DELIVERABLE

Project title: **LetItFlow: Active Distributed Workflow System for elderly**

Project reference number: **AAL-2013-6-128**

D4.1 – LetItFLOW First Release Pilot platform

Revision: 0.8

Main Authors:

Jose Cordero (INTEGRASYS)
Georg Regal (AIT)
Otilia Bularca (SIVECO)
Leon Wiertz (Noldus)

Date: [03/01/2017]
Dissemination Level: Private

REVISION HISTORY

Revision	Date	Author	Organisation	Description
0.1	11/11/2016	Jose Cordero	Integrasys	Initial ToC
0.2	18/11/2016	Leon Wiertz	Noldus	Reviewed ToC and added responsibilities
0.3	22/11/2016	All		First round of contributions (from all partners)
0.4	13/12/2016	Leon Wiertz	Noldus	Revised document based on partner input
0.5	03/01/2017	Ben Loke	Noldus	Contributions from AIT (workshop)
0.6	03/01/2017	Otilia Bularca	SIVECO	Contributions SIVECO and UHB (workshop)
0.7	04/01/2017	Jose Cordero	Integrasys	Contribution from Integrasys and HUVM (workshop)
0.8	04/01/2017	Leon Wiertz	Noldus	Finalized

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS

SVN – Apache Subversion, an open source software versioning and revision control system

API – Application Programming Interface

UCD - User Centred Design

1. INTRODUCTION

1.1 Scope and objectives of the deliverable

This deliverable describes the plan of action to release the first version of the LetItFlow system. The goal of this document is describe upfront what is going to be made on what platforms and with which timeline and how it is planned to this. It also describes some work on the validation and verification of the system. This document will be extended for Deliverable D4.2 with more details.

The main stakeholders involved in this work package are the technical partners: AIT, Integrasys, Noldus and Siveco.

1.2 Structure of the deliverable

The deliverable starts with a description of the integration and verification methodologies that will be used. With respect of the integration plans a schematic overview of the system is shown and described in some details. The next chapter will describe the chosen hardware components and their specifications. And the deliverable is closed by a description of the verification workshops that have taken place and a description of the workflow that will be used for the validation tests

2. INTEGRATION AND VERIFICATION PLAN

2.1 Introduction

To ensure a smooth integration and verification process both a integration and a verification plan have been created. These will be presented here including some background information with respect to the chosen methodologies.

2.2 Integration

Integration works on multiple levels. The first level is the integration of the code of the different partners to work together. This is achieved via close cooperation of the partners to create a single codebase for the components (whenever this is needed). This is mainly done on an ad-hoc base and bilateral. On the second level it is about components being able to talk to each other. This is done by a clear definition of interfaces, messages and Rest API's. These interfaces have been described in D3.2

The last level is the system level. On this level it is all about smooth deployment for the end-users, but it also enables the partners to test the complete system at their own premises.

2.2.1 Code Integration - SVN

To share and control the code during the integration phase between different partners, a directory structure named "Software Repository" has been created in the SVN repository of LetItFlow. Basically, we have a sub-directory for each module and their interfaces. Inside the module directory, we have different sub-folders for each partner that participates in its development. The idea is that each responsible partner(s) uploads/upgrade the code or executables together a readme which explains how to test or integrate it. Inside each partner subdirectory there are three subfolders: "development", "releases" and "documentation". Development contains code and material used for ongoing development; releases contains the binaries and executables that have been released, including previous releases. New versions are added with a new name. Documentation contain docs and metadata to facilitate the handling of the code. Figure 1 and Table 1 show some details of this structure

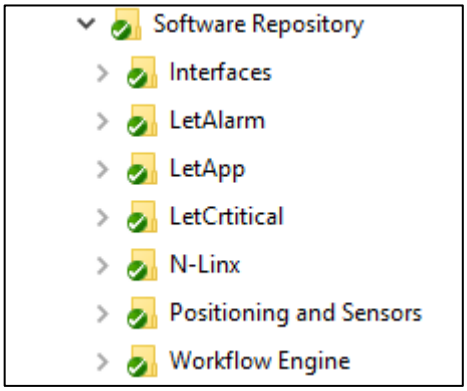

Figure 1 Overview of SVN - Software repository

development	src (source code)
	bin (binaries)
	conf (configuration files), e.g. properties
	script (build & run scripts)
	test (unit tests)
	lib (third party libraries)
releases	bin (binaries)
	conf (configuration files), e.g. properties
	script (build & run scripts)

documentation	Organization
	Contact email
	Installation notes
	Operation procedure
	List of dependencies
	List of included 3rd party libraries/tools
	Short description
	List of other required or dependents modules

Table 1 Content of SVN software repository

2.2.2 System Integration - Remote Server

To ease the integration at system level, a remote server has been configured where all the components and requirements have been installed and properly set up, providing access to all the partners to test their components.

This machine is hosted by Integrasys and runs on Windows 10 operating system. The access information is:

- IP: http://integrasys.no-ip.org/
- Username: letitflow
- Password: letitflow

2.3 Testing

Testing will be performed on multiple levels:

- Components test – Test each component separately to see if it works according to the specifications.
- Integration test – Install the system on a test machine (as if a deployment is done) and see if this works according to the specifications.
- System test – Test the system as a whole based on specific scenarios and see if it works according to the specifications.

2.3.1 Components test

In the documents section of the SVN for each component is a document called testdescription.txt. This document describes how the component can be tested. What tests have been written and what the outcome of each test should be. Mostly these test will be done from within the development environment by the developer

2.3.2 Integration test

In the documents section of the SVN for each component is a document called installation.txt. This document describes the steps needed to create a binary or application. Sometimes it is just a question of copying or unzipping the binaries available in the development branch. Sometimes it means compiling and linking source code. Whatever the steps are that need to be taken a checklist will ensure that the components can be created correctly in a consistent way.

