Report on pilot actions replicability

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1 Introduction

The transfer of project results and main outputs requires appropriate guidelines delivering the methodologies used and a description of the context where projects have been implemented. This report represents the output through which project partners and stakeholders may be able to better understand the methodological frame used for the pilot actions implementation and to replicate and scale-up them in other territorial contexts. As final deliverable of pilot actions, the contents of this document may provide valuable insights, through the FRAMESPORT Toolbox (D.5.4.2), for the strategy consultation and for the structure of the FRAMESPORT strategy paper.

The Replicability report covers various elements related to the pilot action's replicability process. The report begins by providing a description of the territorial context where the pilot action was implemented, including the number and characteristics of small ports involved. It also explains the rationale behind selecting this context, considering the existing status quo and thematic concerns related to small port management.

In terms of the overall vision and activities, the report summarizes the activities carried out during the pilot action and the results achieved. It highlights the development of the innovative Small port smart monitoring system, which significantly contributed to more efficient and effective small port management. Additionally, any discrepancies encountered in relation to the initial expectations are mentioned.

The report includes a section on the state-of-the-art and literature review, which provides an overview of best practices and key insights from relevant sources. This ensures that the pilot action aligns with industry standards and incorporates the latest methodologies and procedures.

A step-by-step procedure is outlined, describing the chronological order of the necessary steps for successfully implementing the pilot action. It covers various aspects, including the development of application solutions, testing, procurement of equipment, and construction of infrastructure.

Stakeholder engagement and collaboration are emphasized as crucial elements for successful replication. The report highlights the importance of involving relevant stakeholders, such as port authorities, local government entities, and technology providers. Effective collaboration and knowledge sharing throughout the replication process are deemed essential.

The report also addresses the main obstacles encountered during the pilot action's development and suggests potential alternative methodologies that could have mitigated their impact or avoided them altogether. This helps identify strategies to overcome challenges and optimize the replicability process.

Key performance indicators (KPIs) are proposed to monitor and evaluate the pilot action's progress and achievements. The report describes the results of the monitoring phase, highlighting the accomplishments based on the selected KPIs. This allows for a comprehensive assessment of the pilot action's effectiveness.

Finally, the report concludes with a summary of the main content covered throughout the preceding chapters. It offers valuable advice and suggestions for replicating the pilot action in another territory, emphasizing important considerations and potential challenges to address.

These elements collectively provide valuable insights and guidance for successfully replicating the Small port smart monitoring system in different territories.

2 Pilot action in a nutshell

2.1 Contextualization

The pilot action within the FRAMESPORT project was implemented in the Primorje-Gorski Kotar County, which is located on the Croatian side of the Adriatic Sea. The choice of this territorial context was driven by several factors that make it suitable for the implementation of the pilot action.

The Primorje-Gorski Kotar County encompasses a number of small ports along the Croatian coast, including the Port of Rab, which was specifically selected as the project location. The County Port Authority of Rab features a diverse range of small ports within its management structure, but to grasp the whole concept it is important to take into consideration that only the port of Rab has a total of 360 communal berths and 160 nautical berths. These berths are distributed among six fixed piers in the communal part of the port, while the nautical part covers a waterfront stretch of approximately 600 meters.

Prior to the implementation of the pilot action, the existing systems in these small ports presented both advantages and disadvantages. Some processes, such as record-keeping for berths and berth users in the communal and nautical parts of the port, as well as bill collection, had already been computerized and integrated with the accounting/financial system. Additionally, field payments were carried out using modern and efficient mobile terminals.

However, there were notable shortcomings in the existing information solutions. These included the lack of real-time display of berth status (busy/free), absence of video surveillance across the entire port area (with only two cameras installed at the Port Authority building), and the absence of systems for monitoring vessel arrivals and departures as well as identifying vessel presence in the communal part of the port.

Considering the unique characteristics of the Primorje-Gorski Kotar County's small ports, the pilot action was chosen to address these limitations and introduce innovative smart systems. The aim was to improve monitoring systems for vessel conditions and movements, enhance security measures within the ports, and utilize modern information and communication technologies to provide real-time administrative data.

By implementing the pilot action in this territorial context, the project sought to demonstrate the replicability and transferability of the proposed solution to other small Adriatic ports facing similar challenges. The lessons learned and outcomes from the Primorje-Gorski Kotar County pilot action can serve as a valuable reference for future initiatives aiming to enhance the sustainability and efficiency of small ports in the region.

