Overview
Lessons learnt
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Flanders Innovation & Enterprise
SEREN3 Training, February 1, 2017
Twofold objective

🔥 Implications of PCP from a legal and methodological perspective, and in terms of innovation support *(pilot project)*

🔥 To address a very **real need**: increase the safety of fire fighters and first responders by making their protective equipment “smarter”

→ Using a concrete case allows us to get down to the nitty-gritty of using PCP: what works, and what doesn’t?
Why Smart@Fire?

Situation 2012...

- Firefighting risky job
- 100 deaths per year
- Lots of wearable technology
- Not Integrated / Expensive
- Stimulate the market
- Smart@Fire - PCP
Project in a nutshell

European FP7 project

52 months: November 2012 – February 2017

6 countries: Belgium, Netherlands, France, Germany, United Kingdom and Hungary

Co-funded by the European Commission (FP7), VLAIO (ex-IWT), IBZ and SDIS 13
Main objectives

Objectives Smart@Fire?

- Decrease risks
- Integrated working PPS Solution
- Commercially viable
- PCP methodology
- Raise PCP awareness
Work packages

WP1: Preliminary Study

WP2: Innovation Platform

WP3: Joint Pre-commercial procurement

WP4: Preparation of the joint final procurement

WP5: Methodology consolidation

WP6: Dissemination of the project & methodology

WP7: Project Management
11 partners

5 Potential Purchasers

2 Innovation Agencies

1 University

1 Innovation Consultancy

1 Confederation

1 Certifier

Agentschap Innoveren & Ondernemen

Universiteit Gent

addestino innovation delivered
Smart@Fire Timeline

- **WP1**: Preliminary Study
- **WP2**: Innovation Platform
- **WP3**: Joint Pre-commercial procurement
- **WP4**: Preparation of the joint final procurement
Smart@Fire Timeline

WP1: Preliminary Study

WP2: Innovation Platform

WP3: Joint Pre-commercial procurement

WP4: Preparation of the joint final procurement
WP 1: Preliminary Study - Objective

How can we increase the safety of firefighters by making use of wearable technology?
### WP 1: Preliminary Study - Tools

#### 1. Needs Assessment

- **Survey**
  - (961 respondents)
- **In depth analysis**
  - (Planning Poker)

#### 2. State of the Art Study

- **Projects logged in EU**
- **IP scan**
- **Web Search**
User-driven innovation ↔ technology-driven innovation

Why user-centric and user-driven?
To match demand (i.e. real needs of end-users) with supply (i.e. relevant and effective solution) from the get-go

Mapping existing demand beforehand ➔ increases market potential of innovation ➔ helps to cross the “Valley of Death”, where innovation goes to die before reaching commercialization
User-Driven Innovation

**Top-down development**
- Technology
  - Producer
  - Competition
  - Product
  - Market A
  - Market B
  - Market C

**Bottom-up and/or co-creative development**
- Sample
  - End-Users
    - = Market
  - Producer
  - Product
Thorough needs analysis gives direction to and speeds up the **Fuzzy Front End** phase in New Product Development (i.e. identifying opportunities and generating ideas)

*Up to 50% of total development time!*
### WP 1: Preliminary Study – Result: Priority Use Cases

#### Enabled use-cases

<table>
<thead>
<tr>
<th>Enabled use-cases</th>
<th>WOW BE</th>
<th>WOW FR</th>
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<tbody>
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<td>An ICO consulting a ‘relative’ map to locate the FF teams</td>
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<td>An ICO using an intuitive visual system and semi-automated data interpretation</td>
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<td>An ICO informing the FF by generating an alert <em>(using the available data)</em></td>
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<td>A FF using an intuitive feedback system not distracting his operations <em>(no visual.)</em></td>
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<td>An ICO escalating alerts/available data to create an aggregated view</td>
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<td>A FF measuring <em>(consulting)</em> env. parameters <em>(temperature and evolution)</em></td>
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<td>A FF, PPE manager relying on self-assessment of available, coupled sensors, devices</td>
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<td>A trainer using similar remote monitoring available info to improve trainees</td>
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<td>A department head using historical logging of available data for RCA, audit trails,...</td>
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<tr>
<td>A FF measuring, <em>consulting</em> env. parameters <em>(explosive gasses)</em></td>
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WP 1: Preliminary Study - Results

- Localisation: Determining the position of the firefighter
- Visualisation & data transfer: Better assessing the situation by providing data to coordinating officer
- Sensors: Measuring environmental and biometric parameters

Integration in a smart, durable and affordable suit
Timeline

WP1
Preliminary Study

WP2
Innovation Platform

WP3
Joint Pre-commercial procurement

WP4
Preparation of the joint final procurement

2012
2013
2014
2015
2016
2017
WP2: Innovation Platform

1. Identify and inform network of suppliers
   - Official Tender channels
   - Cascading
   - Media

2. Market Consultation
   - Planning Poker
   - Networking
Market consultation: Objectives

- Bring together **demand and supply**
- Check **state-of-the-art assumptions**
- Identify the **technological** innovation potential
- Check **feasibility**
- Assess technological **risks**
- Opportunity for suppliers to **form consortia**
- Engage **stakeholders**
Prototype priorities