If all components have been created. They should be installed on the correct devices on the correct place. For all components it makes sense to have either an installer or at least some text in the installation.txt file

2.3.3 System Test

Once all components have been installed on the correct place. Some predefined scenarios will be run. These scenario's give a particular outcome where the state of the system should be checked against. For each scenario a logic flow has been described. See chapter **¡Error! No se encuentra el origen de la referencia.** for details. The integrated/installed system is checked against these flow descriptions.

2.4 Branching

Prerequisite: The testing procedure was successful. A branch from development to release can only be made when the testing procedure indicates no problems

All binaries that are created during the testing procedure will be placed in a releases branch. For each release a new branch is made with a version number. There will also be a readme.txt with some extra information (like date and who did the tests and the branching)

Also the files needed for deployment (like installers, batch files, configuration files, etc.) should be copied too.

2.5 Verification

To verify that the system developed within the LetItFlow project meets the user needs we follow an user centred design (UCD) approach as described in the ISO standard 9241-210 (ISO, 2010). As shown in Figure 2, the user-centered design approach explicitly integrates end users throughput all phases of the project. Evaluations have been and will be conducted at different stages of the project and can resulted in reassessment and adaptations of the LetItFlow system. This iterative involvement of end users is crucial for building a product that suits the needs of the later users, especially in such a highly specialized domain as hospitals.

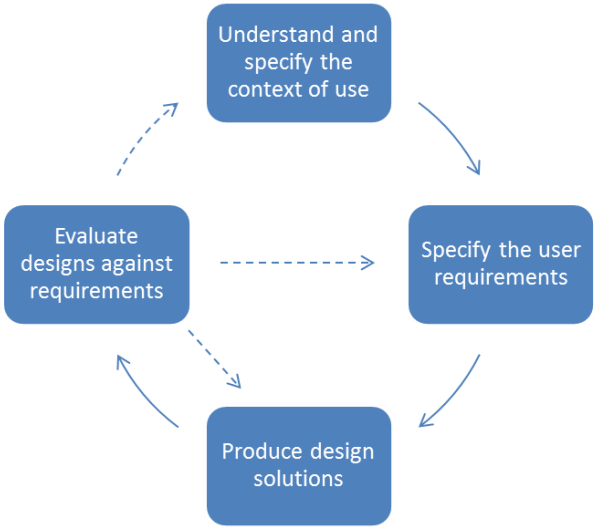

Figure 2 Essential user-centered design activities. Dashed arrows represent potential iterations based on user feedback (adapted from ISO 9241-210, Figure 1).

Prior Phases of gathering user requirements (T2.1 Collecting and Analysing User Needs and T2.2 Defining Scenarios and Use Cases) were successfully conducted, and have been reported in D2.2. Within this deliverable (D4.1) we will describe the plan and activities for T4.3 Prototype Verification.

T4.3 is focused on two aspects: (1) a technical assessment of the developed solutions, as well as a (2) functional verification in terms or acceptance by later end users.

A description of the technical assessment has already been discussed in paragraph 2.3.3 that describes whether or not the LetItFlow system complies with the requirements and specifications.

User centred verification of the developed prototypes is an important in-between step in the user-centred design process, before the iterative evaluation in the real environment within the field trials will take place. Feedback from end-users is crucial in this phase, as functional prototypes are already available for assessment, but still enough room for changes is left. Thus users can provide feedback on the actual implemented solution that results in improvement or re-conception of certain modules. Therefore for functional verification we will conduct workshops with later end users - hospital staff like e.g. nurses, lab technicians, ergo therapists, etc. – to gather feedback on the overall solution as well as on specific design decision.

3. LETITFLOW PROTOTYPE

Roughly speaking the LetItFlow systems consists of 5 subsystems:

1) Beacons – used for location tracking
2) Smartwatch – used for notifications and vital signs monitoring
3) Smartphone – used for task overview, raise alarm and notifications
4) Server PC – used as central entry point to gather and collect data.
5) Client PC – used for administration tasks with the help of front end applications

All systems and components work together as described with the lines connecting the miscellaneous components.