2.2 Overall vision of the pilot

The pilot action within the FRAMESPORT project aimed to improve the existing systems for monitoring the condition and movement of vessels in the Port of Rab, located in the Primorje-Gorski Kotar County. The overarching vision was to introduce innovative smart systems utilizing modern information and communication technologies, thereby enhancing the efficiency and security of the port.

To realize this vision, several key activities were carried out as part of the pilot action. These activities included:

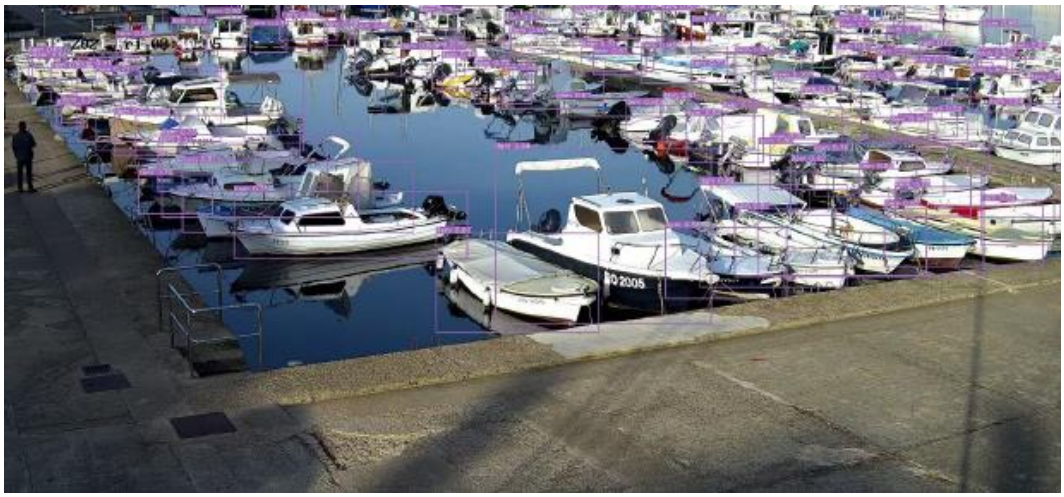
Analysis of the existing system: An in-depth analysis was conducted to assess the strengths and weaknesses of the current information solutions and infrastructure in the Port of Rab. This analysis provided valuable insights into the areas that required improvement and optimization.

Development of a comprehensive solution: A solution was devised to address the identified shortcomings. This solution involved the implementation of surveillance cameras combined with machine learning (artificial intelligence) for the detection of vessels on berths. Additionally, Bluetooth technology, utilizing long-range Bluetooth beacons mounted on vessels within the marina, was employed for vessel presence detection.

Testing and implementation: The proposed solution was tested and implemented within the Port of Rab. Surveillance cameras collected images of the berth area over a period of time, training the computer to distinguish between busy and free berths. Bluetooth technology facilitated the unique identification of vessels in the communal part of the port and enabled real-time data collection on vessel presence and approximate location within the marina.

Integration and visualization: The collected data was processed and integrated into a software solution. This solution allowed for real-time visualization of berth statuses on port maps, indicating whether a berth was free or occupied. The software solution also provided reports on vessel movements within the marina over specific time periods.

Figure 1 Result of image processing from surveillance camera - Vessel detection



The pilot action yielded significant results in line with the overall vision. The introduced smart systems improved the monitoring of vessel conditions and movements within the Port of Rab. The integration of surveillance cameras with machine learning and Bluetooth technology enhanced the accuracy and efficiency of berth status detection and vessel presence identification.

However, there were some discrepancies compared to the initial expectations. The learning process for the computer to accurately recognize berth statuses required a longer period than anticipated due to the inconsistency of berth boundaries caused by factors like waves, tides, and wind. The variety of vessel types and models further complicated the learning process. These factors affected the speed at which the computer "learned" and achieved a high level of accuracy in berth status recognition.

Despite these discrepancies, the pilot action successfully demonstrated the feasibility and effectiveness of the proposed solution. The lessons learned from this implementation will inform future initiatives seeking to replicate and adapt similar smart systems in other small Adriatic ports, taking into account the specific characteristics and challenges of each location.

3 State-of-the-art and literature review

The literature review conducted for the pilot action revealed several best practices and highlights concerning the activities of the pilot action. The literature review focused on procedures, methodologies, and relevant practices implemented in similar projects.

