

EUT<sup>+</sup>

## EUROPEAN UNIVERSITY OF TECHNOLOGY

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## Foreword to deliverable D6.3.3

This deliverable presents the conference proceedings (as they were published at that time) about the development and expansion of the services associated with the European Student Card (ESC) among the different partners.

It presents the European Student Card initiative, the status of the use of Erasmus Without Paper among the partners, their registration status to the ESC platform, as well as the services provided by the different partners.

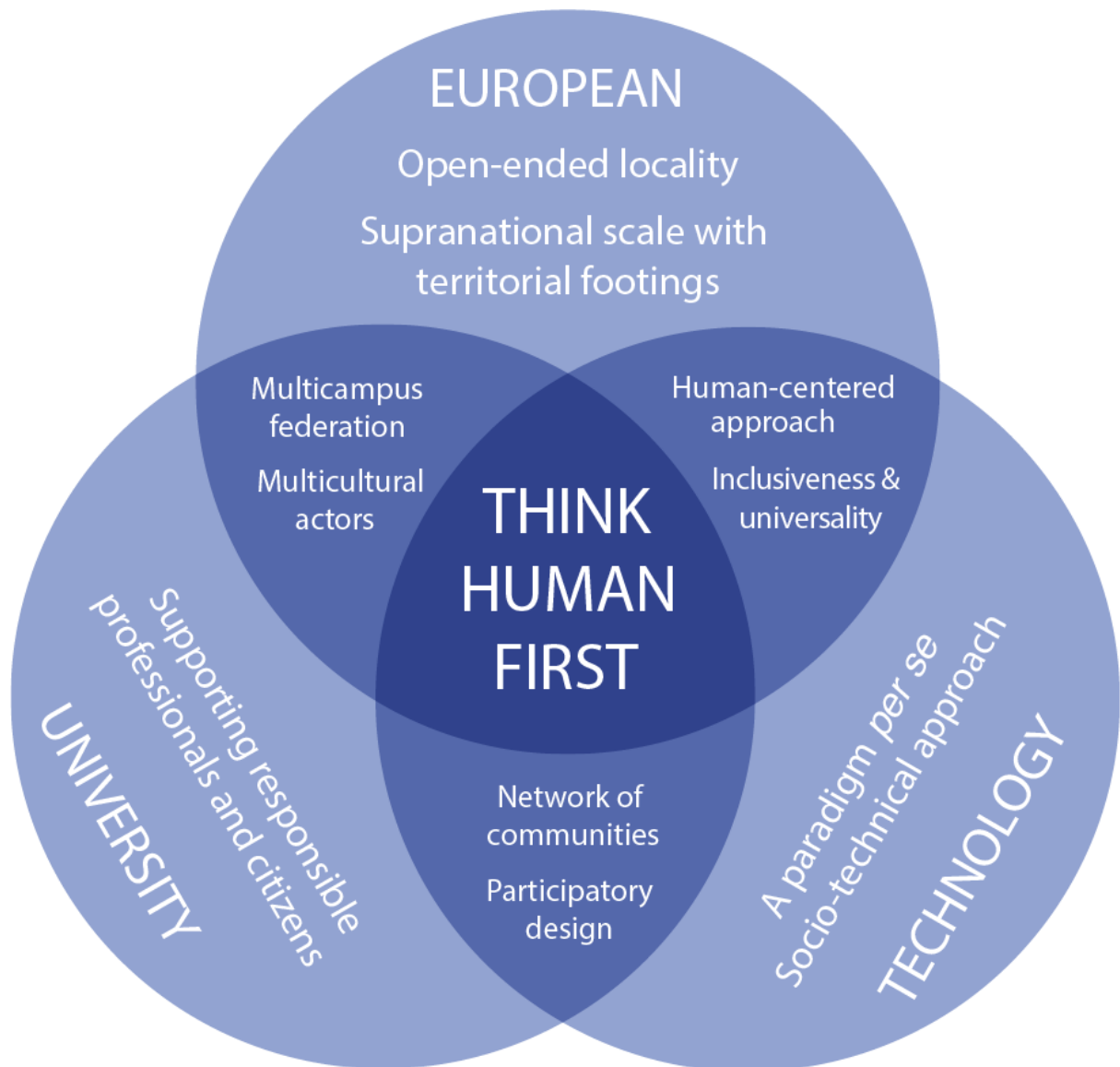
This deliverable provides a good overview of the current status of the ESC platform use among the EUt+ partners.

# Development and EXpansion of Existing Services associated with the EUROPEAN STUDENT CARD

# 2023

# dexesESC





# dexesESC

**Development and EXpansion of Existing Services**  
**associated with the EUROPEAN STUDENT CARD**  
EUt+ Sofia week, 18-19 JAN 2023

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## THE EUROPEAN STUDENT CARD INITIATIVE

An initiative to help students and higher education institutions on Erasmus+ exchanges by simplifying administrative processes and enhancing digitalisation.

It is also crucial to promoting student participation in educational and cultural activities in line with the vision to create a [European Education Area](#) by 2025.



The European Student Card Initiative (the ESCI) is composed of three building blocks:

- **European Student Card** – transforming current student cards into a European Student Card so that students can benefit from on- and off- campus services during their mobility
- **Erasmus+ App** – a single app to help Erasmus students with all their practical administration – before, during and after their mobility programme
- **Erasmus Without Paper** – a digital solution connecting systems in use at higher education institutions allowing to manage their Erasmus+ mobilities online

The Initiative is a step forward in the transition towards a digital European society and a true European Education Area, in which spending time abroad to study and learn is the norm, and educational excellence is a reality for all.

### **The European student card initiative in the broad sense**

In addition to the projects funded by the Erasmus+ programme, projects funded by the Connecting Europe Facility (CEF) programme <https://ec.europa.eu/inea/en/connecting-europe-facility>

#### **Erasmus Without Paper**

<https://www.erasmuswithoutpaper.eu/>, **EMREX** <https://emrex.eu/> and the **European Student Card** <https://europeanstudentcard.eu/> on Erasmus + funding

**ESMO** <https://www.esmo-project.eu/>

gateway to the production version of eIDAS to provide secure authentication for students.

**StudIES+** <https://studies-plus.eu/>


solutions to support HEIs to manage their internal processes, by providing a secure student identity and authentication, and developing electronically signed documents.

**SEAL** <https://project-seal.eu/about>

This project follows on from the ESMO project. It aims to create a virtual wallet that can link the range of different identities that a person may have. It will enable users to securely authenticate themselves and use whichever identity is most relevant to the service they want to use.

**MyAcademicID** <https://myacademic-id.eu/>

MyAcademicID is essential at the heart of the European Student Card initiative, as it is a milestone project, the results of which serve as a basis for subsequent projects concerning service infrastructure. The objective of MyAcademicID is to allow students in an exchange situation abroad to register and authenticate themselves in higher education institutions, to manage their Erasmus+ mobility process as well as to access various student services. In Europe, CEF Digital Service Infrastructures (DSIs) play a key role in supporting Member States to comply with EU Regulations and Directives and facilitate coordination among Member States to share data, develop standards and enable the interoperability of an ecosystem of digital solutions they have developed at national level. This has resulted in faster and more efficient online public and cross-border services for the benefit of citizens, businesses and public administrations across Europe.

The ambition of the European Digital Student Service Infrastructure (EDSSI) project is to create an IT infrastructure that connects  the [Erasmus+ Higher Education mobility programme](#) to the [digital single market of the EU](#).

