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ITEA 3 is a EUREKA strategic ICT cluster programme

Exploitable Results by Third Parties

13034 CareWare

Project details

Project leader:	Isabelle Joubert (Eolane)
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Name: confectioned garments with conductive yarns		
Input(s):	Main feature(s)	Output(s):
▪ Textile fabrics ▪ (Electronics) ▪ Conductive yarns	▪ Conductive yarns are used in a specialized way to make a conductive grid on a fully confectioned garment ▪ Conductivity across seams ▪ High durability (washable at the boil)	▪ A full garment is durably connected with by conductive yarns (across seams)

Unique Selling Proposition(s):	▪ Washable at the boil ▪ 3 double connections in the seams for guaranteed connection ▪ Tested and certified by independent accredited laboratories
Integration constraint(s):	▪ Yarns are visible (esthetic constraint) ▪ Only one circuit across the whole garment is possible
Intended user(s):	▪ ESD clothing ▪ communication grid for electronics
Provider:	▪ Alsico High Tech
Contact point:	▪ Bart Onderbeke: bo@alsicohightech.com
Condition(s) for reuse:	▪ Available for sale ▪ Suitable for tenders

Latest update: December 15, 2017

Name: methodology for integrating electronics to textiles by mass confectioning		
Input(s):	Main feature(s)	Output(s):
▪ electronic modules for textiles (high TRL level) ▪ Fabrics ▪ Various end-applications in workwear	▪ Step-by-step guidance to mass confectioning, with intermediate prototypes and test reports ▪ Customization ▪ Specialized use of conductive yarns, confectioning methods and adhesives suitable for electronics on textiles	▪ An electronic textile
Unique Selling Proposition(s):	▪ Customization ▪ Experience with electronics on textiles ▪ Mass market possibilities ▪ Certified for environmental and ethical confectioning	
Integration constraint(s):	▪ Electronics for integration must be at high TRL level	
Intended user(s):	▪ Electronic textiles ▪ Smart textiles	
Provider:	▪ Alsico High Tech	
Contact point:	▪ Bart Onderbeke, bo@alsicohightech.com	
Condition(s) for reuse:	▪ Case specific shared development	
	Latest update: December 15, 2017	

Name: methodology for integrating electronics to textiles by mass confectioning		
Name: Methodology and architecture for collecting and processing data for wearable intelligence		
Input(s):	Main feature(s)	Output(s):
▪	▪ A methodology for collecting and processing data from wearables (and sensors integrated in textiles) and environmental sensors, and for delivering feedback to users and other stakeholders ▪ An architecture for processing data from wearables and environmental sensors	▪

Unique Selling Proposition(s):	▪ Supporting for a wide range of wearables and environmental sensors ▪ Modular architecture supporting a wide range of data processing operations ▪ Application-agnostic
Integration constraint(s):	▪ None
Intended user(s):	▪ Companies aiming to extract higher level information (e.g. performed activities, habits, predicted user evolution, achieved progress against goals, etc.) and delivering pro-active personalized feedback to users based on data collected from wearables and environmental sensors
Provider:	▪ Sirris
Contact point:	▪ Nicolás González-Deleito (nicolas.gonzalez@sirris.be)
Condition(s) for reuse:	▪ Only through (commercial / research) partnerships

Latest update: December 5, 2017

Name: Demo and testing environment		
Input(s):	Main feature(s)	Output(s):
▪ Data from proximity beacons, bed sensor, accelerometer, pedometer, heart rate sensor	▪ A demo and testing environment, instantiating the architecture for processing data to the project's patient monitoring use case	▪ Performed activities ▪ Patient's evolution indicators ▪ Patient's progress against goals ▪ Alarms raised when dangerous situations are detected