Integration of modern technologies: The literature emphasized the importance of integrating modern information and communication technologies to enhance monitoring systems in small ports. This includes the use of surveillance cameras, machine learning algorithms, and Bluetooth technology, which were also incorporated into the pilot action.

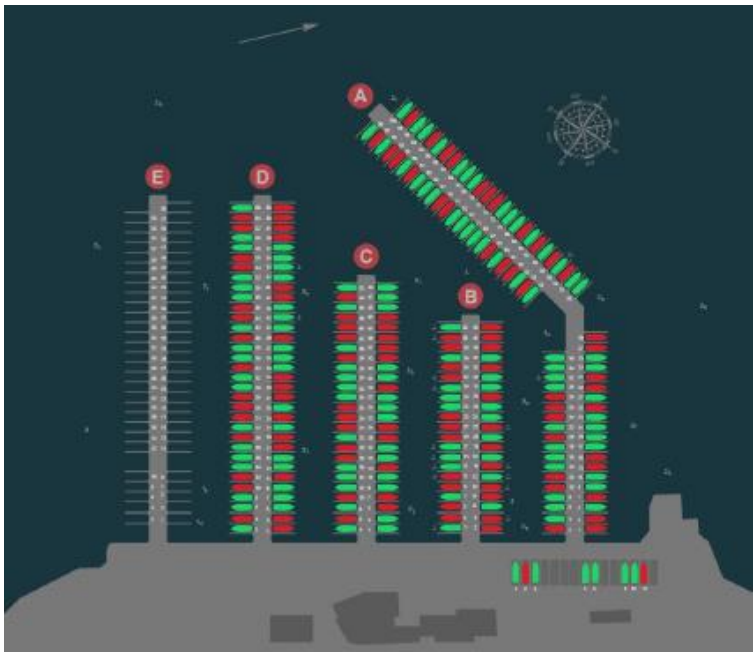
Real-time data collection and visualization: Successful projects emphasized the need for real-time data collection and visualization of berth statuses and vessel movements. This allows port staff to have up-to-date information on the availability of berths and the presence of vessels. The software solution developed in the pilot action aligned with this best practice.

Scalability and adaptability: The literature highlighted the significance of designing solutions that can be scaled and adapted to different port environments. Modular and flexible systems that can accommodate various port configurations, vessel types, and operational requirements were considered essential for wider implementation.

Learning algorithms and training data: Projects with machine learning components emphasized the importance of a robust learning process. A sufficient number of samples, including a variety of berth occupancy scenarios, were required to train the machine learning algorithms effectively. The pilot action incorporated this understanding to enhance the accuracy of berth status detection.

User-friendly interfaces: Successful projects emphasized the development of user-friendly interfaces for port staff to easily access and interpret the collected data. The software solution implemented in the pilot action provided visual representations of berth statuses and generated reports on vessel movements, promoting user-friendly interaction.

Figure 2 Example of visualization of berths and vessels at the berth



4 Pilot action development and main obstacles

4.1 Step-by-step procedure

Conducted Procurement Procedure for Project-Technical Documentation:

a. External experts were assigned to produce documentation, including analysis of the current situation, proposed variants of conceptual solutions, SWOT analysis, risk analysis, conceptual project, and the D.5.2.1. Pilot action preparatory report.
b. The documentation was delivered in two parts

- Analysis of the current situation, proposed variants of conceptual solutions, SWOT analysis, and risk analysis.
- Conceptual project and D.5.2.1. Pilot action preparatory report.

Optimal Conceptual Solution Selection:

a. Based on the documents delivered, the Primorje-Gorski Kotar County selected the optimal conceptual solution for implementation in the small port.
b. The selected solution was further elaborated through the production of a conceptual project, which served as the baseline for the procurement of thematic equipment.

Preparation of Public Procurement Documentation:

a. Primorje-Gorski Kotar County started preparing documentation and annexes for the public procurement procedure for the implementation of the pilot action.
b. The documentation includes the installation of thematic equipment (such as AI cameras, Bluetooth beacons, and Bluetooth gateways) and software.

Publication of Public Procurement:

a. After the preparation of all necessary documents and completion of internal procedures, the public procurement was published.
b. The aim was to select an economic entity that would deliver the most favourable offer.

Contract Signing with Selected Contractor:

a. Upon the selection of the economic entity, Primorje-Gorski Kotar County signed a contract with the selected contractor to proceed with the implementation of the pilot action.