The infrastructure leverages the [Once Only Principle](#) so that higher education students and staff are able to authenticate themselves and access all mobility services and information available with a single login and regardless of their geographical location. Thus, the project strengthens inclusivity and contributes substantially to the delivery of the European Education Area.

The EDSSI will spread the usage of [eIDAS](#) enabled eIDs in the European Education Area. Henceforth, the project will contribute to the common [European data spaces](#) and the [CEF Telecom objectives](#) by supporting enhanced connections and reliable data exchanges among higher education institutions and third-party student service providers.

The new system is fully aligned with the goals set for the European Education Area, such as the [European Universities](#) and the [European Student Card Initiative](#). Also, it contributes and



builds up on a wide array of HE mobility digitisation initiatives, such as the MyAcademicID, Erasmus Without Paper, European Student Card project, EMREX or Erasmus+ App projects.

### **About the European Student Card**

The journey of the European Student Card began in 2016 as an EU-funded project. It gave students an easy access to services across Europe with no need to issue a new student card during their mobility. Since then, the European Student Card has been scaled-up to become a building block of the European Student Card Initiative.

### **Simplifying student mobility**

The European Student Card (ESC) simplifies student mobility in Europe. It enables higher education institutions to seamlessly and reliably verify a student's status at European level.

Student status verification means confirming that a student is currently enrolled at a university or another higher education institution.

By joining the ESC system and building upon existing physical or digital student cards, higher education institutions can centralise specific student card data, cut paperwork and promote green and digital transition.

Students travelling across Europe for their education will get easier access to services – both on and off campus – offered by their host institution. This means a better, more connected mobility experience and a sense of belonging to the European higher education community.

### **Targets**

The target for 2025 is that as many European students as possible can benefit from an ESC in their pocket, or digitally on their phone, making their access to on- and off-campus services (e.g. access to building, libraries services, discounts on transports) easier and their Erasmus mobility experience simpler.

During 2022-2025, the European Student Card should:

- become more widely available in all Erasmus+ programme countries

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<https://europeanstudentcard.eu>  
<https://erasmus-plus.ec.europa.eu>  
<https://education.ec.europa.eu>

- *bring more possibilities for validation of student status by higher education institutions and student service providers*
- *become more widely used by higher education institutions and student service providers*
- *increase the offer of digital student cards by higher education institutions in all Erasmus+ programme countries*

## Benefits of the European Student Card

### Card issuers

Integrate your current card with the ESC to gain the benefits of a European dimension. By adding the ESC to your existing cards you can

- avoid the need to issue a new student card for mobility students if the home institution is also part of the ESC
- validate the student status from incoming mobility students securely

### Students

The ESC is your gateway to on- and off- campus services by affirming your student status recognition at other universities around the EU. You'll be able to:

- use your student card while studying abroad without needing to get a new student card from your host institution
- more easily access student services during your mobility experience
- gain a “European student” status

### On- and off-campus service providers

Streamline how you verify student status more quickly. You will get:

- increased certainty about students' status
- a wider network of users by adding mobility students in the services provided

### How the European Student Card works

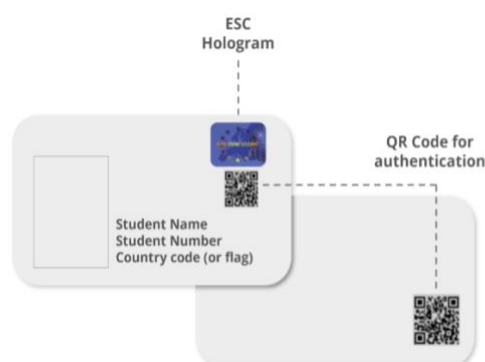
The European Student Card runs through a centralised digital platform called the [ESC Router](#). This is a database which:

- allows participating institutions to generate a European Student Card
- enables card validation between the information systems of card issuers in Europe
- identifies the student and their status across Erasmus+ programme countries



The ESC-Router delivers the following features:

- **European Student Card Number (ESCN):** a unique card identifier which serves to identify student cards and validate them
- **European Student Identifier:** an identification number which enables students to uniquely identify themselves when they access student mobility services online
- **ESC Hologram:** a logo on the front of the card which certifies the card's authenticity at European level.
- **ESC QR Code:** a digital format code on the front and back of the card which also certifies the card's validity at European level.



Only the necessary data on the ESC (i.e., the ESCN) will be stored in the ESC Router allowing the central management of the ESCs and facilitating the exchange of information between card issuers.

Beyond the card as a passport, the process is part of a vast digitisation process intended to make exchanges more fluid. The card project gave its name to a vast project called the [European student card initiative](#), launched by the European Commission, intended to facilitate student mobility in Europe by offering higher education institutions and students services based on the digital boom.

### **What can it be used for, specifically?**

This will, for example, facilitate your reception in an establishment during an Erasmus+ exchange or any mobility in Europe.

For your Erasmus+ mobility, your university, your establishment, will be able to communicate and organise exchanges digitally, and you will be able to complete your administrative procedures online, without a paper file.

Your European student status being recognised and authenticated, you can use your card to enter a campus, a university library, a university restaurant, get student rates to buy a

*coffee, pay for photocopies, laundry and any other service, right, tariff, linked to your condition as a student.*

## THE EUROPEAN STUDENT CARD AND SERVICES IN THE EUROPEAN UNIVERSITY OF TECHNOLOGY

The administrative implementation of the European Student Card (ESC) in the EUT+ is an important step forward to the optimisation of students' mobility and students' lifestyle. The platform which is developed under another project funded by the European Commission is still in testing period but its functionalities are fully accessible for the educational institutions. Each university is able to register administrators at <https://router.europeanstudentcard.eu/loghome> who can manage (add or remove) provided services by their own institution and restrict them to the different users (local or international/mobility students). The data exchange codes for the information transfer between home institution and cloud space of the ESC platform are provided in the technical administrators' profiles of each university. The current task (6.3.2) is related to summarising of available data in the ESC platform of EUT+ partners and their readiness to exchange different services by their own administrative systems to the ESC users.

### I. APPLIED METHODS

The work team made up of all eight partners is involved in the implementation of the task. Every partner has previously declared the responsible person who provides and processes the information on behalf of the institution. The methods applied during the common work include: on-line discussions via video meetings; on-line discussions in Whaller platform. A seminar in hybrid mode on the topic of current task was held during the Sozopol week at the end of June 2022.

For those who were unable to participate in the event, an accessible file for the required data filling in cloud space was provided.

For the future work of EUT+ and the facilitation of data transfer between partners and students, all participants in the seminar provided their PIC number in the ESC platform and their ability for uploading of services based on the current state of their own students' cards. The status of partners regarding the use of **Erasmus Without Paper** over the last two academic years as working digital process for administration of student mobility actions was also discussed.

### II. EVALUATION

The final evaluation of the current state of the partners' availability to provide services is made on the grounds of discussions and the data presented by

representatives. The performed analyses and recommendations are based on the data provided by partner Universities and the available information in the ESC platform.

### III. RESULTS FROM SEMINAR WORKING PROCESS

This section of the document presents in brief the results from the discussion during the seminar and the provided data from partners' representatives regarding the actual status of **Erasmus Without Paper** implementation and availability for different services deployment in ESC platform.

The seminar was chaired by Rossen Radonov and Denitza Zgureva from the Technical University of Sofia which is the responsible institution for WP6 and Task 6.3. During the introductory part, Lubomir Dimitrov as the TU-Sofia's principal representative, elaborated on the main points regarding the European Student Card implementation in the future work of EUT+, sharing the actual status of partners' work packages liaisons and task managers. During the discussion panel, all representatives took an active part in the range of topics covered and shared their opinions for the future work over Task 6.3.