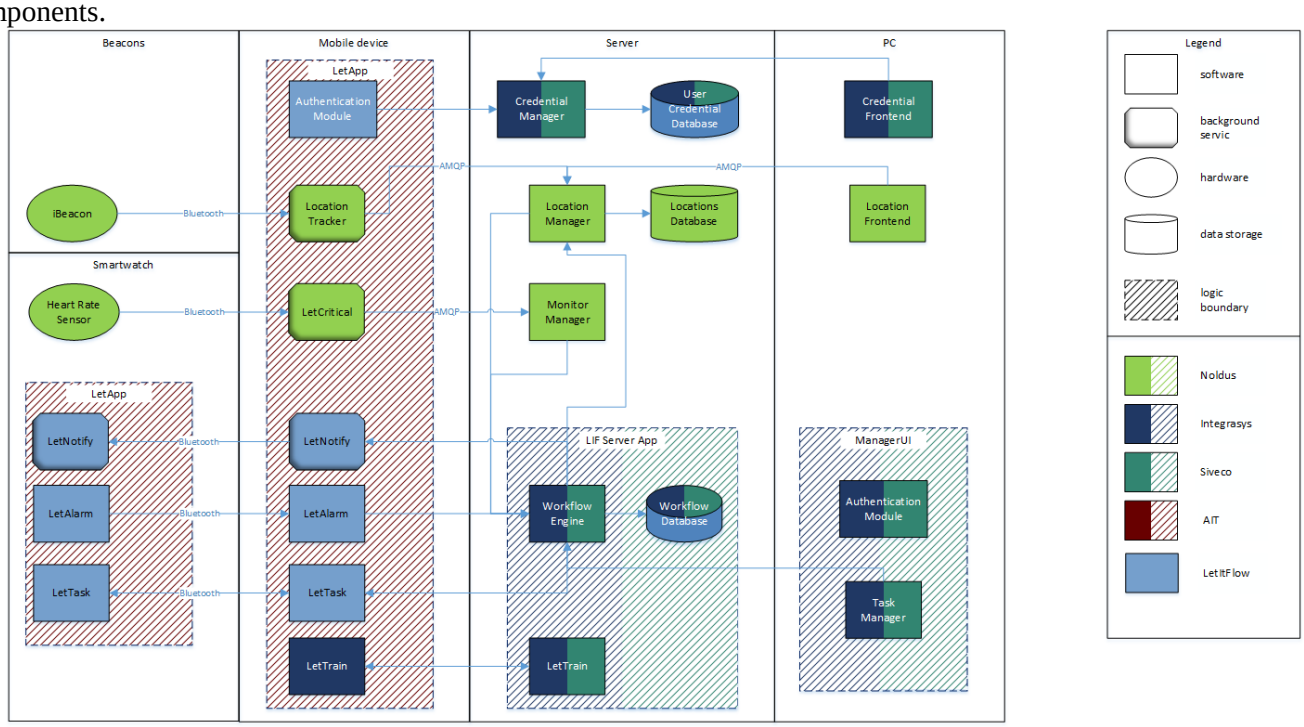

Figure 3 Integrated System Overview

4. PROTOTYPE HARDWARE CONFIGURATION

The following hardware will be used to test the system during the trials. For each of the five subsystems a hardware platform is selected to be used during development and during the trial period. By selecting specific hardware it enables the consortium to focus on the functionality. Whenever the system will be released as a commercial product it can and will run on other devices as well of course.

Figure 4 Estimote Bluetooth Beacons

Beacons – For the location tracking Bluetooth beacons from Estimote have been chosen for the first phase. These beacons are widely available, have a good price/quality ratio, are configurable on the most important aspect for the project (ID, Tx Power signal), battery life is OK and they look good. One important short coming is that it is hard or next to impossible to replace the battery. Other Bluetooth beacons vendors are being investigated as well. Beacons from the Polish firm Kontakt.io and the Spanish Accent Systems are being ordered and will be compared against each other and against the Estimote beacons for a final decision

Smartwatch – Motorola Moto360 sport. A smartwatch that looks like a normal watch due to its round display and since it runs Android wear we can use the parts of the code that have been used for the smartphone components. As a plus it has a built in heart rate sensor that can be used for the vital signs monitoring.

Figure 5 Motorola 360 Sport

Smartphone – LG Nexus 5X or Huawei Nexus 6P. The consortium opted for the Android platform for development. It ensure to have an open and readily available platform. The Nexus series was chosen because those devices tend to have relative good hardware and they run on recent and plain Android versions.

Figure 6 LG Nexus 5X

Figure 7 Huawei Nexus 6P

Tablet - Huawei MediaPad X2 and/or Samsung Tablet 10". Instead of a smartphone the system runs as well on devices with bigger screens. Depending on the use case a tablet might be the most logic device.

Figure 8 Huawei Mediapad X2

Figure 9 Samsung Table 10"

Server PC – The LetItFlow system has a server as central hub for all data, tasks, etc. to be retrieved, processed and stored. For the trial we will make use of two PC (one for the HUVM trials case, the other for the UHB trial case). The exact specifications of the PC are under investigation. At this moment, no high system requirements are necessary; the exact specifications will be provided in the next deliverable.

Client PC – Standard PC as used by the hospital, needs to have network/internet access.

5. TIME SCHEDULE OF INTEGRATION ACTIVITIES

The time schedule for the integration activities is split into two. The first table (see below) describes the schedule until the second review meeting. It focusses on having an integrated system ready to demonstrate during the review meeting. Input from the review remarks from the MTR, the board of advisors and/or first tests at the hospitals will be source of data for a second table, that defines a list of activities that needs to be completed before the start of the trials.

Devices	App	Components	Responsible	v0 (16 Nov)	v1 (30 Nov)	v2 R1 (16 Dec)
Beacons			Noldus		x	
Smartwatch	LIF Smart watch App	GUI	AIT		x	
Smartwatch	LIF Smart watch App	LIF Smart watch App	AIT [Siveco / Integrasys]			x
Smartwatch	LIF Smart watch App	Heart rate sensor	Noldus	x		
Smartwatch	LIF Smart watch App	LetNotification	AIT [Siveco]			x
Smartwatch	LIF Smart watch App	LetTask	AIT [Integrasys]			x
Mobile device	LIF Mobile App	GUI	AIT		x	
Mobile device	LIF Mobile App	LIF Mobile App / framework	Integrasys	x		
			Siveco		x	
Mobile device	LIF Mobile App	Authentication module	Integrasys	x		
			Siveco	x	x	
Mobile device	LIF Mobile App	Location Tracker	Noldus		x	
Mobile device	LIF Mobile App	LetCritical	Noldus		x	
Mobile device	LIF Mobile App	LetAlarm	Siveco		x	
Mobile device	LIF Mobile App	LetTask	Integrasys	x		
			Siveco		x	
Mobile device	LIF Mobile App	LetTrain	Integrasys		x	
			Siveco		x	
Server	LIF Server App	LIF Server App	Integrasys	x		
			Siveco	x		
Server		Credential manager	Integrasys	x		
			Siveco	x		
Server		User Credential database	Integrasys	x		
Server		Location manager	Noldus	x		
Server		Location database	Noldus		x	
Server		Monitor manager	Noldus	x		