Procurement and Installation of Thematic Equipment:

a. Procure surveillance cameras, Bluetooth devices, and related infrastructure according to the confirmed contractor's specifications.
b. Develop the necessary infrastructure for the installation of hardware and software components.
c. Install and configure surveillance cameras, Bluetooth hubs, and Bluetooth beacons as per the technical requirements.

Application Solution Development:

a. Design and develop an application solution for collecting, processing, and analyzing data from surveillance cameras and receiving data from Bluetooth sensors.
b. Develop an application solution for visualizing the status of berths in the communal part of the port.
c. Ensure the application solution is web-based and adaptable for viewing on desktop computers and mobile devices.
d. Enable port authority employees to easily review the status of berths and vessels in real-time.

Testing and Error Correction:

a. Write tests to ensure the correctness and functionality of the system.
b. Test each module individually, considering real situations and possible events in the communal part of the port.
c. Correct any errors found during the testing process.

Preparatory Works:

a. Prepare a main construction project defining the positions of camera columns, DTK route, well construction, and cabinet installation.
b. Obtain the necessary permits and approvals required for the construction works.

Construction Works:

a. Commence construction works, including the construction of DTK infrastructure in the defined area of the municipal port.
b. Construct wells along the DTK route and foundations for communication cabinet installation.
c. Anchor and install columns on piers at designated positions.

Structured Cabling:

a. Perform structured cabling according to the newly installed DTK infrastructure.
b. Use CAT.7 cables designed for outdoor installation and resistant to weather conditions.
c. Install communication cabinets with necessary equipment for connecting active devices and ensure appropriate protection against external factors.

Installation of Surveillance Cameras:

a. Mount surveillance cameras on galvanized poles at a height of 4 meters from the pier tread/sidewalk.
b. Connect the cameras to the network and configure them as per the defined frames covering the berths.
c. Verify the functionality and framing of the cameras.

Installation of Bluetooth Hub:

a. Mount Bluetooth hubs on galvanized poles at a height of 4 meters from the pier tread/sidewalk.
b. Connect the hubs to the network via switches in the communication cabinets.
c. Verify the functionality of the Bluetooth hubs.

Installation of Bluetooth Beacons on Boats:

a. Mount Bluetooth beacons on vessels in visible and easily legible places, typically at the front of the vessels facing the pier.
b. Secure the beacons to the vessels using a UV-stable and salt-resistant three-component resin.
c. Place a sensor on the vessel wall beneath the beacon for alarm activation in case of intentional removal.

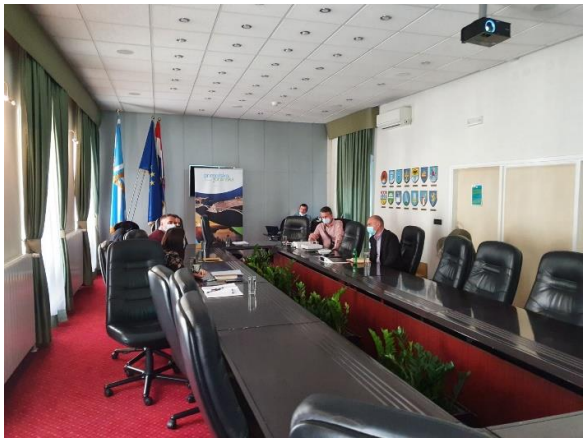
Real-time Testing:

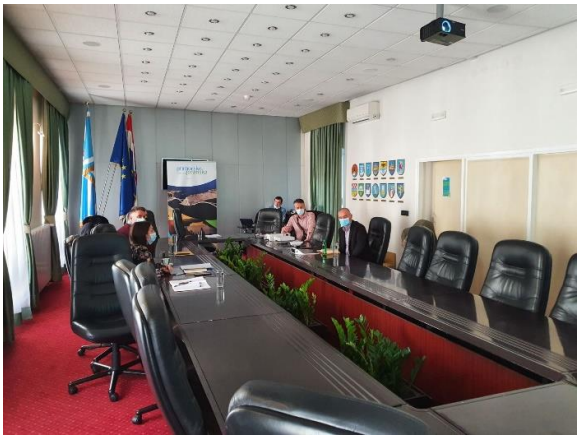
a) Conduct real-time testing of the system by simulating real environments and events.
b) Set devices to initial values through the information system and test with vessels sailing out of range.
c) Verify the status of the collected information and compare it with actual conditions.
d) Repeat the testing procedure multiple times, re-verifying and comparing obtained and actual data.

