D5.1 Pilots and use cases definition

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D5.1 Pilots and use cases definition

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Executive Summary

The deliverable is closely associated to T5.1, on the coordination, replication and validation of results and shared learning between pilots, as well as to Tasks 5.2, 5.3 and 5.4, each dealing with one of the three pilots of the project. To effectively manage and monitor the progress in the transformational changes envisioned in the INITIATE project, detailed reporting guidelines were developed in coordination with researchers from each of the pilots. This deliverable reports on the baseline assessment, presenting the initial state of the pilots, the expected transformations and the activities carried out or planned to be initiated during the first reporting period. Given the importance of proper documentation until the end of the project, feedback was received and integrated in the guidelines and templates, from partners of the pilot case studies as well as the WP coordinator and leader of the final deliverable (D5.2, to be submitted by M42).

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1 Introduction

1.1 Objectives

This deliverable aims to describe the baseline and summarize the level of preparedness of pilots, focusing on key aspects for successful demonstration of the institutional transformations. The three pilots are located in the University of Zagreb (UNIZAG - Zagreb), University Institute of Lisbon (ISCTE - Lisbon) and the Ss. Cyril and Methodius University (UKIM - Skopje), as observed in Figure 1.



Figure 1 *- Universities participating as pilots related to their geographic location – UNIZAG is in yellow, ISCTE is in red, and UKIM is in blue.*

Task description (T5.1)

From the Grant Agreement, the description corresponding to T5.1 (pg. 72) is:

"*This task will ensure the coordination of activities across pilots by facilitating the active information exchange between the three pilot sites throughout the execution of the INITIATE project. Task 5.1 will coordinate the iterative feedback process between the piloting (WP5) and the knowledge creation (WP1, WP3, WP4), support development activities (WP2), and D&C and exploitation activities (WP6). T5.1 will coordinate the joint activities that will occur in all pilot sites: the expert and stakeholder engagement (starting M3), the co-creation process involving multiple stakeholders, policy and market recommendations definition, and the D&C and exploitation activities. The details of the planned interventions, number of experts and other stakeholders involved, and implementation of INITATE community-based approach will be defined by the start of the implementations in the pilots, in M11, and described in D5.1. Moreover, Task 5.1 will draw together the key results and learnings from all three pilots, yielding an overview of the results of the implementation and validation process of the INITIATE approach (D5.2).*"

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Methodology for T5.1

To fulfil the requirements of this task relative to the two deliverables and the effective coordination of activities in the pilots, a structured methodology was developed to accurately formulate the baseline situation and keep track of activities and milestones of the institutional transformations. A set of templates and reporting guidelines were provided to the pilot partners and frequent reporting periods were agreed upon, as observed in Figure 2. The baseline and update reporting templates (including the final report - M40) that will be used throughout the project can be noticed in Annex I.

A

Work Packages, Project Deliverables & Tasks			Feb 2024	Mar 2024	Apr 2024	May 2024	Jun 2024	Jul 2024	Aug 2024	Sep 2024	Oct 2024	Nov 2024	Dec 2024	Jan 2025	Feb 2025	Mar 2025	Apr 2025	May 2025	Jun 2025	Jul 2025	Aug 2025	Sep 2025	Oct 2025
		Lead	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
WP5	**Implementation of INITIATE approach and piloting**	**UTBV**																					
Task 5.1	Coordination, replication and validation of results and shared learning between pilots	CYI									RP1	**D5.1**						RP2					
Task 5.2	Zagreb pilot (Croatia)	UNIZAG																					
Task 5.3	Lisbon pilot (Portugal)	ISCTE																					
Task 5.4	Skopje pilot (North Macedonia)	UKIM																					
D5.1	Pilots and use cases definition	CYI																					

RP1 Baseline [M9]
RP2 Update [M16]

B

Work Packages, Project Deliverables & Tasks			Nov 2025	Dec 2025	Jan 2026	Feb 2026	Mar 2026	Apr 2026	May 2026	Jun 2026	Jul 2026	Aug 2026	Sep 2026	Oct 2026	Nov 2026	Dec 2026	Jan 2027	Feb 2027	Mar 2027	Apr 2027	May 2027	Jun 2027	Jul 2027
		Lead	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
WP5	**Implementation of INITIATE approach and piloting**	**UTBV**																					
Task 5.1	Coordination, replication and validation of results and shared learning between pilots	CYI	RP3						RP4						RP5						RP6		
Task 5.2	Zagreb pilot (Croatia)	UNIZAG																					**D5.2**
Task 5.3	Lisbon pilot (Portugal)	ISCTE																					**D5.2**
Task 5.4	Skopje pilot (North Macedonia)	UKIM																					**D5.2**
D5.1	Pilots and use cases definition	CYI																					
D5.2	INITIATE Pilot Results and validation	UTBV																					

RP3 Update [M22]
RP4 Update [M28]
RP5 Update [M34]
RP6 Final report [M40]

***Figure 2** - Gantt chart for WP5, outlining the reporting periods (RPs) and deliverables (D) for T5.1 until the end of the project*

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1.2 Structure of the document

The deliverable reports on the three pilots of transformational change participating in the INITIATE project and has been based on the collection of horizontal information across the pilots used as case studies. For this reason, Chapters 2-5 cover the same type of information for each of the pilots, starting with descriptions of the existing situations (Chapter 2), the envisioned transformations (Chapter 3) and the activities already carried out or planned in the upcoming months (Chapter 4). The final section (Chapter 5) reports on the projected risks and relative mitigation actions. The annexes present the templates developed during T5.1 for the pilots reporting across horizontal domains (Annex I), as well as indicative activities performed in each pilot during the first 10 months of the project (Annex II).

1.3 Relation to other tasks

This deliverable falls within WP5 - Implementation of INITIATE approach and piloting, which links virtually with all other WPs of the project, as observed in Figure 3. Moreover, this deliverable is related to Tasks 5.2, 5.3 and 5.4, since it specifies the reporting framework until the end of the project. The results of all reports will then define the final deliverable of WP5, namely D5.2 - INITIATE Pilot Results and validation.