Devices	App	Components	Responsible	v0 (16 Nov)	v1 (30 Nov)	v2 R1 (16 Dec)
Server	LIF Server App	Workflow Engine	Integrasys	x		
			Siveco	x		
Server	LIF Server App	Workflow Database	Integrasys	x		
			Siveco	x		
Server	LIF Server App	LetTrain	Integrasys		x	
			Siveco		x	
PC	Manager UI	Task Manager	Integrasys		x	
PC	Credential Frontend		Integrasys	x		
PC	Location Frontend		Noldus			x

Table 2 Schedule of activities

6. VERIFICATION

6.1 Function Verification

For functional verification we conduct two rounds of workshops in Vienna, Bucharest and Seville with hospital staff (nurses, lab technicians, ergo therapists, etc.).

In the first workshops a functional prototype of the LIF solution is presented to the users and users can as well themselves try out the current solution..

The first workshops were conducted in Vienna, Bucharest and in Seville. The objectives of these workshops were the familiarization of nurses and orderlies with the prototype of LetApp component (server-side and client-side) functionally and operationally by following a typical scenario and gathering feedback from end-users considering functionality, ease-of-use, accessibility, potential. Moreover through these workshops we aim to gather feedback on the overall solution as well as on specific design decisions.

The workshops were organized as an interactive focus group. Participants first received relevant information about the project (basic idea and goals), which was followed by a presentation of the prototypes (demonstration), and a session for hands-on experience (experimentation).

First a live-demo based on a particular scenario was conducted by the LetItFlow team (in Bucharest by the SIVECO Romania team, in Vienna by researchers from the AIT and in Seville by the Integrasys team). Each phases, menus, features and buttons were explained in detail. Also details regarding the web appearance and relevant features of the LetApp prototype administration like how to configure the application, how to assign a task, management of users, authentication were approached.

Both in Bucharest and Vienna, to elaborate on the initial feedback received during the demonstration and experimentation, the participants were further involved in an interactive *gamestorming* activity (Gray, Brown, Macanufo, 2010) where they faced off in a card game. For this card game, the participants were split into two teams, a “challenge team” and a “solution team”. The goal of the challenge team was to come up with disadvantages (negative aspects) concerning the proposed smartphone and smartwatch solutions, which they had to write down on cards. Similarly, the solution team prepared cards that mentioned advantages (positive aspects). Following this brainstorming and preparation phase, the two teams would face off, with one team playing a “challenge card” and the other team countering with a “solution card”. In each round, the team with the better argument would receive a point.

6.2 Vienna Workshop

On Dec. 13, 2016, AIT conducted a workshop with six end-users -- four nurses, one physiotherapist, and one occupational therapist -- to get their unique perspective and feedback on the latest version of the LetItflow prototypes.

Figure 10 (a) Participants in the workshop in Vienna and (b) Challenge Cards

In the workshop the LetItFlow concept and in particular the smartwatch solution were overall perceived very well.

Some of the key feedback received included the following:

- *Feeling Secure:* Participants liked the idea that the LetItFlow system can provide step-by-step workflow guidance, which is useful in particular for workflows and procedures that have to follow certain standards. Participants reported that this step-by-step task model makes them feel more secure.
- *Communication:* Participants mentioned that a smartwatch solution is very useful when calling for help and for supporting communication between stations. Especially older nurses praised that feature.
- *Simplicity:* This is a very important feature. The smartwatch must provide simple and efficient solutions, especially sending alarms must be fast and simple otherwise it is not useful. Also receiving messages should be clearly evident and should not disturb or irritate medical personnel by notifications. Double accountancy must be avoided, therefore the LIF system must fit into the existing hospital system.
- *Hygiene*: Participants mentioned that a smartwatch solution is not permitted in all medical specialties due to strict hygiene regulations (e.g., internal medicine). In those specialties nurses and doctors cannot wear anything from their fingertips up to their elbows. A viable alternative mentioned was a type of smart pocket watch on a chain that can be kept in the front pocket. Moreover The hardware must be water proof and resistant against disinfectant
- *Content of tasks:* The TPs emphasize three main categories of information that should be provided by the LIF system, Immediate help (asking others for support in special situation) , time-critical tasks: (special medication intake for patients) and step-by-step guidance: supporting medical personnel in special tasks as infrequently done medical procedures
- *Costs*: The biggest criticism users raised was the fact that the full LetItFlow package (consisting of tablets, smartwatches, vital sign tracking, beacons for localization, etc.) might be too expensive for their hospital. Here another positive aspect of the smartwatch solutions was seen by the participants, as it is relatively cheap and can thus be deployed more easily on a large scale.
- *Privacy / Surveillance:* Users reported, that monitoring of personnel is a risk / threat that needs to be taken into account! A proposed solution could be to anonymize the devices.

6.3 Bucharest Workshop

The Neurology Department of the University Emergency Hospital of Bucharest hosted a workshop on the 16th of December 2016 to collect feedback from end-users considering the user interface design and first step implementation of the LetItFlow project, mainly LetApp prototype. SIVECO Romania attended this event as co-organizer and technical partner of the LetItFlow project providing insights considering the challenges and current status of development.