4.2 Target groups and stakeholders

Target Group:

The target group of the pilot action is primarily the Primorje-Gorski Kotar County, specifically the County Port Authority of Rab, both of which are responsible for the administration, construction, and use of ports open for public traffic in the county. The target group also includes the employees and management of the small port in Rab.





Stakeholders:

County Port Authority of Rab:

Involvement Methodology: The County Port Authority of Rab actively participated in the pilot action by providing insights and participating in the analysis of the current situation, the selection of optimal solutions, and the testing phase.

Contribution: The County Port Authority's involvement ensured that the pilot action was aligned with the specific needs and requirements of the small port in Rab. Their expertise and input helped in making informed decisions during the implementation process.

External Experts:

Involvement Methodology: External experts were engaged to prepare the project-technical documentation, conduct analysis, propose conceptual solutions, and provide preparatory studies for the pilot action.

Contribution: The expertise and knowledge of the external experts were crucial in conducting thorough analysis, proposing optimal solutions, and preparing the necessary documentation. Their involvement ensured the pilot action was based on best practices and industry standards.

Primorje-Gorski Kotar County:

Involvement Methodology: Primorje-Gorski Kotar County played a significant role as the project partner and coordinator of the pilot action. They were involved in decision-making, procurement procedures, and overall project management.

Contribution: The county's involvement ensured the pilot action received necessary support, resources, and coordination for successful implementation. Their contribution included selecting the optimal conceptual solution, preparing procurement documentation, and managing the overall project timeline.

Economic Entity (Selected Contractor):

Involvement Methodology: The economic entity, selected through the public procurement procedure, played a crucial role in the implementation of the pilot action. They were responsible for the supply, installation, and configuration of the thematic equipment and software.

Contribution: The selected contractor's involvement ensured the successful procurement and installation of the surveillance cameras, Bluetooth devices, and related infrastructure. Their expertise and technical capabilities were essential in delivering the required hardware and software components.

The involvement of the target group and stakeholders through active participation, decision-making, and expertise contributed to the successful implementation of the pilot action. Their input helped align the pilot action with the specific needs of the small port, ensured adherence to industry standards, and facilitated the achievement of the desired results.

4.3 Main obstacles

During the development of the pilot action, several obstacles were encountered. Here are the main obstacles along with potential alternative methodologies that could have helped avoid or mitigate their impact. It is important to keep in mind that most of these obstacles are normal and are expected in any kind of endeavours.

COVID-19 Pandemic:

Obstacle: The COVID-19 pandemic caused delays in the project due to the accelerated spread of the infection among employees, impacting the progress of work.

Alternative Methodology: To mitigate the impact of the pandemic, alternative methodologies could have been implemented, such as:

- Remote collaboration: Encouraging remote work and utilizing digital communication tools to continue project activities and consultations.
- Flexible timelines: Adapting project timelines and deadlines to account for potential delays caused by the pandemic and related restrictions.

- Risk assessment and contingency planning: Developing contingency plans to address potential disruptions caused by the pandemic and ensuring alternative approaches were in place.

Technical Challenges:

Obstacle: The installation and configuration of surveillance cameras, Bluetooth devices, and related infrastructure may have presented technical challenges that could have caused delays or complications.

Alternative Methodology: Alternative methodologies to overcome technical challenges could include:

- Pilot testing: Conducting smaller-scale pilot tests before full-scale implementation to identify and address technical issues early on.
- Expert consultation: Seeking advice and guidance from experts in the field to ensure optimal installation and configuration of the equipment.
- Collaboration with technology providers: Engaging with technology providers and leveraging their expertise to overcome technical challenges during implementation.

Budget Constraints:

Obstacle: Budget limitations or constraints may have posed challenges in procuring necessary equipment and implementing the pilot action within the allocated resources.

Alternative Methodology: Alternative methodologies to address budget constraints include:

- Cost optimization: Exploring cost-effective alternatives for equipment procurement without compromising the functionality and quality of the pilot system.
- Resource allocation: Prioritizing and allocating resources effectively to ensure the critical aspects of the pilot action are adequately funded.

- Partnerships and collaborations: Seeking partnerships or collaborations with other organizations or institutions to secure additional funding or resources for the project.

Regulatory and Permitting Processes:

Obstacle: Obtaining the necessary approvals, permits, and documentation required for construction and installation works may have posed challenges and delays.