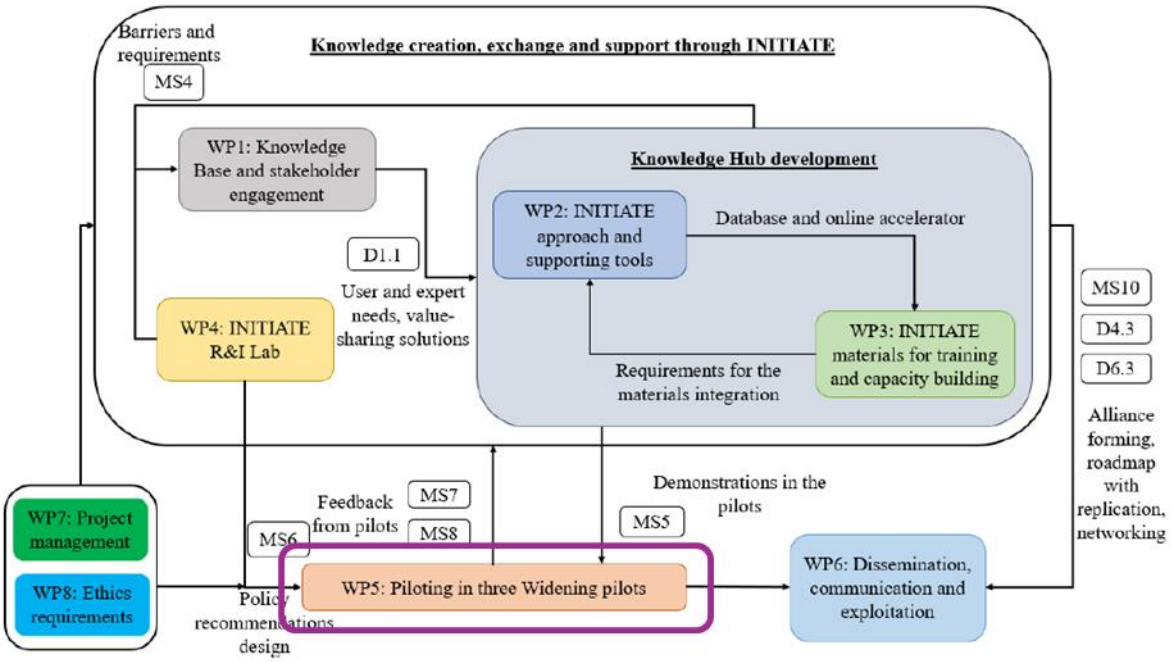


***Figure 3** - INITIATE Pert chart and WP overview from the Grant Agreement (WP5 linked to this deliverable is indicated by the purple rectangle).*

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2 Pilots' description

2.1 Introduction

As presented in the Grant Agreement, the following pilots will be developed within the context of the INITIATE project:

T5.2 University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture (Croatia)

"The objective of this task is to demonstrate the INITIATE concept in the transformation that requires formal and high-level structural change with feasible transformational actions identified in T2.1. The transformation that will be implemented in Zagreb will result in forming the new Smart Energy Systems Laboratory in structure of the University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture (UNIZAG FSB). The transformation will require administrative changes in the faculty structure and will be on-going in parallel with faculty building renovations (thus the Lab will be placed in a new space). The Lab will be the legal addition to the existing Power Engineering and Management Chair that became too big and faces difficulties in project implementation due to local administrative barriers. The transformation will be aligned with the development of a Support Centre that will join the currently existing Career, PR and industry cooperation centres. Joint implementation of these activities integrated in the INITIATE concept will result in enhanced R&I and scientific excellence, stronger connections with the industry in terms of career paths as well as projects and greater international outreach of the Department. The results of the project will be reported in D5.2 and later in the Roadmap (KER 8)."

T5.3 ISCTE - UNIVERSITY INSTITUTE OF LISBON (Portugal)

"*The objective of T5.3 task is to implement transformational activities in the Lisbon site. The key institutional transformation in this pilot is the upgrading of the Data Analytics Group – already formally created at BRU-Iscte – with the incorporation of new competencies to help companies dealing with the data-driven business era of the 21st century and the current impeding changes e.g. green and digital transitions. More specifically, at an institutional level, the Business Analytics & Data Science Lab will consolidate networking research efforts that are currently distributed across different research groups at Iscte, BRU-Iscte and other external laboratories, which will contribute to maximizing the institutional R&I potential and capacity of BRU-Iscte. Through this empowerment BRU-Iscte will act as a gateway through which the Business Analytics & Data Science Lab cooperates with key actors to understand the business reality and to respond to business problems using data-driven approaches. This change should result in enhanced reputation of Iscte and BRU-Iscte which already detains an Excellent grade granted by Fundação para a Ciência e Tecnologia and will be reported in D5.2.*"

T5.4 Faculty of Electrical Engineering and Information Technology (North Macedonia)

"*The key institutional transformation in this pilot comes from formally linking Smart Energy Systems Group (SESG) to the Centre for Technology Transfer and Innovations (INNOFEIT), which has been recognized by European Investment Bank as a Centre of Excellence in renewable energy sources and energy efficiency, among other areas. Through this establishment, INNOFEIT will act as a gateway through which SESG cooperates with key stakeholders in industry and policy in the energy sector. This will result in an enhanced reputation of the University as a leading R&I hub in the green transformation, increased visibility of SESG and UKIM FEEIT and improved collaboration with key stakeholders, leading to joint research projects, events and knowledge exchange activities. At an institutional level, the formation of SESG will consolidate synergistic research effort that are currently distributed across different institutes and laboratories, which should*

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contribute to maximizing the institutional R&I potential and capacity of UKIM. The pilot actions will be aligned with capacity building activities (WP2, WP3) and R&I labs (T4.2), while D5.2 will present key results from this demo site."

2.2 UNIZAG - Faculty of Mechanical Engineering and Naval Architecture

The main focus of the existing UNIZAG FSB is the optimization of business processes through digitization and the introduction of a business information system. Through cooperation with industrial partners and innovation encouraging, intellectual property (IP) should be developed, and research capacities should be improved. Educational programs should be adapted to the needs of the labour market, while cooperation with industry ensures professional internships and joint projects for students. Focus is placed on the strategic development of the UNIZAG FSB, aiming at increasing the number of projects and connections to business and better management of IP in coordination with the Centre for Technology Transfer. During the discussions and consultations with various stakeholders (internally, at the Department of Energy, Power and Environmental Engineering, with UNIZAG FSB's management, line Ministry and external stakeholders, mostly business) a Smart Energy Systems Laboratory emerged as an option for better support to the innovation development.

Due to their excellence in research, the members of the Department of Energy, Power and Environmental Engineering are recognized as the leading group in Croatia considering the number of the European projects approved, carried out and implemented. The core of the new Smart Energy Laboratory should be a team led by the faculty of the existing department, with one Dean presiding over the UNIZAG FSB Board with four Vice-Deans. UNIZAG FSB currently has about 500 employees in 14 departments, 42 chairs, library, centre for support and service offices. It also has 52 laboratories and more than 2500 students, as well as a centre for technology transfer for easier connection with the industry. A major infrastructure reform includes a complete renovation of faculty buildings (€67 millions of national and EU investment), because of the Zagreb 2020 earthquake. The renovation includes higher energy efficiency performance and new renewable technologies installed such as heat pumps and photovoltaics. The laboratories of UNIZAG FSB include also National laboratories that are standardised for measurements of different physical values (e.g temperature, mass and length), also contributing to EURAMET network. The pool of experts and stakeholders planned to be involved includes researchers, academic staff members and students of UNIZAG FSB, as well as external stakeholders such as companies, NGOs and policy makers, engaged via events organised by UNIZAG FSB (e.g. FSB Jobs, Alumni gatherings, Career promotions etc.).

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2.3 ISCTE – Business Analytics & Data Science Lab

The pilot case *Iscte* involves the Business Research Unit (*BRU-Iscte*), which currently (in 2023) includes a research team comprised of 184 members (including 151 PhD holders) spread out through 7 research groups: Accounting (17 members); Data Analytics (21 members); Economics (25 members); Finance (18 members); Management (38 members); Marketing (29 members); and Organizational Behavior & Human Resources (36 members). Among these, 99 are integrated members, 52 are associated members, and 33 are research assistants (mainly PhD candidates). In addition, the *BRU-Iscte* research unit operates with an administrative staff of five members.

