



FUTURE REPAIR AND MAINTENANCE FOR AEROSPACE INDUSTRY

Deliverable 8.2

REPAIR IT PLATFORM COMPONENTS –

Function and requirements list, graphical and UML representation of the components of the central IT node

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Short description	<i>This document aims to give an overview of the core element of the RepAIR IT Platform, i.e., the Central Node components (cp. deliverable D8.1). It shall increase the understanding of all project participants through a detailed description of the different aspects about how the RepAIR IT central node will manage the information and how it would communicate with their subsystems through 'bridges'. Furthermore, this document explains how each of the components could help to maintain an updated supply chain and avoid procurement problems on real time.</i>

History	Version	Date	Author	Comment
	V1.4	29/01/2014	OGA	Update of deliverable after review
	V1.5	30/01/2014	UPB	Formal and Grammar Adjustments
	V1.6	31/01/2014	UPB	Final deliverable

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Deliverable 8.2 (summarize)

TITLE: REPAIR IT PLATFORM COMPONENTS

Description: Function and requirements list, graphical and UML representation of the components of the central IT node

Introduction

This document aims to form a common thread with RepAIR deliverable D8.1 'System architecture design IT platform' and to give an overall overview of the core element of the RepAIR IT Platform, i.e., adding the central node components designs and UML.

This document explains what would be the components missions and how each of them could help to maintain an updated supply chain and avoid procurement problems on real time.

Relations to other documents

For this deliverable, the most significant relation to other RepAIR documents is the list of requirements stated in deliverable D2.1:

- a. Security Role: each user has a role in the system. The access to the process in the platform and the documents and pieces information will be managed using these roles. (WP7_001, WP7_002, WP7_006, WP2_006)
- b. Standard applications: ITPlatform will be done with standard tools (WP2_003, WP2_004, WP2_005):
- c. Communication ITPlatform and partners system: webservice (guarantee a failsafe mechanism of the system) (WP7_012, WP2_005)
- d. Access: the access to ITPlatform will be done by https (WP2_006)
- e. Documents: Repository of all regulations has to be available for users (WP7_001)
- f. Architecture: WP8_001

In general, relevant RepAIR documents are:

- a. [RepAIR-DOW] RepAIR Grant agreement N 605779, Annex I - 'Description of Work'
- b. [RepAIR-D2.1] RepAIR Deliverable D2.1: Draft Requirements specification of IT-System
- c. [RepAIR-D2.3] RepAIR Deliverable D2.3: Draft Requirements specification of certification processes
- d. [RepAIR-D2.5] RepAIR Deliverable D2.5: Draft of production, supply chain and workflow requirements specifications and process control system
- e. [RepAIR-D2.8] RepAIR Deliverable D2.9: Requirements specifications of potential parts and end-user guidance
- f. [RepAIR-D2.9] RepAIR Deliverable D2.9: Draft specification of RepAIR scenarios
- g. [RepAIR-D3.2] RepAIR Deliverable D3.2: Defined scenarios that will be considered in the following project steps

Contribution to this document

This document provides the IT components system architecture and functionalities, which comprises:

- a. General documentation store: repository where all the necessary information will be stored and classified

- b. Parts lifecycle analysis (reliability): analyze the behavior of the spare parts along its use in aircraft1 and bring this information to the adequate users
- c. Certification monitoring: to validate the certificate of each step along the supply chain and prevent problems related with this which would suppose a risk
- d. Supply Chain management and monitoring process: to supervise all the supply process, dividing the overall process in small steps that would interact with other systems and IT central node components
- e. Production and analysis planning: to supervise the production sub-chain, the on load work of the agents and control that the production is in time, among others
- f. Logistic process monitoring: to supervise the external agents and assure the deliveries door-to-door
- g. Maintenance monitoring: comprise the monitoring of predictive maintenance (in flight sensors and CAMO) and the ground maintenance (workshop, base, line). Its goal is to supervise the on load work of the agents and control that the production is in time
- h. Workflow management: each event, with the defined use case, would create a unique workflow. Its role is to supervise the workflow accomplishment and launch actions if any workflow rule is broken

RepAIR IT Central Node components: functions, requirements list and UML

The central node was introduced as the centralised part of the overall RepAIR IT system. D8.1 describes mechanisms for replication of data etc.; in this deliverable the components (i.e., the functional parts) of the central node will be described. The clearest way to expose the functions and the requirements list is exposing them by components; the idea is to explain easily what each component will do and what their list of requirements is. Therefore, trying to be clear and precise in explaining each component, the following structure will continue in the following sections: functionality, list of requirements, UML.

