



JERICO-S3 DELIVERABLE

Joint European Research Infrastructure for Coastal Observatories
Science, Services, Sustainability

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1. Executive Summary

JERICO-S3 Work package 9, titled "A sustainable JERICO-RI: Preliminary design towards implementation", gathers information throughout JERICO-S3 and prepares specific recommendations to move towards a sustainable research infrastructure. Task 9.2 aims to analyse the users and their uses of JERICO products and services in order to define a User Engagement strategy that will benefit JERICO's sustainability.

As part of the overall process of defining a sustainable Business Model for JERICO, this strategy will enable and facilitate the creation of new, fit-for-purpose products and services and the fine-tuning of new ones tailored to users' needs, optimise access programmes, and provide a better response to the challenges of coastal observation, thereby making a major contribution to the financial and operational sustainability of a future JERICO.

The User Engagement strategy plan presented here is divided into seven parts: (1) the identification of stakeholders; (2) the understanding of user needs; (3) the communication strategies deployed; (4) the training and support aspects; (5) the various feedback mechanisms envisioned for the RI; (6) the community building activities and (7) the iterative evaluation mechanism to keep updating JERICO. This comprehensive approach will help JERICO to effectively engage users and attract new users, and to translate satisfaction metrics and detailed feedback into concrete changes, to address areas of concern, ensuring the evolution of JERICO with its landscape.

2. Introduction

On 14th August 2023, the European Commission adopted its third report on the European Research Infrastructure Consortium (ERIC) Regulation¹. Although the report underlines the enthusiasm of the scientific community for this statute, which enables research activities to be structured within the European Research Area (26 ERICs created since 2011), it also highlights that, for many infrastructures, financial and operational viability remains a challenge. The report calls for continued efforts to strengthen the ERICs' access programmes, improve the range of Products and Services (P&S) offered and facilitate engagement with external partners, and the scientific community.

JERICO (Joint European Research Infrastructure for Coastal Observation) aims to provide a holistic understanding of European coasts, by strengthening the integration of existing observation facilities, harmonising and labelling observing methods, and favouring innovation. In JERICO-S3 (Science, Service, Sustainability), WP9 "A sustainable JERICO-RI: Preliminary design towards implementation" is tasked with developing the different sustainability aspects of the future RI (Research Infrastructure), including identification and engagement of users, definition of a business plan, and of a legal entity with a governance scheme. In relation to the 3rd ERIC Regulation report, in order to improve JERICO's access programme, an Access and Security Policy was set up for JERICO-CORE (the pilot e-infrastructure) by WP3 in the framework of JERICO-DS D3.1 "Outlined JERICO virtual resources Access and Security policies". It reflected upon and defined an access policy providing fair, transparent, and non-discriminatory access to JERICO-CORE data, information and services to all users. This JERICO Access Policy is guided by the principles and recommendations of the European Charter of Access for Research Infrastructure, that aims to promote scientific excellence, international cooperation, and knowledge dissemination. This work compounds well the efforts made towards User Engagement by WP9, begun in deliverable D9.1 "User requirement and classification", done within Task 9.2, which includes the analysis of the potential user community and uses of the RI's P&S. Engagement with the various user communities of JERICO is what ultimately will determine financial viability and long-term operations. Deliverable D9.1 paved the present work, deliverable D9.2 "User engagement strategy plan with metrics to assess user satisfaction/expectations" that reports the strategy designed to address the need for a User Engagement Plan.

2.1. Previous user-oriented developments in JERICO-S3

Besides D9.1 that is detailed in a later section, two developments related to users within JERICO-S3 are relevant to the User Engagement Plan defined in the present document. They are summarised hereby in order to provide context for the User Engagement Plan devised.

¹ REPORT FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT
Third Report on the Application of Council Regulation (EC) No 723/2009 of 25
June 2009 on the Community legal framework for a European Research Infrastructure Consortium
(ERIC). <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2023:488:FIN>

Development 1: Plenary discussions: (1) the scientific community's position in the user landscape, (2) the difference between Users and Stakeholders

Deliberations at the JERICO-S3 General Assembly, framing the writing of deliverable D9.1, highlighted the specific status held by the scientific community, as they stand both as Providers/Operators and Users of JERICO. Because of that duality of roles, this community should receive special attention in our user engagement strategy plan, and special care should be given to service provision so that a provider does not favour his own or his Institute's interests. Another discussion focused on the distinction between a "user" and a "stakeholder", as the terms are sometimes used interchangeably in the Description of Action. Whereas a user is generally defined as "someone with a need", a stakeholder is "someone with an interest with the development of - hereby - coastal observation". A stakeholder may have varying degrees of influence and power over the decisions and direction of the RI, and their involvement and satisfaction are considered important for the overall success and sustainability of the endeavour.

Development 2: University of Milan Training Programme: Strategic Development Programme for JERICO

While D9.1 has shown us that we can have entities that are both a stakeholder and a user, it is important to focus our attention on a user-oriented approach (*i.e.*, oriented on user satisfaction). As part of Task 9.4, the Irish Marine Institute organised an online training to consolidate the development of the JERICO economic model and Business Plan, tailored for the JERICO Nations Committee and the Funding Working Group members of JERICO-DS, and for the Business Development Group of JERICO-S3 (approx. 15 participants). This training program, facilitated by lecturers from the University of Milano Bicocca involved in the graduate training "Executive Masters in Management of Research Infrastructures", ran from March 2022 to May 2022. Days 3 & 4 of this training programme were dedicated to users and User Journey Maps (defined in a later section) including a presentation, individual assignment, and teamwork on customer/user profiling (see Figure 1 for an example of useful output). The results and recommendations of the JERICO training exercise were quite beneficial for Task 9.2. For instance, it was pointed out in these sessions that a significant difference might exist between direct users and indirect users of JERICO. While indirect users will be expecting reports or other processes that will require the RI's P&S, direct users (or end-users) will actually be the ones who, for example, browse JERICO-CORE and download and exploit its P&S.

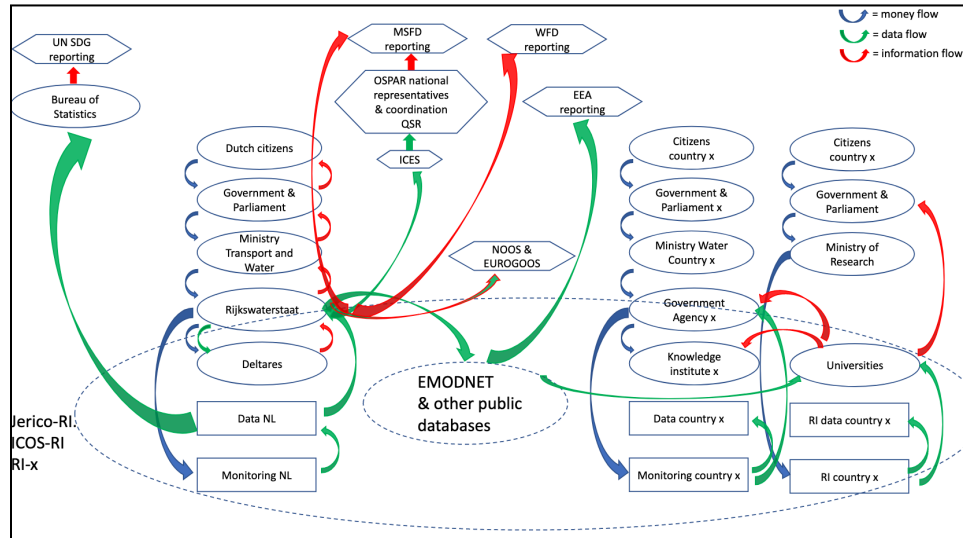


Figure 1. “Who is the User in the Netherlands”, by Anouk Blauw (Deltares) in the framework of the JRI training assignment for Day 3, showing the complex landscape of money, data, and information flows between the varied research and funding entities.

It has to be kept in mind that only end-users and their perspectives are considered in this deliverable. This is not to say that the other sectors identified in deliverable D9.1 will not be engaged: they will be, with the same methodology outlined hereby, albeit with the necessary considerations related to their respective organisations and interests. The work already produced efficiently frames the present deliverable D9.2, and the User Engagement Plan that it defines in the following parts. User satisfaction is paramount, as it ensures that users will be more likely to (a) provide constructive feedback, helping to keep P&S tailored to end-users' needs, and (b) come back to the RI for the same or other P&S. Satisfied users are also much more likely to attract new users to the RI by word of mouth, solidifying the sustainability of the RI in the longer-term. User engagement is directed in priority towards the scientific community, from an internal point of view: as previously stated, scientists of all levels are envisioned to compose the backbone of the user community.

2.2. Needs for a User Engagement Plan

The vision of JERICO is to be a “pan-European integrated gateway to long-term scientific and harmonised observations and related services for coastal marine systems”. After the definition of the vision and desired identity, a central step in the Strategic Planning Process is the definition of a Business Model including a value proposition, a supply chain, a customer interface, and a financial model (Figure 1).

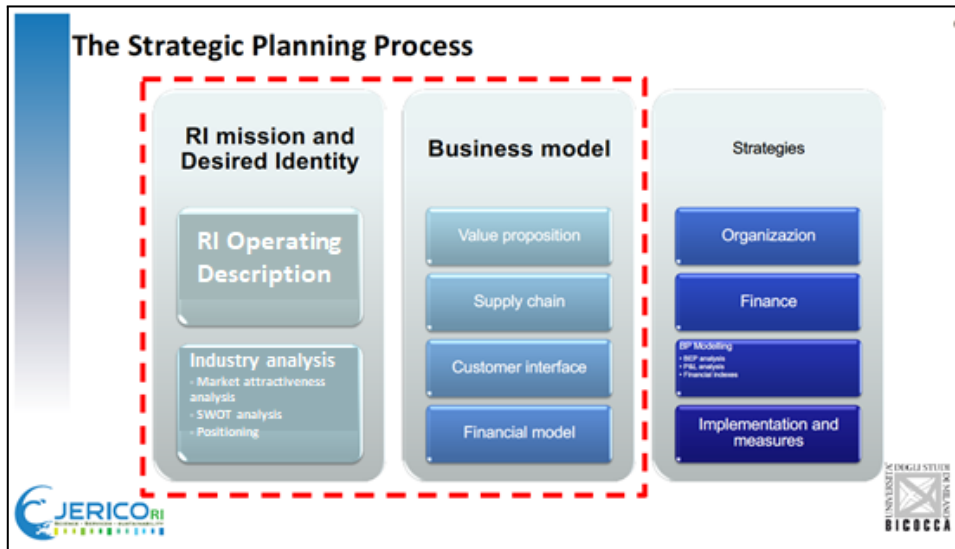


Figure 1: Strategic Planning Process presented to the JERICO team during the University Bicocca of Milan RI-Train course between February and June 2022.

The establishment of JERICO as a consolidated RI will lead to the definition and development of more services in order to meet user requirements. Often, there is a gap between services offered and demands from the user base. This is due to (a) ill-defined or fragmented demands by users who may lack cross-disciplinary skills, and (b) insufficient identification of users' needs as a result of oversight, past experiences, or lack of communication. This gap resulting from communication failures is summed up well by a 1960s cartoon that depicts various interpretations of user needs, plans, and subsequent product development (see Figure 2 for a modernised version of it). This type of communication failure needs to be kept as minimal as possible between JERICO services and user needs, which can be achieved through a thoughtful User Engagement Plan.