Figure 11 Workshop in Bucharest

The game cards filled by each participant with the benefits of using the solution as perceived by users during the workshop revealed the following aspects:

- *Ease of Use:* The tasks were successfully performed by nurses and medical staff on smartphones, smartwatches and tablets.
- *Hygiene*: The discussions revealed some issues considering hygiene principles when using the smart devices in hospital within daily activity. The usage of the smartwatch does not breach the rules of hygiene as the wrist carrying it may be covered with the surgical glove without affecting its usage and functionalities.
- *Potential*: Considering the potential of the LetApp, end-users suggested that some reports showing the activity of nurses on a certain period of time could improve the marketability and usability of the application as most health solutions lack traceability of nurse's tasks, responsibility and accountability.
- *Look and feel*: The users considered the user interface as looking satisfactory. The selection of colours and fonts layout were considered appropriate and friendly.
- *Usability*: the nurses suggested that the possibility to navigate back to the task list from the subtask list should also be available. Also, they mentioned the use of the task button in order to refresh and navigate back to the task list is rather inconsistent (see Figure 12).

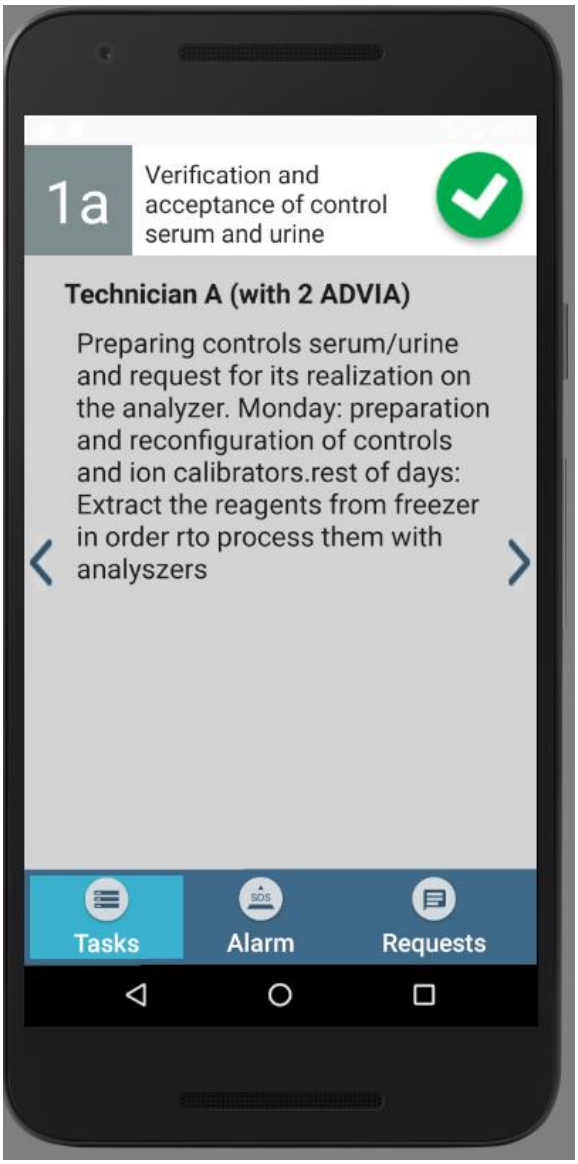

Figure 12 Subtask - Prescreen from the application

6.4 Seville Workshop

A third workshop was carried out by the partners Integrasys and HUVM on Dec. 22, 2016, held at HUVM's own facilities. Basically, the aim of this workshop was to show the current status of the project to the end users and to collect feedback from them regarding the usability, interface design, operation and functionality.

The workshop was initiated with a brief description of the project to introduce the users, showing the different components and features of the LetItFlow solution. The group of users was formed by 2 nurses and 3 laboratorian technicians, mainly elderly. The introduction was followed by a live-demo that allowed the interactivity of the participants with the LetItFlow solution for a simulated scenario, always supported by explanatory presentation.

