D 4.3.2 – E-CHAIN COMMISSIONING REQUIREMENTS

Activity 4.3 – Integration and testing

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TABLE OF CONTENTS

ACRONYMS / ABBREVIATIONS

ACRONYM	DEFINITION
AC	Acceptance criteria
PP	Project partners
PT	Project Team
TC	Technical task coordinator
WP	Work package
IT	Information Technologies

REFERENCE DOCUMENTATION

No	TITLE	REPORT No.	PUBLISHED BY
1	**Application Form – E-CHAIN - Enhanced Connectivity and Harmonization of data for the Adriatic Intermodal Network** 2014 - 2020 Interreg V-A Italy - Croatia CBC Programme Call for proposal 2017 Standard - E-CHAIN Priority Axis: Maritime transport	Application ID: 10048282	Lead Applicant: Municipality of Ancona
2	D 4.2.1 – E-CHAIN software environment		
3	D 4.2.2 – E-CHAIN platform (first release). Platform developed		
4	D 4.2.3 – Interface development kit		
5	D 4.2.4 – E-CHAIN platform (final release)		

1. INTRODUCTION
1.1 PURPOSE OF THE DOCUMENT

This document is relevant to the activity 4.3 Integration and testing of E-CHAIN project - Enhanced Connectivity and Harmonization of data for the Adriatic Intermodal Network.

The purpose of this document is to identify commissioning requirements and procedures leading to the release of E-CHAIN platform and components into the operational environment upon successful completion. It documents the requirements that has to be meet to ensure E-CHAIN platform is build and tested according to the specifications, operates in accordance with project aims and to enhance the quality of system start-up and aid in the orderly completion and transfer of systems for beneficial use by the owner and users of E-CHAIN platform.

This Commissioning Plan identifies the processes and procedures necessary for the successful delivery of E-CHAIN platform.

It is the operational document for the execution of the project being used:

•   by the Task Manager (TM) and Project Team (PT) to define procedures for testing and system acceptance

•   by the other Activity 4.3 Integration and testing - needed as a reference document for D 4.3.3 – E-CHAIN Test environment report and D 4.3.4 – Commissioning report.

1.2 WORKING PRINCIPLE

The commissioning process is the integrated application of a set of procedures to check, inspect, and test every operational component. It consists of defining requirements and procedures for documenting, testing and accepting a complete system before it goes into production.

The main sources of data for defining commissioning procedures derive from other deliverables, as follows:

D 4.2.1 – E-CHAIN software environment. Identifies requirements software environment, specifies software environment and infrastructure.

D 4.2.2 – E-CHAIN platform (first release). Platform developed, first draft

D 4.2.3 – Interface development kit. Guidelines how to use APIs/Web Services realized according to different services offered to travelers using standards (XML, JSON, etc.). E.g. WS to gather data about timetable (GTFS format), to integrate E-CHAIN platform with local systems. Guidance for using web service will be provided

D 4.2.4 – E-CHAIN platform (final release). Platform and components developed. The release includes different communication channels and relative guidelines: WEB, WEB APP, totem and alert. Multilanguage will be available including language detected by the device. Moreover, geo-localization by m-device supports and navigates the users until the next destination (e.g. routing up to the boarding point) having the scope to limit the traffic congestion and fuel.

D 4.3.1 – E-CHAIN System Localization translation to Croatian and English. Translation verifications and updates of the E-CHAIN System Localization to Croatian and English.

The main tasks planned in this activity are the following:

- Definition of commissioning requirements and procedures
- Commissioning plan

2. BACKGROUND INFORMATION

E-CHAIN (Enhanced Connectivity and Harmonization of data for the Adriatic Intermodal Network) main objective is to enhance connectivity and harmonization of data for the Adriatic Intermodal Network, through the realization of a modular integrated software (E-CHAIN

platform) for the management of intermodal transport services in port areas for passenger transport. To enhance the current situation, E-CHAIN will focus on providing new services such as an improved Port multimodal info mobility system for the passengers, a ticketing system integrated with other transport modes, an advanced touristic co-marketing tool for the operators. These services will be designed and deployed in the selected pilot sites (Ancona, Split and Venice). A Business model suited to adapt the technology developed in the three applicative contexts will be created and specific needs will be taken into account.