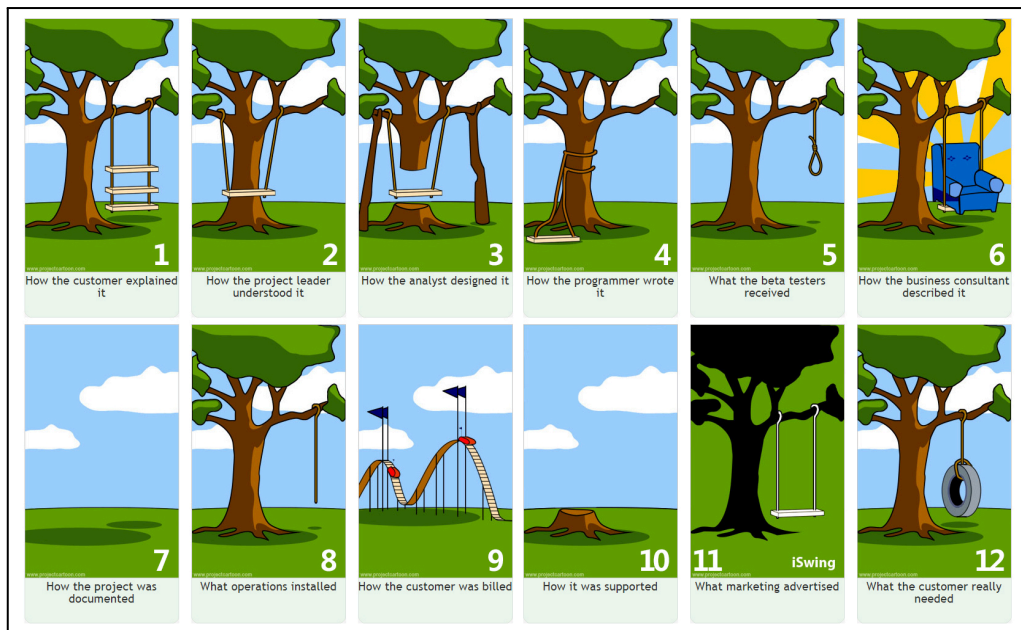


Figure 2: Tree Swing cartoon (reproduced from <https://pmac-agpc.ca>), depicting the communication gap between the user's/customer's request and the product or service developed after that.

A User Engagement Plan refers to a strategic framework designed to actively involve and interact with end-users who are affected by JERICO's P&S. Typically, it outlines specific objectives, methodologies, and activities aimed at fostering meaningful interactions, gathering feedback, and building relationships with end-users to enhance their experience and thus maximise the effectiveness of the infrastructure, as well as its reach. Several key components of a user engagement plan are listed below, and represented in the framework of JERICO (see Figure 3). These key components constitute the structuration of the present deliverable:

- **Identification of Stakeholders** (defining the various stakeholders involved, and the broader community)
- **Understanding User Needs** (conducting surveys or interviews to understand the specific needs, preferences, and challenges of the different users)
- **Communication Strategies** (developing tailored communication channels and materials so as to disseminate information about services, updates, and opportunities for engagement)
- **Training and Support** (providing training sessions, workshops, or resources so as to help end-users effectively use the infrastructure's capabilities, and address any technical or operational challenges)
- **Feedback Mechanisms** (establishing mechanisms for collecting feedback from end-users on their experiences and emerging needs)
- **Community Building** (organising events, seminars, or networking opportunities to facilitate collaboration, knowledge exchange, and community-building among end-users)
- **Evaluation and Iteration** (regularly evaluating the effectiveness of the engagement activities and making adjustments based on feedback and evolving user needs)

In WP9, Task 9.2, the focus is put on the first two key components listed. In order to guarantee the creation of a sustainable, fit-for-purpose RI, our User Engagement Plan must focus first on these three aspects:

- clearly defining our users
- clearly defining their needs
- maintaining a dialogue to ensure a co-creative approach on the long-term, both for users and user needs identification



Figure 3: Structure of JERICO's User Engagement Plan, through JERICO-S3 and beyond the 2025 ESFRI application.

A first typology of users and stakeholders has been defined already in D9.1, categorising them into sectors (see Table 1 and Figure 4). The classification of all sectors in “Power vs Interest” matrices (Figure 5) is particularly interesting in that regard, and it needs to be completed with more data as they are available. This will guide the priorities that JERICO, through the JERICO User Committee (JUC), will need to tackle by defining their needs. As shown in the D9.1, this will be done via User eXperience (UX) design approaches and fed via the JERICO User Forum (JUF), which will provide an interactive platform ensuring that dialogue is maintained.

3. JERICO User Engagement Plan

3.1. Identification of users

As shown in deliverable D9.1, users of the RI come from various backgrounds; although scientists of all levels are foreseen to be the main users of the RI, other actors performing economic, societal or political activities in Europe are also to be taken into account (Table 1 and Figure 4).

Table 1 – Examples of user typology as defined in D9.1 (reproduced from Table 5 of D9.1).

User	Region	Category	Sector	Scientific field
OSPAR	English Channel / Irish coastal seas / Bay of Biscay / North-East Atlantic	Public	Coastal protection and management	Biodiversity / eutrophication / habitat + contaminants (chemical and biological)
National University of Ireland Maynooth	Irish coastal seas	Academia	Fundamental and applied research	Hydrodynamics and transport
COPERNICUS/CMEMS	(All region)	Public	Weather services and ocean forecasting	Not relevant to this user
WWF	(All region)	NGO	Other	Not relevant to this user
SASEMAR	Bay of Biscay, Iberian Atlantic Margin / North-Western Mediterranean	Public	Marine safety / Crisis responses	Hydrodynamics and transport

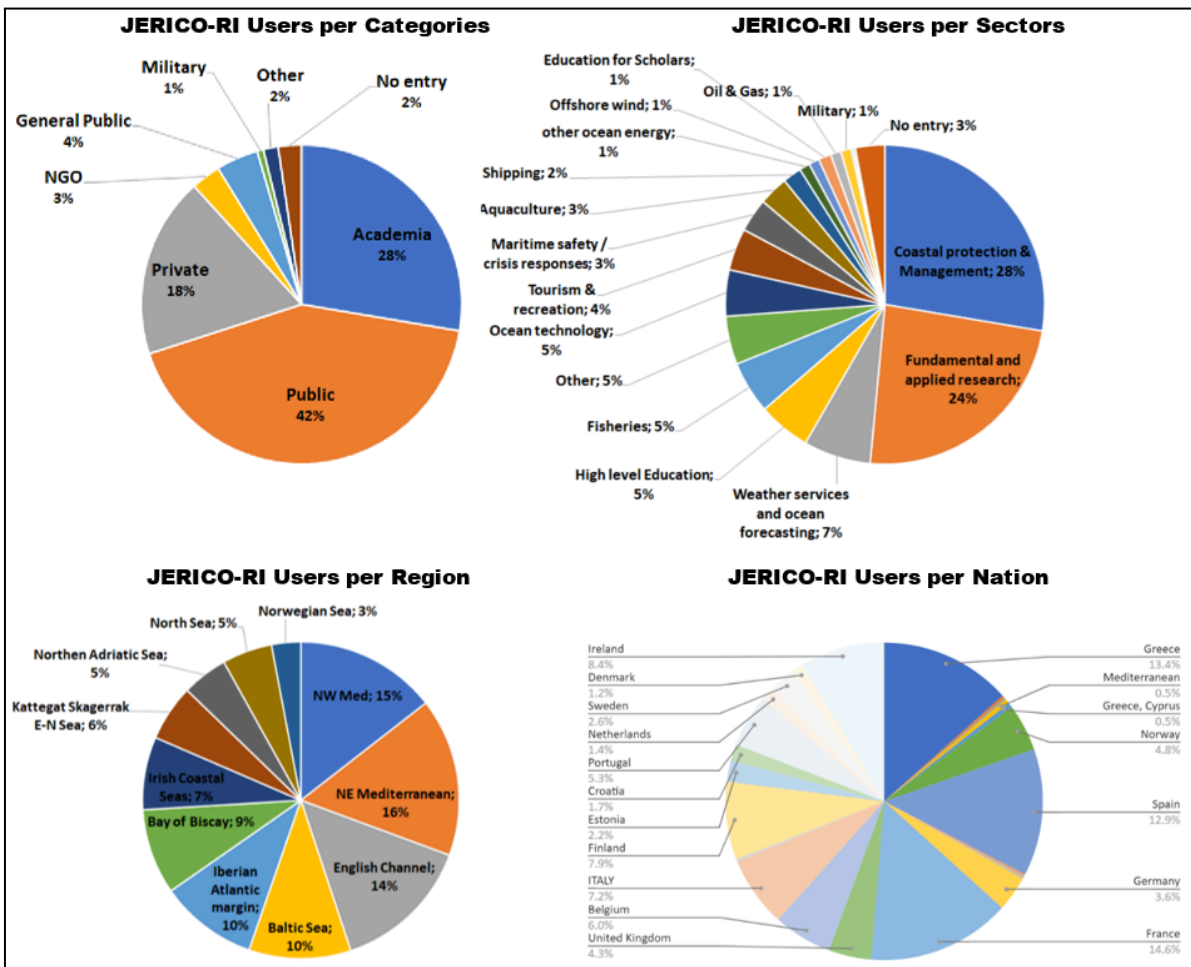


Figure 4: JERICO user categories and sectors of activities as evaluated in D9.1 (reproduced from JERICO-S3 D9.1).

JERICO is already distributed across 14 countries with quite different marine regions in terms of ocean economy activities. This leads to different coastal management issues and scientific priorities, thus the relative importance of JERICO's Key Scientific Challenges (KSCs) varies across regions. Users' needs will be different from one location to another and will evolve over time. In D9.1, a mapping of current users of the JERICO was conducted by regions, taking into account their Power (Ability) and Interest (Willingness) in the decision-making processes of the RI (see Figure 5), as well as an analysis of the

needed services compared to the presently offered ones. This allowed us to ascertain the actual level of interest in JERICO and to classify current users and current usages of P&S.

The conclusion of D9.1 was that (a) the current user group was composed of three main sectors of activity (Coastal protection and management, Fundamental and applied research, and Weather services and Ocean forecasting), including those with the highest influence coming from both Governmental Organisations and Academia; and (b) the current main access mode was by far the *Virtual Access* (VA) provided by JERICO-CORE (formerly e-JERICO).

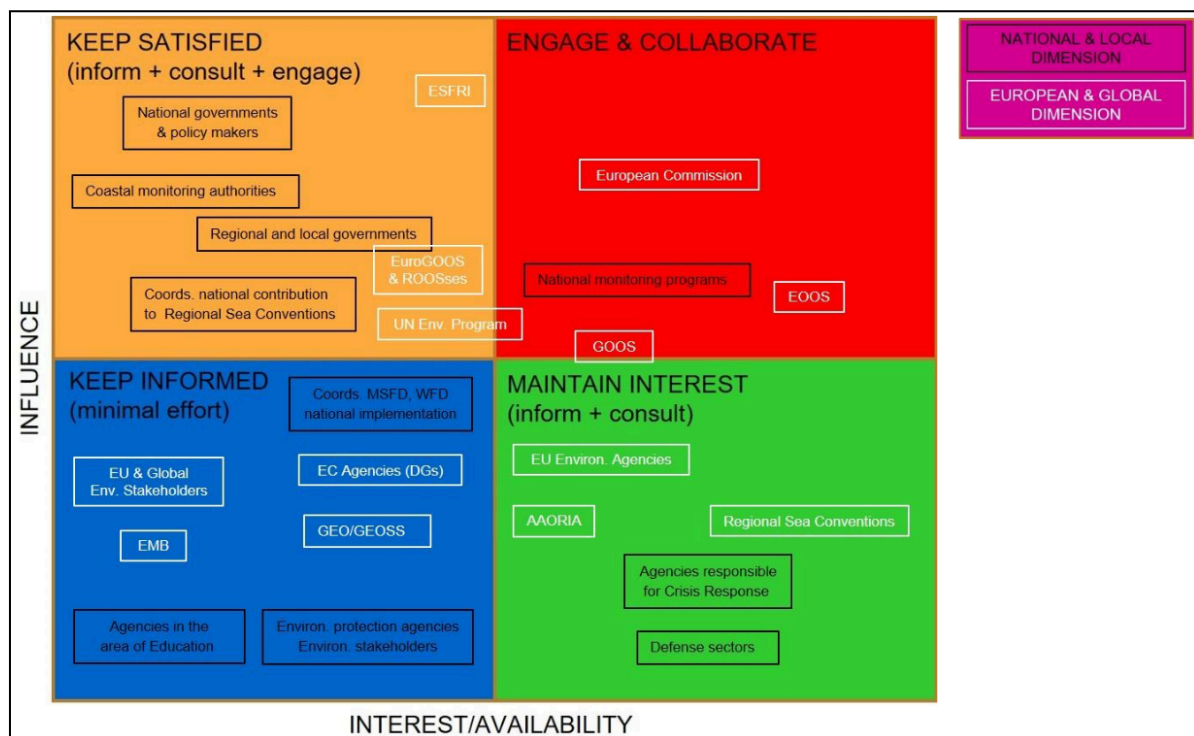


Figure 5: JERICO user classification following a Power vs Interest matrix, indicating the most adapted behaviour towards each currently identified user (reproduced from Figure 3a of D6.2 of JERICO-DS).