Unique Selling Proposition(s):	▪ Illustrating the processing of data from wearables and environmental sensors ▪ Illustrating data processing components detecting a patient's performed activities, tracking a patient's evolution, tracking a patient's progress against goals, and raising alarms when dangerous situations are detected
Integration constraint(s):	▪ Android Wear watch (for the smartwatch) ▪ RabbitMQ (for inter-component communication) ▪ Python, Spark, Kafka (for the backend) ▪ Node.js (for the frontend)
Intended user(s):	▪ Companies aiming to extract higher level information (e.g. performed activities, habits, predicted user evolution, achieved progress against goals, etc.) and delivering pro-active personalized feedback to users based on data collected from wearables and environmental sensors
Provider:	▪ Sirris
Contact point:	▪ Nicolás González-Deleito (nicolas.gonzalez@sirris.be)
Condition(s) for reuse:	▪ Only through (commercial / research) partnerships

Latest update: December 5, 2017

Name: Demo and testing environment		
Input(s):	**Main feature(s)**	**Output(s):**
▪ Sensor data ▪ Patient data ▪ Device data	▪ Modular architecture allowing easy integration of various services processing sensor data and defining actions ▪ Includes sensor APIs (REST based and CoAP), FHIR based data storage to interface with EPDs, ▪ Integration of several business module inside the architecture as a service o Activity recognition o Patient progress monitoring o Communications	▪ Events, notifications, communications by means of standardized APIs based on FHIR ▪ Interface to alarm server Interface to dashboards
Unique Selling Proposition(s):	▪ Cloud deployment ▪ Interoperable with Health systems by means of FHIR ▪ Seamless integration with alarming ▪ Highly scalable ▪ Possible to integrate multiple types of sensors	
Integration constraint(s):	▪ Sensor API is linked to specific hardware ▪ Integration of new services require protocol buffers and rabbitMQ client to interface with the core system	
Intended user(s):	▪ Care organizations, system integrators	
Provider:	▪ Televic Healthcare	
Contact point:	▪ Pieter Crombez, p.crombez@televic.com	
Condition(s) for reuse:	▪ Commercially available	
	Latest update: December 5, 2017	

Name: Personal hub interfacing MI BAN and BLE		
Input(s):	Main feature(s)	Output(s):
▪ Interface to master node of BAN network over I²C communication	▪ A personal hub is developed responsible to collect data of a MI based Body Area Network and forward it via BLE to a gateway. ▪ BLE based sensors can be attached to the personal hub. ▪ The communication between personal hub, gateway and client devices is via CoAP protocol over IPv6. ▪ The personal hub also creates virtual representations of the sensors attached to the body area network as CoAP resources.	▪ BLE communication to gateway

Unique Selling Proposition(s):	▪ Possible to connect specific sensors (integrated into textiles) to the backend as well as personal off the shelve standard sensors via a personal hub using BLE technology ▪ Standardized connectivity from client applications by IPv6
Integration constraint(s):	▪ Connection to the body area network needs specific integration as the BLE hub needs to interface to the MI network ▪ Application protocol only supports CoAP, not yet Bluetooth GATT profiles
Intended user(s):	▪ System integrators
Provider:	▪ Televic Healthcare
Contact point:	▪ Pieter Crombez, p.crombez@televic.com
Condition(s) for reuse:	▪ Commercially available in separate modules o Hardware with BLE interface o Hardware with MI interface (via NXP)
	Latest update: December 5, 2017

Name: Gateway with IPv6 network bridge between BLE and LAN		
Input(s):	Main feature(s)	Output(s):
▪ IPv6 network over BLE interface	▪ The gateway implements the 6LBR – IPv6 border router role. ▪ For the communication between personal hubs and gateway, we rely on IPv6 over Bluetooth Low Energy. The client connects with the gateway via Ethernet. ▪ Two different IPv6 networks are established (over BLE interface and over Ethernet interface) and routing between them will to be configured.	▪ IPv6 network over Ethernet/WiFi interface

Unique Selling Proposition(s):	▪ Personal hubs and its attached resources are IP addressable and can connect with any IP based client ▪ IP routing over various interfaces ▪ IP routing over BLE
Integration constraint(s):	▪ Set up of unique local address on each network ▪ Configuration of the routing in linux
Intended user(s):	▪ System integrators
Provider:	▪ Televic Healthcare
Contact point:	▪ Pieter Crombez, p.crombez@televic.com
Condition(s) for reuse:	▪ Licensing

