679. The Erasmus Dashboard and Online Learning Agreement (OLA) system for students are designed to be compliant with GDPR and the compliance is also reflected in the Terms and Conditions and Privacy Policy, which give more detailed explanations about the information that the dashboard stores, how it is collected, what it is used for and with whom it is shared.

Based on this, all actors involved in the functioning of the dashboard take the principles of data protection, accuracy, storage limitation, accountability, data minimization, purpose limitation, lawfulness, fairness and transparency at its core.

3.1.4. Technical infrastructure and digital tools

Considering the extant technical infrastructure of UNINA, the choice fell on the use of the dashboard to create a unique and easy-to-read approach for all partner universities that could already exploits the previous hardware and software owned by UNINA. The EWP platform fully complied this aim, given that the implementation of the Dashboard requires only the free public infrastructure provided by EU and does not weigh on the costs of HEIs. Also,

since the dashboard is "cloud-based", no installation or particular configuration is required, and thus extant IT material it has been used.

The main objective was to optimize and simplify processes, but above all to improve communication between IRO staff from different HEIs. However, the use of the dashboard has not proved to be an optimal choice as the expectations have not always been met, sometimes the excessive simplification of the processes implied the elimination of important information that sometime required to be offset by paper material as for integrate.

3.1.5. Trainings office staff, coordinators, and students

At the beginning of the implementation of the dashboard, UNINA perceived with great expectation and excitement for this new platform that would simplify and speed up the processes without counting the innumerable economic savings and ethical approach that it developed through the socio-environmental policy deriving from the standards EWP extension.

Since the dashboard system was implemented, both the IT Team and IRO staff held several meetings and workshops together to understand the main features and issue related to the EWP dashboard. Furthermore, additional training and meeting have been done to integrate the relevant and important information that have been initially provided by training EU websites (i.e., <https://esci-sd.atlassian.net/wiki/spaces/DASH/overview>; <https://erasmus-plus.ec.europa.eu/european-student-card-initiative/ewp>).

Lastly, trainings that have been organized mainly for coordinators and students concerned the Erasmus+ App, rather than the functionalities of the EWP dashboard.

Overall, the staff is always attentive to new approaches and to enrich their skills intended as always new stimuli. Unfortunately, the platform has not always lived up to the needs of the IRO staff, as noted by the National Agency. Most likely, given the size of the university in terms of ingoing and outgoing students, the management of mobility through the dashboard still required a high level of expertise which was only achieved at a later stage and not immediately. In any case, the initial digital skills relating to the IRO staff allowed for linear integration which was achieved quickly and made it possible to obtain the benefits deriving from the almost total elimination of bureaucratic procedures through the use of paper.

3.1.6. Advantages, Disadvantages and Good Practices

The main advantages deriving from the use of the EWP dashboard can be found in the incomparable management and optimization of time.

Furthermore, the approach to the platform is generally user-friendly, even if a long training activity was needed at the beginning and even today the staff continues to update and interface both with the FAQs for the resolution of minor problems, which have proven to be and continue to be invaluable, and with IT team personnel who are more skilled and more sensitive to the more complex issues that can arise.

Another advantage of the EWP Dashboard is that it also connects to the Erasmus+ Mobile App, allowing interaction with the incoming and outgoing students directly via the App, thus avoiding paper flows and endless emails that slow down response times and staff productivity which manages Erasmus mobility.

Furthermore, further advantages of the EWP Dashboard are:

- 1) the ability to "get started quickly" since the dashboard is "cloud-based", meaning no installation or configuration is required.
- 2) the replacement of paper-based workflows with a digital one. Administrative practices in Erasmus are still largely paper based. EWP stands for a digital workflow that leaves no university behind tackle the administrative workload for students and staff.
- 3) The use of a free public infrastructure which does not weigh on the costs of HEIs which would be higher if you wanted to use an "in-house" platform or entirely outsource Erasmus practices to a 3rd party provider.

Nonetheless, difficulties continue to be encountered mainly related to the different speed of movement between the universities that sign the Erasmus agreements. In fact, for better management it is essential that these HEIs have the same responsiveness and file processing capacity on the same platform. Evidence from the UNINA IRO staff suggests that very often it happened that one of the two universities involved in Erasmus agreement was active on the platform whereas the other was not: this circumstance generated a huge workload that tripled when compared with the old and obsolete paper-based system. In fact, sometimes, in the case of bilateral agreements, the agreement has not been successful, not only for reasons of technical malfunctions, but also for the loss of time deriving from the lack of activity on the university dashboard. In these circumstances, it happened that the procedure was completed with the old paper supports. Therefore, at the moment the management of Erasmus practices cannot be said to be "fully-digital", despite UNINA's commitment to optimize and completely dematerialize these activities.