As per the analysis of deliverable D9.1, **the following sectors will be the highest priorities for JERICO and the JUC: Coast protection and management, Fundamental and Applied Research, and Weather services and Ocean forecasting.** This methodology, when completed with more compiled data, shall be quite useful in determining which category of users should be addressed first. These other categories of users will be tackled at a later date, which will be defined by the JERICO Coordination Team advised by the JUC. The UX Design approach outlined in the previous sections will be followed, accounting for the differences inherent to these other categories of users. It will be necessary for JERICO to consolidate the network already built through the different projects that concluded over time: for that matter, the JUC and the JUF will be paramount.

3.2. Understanding User Needs

3.2.1. UX Design approach

UX (User eXperience) design is a method by which a product or service is designed while having in mind the user's or customer's point of view to provide them with a meaningful experience when interacting with a set of services or products.

The above-mentioned training course, provided by the University Bicocca of Milan between March and May 2022, was given to the JERICO core team, to help fine-tune the strategic direction that should be taken for the RI. This course covered notions of Business Model development in general, and that of UX design approaches in particular, which fueled subsequent work.

This involved the approach of developing User Journey Maps (UJM), a mostly graphic representation of the steps a potential future user would have to go through for a given process. This representation carries - purposely - a notion of subjectivity, as it attempts to recreate as best as possible the feelings and thoughts of a user, defined by a persona. A user persona represents a compilation of users with common features such as needs, frustrations, psychological profiles, and behaviour. It is helpful, when designing a product or a service, to define several user personas representing different categories, so as to better answer the needs of different types of potential users.

In JERICO-S3 D11.1, such an approach has been taken already in the framework of the pilot e-infrastructure JERICO-CORE. This allowed to pinpoint the needs of a user who seeks to gather coastal oceanography data, through a dedicated website, at two different stages: resource discovery, and related resources discovery. This shaped the concept of JERICO-CORE as being a discovery platform. This User Journey for JERICO-CORE was a first, useful exercise showcasing interactions with the VA component of JERICO, as well as with service provision.

In fact developing a UJM is best to highlight the different needs and challenges a user might have while using P&S, in order to take corrective actions. It allows us to test directly and precisely the designed UX. A UJM is made of a scenario - that is, a persona with a goal - cut into different phases. For each phase, one has to identify interaction points and associated channels, the mindset of the persona, and the barriers encountered for each process. This helps identify where and how the JERICO can improve the situation. For the definition of personas and of UJM, as preliminary work, scientists of all levels were defined. This decision was taken because scientists will constitute, at least initially, the backbone of the user community, as shown in D9.1: *Public* and *Academia* categories harbour the most users, and the *Fundamental and applied research* sector represents the second sector in terms of number of users. Additional external users will be defined more precisely by the JUC in the future.

3.2.2. User Persona and User Journey maps

The JERICO User Forum (JUF) held between 18-20 April 2023 was specifically dedicated to a UX design approach to be taken within the context of JERICO. It involved the core team of JERICO, as well as a panel of partners related to WP9. The outcome was the definition of several 'user personas' representing users of different levels from research institutes involved in coastal observations (Figures 6 to 14). In doing so, it was possible to theorise their interaction with JERICO, and to more accurately pinpoint user experience and potential frustrations when using P&S, by building a UJM. In total, five user personas were defined during the JUF by five small groups, comprising a mix of the core team as well as of WP9 partners. This exercise required specifying as many details as possible, including name, age, geographical location, current feelings, social media activity, general personality, and frustrations and needs encountered while working. Those user personas represent scientists of different backgrounds and levels, thus with different practices, expectations, and needs, in their professional context. The included user personas attempted to cover as many aspects of current research as possible, and to be as inclusive as possible. Four more were created before the writing of this deliverable, to extend coverage of potential users. The result of this exercise is hereby presented (Figures 6 to 14), with each user persona being shown under a CV format. This CV contains a broad background ("About"), specific demographic details (age, profession, personal status, and location), current professional frustrations and resulting needs, personality, and average social media activity.

'Vincenzo' represents a PhD student who just started his journey, thus who lacks basic work experience. He needs advice and tools to process samples and data quicker, and a universal data and knowledge repository to regularly consult.


	About		Age	24																								
	Vincenzo is an enthusiastic PhD student, eager to finally contribute to marine research. He started months ago and is still getting background experience in his field of research, while starting experiments and fieldwork. He is hopeful to start a career in academia after completing his PhD, and is looking after networking opportunities.		Occupation	Ph.D. student																								
			Status	In relationship																								
			Location	Naples, Italy																								
Frustrations		Needs																										
<ul style="list-style-type: none"> • Too many things to do • Lack of background knowledge • Lack of funding for more equipment, fieldwork, and travel 		<ul style="list-style-type: none"> • Knowledge repository • Simpler, quicker ways to analyse, validate and store data • Expert advices 																										
Personality																												
Creative / Perfectionist / Courteous / Self-critical																												
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Figure 6: First user persona CV, as defined during the JERICO User Forum. This user persona represents a PhD student and potential end-user of JERICO.

'Lara' represents a young post-doc who continues to work more on the topic covered by her PhD. Her interests lie in having easy access to data and analysis tools for her work, as well as building up a professional network.


	About		Age	27																								
	Lara has recently completed her PhD in plankton ecology explored through genomics, and has been recruited as a PostDoc in the same lab to continue her research work. She has always been interested in biology in general, and her positive, open-minded attitude contribute to her fast-expanding scientific culture. She likes her work environment, both well-equipped and demanding.		Occupation	Post-doc																								
			Status	Single																								
			Location	Rovinj, Croatia																								
Frustrations		Needs																										
<ul style="list-style-type: none"> Where to get the data?! There are way too many acronyms to look for. I need a Google-like/Chat-GPT-like system to get data and metadata, and advice on how to best analyse them 		<ul style="list-style-type: none"> Samples from across Europe Training and expert advice for data processing Computing capacities and codes Scientific network and emulation 																										
Personality																												
Lively / Demanding / Focused / Organised																												
Social media activity																												
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Figure 7: Second user persona CV, as defined during the JERICO User Forum. This user persona represents an early-career scientist and potential end-user of JERICO.

'Hans-Peter' also represents a young researcher, converted into a data analyst working on the Marine Strategy Framework Directive (MSFD) related studies, who needs commonly formatted time-series to efficiently exploit them.

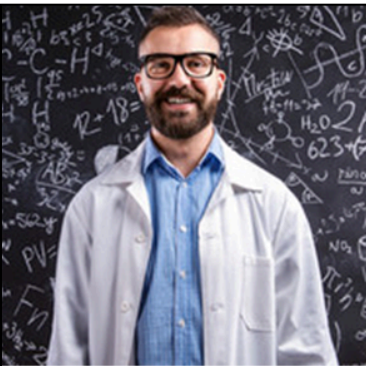
	About		Age	32																								
	Hans-Peter is a data manager and analyst working at the Max Planck institute who cares about policy tools and how to optimise their inputs. He wishes for society to be more tolerant towards LGBTQ persons, including in academia. Although he obtained a PhD in marine sciences, he quit fundamental research to work on the MSFD.		Occupation	Data analyst																								
			Status	Single, non-binary, handicapped (colour-blind)																								
			Location	Bremen, Germany																								
Frustrations		Needs																										
<ul style="list-style-type: none"> Incorrectly formatted data, redundancy in multiple databases Noisy data with gaps in time-series Changes in data access 		<ul style="list-style-type: none"> Common, standardised format for datasets Already existing plots of analysed and validated data, for reports Tools specifically for time-series analysis (noise clearance, gap-filling) 																										
Personality																												
Genuine / Content / Careful / Protective																												
Social media activity																												
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Figure 8: Third user persona CV, as defined during the JERICO User Forum. This user persona represents a mid-career scientist and potential end-user of JERICO.

'Cécile' represents a technician who, despite her expertise, is not employed to the best of her capacities. The data she collects could be better exploited, and routine tasks could be eased up substantially.


	About	Age	36												
	Cécile is a highly-skilled technician, owner of a PhD degree, who struggles to get a permanent position as a researcher or engineer. She is highly professional, but also feels underused, and feels that the data she collects won't be useful to anyone.	Occupation	Technician												
		Status	Married, 1 children												
		Location	Marseille, France												
	Frustrations	Needs													
	<ul style="list-style-type: none"> Overqualified and underused Does not see the added value of her routine work Has to fix instruments only with available means 	<ul style="list-style-type: none"> To be useful – no one seeks her skills with advanced equipment Help with routine instrumentation maintenance 													
	Personality	Outgoing / Attentive / Supportive / Big-headed													
	Social media activity														
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Figure 9: Fourth user persona CV, as defined during the JERICO User Forum. This user persona represents a technician and potential end-user of JERICO.

'Mark' represents an engineer with many ideas and energy to back them up, but who lacks the funds to do so. He changed his focus to start coding specialised software tailored for the kind of data he is used to. He would appreciate contributing to the definition of Best Practices (BPs) in his tight field of expertise.


	About	Age	38												
	Mark is an engineer tired with the academic system, trying to finally get a fixed position somewhere. He accumulated an extensive expertise in his field, and tries to train new users of the technique to his own best practices. Due to a failed funding for more fieldwork, he now started to code a software useful for the analysis of his own type of data.	Occupation	Engineer												
		Status	In relationship												
		Location	Wageningen, the Netherlands												
	Frustrations	Needs													
	<ul style="list-style-type: none"> Not enough funding for fieldwork No state-of-the-art best practices guide Near impossible interdisciplinary research 	<ul style="list-style-type: none"> Networking capacities To contribute to a best practices guide Way to connect remotely to sensors once installed Training sessions for coding 													
	Personality	Blunt / Willing / Passionate / Relaxed													
	Social media activity														
	<table border="1"> <tr><td>Email</td></tr> <tr><td>LinkedIn</td></tr> <tr><td>ResearchGate</td></tr> <tr><td>GitHub</td></tr> </table>	Email	LinkedIn	ResearchGate	GitHub	<table border="1"> <tr><td>YouTube MOOC</td></tr> <tr><td>Facebook</td></tr> <tr><td>Twitter</td></tr> <tr><td>Instagram</td></tr> </table>	YouTube MOOC	Facebook	Twitter	Instagram	<table border="1"> <tr><td>TikTok</td></tr> <tr><td>Snapchat</td></tr> <tr><td>WhatsApp</td></tr> <tr><td>Signal</td></tr> </table>	TikTok	Snapchat	WhatsApp	Signal
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Instagram															
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Snapchat															
WhatsApp															
Signal															

Figure 10: Fifth user persona CV, as defined during the JERICO User Forum. This user persona represents a field engineer and potential end-user of JERICO.

'Sofia' represents an experienced engineer, whose mission lies in gathering local data despite financial difficulties, and keen on raising awareness in younger generations on future environmental challenges.


	About	
	Sofia is a data manager at the Institute of Oceanology BAS, and leads the local instrumentation team. She has been an environmental activist for many years, and sincerely believes in Citizen Science. Overall, she stands for the education of the next generations. She wishes to benefit from more low-cost technical solutions for her team's activities	
	Age	41
	Occupation	Chief Engineer
	Status	Single, 2 children
	Location	Varna, Bulgaria
	Frustrations	Needs
	<ul style="list-style-type: none"> Not able to travel to meetings – too busy with children Datasets are never ever harmonised Low resources for buying and operating hardware 	<ul style="list-style-type: none"> Good quality, open-source data Education material Low-cost hardware Clear professional needs from scientists
	Personality	
	Shy / Egocentric / Reflective / Over-indulgent	
	Social media activity	
	<input type="text" value="Email"/>	<input type="text" value="YouTube MOOC"/>
	<input type="text" value="LinkedIn"/>	<input type="text" value="Facebook"/>
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Figure 11: Sixth user persona CV, as defined during the JERICO User Forum. This user persona represents a data manager and potential end-user of JERICO.

