NIGHTINGALE prototypes for upgrading triage

D2.2

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NIGHTINGALE

DOCUMENT SUMMARY INFORMATION

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HISTORY OF CHANGES

Version	Date	Changes
0.1	16/11/2022	Table of contents (ICCS)
0.2	20/12/2022	First version: UPV contribution for VSE, INOV, PARTICLE, DW and contributions for SWAPP LDO contribution for the Thermographic Scanning System ICCS contribution for DTT, FRW, TVSA
0.3	15/01/2023	Consolidation (ICCS), refinements (ICCS), additional input received from partners (UPV, ICCS, LDO, FOI)
0.4	24/01/2023	Version ready for internal review
1.0	31/01/2023	Final version

PROJECT PARTNERS

No.	Logo	Partner	Short name	Country
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2		TOTALFORSVARETS FORSKNINGSINSTITUT	FOI	Sweden
3		LEONARDO – SOCIETA PER AZIONI	LDO	Italy
4		C4CONTROLS LTD *[TERMINATED]*	C4C *[TERMINATED]*	UK *[TERMINATED]*
5		NETCOMPANY-INTRASOFT	INTRA	Luxembourg
6		INOV INSTITUTO DE ENGENHARIA DE SISTEMAS E COMPUTADORES, INOVACAO	INOV	Portugal
7		EXUS SOFTWARE MONOPROSOPI ETAIRIA PERIORISMENIS EVTHINIS	EXUS	Greece
8		UNIVERSITAT POLITECNICA DE VALENCIA	UPV	Spain
9		ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS	CERTH	Greece
10		DEVERYWARE	DW	France
11		PARTICLE SUMMARY	PARTICLE	Portugal
12		TREE TECHNOLOGY SA	TREE	Spain
13		EUROPAISCHE GESENLLSCHAFT FUR TRAUMA -UND AKUTCHIRURGIE - ESTES	ESTES	Austria
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LIST OF ABBREVIATIONS

Abbreviation	Definition
AC	Alternating Current
ADC	Analog to Digital Converter
AI	Artificial Intelligence
AMP	Advance Medical Post
ANS	Autonomic Nervous System
API	Application Programming Interface
App	Application
AR	Augmented Reality
ASA	Acrylonitrile Styrene Acrylate
BLE	Bluetooth Low Energy
BP	Blood Pressure
C3&IMS	Command, Control and Coordination and Incident Management System
CCPs	Casualty collecting points
COP	Common Operational Picture
COTS	Commercial Off The Shelf
DC	Direct Current
DBP	Diastolic Blood Pressure
DSS	Digital Signal Processor
DTT	Digital Triage Tag
ECCs	Emergency Communications Centres
ECG	Electrocardiogram
ED	Emergency Department
EDXL	Emergency Data Exchange Language
EDXL-TEP	EDXL- Tracking of Emergency Patients
EMS	Emergency Medical Services
EOCs	Emergency Operation Centres
EU	European Union
EVM	Eulerian Video Magnification
FIFO	First-In First-Out

FIR	Finite Impulse Response
FR(s)	First Responder(s)
FRW	First Responder Wearable
GA	Grant Agreement
GCS	Ground Control Station
GDPR	General Data Protection Regulation
GIS	Geographic Information System
GPIO	General-Purpose Input/Output
GPS	Global Positioning System
Hb	Hemoglobin
HbO2	Oxygenated hemoglobin
HR	Heart Rate
HRV	Heart Rate Variability
I2C	Inter-Integrated Circuit
IBI	Inter-Beat Intervals
IC	Integrated Circuit
IMU	Inertial Measurement Unit
IR	Infrared
JSON	JavaScript Object Notation
LCD	Liquid-Crystal Display
LED	Light Emitting Diode
Mx	Month x of the project
MAC	Media Access Control
MCI	Mass Casualty Incident
MCU	Micro Controller Unit
ML	Machine Learning
NDEF	NFC Data Exchange Format
NFC	Near Field Communication
NG	Next Generation
NIT-MR	Novel Integrated Toolkit for Emergency Medical Response
NMEA	National Marine Electronics Association
OLED	Organic Light-Emitting Diode

PAT	Pulse Arrival Time
PC	Personal Computer
PCB	Printed Circuit Board
PEMEA	Pan-European Emergency Application
PPG	PhotoPlethysmoGraphy
PR	Pulse Rate
PRV	Pulse Rate Variability
PR1	Prototype version 1
PR2	Prototype version 2
PSAP	Public Safety Answering Point
PTT	Pulse Transit Time
PWA	Pulse Wave Analysis
PWV	Pulse Wave Velocity
QR code	Quick Response code
QSPI	Quad Serial Peripheral Interface
RAM	Random Access Memory
REST	Representational State Transfer
RF	Radio Frequency
RGB	Red, Green, Blue
RFID	Radio Frequency Identification
RHb	Deoxygenated haemoglobin
RR	Respiratory Rate
SBP	Systolic Blood Pressure
SMT	Surface-Mount
SoC	System on a Chip
SPI	Serial Peripheral Interface
SpO2	Peripheral oxygen saturation
SWAPP	SoftWare mobile APPlication
TPU	Thermoplastic Polyurethane
TVSA	Triage and Vital Signs App
UAS	Unmanned Aerial System
UAR-SAS	Unmanned Aerial Rapid Scene Assessment System

UAR-TIS	Unmanned Aerial Remote Triage Indicator and vital parameter estimation System
UART	Universal Asynchronous Receiver-Transmitter
UAV	Unmanned Aerial Vehicle
UI	User Interface
UID	Unique IDentifier
USB	Universal Serial Bus
VSE	Vital Signs Earplug
WP	Work Package
XML	Extensible Markup Language

Executive Summary

The NIGHTINGALE project aims to develop, integrate, test, deploy, demonstrate, and validate a Novel Integrated Toolkit for Emergency Medical Response (NIT-MR) comprising a multitude of tools and applications at the service of all first responders (FRs), emergency medical services and non-medical civil protection agencies, which will ensure an upgrade to Pre-hospital life support and Triage during Mass Casualty Incidents (MCIs).

The present deliverable has been prepared in the context of Task 2.2 "Development & Prototyping of a novel Triage System" of NIGHTINGALE Work Package (WP) 2 "Upgrading Triage". The main objective of the deliverable is to present the first version of the hardware and software prototypes developed within WP2. The prototypes have been developed considering the corresponding end user and technical requirements as well as the scenario and use cases describing the context of the use of the technologies within the NIGHTINGALE scope.