# vf-OS: virtual factory Operating System

# WP8: vf Smart Application Piloting and Validation

# D8.1c: Annex D: Pilot 2 Evaluation Report
# Vs: 1.0.3

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**Short Abstract**

This document provides general information about the vApps that are going to be developed in the vf-OS project related to Pilot2 needs re Construction-Industrialisation. This describes the vApps and their functionalities, the interactions between manufacturing and logistic users and software developers, and the story maps developed.

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## History

See Annex A.

## Status

This deliverable is subject to final acceptance by the European Commission.

## Further Information

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# Executive Summary

Deliverable “D8.1c Annex Pilot 2 Evaluation Report” provides a detailed description of the evaluation activities within Pilot 2: Construction-Industrialisation. The pilot vApps described in this document focus on providing support to the supervision procedures and the control of construction projects.

The annex contains the reports corresponding to the three evaluation periods identified in the DOA at M24, M30, and M36. Each evaluation report contains a description of the software used for the evaluation (Software Under Test), the evaluation questionnaires generated using the Goal-Questions-Metrics (GQM) methodology, and the results of the evaluation.

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# 1 Pilot 2 Detailed Calendar

This section is related to the detailed development and validation schedule regarding Pilot 2 vApps. For a less, detailed schedule version please refer to deliverable D8.1c Validation Scenarios main document. The schedule structure adopted proceeds as follows:

- **Phase 1:** Tto be released at month M26, which covers the developments related to vfConcreteFeedback R1. KBZ oversees the development, which after completion, will be validated by UNINOVA at M27
- **Phase 2:** To be released at month M30, which covers the developments related to several vApps, vfSteelValidation R1, vfDocumentPortal R1 and vfConcreteFeedback R2 Please note that vfConcreteFeedback R2 is an enhancement to be conducted during this phase. vfDocumentPortal is develop by ICE and the remaining vApps in this phase are developed by KBZ. The validation process is conducted by UNINOVA
- **Phase 3:** To be released at month M36, covering all the vApps respectively: vf vfOnSiteManager R1, vfProductValidation R1, vfSteelValidation R2, vfDocumentPortal R2 and vfConcreteFeedback R3. The validation process is conducted by UNINOVA

Some of the key concepts to be considered are:

- As shown in Figure 1, the vApps development schedule is divided in several development iterations due the availability of vf-OS components. vApps with more iterations involve less development effort in some of their iterations, as previous vf-OS components are integrated in previous releases of this same vApp
- The parallelism between vf-OS component developments (releases) and vApps developments (releases) forces vApps developers to freeze the baseline of vf-OS component software packages used for evaluation purposes at M26, M29 and M35, and using for integration purposes versions of vf-OS component that could not be the latest available versions
- A complete evaluation of vApps is intended at the end of the project, where all the vf-OS components are in their last and complete development, and end users have fully deployed and run their business processes with the new software systems

The development of vApps is based on agile methodologies, where the global functionality of an app is split in smaller functional groups called user stories. Those user stories were provided in D8.1a and a detailed specification of user stories per vApp was done for the Pilot 2 case in the Annex D of D8.1b. User stories are grouped in sprints, that are bi-weekly deadlines where several user stories are developed and technically tested. Work generated in a sprint will be acknowledged and showcased at WP8 bi-weekly meetings, where status and risks are communicated to CONSULGAL users. Development problems due to inconsistencies with vf-OS component functionalities will be posted at the same bi-weekly pace. Development of vApps will finish 1 month before the ending of the phase. Evaluation of the vApp will be done the last month along with light bug-fixing.

With all the previous considerations, the development calendar foreseen for Pilot 2 is shown in Figure 1.