'Angelica' represents a middle-aged scientist, recently tenured, who seeks to organise the research of her newly-formed lab. In doing so, she needs expert advice for technical matters, and a network in which she could seek lab members.


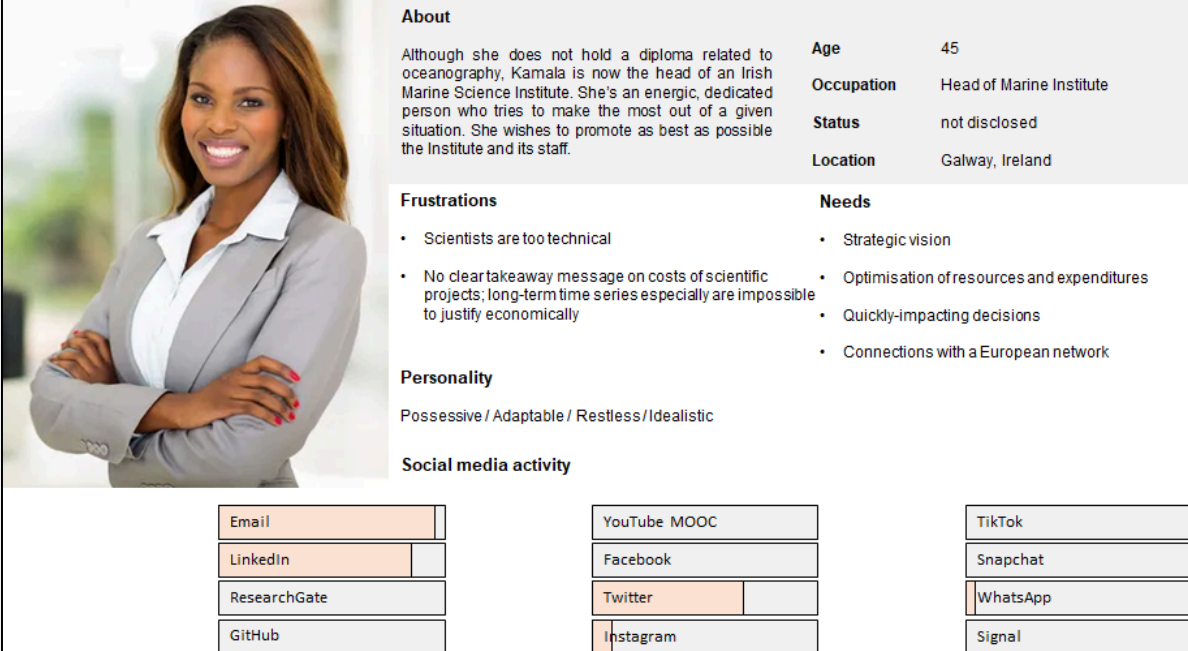
	About	
	Angelica is a freshly tenured scientist working at CSIC, who ambitions to build a team able to tackle scientific coastal issues, in collaboration with other fields. Currently, despite her best efforts, the situation is on a standstill so she keeps on working on scientific papers long overdue.	
	Age	40
	Occupation	Mid-level scientist
	Status	Not disclosed
	Location	Barcelona, Spain
	Frustrations	Needs
	<ul style="list-style-type: none"> Not sure how to organise future projects of coastal samplings, and what sensors will be most useful I can't find easily labs and scientists with specific skills that I need, for a collaboration 	<ul style="list-style-type: none"> Scientific network Pool of skilled labour to address for recruitment Expert advice on sensors' capacities
	Personality	
	Frank / Overemotional / Original / Flexible	
	Social media activity	
	<input type="text" value="Email"/>	<input type="text" value="YouTube MOOC"/>
	<input type="text" value="LinkedIn"/>	<input type="text" value="Facebook"/>
	<input type="text" value="ResearchGate"/>	<input type="text" value="Twitter"/>
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		<input type="text" value="Snapchat"/>
		<input type="text" value="WhatsApp"/>
		<input type="text" value="Signal"/>

Figure 12: Seventh user persona CV, as defined during the JERICO User Forum. This user persona represents a tenured, mid-career scientist and potential end-user of JERICO.

The two last profiles represent senior staff: 'Kamala', although not a scientist *per se*, leads a Marine Science Institution and her task lies in expanding the activities of her scientific staff; and 'Tom Boyer' is a grizzled, demanding scientist who wants to focus on data analysis rather than on leadership tasks.



About

Although she does not hold a diploma related to oceanography, Kamala is now the head of an Irish Marine Science Institute. She's an energetic, dedicated person who tries to make the most out of a given situation. She wishes to promote as best as possible the Institute and its staff.

Age 45
Occupation Head of Marine Institute
Status not disclosed
Location Galway, Ireland

Frustrations

- Scientists are too technical
- No clear takeaway message on costs of scientific projects; long-term time series especially are impossible to justify economically

Needs

- Strategic vision
- Optimisation of resources and expenditures
- Quickly-impacting decisions
- Connections with a European network

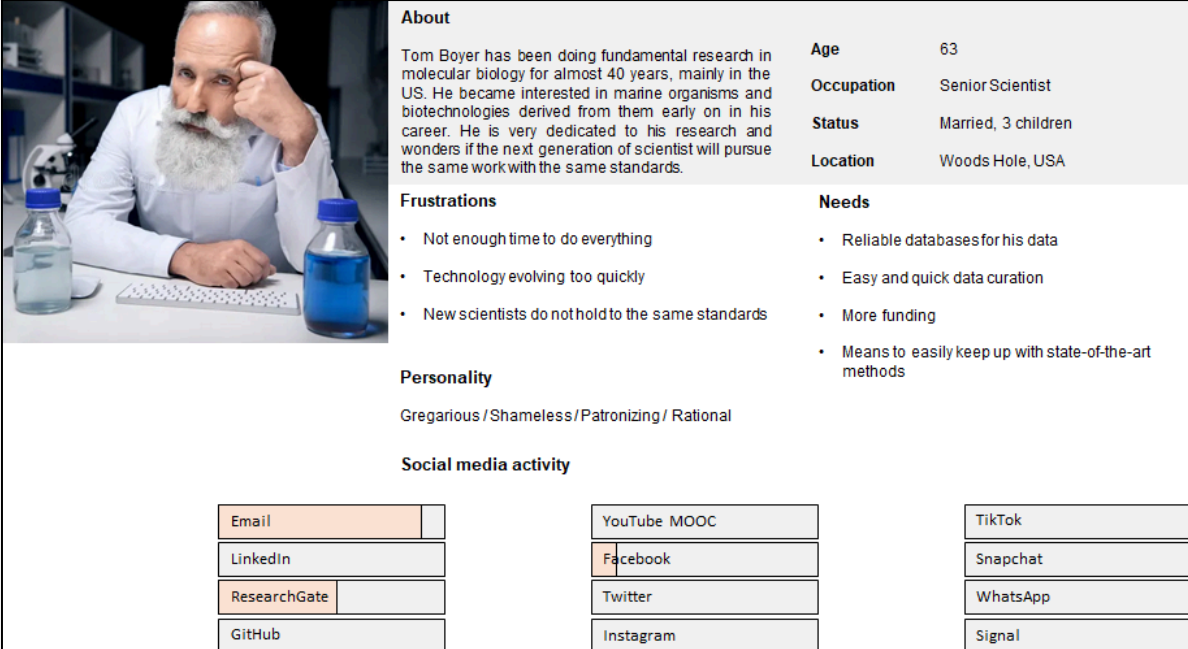
Personality

Possessive / Adaptable / Restless / Idealistic

Social media activity

Email	YouTube MOOC	TikTok
LinkedIn	Facebook	Snapchat
ResearchGate	Twitter	WhatsApp
GitHub	Instagram	Signal

Figure 13: Eighth user persona CV, as defined during the JERICO User Forum. This user persona represents a Head of Institution and potential **stakeholder** of JERICO.



About

Tom Boyer has been doing fundamental research in molecular biology for almost 40 years, mainly in the US. He became interested in marine organisms and biotechnologies derived from them early on in his career. He is very dedicated to his research and wonders if the next generation of scientist will pursue the same work with the same standards.

Age 63
Occupation Senior Scientist
Status Married, 3 children
Location Woods Hole, USA

Frustrations

- Not enough time to do everything
- Technology evolving too quickly
- New scientists do not hold to the same standards

Needs

- Reliable databases for his data
- Easy and quick data curation
- More funding
- Means to easily keep up with state-of-the-art methods

Personality

Gregarious / Shameless / Patronizing / Rational

Social media activity

Email	YouTube MOOC	TikTok
LinkedIn	Facebook	Snapchat
ResearchGate	Twitter	WhatsApp
GitHub	Instagram	Signal



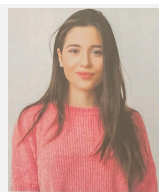

Figure 14: Ninth user persona CV, as defined during the JERICO User Forum. This user persona represents a late-career scientist and potential end-user of JERICO.




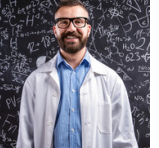

These first user personas are useful for the assessment of the added value of current P&S, and of the planned ones, for the academic community. They cover a range of work experiences, occupations, and needs, and will guide new P&S practical elaboration.

Overall, it will also be necessary to put forward the added value of the JERICO for already existing P&S, and during future outreach activities, to engage more efficiently both end-users and stakeholders, as it is done in Table 2. This table shows the concrete added-value given by JERICO to the various users of the scientific community, and should be seen as a starting point in terms of P&S provision. It is also useful as a guide in order to prioritise, for each P&S provided, which User Persona and which UJM should be worked upon. Created user persona will be used to define UJMs for the most critical P&S of the RI yet to be defined, or updated. A UJM covers processes as they are being done currently, and helps to identify where and how the RI can provide specific added-value. As an example, two were created (Figures 15 and 16). The two UJM cover two potential scenarios that are relatively common in the scientific field, and that could be improved by JERICO-CORE.

Table 2 – Added value of planned or existing products and services of JERICO, for user personas of the Academic sectors. This table is adapted from Chapter 6 of JERICO-S3 Deliverable D10.1, where various types of Key Exploitable Results for JERICO are listed.

Product type	Product	Owner(s) (If IPR aspect)	Product or Service added value	Envisioned exploitation form after the end of J-S3	Envisioned way of exploitation	What user persona will benefit the most?
Technological innovations	JERICO Interoperable Instrument Module (cEGIM)	IFREMER	To investigate commercial opportunities on the basis of new developments and sensor payload for biogeochemistry and biology.	Product/Patenting	Scientific and potentially industrial partner for production	Mark, engineer 
Technological innovations	JERICO Plankton dynamics multi-sensor package (PSP)	IFREMER	To investigate commercial opportunities. Integration of the new sensors into monitoring strategies and platforms. Seeking further research funds from industries for R&D continuation or further development of the technologies. Encourage users to be able to collect data for future R&D development.	Best Practice	Scientific and potentially industrial partner for production	Mark, engineer 
Technological innovations	Water sample filtering and preserving device (WASP)	NIVA	Demonstrate a method for eDNA sampling based on a commercially available solution.	Best Practice	Scientific and potentially industrial partner for production	Sofia, chief engineer 
Technological innovations	Autonomous Coastal Observing Benthic Station (ACOBS)	CNRS	Integration of the new sensors into monitoring strategies and platforms. Best practices in operational and integrated benthic (soft bottom) observation.	Best Practice/Product	Scientific results/monitoring awareness	Mark, engineer 