The main goal of *BRU-Iscte* is to be recognized as a leading research unit in the business and economics scientific areas, both in Portugal and in Europe anchored in 3 Interweaving Pillars:

- Excellence in Research: Develop and improve sound research in core Business areas that further advances international scientific literature; engage in innovative research projects in partnership with public and private organizations.
- Engaging with Society: Use research capacity to answer the needs of managers and companies; share academic knowledge with the general population beyond academia.
- World-class Doctoral Programs: provide world-class Doctoral programs that can attract top national and international students; Contribute to advancing the scientific knowledge and training of junior researchers.

At present, *BRU-Iscte* coordinates three PhD programs in Management (with 7 specializations: Accounting, Data Science, Human Resources and Organizational Behavior, Marketing, Operations Management, Logistics and Supply Chain Management, Quantitative Methods applied to Management, and Strategy and Entrepreneurship), Finance, and Economics, the latter in collaboration with Iscte's research unit DINÂMIA'CET. Concurrently, *BRU-Iscte* offers a Doctor of Business Administration (DBA) program, in collaboration with Chinese universities accredited by the Chinese Ministry of Education.

The Business Analytics & Data Science Lab does not exist yet, so it is a project to be developed from scratch – for this reason, there are no existing staff members or potential human resources and infrastructure. The pool of experts and stakeholders planned to be involved includes INITIATE *Iscte* team members; *BRU-Iscte* (Data Analytics Group) researchers; Information Sciences and Technologies and Architecture Research Centre (*ISTAR-Iscte*) researchers; INITIATE stakeholders, the *BRU-Iscte* director, and *ISTAR-Iscte* director.

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2.4 UKIM - Faculty of electrical engineering and information technology

The pilot project at the Faculty of Electrical Engineering and Information Technologies (FEEIT) is currently in the early stages of conceptualization. FEEIT has a robust pool of professors and research staff specialized in smart energy systems and related technologies. These experts are distributed across several institutes, each focusing on specific disciplines within the broader field of electrical engineering, such as power engineering, renewable energy, automation, electronics, measurement, and ICT. The faculty's infrastructure includes 15 operational laboratories, rooftop PV generators, battery storage systems, an EV charging station, and smart energy monitoring tools. Additionally, FEEIT includes the Digital Innovation Hub (DIH) and the FabLab, both integral with R&I activities.

At this phase, the primary objective is the formation of the Smart Energy Systems Group (SESG), which is envisioned to become a central hub for coordinating and aligning research and innovation (R&I) activities within the University. This effort is driven by the recognized need to consolidate energy-related researchers that are currently spread across various institutes and laboratories at FEEIT, at the Ss. Cyril and Methodius University in Skopje (UKIM). The current activities are targeting the optimization of the human resources and of the available infrastructure to establish the Smart Energy Systems Group and potentially create the SESG Living Lab. This lab will integrate existing energy generation, storage, and consumption technologies, and will be used on a regular basis by different stakeholders that work in, visit or interact with the Centre for Technology Transfer and Innovations (INNOFEIT), thereby integrating a societal dimension to the use of the technical equipment. Another key ongoing operation around the pilot involves organizing and coordinating meetings with industry partners and key stakeholders. These discussions are focused on identifying the main pillars of SESG—Distributed Energy Systems, Integrated Planning and Optimization, Advanced Energy Analytics and Management and Energy Storage —as well as the enabling technologies that will underpin these areas, such as the Internet of Things (IoT), Industrial Internet of Things (IIoT), Digital Twins, and Machine Learning. The input from these industry partners is crucial for ensuring that the SESG's activities are aligned with both current market needs and future technological trends in the energy sector.

Currently, the pilot gathers researchers at FEEIT, who are engaged in the early conceptualization phase of the project. They are working closely with industry partners to define the core focus areas and enabling technologies for the Smart Energy Systems Group (SESG). In the coming period, the pilot will be strengthened by additional research staff from FEEIT who specialize in smart energy systems and enabling technologies. The pool of experts and stakeholders planned to be involved includes researchers and academic staff members from UKIM FEEIT. During the project, the group will work on advancing the relevant skills for technology transfer and innovations and interact with external experts on the topic, potentially from the INITIATE consortium.

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3 User cases in pilots towards institutional transformation

3.1 UNIZAG - Faculty of Mechanical Engineering and Naval Architecture

The transformation to take place is the development of a Smart Energy Systems Laboratory within the Department of Energy, Power and Environmental Engineering. The new lab will serve as a central Hub for generating smart energy innovation and accelerator of new products, projects and industry collaborations. In the field of research, the Department collaborates with a significant number of world leading universities and organizations well supporting the development of new products in synergy with the industry sector. The planned new Smart Energy Systems Laboratory will serve as a key instrument for attracting and establishing cooperation with different stakeholders from the local ecosystems, boosting the Department's existing activities.

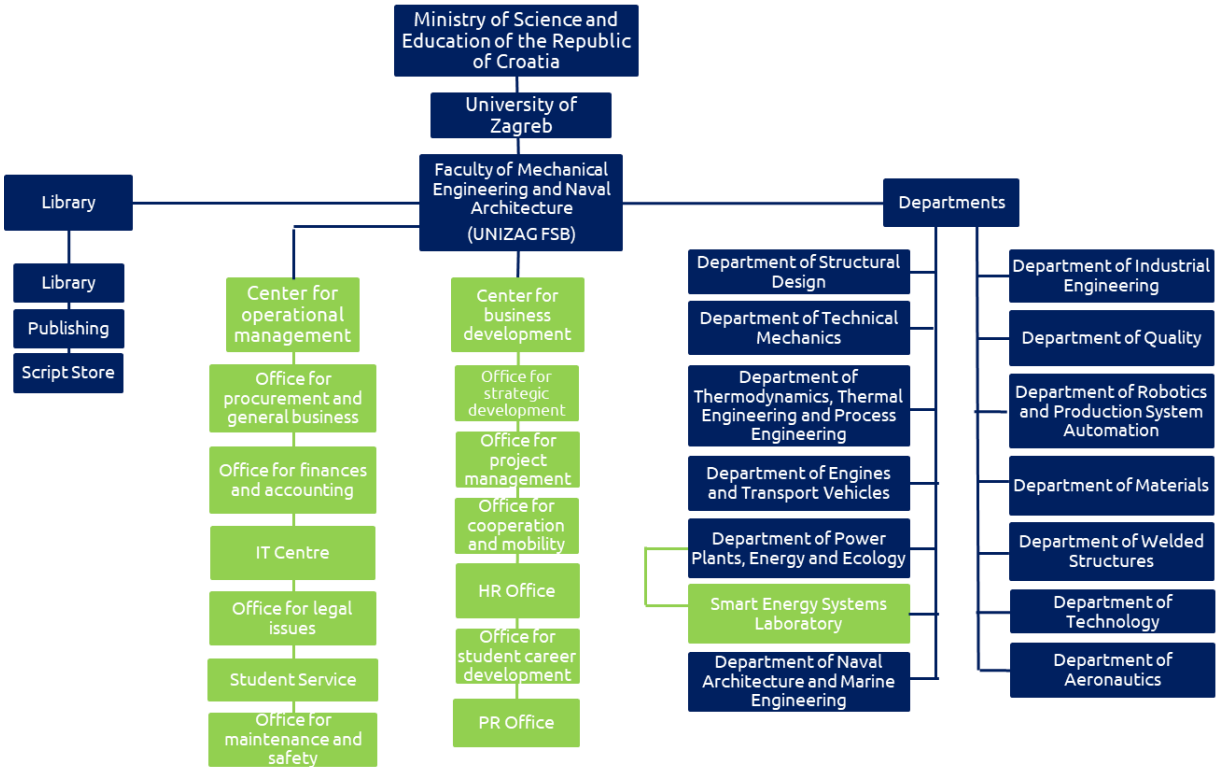


***Figure 4** - New faculty structure at UNIZAG FSB (green) and Smart Energy Systems Laboratory (green)*

On a horizontal level, this new structure will be introduced including two new major centres – the Centre for Business Development and the Centre for Operational Actions. Both will offer crucial support for the development of all the aspects at UNIZAG FSB (collaboration with industry, better conditions for students, wider career opportunities, implementation of projects, planning of financial streams and better financial stability). To achieve the goals of the UNIZAG FSB, the organizational structure in Figure 4 is considered.