Latest update: December 5, 2017

Name: A textile integrated push button for nurse call		
Input(s):	Main feature(s)	Output(s):
▪ Textile ▪ Electronics ▪ Sensor elements printed on PET foil	▪ Capacitive touch based push button ▪ Touch surface created by conductive silver ink, printed on PET foil ▪ Standard I2C touch controller glued on PET foil	▪ Textile integrated push button that can be interfaced with a personal hub

Unique Selling Proposition(s):	▪ Textile integrated push button can be integrated with the nurse call system to make alarms call e.g. distress calls of staff or patient alarms call. These interfaces are less stigmatizing ▪ Very flexible, ultra-thin push button that can be easily integrated into textiles
Integration constraint(s):	▪ Specific procedure to apply printed electronics to textiles ▪ Connectors are not commercially available and need optimization
Intended user(s):	▪ Attachment and integration of electronics on textiles ▪ System integrators
Provider:	▪ Televic Healthcare
Contact point:	▪ Pieter Crombez, p.crombez@televic.com
Condition(s) for reuse:	▪ On request
	Latest update: December 5, 2017

Name: A textile integrated push button for nurse call		
Name: PERSONAL HUB (Lora BLE gateway)		
Input(s):	Main feature(s)	Output(s):
▪ Data from Bluetooth low energy sensor ▪	▪ Collects data from BTLE sensors and expose them with Bluetooth services ▪ Process data : test and analyze data, generate messages if measure above predefined threshold complete frame, send a LoRa message	▪ Data emission using LoRa technology ▪
Unique Selling Proposition(s):	▪ New product not existing on the market : LORA-BLE gateway ▪ Can connect with standard BLE devices: belt for heart beat measurement, and many other existing devices (temperature sensor, Texas Instruments Sensor Tag, 2 body scales, 2 blood pressure monitor.) ▪ Can establish up to 3 connections, data can be seen directly on a Bluetooth Smartphone application. Services fully Bluetooth low energy compliant ▪ GPS enabled when movement Is detected (to save power)	
Integration constraint(s):	▪ Bluetooth Low Energy only, ▪ The hub is Bluetooth 5 ready	
Intended user(s):	▪ Application are sport and healthcare.	
Provider:	▪ Eolane	
Contact point:	▪ Isabelle Joubert - isabelle.joubert@eolane.com	
Condition(s) for reuse:	▪ Not yet on the market ▪ Eolane is able to reuse and adapt this product (hardware modification, software modification) for different applications	
	Latest update: December 15, 2017	

Name: PICOGATEWAY		
Input(s):	Main feature(s)	Output(s):
▪ Messages received in LoRa ▪	▪ Gateway which transfers data from a node to server ▪ Exposes a web server with the messages received	▪ Raw data ▪
Unique Selling Proposition(s):	▪ A ready-to-use Indoor LoRa concentrator for Small & Private Network,Smart Building, Smart Farming, Smart Asset ▪ Network & Application Server Embedded	
Integration constraint(s):	▪ REST API service for data access ▪ Indoor only ▪ LoRa 868 or 433 MHz band 3 channels(LoRaWan™default) ▪ 470 MHz version for China's market	
Intended user(s):	▪ Customer who wants to get data from LoRa network	
Provider:	▪ Eolane	
Contact point:	▪ Isabelle Joubert - isabelle.joubert@eolane.com	
Condition(s) for reuse:	▪ Commercially available	
	Latest update: December 15, 2017	

Name: LORA STACK		
Input(s):	Main feature(s)	Output(s):
▪	▪ Software brick that decodes and encodes data using LORA protocol	▪ Data over LoRa

Unique Selling Proposition(s):	▪ Integration in products and solutions made by éolane (éolane vibration sensor “movee”, LORA/RS422 adapter for Alstom, doors)
Integration constraint(s):	▪ Hardware : STM32 microcontroller with FreeRTOS
Intended user(s):	▪ Internally used by eolane for customer product development.
Provider:	▪ Eolane
Contact point:	▪ Isabelle Joubert - isabelle.joubert@eolane.com
Condition(s) for reuse:	▪ Internal reuse only