3.2. IN-HOUSE USERS: EXPERIENCE FROM IZTECH

3.2.1. Starting point before SUDTE project

IZTECH started receiving Outgoing Erasmus Student Study Mobility applications through an online in-house system designed by its IT personnel in 2016 to save time and paper. Applications for Outgoing Student Placement Mobility and Outgoing Staff Mobility (both administrative and academic staff) were received through software purchased in 2016. Due to the high number of Outgoing Erasmus Student Study and Placement Mobility applications, and to the overlapping situations of the two mobilities, the idea of creating a Joint Online In-house Study and Placement Mobility Application System emerged in 2019, and the works towards creating one started in 2020. IZTECH's IT Team and International Office Staff held a series of meetings and workshops together to design a relevant system which could meet the International Office needs. CGPA's (Cumulative Grade Point Average) of the Applicant IZTECH Students were retrieved from the system automatically thanks to the integration of the in-house system with the IZTECH SIS (IZTECH Student Information System). The in-house system checks the eligibility of the student applications and eliminates the ones that do not meet the application prerequisites. In this way, ineligible applications are not included in further steps such as placement. The International Office Staff authorized as system administrators has access to the system so as to control the irregular cases such as applications of students having no IZTECH CGPAs. The Administrator enters these grade averages into the system manually with reference to the Transcript of Records (ToRs) of the students. IZTECH's online in-house system has Erasmus Student Study Mobility Application Module, Erasmus Student Placement Mobility Application Module, Ranking Module, Study Mobility Placement Module, Inter-institutional Agreement Module, Coordinator Assignment Module, Foreign Language Proficiency Exam Module, and Reports Module. It is also planned to add Student Grant Distribution Module to the in-house system. Our work on the EWP integration of the in-house system is about to be completed.

3.2.2. Internal communication and commitment from the top management

IZTECH has been using an in-house system to accept student applications to Erasmus+ since 2016. IZTECH is one of the few HEIs in Türkiye that have been using an online application system produced by the IT department of the institution to receive and manage Erasmus+ mobility applications. IZTECH has

joined the SUDTE project with the full support and commitment of the upper management as the only institute of technology in Türkiye, our aim is to be a frontier in digitalization and information technologies. In terms of administration International Office (IO) works under the guidance of the Advisor to the Rector on Internationalization (Prof. Dr. Volga Bulmuş) while IT department works under the Vice Rector (Prof. Dr. Serdar Kale). Therefore, internal communication meetings had to be conducted with all parties involved. One setback for the SUDTE project outputs arose when the National Agency of Türkiye decided that all Erasmus+ applications from students had to be completed through a central system (<https://portal.ua.gov.tr/>). This development led to the belief that the in-house system for our HEI will be obsolete since collecting Erasmus+ applications was the main purpose of the program. This has led to some internal miscommunications between the IT department and IO and resulted in a delay in starting the development of necessary APIs. As of today, the Turkish National Agency has announced that in-house systems can be integrated into the national portal but IZTECH has not started this project yet so for the upcoming year we are planning to collect applications using two different software. Another setback arose due to significant changes in the economic dynamics of Türkiye after the COVID-19 pandemic. COVID-19 pandemic resulted in an explosive demand for software developers in Turkey, as a lot of local businesses observed a significant increase in revenue due to online sales and decided to invest in digital infrastructure. In addition, as working from home became more normalized for international companies, Turkish software developers became very attractive due to the low cost of living in Türkiye. As a result of these developments, three (out of four) of the software developers in the IT Department working on the SUDTE project have quit their positions in our institute and started working in the private sector. Since it is not possible to complete the integration of our in-house system to the EWP network with one software developer (that also has other institutional duties), we got help from the computer engineering department in our HEI. Assoc. Prof. Dr. Tuğkan Tuğlular and Assoc. Prof. Dr. Tolga Ayav have joined our project and completed the development of the software but testing and connection still required help from the IT department. While our project had full support and commitment from the upper management, some unforeseen problems could not be avoided. Overall, the commitment of the upper management is essential for sustaining the in-house system as changes and updates in the EWP system will require constant maintenance of the software developed.

3.2.3. Data privacy and legal issues

Submitting application documents (application form, transcript, etc.) through the application portal is much safer than handing them in physically or submitting them through e-mail. Security measures are taken in the Erasmus+ Application process and Servers (application server and the database) to protect the student information against unauthorized access or loss, retention, or alteration by third parties. Exemplary security measures are as follows: system login via LDAP, not allowing unauthorized users to enter the system, defining the digital certificate (SSL Certificate) on the servers, etc.

During the application, we ensure that the students' education and contact information are transmitted through the Student Information System (ÖBS), preventing the student from entering the information in the wrong place or entering wrong information. Thus, we ensure that the information entered is accurate. The following data types can be exemplified for these student information: the student's GPA, faculty, department names, class, advisor name and surname Information, education degree (bachelor, MSc, DR), compulsory internship, etc.

To enable legal information submission and to enable the sharing of the information according to the Personal Data Protection Law in Türkiye (KVKK), we obtain online approval from the students. The information shared includes documents regarding the effect of disabilities and all other information entered into the application form online.

3.2.4. Technical infrastructure and digital tools

The EWP software is developed in-house and is built on the Microsoft.Net architecture, Entity Framework, and C#. The asynchronous programming approach is used to create APIs. The C# packages are designed using the Model-View-Controller paradigm. For coding, building, testing, and generating deployment packages, the most recent stable version of the Microsoft Visual Studio integrated development environment is utilized. Version control is handled using the GitHub repository. The information is kept in the most recent stable version of Microsoft SQL Server, which serves as a database server. The program operates on the most recent stable version of Microsoft IIS Server on a virtual server with 8 core CPU and 16 GB RAM. The Microsoft Performance Monitor is employed to track performance issues. The EWP validator is utilized for API conformance checking. Logging facility is integrated to the in-house EWP software to record events and operations.