The aim of WP4 is to develop, test and implement all components of E-CHAIN platform.

For this reason, development shall comprise a set of customer oriented services, related to mobility and tourism that have been selected in the WP3. Specific objectives:

•Develop selected services according to the specifics (technical and not) identified in WP3;

•Roll out service versions at pilot sites;

•Develop WSs to allow the integration between different services/systems for a multimodal and interoperable transportation

    - Timetables and travel solution optimizing resources (vehicles, staff), real-time events (e.g. delays) in a seamless solution: from Ancona centre to Split, train+bus+ferry complete information available by APP, WEB, totem.

    - Booking and ticketing modules to allow the payment of transport modes operated by different operators (Conerobus in Ancona + Trenitalia + Jadrolinjia), thanks to the integration between different IT systems and stakeholder involvement.

•Develop help-desk system to assist travellers during the trip according to their needs.

3. COMMISSIONING REQUIREMENTS

3.1.   INTRODUCTION

The purpose of this chapter is to describe the procedures for commissioning E-CHAIN platform. This is a reference document for for defining test case procedures and conducting testing of the E-CHAIN platform which are subject to *D 4.3.3 Test Environment report* and verification and acceptance of the E-CHAIN platform as a basis for the hand over authorisation - *D 4.3.4 Commissioning report*.

3.2.   SUBJECT OF COMMISSIONING

Prior to handover, all components of the E-CHAIN platform must be inspected, tested and signed as complete and operational.

CODE	NAME	DESCRIPTION
B2C	E-CHAIN B2C	E-CHAIN FrontEnd Web Business to Customer
B2B	E-CHAIN B2B	E-CHAIN FrontEnd Web Business to Business
PA	E-CHAIN PA	E-CHAIN FrontEnd Web Public Authorities
BO	E-CHAIN BO	E-CHAIN BackOffice
TO	E-CHAIN TOTEMS	E-CHAIN Info-panels in pilot Sites Ancona, Split and Venice

3.3.   ACCEPTANCE CRITERIA

Acceptance criteria (AC) are the conditions that a software product must meet to be accepted by a user, a customer, or other systems. They are unique for each user story and define the feature behavior from the end-user's perspective.

Reasons for defining acceptance criteria:

- Detailed description of the feature - AC provide precise details on functionality to understand whether the story is completed and works as expected.
- Define negative scenarios – AC define these scenarios and explain how the system must react to them.
- Setting communication - AC synchronize the visions of the client and the development team. They ensure that everyone has a common understanding of the requirements.
- Streamlining acceptance testing - AC are the basis of the user story acceptance testing. Each acceptance criterion must be independently testable and thus have clear pass or fail scenarios.
- Feature evaluations – AC are to be defined at a task level to verify whether the developed task whether the developed feature meets specifications and expectations.

Acceptance criteria can be written in different formats like: scenario-oriented, rule-oriented and other custom formats.

For the purpose of E-CHAIN project main platform feature acceptance test, the most appropiriate is the AC format that llustrates each criterion in scenario form. It can be represented as follows:

Scenario 1 - /name of behaviour to be tested/:

- Precondition – /beginning state/
- Action – /specific action user makes/
- Result - /expected outcome of action/

Functional testing of the E-CHAIN platform will be conducted according to the AC principles.

3.4. FUNCTIONAL PERFORMANCE TEST

The section describes the test procedures aimed at verifying the correct behaviour of E-CHAIN platform and following criteria set in previous section.

In order to verify the full functionality of all components that make up the E-CHAIN platform, a series of tests need to be performed and for this purpose the test cases shown in the table below have been identified.

Table: FUNCTIONAL TESTS LIST

Code	Description of the functionality to be tested
	E-CHAIN FrontEnd Web Business to Customer
B2C-D1	B2C - Home page - Screen Apperiance (design test)
B2C-F-1.1	B2C – Home page - Language selection functionality
B2C-F-1.2	B2C – Home page – Menu items selection functionality
B2C-F1.3	B2C – Plan section – Route planning/searching
B2C-F1.3.1	B2C – Route transport options selection/detailes
B2C-F1.4	B2C – Travel section – Sign up form content/functionality
B2C-F1.5	B2C – Share section display with hastag #greenechain
	E-CHAIN FrontEnd Web Business to Business
B2B-D1	B2B - Home page - Screen Apperiance (design test)
B2B-F-1.1	B2B – Home page - Language selection functionality
B2B-F-1.2	B2B – Home page – Menu items selection functionality
B2B-F-1.3	B2B – Home page – Restricted zone Log in functionality
B2B-F1.4	B2B – Home page –/ "Join now"/ "Sign up"/ "Join in" form content and functionality
B2B-F1.5	B2B – email communication functionality