Latest update: December 15, 2017

Name: method to apply printed electronics to textiles		
Input(s):	Main feature(s)	Output(s):
▪ Electronic circuit design ▪ Textile substrate	▪ Durable integration (washable at 30°C) ▪ Encapsulated for protection from environment ▪ Optional functionalization (e.g. flame retardant)	▪ A textile with printed electronic tracks

Unique Selling Proposition(s):	▪ Washable (30°C) ▪ Stretchable (dependent on the conductive and dielectric inks chosen) ▪ Bendable ▪ Tested in accredited labs (bending & washing) ▪ Freedom of design ▪ Suitable for multiple applications in EMI shielding, signal transfer of electronics on textiles and powering electronics on textiles
Integration constraint(s):	▪ Washability at higher temperatures (40°C or higher) not yet possible ▪ Connectors are not commercially available and need optimisation
Intended user(s):	▪ manufacturer of printed electronics ▪ manufacturer of textile fabrics
Provider:	▪ Centexbel
Contact point:	▪ Brecht Demedts and Myriam Vanneste bdm@centexbel.be, mv@centexbel.be
Condition(s) for reuse:	▪ On request

Latest update: December 15, 2017

Name: method to encapsulate electronics on textiles		
Input(s):	Main feature(s)	Output(s):
▪ electronic compounds ▪ Textile substrate	▪ Optional functionalization (e.g. flame retardant, heat conductive, EMI shielding) ▪ Through resins (PU) and casted films ▪ Broad range of flexibility (starting from modulus 20 MPa)	Electronics are integrated and attached to textiles in an encapsulated manner

Unique Selling Proposition(s):	▪ Adaptable to electronic compounds ▪ Functionalisation possible (FR, heat conductive, insulative, electrically conductive, EMI shielding, …)
Integration constraint(s):	▪ Durability (especially washing at higher temperature) needs to be confirmed and retested for each development case
Intended user(s):	▪ confectioning companies ▪ Formulator of adhesives, coatings and sealants ▪ (textile) coating companies
Provider:	▪ Centexbel
Contact point:	▪ Brecht Demedts and Myriam Vanneste bdm@centexbel.be, mv@centexbel.be
Condition(s) for reuse:	▪ on request
	Latest update: December 15, 2017

Name: Semantic data modeling and Ontology		
Input(s):	Main feature(s)	Output(s):
▪	▪ BANs (Body Area Networks) data, Device and semantic interoperability ▪ Semantic analytics and rule-based embedded intelligence ▪ BANs IoT reference architecture	▪

Unique Selling Proposition(s):	▪ Semantic data modeling, associated modular ontology and corresponding management functionalities dedicated for BANs (Body Area Networks) and WSNs (Wireless Sensor Networks). ▪ Device interoperability, ▪ Semantic data driven and rule-based embedded analytics/intelligence mechanisms, ▪ More integrated global IoT platform with data/device/semantic interoperability management, ▪ Multi-Agent IoT/oneM2M strategies for: data sharing and distributed monitoring/control, providing generic interactions to any sensor/actuator and associated data irrespective of whatever lower layers are used underneath, ▪ Data reusability at application level, ▪ Architecture/service/application design facilities and scale economy,
Integration constraint(s):	▪ Bluetooth Low Energy, LoRa, Wi-Fi, MQTT, HTTP/REST, JSON ▪ Smartphone with android operating system for the monitoring and control application,
Intended user(s):	▪ Caregivers, care institutions, patients and any companies aiming to extract higher level information (e.g. vital status, activities monitoring, behavior, patient evolution…), to perform remote monitoring and control of patients and to deliver pro-active personalized feedback to users based on data collected from wearables and sensors.
Provider:	▪ Institut Mines-Télécom - Télécom SudParis
Contact point:	▪ marc.girod_genet@telecom-sudparis.eu
Condition(s) for reuse:	▪ Actually internal reuse only, ▪ Reuse through research partnerships could be envisioned, ▪ Standardization activities on both semantic data models and IoT reference architecture are ongoing at the ETSI level.
	Latest update: December 15, 2017