### IV. ERASMUS WITHOUT PAPER STATUS

The following table presents the status, as declared by the partners' representatives, regarding the use of **Erasmus without paper** in their own institutions:

Academic year	Insert name of full partner	2020-2021	2021-2022
Full partner 1 connected to Erasmus Without Paper and using its features (YES/NO)	<b>Université de technologie de Troyes</b>	YES	YES
Full partner 2 connected to Erasmus Without Paper and using its features (YES/NO)	<b>University of Applied Science Darmstadt</b>	YES	YES
Full partner 3 connected to Erasmus Without Paper and using its features (YES/NO)	<b>Riga Technical University</b>	NO	YES
Full partner 4 connected to Erasmus Without Paper and using its features	<b>Technological University Dublin</b>	NO	YES



(YES/NO)			
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Full partner 5 connected to Erasmus Without Paper and using its features (YES/NO)	<b>Technical University of Sofia</b>	NO	YES
Full partner 6 connected to Erasmus Without Paper and using its features (YES/NO)	<b>Cyprus University of Technology</b>	NO	YES
Full partner 7 connected to Erasmus Without Paper and using its features (YES/NO)	<b>Universidad Politécnica de Cartagena</b>	NO	YES
Full partner 8 connected to Erasmus Without Paper and using its features (YES/NO)	<b>Universitatea Tehnică din Cluj-Napoca</b>	NO	YES

The detailed information concerning the responsible technical administrators from all partners, as well as the data exchange through Dashboard platform, represent an objective of WP5 of the project, and they are therefore available in their reports.

## V. ESC DATA DEPLOYMENT

The data regarding the registration and PIC numbers of all partners and their availability for uploading services at ECS platform are listed below:

<b>EUT+ partner</b>	<b>Registered YES/NO PIC of institution</b>	<b>Availability for services deployment</b>
Université de Technologie de Troyes	YES PIC 997576228	<ul style="list-style-type: none"> <li>• Access to library</li> <li>• Access and payment in the student canteen</li> </ul>

University of Applied Science Darmstadt	YES PIC 986100255	<ul style="list-style-type: none"> <li>• Proof of student status</li> <li>• Access to all areas with controlled access to universities (libraries, dormitories, etc.)</li> <li>• Payment instrument</li> <li>• Public transport</li> </ul>
Riga Technical University	Yes PIC 999920718	<ul style="list-style-type: none"> <li>• Proof of student status</li> <li>• Digital identity services</li> <li>• Access to some areas with controlled access to universities (libraries, dormitories)</li> </ul>
Technological University Dublin	NO	<i>Only local student card services are provided</i>
Technical University of Sofia	YES PIC 999868532	<ul style="list-style-type: none"> <li>• Proof of the student status</li> <li>• Access to the library</li> <li>• Services in a student dormitory</li> <li>• Access and payment in the student canteen</li> <li>• Sports centres and facilities within the campus</li> <li>• Option to connect with a bank account and debit card at the student's request</li> </ul>
Cyprus University of Technology	YES PIC 999597223	<ul style="list-style-type: none"> <li>• Access to library</li> </ul>
Universidad Politécnica de Cartagena	YES PIC 999828859	<ul style="list-style-type: none"> <li>• Access to all areas with controlled access to universities (laboratories, libraries, dormitories, etc.)</li> <li>• Access and payment in the student canteen</li> </ul>

Universitatea Tehnică din Cluj-Napoca	YES PIC 999897244	<ul style="list-style-type: none"><li>• Access to all areas with controlled access to universities (laboratories, libraries, dormitories, etc.)</li><li>• Access and payment in the student canteen</li></ul>
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As seen, seven of all partners have already been registered in the platform for the ESC management, with the only exception of the Technological University Dublin which still has not. Most of the partners demonstrate the availability of a range of services, such as: Access to all areas with controlled access to universities (laboratories, libraries, dormitories, etc.); Access to and payment in the student canteen; Proof of student status and Payment in local Universities structures. It is only the Cyprus University of Technology that is not able to provide additional services, except for the access to the library.

Regarding the bank accounting and common implementation of debit and ESC student card, only the Technical University of Sofia is able to provide this service under the agreement with the DSK bank. The e-payment option is one of the priority aspects of the ECS development, in line with the European Commission purposes. The other partners shared the results from their inquiries in local banks and card issuers which do not pursue a policy of cooperating their plastic cards with other services. The major debit card issuers, Visa and MasterCard, refuse to issue joint student cards on account of their security and privacy policies.

## **VI. ESC data exchange and ESC platform resources**

This section of the report presents some key points regarding the organisation of service deployment by Universities at the ECS platform. The source of data is the ESC guide uploaded in the platform (<https://router.europeanstudentcard.eu/docs/deuinfo>).

The Data European University Info (DEUInfo) is the name of a standardised, readable data area to reinforce the security of the European Student Card. This zone contains the ESCN, a digital signature and a certificate which makes it possible to prove the authenticity and the integrity of the European student card. With this zone, the development of new services requiring a high level of security can be expected, such as payment or access control. Writing DEUInfo is a prerequisite to develop Data Management Application (DMA).

Currently, the DEUInfo is designed to DESFIRE (EV1 and EV2) chips by NXP, but the specification aims to ensure a future portability to any other ISO 7816-4 compliant IC or mobile phone chips.

**The key features are as follows:**

- Data should be accessible in the clear, without prior authentication
- Data integrity could be validated thanks to a digital signature and a certificate
- The size of the data should remain as small as possible to save storage for the universities or partners
- The system should be based on open and standard features, OpenSSL being the underlying tool for all examples
- PKI Architecture
- Each university shall create and manage its own University authority.

At each university, this authority has the following roles:

- Create the university's private key(s) and hold the corresponding certificates integrated in the PKI hierarchy
- Populate the student's card with appropriate data
- Sign the data and write the signature, together with the corresponding certificate, onto the student's card.

**The DEUInfo authority is the supervisor of the system. This top-level authority has the following roles:**

- Sign the certificates issued by the universities
- Manage these certificates (backup, revocation)

DESFIRE Application. The standardised application DEUInfo contains:

- ESCN is the European student card number.
- SIGNATURE is the European student number concatenated with card UID. This concatenation is encrypted by the private key of the university intermediate CA.
- UNIVERSITY CERTIFICATE is the certificate created by university intermediate CA from university root CA, DEUInfo intermediate CA and DEUInfo intermediate CA (see PKI Architecture).

## VII. Conclusions and recommendations

This report has been developed on the basis of a series of performed inquiries, analyses, and discussions. In order to facilitate the future information exchange activities between the partners, the personal identification codes of the universities in the ESC platform are provided. Technological University Dublin is still not registered to the data basis, which accounts for one of the main recommendations – namely, that this action should be performed by the responsible people as soon as possible.

Most partners state their willingness to provide basic services through the platform when it becomes active for working with students. The next recommendation is directed to expanding the range of services which the Cyprus University of Technology could provide for its own students and for those of the EUT+.

Finally, the services concerning the e-payment and bank accounting represent a key point regarding the ESC implementation which has to be intensively developed. In this context, the common opinion expressed by all participants in the working group of 6.3 is that the national legislations and policies have to be adapted to the possibilities of joint use of the debit and student card.