3.2.5. Trainings office staff, coordinators and students

IZTECH's IT Team and International Office Staff held several meetings and workshops together so as to establish the in-house system. Since the in-house system was designed together with the IT Team and the International Office Staff, no additional training was required for the Office Staff. Training will be organized for Coordinators and Students as soon as the integration of the in-house system into EWP is completed.

3.2.6. Advantages, Disadvantages and Good Practices

Firstly, using our own in-house system is fundamentally very user-friendly since it is designed together with our IT department and International Office taking into account the International Office personnel's needs. It is also cost-efficient since we did not have to purchase any software from a third-party provider. Updating the system according to our needs and National Agency's new regulations is quite easy since we can communicate with our IT Team, and we get fast results.

Integration of the in-house system to EWP is not completed yet. Only IIA and OLA connection is achieved. We have still difficulty connecting to the other services of EWP.

3.3. 3rd PARTY PROVIDERS USERS: EXPERIENCE FROM SELÇUK UNIVERSITY

3.3.1. Starting Point before SUDTE Project

Selçuk University has started to follow the developments in Europe on the digital transformation of Erasmus+ mobility management carefully since 2019 and has participated in various meetings on this subject. In this context, the representatives of Selçuk University, who came together with the managers of the EWP project, started initiatives to promote digital transformation projects such as EWP and ESCI in Turkey. Experts from IRO of Selçuk University who discussed the issue in detail with the university top management and the Turkish National Agency; they reported that digital transformation in Erasmus Program should be considered in terms of technical structure, required workforce profile, administrative processes, economic requirements, and sustainability strategy. In particular, the fact that integration into the EWP network is a very complex process has made it important and necessary to determine which of the proposed scenarios for connecting to EWP is preferable at the institutional level. In this context, a comprehensive planning

has also been carried out in which the functioning of the EWP network, the roles, and responsibilities of the stakeholders in the university such as top management, institution coordination, information processing, who will be involved in the process of connecting to the network, are discussed.

As a result of these studies, Selçuk University IRO organized the first Digital Erasmus Workshop on September 30, 2019, with the participation of 33 different Turkish universities at Selçuk University with the support of Turkish National Agency and European University Foundation which is designer of EWP and ESCI projects. In this Workshop, issues such as how universities should be integrated into the EWP structure, the steps to be followed in the process, the responsibilities of stakeholders, technical and legal requirements were discussed in detail. In this way, while increasing the awareness of many universities throughout Turkey about the EWP transformation process; in the light of the information and sharing obtained from these universities, it has also been found that connection to the EWP network is associated with managing a wide variety of problems and processes.

3.3.2. Internal communication and commitment from the top management

The process of connecting to the EWP network requires a digital transformation process based on highly complex process management and requiring multiple stakeholders to act together within the university. By the announcement of the EU Commission about the roadmap for the digital transformation in Erasmus+, Selçuk University has taken the necessary actions immediately and started to implement the EWP standards almost in the earliest time possible. In this context, the top management of the Selçuk University was informed about the digital transformation of the EWP and the participation support of the IRO staff in various meetings on the EWP was provided. With this support, while awareness was formed within the organization, it was also possible to determine the requirements of the EWP digital transformation process. With the approval and support of the top management of university administration, stakeholders within the institution were brought together and the university top management was enabled to take action decisively for the technical and administrative requirements necessary for the EWP connection.

Several reviews have been conducted to determine which one should be preferred between the Dashboard, 3rd Party Service Provider and In-House systems that can be used to connect to the EWP network. After the connection scenarios to the EWP network were discussed in detail, it was decided to connect Selcuk University to the EWP network through a 3rd Party Commercial Service Provider (KION), to which the university has already

purchased the license rights and been using it for more than 8 years. It is worth noting that a number of factors are decisive in this choice. The fact that Selçuk University is one of the most populous universities in Turkey and this increases the workload of the university's IT team quite a lot. It causes them to have enough time to carry out the process of connecting to the EWP network. The difficulties in providing the software language and technical processes required for the EWP network by the university IT team have been another determining factor. In addition, there are determining factors such as the fact that the KION program has been taken in advance, the IRO staff has experience in the program, the number of outgoing and incoming students, and the integration of the KION to Selçuk University Student Affairs System. In this context, the documents required for connecting to the EWP network were approved by the university top management, a legal application was made and the software company was approved to start the connection processes under the supervision of the Selçuk University IRO. Signing a contract with the KION including the API implementation steps, durations and costs was one of the most important steps as it set out the framework of the digital transformation. This process is followed by IT integration seamlessly, several online trainings and functionality tests with partner institutions. Another important step was to get connected to the Edugain which has been done by the IT Department of SU. The situation where we are now is making us to be able to process the following digital features:

- Authentication and Identification
- Factsheets
- Interinstitutional Agreements
- Online Learning Agreement
- Nominations

The further implementations will be carried out once the existing features work without a hustle and the EU commission's announcements to do so.