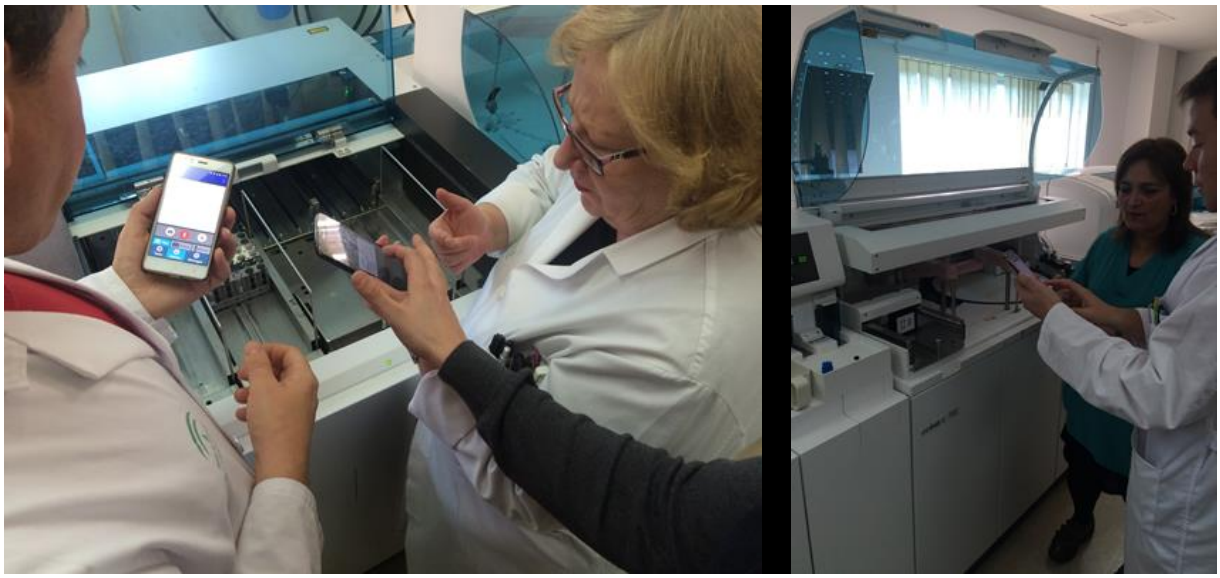

Figure 13 Workshop in Seville

The end users were provided with the available equipment by the partners (smartphones and tablets), showing the smartwatch interface with mockups (still in development)

Figure 14 Workshop equipment

The workshop finished with an informal meeting where the participants provided their feedback. In general, the recollected comments show a positive vision about the interfaces and functionality of the solution, indicating some issues and possible improvements to be corrected or included in the last stage of the project.

A summary of the feedback:

Pros:

- *Design:* all participants showed good feedback on the interface design, highlighting the simplicity and user-friendliness, some minor comments were provided about color range, icons, etc.
- *Messaging:* the participants indicated as positive the use of an internal and professional chat to communicate among them allowing sending voice and pictures notes, to avoid knowing for example the mobile or professional phone number for each one, improve the interchange of information in the shift change, etc.
- *Alarms:* some participants highlighted this feature as very positive to send requests among workers and asking for help if it was required. This feature could be viewed like a mentoring tool for elderly people.

Cons:

- *Laboratory/LetItFlow systems:* Initially, laboratory technicians indicated their dissatisfaction with the idea to work with two systems (laboratory and LetItFlow). It was explained that LetItFlow solution should be viewed like a complementary system in the case of the laboratory, because LetItFlow system is fed back with inputs or information from laboratory system.
- *Equipment:* Some participants were opposites to carry a smartphone/tablet on the hand (or use their own smartphones) during the working day, they commented that it could be an obstacle to working in terms of usability, providing discomfort, interruption or disturbs. In opposite, they highlighted the use of smartwatches to avoid these problems commented previously.
- *Step-by-step:* all participants pleased the LetItFlow solution as step-by-step workflow guidance but laboratory technicians indicated the inefficiency of providing step-by-step and performing interactions with the interface for each step (assigning and executing the task). They indicated that it would be better to have the solution as a support (unknown task for the worker) or reminder (some action to be executed at specific time/day or indicators of the equipment like low level of reagents) tool and to interact with it when it was only necessary (information required by the task, know the procedure, etc.)
- *Privacy / Surveillance:* Participants showed their distrust over the solution regarding the location, thinking that this could be used as a tool to control of their work and not to facilitate it.

6.5 Conclusion and Next Steps

The gathered aspects are now used to improve the system. In terms of user interface we will redesign the call for help function, as well as the notification. Special emphasis will be put on the smartwatch interface as participants saw great potential especially in the smartwatch solution.

The improved and redesigned system will be evaluated in a second workshop (most likely in February 2017). In the second workshop the overall solution will be in a mature state, thus in the second workshop we aim to find errors, bugs, and usability problems that need to be fixed before the system is deployed in the hospitals HUVM and UHB for the field trials in T5.1.

7. SYSTEM OVERVIEW – WORKFLOW MAIN TASKS

This chapter describes the three main cases for the LetItFlow system. These cases form the basis of the system tests. Besides these three main cases (that directly involve the nurse) there are other subcases too (like management of tasks and location and credential management), but these are not described here.

7.1 Normal Task Cycle

7.1.1 Description

This is the normal order of events when a nurse is performing her daily routine

7.1.2 Logic Flow

1. The nurse starts her work
2. The nurse gets a phone / logs in to the LetItFlow network
3. The application shows the tasks that need to be done
    a. The task are based on her role.
    b. The tasks are based on the location.
4. The nurse selects a task that she is going to do.
5. If the nurse want more information about a task, she can click on a task and get more information and instructions (LetTrain)
6. The nurse performs the task
7. The nurse marks a task complete
8. [Go back to step 3]
9. At the end of the day the nurse logs out