In order to successfully introduce all the functionalities of the European Student Card for the needs of EUT+, it is necessary to have a clear strategy from the European Commission regarding the actual commissioning of this attribute. The national policies of the countries where the partner universities are located also need to be adaptive and operational. As long as these conditions are not met, the integration of the ESC into the EUT+ can only be developed at a conceptual level.

The next important point is related to the fact that the EUT+ partners should strive to ensure similarity in the services offered through the students' cards when the real educational process throughout the eight universities begins. In order to proceed to ensuring these conditions, each of the partners has explored the possibility of expanding the services offered by the student cards of their own students and their subsequent integration into the work process. The availability of developed services is a prerequisite for their successful inclusion in the ESC platform.

**The next section of this document presents extended abstracts of partners' research into the development and expansion of existing services associated with the ESC. The detailed research results were presented during the dexesESC conference, held in Sofia in the period of 18-19 January 2023.**

## SERVICES EXPANSION OF THE ESC: A SURVEY STUDY AMONG STUDENTS AT THE TECHNICAL UNIVERSITY OF SOFIA

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### **I. Introduction**

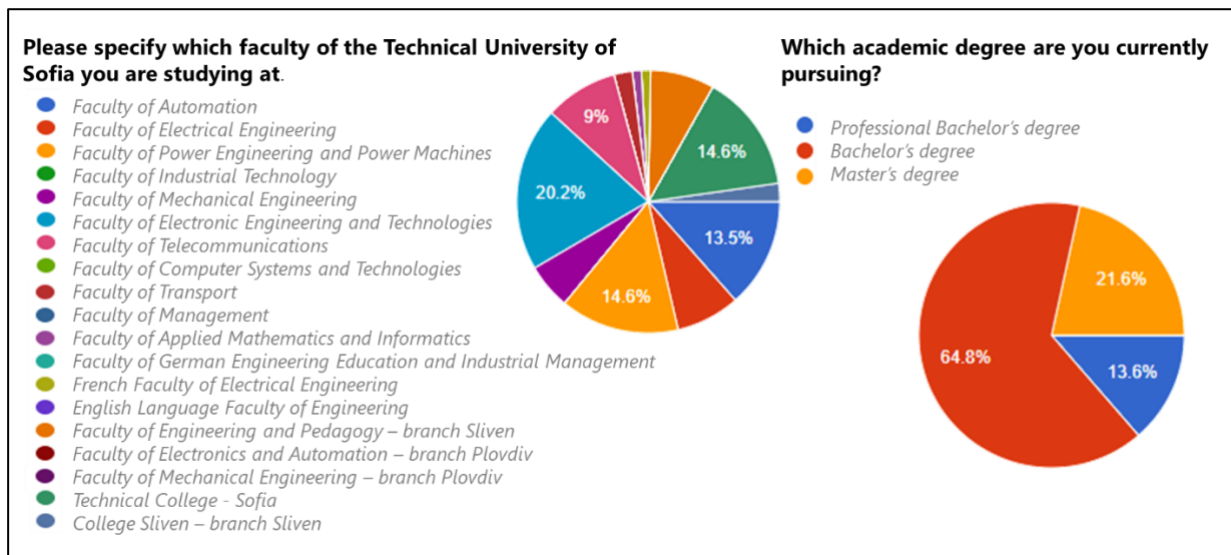
The Technical University of Sofia (TUS), as the biggest technical higher education institution in Bulgaria and part of the network European University of Technology (EUT), works intensely towards the integration of the European Commission initiative for implementation of the common European Student Card (ESC). During the last year, TUS was adapting its own students' information system called "University Information System Student" to exchange data through the established protocol in the platform available at <https://router.europeanstudentcard.eu>. The real implementation of the ESC for students at the TUS is planned to be performed when the consortium of EUT starts with education in common Curricula. Based on the assumption that all of the currently available services will be fully provided, a work team of the TUS developed a survey to analyse the attitudes among students regarding their opinion about expansion of services which could improve the functionalities of the ESC.

### **II. Method**

An on-line survey was shared with all active students at the Technical University of Sofia at the link <https://forms.gle/G2SEVKNCr5FQBi7v6>, and their responses were collected in the period of 01.12.2022 – 10.01.2023. Over 500 students took part in the online survey. The survey was conducted in Bulgarian language preceded by the following welcome message: "Dear students, the European Student Card (ESC) is a project of the European Commission aimed to create a single card with a standard package of functionalities which can be used by all students from the European Union member states. With this survey, we would like to explore your attitudes regarding potential additional services to be provided by the European Student Card (ESC) within the Republic of Bulgaria."

### III. Results

The academic profiles of the respondents are presented in Figure 1. The largest share of students who participated in the survey belongs to those pursuing a Bachelor's degree, followed by Professional Bachelor's and Master's degree students. Although the Technical University of Sofia provides education to more than 1,200 Masters in technical science, they do not normally tend to show interest in social events, surveys etc. due to the fact that they have already found their orientation in some professional sphere and are directly involved in the business and industry. From the faculties and colleges at the TUS, the most active students in their responses are those studying electronics, computer engineering or power engineering, the most developed sectors in the country and with the highest rate of interest among the young people.



**Figure 1. Academic profiles of students participating in the online survey**

Students consider the single card replacing the functionality of several different ones to be an advantage, with more than 90 % choosing the answers “fairly useful” and “very useful”. The same students would like to be able to request by themselves additional services to be provided by the ESC. The described results are plotted in Figure 2.

The next group of questions investigated the students’ attitudes towards the expansion of ESC services regarding social, economic, transport and other issues (Figure 3). Young people express the opinion that a common card would be convenient for their identification as students, and as a card to travel in public transport or railways. The share of respondents who would like to utilise the same card as a dormitory entrance pass tends to be smaller, but this is due to the fact that for many students the problem in question is of no concern as they make use of other types of accommodation.