B2B-F1.6	B2B – Restricted zone/Web services functionality
B2B-F1.6.1	B2B –Web services for transport providers – GTFS data upload
B2B-F1.6.2	B2B –Web services for Tourist services providers - data upload functionality
B2B-F1.6.3	B2B –Web services for Green experiences and activities providers - data upload functionality
	E-CHAIN FrontEnd Web Public Authorities
PA-D-1	PA - Home page - Screen Apperiance (design test)
PA-F-1.1	PA - Home page - Language functionality
PA-F-1.2	PA - Home page – Restricted zone Log in functionality
PA-F-1.3	PA – Home page – "Enter the network" form functionality
PA-F1.4	PA – email communication functionality
PA-F1.5	PA – Restricted zone/Web services functionality
	E-CHAIN BackOffice
BO-F1	BO -
BO-F2	BO -
	E-CHAIN Info-panels in pilot Sites Ancona, Split and Venice
TO-A-D-1	TO-Ancona – Home page Screen Apperiance and content
TO-A-F1	Totem Ancona – Language functionality
TO-A-F2	Totem Ancona – "Travel" Info Group functionality
TO-A-F3	Totem Ancona – "Experience Ancona" Info Group functionality
TO-A-F4	Totem Ancona – "Moving in the City" functionality
TO-A-F5	Totem Ancona – "Usefull info" functionality
TO-S-D-1	Totem Split – Home page Screen Apperiance and content
TO-S-F1	Totem Split – Language functionality
TO-S-F2	Totem Split – "Travel" Info Group functionality
TO-S-F3	Totem Split– "Experience Ancona" Info Group functionality
TO-S-F4	Totem Split – "Moving in the City" functionality

TO-S-F5	Totem Spit – "Useful info" functionality
TO-V-D-1	Totem Venice – Home page Screen Apperiance and content
TO-V-F1	Totem Venice – Language functionality
TO-V-F2	Totem Venice – "Travel" Info Group functionality
TO-V-F3	Totem Venice – "Experience Ancona" Info Group functionality
TO-V-F4	Totem Venice – "Moving in the City" functionality
TO-V-F5	Totem Venice – "Useful info" functionality

For each of the above test cases, a well-defined test procedure needs to be defined. It comprises:

• a Code to facilitate its identification;

• a Title summarizing the scope of the specific test;

• a Scope describing the scope of the test;

• a set of Pre-Conditions describing the initial conditions of the system and of the test environment and facilities before to execute the test procedure;

• a Procedure describing how the test will be carried out;

• the Successful Expected Results describing the set of results to consider the test successfully passed

For this purpose, in order to enable the creation of test procedures in a uniform manner and to facilitate the monitoring of performed tests and tracking their results, a test form was created for testing all components of the E-CHAIN platform.

Form: FUNCTIONAL TEST FORM

Test Code	Description	Result	Comment

Preconditions		
Test Objectives		
Test Procedure		
STEP 01		
STEP 02		
STEP 03		
/TEST CODE/ Test Report Section Date / /		
This section logs the result.		

Form: TEST FORM EXAMPLE

Test Code	Description	Result	Comment
B2C-D1	B2C - Home page - Screen Apperiance (design test)		
Preconditions			
Web server https://e-chain.eu/B2C up and running; Test device (desktop, tablet, mobile device) with internet access			
Test Objectives			
Checking how web content is displayed on different devices and OS and Internet browsers; check the display of design elements			
Test Procedure			

STEP 01	Home page on the Top screen - check that the elements are displayed in accordance with the design: E-CHAIN logo on the left, menu items and language icons on the right		
STEP 02	Home page Bottom - check that the elements are displayed in accordance with the design: E-CHAIN LP and other PP logos with links to their respective web pages.		
STEP 03	Home page Central part of the scrolable screen – check its design arranged in sections against the document_____ with clickable buttons (language depending).		
/TEST CODE/ Test Report Section Date / /			
This section logs the result.			