7.1.3 Sequence Diagram

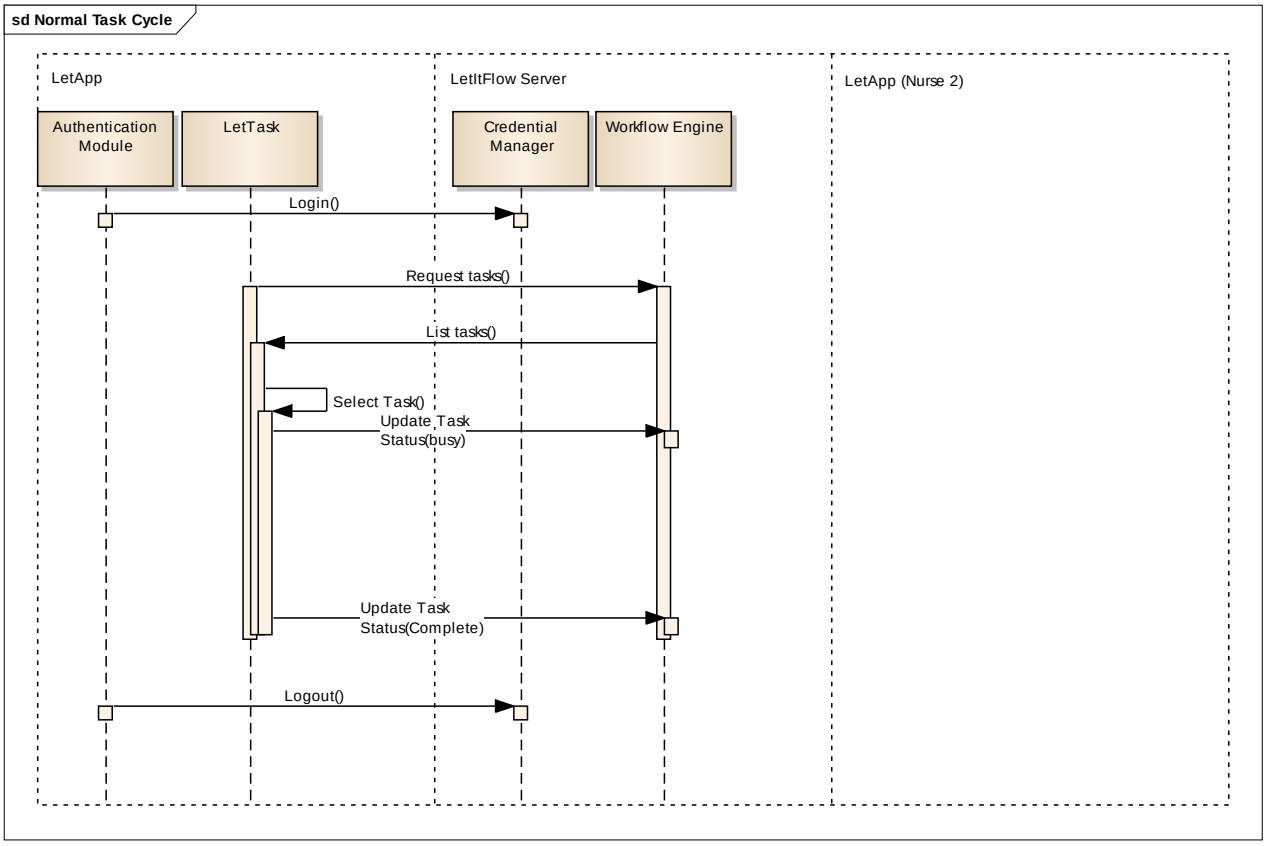

Figure 15 Normal task cycle

7.2 Abnormal Task Cycle - Manual Alarm Trigger

7.2.1 Description

This is an change in normal order of events because something abnormal happened external to the nurse.

7.2.2 Logic Flow

Same as Normal Task Cycle until step 6

6. The nurse performs the task
7. Something abnormal happens (e.g. a patient has fallen out of bed)
8. The nurse sends an alarm
    a. The alarm is send with the nurse's name and location
    b. The alarm is send to nurses nearby
9. A nurse acknowledges the alarm
    a. The alarm is removed from other devices
    b. The nurse who send the alarm will be notified who is coming to help
    c. The task of the nurse who raised the alarm is switched from the current task to the alarm task. (The current task is put on hold)
    d. The task of the helping nurse is switched from the current task to the alarm task. (The current task is put on hold)
10. The nurses solve the task
11. The nurse (who raised the alarm) mark the task as complete
12. The nurses perform the main task again.

7.2.3 Sequence Diagram

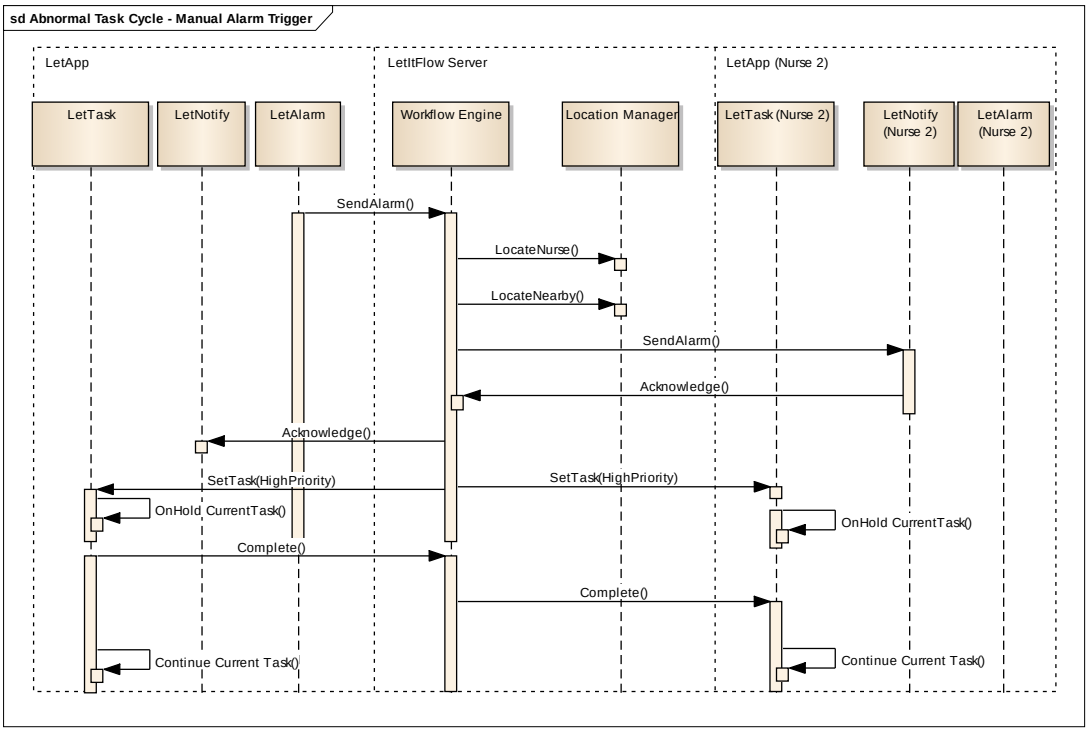

Figure 16 Manual Alarm Trigger

7.3 Abnormal Task Cycle - Automatic Alarm Trigger

7.3.1 Description

This is an change in normal order of events because something abnormal is about to happen to a nurse.

