

Deliverable 2.3

Presentation on approach Innovation Platform

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Project co-funded by the European Commission within the Seventh Framework Programme

Grant agreement	317898
Project Acronym	Smart@Fire
Project Title	Integrated ICT Solutions for Smart Personal Protective Equipment for Fire Fighters and First Responders
Type of funding scheme	FP7-ICT Combination of Collaborative Project and Coordination and Support Action
Project website	http:// www.smartatfire.eu
Start Date of project	November 15 th , 2012
Duration	39 months
Document due date deliverable	May 15th, 2013
Dissemination level	Consortium
Nature	Report
Version	Version 1.0
Work package	WP 2: Innovation Platform
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Keywords	Innovation potential user perspective, innovation potential technological perspective, scope potential prototypes, market consultation, prioritisation

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Acronyms and abbreviations

Acronym/Abbreviation	Description
PPE	Personal Protective Equipment

Executive summary

Goal Innovation Platform

The Innovation Platform brings together the demand/buyer's side (the public purchasers which have a specific need or request) and the supplier's side (private companies, R&D organizations, Research Centers, Industry sector organizations).

The objective is to formulate a detailed answer on following key questions:

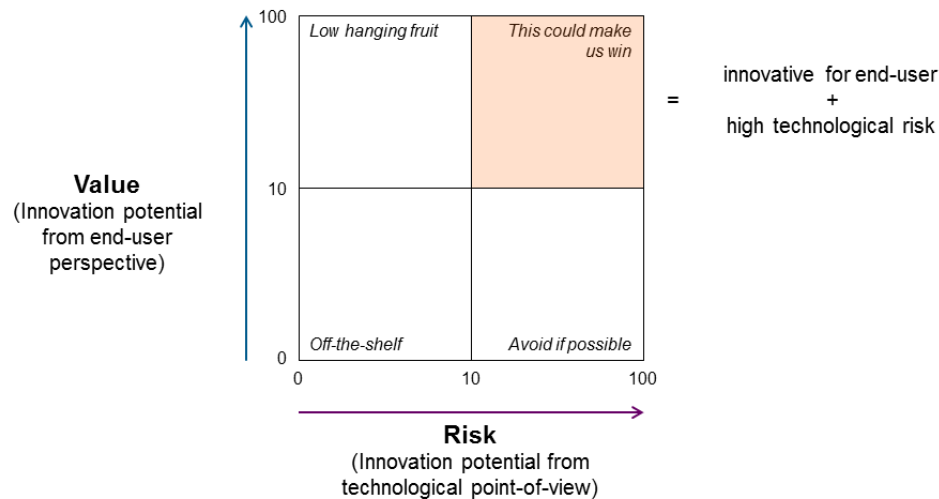
- What is the **innovation potential** of the project initiative from an **end-user perspective**?
Is there any added value for the end-user? Which needs are being answered?
- What is the **innovation potential** of the project initiative from a **technological point-of-view**?
Where does today's state-of-the art technology stand?
What is achievable today, where are extra breakthroughs required?
What are the potential implementation risks?
- **What are the priorities for a potential prototype?**
*What is the **overall innovation potential**, both from an end-user and technological perspective?*
The priorities for a potential prototype are those elements bearing a high innovation potential both from an end-user perspective, as from technological point-of-view.
- Given the prioritized broader scope of a potential prototype, which choices will be made to set the **effective scope and functional specifications of the prototype**?

User value vs. technological risk matrix

Based on the user experiences and prioritized use cases (D1.2, D1.1...), the value or innovation potential for the end-user of functional elements is determined. The preliminary research on the supplier side (state-of-the-art study D1.4, related projects D1.3...) completed with the market consultation sessions allow determining innovation potential from a technological point-of-view. Both can be mapped on the following **value vs. risk matrix**:

Prioritization grid: value vs. risk

Value vs. risk



The elements in the high-value high-risk area, determine the **scope of potential prototypes**, as these functional elements are most interesting for de-risking.

