7th Framework Programme

FP7-SEC-2012.4.3-1

Next Generation Damage and Post-Crisis Needs Assessment Tool for Reconstruction and Recovery Planning

Capability Project

The Integrated System

Deliverable No.	D6.1		
Workpackage No.	6	**Workpackage Title**	System Integration
Author(s)	Sathish Nammi (ARU);Wayne Kimberlin (GS); Jonathan Naundrup (GS); Hassan Shirvani		
Status	Final		
Version No.	V1.00		
File Name	"D6.1_The_Integrated_System_V1.00"		
Delivery Date	14/02/2017		
Project First Start and Duration	Dec. 1, 2013; 42 months		

"This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no [312718]"

DOCUMENT CONTROL PAGE

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Format	Text-MS Word	
Language	en-UK	
Work Package	WP6	
Deliverable Number	D6.1	
Due Date of Delivery	31/07/2016	
Actual Date of Delivery	14/02/2017	
Dissemination Level	PP	
Rights	RECONASS Consortium	
Audience	☐ public ☒ restricted ☐ internal	
Revision	none	
Edited by		
Status	☐ draft ☒ Consortium reviewed ☒ WP leader accepted ☒ Project coordinator accepted	

REVISION LOG

Version	Date	Reason	Name and Company
V 0.6	14/09/2016	Draft – Pending ARU, RISA	Wayne Kimberlin (GS)
V 0.8	15/09/2016	Draft –Input Received from RISA	Stephanos (RISA)
V 0.9	15/09/2016	Draft – pending more input from ITC	Sathish Nammi (ARU) & Wayne Kimberlin (GS)
V 0.9.1	21/09/2016	First submission	Sathish Nammi (ARU) & Wayne Kimberlin (GS)
V 0.9.2	20/12/2016	Amendments	Sathish Nammi (ARU) & Wayne Kimberlin (GS)
V 0.9.3	16/01/2017	Inclusion of TUD edits	Wayne Kimberlin(GS)
V 0.9.4	23/01/2017	Inclusion of ICCS edits	Sathish Nammi (ARU)
V 0.9.5	23/01/2017	Inclusion of RISA edits	Sathish Nammi (ARU)
V 0.9.6	24/01/2017	Inclusion of ITC edits	Sathish Nammi (ARU)
V0.9.7	27/01/2017	Amendments	Sathish Nammi (ARU)
V1.00	14/02/2017	PC review and submission	Evangelos Sdongos (ICCS)

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ABBREVIATIONS AND ACRONYMS

ABBREVIATION	DESCRIPTION
2G	2nd Generation
3G	3rd Generation
ADC	Analogue to Digital Converter
ADSL	Asymmetric Digital Subscriber Line
AES	Advanced Encryption Standard
DBMS	DataBase Management System
DC	Direct Current
DFS	Dynamic Frequency Selection
EDGE	Enhanced Data rates for GSM Evolution
EIRP	Equivalent Isotopically Radiated Power
EU	European Union
FNCNR	Functional Requirement-Connectivity
FNRCR	Functional Requirement-Recovery
FNRLR	Functional Requirement-Reliability
FNTLR	Functional Requirement-Tools
GF	Gauge Factor
GIS	Geographic Information System
GND	Ground
GPRS	General Packet Radio Service
GPS	Global positioning System
GSM	Global System for Mobile communications
HSPA	High Speed Packet Access
HTTP	Hypertext Transfer Protocol
IEEE	Institute of Electrical and Electronics Engineers
LAN	Local Area Network
LCD	Liquid Crystal Display
LPS	Local Positioning System
NTP	Network Time Protocol
NQS	Network Quake Server
OFDM	Orthogonal Frequency-Division Multiplexing
PCCDN	Post Crisis Needs Assessment Tool in regards to Construction Damage and related Needs

RECONASS	Reconstruction and REcovery Planning: Rapid and Continuously Updated COnstruction Damage, and Related Needs ASSessment
SES	Sensor Event Service
SOH	State Of Health
SOS	Sensor Observation Service
SQL	Structured Query Language
TCP	Transmission Control Protocol
UAV	Unmanned Aerial Vehicle
UMTS	Universal Mobile Telecommunications System
UPS	Uninterruptible Power Supply
VPN	Virtual private network
WAN	Wide Area Network
WGS84	World Geodetic System
WLAN	Wireless Local Area Network
WP	Work Package
WSN	Wireless Sensor Network