7.3.2 Logic Flow

Same as Normal Task Cycle until step 6

6. The nurse performs the task, and her vital signs are being monitored
7. The monitor manager detects an abnormal situation (i.e. the nurse is near exhaustion)
8. The monitor manager sends an notification to the nurse
    a. The nurse declines the alarm (she doesn't feel exhausted) → [continue with normal task cycle, end of case], Monitor Manager is being updated
    b. The nurse acknowledge the alarm → [continue with step 9]
    c. The nurse does not react within a specific timespan. → [continue with step 9]
9. The monitor manager sends an alarm
    a. The alarm is send with the nurse's name and location
    b. The alarm is send to nurses nearby
10. A nurse acknowledges the alarm
    a. The alarm is removed from other devices
    b. The nurse who send the alarm will be notified who is coming to help
    c. The task of the nurse who raised the alarm is switched from the current task to no task. (The current task is freed)
    d. The task of the helping nurse is switched from the current task to the alarm task. (The current task is put on hold).
11. The helping nurse checks if extra steps need to be done
12. The helping nurse mark the task as complete
13. The helping nurse perform the main task again.
14. The nurse who raised the alarm will go back to her work once she is in a better condition again (Question: who decides this)

7.3.3 Sequence Diagram

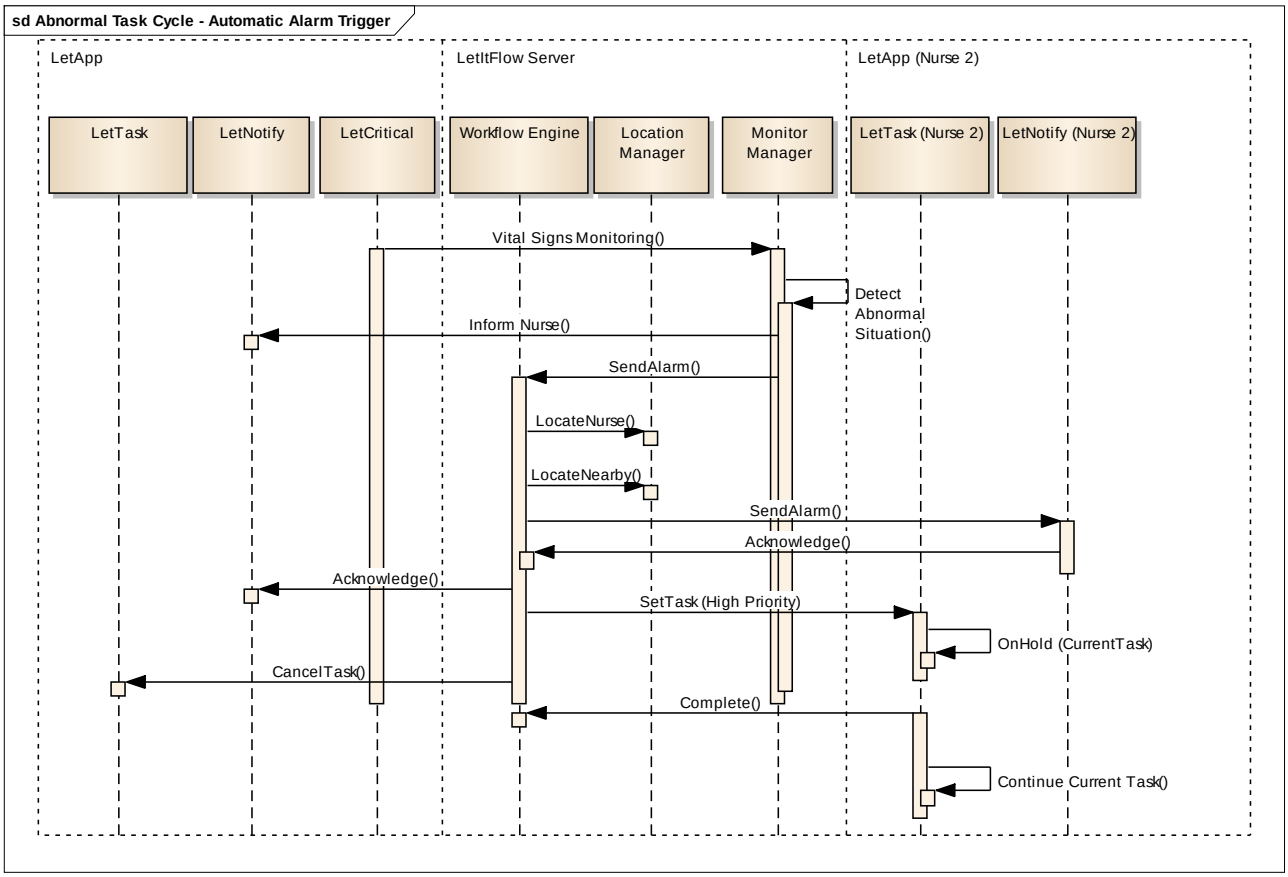

Figure 17 Automatic Alarm Trigger