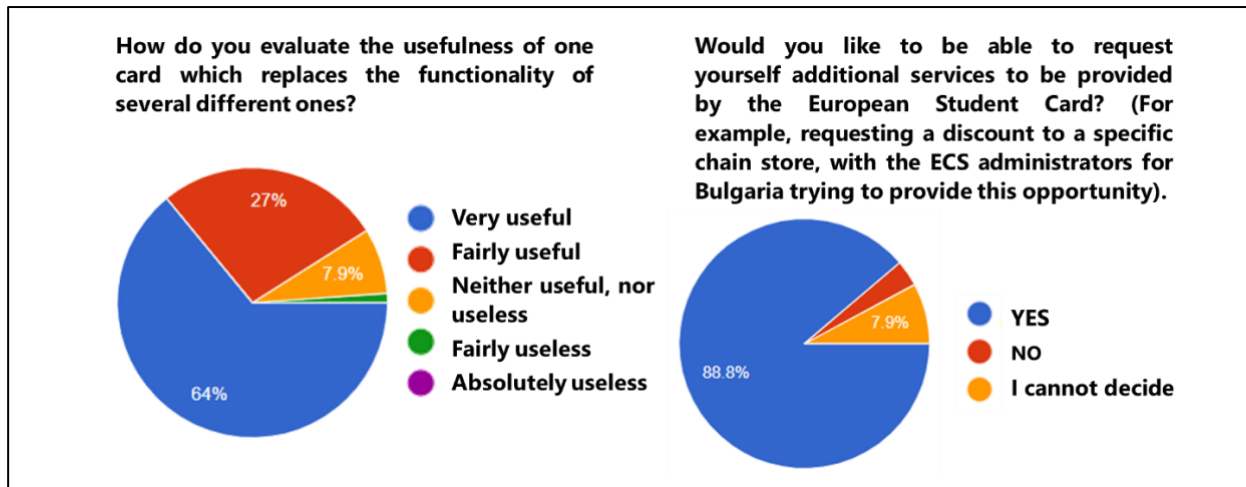


Figure 2. Opinions regarding functionalities of the ESC

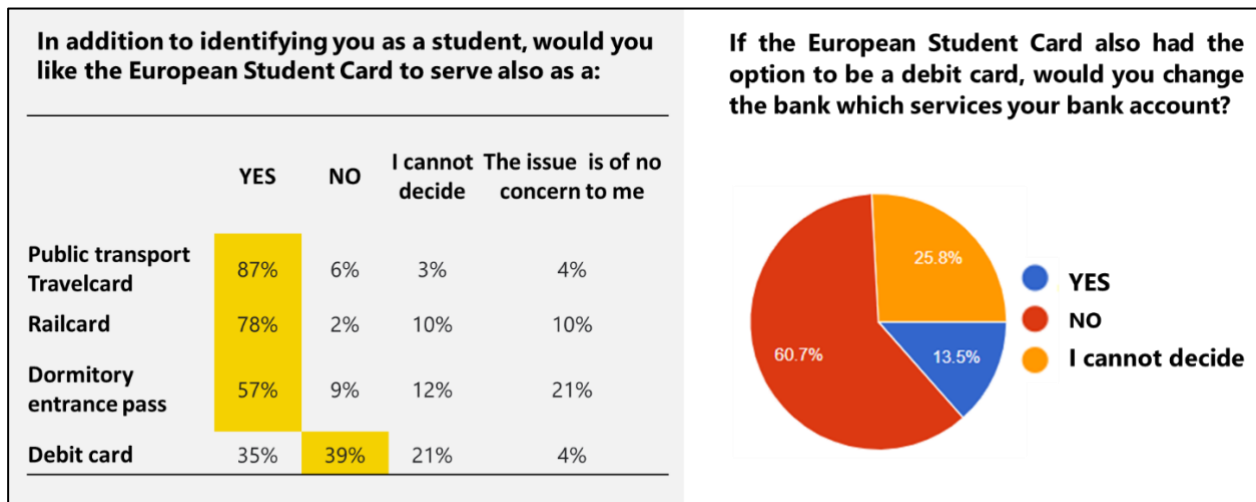


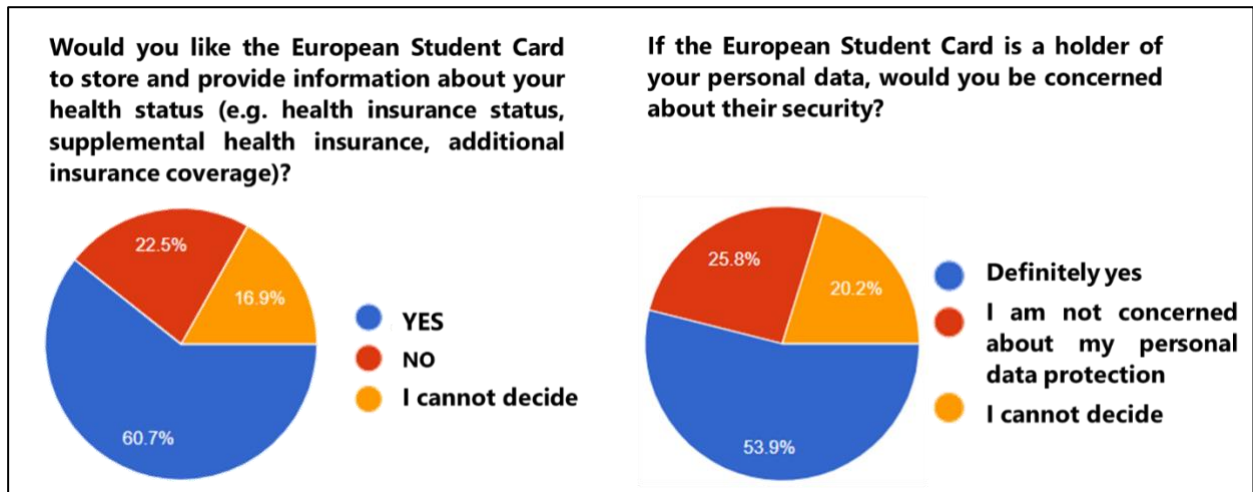
Figure 3. Students' attitudes towards expansion of the ESC services

An unexpected result is obtained regarding the option to affiliate the bank card to the ESC. The largest share of respondents, almost 40 %, do not want to use their student card as a debit card and despite the fact that 35 % of respondents would like to combine these functionalities, it accounts for barely 13.5 % that would agree to change their servicing bank.

The next two questions in the survey explore students' attitudes towards personal data storage by the ESC (Figure 4).

The healthcare system in Bulgaria is still far from being perfect, and various technological solutions are still being implemented to facilitate patient care, which bears a relation to the question "Would you like the ESC to store and provide information about your health status?". As expected, the vast majority of the participants respond

positively, and this fact will be taken into account when the card is actually implemented by the Technical University of Sofia. At the same time, the majority of students voice concerns about the safe storage of their personal data. It is interesting to note here that Master's students (48%) are most concerned about their personal data, followed by Bachelors (44%) and Professional bachelors (29%).



**Figure 4. Students' attitudes towards personal data storage by the ESC**

#### IV. Conclusion

On the grounds of the conducted survey, some challenges related to the implementation and expansion of the ESC services for both the Technical University of Sofia and European University of Technology's students to meet the students' requirements and the European commission targets could be outlined:

1. Obviously, students would like to have a student ID, as well as a card for public transport, rail transport, etc. on one cardholder. In Bulgaria, there is a national initiative for the issuance of exactly such cards, which, however, is not tied to the ESC. This problem must be solved at national level and the Technical University of Sofia cannot do it alone.

2. One of the goals of the European Commission is that the ESC should be used as a bank card. The results of the survey indicates, however, that students do not approve of it, on the one hand, because they are concerned about their personal data security, and on the other hand, because they would not want to change their service bank. In order to achieve this target, it is necessary to carry out a number of explanatory campaigns, as well as to negotiate special preferential conditions with the banks, again at national or European level.

3. In order to fulfil the possibility for students themselves to "give requests" for upgrading the services of the European Student Card, it is necessary to further develop the software platform with such functionality.

## ENHANCING STUDENT EXPERIENCE WITH THE EUROPEAN STUDENT CARD AT THE TECHNICAL UNIVERSITY OF TROYES

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<sup>1</sup>Université de technologie de Troyes, FRANCE

**Keywords:** European Student Card; ESC; Integration

**Abstract:** The Technical University of Troyes (UTT) has been issuing the European Student Card (ESC) to its students, teachers, and staff members since the beginning of the 2020/2021 academic year. UTT is registered on the ESC Platform and has been assigned a PIC number. Each member has a unique European student identifier and a QR CODE which is valid for the duration of their schooling or contract. The card provides access to the library, student canteen, rooms and buildings, and serves as proof of student status. Currently, there are no extra applications or discounts associated with the card, but there is a plan for future development, including a possible connection with a bank account and debit card, a website which provides visualization of payments made and complete library loan management for students and members. The system will be based on open and standard features and will have data integrity validated by a digital signature and certificate. The size will be optimised for storage and network flow, and the PKI architecture will be based on common or individual certification authorities. The essential data to be shared have been studied previously and a common standard for academic information exchange has emerged using Erasmus+.