The use of an automation system supported by technological developments allowed Selçuk University's transition from manual to digitized workflows even before the launch of Erasmus Without Paper in 2019. For example, the software has already been connected to the Student Information System (SIS) of our university. That made it easy to gather necessary information of the participants internally and helped with the authentication and identification issues and contributed to the "Paperless Erasmus" motto.

To sum up, getting connected to the EWP Network did not require a lot of technical effort for the IRO staff at Selçuk University. This was mainly due to the readiness of Erasmus Office at SU to adapt the digital changes. Of course, everything comes with a price. Compared to the other means of digital

transformation, using a 3rd party service provider was little more costly and more importantly it makes your institution to be more dependent on the third-party provider. This means that whenever an update is required for the implementation, you must accept the invoice issued to you by the company. Otherwise, you cannot proceed with the latest technology because they have control of the system. Since the EU Commission will make the digital transformation mandatory, you will have no other option but to obey with what the 3rd party service provider requests.

3.3.3. Data privacy and legal issues

Erasmus+ Program is carried out through a process that transfers the data of institutions and individuals who want to benefit from mobility to the other institutions. As a result of this process, various legal regulations have been made for data sharing between higher education institution all around Europe. The sharing of data generated in Erasmus mobility is regulated by the General Data Protection Regulation (GDPR), which has been implemented throughout Europe, as well as by institutional regulations. In Turkey, this situation has also been regulated by the Law on the Protection of Personal Data (KVKK). Today the legal regulations in force in HEIs in Europe and Turkey being updated for various reasons resulting from the digital conversion process or need to be updated. Due to issues such as validity of digital signatures, data sharing and recognition, various problems are experienced that cause disruption of digitalization processes.

The data belonging to the beneficiaries of the Erasmus Program, which were protected and stored by higher education institutions prior to the EWP transformation process, are subjected to different storage and security applications according to the method of connecting to the EWP network in the new period. Selçuk University, which is connected to the EWP network with the 3rd Party Service Provider, processes and stores the data of the beneficiaries of the Erasmus Program in its own database and share with the service provider's database. The 3rd Party Service Provider transfers the data collected from the university database to the corresponding institutions via the EWP network and processes all data related to this process in accordance with the rules of KVKK and GDPR. Moreover, the beneficiary information is prevented from being lost or not transmitted in the processes of the old period, such as mail or fax. In addition to this, in accordance with corporate procedures prior to the EWP, the data printed out as paper were prevented from being seen or seized by unrelated people within the institution. In the case of Selçuk University, both Dashboard and 3rd Party Service Provider experiences have shown that digital signatures are positive developments in

terms of data security. Employees who are not authorized within the IRO also do not have the opportunity to access beneficiary information, sign documents or send them to the other institutions. In this sense, the integration process into the EWP network has introduced an international standard in the processing and protection of data generated during the Erasmus mobility management process.

3.3.4. Technical infrastructure and digital tools

The main reason for working with the 3rd Party Service Provider for Selçuk University was the acquisition of Erasmus mobility management software from KION in 2011. The right to use the software and the integration of the university student affairs software into KION are also among the decisional factors in making this decision. In addition, the fact that Selçuk University has an intensive IT workload and the lack of sufficient technical personnel within the IRO are among the factors that led to the EWP integration being performed by the 3rd Party Service Provider.

The use of 3rd Party Service Provider which is specifically built for Erasmus Program has been supported by the top management of the university although moving to another service providers has sometimes been a topic of discussions due to its cost and functionalities it provides. To give a brief information about the system, student, and staff mobilities are divided into two separate menus as outgoing and incoming in the KION software. The information about the student and staff is grouped in different tabs (personal information, student information, contact information, documents, grants, and payments, etc.) and the documents are followed up by the office staff using these menus. The system calculates the student's Erasmus grants, processes Erasmus applications considering the pre-determined definitions like quota, language threshold, min transcript grade, etc.) and allows tracking the mobility processes of the participants.

The use of an automation system supported by technological developments allowed Selçuk University's transition from manual to digitized workflows even before the launch of Erasmus Without Paper in 2019. For example, the software has already been connected to the Student Information System (SIS) of our university. That made it easy to gather necessary information of the participants internally and helped with the authentication and identification issues and contributed to the "Paperless Erasmus" motto.

3.3.5. Trainings for Office Staff, Coordinators and Students

When we consider the EWP digital transformation process on the example of Selçuk University, it is possible to say that there is a significant differentiation in the digital skill levels of the related units. Although it is observed that digital skills have generally reached a certain level, the EWP digital transformation process requires some specific technical knowledge and digital skill level. In this context, people who will manage student or staff mobility are requested to use EWP digital platforms. Hence, it is necessary to be familiar with the conceptual directory of the Erasmus program, its logic, and their workflows on digital platforms. Within this logical framework, IRO Staff, department coordinators and beneficiaries, who are stakeholders of Selçuk University EWP digital transformation process, have been provided information meetings and trainings at various levels in the form of pilot groups. It has been observed that students identified as digital natives comprehend and use the use of EWP digital platforms more quickly in these training processes. IRO staff's mastery of the functioning and conceptual logic of mobility management has made it easier for staff to use EWP platforms. The trainings to be given on the use of the EWP network should be given in different ways and methods according to the digital knowledge and skill levels of the target groups. For example, while a large-scale webinar is sufficient for students with high digital skills, it has been found that it is beneficial to provide practical trainings in small groups for department coordinators who can be defined as digital immigrants. In addition, it is useful to convert the training materials into user manuals and share them with the actors involved in process management by the Erasmus Institution Coordinators.