Name: Sociological Survey and Protocol for User-Centered Innovation Process		
Actions	Methods	Exploitable Results expected
▪ Definition of use cases and scenarios ▪ Co-building the experimentation protocol for real context of uses investigation with the living lab Info Autonomie ▪ Sociological survey on experimented solutions acceptability, uses and appropriation	▪ Interviews and Focus group with key stakeholders ▪ Questionnaire-based survey with users ▪ Direct Observation (ethnographic approach) of the uses situation ▪ Documentary research and Social Sciences Bibliography	▪ Detailed analysis of technologies and system tested social reception and uses in real life situation on different sites ▪ User-centered innovation protocol for socio-technical devices experimentation in medical environment ▪ State of the art of sociological studies about innovation projects for Health and Well Being ▪ Achieve a full-scale test in Info Autonomie with a panel of users in order to validate all off the development regarding to the users needs.

Unique Selling Proposition(s):	▪ Enhance the visibility of the living lab Info Autonomy which is an important tool of co-design and it will permit validation of devices and services.
Integration constraint(s):	▪ The sociological survey on uses of technical solutions in real life situations can only be performed when the system is fully functional and if interfaces allow users to consult the data collected and to develop actions from it.
Intended user(s):	▪ All the partners
Provider:	▪ Télécom Paristech
Contact point:	▪ Bastien Tavner (bastien.tavner@telecom-paristech.fr), Edgar-Charles Mbanza (edgar.mbanza@telecom-paristech.fr) & Marc Relieu (marc.relieu@telecom-paristech.fr)
Condition(s) for reuse:	▪ The protocol is built around specific needs of experimentation and will have to be adapted in case of replication for future tests
	Latest update: December 15, 2017

Name: BAN with Sensor Nodes		
Input(s):	Main feature(s)	Output(s):
▪ transducers	▪ A sensor node is developed that measures capacitance changes of a transducer, and forwards the data over an NFEMI body area network.. ▪ It connects to a host processor, application processor or long-range transceiver	▪ IPv6/UDP packets containing measurement data
Unique Selling Proposition(s):	▪ Ultra-low power sensor nodes to sense capacitive changes ▪ Multi-node body-area network ▪ Standardized connectivity from client applications by IPv6/UDP and JSON-RPC interface	
Integration constraint(s):	▪ Connection to the body area network needs specific integration (external master/host must query the sensors) ▪ Application protocol specific for capacitance measurements	
Intended user(s):	▪ System integrators	
Provider:	▪ NXP Semiconductors	
Contact point:	▪ Axel Nackaerts, axel.nackaerts@nxp.com	
Condition(s) for reuse:	▪ Only components and integration support are available o Commercial: NxH2280 BAN transceiver, with antenna design guide and SDK o On request: NHS3153 sensor front-end processor	
	Latest update: December 15, 2017	

Name: User interfaces		
Input(s):	Main feature(s)	Output(s):
▪ Raw data from Picogateways	▪ Listen & decode data ▪ Store data ▪ Interfaces rendering ▪ Settings encoding & sending	▪ Setting raw data to Picogateways

Unique Selling Proposition(s):	▪ Fully integrated interfaces for professionals and caregivers. It is gathering all the coordination tools and an easy to use sensor's dashboard for each elderly profile. This is available through a webapp & a tablet interfaces.
Integration constraint(s):	▪ Decoding of raw data.
Intended user(s):	▪ Professionals, caregivers, family, elderlies
Provider:	▪ Santech
Contact point:	▪ Emmanuel Havet – ehavet@santech.fr
Condition(s) for reuse:	Only through (commercial / research) partnerships
	Latest update: December 15, 2017

Name: Methodology for home care and elderly monitoring using a body-worn 3D camera		
Input(s):	Main feature(s)	Output(s):
▪ 3D camera	▪ A methodology for monitoring patients with a use of body-worn 3D camera and a smart gesture recognition software. Patients can be trained to provide simple hand gestures which can be captured by the camera and the data can be further processed to provide information of the patient current condition by the health professionals.	▪