Alternative Methodology: To navigate regulatory and permitting processes more efficiently, alternative methodologies could include:

- Early engagement with regulatory authorities: Initiating discussions and seeking guidance from relevant regulatory bodies early in the project to understand requirements and streamline the permitting process.
- Efficient documentation management: Ensuring all required documentation and permits are prepared and submitted in a timely manner, following clear processes and communication channels.
- By implementing alternative methodologies such as remote collaboration, pilot testing, expert consultation, cost optimization, resource allocation, partnerships, early engagement with regulatory authorities, and efficient documentation management, the impact of the main obstacles could have been reduced or mitigated during the pilot action development.

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4.4 Identified KPIs and related achievements

When considering the monitoring activities of the pilot action, the following Key Performance Indicators (KPIs) could be suitable for assessing the progress and outcomes of the pilot itself:

Accuracy of Berth Status Detection:

- Justification: This KPI measures the accuracy of the system in detecting the status of berths (occupied or vacant). It determines the reliability and effectiveness of the surveillance cameras and machine learning algorithms in identifying berth occupancy.
- Usage: This KPI could be used to evaluate the system's performance in accurately detecting and differentiating between occupied and vacant berths.
- Results: The monitoring phase should assess the system's accuracy in detecting berth status, with the goal of achieving a high level of precision.

Real-time Data Availability:

- Justification: This KPI measures the availability and timeliness of real-time data on berth status, vessel movements, and other relevant information. It assesses the system's ability to provide up-to-date and reliable data to port authorities and stakeholders.
- Usage: This KPI helps evaluate the effectiveness of the system in delivering real-time information for decision-making and operational purposes.
- Results: The monitoring phase should assess the system's performance in delivering real-time data, ensuring that information is accessible and updated promptly.

System Reliability and Uptime:

- Justification: This KPI measures the reliability and uptime of the monitoring system, including surveillance cameras, Bluetooth devices, and software infrastructure. It reflects the system's ability to operate continuously without significant downtime.
- Usage: This KPI helps evaluate the system's stability and its ability to provide uninterrupted monitoring services.
- Results: The monitoring phase should assess the system's reliability and uptime, identifying any instances of downtime or technical issues that may require improvement.

User Satisfaction:

- Justification: This KPI measures user satisfaction with the implemented monitoring system. It assesses the usability, functionality, and overall user experience of the system from the perspective of port authorities and other relevant stakeholders.
- Usage: This KPI helps gauge user satisfaction and identifies areas for system refinement and user interface enhancements.
- Results: The monitoring phase should collect feedback from users to evaluate their satisfaction with the system's performance, interface, and usefulness.

5 Final consideration, tips&tricks

In summary, the previous chapters have highlighted the development and progress of the pilot action, focusing on the implementation of a Small port smart monitoring system in the selected territory. Here are the main considerations and tips for the replication of the pilot action in another territory:

- **Comprehensive Project Documentation**: The pilot action emphasized the importance of thorough project documentation, including analysis of the current situation, proposed conceptual solutions, SWOT analysis, risk analysis, and a conceptual project. This documentation serves as a foundation for decision-making, procurement, and implementation processes. Replication should prioritize the creation of comprehensive project documentation specific to the new territory.

- **Stakeholder Engagement**: Effective involvement of stakeholders, including the target group and relevant entities such as port authorities and external experts, played a crucial role in the success of the pilot action. Replicating the pilot action requires active engagement and collaboration with stakeholders, ensuring their input, expertise, and support throughout the project.

- **Adaptation to Local Needs**: When replicating the pilot action in another territory, it is essential to tailor the solutions and methodologies to address the specific needs and

challenges of the new context. Conducting a thorough analysis of the target territory's small port infrastructure, existing systems, and regulatory requirements will help identify the necessary adaptations for a successful implementation.

- **Technological Considerations**: The pilot action utilized innovative information and communication technologies, such as surveillance cameras, Bluetooth devices, and real-time data processing. Replication should consider the technological requirements and feasibility in the new territory, ensuring compatibility with existing infrastructure and evaluating the availability of skilled technicians or external expertise for installation and maintenance.

- **Monitoring and Evaluation**: Implementing a robust monitoring and evaluation framework is crucial for assessing the progress, outcomes, and impact of the pilot action. Replication should prioritize the establishment of appropriate Key Performance Indicators (KPIs) and mechanisms for monitoring, tracking, and evaluating the performance and effectiveness of the implemented solutions.