3.3.6. Advantages, Disadvantages and Good Practices

In the process of digital transition, KION software struggled when providing service to its customers at some points compared to other service providers in terms of ease of use. The company has launched software updates to close this gap and has made various improvements to the interfaces. In this regard, regular updating of the software has caused a number of glitches and delays in the EWP integration process. In addition, the company, which has started to provide services to many universities in the Turkish Sunday with the start of the EWP transformation process, is experiencing various difficulties in complying with the calendars determined in the connection processes due to the increasing work intensity. In terms of cost, KION, which makes price updates at various levels, incurs extra costs to higher education institutions for connecting to the EWP network and Erasmus process management. The fact

that only two companies operate in this field in Turkey and have the authority to integrate EWP prevents competition in the sector, while economically it brings with it the danger of making higher education institutions dependent on 3rd Party Service Providers. KION, which provides information and training opportunities to the universities it serves regarding the EWP digital transformation process in various meetings, has gained the opportunity to listen to the demands and complaints from its customers. " - Good notification system to inform when there is a communication error.

It is worth mentioning the advantages of the system in terms of interinstitutional agreements (IIA) and learning agreements, which are the most basic documents of Erasmus student mobility. It is possible to list the benefits of the IIAs module in this digital transformation process, the KION software used by Selçuk University, as follows:

- When modified an IIA, the changes are easy to identify
- Existing links with the University databases such as SIS and Unit Tree
- Pre-defined user accounts
- History record feature that allows tracking the flow of the changes at the IIA
- Allows the transfer data to/from Erasmus Mobility Application system
- Changes in the official IIA template is followed by the 3rd party provider
- Handles agreements with several subject area codes inside one and the same cooperation condition
- User-Friendly Interface

Learning agreements that were transferred to the online platform were named OLA in the new process. We can list the examples of good practices experienced by the Erasmus staff of Selçuk University when using OLA using the KION 3rd party software:

- A new LA can be created by the KION without entering from other platforms
- Approval or rejection including comments should be visible for student
- Provides a good overview of learning agreements and its status
- Mobility types from the template (Long-term physical mobility (with an optional virtual component), Short term blended mobility (with a compulsory virtual component) and Short term doctoral mobility (with an optional virtual component) should be supported.

To summarize, although there were some difficulties in connecting to a third-party service provider called KION, the establishment of the technical infrastructure prepared by the software developer did not create a workload for Selçuk University in terms of business practices. It can be said that out of all three means of connection to the EWP network, it is the costliest one. However, once the technical problems solved which does not seem very far, it

is clear that the users of the software will take advantage of the benefits it provides.

3.4. 3rd PARTY PROVIDERS USERS: EXPERIENCE FROM UVIGO

3.4.1. Starting point before SUDTE project

For some years now, the University of Vigo has been immersed in a digital transformation project that has as one of its first objectives the elimination of paper in all administrative processes. Thus, in recent years, an electronic registry and an electronic office have been implemented, allowing all the exchange of documentation with the university to be carried out in digital format. With this objective in mind, in recent years all administrative procedures have been redefined and adapted to eliminate the use of paper.

The COVID-19 pandemic and the initial confinement of the Spanish population to their homes for approximately four months, gave an important boost to this digitization process, also covering teaching activities. Thus, the University of Vigo put into operation in record time a digital twin of all the physical facilities of the University, which was called Campus Remoto. This digital twin replicates each and every one of the physical spaces existing in the university (buildings, classrooms, offices, laboratories, meeting rooms, etc.), which meant that teaching was not interrupted and could continue to be taught through this tool, synchronously and respecting the same schedules as those defined for face-to-face teaching.

In this digitization process, as could not be otherwise, the International Relations Office of the university could not remain on the sidelines, since the workload was increasing due to the constant increase in the number of incoming and outgoing mobilities linked to different mobility programs, although the one with the greatest workload was the Erasmus program.

Initially, the management of the mobilities was done completely manually with the only help of office tools (mainly Excel and Access). In a second step, the learning agreements were computerized through the academic management tool available at the university, called Xescampus. This computerization allowed both the automatic management of the records of outgoing students and the inclusion in the records of incoming students. However, there were still time-consuming tasks to be computerized, such as the payment of scholarships for outgoing students and also the agreements with the universities from which we received students and/or sent students.

Approximately two years ago, we began implementing the MoveOn tool to automate the agreements with other universities and also the payment of scholarships to outgoing students. MoveOn also offers support to the EWP

(Erasmus Without Paper), which makes it possible to establish and sign agreements between universities automatically.