Prototype Scope: value vs. risk

Off-the-shelf

Avoid if possible

Innovative for end-user

= Significant technological risk

Added Value

Innovation potential from end-user perspective

Market consultation: Objective
Belgium (Brussel, 10 & 11 September 2013)
- Localisation systems
- Integration of ICT-solutions in PPE

France (Marseille, 17 & 18 September 2013)
- Datatransfer & visualisation systems
- Integration of ICT-solutions in PPE

Germany (Dortmund, 1 & 2 October 2013)
- Sensors
- Integration of ICT-solutions in PPE

Wrap-up session (Brussels, 10 October 2013)
- Final conclusion and netwerk event
Market consultation: Practical

Total number of participants: 470/210 different/18 countries
Market consultation: Outcome

- Gas detection (handheld, high performance)
- Physiological monitoring (belt)
- PPS backbone architecture
- Integration (cabled, wireless, shielded, ...)
- Localization (GPS + inertial unit, relative map)
- User feedback (ICO, FF)
- Coupling with:
  - Environmental temperature
  - Optional: simple expl. gas det.
  - ...
- Sweat absorbing multi-layer underwear
- IR thermal hotspot detector (standalone)
- HMD, HUD
- "Be seen" illumination

Risk

Avoid if possible
PCP: Phased trajectory

R&D / Pre-commercial Procurement (PCP)

Phase 0: Curiosity Driven Research
- Supplier A
- Supplier B
- Supplier C
- Supplier D

Phase 1: Solution design
- Supplier A
- Supplier B
- Supplier C
- Supplier D

Phase 2: Prototype development
- Supplier B
- Supplier C
- Supplier D

Phase 3: Original development and testing of limited volume of 1st test products/services
- Supplier B
- Supplier D

Phase 4: Deployment of commercial volumes of end-products
- Supplier(s) A, B, C, D and/or X

Public Procurement of Innovative Solutions (PPI)
PCP: ‘knock-out’ competition & evaluation

Stap 1: Solution Design
- Four consortia
- Tender Evaluation
- End of phase evaluation

Stap 2: Prototyping
- Three consortia
- Tender Evaluation
- End of phase evaluation

Stap 3: First Batch
- Max. two consortia
- Tender Evaluation
- End of phase evaluation
## PCP: Deliverables

### Step 1: Solution Design
- Detailed Solution Design
- Report

### Step 2: Development and demonstration prototype
- Functional specification of prototype
- Prototype demonstration
- Report

### Step 3: First Batch & Field Testing
- First batch of 10 products
- Functional specification of prototype
- Description of commercialisation approach
- Report
PCP: Phase 3: Testing

- 8, 9 November 2016
- Centre de Formation Départementale des Sapeurs-Pompiers des Bouches-du-Rhône
- **Test scenarios**
  - Functional
  - Ergonomic
  - As realistic as possible
  - Full use cycle, including e.g. washing & drying
Timeline

WP1 Preliminary Study

WP2 Innovation Platform

WP3 Joint Pre-commercial procurement

WP4 Preparation of the joint final procurement
Lessons learnt (1)

- Need for solid **project management skills**

- Need for solid **legal expertise** (thorough understanding of rationale and logic behind public procurement)

- Need for solid **technical expertise**

  ➡️ If knowledge or skills are lacking in-house ➡️ find the right partners!
Lessons learnt (2)

Need to strike a balance between radical innovation and a feasible solution within given constraints, or: between creating value and capturing value

Constraints?
- Resources (time, budget, people)
- Legal framework
- State-of-the-art of technology
- Market conditions (speed of development, sector characteristics, etc.)
  E.g. feasible in defense industry ≠ feasible in emergency services sector

Development process in PCP is shared between suppliers and procurer. This requires both rigidity and flexibility from both parties.

Private companies/researchers ➔ often have difficulty with rigid frameworks
Public organizations ➔ often have difficulty with uncertainty and “adjusting for reality”
Map, manage, engage and use your stakeholders!

Make clear what is “at stake” for them. (E.g. certification bodies)
Use “tools” such as needs assessment, market consultation, steering group, etc.
Over the years, lots of people have contributed to the project (need for social skills!)

Spend sufficient time on large-scale needs assessment. There’s little use in procuring an innovative solution that doesn’t meet the needs of end-users.

Do not underestimate the complexity of these kinds of projects!

E.g. does “psychology” play a role?
Yes! Resistance to new solutions, difference between measurable data and user experience, subjective notion of “safety”, getting stakeholders on board, etc.