- **Collaboration and Knowledge Sharing**: Replication of the pilot action can benefit from collaboration and knowledge sharing with similar initiatives or organizations in other territories. Leveraging existing networks, partnerships, and cross-border cooperation programs can provide valuable insights, best practices, and lessons learned for a more effective implementation.

- **Budgeting and Resource Allocation**: Adequate budgeting and resource allocation are essential for successful replication. Identifying and securing sufficient financial resources, as well as allocating human resources and expertise, are critical factors in ensuring the smooth implementation of the pilot action.

- **Continuous Improvement**: The pilot action highlighted the importance of ongoing monitoring, testing, and refinement of the implemented solutions. Replication should prioritize a culture of continuous improvement, actively seeking feedback from users, monitoring system performance, and addressing any identified issues or areas for enhancement.

By considering these tips and suggestions, the replication of the pilot action in another territory can increase the likelihood of success and promote the sustainable development of small ports through the implementation of smart monitoring systems.

Annex: Pilot action synthesis

Please fill the following table with the information related to your pilot action. Please, use concise bullet points where indicated.

Project partner	PP 8	**Pilot action number**	8.1.	**Macro-theme***	ICT
Pilot action name		Improvement of the small ports monitoring system (mooring management, billing system, analysis of customer habits)			
Group of stakeholders involved (bullet points)		The pilot action involved a diverse group of stakeholders, including the Primorje-Gorski Kotar County, County Port Authority of Rab, external experts engaged for project-technical documentation, and technology providers. The collaboration and involvement of these stakeholders were instrumental in the successful implementation of the pilot action.			
Main steps (bullet points)		The main steps of the pilot action can be summarized as follows: 1. Conducting an analysis of the current situation in the defined small port, including the existing monitoring system. 2. Developing five proposed variants of conceptual solutions for the smart monitoring system. 3. Conducting a SWOT analysis and risk analysis for each conceptual solution. 4. Selecting the optimal conceptual solution based on the analysis and recommendations. 5. Elaborating a conceptual project based on the chosen solution. 6. Preparing the necessary documentation for the public procurement procedure. 7. Procuring and installing the required thematic equipment, including surveillance cameras and Bluetooth devices. 8. Testing the system's functionality and accuracy through real-time scenarios. 9. Assessing the reliability and performance of the pilot system, identifying any errors or improvements.			

KPIs (bullet points)	Key performance indicators (KPIs) were crucial in monitoring the progress and effectiveness of the pilot action. Some of the identified KPIs included: 1. Accuracy of berth status detection through surveillance cameras and machine learning. 2. Reliability and precision of vessel presence detection using Bluetooth technology. 3. Real-time display and visualization of berth status on the port map. 4. Reduction in manual data entry and administrative workload. 5. Enhanced efficiency and effectiveness of small port management processes.
Main obstacles (bullet points)	During the pilot action, several obstacles were encountered, and they were addressed to ensure successful implementation. These obstacles included: 1. Delays in the work caused by the COVID-19 situation, affecting the timeline of the pilot action. 2. Technical challenges in training the machine learning algorithm to accurately recognize berth status. 3. Logistics and installation difficulties for surveillance cameras and Bluetooth devices in the maritime environment.
Advice and suggestions	Based on the pilot action experience, valuable advice and suggestions for replication include: 1. Engaging and involving relevant stakeholders from the early stages to ensure their commitment and support. 2. Conducting a thorough analysis of the target area's specific needs, challenges, and infrastructure before implementing the pilot action. 3. Developing a clear and well-defined replication strategy, customized to the new territory's context and requirements.

	4. Establishing strong partnerships with technology providers and ensuring compatibility of the solutions with the existing infrastructure. 5. Implementing a comprehensive monitoring and evaluation framework to measure the performance and impact of the replicated pilot action.
Other comments	In conclusion, the pilot action successfully demonstrated the implementation of a Small port smart monitoring system, improving efficiency and effectiveness in small port management. The involvement of stakeholders, adherence to key steps, monitoring through KPIs, addressing obstacles, and following the provided advice and suggestions are vital for the successful replication of the pilot action in other territories.

* Use the following acronyms:

- **ICT**: ICT application and service development
- **P&M**: Spatial planning and management
- **BSN**: Business oriented aspects
- **T&K**: Training and knowledge
- **E&E**: Environment and energy aspects