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3.2 ISCTE – Business Analytics & Data Science Lab

The Business Analytics & Data Science Lab was established to meet the growing demand for analytics research and knowledge from institutions, with special focus on SME. The Lab serves as a bridge between Iscte's research excellence and the business community, fostering collaborative projects that allow knowledge transfer well aligned with the specific needs of these organizations. At an institutional level, it strengthens Iscte's Research & Innovation capabilities through partnerships, knowledge sharing, and by amplifying the societal impact of academic research. More broadly, it contributes to advancing European objectives related to the digital and green transformation of businesses, helping organizations navigate the complexities of data-driven economies.

The Lab is affiliated to the Business Research Unit (*BRU-Iscte*) and involves collaboration of the Information Sciences, Technologies and Architecture Research Center (ISTAR-Iscte). The coordination board is responsible for relationship with organizations, overseeing project timelines, resource allocation, and supervising the interrelation of the three sections of the Lab in each project – data management, data science and business intelligence – ensuring that data and analytics provided to the organization/client leads to value creation. The Data Management section is responsible for data collection from the client and other sources and preparing these for use in the project; the Data Science section is responsible for the development of algorithms, statistical models, and machine learning solutions and the Business Intelligence section analyzes data to provide actionable insights, create reports, and support decision-making processes, ensuring that analytics solutions align with business needs. Additionally, there is one supporting structure - the Data Center - which is critical for security and risk issues and compliance with data management ethics in each project (see Figure 5).

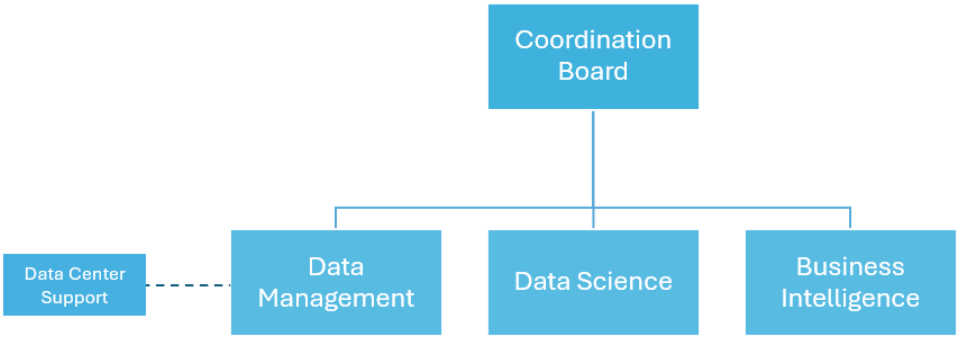


***Figure 5** - Business Analytics & Data Science Lab structure*

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3.3 UKIM - Faculty of electrical engineering and information technology

The intervention's short-term goal is to establish the Smart Energy Systems Group (SESG) as a central hub for energy research and innovation at FEEIT. This initiative aims to define the group's focus area(s) and ultimately integrate existing infrastructure into a Living Lab, enhancing research capabilities, fostering industry collaboration and enhancing innovation capabilities. Inviting outside stakeholders to engage with the Living Lab will foster inclusivity and will provide a realistic use of the advanced energy assets in the Living Lab, enabling SESG to evaluate social aspects of the energy transition (such as energy literacy, engagement fatigue, consumer responsiveness), along with the technical ones.

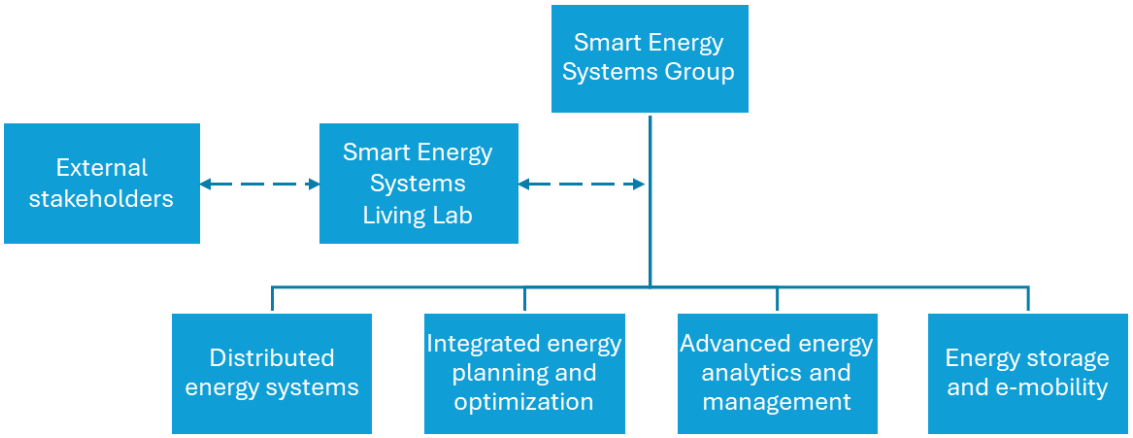


***Figure 6** - Conceptual Structure of Smart Energy Systems Group at UKIM.*

In the long term, the ongoing coordination and collaboration with industry stakeholders will enable SEGS to play a pivotal role in the green transformation and digitalization of North Macedonia's energy sector and will support a better position in the regional and European-wide R&I ecosystem. This alignment of academic research and industry needs is expected to yield joint research projects, knowledge exchange activities, and other collaborative efforts, thereby enhancing the University's reputation and supporting its mission to advance education and innovation in energy-related fields both nationally and internationally. The success of these efforts will be measured through both qualitative and quantitative indicators, ensuring that the impact is tangible and aligned with strategic objectives. The conceptual structure of the Energy System Group is presented in Figure 6.