The University of Vigo is currently implementing a new academic management tool, called SIGMA, which is expected to fully replace Xescampus in the academic year 2024/2025. Initially, it is planned to continue working with MoveOn, so it will be necessary to develop the necessary interoperability procedures between both tools.

3.4.2. Internal communication and commitment from the top management

The digitization plans of the University of Vigo were backed by resources of its own as well as support from public funding programs. The Ministry of Education and Vocational Training, for instance, has been offering subsidies since 2020 to public universities for the modernization and digitization of the Higher Education system. These aids are aimed at promoting investment in infrastructures, technological developments, and teaching innovation projects to improve academic resources in digitization; reduce the digital divide for academic staff and students; promote inter-university digital innovation projects of a strategic and interdisciplinary nature, and promote digital training, among other actions.

The IT department of the University of Vigo has been working hand-in-hand with the providers of information services under the supervision of its Chief Digital Officer, in order to achieve full and seamless integration with the in-house systems. A number of data migration and consolidation subsystems have been implemented.

3.4.3. Data privacy and legal issues

The University of Vigo worked extensively on the full compliance of its procedures (digital and non-digital) with the General Data Protection Regulation (GDPR) since this was approved in 2016, building upon the foundations set previously by national legislation. The process was decisively boosted by the exceptional measures mandated by the COVID-19 pandemic and the shift to telework and teleteaching. It can be said that data privacy and legal issues are not a technical issue anymore. However, it is still a challenge to make the administrative, teaching and research staff of the University fully aware of the norms, so that they do not incur in inadequate practice. To this aim, the authorities are promoting yearly programs to deliver specific training.

3.4.4. Technical infrastructure and digital tools

In general, the IT services of Spanish universities are not sized to be able to undertake the development of medium or highly complex software. In the case of the University of Vigo, the objective of these IT services is to keep the ICT infrastructures and the different IT systems operational, to analyze the requirements of new IT systems and to supervise the work of suppliers. For this reason, it is very common to purchase commonly used software systems from 3rd party providers (ERPs, electronic headquarters, etc.) and to contract 3rd party providers for the development of other more specific systems (university research production database, academic management tool, etc.).

In the case of the digitization of mobility management, the situation is no different. In a first step, it was decided to provide the academic management tool (Xescampus) with a module for the management of learning agreements, leaving for a second phase the automation of the signing of agreements between universities and the payment of scholarships to outgoing students (which continued to be done manually through Excel and a rather rudimentary Access database). More recently, following the good experience of many Spanish universities, it was decided to acquire and deploy the MoveOn tool, which also made it possible to computerize the payment of scholarships and, more recently, the automatic establishment of agreements with other universities, since MoveOn implements EWP. The MoveOn deployment process was quite costly and took much longer than initially planned. The main difficulty came from the need to transfer all the information available on paper, spreadsheets, etc. to this new environment. Now that the process is finished, the evaluation made by the International Relations Office of the university is very positive, due to the advantages of all kinds offered by having all this information digitized. Just to give one piece of information, at the time of initializing this process, the University of Vigo had more than 6,000 agreements with other universities.

At present, the process of integrating MoveOn with the rest of the University of Vigo's IT ecosystem is at a standstill while waiting for the new academic management tool SIGMA to be deployed. When the deployment of SIGMA is completed, it will be possible, automatically and without human intervention, that through MoveOn the incoming students will be able to enroll in the subjects they are going to take at our university and, on the other hand, it will be reflected in SIGMA that the subjects they are going to take at the University of Vigo will be registered in the new academic management tool, it will be reflected in SIGMA that the subjects of the University of Vigo in which

each outgoing student enrolled will be taken at the host university and that, therefore, the grades of these subjects will be those obtained by the student in the corresponding subjects taken at the host university, according to his/her learning agreement.

Currently, these developments have been outsourced to suppliers and this integration between tools is expected to be fully operational by the 2023/2024 academic year.

3.4.5. Trainings office staff, coordinators, and students

The staff of the IRO of University of Vigo have been key in order to achieve the current level of maturity. They have been deeply involved as end users of the tools intended to manage Erasmus+ mobilities, given the horizon that such tools will speed up their work significantly in the future (hopefully, already during the management of the mobilities for the 2022-23 academic year). Nonetheless, the process has been painstaking for them because their current workload is high all year round and the number of staff members is limited. Furthermore, they often have to try new user interfaces for which there is not yet sufficient, complete, and detailed documentation, and they are frequently puzzled by the technical jargon used during the troubleshooting stages.

Finally, it is important to highlight the fact that part of the IRO staff have non-permanent contracts, so they may leave their current positions in the future, despite the ample know-how that they have accumulated. The quality of the documentation and the streamlining of the processes are key to ensure smooth transitions, which falls under the responsibility of the IRO directors.

3.4.6. Advantages, Disadvantages and Good Practices

The staff of the University of Vigo have gathered substantial evidence that the digital transformation serves to attain improvements and savings. The SUDTE project brought a complete awareness of the importance of digitizing the activities of the International Relations Office. This importance stems not only from the reduction of the carbon footprint due to the significant savings in paper produced by digitization, but also from the no less important savings in staff hours spent on these routine activities, time that can be devoted to other more productive activities. In this regard, SUDTE provided very eloquent quantitative measures of the savings in paper and personnel costs that this digitization entails.