Figure 1. European Student Card issued at the Technical University of Troyes (UTT)

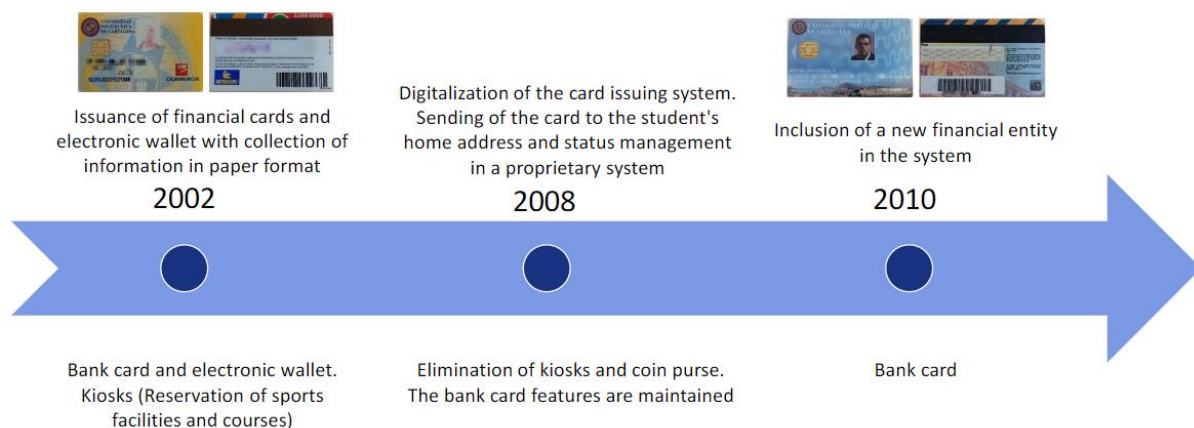
## PAST, PRESENT AND FUTURE OF THE UNIVERSITY CARD AND ITS SERVICES AT THE POLYTECHNICAL UNIVERSITY OF CARTAGENA (UPCT)

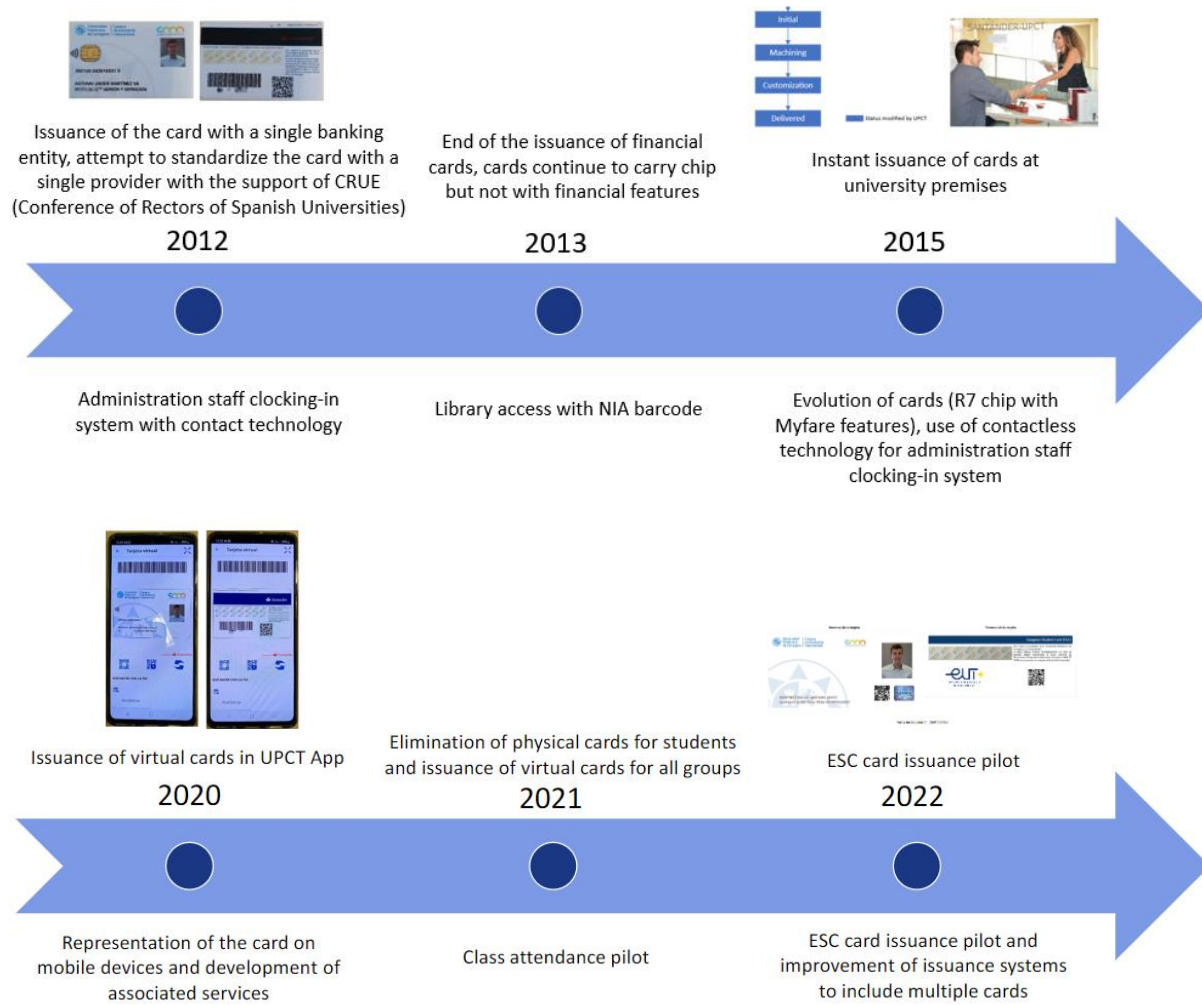
<sup>1</sup>Antonio Maximo Gonzalez Adan, <sup>1</sup>Antonio Javier Martinez Vaillo

<sup>1</sup>Polytechnical University of Cartagena (UPCT), **SPAIN**

**Keywords:** Polytechnical University of Cartagena. University Card (TUI). History of the University Card and its services at the UPCT. European Student Card Initiative. European Student Identifier

**Abstract:** The history of the University Card (TUI) at the Polytechnical University of Cartagena (UPCT) dates back to its origins in 1998. From the beginning, the TUI has been associated with the university and the services it offers to its students. The evolution and digitalisation of the university and the card have gone hand in hand and have adapted to the changing times in equal measure. Now a new period is opening up for the TUI, with the launch of the EUT+, the introduction of the ESC and a new scope of European services. In this document, we deal with the history of the student card at UPCT, as well as with the evolution of its services up to the present time, ending with a summary of the services currently offered for each profile of the university community. With the advent of the virtual TUI in the UPCT App, new services and applications appear, such as attendance control via Bluetooth connection of the cell phone in 2021. This same year, in the cards for students, the chip was eliminated. The year 2022 also saw the start of the ESC card issuance pilot, in a virtual version through the UPCTApp. The inclusion/issuance of several virtual cards is allowed.