Technological innovations	JERICO-CORE e-infrastructure	SOCIB	Supporting the current and future JERICO services.	JERICO RI digital infrastructure front-end, back-end, and linked resources.	Scientific results aggregation	 Vincenzo, PhD student
Access	JERICO-CORE/VRE	SOCIB	Promote VA and ensure service beyond the end of the project.	Online Service	Institutional partners for promotion and maintenance	 Vincenzo, PhD student
Access	RD&I results/success stories	JERICO	Success stories for engaging with stakeholders.	Publication, communication material	Institutional partners for promotion and maintenance	 Kamala, head of institute
Best practices & Innovative monitoring strategies	JERICO-RI Best practices for coastal observation	JERICO	To implement best practices within the coastal observatories. Maximising impact of JERICO-RI in the European landscape. Maximising interactions with stakeholders at a regional level. Creating added-value for science, monitoring, and sustainable growth at regional and pan-European scales.	Best Practice/Publication	Scientific results, citations	 Mark, engineer
Best practices & Innovative monitoring strategies	Best practices for Data Management	MARIS	Maximising impact of JERICO-RI in the European landscape.	Best Practice/Publication	Scientific results, citations	 Hans-Peter, data analyst

<p>Cooperation agreements</p>	<p>MoC with key RIs</p>	<p>IFREMER</p>	<p>Making JERICO's positioning in the RI landscape clear and unquestionable. Initiating new collaborations between RIs.</p>	<p>MoC, cooperation agreements</p>	<p>Institutional long-term partnership</p>	<p>Kamala, head of institute </p>
<p>Cooperation agreements</p>	<p>Partnership with Copernicus marine service, ESA and EUMEDSAT</p>	<p>JERICO</p>	<p>Elaborating fit-for-purpose products. Promoting this product/service towards different communities, commercialisation, and IPR.</p>	<p>Fit-for-purpose products</p>	<p>Institutional partners for the elaboration of products or services.</p>	<p>Hans-Peter, data analyst </p>
<p>Cooperation agreements</p>	<p>Roadmap for cooperation with industries</p>	<p>JERICO</p>	<p>Publishing and promoting a long-term strategy with respect to the industry - giving confidence to investors.</p>	<p>MoU, cooperation agreements</p>	<p>Industrial long-term partnership</p>	<p>Kamala, head of institute </p>

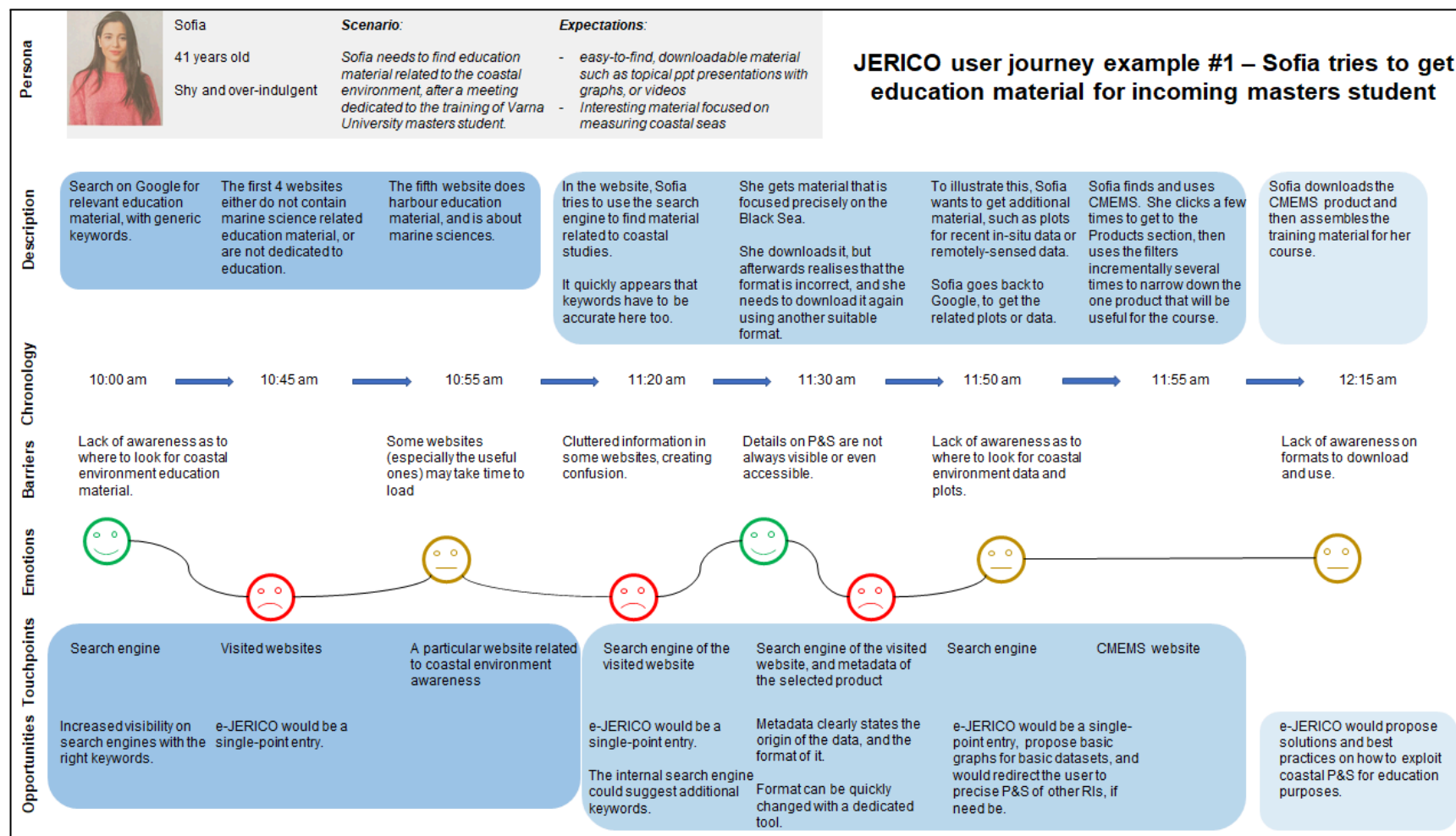


Figure 15: First User Journey Map example, showing the potential added value of JERICO. This first UJM presents the process of gathering educational material by 'Sofia' on a specific, local topic (coastal oceanography in the Black Sea). It illustrates how difficult this gathering process can be, especially without prior knowledge of the right keywords and websites: several websites have to be checked before finding one with suitable material. Data or product formats are not always properly indicated, generating confusion and loss of time. Related graphics, especially for recent data, may not be always available or at least, easily discoverable. Overall, the time theoretically spent by 'Sofia' could be significantly shortened by the envisioned RI and its virtual component.

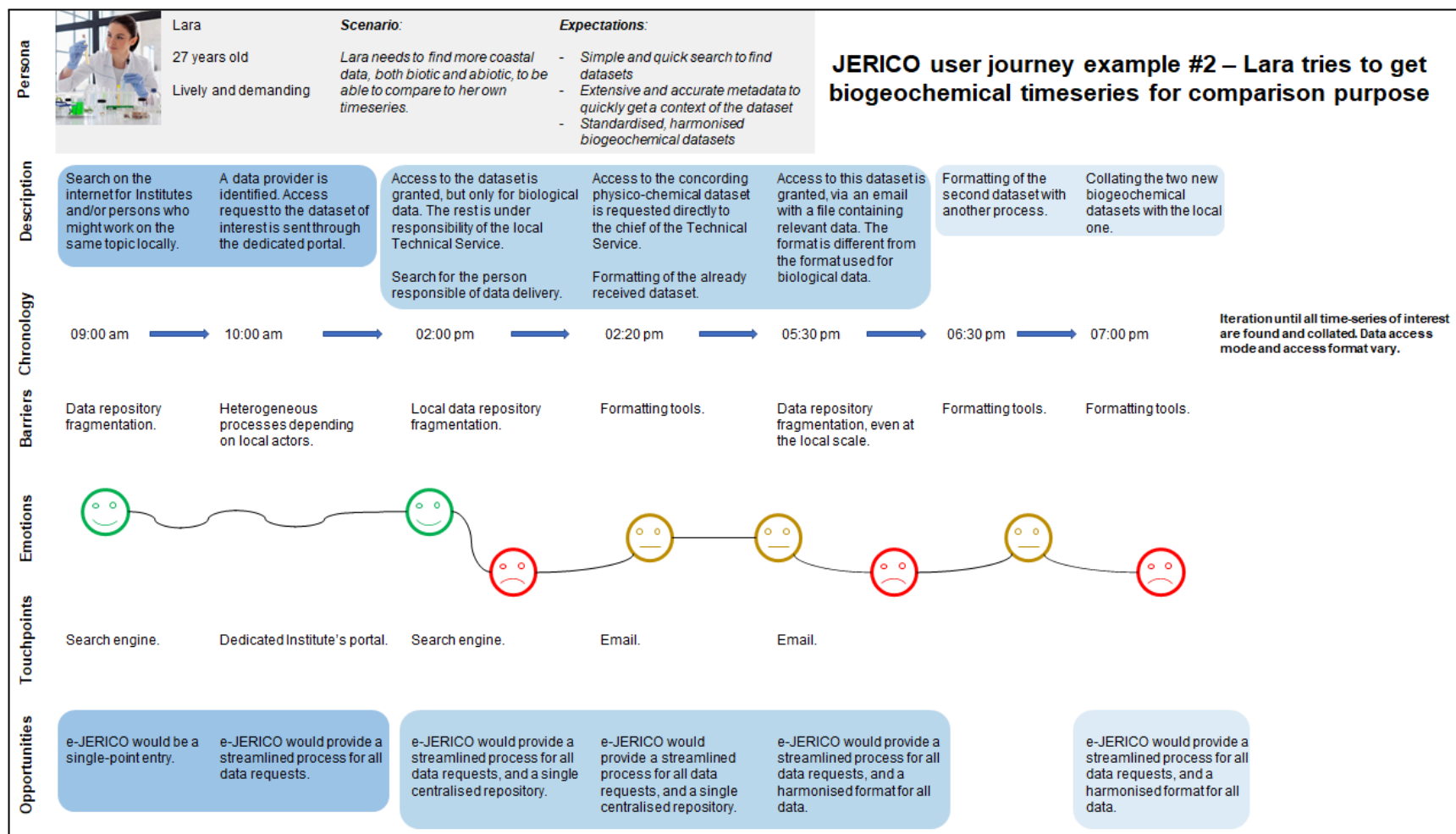


Figure 16: Second User Journey Map example, showing the potential added value of JERICO. This second UJM shows the journey needed to gather and compare time-series of different kinds of data, from different sources. Identifying data providers and requesting access to datasets can be tedious, as shown in this example: for the same location, biological data are requested through a dedicated portal but physico-chemical data have to be requested directly to someone, who may have formatted it differently. In this context, assembling datasets is a time-consuming process that has to be done frequently, limiting the time spent on data analysis. Standardising both data formats and access modalities (as proposed in JERICO) would lead, in such cases, to a significant improvement.

3.3. Communication Strategies

A sound communication strategy is crucial to ensure the visibility of JERICO, towards all kinds of stakeholders and users, in order to reach out to a maximum of individuals, thus to maximise the impact of the infrastructure. In JERICO-S3, three intertwined activities make up the communication strategy:

- a Dissemination and Exploitation Plan (DEP), developed in D10.1
- a Communication Plan (CP), developed in D10.2
- a User Engagement Strategy Plan, developed in the present document

The DEP worked upon for JERICO-S3 defined four goals:

- Engagement with stakeholders and society
- Increase the availability of JERICO P&S
- Increase the visibility and use of JERICO P&S
- Identify Key Exploitable Results (KER), and manage their exploitation during and beyond the project.

These aspects will greatly enhance the capacity of JERICO to reach a larger user base. The resulting increase in P&S utilisation will contribute to the decrease of P&S unit access cost and overall to the economic sustainability of JERICO. In JERICO-S3, the DEP has been put into action effectively and its results are summarised in D10.6 'Dissemination & exploitation plan: impact report'.

The CP laid out for JERICO-S3 defined four goals:

- Communication of JERICO project activities and results
- Communication of JERICO P&S uses
- Support to Dissemination of results by tailoring per stakeholder categories
- Engagement with project partners, stakeholders and end-users

The CP also took an interest towards internal communication, by promoting outcomes of the DEP and by defining internal communication protocols and guidelines, so that all dissemination is done in a consistent and timely fashion.

To help in managing these different activities, WP10 was tasked with establishing the Communications Working Group (CWG) and the National Research Infrastructures Communications Group (NRIC). Briefly, the CWG ensures that the CP is implemented according to guidelines and monitors its effectiveness through reviews, while the NRIC is more focused on relevant dissemination channels at both national and regional levels, so as to build a multilingual common message.