Unique Selling Proposition(s):	▪ Recognition of patient's hand gesture ▪ Unobtrusive method for patient monitoring
Integration constraint(s):	▪ Cabling
Intended user(s):	▪ Companies aiming to integrate 3D camera for patient monitoring
Provider:	▪ Softkinetic
Contact point:	▪ info@softkinetic.com
Condition(s) for reuse:	▪ Only through (commercial / research) partnerships, subject to license agreements

December 18, 2017

Name: Body-worn 3D Camera Demo		
Input(s):	Main feature(s)	Output(s):
▪ 3D camera data, hand gestures	▪ A demonstrator for elderly patient monitoring using a 3D camera with gesture recognition capability	▪ Representative recognized hand/finger gestures • Thumbs up • Thumbs down • Hand's open • V-sign useful for conveying patient's condition

Unique Selling Proposition(s):	▪ Demonstrating capability of 3D camera to recognize patient's hand gesture ▪ Unobtrusive monitoring demo
Integration constraint(s):	▪ USB3 cable connection ▪ Proprietary gesture recognition software ▪
Intended user(s):	▪ Companies aiming to integrate 3D cameras for patient monitoring
Provider:	▪ Softkinetic
Contact point:	▪ info@softkinetic.com
Condition(s) for reuse:	▪ Only through (commercial / research) partnerships, subject to license agreement

December 18, 2017

Name: Shirt with integrated ECG electrodes		
Input(s):	Main feature(s)	Output(s):
▪ Textile ▪ Silver ions based electrodes	▪ Collects heart electric activity signal ▪ Flexible, watchable, sufficient comfortable	▪ Shirts for ECG registration
Unique Selling Proposition(s):	▪ Unique construction and replacement of ECG electrodes ▪ Sufficient quality of ECG signal during physical activity allowing indices (RR, JT, QRS) recognition	
Integration constraint(s):	▪ Specific procedure to apply electrodes to textiles ▪ Connectors to registering device are not commercially available and need optimization	
Intended user(s):	▪ Sport and healthcare organizations.	
Provider:	▪ Audimas	
Contact point:	▪ Arvydas Povilaitis - arvydas@audimas.lt	
Condition(s) for reuse:	▪ On request	
	Latest update: December 15, 2017	

Name: Shirt with integrated ECG electrodes		
Name: Methodology of ECG analysis for exercising dosage control		
Input(s):	Main feature(s)	Output(s):
▪ Data from ECG sensors	▪ A methodology for recording and processing data from wearables ECG sensors and for delivering feedback to users; ▪ An architecture for processing data from wearables sensors and generating feedback	▪ Person training intensity and duration indicators

Unique Selling Proposition(s):	▪ Supporting simple ECG sensors and Cardioscout registering device; ▪ Modular architecture supporting such data processing operations: noise filtering, indices recognition; ▪ Feedback generation based on complex state evaluation, high individualization level
Integration constraint(s):	▪ None
Intended user(s):	▪ Companies aiming provide high level product for sportsmen's and delivering pro-active personalized feedback to users based on data collected from wearables sensors
Provider:	▪ LSU, KTU
Contact point:	▪ Jonas Poderys (jonas.poderys@lsu.lt)
Condition(s) for reuse:	▪ Only through (commercial / research) partnerships
	Latest update: December 15, 2017

Demo and testing environment		
Input(s):	Main feature(s)	Output(s):
▪ ECG data	▪ Modular architecture allowing ECG processing data and defining feedback; ▪ Includes real time platform for data cloud processing and storage; ▪ Provides feedback visualization.	▪ Interface to exercising dosage control

Unique Selling Proposition(s):	▪ Cloud deployment ▪ Valuable to Android smart phones
Integration constraint(s):	▪ Integration with Android watches
Intended user(s):	▪ Sport and wellbeing organizations, individual users
Provider:	▪ Optitecha
Contact point:	▪ Saulius Savickas, s.savickas@opitecha.lt
Condition(s) for reuse:	▪ On request

Latest update: December 15, 2017