However, the University authorities have noticed that there may be risks ahead related to the increased reliance on technological means that are beyond the

University's control. Apparently, there is always "one more step" in digitization or specification updates looming ahead, and HEIs play the role of plain consumers. Any future updates will have to be implemented in order not to be left out, and they will come along with invoices from the 3rd-party providers. In many cases, there will be no real possibilities to switch to alternative companies because of all the time, effort and resources previously invested to make the former's solutions work together with the in-house systems.

Within the framework of SUDTE, the first tests of the management of agreements between universities through the EWP facilities provided by MoveOn were carried out. Finally, the University of Vigo expects to be able to take advantage of the training contents to be developed within the SUDTE network, as well as the software modules to extend the available IT services.

There is clearly a need for support staff for this process, both in the International Relations Office and in the IT services. It should be taken into account that the implementation of these digitization processes requires a timely effort, not only in terms of economic resources but also in terms of human resources, which are much more difficult to achieve.

A close-up photograph of a hand holding a glowing blue ring. The ring has a textured, mesh-like surface and is emitting a bright blue light. The background is dark, and the lighting is dramatic, highlighting the hand and the ring. A semi-transparent blue rectangular overlay is positioned in the center of the image, containing the word "CONCLUSIONS" in white, bold, uppercase letters.

CONCLUSIONS

4. CONCLUSIONS

The current report represents one of the output of the intellectual output 3 in the SUDTE project. Because there is not a “one best way”, the aim of this report was to describe how different Universities reach the Erasmus digital transformation in different ways. To this aim we describe the case of University of Naples Federico II (as *Dashboard user*), Iztech University (as *InHouse user*), Selkuk University and University of Vigo (as *Third party provider user*).

The first section of this report describes the aim and the objectives of the report, the target groups and the main elements of innovation provided by the SUDTE project as well as by Erasmus without paper. Few insights are provided about the project expected impact and the transferability potential.

The second section provides the results of a questionnaire created on the basis of Technology acceptance model disseminated among students of HEI participating to the project. Research results shows a students generalized intention to substitute paperwork with digital tools in Italy, Spain and Turkey. Also, according to research results performance and effort expectancy, social influence, and output quality are the main predictors of students’ intentions to use digital tools to manage Erasmus activities. This findings describe a situation in which the implementation of digital tools is not only a need of HEIs in order to increase the effectiveness of the processes, but also a need of final users (students) that are well intentioned. This preliminary study provides on one hand interesting insights that allow us to offer a real contribution for implementation of SUDTE project, while on the other hand it constitute a solid base for awareness of the topic among pivotal institutions (e.g., EU, HEIs, NAs).

The third section of this documents contains a qualitative research. Each participating organization reported the situation before and after the process of Erasmus activities digitalization describing six main aspect: the starting point before the SUDTE project, the internal communication and commitment of the top management, the data privacy and legal issues, the technical infrastructure, the training activities for office staff and coordinators and, finally, advantage and disadvantage arising the tools adoption. Because the aim of the research is to describe best practices but, also, to show differences and similarities between different experience in EWP processes, the same structure was employed for all the participating partners. The different experiences described in section three can be summarized in the following table 1.

Table 1 – Main features and guidelines of EWP dashboard, In-house and 3PPs systems

	ADVANTAGES	DISADVANTAGES	BEST PRACTICES	GUIDELINES
EWP DASHBOARD USERS (UNINA)	<ol style="list-style-type: none"> 1.High user-friendly platform; 2.Direct connection to Erasmus+ App; 3.A "cloud-based" system; 4.The use of a free public infrastructure 5.Very safe management of privacy and legal issue 6. exploit a unique and "harmonized" system that a great part of EU HEIs use. 	<ol style="list-style-type: none"> 1. In bilateral agreements, it is not allowed to upload some complementary information via dashboard (when required) 2. Lack of system's control on deadlines of the agreements' 3. Continuous and long training activities 	<ol style="list-style-type: none"> 1. Integrate with paper/emailing when dashboard do not allow to upload particular information 2. Test the dashboard following very carefully the provided FAQs 	<ol style="list-style-type: none"> 1. Upload the dashboard functionalities for insert further information 2. Improve the FAQs for IRO staff 3. Enhance the level of control on IRO to speed up the bilateral agreements 4. Provide for uploaded trainings, harmonized among all dashboard users
IN-HOUSE USERS (IZTECH)	<ol style="list-style-type: none"> 1.High user-friendly that already fit with internal personnel of IRO 2.Faster communication with IT Team 3. Great independence in the Erasmus mobilities management 4.Fast adaptation to new NA's regulations 5. Efficient IRO training activities (together with IT team) 	<ol style="list-style-type: none"> 1. More impediments and difficulties in EWP integration compared to EWP dashboard system 2. Partial connection with all EWP services 3. High-costly and specific technical infrastructure to support the in-house system 4. High risk of compliance for privacy and legal issues 	<ol style="list-style-type: none"> 1. To be compliant with the Personal Data Protection Law in Türkiye (KVKK), online approval from students is obtained 2. Usually, further information are collected online via application form 	<ol style="list-style-type: none"> 1. NA need to facilitate the integration and the connection between in-house system and EWP system 2. Support Turkish HEIs that implement in-house systems in looking for software developers (one is not enough to manage Erasmus mobilities)
3rd PARTY PROVIDERS USERS (SELÇUK UNIVERSITY)	<ol style="list-style-type: none"> 1.User-Friendly Interface 2. Existing links with the University databases such as SIS and KION 3.When modified an IIA, the changes are easy to identify 4.Allows the transfer data to/from Erasmus Mobility Application system 	<ol style="list-style-type: none"> 1. Lack of control in 3PP's workflows 2. High-costly connection to EWP (fee paid to providers) 	<ol style="list-style-type: none"> 1. A new IA can be created by the 3PPs without entering from other platforms 2. KION provides training opportunities to the HEIs 	<ol style="list-style-type: none"> 1. Approval or rejection including comments should be visible for students 2. Provide a good overview of learning agreements and its status 3. Short term blended mobility and Short-term doctoral mobility should be supported
3rd PARTY PROVIDERS USERS (UVIGO)	<ol style="list-style-type: none"> 1.Great time-saving related to Erasmus activities and training activities 2.Personnel cost-saving 	<ol style="list-style-type: none"> 1. System highly dependent from the 3rd party provider 2. Risk of unprepared IRO staff when problems with 3PPs arise 3. IRO staff with non-permanent contacts 	<ol style="list-style-type: none"> 1. Monitor and integrate 3PPs workflows with internal academic tools (e.g., Xescampus, next SIGMA) 	<ol style="list-style-type: none"> 1. HEIs should be aware of digital skills of candidates when they hire, since the outsourcing to 3PPs imply a high risk to underate IRO digital skills.