3.4. Training and Support

Support and training activities in JERICO-S3 are ensured through several WPs. Currently, through the Transnational Accesses (TAs) offered, different kinds of trainings are proposed, for example access to the Ifremer Metrology Laboratory (METLAB) for metrology trainings, or access to the Plataforma Oceánica de Canarias (PLOCAN) for technical trainings. These training activities are encouraged and will be developed beyond the end of the project, and are bound to make up a significant share of JERICO TAs as it is done so.

Best Practices (BPs) stand as crucial to increase the overall scientific impact of JERICO, and several BPs guidelines have been so far established in the various JERICO projects. JERICO-S3 further developed BPs through its WP5, addressing for example the harmonisation of coastal observatories (D5.2 'Technical handbook published within the OBPS Repository of BP for implementing and operating coastal observatories') and of biological observations through innovative automated sensors (D5.6 'Best practices document for sampling procedures of biological automatic sensors (imaging-in-flow, automated flow cytometry and multispectral fluorometry)'). These BPs help to harmonise overall practices in coastal sciences at the European level, and are a cornerstone of further data integration, helping *in fine* in delivering integrated datasets as products to users. In the longer-term, JERICO will offer more training sessions on BPs defined, either through Physical or Virtual Accesses. Likewise, technical support will be ensured in a timely fashion by JERICO through dedicated tools accessible as TAs or VAs.

3.5. Feedback Mechanisms

The JERICO User Committee (JUC), and the JERICO User Forum (JUF), will play pivotal roles in enhancing the effectiveness and relevance of JERICO by completing a true feedback loop (Figure 17).

The JUC acts as a link between JERICO and its different users, ensuring that their needs and concerns are addressed while providing valuable feedback that will help to improve P&S. The JUF is intended to foster direct assessment from users, peer-to-peer collaboration and interaction, knowledge exchange, and innovation among users. It will promote interdisciplinary interactions and enhance the overall quality and impact of JERICO. These two tools will be essential communication channels for users to voice their experiences, suggestions, and concerns regarding P&S. By actively soliciting feedback through these channels, JERICO will have put in place an efficient feedback loop and in doing so, will demonstrate its commitment to user-centricity and continuous improvement, and foster a sense of ownership and community among its user base.

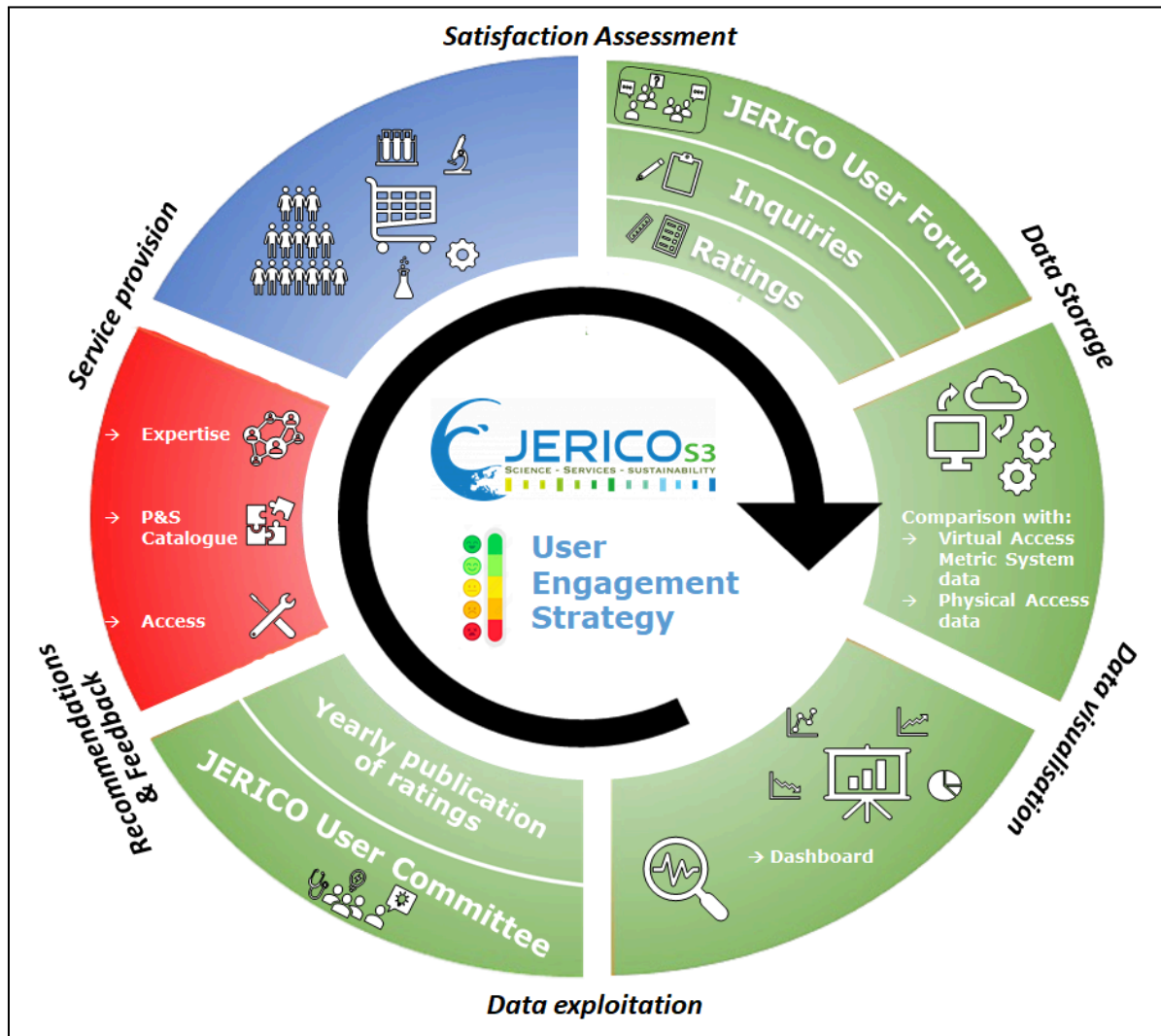


Figure 17: Graphical representation of the ISO-9001-inspired feedback loop that will be put in place for JERICO. Items in blue represent external users and their involvement, items in red represent JERICO's features and items in green represent JERICO's features specifically dedicated to user engagement.

3.5.1. JERICO User Committee

Up to June 2023 (M41), the JUC was informally composed of Blue-Cloud members as well as Copernicus Marine Service In Situ TAC members. A formal invitation was sent during July 2023 (M42) to four individuals, to form a first formal JUC able to efficiently analyse the first steps to be taken up to the end of JERICO-S3, after which the JUC may be expanded to include more persons. **The task of the JUC will be to advise on matters of P&S, and of user engagement.** The four individuals who were invited by the WP9 team (advised by partners from SOCIB) to be part of the JUC were selected on the basis of their recognised expertise on the topics to be covered; the following is a short summary of each member's profile.

Patricia Martin-Cabrera (VLIZ/Blue-Cloud). Patricia Cabrera worked in the previous Blue-Cloud project and is now the Work Package leader of Virtual Research Environments development in the current BC2026 project. She has extensive knowledge about the Blue-Cloud landscape, under a wide variety of user perspectives, and has the scientific background required to envision the perspective of the main JERICO users. Thus, she pinpoints the role of a scientist who would be a user of a cloud computing platform proposed by JERICO.

Julia Vera Prieto (Seascape/EMODNET). Julia Vera has a background as a project officer at Blue-Cloud projects. She has deep knowledge in both stakeholder management and engagement processes, in the context of environmental projects. Given these past experiences, it is thought that she will provide much needed contributions to stakeholder and user engagement within the frame of JERICO.

Dick M.A. Schaap (MARIS/Blue-Cloud). Dick Schaap has the technical and scientific background needed for JUC. Due to his past experiences and involvement, he has a clear vision of Blue-Cloud, and of the future of 'Digital Twins' development. He has deep experience in cloud-computing projects and demonstrated great leadership skills in that regard, which will be necessary for the JUC.

Dominique Obaton (ODATIS/Copernicus In-situ TAC). Dominique Obaton has been part of the management team of ODATIS for several years, and is thus quite knowledgeable on the topic of data handling and data product delivery to a scientific community. She has the needed experience and foresight to engage future users of JERICO.

The kick-off meeting of the JUC occurred on the 29th of September 2023. The Terms of Regulation agreed upon for the JUC can be found in annex 1. In time, the JUC will advise on which products or services should be developed by the RI through UX Design. Most of these P&S will concern JERICO-CORE, hence the first composition of this committee, populated with experts in the field of data management. Because it is planned to have JERICO-CORE continued after the end of JERICO-S3, as a component of Blue-Cloud in the Blue-Cloud2026 framework, the presence of Blue-Cloud members is important for that they are able to inform and create synergies between Blue-Cloud Virtual Labs (VLabs) and JERICO's user base. Links with these individuals will be built during JERICO-S3 and reinforced beyond completion of the project.

The above-mentioned processes are presently directed towards the scientific community, thought of as being the pillar of the user community early on. In time, the JUC will handle the engagement of users outside of this community, and in particular, will build relations between JERICO and industry partners. In that regard, the JUC could be extended to more members representing other user bases. As highlighted in deliverable D9.1 and in the JERICO Main Elements of Design document, ideally, members invited into the JUC would represent stakeholders with both high Influence and Interest over the JERICO.

The Terms of Reference (ToR) document was produced by the Coordination Team, with the help of partners from JERICO-S3 WP9 and WP11, on the 5th of June 2022. It defines the body itself, its involvement in JERICO matters, its composition (mandate, maximum

number of persons, roles), its resources, and meeting and decision-making modalities. It also regulates the establishment of potential subsidiary bodies.

3.5.2. JERICO User Forum

There are two different ideas behind the 'JERICO User Forum'. Up to the end of JERICO-S3, User Fora have been and will be organised as physical meetings, where JERICO partners exchange on the topic of user engagement. Several have taken place and have been fruitful, such as the March 2023 JERICO User Forum where the UX Design approach was debated and adopted. In the long-term, it is considered to establish a web-based forum holding this name as well. However challenging to properly manage, a web-based forum is essential to foster more direct communications between users and JERICO, may it relate to innovative ideas, TA requests, questions on the functioning of JERICO and on the marine data landscape, or help requests that generally make up for most of the activity of such fora.

All users, all sectors combined, will be able to express themselves and interact with JERICO through the JUF. Within this forum, users would be able to register, give feedback, ask questions, and benefit from access to the infrastructure. Open to communities of users from the scientific and private sectors, the JUF should be the main direct communication channel between users and the JERICO Central Management Office. **The JUF will provide an organised framework for discussion and exchange, and will also serve as a platform to promote collaboration between different user communities** in order to stimulate synergies that will increase the scientific and economic impact of JERICO.

3.6. Community Building

Building community engagement within JERICO is paramount for fostering collaboration, sharing knowledge and BPs, networking, and overall creating a sense of belonging. In that regard, D9.1 helped understanding the demographics, interests, and preferences of the community members, leading to better tailor JERICO community building activities to their needs and preferences. The following activities have been put in place throughout JERICO-S3:

Provide Regular Updates and Communications: WP10 ensured regular internal communications.

Facilitate Knowledge Sharing: WP10 organised, with the help of other WPs, various events (webinars and workshops) dedicated to the sharing of expertise and BPs.

Promote Engagement through Events: Regular events taking place online or in-person were organised through the lifetime of JERICO-S3, including conferences, trainings, workshops and seminars, to promote interaction among members.

Foster Collaboration Opportunities: JERICO-S3 facilitated the collaboration among members, creating more opportunities for coastal interdisciplinary research initiatives and increasing data sharing.

In addition to these community-building efforts, beyond the end of the project, the creation of the JERICO User Forum will allow to **establish a community platform** also acting as a community hub where members can share resources and collaborate freely.