3.5.   DOCUMENTATION REQUIREMENTS

An important part of commissioning is the acceptance of the E-CHAIN platform documentation, namely:

- detailed specification of the system referred to in section 3.2
- operation and maintenance manuals
- user manuals.

The availability of documentation is one of the preconditions for the handover of the E-CHAIN system to the Lead project partner therefore it is necessary to list all manuals and documents that contain descriptions of the system with their storage location. User manuals are to be available on-line.

3.5.1. E-CHAIN SPECIFICATION DOCUMENTATION REQUIREMENTS

The system documentation should contain specification and descriptions of all components of the final edition of the E-CHAIN platform, including hardware and network specifications and other prerequisites that must be met for its smooth long-term operation. The documentation should also include printouts of the program code and complete system settings. They should also be stored in digital form with an indication of storage location.

3.5.2. E-CHAIN OPERATION AND MAINTENANCE MANUALS REQUIREMENTS

The operation and maintenance manual should contain all operating procedures for system management as well as step by step procedures in case of downtime or interruptions of operatins.

Since these are Web platforms, the procedures should be described in detail:

- in case of an internet attack,
- hate speech or other punishable acts
- checks and acceptance of new stakeholders (transport and service providers)

The operation manual for the pilot sites also contains instructions for procedures in case of physical damage to the totem, and outages from the power and communication network.

System operators should have credentials, the handover of credentials is done at the time of handover of the system.

3.5.3. E-CHAIN USER MANUAL REQUIREMENTS

The draft does not provide for printed editions of user manuals. During the work on the project, video materials and digital manuals for users were created, which should be available to users online. Users who are also partners of the E-CHAIN project (public administration, transport and service providers) should be provided with online support that will guide them through the application (Web services). For the end-users of E-CHAIN platform there is no need for a user's manual, as the platform is intuitive and self-explaining.

3.6. E-CHAIN COMMISSIONING DOCUMENTATION CHECK LIST

As part of the commissioning procedure, it is checked that the system complies with all acceptance conditions, guaranteeing its integrity and functionality in accordance with the required specifications. Prerequisites for the acceptance of the system are functionality tests of all system components completed and their results recorded (D 4.3.3), all components installed and functional (D 4.2.4, D 5.1.2) and all commissioning requirements met.

For the purposes of commissioning, it is necessary to prepare a **commissioning check list** which records and confirms the compliance and completion of all parts of the system intended for commissioning and its readiness for handover

Table 2: COMMISSIONING – PLATFORM TEST RESULTS CHECKLIST */-EXAMPLE-/*

CODE	DESCRIPTION	TEST RESULT	TEST DATE	ACCEPTED BY	COMMENT
	E-CHAIN FrontEnd Web Business to Customer			XY	
B2C-D1	B2C - Home page - Screen Appearance (design test)	ok	6.4.2022		

B2C-F1	B2C – Home page - Language selection functionality	ok	6.4.2022		
...					

Table 3: **SYSTEM ACCEPTANCE CHECK LIST** */-EXAMPLE-/*

CODE	NAME	DESCRIPTION/REFERENCE DOCUMENT	RESULT
B2C	E-CHAIN B2C	Functional tests (D 4.3.3 Test Environment Report)	
B2B	E-CHAIN B2B	Functional tests (D 4.3.3 Test Environment Report)	
PA	E-CHAIN PA	E-CHAIN FrontEnd Web Public Authorities	
BO	E-CHAIN BO	E-CHAIN BackOffice	
TO-A	E-CHAIN TOTEMS - ANCONA	D 5.1.2 Deployment definition in the Pilot Site - Ancona	
TO-S	E-CHAIN TOTEMS - SPLIT	D 5.1.2 Deployment definition in the Pilot Site - Split	

TO-V	E-CHAIN TOTEMS-VENICE	D 5.1.2 Deployment definition in the Pilot Site - Venice	
DOC-SYS	E-CHAIN SYSTEM DOC		
DOC-OP	E-CHAIN SYSTEM DOC		
DOC-USR	E-CHAIN SYSTEM DOC		