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4 Activities towards institutional transformation

4.1 Activities already completed

UNIZAG - Faculty of mechanical engineering and naval architecture

The activities already completed in UNIZAG up to M10 are listed in the table below:

***Table 1** - Activities completed at UNIZAG up to month 10 (November 2024).*

Activity	Description	Date of completion
Recording of AS-IS status	This activity started before the start of the project to scan the current state of the UNIZAG FSB structure and start planning the transformations.	M1
Decision of optimal structure for R&I excellence in smart energy field	This activity also started prior to start of the project to provide more time available during the implementation. The objective is to define an optimal legal form to stimulate innovation in the energy sector and to get aligned with the internal and external regulation (at the faculty and national level).	M1
Initial qualitative analysis and proposal for process improvement	This activity investigates the existing state and provide initial proposal for improvement.	M3
Graphical analysis of other services	This activity includes graphical design of the UNIZAG FSB structure and planned interventions for better understanding for staff and external stakeholders.	M3
Regulation for intellectual property management at UNIZAG FSB	This activity includes design of the new regulation on intellectual property at UNIZAG FSB. It will include rules and procedures for creation of spin-offs and utilization of R&I infrastructure at the faculty.	M6
Organizational structure design, job description	The objective here is to define a master overlook of UNIZAG FSB structure and inclusion of new units, provide descriptions of jobs at every unit based on the needs.	M5
Organizational structure of the subject services with systematization and job description (TO-BE)	This activity focuses on defining the processes between different units, mutual responsibilities and description of actions of each actor in the new structure.	M8
Initial responsibility matrix for the entire scope responsibilities	The objective is to define an initial responsibility matrix that outlines inputs and outputs of different tasks for each unit. It will also include formal requirements (e.g. approvals, signatures) for concluding the specific task. This activity will also identify persons that need to be informed and/or secondary responsible for the specific task.	M9
TO-BE implementation plan	Implementation plan for implementing the transformation that will be designed in this activity. This includes formal requirements necessary for further execution of the transformation.	M9
GAP analysis	This task aims to measure the performance of specific units to determine if they are meeting their objectives and if not, what can be done to help them meet the objectives.	M9

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ISCTE – Business Analytics & Data Science Lab

The activities already completed in Iscte up to month 10 are listed in the table below:

***Table 2** - Activities completed at ISCTE up to month 10 (November 2024).*

Activity	Description	Date of completion
Preliminary meetings with Iscte governance bodies	Meetings were conducted with i) Iscte Vice-Rector for Research and Technological Modernization, and ii) Bru-Iscte Director. The purpose of these meetings was to make a brief presentation of INITIATE project and the Pilot case.	M2
Workshop with stakeholders	The workshop "Data (&) Analytics on the Green and Digital Transition" was organised with the aim of reflecting on the challenges of the green transition and digitalization for companies and institutions in Portugal, and to what extent the Research & Innovation centres in Data Analytics can support and accelerate the green and digital transition of companies and institutions. Near 20 Leading experts in these fields, both from academia, associations and business domains, from different sectors of activity, were present and shared their vision and business practice in these areas, helping at the same time to reflect on the contribution that the establishment of partnerships with the Academy can work in those areas.	M5
Information gathering (internal)	Information gathering about supporting structures for research and knowledge transfer at Iscte. Specifically, information was collected on aims, facilities and equipment, human resources, funding and results about laboratories that exist at Iscte covering a range of different research areas.	M7
Information gathering (external)	Information was collected about Data Analytics laboratories that exist in other universities, both Portuguese and foreign with the purpose of finding out aims and services provided by these labs.	M7
Identification of pioneer clients	Identify and contact companies or organisations to provide the lab with data to be used in business analytics experiments. The outcomes will serve as demonstration work of lab's future capacity and competences.	M9
Meetings with relevant Iscte governance bodies	The following governance members shall be involved in the process of Lab's creation: a) Iscte' s Vice-Rector; Data center manager b) BRU-Iscte Director; ISTAR-Iscte Director c) Iscte Business School Dean Topics to discuss include the lab's mission, lab's affiliation (within Iscte), funding, facilities and equipment	M10

UKIM - Faculty of electrical engineering and information technology

The activities already completed in UKIM up to month 10 are listed in the table below:

***Table 3 -** Activities completed at UKIM up to month 10 (November 2024).*

Activity	Description	Date of completion
Analysis of framework conditions and gather insights	Desk-research of the framework conditions on R&I has been conducted and R&I groups with a similar focus to that of SESG have been evaluated. This activity ensures the alignment of SESG with national, regional, and EU-wide priorities. The research and review process includes review of internal regulation of Ss. Cyril and Methodius University in Skopje and the Faculty of Electrical	M3

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from identified use cases	Engineering and Information Technologies, national regulation on higher education and R&I as well as key strategic documents and action plans.	
Forming a Core Team	A multidisciplinary team of specialists in energy system modeling, optimization, digitalization, energy monitoring, electricity markets, machine learning, and electromagnetic analysis has been gathered. The team will also work on enhancing the innovation and technology transfer capabilities and collaborate with outside experts on the topic. This phase aimed to integrate diverse skills, consolidate intellectual resources, and promote knowledge exchange to address future-oriented energy challenges.	M7
Creation a Shared Vision and Mission of SESG	A cohesive vision and mission for the Smart Energy Systems Group (SESG) have been defined. Initial concepts for the R&I fields, topics, and preliminary research questions have been outlined, along with an initial allocation of research topics among team members.	M8

4.2 Further planned activities

UNIZAG - Faculty of Mechanical Engineering and Naval Architecture

To plan the upcoming months, the pilot set internal major milestones and defined activities that will help achieve these. The following has been planned for UNIZAG for months 10-16:

***Table 4** - Activities planned at UNIZAG in the upcoming months.*

Major internal Milestone	Activities to fulfil the internal milestone and description	
Finalizing TO-BE organizational structure	**Regulations draft**	The new structure needs to be defined with new regulation on the faculty structure which needs to be approved by the UNIZAG FSB Board, Faculty Council, Senate of the university and the Ministry. This activity is for the draft creation. Date of completion: M12
	Internal project for increasing capabilities for applications on Horizon Europe	Internal project for increasing capacity for applications on Horizon Europe projects started in July 2024 and will be running, in the first phase, until the end of 2025. Date of completion: M23
	Approval of the UNIZAG FSB Council	Regulation on UNIZAG FSB structure needs to be approved by the UNIZAG FSB council. Date of completion: M16
	Approval from the University of Zagreb	Regulation on UNIZAG FSB structure needs to be approved by the Senate of the University of Zagreb. Date of completion: M20
	Approval of differential coefficients by Ministry of Science, Education and Youth	Regulation on UNIZAG FSB structure needs to be approved by the Senate of the University of Zagreb. Date of completion: M23

ISCTE - Business Analytics & Data Science Lab

To plan the upcoming months, the pilot set internal major milestones and defined activities that will help achieve them. The following has been planned for Iscte for months 10-16:

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Table 5 - *Activities planned at ISCTE in the upcoming months.*