3.7. Evaluation and Iteration

Different metrics and feedback mechanisms related to the ISO-9001 international norm (Quality Management) were envisioned for JERICO, as they provide clear benefits (Simoes et al., 2016, Davis et al., 2012). They are presented in the following section. Then, feedback mechanisms already in effect are briefly presented. In addition, advantages that could be brought to JERICO by following the ISO-14001 (Environmental Management) norm are discussed. Both ISO standards were shown to improve operational results without significant costs (Tarí et al., 2012). These standards do not aim to measure performance or compliance to a specific goal: they aim to formalise processes taking into account, respectively, continuous improvements of JERICO P&S with user inputs and environmental management of JERICO activities.

3.7.1. Current feedback mechanisms

On the JERICO website, similarly to EMBRC-ERIC (detailed in the upcoming section), there is the possibility for users to share their “user story”, by filling out a survey that collects detailed information (Figure 18). This survey was updated in March 2021, with minor changes and additions aimed at better tailoring it to coastal observations and observing systems. Besides the user’s job or task, data or product needs and uses can be detailed, as well as how these support the user’s activities. Expectations and improvements can also be suggested by the user, and two 1-to-5 ratings are optionally asked about the importance of Ocean Observing Systems and of JERICO, with the possibility to expand in detail on the latter.

A post-Transnational Access (TA) questionnaire was drafted, with the aim of gathering specific details about users and about their experience with the TA. The questionnaire is made of 13, mostly open, questions to gather information about the user’s organisation and project, whether or not JERICO funds allowed a TA that would not have been possible otherwise, and the user’s ratings of the service accessed. It also leaves room for the user to state difficulties met and provide suggestions. Overall, this post-TA questionnaire allows us to get specific information on the user-base (size and composition) and user needs.

Two previous deliverables (D11.1 and D11.2) have been completed on the topic of Virtual Access (VA). The first one dealt with access metrics, outreach activities, VA concept within JERICO CORE (formerly e-JERICO), and the VA Expert Panel, for the first 19 months of JERICO-S3 (February 2020 to August 2021). The creation of a Virtual Access Metrics

System was directly concerned with the measurement of access metrics (the reader is kindly redirected to D11.1 for more details).

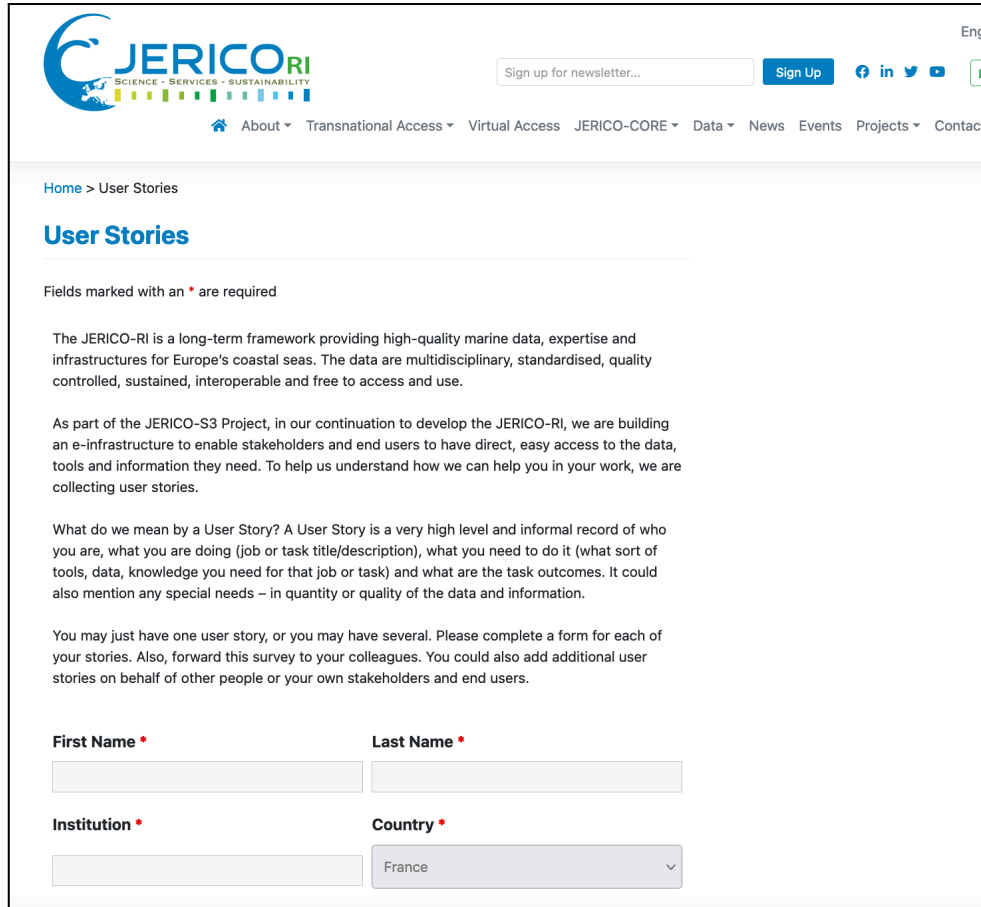
The screenshot shows the 'User Stories' form on the JERICO website. The page header includes the JERICO logo, a newsletter sign-up box, and social media icons. The navigation menu contains links for About, Transnational Access, Virtual Access, JERICO-CORE, Data, News, Events, Projects, and Contact. The main content area is titled 'User Stories' and includes an introductory paragraph about the JERICO-RI framework, a paragraph explaining the purpose of user stories, and a paragraph defining what a user story is. Below the text is a form with four fields: 'First Name *', 'Last Name *', 'Institution *', and 'Country *'. The 'Country' field is a dropdown menu currently showing 'France'. The form is enclosed in a light gray border.

Figure 18: Entry of the User Stories online form available on the JERICO website.

3.7.2. ISO 9001 norm and potential metrics for JERICO

The long-term sustainability of JERICO will depend heavily on user engagement and satisfaction, to keep the initial user base and attract new users, hopefully with a 'snowball' effect from the beginning onward. Monitoring of user satisfaction is therefore paramount and requires the establishment of a Quality Management System (QMS). The ISO 9001 is the international norm of reference for the definition of such a QMS and will benefit the RI, as this norm helps to keep users consistently satisfied with the proposed P&S. In fact, the implementation of this norm goes along with the implementation of a quality policy that will be defined for the JERICO.

When put in effect, such a QMS provides many benefits to an organisation. It includes an enhanced detection of dysfunction for any process, and an enhanced ability to correct and prevent them. A KPI-fed dashboard solely dedicated to management brings rationality to management processes, and helps to continuously improve P&S based on clear feedback mechanisms. The QMS also affects documentation management, and especially best practices documentation, aiming to systematise and normalise it: "Write what you do and do what you write". This does not imply that every single activity has to be documented thoroughly, which would lead to a massive document production of little added value;

rather, it aims at describing key business processes, potential issues pertaining to them as they arise, and how corrective steps are taken and put into action. Finally, the QMS also leads to a better and clearer definition of responsibilities, effectively increasing efficiency.

Monitoring of user satisfaction can be done in several ways, all requiring at least minimal input from the user. Although some surveys can be quite detailed and require significant time from the user, most surveys are quick to fill. The scores described hereby could be of use for JERICO, are considered and will be implemented at a later stage. They are summarised in Table 3.

The **Net Promoter Score** measures the likelihood that a user of the JERICO would recommend it to other colleagues. Based on a rating from 0 to 10, it divides answers into three categories: active promoters (9-10 rating), passive individuals (7-8 rating), and detractors (6 or less rating). The score is defined as the number of promoters subtracted by the number of detractors and is often interpreted as a measure of overall user loyalty and promotion through word of mouth. The **User Effort Score** is a measure of the ease of interaction with a very specific product or service of the JRI, and is based on a rating that ideally is provided by the user right after access. The timing is important, as it ensures a degree of reliability. This metric specifically measures user satisfaction in relation to a particular process, and it is calculated as an average score (*i.e.*, the sum of all scores divided by the number of answers). The **User Satisfaction Score**, similarly to the User Effort Score, should be performed at the end of an interaction with the JERICO P&Ss, but can also be done at recurring intervals. It evaluates user satisfaction with either a process (product or service) or with the overall JERICO. Like the User Effort Score, it is based on a rating. The **Time of First Response** measures the average time for a user to receive an answer, following any type of support request from the RI. In case of an issue to be fixed, the **Resolution Time** measures the time needed for an issue to be fully solved. This score is an evaluation of the responsiveness of the RI's support service. The **Retention Rate** measures the percentage of users who keep on coming back to the RI for the same or similar services and products. This metric shows the relevance of the RI and the added-value of its P&S to its existing user base, and could be fed regularly and reliably by the VAMS put in place for JERICO-CORE (see JERICO-S3 D11.1 for further details). Adoption and Usage metrics measure more specifically how services and other resources are used. Examples include measurements of **Active Users** (unique users engaged within a given timeframe - *e.g.* daily to monthly), of **Session Duration** (average time spent interacting with the infrastructure), of the number of **Page Views** (number of pages consulted within a given session), of particular **Feature Usage** (frequency and patterns), of **Conversion Rate** (percentage of users undertaking an action desired by the infrastructure, *e.g.* signing up for a newsletter), and of **Bounce Rate** (percentage of visits ending after viewing a first page). Such metrics give a more thorough understanding into the functioning of the infrastructure, and help identify areas of improvement.

Table 3 - Summary of considered metrics for evaluating user satisfaction, in the framework of JERICO's User Engagement Plan.

Data collection	Metric	Definition	Description	Purpose
<i>User input needed after P&S usage</i>	Net Promoter Score	$NPS = \frac{\text{Number of Promoters} - \text{Number of Detractors}}{\text{Total Respondents}} \times 100$	Likelihood of the RI being promoted	Estimation of users' overall satisfaction
	User Effort Score	$UES = \frac{\sum \text{Individual effort rating}}{\text{Total number of ratings}}$	Measure of the ease of interaction	Assessment of User Experience
	User Satisfaction Score	$USS = \frac{\sum \text{Individual satisfaction rating}}{\text{Total number of ratings}}$	Measure of the satisfaction with a process	Estimation of users' satisfaction for a given service or product
<i>Input data collected automatically (or semi-automatically)</i>	Time of First Response	NA	Average time for a request to receive a first response	Estimation of the RI's support responsiveness
	Resolution Time	NA	Average time needed to solve an issue	Estimation of the RI's support efficacy in solving arising issues
	Retention Rate	$RR = \frac{\text{Number of customers at end of period} - \text{Number of new customers acquired during period}}{\text{Number of customers at start of period}} \times 100$	Percentage of users utilising again the same service	Estimation of the long-term relevance of the infrastructure for its users
	Active Users	NA	Number of users engaged during a given timeframe	Estimation of the number of users simultaneously engaged
	Session Duration	NA	Average time spent interacting with the infrastructure	Estimation of the time spent
	Page Views	NA	Number of unique views for a given page of the website	Estimation of the popularity of the various pages of the website
	Feature Usage	NA	Frequency and pattern of use of a given feature	Estimation of the popularity of the various products or services of the website
	Conversion Rate	$CR = \frac{\text{Number of conversions}}{\text{Number of total visitors or interactions}} \times 100$	Number of users carrying out a desired action	Estimation of the efficacy of the RI's engagement actions
	Bounce Rate	NA	Number of connections ended after a first view	Estimation of potential disinterest, or of usability issues

Different European projects and RIs engage users in ways similar to what is planned for JERICO. For example, **EGNOS** (European Geostationary Navigation Overlay Service) **has been surveying users annually**, since 2014 (see Figure 19 for an example). Users are requested to provide a simple rating (from 1 to 10), both for global satisfaction and for specific topics. In particular, users are required to rate each service ('Safety of Life', 'Open

Service', 'EGNOS Data Access Service') in its globality, and specific aspects for each of those services ('accuracy', 'availability', 'continuity', 'coverage'). Users are also required to rate each support service ('Support Website', 'Documentation', 'Helpdesk'). All user satisfaction scores are classified per domain of activity, and per EGNOS service used (although a user can be concerned with more than one service). All results of the survey are compiled and presented in a dedicated presentation available freely on EGNOS' website. The presentation contains a graphic representation of user satisfaction data with indicators of each rating's evolution over time. Finally, recommendations for further improvement, derived from feedback, are clearly presented as well.