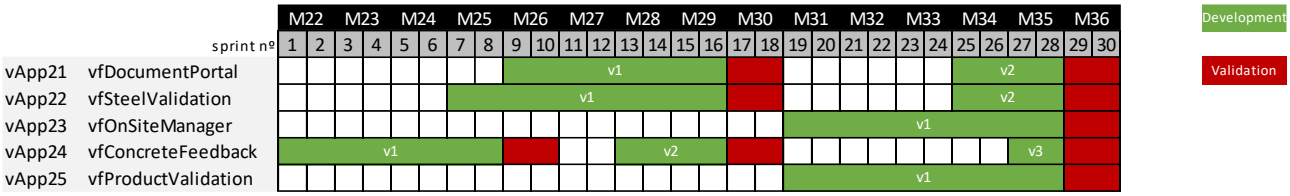


Figure 1: Pilot 2 development and validation calendar

# 2 M27 Evaluation Report

## 2.1 Software Under Test

As described in D8.1b, the purpose of this vApp 24 - vfConcretFeedback is to prevent fresh concrete rejection by sending alerts to the concrete supplier. vfConcretFeedback compares concrete test results with the acceptable thresholds and send an alert if the test result become close to the limits. Hence, the supplier can adjust the concrete quality before getting a rejection.

At M24, vApp24 is implemented and currently has the basic functionalities. The vApp receives the test results and uses the Notification Enabler to send email alerts to the provider's account when a deviation is detected. Furthermore, based on the notification received, the supplier can adjust its production process, avoiding the non-compliance results, rejection of the concrete truck and associated delays.

CONSULGAL is testing the notification mechanism on each ongoing construction project. As known, a construction project has different stages where some of them do not exist at the concrete validation scenario. However, to overcome this project calendar constrains CONSULGAL is working closely with concrete suppliers to conduct vApp tests as presented in the following figures.

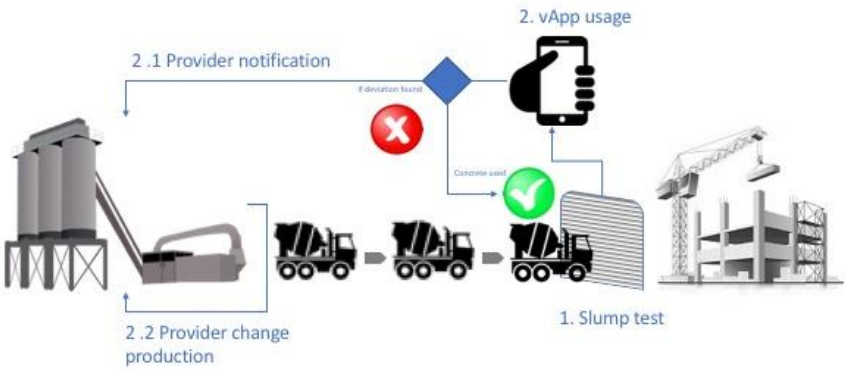


Figure 2: Real Scenario`

Figure 3: Test Scenario

The vApp24 at the current reporting month (M24) does not test the complete vApp functionality as stated in D8.1c, but a subset of already integrated components covering the backbone of the vApp.

| Component | Functionality |
|---|---|
| **Enabler Framework** | The EF component acts as an entry point for the enabler's usage. Thus, and in the scope of vApp24, the vf-OS Specific Enabler being used is the Notification Enabler. |
| **Notification Enabler** | The Notification Enabler is used by the vApp to define the threshold values as internal rules, and based on those, a notification can be triggered if the fresh concrete under analysis is above that threshold. |
| **Storage** | The Relational Storage component is being used to record the slump test results history to detect deviations. |

Figure 4: Pilot 2 test components

## 2.2 GQM Questionnaire

This section will be updated in M27.

## 2.3 GQM Results

This section will be updated in M27.

# 3 M30 Evaluation

Contents to filled in at M30.

# 4 M36 Evaluation

Contents to be filled in at M36.

# Annex A: History

| Document History | |
|---|---|
| **Versions** | V0.0.1-2:<br>• ToC<br>V0.0.3:<br>• Section 1.1 filled with the vApp to be tested in M24<br>V0.1.0:<br>• New section Pilot 2 detailed calendar introduced<br>V0.1.1:<br>• Changes to section 1<br>V1.0.2, v1.0.3:<br>• Internal review and fixing |
| **Contributions** | CONSUGAL:<br>• Ahmad Merhbod<br>UPV:<br>• Francisco Fraile, Víctor Anaya (internal review and fixing)<br>KBZ:<br>• David Aleixo, Carlos Agostinho (1st internal review)<br>IKERLAN:<br>• Eduardo Saiz (2nd internal review)<br>IKERLAN:<br>• Óscar García (Coordinator review) |

# Annex B: References

None

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