Major internal Milestone	Activities to fulfil the internal milestone and description	
Define the following features of the lab: mission, objectives, affiliation within Iscte, funding, facilities and equipment.	**Workshop with INITIATE stakeholders**	This will be held as a brainstorm meeting with stakeholders to understand their needs in terms of business analytics and willingness to adopt data-driven management approach. Date of completion: M12
	Write the Internal Regulation of the Lab	This will state the mission, vision, objectives, affiliation, location (facilities), coordination, funding, human resources, equipment and other aspects relevant to lab's functioning. Date of completion: M14
Define a transfer protocol, cleaning storage of data coming from clients. This first client will allow us to test and subsequently improve the customer data collection process.	**Selecting the first client and establishing of a collaboration protocol with this client**	It will be necessary to work with the selected client to design a protocol on how to transfer and make data available that safeguards both parties. It is intended that this protocol can later serve as a model for future protocols with other clients. Date of completion: M11
	Definition of the data to be transported	In collaboration with the client, exhaustively identify the series of data that will be transported to the Business Analytics & Data Science Lab, as well as the form of transport (periodic, real-time, magnetic support, etc.). The transport mechanism must be implemented. Date of completion: M12
	Cleaning and Modelling data in the data centre	In collaboration with the client, it is necessary to integrate and clean the imported data. Subsequently, the data must be modelled and stored in a way that facilitates data analysis and consultation by researchers. Date of completion: M14
Set up a technological infrastructure that allows testing the storage and analysis of data brought by a client. It will be a partial version of the Business Analytics Lab that will allow testing the solution.	**Recruitment of a computer technician**	The technician must have skills to develop interfaces (front end) so that customers can easily extract data. This front end is intended for customers who want to access their data stored in the data centre without intermediation from the analysis team. This recruit will be a software programmer and will have a part-time position. Date of completion: M12
	Specification of requirements for customer interface software	The result of this task is the preparation of a technical document specifying the functional requirements of the interface. The level of detail will be high, namely the graphical interface, supporting data structure and procedures will be defined. Date of completion: M12
	Data Centre configuration	The lab will use the Iscte-Knowledge and Innovation Data Centre (DC) and will benefit from its security and maintenance. Inside the DC there will be a slot for the Lab. However, it

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		is necessary to define and implement access mechanisms, particularly regarding privileges and access features for external users. Date of completion: M13
	Software installation in the Data Centre	The data will initially be stored in non-relational databases in order to support all types of information, more or less structured. When possible, and considered useful, some data that can be exported by the front end may be transported to relational structures. Initially, we intend to use free licensing software, namely Mongo DB and MySQL, to be installed and parameterized in the DC. Date of completion: M14
	First prototype of the interface	A first prototype should be ready for demonstration by May, drawing conclusions about the functionalities of the final version. Date of completion: M16

UKIM - Faculty of electrical engineering and information technology

To plan the upcoming months, the pilot set internal major milestones and defined activities that will help achieve them. The following has been planned for UKIM for months 10-16:

***Table 6 -** Activities planned at UKIM in the upcoming months.*

Major internal Milestone	Activities to fulfil the internal milestone and description	
Foundation of the Smart Energy Systems Group is established	**Areas definition of SESG**	This activity involves identifying and establishing the key focus areas for the Smart Energy Systems Group (SESG). The goal is to create a clear framework that will guide the group's research and innovation efforts. SESG will be organized around four main pillars conceived so far: Distributed Energy Systems, Integrated Planning and Optimization, Advanced Energy Analytics and Management and Energy Storage. This foundational step ensures that SESG's work is aligned with the current and emerging needs in the energy sector, setting the stage for targeted research, collaboration with industry partners, and the integration of advanced technologies such as IoT, Industrial IoT, Digital Twins, and Machine Learning. Deadline: M12
	Identification and engagement of key staff	This activity focuses on selecting and formally involving the essential key staff needed to drive the success of the Smart Energy Systems Group (SESG). The process involves identifying experts and researchers within FEEIT who have specialized knowledge in areas such as Distributed Energy Systems, Integrated Planning and Optimization, Advanced Energy Analytics and Management, and Energy Storage. Once identified, these key staff members are engaged in SESG's activities, contributing their expertise to research initiatives, collaboration efforts, and the development of new technologies. Deadline: M14

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	Collection of internal intellectual resources for SESG	This activity involves gathering and consolidating the intellectual assets within FEEIT that will support the Smart Energy Systems Group (SESG). These resources include published scientific papers, educational materials, ongoing and completed research projects, technical reports, patents, etc. Deadline: M16

4.3 The INITIATE concept reflected in pilot activities

UNIZAG - Faculty of Mechanical Engineering and Naval Architecture

The INITIATE approach supports the transformation from the initial state analysis, which included baseline assessment internally via comments, inputs, consultations with the leaders of offices and services at UNIZAG FSB. Numerous co-design events were organized to gather opinions from different stakeholders, including internal stakeholders (such as members of different organizational divisions and managers, board, teaching staff etc.), students and external stakeholders (business, policy actors and NGOs). Since such a wide group had to be considered, the INITIATE concept is essential for successful execution of this inclusive phase. Additionally, meetings with the UNIZAG FSB board were crucial as without their support, it would have been impossible to carry on with the implementation of the new structure. The consultation process was essential for deciding on the exact form of the new structure. Key takeaways from this process was that the focus should be placed on: (i) stronger collaboration with the industry in energy sector; (ii) overall stronger collaboration with the industry (on the faculty level, which includes all laboratories and approx. 350 staff members working only in R&I); (iii) reduction of administrative complexity that represents a barrier to innovation creation (e.g. lower or no possibility for creation of spin-offs).

Because of this, the joint conclusion is not to establish a new Department of Smart Energy Systems, but to proceed with the foundation of new Smart Energy Systems Laboratory which would place focus on collaboration with the industry. The new Department would require the inclusion of staff members not dealing with smart energy systems, thus resulting in less efficient process. The new Smart Energy Laboratory, on the other hand, will enable a clear framework for a group of 30 researchers to work in this field (which, currently, do not have a formal framework for work established). This change, however, requires the same administrative effort as would be required for establishing a new Department. The Faculty Council in both cases would need to make a formal decision and make changes in the Faculty Statute which later need to be approved by the Senate of the University and the Ministry of Youth, Science and Education. The idea for the first spin-off company of the laboratory was also elaborated, focusing on the energy communities as a crucial means for higher penetration of photovoltaics on the residential level.

Moreover, the INITIATE approach helped understand that the role of the Centre for Business

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Development can be a key accelerator for increased collaboration between industry and academia. The conclusion is to proceed with a much more detailed structural change than initially indicated (initially, only a simple Centre for Support was designed without detailed processes between different offices).

ISCTE - Business Analytics & Data Science Lab

"The basis of the INITIATE approach are participatory actions that will allow for identification of barriers, needs and opportunities for structural transformation. It will also consider relevant initiatives, alliances and stakeholders to be included."

The workshop held at Iscte in M5, and the survey conducted among stakeholders participating in that event, allowed the identification of 3 relevant aspects for establishing the starting point for the creation of the Business Analytics & Data Science Lab (Understanding Phase/Step 1 – Baseline assessment of INITIATE approach):

- Companies and other institutions (stakeholders) recognize and value collaboration with academia as it allows them access to cutting-edge research and expertise.
- Companies and other institutions recognize difficulties in streamlining collaboration between academia and companies, namely differences in objectives, priorities and timelines and lack of clear communication channels.
- They point out that establishing dedicated industry liaison offices at HEI would be an important step in improving cooperation academia-industry.

We are therefore facing a favorable environment for the creation of a Lab whose main objective is to work in strict collaboration with organizations in the development of data-driven management strategies. The benefits of this structure are twofold: i) help companies to pursue an effective and efficient green and digital transition and ii) improve the societal impact of Iscte' s research and innovation as it provides researchers with real-base context to conduct their investigation.