Table 1 present main advantages, disadvantages, suggested best practices and guidelines arising from each experience from partners point of view that can be useful as good practices and potential guidelines for the report's targets (i.e., HEIs and NAs). It is worth to note that no "one best way" emerges. Indeed, by using different approach to EWP implementation there are different point of advantages and disadvantages that emerges and that ask for the attention of HEIs. However, previous table reports best practices and guidelines that can be useful for Universities in order to improve the effectiveness of EWP implementation process.

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APPENDIX

APPENDIX A – Likert- based questionnaire

From TAM3	I could use digital technology for erasmus if someone showed me how to do it first
	I could use digital technology for erasmus activities if I had just the built-in help facility for assistance
	I think that I can use digital technology for erasmus activities if my university will organize a good training
	I have control over using digital technology for erasmus
	I have the resources necessary to use digital technology for erasmus
	In erasmus organization activity, technology usage is relevant
	Digital technology for erasmus is relevant for future auditing service
	The future of erasmus activities is digital technology
	By using technology, I will not have any problems with the quality of ERASMUS activities
	I expect technology will improve the quality of my activities
	I expect the results from using technology in erasmus activities to be excellent
	I have no difficulty telling others about the results of using digital technology for erasmus
	I believe I could communicate to others the consequences of using technology for erasmus activities
From UTAUT	I would find it easy to use technology for erasmus activities
	Learning to use digital technology would be easy for me
	It would be/is easy for me to become skillful at using digital technology
	Using digital technology would enable me to improve erasmus activities
	Using technology would make it easier to provide and receive erasmus service
	Using technology would enhance/enhances my effectiveness in erasmus activities

From UTAUT	People who are important to me would think/think that I should use digital technology in erasmus activities
	My colleagues think I should learn how to use digital technology for erasmus activities
	People who study with me would think/think that I should use technology in erasmus activities
	I need to improve my ICT skills for use digital technologies for ERASMUS
	I think I can find a good support to start using digital technologies for erasmus
	I intend to start use digital technology for erasmus activities
	Digital tools may support better choices concerning the use of technical infrastructures
ADDITIONAL	The integration between technical infrastructure and Digital tools would enable HEIs to improve Erasmus activities management;
	I expect Erasmus students to get benefits by integration between technical infrastructure and Digital tools.
	Digital technologies would improve the communication between Erasmus students and coordinators
	Trainings office staff would get benefits related to Erasmus activities by implementation of digital technologies
	Digital technologies encourage HEIs students in choosing Erasmus experience
	Coordinators and Teachers would benefit by digital transformation in terms of students management activities
	In erasmus organization activity, internal communication and commitment from the international office management are relevant
	Internal communication and commitment from the international office management would enable me to improve erasmus activities
	Internal communication and commitment from the international office management would enhance the efficiency of the service
	I feel that I would use erasmus without paper activities only whether data privacy and protection are guaranteed
	I expect that the quality of the output I get from using technology is dependent from data privacy and protection
	I feel that data privacy and protection are the major issue to be managed

APPENDIX B – Sample description

Variable	Item	n.	Percentage (%)
Age	18-22	238	74.37
	23-27	65	20.31
	28+	15	04.68
Gender	Male	171	53.43
	Female	149	46.56
Home University's country	Italy	158	49.37
	Spain	55	17.18
	Turkey	107	33.45
Erasmus+ exp.	Yes	76	23.75
	No	244	76.25
<i>Full sample – 320 interviewee</i>			

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