GLOSSARY OF TERMS

GEM (Global Earthquake Model)	In the GEM project researchers from different countries are developing a physical earthquake risk estimation model of global use. In it a common terminology or taxonomy is critical to document variations in building design and construction practices around the world
GSM, GPRS, UMTS, HSPA, LTE	GSM, GPRS, UMTS, HSPA, LTE refer to a holistic package of public mobile communication solutions with capabilities to transmit data.
Richter Magnitude	Size of an earthquake measured on the open ended scale of moment magnitude.
Non-structural	All items in a building other than the building structural system and its foundation. Included are all architectural elements such as cladding, glazing, ceiling systems and interior partitions that are permanently attached to the building; all mechanical and electrical equipment such as fire sprinkler systems, water and sewer piping, HVAC (Heating, Ventilating and Air Conditioning) systems and electrical distribution and lighting systems that are permanently attached to the building. For the purposes of this deliverable non-structural components do not include building contents.
Point Cloud	A point cloud is a set of data points in some coordinate system. In a three-dimensional coordinate system, these points are usually defined by X, Y, and Z coordinates, and often are intended to represent the external surface of an object.
Remote-Sensing	Remote sensing is the acquisition of information about an object or phenomenon without making physical contact with the object and thus in contrast to in situ observation. In this work by using such term we refer to the procedure of obtaining data through aerial or satellite photos regarding the condition of a building as seen from its exterior.
Structural Components	Building components that are part of the intended gravity, seismic, blast/impact or fire forces resisting system, or that provide measurable resistance to these forces.
Taxonomy	Categorization system
Wi-Fi	The Wi-Fi Alliance, the organization that owns the Wi-Fi (registered trademark) term specifically defines Wi-Fi as any 'wireless local area network (WLAN) products that are based on the IEEE 802.11 standards.'
WiMAX	WiMAX (Worldwide Interoperability for Microwave Access) is a wireless communications standard designed to provide 30 to 40 megabit-per-second data rates, with the 2011 update providing up to 1 Gbit/s for fixed stations.
Wireless Sensor Network	Spatially distributed autonomous devices (nodes) using sensors to cooperatively monitor physical (such as, acceleration, strain) or

(WSN)	environmental conditions

EXECUTIVE SUMMARY

This report describes the development of the integrated RECONASS system including the communication gateway, wireless strain sensor nodes, local positioning system and the PCCDN Tool. Details of the integration process and testing against the requirements are outlined. It also includes the approach taken to packaging by each other system modules. By 'integration' is meant that the assembly of the full integrated platform with the generic embedded electronics, the sensors, the wireless network, the software and all the modules within the project. Thus, this WP focuses on the integration of the components and modules developed in WP 2, 3 and 4 and 5

The approach taken was to precisely follow the task descriptions outlined in the description of work (DoW) and complete the integration tasks in a timely effective manner. To this end task 6.2 started early with the development of blast resistant enclosures by ARU. This has already generated some external exploitation interest in other applications.

The first practical stage of integration was to perform remote integration tests between various key modules within the system. The key remote integration tests were between the gateway, datahubs and the PCCDN tool. The tests were conducted between the international sites of ICCS, RISA, GeoSIG and TUD. Initially the success of the tests was limited and often resulted in extensive revisions to various elements of the system software. Over a period of months the results improved. Eventually the function, reliability and speed of these integration tests reach satisfactory levels.

Toward the end of the integration work package, integration workshops were held to perform end to end tests of the system, prior to full system tests in WP7. These integration workshops proved a very successful method of test and identifying opportunities for improvements.

During integration the system was tested against the requirements identified in the previous work packages. For the most part these requirements have been met. Some compromises in functionality were made, which can be seen in the functional and validation test results. Upon the successful completion of the 2nd integration workshop we demonstrated End to End integration. In the consortiums opinion, identified short falls have insignificant functional and performance losses to the overall system. The state of art system developed for this project is now ready for full testing under WP7.