UKIM - Faculty of Electrical Engineering and Information Technology

The INITIATE approach is integrated into our planned activities by guiding the institutional transformation process through co-design activities and leveraging a network of experts and researchers. This approach ensures a collaborative and structured pathway for creating the Smart Energy Systems Group (SESG) at FEEIT, aligned with the broader goals of enhancing research, innovation, and industry collaboration. The participatory actions and supporting tools developed under the INITIATE framework will facilitate the involvement of relevant stakeholders, reduce cooperation risks, and contribute to the successful implementation and sustainability of the transformation.

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5 Risks and mitigation actions

A risk matrix was created based on the specific possible challenges identified per pilot, in sections 5.1, 5.2 and 5.3; the aggregate results are presented in Table 7, while for each pilot, the risk matrices can be observed in Table 8-Table **10**. In general, the risks with the highest severity are budgetary strains and the competitive market for new recruits, while the risks with the highest likelihood are time-consuming adjustments, competitive markets for new recruits and the diverse interest of stakeholders. Mitigation actions are expected to lower all critical risks and decrease their likelihoods.

***Table 7** - Aggregate risk matrix showing average results from the three pilots.*

Risk	Severity	Likelihood	Mitigation Action	Severity after Mitigation	Likelyhood after mitigation
Administrative complexity increase	Moderate	Medium	Yes/No/Yes	Moderate	Medium
Disruption of established communication channels	Minor	Low	No/No/Yes	Minor	Low
Time-consuming adjustments	Moderate	High	Yes/No/Yes	Moderate	Medium
Budgetary strains	Critical	Medium	No/Yes/Yes	Moderate	Medium
Space allocation constraints	Moderate	Medium	Yes/Yes/Yes	Moderate	Medium
Competitive market for new recruits	Critical	High	Yes/Yes/Yes	Moderate	Medium
Diverse interests of stakeholders	Moderate	High	No/Yes/Yes	Minor	Medium

***Table 8** - Risk matrix for UNIZAG FSB.*

Risk	Severity	Likelihood	Mitigation Action	Severity after Mitigation	Likelyhood after mitigation
Administrative complexity increase	Critical	High	Yes	Moderate	Medium
Disruption of established communication channels	Minor	Low	No	Minor	Low
Time-consuming adjustments	Moderate	High	Yes	Moderate	Medium
Budgetary strains	Moderate	Low	No	Moderate	Low
Space allocation constraints	Moderate	Medium	Yes	Minor	Low
Competitive market for new recruits	Moderate	High	Yes	Moderate	Medium
Diverse interests of stakeholders	Minor	Medium	No	Minor	Medium

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Table 9 *- Risk matrix for Iscte.*

Risk	Severity	Likelihood	Mitigation Action	Severity after Mitigation	Likelyhood after mitigation
Administrative complexity increase	Minor	Low	No	Minor	Low
Disruption of established communication channels	Minor	Low	No	Minor	Low
Time-consuming adjustments	Moderate	High	No	Moderate	High
Budgetary strains	Critical	High	Yes	Moderate	Medium
Space allocation constraints	Critical	High	Yes	Moderate	Medium
Competitive market for new recruits	Moderate	High	Yes	Minor	Medium
Diverse interests of stakeholders	Moderate	High	Yes	Minor	Medium

Table 10 *- Risk matrix for UKIM.*

Risk	Severity	Likelihood	Mitigation Action	Severity after Mitigation	Likelyhood after mitigation
Administrative complexity increase	Moderate	Medium	Yes	Minor	Low
Disruption of established communication channels	Minor	Low	Yes	Minor	Low
Time-consuming adjustments	Minor	Low	Yes	Minor	Low
Budgetary strains	Moderate	Low	Yes	Minor	Low
Space allocation constraints	Minor	Low	Yes	Minor	Low
Competitive market for new recruits	Critical	Medium	Yes	Moderate	Medium
Diverse interests of stakeholders	Moderate	Medium	Yes	Minor	Low

5.1 UNIZAG - Faculty of mechanical engineering and naval architecture

Risks:

1. Bureaucratic complexity increase: Changes in structure can result in more layers of approval, complex reporting lines, and increased administrative overheads.
2. Disruption of established communication channels: A reorganization could disrupt established communication channels and processes, while new reporting lines and changes in roles may lead to confusion about task responsibilities.
3. Time-consuming adjustments to new structure: The transition to a new structure may take longer than anticipated, particularly if it involves retraining staff, updating IT systems, or realigning reporting lines.

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4. Budgetary strains: Reorganizing might require new resources such as staff, infrastructure, or technology, but the budgetary constraints could limit the ability to implement the new structure effectively.

Mitigation actions:

1. Transparency: we defined clear roles and responsibilities to avoid unnecessary complexity and included relevant stakeholders in consultation processes to ensure all activities are clearly communicated on time
2. Communication strategies: There should also be clear communication strategies implemented, and specific points of contact designated. For this, a yearly plan of activities was established that continuously includes different stakeholders via various means.
3. Transition plan: To prevent delays in the transition, we could develop a detailed transition plan with clear timelines, milestones, and responsibilities, and allocate resources to manage the transition effectively.
4. Resource allocation and phased implementation: We can ensure that resource allocation is planned carefully and consider phased implementation to spread out costs.

5.2 ISCTE – Business Analytics & Data Science Lab

Risks:

1. Strict regulation in space allocation at Iscte-Knowledge and Innovation building: This building hosts cutting-edge projects, but space allocation and use are made on a rotative basis. The Business Analytics & Data Science Lab needs a fixed space to serve as working space for projects' team and meetings with clients. The strict regulation regarding spaces is likely to make it difficult getting an office (physical space) to host the lab at Iscte-K&I building.
2. Administrative procedures regarding Data Center use: The Data Centre is already implemented at Iscte campus, but it is not yet operative and no regulation on "Usage conditions" has been defined. The Lab is the first user of the Data Centre, but the lack of usage regulation is expected to make it difficult to establish the conditions under which the Lab can access the data center.
3. Unexpected delay in formalizing the protocol with the client: The confidentiality of the data is a key issue, so it is possible that the definition of the form of data transport and accessibility raises questions that will require additional time to be answered.
4. Competitive market for computer technicians: difficulty in hiring a computer technician as these people are in high demand from companies where they can earn high salaries.

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Mitigation actions:

1. Negotiation and synergies: We shall negotiate with Iscte the allocation of a space placed in other campus buildings (other than K&I building) or try to outline synergies with other laboratories or associations already settled in Iscte.
2. Active role in definition of regulations: One way to speed up is to actively participate in the drafting of the regulations. Furthermore, since we will be the pioneers in its use, it can be defined that it will be a provisional, experimental regulation, just for us. This removes some pressure on its preparation.
3. Prioritization in data transfer protocol and phased implementation: If identifying all the data series to be transported and their respective transport mechanisms is complex, this process can be phased in and begin by transporting only less sensitive information. This information may be sufficient for data query interfaces.
4. Internal recruitment: One way to mitigate difficulty in hiring a computer technician is to resort to final year students from MSc or PhD students in Data Science or Computer Engineering.

5.3 UKIM - Faculty of electrical engineering and information technology

Risks:

1. Competitive market for new recruits: Competitive engineering market may make it difficult to have onboard new recruits.
2. Diverse interests of stakeholders: potential challenges in aligning the diverse interests of stakeholders, which could lead to delays in decision-making or conflicts during the co-design process.
3. Coordination between departments: this risk involves the complexity of coordinating efforts across different departments and institutes within the university that could hinder smooth progress, requiring effective communication and collaboration to mitigate these risks.