### Current services offered by UPCT TUI

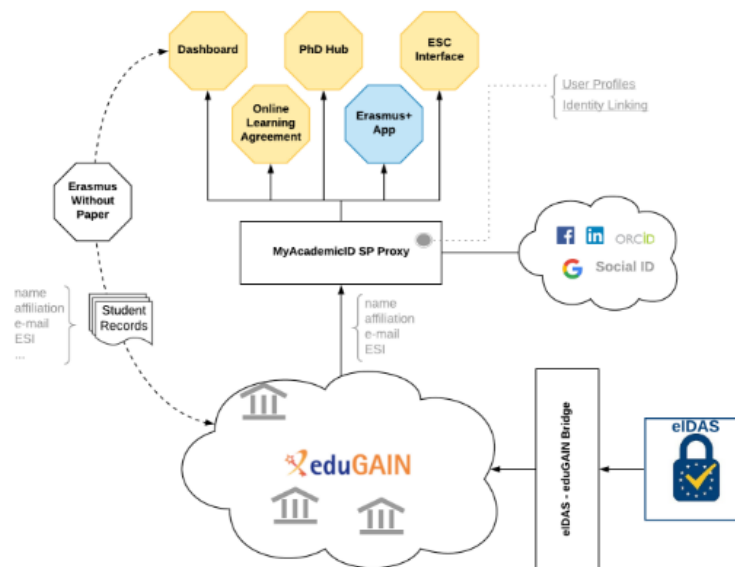
	Student	Faculty	Staff
Physical Card		X	X
Identification and status recognition	X	X	X
Library access	X	X	X
Library loans	X	X	X
Library lockers	X	X	X
UPCTApp discounts	X	X	X
Participation in challenges	X		
Class attendance control	X	X	
Clocking in			X

Afterwards, the European Student Card (ESC) was introduced, its characteristics and the associated technology or standards, as well as the implementation carried out at UPCT.

In order to be able to integrate the ESC into the Erasmus+ suite of applications, the ESC uses the standardised ESI (European Student Identifier) to uniquely identify the student for whom the card is issued.



This ESI will be acting as the student’s base identifier in all the tools within the ESCI project, such as EWP and ErasmusApp, having a full interconnected scenario to connect the student academic identities with their identities as natural persons thanks to the bridge with eIDAS national nodes, and enable the once-only principle by introducing the European Student Identifier.



MyAcademicID brings us these options by the creation of an identity and access management platform combining both eIDAS and eduGAIN for the authentication on e-services related to the Erasmus+ programme.

To close the study of the TUI services, the results of a survey carried out among the student community at the end of 2022 are shown.

The survey has been carried out among approximately 500 students, including all types of studies offered at the UPCT (Bachelor, Master, Doctorate), as well as Erasmus+ students



## LESSONS LEARNT DURING THE IMPLEMENTATION OF THE ESC AT THE TECHNICAL UNIVERSITY OF CLUJ-NAPOCA

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**Keywords:** PDCA; Electronic ESC; Student card

**Abstract:** Implementing the ESC at a campus level poses challenges in terms of ensuring the proper infrastructure required by this endeavor. This paper discusses the approaches pursued at the Technical University of Cluj-Napoca with this respect. The process followed the PDCA (plan-do-check-adjust) structure and ended into an implementation where the students have an ESC issued in electronic format (e.g. presented as a tile in web app). Starting from the official documentation of the ESC, we detail the choices made and present in brief the status of the services currently integrated in the app, as well as future steps.

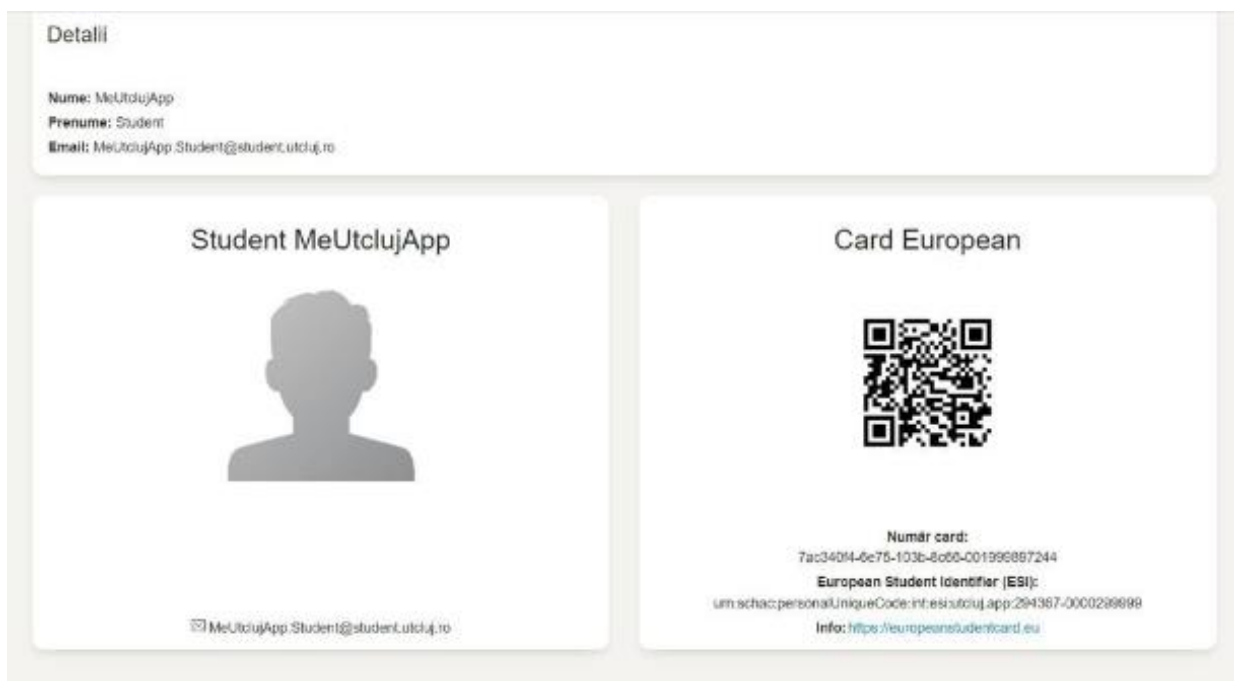


Figure 1

## THE HOCHSCHULE DARMSTADT CAMPUSCARD OVERVIEW

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**Keywords:** CampusCard, Darmstadt, ESC could be integrated

**Abstract:** For eight years, the Hochschule Darmstadt CampusCard serves primarily as a student ID card, a semester ticket, a cafeteria wallet, an access authorisation and a library card. Furthermore, it describes how the ESC could be integrated and where the technical limits are. The ESC commission describes a five-level model of ESC usage. In general, the requirements can be implemented up to Level 3. The student status is verifiable with the ESC QR-Code or the combination of the EUT+ and ESC logo. There are already many benefits and discounts for students in Germany. For this reason, the expansion of ESC services outside the university is limited.

### I. CONTENTS OF THE ARTICLE

- Hochschule Darmstadt Campuscard
- Initialization
- Master Data
- Dynamic Data
- RFID Chip
- European Student Card ESC
- ESC Logo
- ESC QR code and ESI
- ESC Router
- ESC-Router Level
- Level 0 Hologram
- Level 1 QR Code Validation
- Level 2 API Validation
- Level 3 Chip Validation
- Level 4 Offline Validation
- Technical Usage
- Problems
- ESC expansion of services
- Summary

## IMPLEMENTING THE EUT+ EUROPEAN STUDENT CARD VIA OPEN SOURCE SERVICES

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<sup>1</sup>Cyprus University of Technology, Limassol, **CYPRUS**

**Keywords:** European Student Card, MyAcademicID, eduGAIN, document management, open source services, interoperability, scalability

**Abstract:** In this paper, we present our implementation of the European Student Card authorisation process according to the guidelines provided by GEANT research and networking community in Europe, implemented via Open Source Services. The proposed solution adheres to the principles of interoperability and scalability; the latter meaning that, as we show, additional to authorisation, services can be easily embedded.