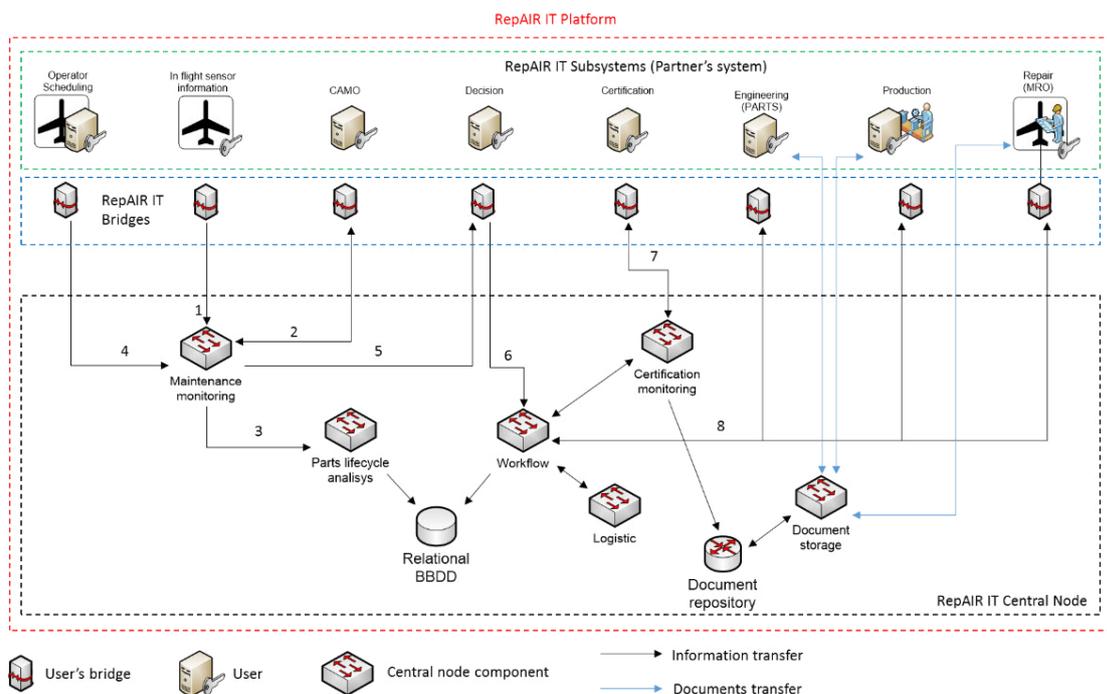


Figure 1: RepAIR Platform representation and interaction between users and central node components

This figure provides a graphical representation of information and communication channels between subsystems, bridges and the central node (see D8.1 for more details). Central node components are highlighted by symbols, each one is described and detailed in one of the following sections (cp. section 1.4):

- General documentation store
 - Document storage
 - Document repository
- Parts lifecycle analysis
- Certification monitoring
- Supply Chain management and monitoring process
 - Maintenance monitoring
 - Logistic
 - Relational BBDD
- Workflow management

General documentation store

Scope

To store all the documentation that users may need. It will be an external repository to the operational database, the database will store all the information about the document, such as the location and attributes, and profiles that can access to this document and its security level. There are two types of levels of documentation: general documentation (lowsecurity) and specific documentation (restricted and high levels of security access as defined by the user who stored the document).

Functionalities

- Manage documents
- Change version document
 - Obsolete
 - In course
 - Draft

Use case

- Assign companies
- Assign skills
- Up-Load Documents
- Down-Load Documents

Parts lifecycle analysis (reliability)

Scope

The life cycle analysis of the pieces will serve to analyse their behaviour during periods of work (hours of operation, number of jumps, etc..). It is important to maintain traceability of the plane on which it is mounted as these data are derived from log and technical details of the plane flight.

The objective is to obtain information about the durability of the component mounted on the plane and compare it with the standards defined by the manufacturer or by the engineering that has developed it.

Functionalities

- Add / delete part number
- Add / delete serial number
- Register part change

Use case

- New Part
- New Serial Number
- Register change

Certification monitoring

Scope

The monitoring component of the certification process will be responsible of validating the certification of each step designated as appropriate use of selected process.

Its mission is validating the certification of each step comparing with the rules available and appropriate certification requirements. It will not allow progress in the supply chain if any of the partial certifications violates rules established on the certification process.

Functionalities

- Add / delete / edit capabilities list
- Add / delete / edit certification list
- Validate capability
- Validate certification

Use case

- Validate Level

Supply Chain management and monitoring process

Given the nature of the supply chain, comprising all steps and agents involved on it since the request is initiated until the end of the process with the delivery of the piece, we have seen fit to include this component in its related components such that it is clear how the monitoring of the supply chain involves the monitoring and review of each of its steps.

Production and analysis planning

Scope

Production Analysis & Planning: all the production chain will be supervised by the Central IT Node. Each production partner will have his own visual interface to interact with the IT System.

Functionalities

- Manage work order
- Manage manufacturing / purchase item
- Update workflow

Use Case

- Start Item
- New Workorder
- Made Item
- Check Item

Logistic process monitoring

Scope

The monitoring of the logistics process will verify that each step of the supply chain is being fulfilled in time date and plan (taking into account the travel time and cost) supply chain in the door-to-door format.

If any of the rules of the label chain is breached, the logistic process may initiate actions towards the agents to request changes or take actions to solve the deviation that has been caused.

It will calculate the deviations of each agent of the supply chain by comparing the values obtained with the standard.

Maintenance monitoring (predictive and workshop, base [MRO], line)

Scope

The maintenance of the plane will be the last step in the supply chain, one in which the parts manufactured will be mounted.

Therefore, it must be controlled and monitored since the objective is to deliver the plane on time and available to fly having fulfilled all the requirements of production and certification at each stage of the supply chain and manufacturing.

Functionalities:

- Manage flight
- Manage Task card
- Manage measure
- Check serial number

Use Case:

- Add Flight
- Add Measure
- Add Taskcard

Workflow management

Scope

The functionality of the component is to ensure workflow process and accomplish SeMS requirements. It will shape each step of the supply chain and show graphically the information of the processed string.

It divides each generated event or request of the system, so that we get a workflow design and supply chain event for any repair request. This allows us to ensure compliance and traceability of each process and its reports can be issued if necessary.

Functionalities

- Check items
- Launch corrective actions