Mitigation actions:

1. Competitive market for new recruits: The scope of potential recruits may be expanded beyond the premises of FEEIT, since UKIM has a continued influx of high-quality students in all faculties.
2. Stakeholder Alignment: Implement regular, structured meetings and workshops to facilitate clear communication and ensure that all stakeholder interests are aligned. Establishing a steering committee with representatives from key stakeholder groups can help manage conflicts and streamline decision-making.

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3. Coordination and Communication: Maintain a comprehensive communication plan to ensure continual coordination among different departments and institutes within FEEIT. This plan should include regular updates, progress reports, and designated points of contact to address issues promptly and maintain alignment with project goals.

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Annex I

Baseline reporting template

Template for progress report in pilot cases (xx)		
Description of current Pilot use	[describe how the pilot is currently being used, what operations are ongoing, what is their role in the HEI]	
Description of existing staff / human resource involved	[describe who currently uses the pilot and how]	
Description of planned intervention	[details of intervention end-goal]	
Experts and stakeholders planned to be involved	[e.g. renovation experts, facility managers, IT experts, HEI admin…]	
Please answer considering the next planning period (Mxx-xx)		
Description of Major Milestone	[Describe the next major milestone that needs to be competed to achieve the end-goal]	
Timeline to complete milestone	Activity 1: [title]	[Detailed description of Activity 1] [Deadline]
	Activity 2: [title]	[Detailed description of Activity 2] [Deadline]
	[add more activities if necessary]	
How is the INITIATE approach reflected in your planned activities?	[please elaborate]	
What kind of risks do you anticipate?	[please elaborate]	
What kind of mitigation actions can you take for these risks?	[please elaborate]	

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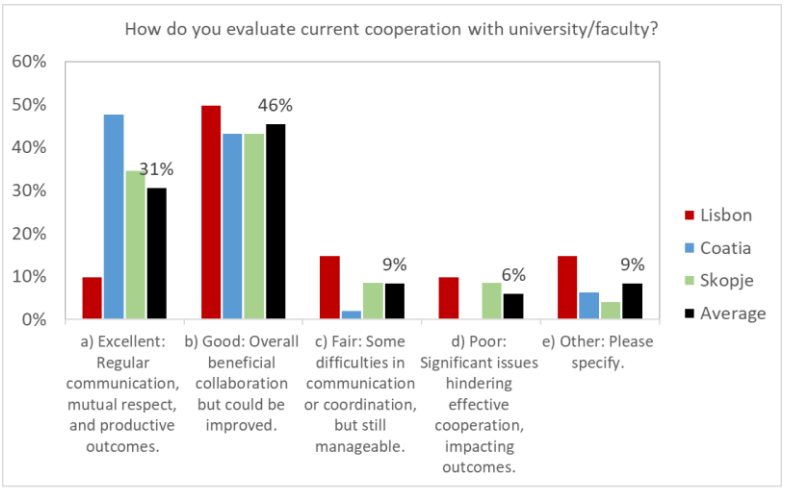
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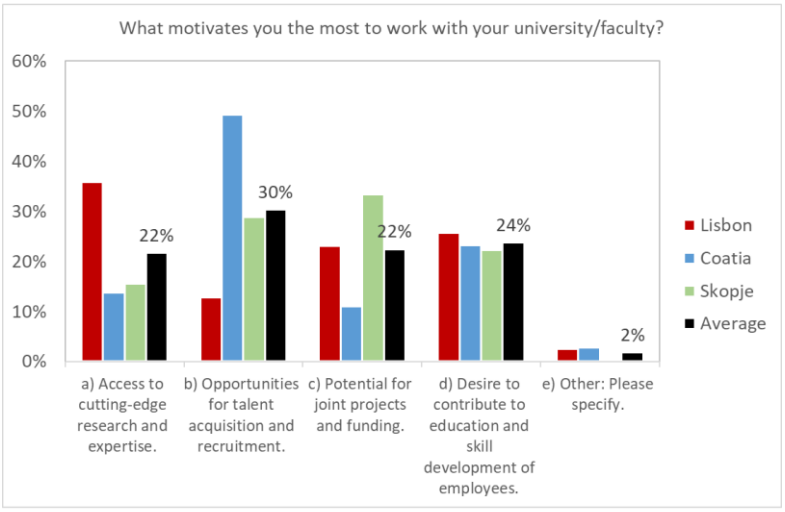
Template for progress report in pilot cases (xx)		
Description of current Pilot use	[describe how the pilot is currently being used, what operations are ongoing, what is their role in the HEI]	
Description of existing staff / human resource involved	[describe who currently uses the pilot and how]	
Description of planned intervention	[details of intervention end-goal]	
Experts and stakeholders planned to be involved	[e.g. renovation experts, facility managers, IT experts, HEI admin…]	
Please answer considering the next planning period (Mxx-xx)		
Description of Major Milestone	[Describe the next major milestone that needs to be competed to achieve the end-goal]	
Timeline to complete milestone	Activity 1: [title]	[Detailed description of Activity 1] [Deadline]
	Activity 2: [title]	[Detailed description of Activity 2] [Deadline]
	[add more activities if necessary]	
How is the INITIATE approach reflected in your planned activities?	[please elaborate]	
What kind of risks do you anticipate?	[please elaborate]	
What kind of mitigation actions can you take for these risks?	[please elaborate]	
Please answer considering the previous reporting period (Mxx-xx)		
Have there been any deviations with respect to the planned activities of the previous reporting period?		
What kind of mitigation actions have you taken during the previous reporting period?		

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Annex II

Materials from past activities of the pilots





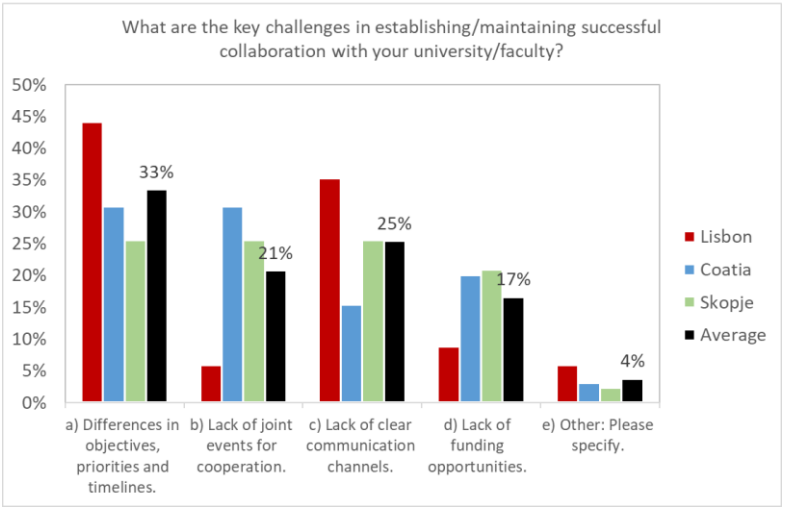


***Figure 7** - Results of workshop questionnaires in the pilots.*

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Figure 8 *- Workshops at the pilots (top to bottom: UNIZAG FSB, UKIM, Iscte).*

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