### I. INTRODUCTION

The European University of Technology (EUt+)<sup>2</sup> is the result of the alliance of eight European partners who share in common (a) the “Think Human First” vision towards human-centred approach to technology, and (b) the ambition to establish a new type of institution on a confederal basis. The EUt+ was initiated through a successful proposal submitted in the second call of the European Universities Initiative<sup>3</sup> with the aim to provide a sustainable future for students and learners in European countries, for the staff of each of the institutions and for the territories and regions where each campus is anchored. In this context, an initial step is to provide to the EUt+ academics, students and admin staff visiting a different, from their own, campus a transparent and seamless access to all services that they have in their campus.

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<sup>2</sup> <https://univ-tech.eu/>

<sup>3</sup> <https://civis.eu/en/about-civis/european-university-initiative>

## II. PROBLEM FORMULATION

Student mobility is a critical part of the European University Initiative, in general, and the EUt+ alliance in particular. Seamless and transparent access of the mobility students to services the host campus provides to the local students is an absolute necessity. Mobility students should not be treated in a manner different from that applied to the local ones because if this happens they would never feel that the new European University (here the EUt+) is their university.

The European Student Card Initiative<sup>4</sup> is an action taken by EC (through Erasmus+) to minimise the administrative procedures and put information at the fingertips of students so as to boost student mobility across Europe. One of the three building blocks of this initiative is the European Student Card. The European Student Card aims at transforming current student cards (issued by the individual universities / training institutions) into a European Student Card so that students can benefit from on and off campus services during their mobility. Thus, the implementation of the European Student Card across the individual universities of the EUt+ alliance is a must. However, an implementation that ensures both interoperability and scalability, in terms of the ability to add additional services [2]the students may have at a local campus, would be much more beneficial [1, 4].

## III. THE PROPOSED ARCHITECTURE

In Figure 1, we present the flowchart of the proposed solution to the problem stated above. It can be seen that in addition to the identity verification and seamless access to host university services, which are the basic requirements to support student mobility within the EUt+ alliance, a new block, denoted as ‘Augmented Services’ has been added. This may refer to services that the students have in their own campus, such as access to specific databases, and need them during their mobility. Augmented services can also refer to any agreements with third party organisations, such as fees discount on public transportation, access to health services, etc.

## IV. BASIC TECHNOLOGIES & SERVICES

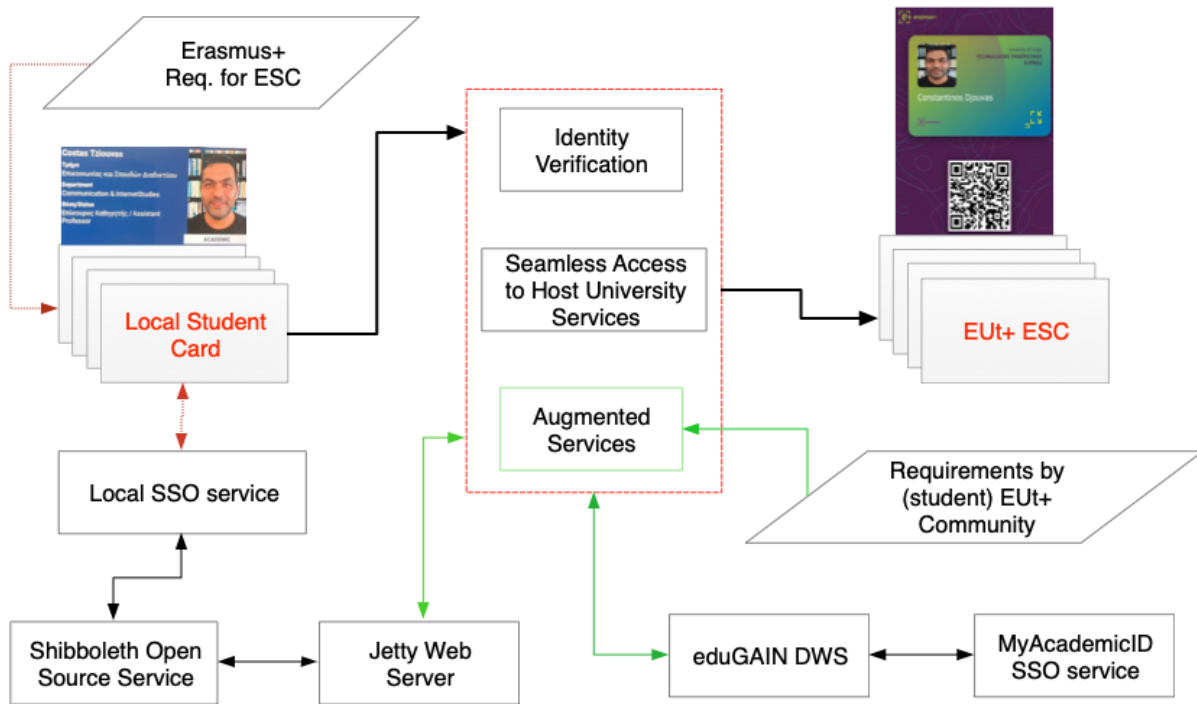
The eduGAIN<sup>5</sup> [5] interfederation service connects identity federations around the world, simplifying access to content, services and resources for the global research and education community and services. Shibboleth<sup>6</sup> is among the world’s most widely deployed federated identity solutions, connecting users to applications both within and

<sup>4</sup> <https://education.ec.europa.eu/education-levels/higher-education/europeanstudent-card-initiative>

<sup>5</sup> <https://edugain.org/>

<sup>6</sup> <https://shibboleth.net/documents/internet2-mace-shibboleth-arch-protocols-200509.pdf>

between organisations. The Shibboleth components are open source and, while initially developed by the Internet, are now maintained by the international Shibboleth Consortium [3].



**Figure 1: Flowchart of the proposed solution**

MyAcademicID<sup>7</sup> was funded by the Connecting Europe Facility programme in 2019-2020 in the context of the European Student Card initiative and delivered on the core promise to enable students to authenticate for their studies abroad using their home student account thanks to eduGAIN, connect their academic identities with their identities as natural persons thanks to the bridge with eIDAS<sup>8</sup> national nodes and enable the once-only principle by introducing the European Student Identifier<sup>9</sup>.

Jetty<sup>10</sup> provides a web server and servlet container, additionally providing support for HTTP/2, WebSocket, OSGi, JMX, JNDI, JAAS and many other integrations. These components are open source and are freely available for commercial use and distribution. Jetty is used in a wide variety of projects and products, both in development and

<sup>7</sup> <https://myacademic-id.eu/>

<sup>8</sup> <https://digital-strategy.ec.europa.eu/en/policies/eidas-regulation>

<sup>9</sup> <https://wiki.geant.org/display/SM/European+Student+Identifier>

<sup>10</sup> <https://www.eclipse.org/jetty/>

production. Jetty has long been loved by developers due to its long history of being easily embedded in devices, tools, frameworks, application servers, and modern cloud services.

## VI. CONCLUSION & FURTHER WORK

In this paper, we have presented our proposal to address the task of implementing a student eID credential architecture across the EUt+ campuses. The proposed architecture satisfies the interoperability requirement by adopting open source technologies and services and it is highly scalable in terms of student services support.

As a future work, a collaboration with relevant stakeholders to gain valuable knowledge and information on the needs and requirements of a European Student Card implementation that supports cross-border services will be pursued. In addition, a satisfaction survey of the current implementation of the EUt+ ESC will be conducted targeting the EUt+ student population.

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