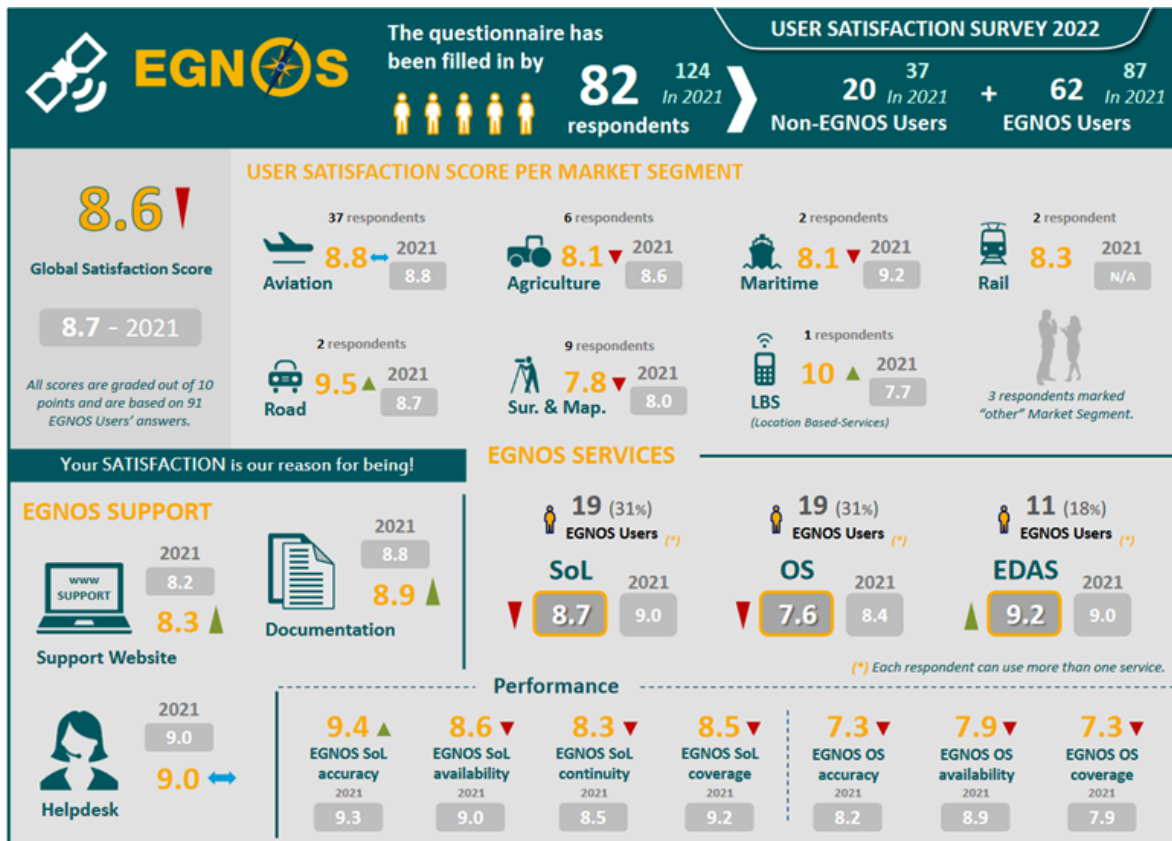


Figure 19: User satisfaction survey feedback, for 2022, of EGNOS-RI. They are compared to each previous year's results.

The Euro-Argo ERIC also had an online questionnaire, sent to a broad audience in 2020, to gather feedback on users' needs. It collected a total of 57 answers, and the results can be assessed in D7.4 of Euro-Argo (Fitzhenry et al., 2021). It contained questions in different formats, some of which were obligatory: multiple choice answers, checkboxes, and short or long text answers. The questionnaire was constructed in six sections: Who and Where, Involvement, Existing Argo User, Data & Products, Euro-Argo ERIC Communications & Outreach, and Additional Information. Feedback collected resulted in the formulation of eight general recommendations, which were eventually followed.

The EMBRC ERIC continuously collects user stories, in addition to regular surveys. These testimonials help present the added value of the RI, by describing research cases that were successfully and significantly improved by the P&S of the RI. They include



several sections: 'Project Background', 'Scientific objectives', 'Methodology', 'Preliminary results and findings', and 'Future prospects and potential economic applications'. Pictures can be uploaded as well, making testimonials livelier. In addition, the 2017 Business Plan of EMBRC ERIC planned for the development of a Knowledge and Technology Gap Forum, in which the user community (comprising academics, industry and policy workers) could express their needs in terms of technological innovations to be included in the future.

Following the philosophy of the ISO 9001 norm will considerably improve the sustainability of JERICO, by favouring user satisfaction and improving overall services (see Simoes et al., 2016, for an example of such benefits for a Portuguese national RI). JERICO shall take inspiration from these various feedback mechanisms, for its User Engagement Plan. Ideally, for each virtual service or product, the three scores mentioned would be put in practice, and a survey with open questions would follow as well through an email. For physical services, only an email communicating the survey would be sent. An annual survey for each type of service and satisfaction parameters (e.g., 'accuracy', 'coverage', 'documentation') would also be conducted, inspired by EGNOS' iterative evaluation and feedback, and disseminated. As well, the JUF would be another place where feedback could be submitted and summarised over time.

4. Conclusions

A User Engagement Plan is useful for creating an ongoing positive experience and for retaining users of the proposed Products and Services. Its goal is to increase user interaction with every channel set up by the company or, in the present case, Research Infrastructure. It is, generally speaking, related to the relationship between the user and offered P&S. To engage users more efficiently, there is a need to set up a clearer long-term vision of JERICO that encompasses ways to engage and retain users, based on metrics that can reliably and reactively assess satisfaction and expectations.

The preliminary work done toward the definition of a User Engagement Plan presented in this deliverable focused on the scientific community. For non-scientist users (*i.e.*, funding bodies, private companies, citizens), which are either intermediate or end-users of P&S, the need for tailored P&S is stronger than for data: for example, harbour authorities will be interested in model results of current and tide dynamics based on raw data, so to improve their decision-making processes (El-Serafy et al., 2023 and references therein). Moreover, P&S offered by the RI will need to be adapted over time to suit changes in evidence-based management practices.

The philosophy of the ISO 9001 norm will provide significant benefits, and should be followed to ensure stakeholder and user engagement. Multiple actions will be taken for this. The development of future P&S will be done as much as possible from the end-user's perspective, using UX design approaches, such as the ones described in the present deliverable.

JERICO will systematise the use of surveys and questionnaires of different types and lengths, for each proposed P&S, in order to collect more extensive data both on the user base and on the type of P&S most used. As previously stated, both the user base and uses made of P&S will evolve in the long term, and it will be necessary to closely monitor these evolutions. These surveys will be the backbone of a feedback loop that is currently lacking at the moment for JERICO. It will feed with metrics the User Engagement Dashboard that will be used by the JUC to monitor and adapt the User Engagement Plan in a data-driven manner. Analysed data will include ratings provided by end-users, and more lengthy, detailed answers. These processes will help the long-term sustainability of JERICO, by engaging the current user base, attracting new users, and defining new fit-for-purpose P&S.

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6. Annex 1

TERMS of REFERENCE of the JERICO User Committee (JUC)

Article 1. The body

The Parties agree to establish the following body:

- 1) The JERICO User Committee (JUC), acting as the **advisory committee within the JERICO-S3 and JERICO-DS projects** for the **elaboration of JERICO-RI Services and Products to be delivered to end-users.**

The Parties also agree on the possibility to establish subsidiary and/or temporary bodies (*e.g.* working groups) as described in Article 3.

Article 2. The JERICO User Committee (JUC)

§2.1: Role

The JERICO User Committee (JUC) is the advisory committee guiding the strategy for the elaboration of Services and Products in the framework of the JERICO-S3 and JERICO-DS projects.

Parties will be consulted to contribute to the actions of their choice among the following tasks of the JUC:

- 1) To contribute to the long-term strategic vision of JERICO products and services delivery.
- 2) To suggest to the Coordinator relevant new users to be involved in the JUC
- 3) To represent the User Community along the JERICO-S3 and JERICO-DS projects to further design the governance of JERICO-RI.
- 4) To advise JERICO-S3 and JERICO-DS Partners on the products and services catalogue of the future Infrastructure.
- 5) To collect and express JERICO user's feedback after experience on the currently offered services and pilot services, such as Virtual Access.

§2.2: Resources

The JERICO consortium recognises the limited resources available for Users to compensate for their contribution in the JUC, and is therefore open for variable involvement, based on the parties' own possibilities and constraints.

§2.3: Composition and membership

The JUC is composed of selected Users that have signed this agreement. The modalities of involvement and membership are as follow:

- The Users invited to sign the agreement are unilaterally chosen by the Steering Committee of the JERICO-S3 project. However the Users already members of the JUC are legitimate to make any suggestion, as part of their role.

- The signatory Users are involved in the JUC for the duration of the H2020 JERICO-S3 and JERICO-DS projects (end of last project in July 2024).
- The JUC can start with at least 1 stakeholder and can be further enlarged **to reach a maximum of 10 members**.
- One member of the JUC will act as the representative of the Virtual Access Board of International Experts that is in charge of assessing the efforts done under WP11 of JERICO-S3.

The JUC is chaired by a Chairperson and a Deputy Chairperson, both elected among the Users.

§2.4: The Chairperson

The Chairperson of the JUC leads the JUC meetings and ensures the smooth preparation of the agenda with the leaders of the Work Package 9 of the JERICO-S3 project. During the discussions, the Chairperson is neutral and does not represent any specific entity or business.

The Chairperson is responsible for ensuring that the conclusions of the JUC on (1) Users feedback after experience, (2) Users expectations, (3) long-term strategic vision for services delivery and (4) potential new Users to be involved in the JUC are transmitted to the JERICO-S3 Steering Committee of the project, for their approval.

The Chairperson represents the JUC towards other stakeholders and users external to the JUC.

The Chairperson can delegate tasks to the Deputy Chairperson.

§2.5: The Deputy Chairperson

The Deputy Chairperson is supporting the Chairperson in its tasks. He/She can substitute the Chairperson in some tasks that have been delegated, and in chairing the JUC meetings. In the latter case, the Deputy Chairperson also leads the discussions in a neutral way and does not represent any specific entity or business.

§2.6: Modality for meeting

The JUC meets at least twice a year: once a year in a plenary session, according to the possibilities in relation with the sanitary situation, and once in a virtual meeting session.

A virtual meeting of the JUC can be convened at any time if the majority of the Parties wishes so.

§2.7: Decisions

Decision related to the advisory mission of the JUC:

The JUC strives to provide the Partners with conclusions that are based on consensus and that bring benefits for the JERICO User Community and JERICO-S3 Project Partners in all their diversity. However, if no consensus can be reached, all constructive views and opinions related to the JUC tasks are welcome and will be duly recorded and transmitted to the WP9 leaders and the Steering Committee of the project.

Decision related to Chairperson and Deputy Chairperson election and Subsidiary and/or temporary bodies:

The JUC strives to reach decisions on Chairperson and Deputy Chairperson election and Subsidiary bodies based on consensus. If no consensus can be reached and a vote is needed, each Stakeholder or User can only express one vote. To be approved, a decision requires a simple majority, unless the Parties have previously agreed unanimously on a different procedure.



Article 3. Subsidiary and/or temporary bodies

It is possible to establish subsidiary and/or temporary bodies (*e.g.* working groups) if they could be helpful to support the work of the JUC. The creation of the relevant bodies and their duration will be decided by the members of the JUC during the yearly meetings.

The establishment of such subsidiary / temporary bodies is particularly expected to collect and express JERICO user's feedback after experience on the currently offered services and pilot services as Virtual Access, as an International VA Board will be constituted as part of the JUC.

Article 4. Resources

Travel and accommodation costs related to the annual plenary session of the JUC will be covered by the JERICO-S3 budget. No Stakeholders can be forced to any monetary contribution.

Article 5. Miscellaneous

The ToR of the JUC is meant to evolve according to the advancement in the elaboration of the JERICO Research Infrastructure. In particular, some adjustments could be necessary to specify the way the JUC will be embodied in the governance structure of the future JERICO Research Infrastructure.