Market consultation sessions

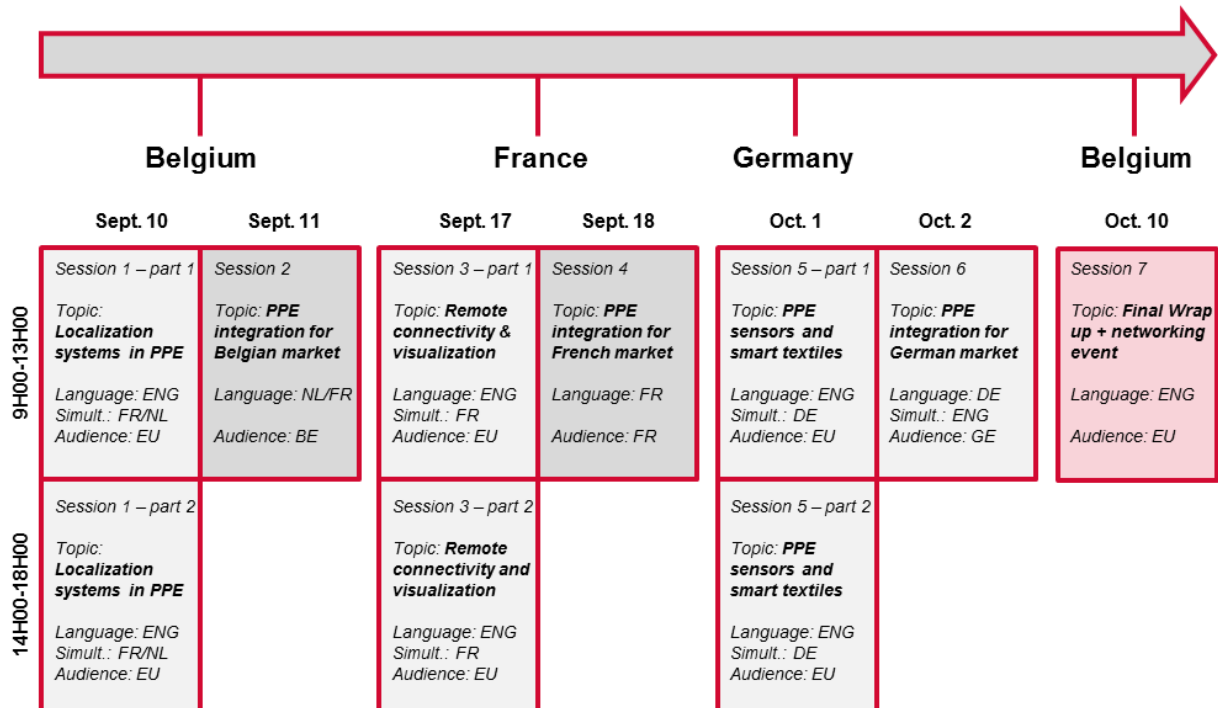
Based on the insights gained from the state-of-the-art research, a *reference architecture* was developed i.e. a representation of 41 capabilities derived from the use cases (see D1.4 for more info). Mapping the prioritized use cases and potential suppliers on this reference architecture resulted in 3 focus points that are homogenous in challenge, use cases & potential participants.

- **Focus point 1:** on ICT localization systems embedded in PPE.
- **Focus point 2:** on ICT solution for remote connectivity & visualization systems in PPE.
- **Focus point 3:** on PPE sensors and their integration in smart textiles.

Sessions focusing on these points will allow understanding the vendors' capabilities to satisfy the most important & commonly shared user needs. The common needs in terms of robustness & maintainability will be applied in all sessions as a boundary condition. Also, all constraints imposed by any of the procurers' countries (i.e. the minimum requirements set), will be taken into account in a similar way.

Practically, we propose 7 sessions in total, organized in three countries:

Resulting market consultation sessions



During these market consultation sessions, the *Planning Poker* methodology is used to assess the innovation potential from a technological perspective. The technique is based on domain expert evaluation and attaining consensus.

Potential Prototype scope

Based on the prioritized use cases and the market consultation sessions, we will be able to map functional elements on the value vs. risk matrix, according to their innovation potential from user perspective and technological perspective. The elements in the high-value high-risk area are the ones to focus on when scoping potential prototypes.



smart@fire

SMARTER
FIREFIGHTER SUITS
BY 2015

Dominique Buyse

addestino
innovation delivered

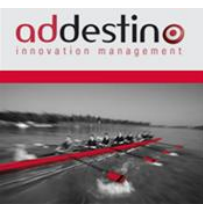
Smart@Fire: Innovation Platform

1. Innovation potential from user-perspective
2. State-of-the-art analysis - ICT perspective
 - Smart PPE reference architecture
 - Mapping of existing state-of-the-art suppliers on reference architecture
3. Resulting market consultation sessions

56 use cases have been generated in brainstorm

Sample

Nr	As a...	I can... <do something>	so that... <value is created for me>
1	Firefighter	consult my vital body functions (body temp), which are normally shielded to me due to my Personal Protective Equipment	I can better make an assessment and decide what to do
6	Firefighter	measure and consult the environmental parameters (toxic gasses)	I can better make an assessment and decide what to do
13	Firefighter	receive a map of the area (e.g. forest) I'm in with my exact location (and my colleagues)	I can better navigate through the area
19	Firefighter	have my PPE leave marks on the building where I walked	I can find my way back, or others can find me
21	Firefighter	activate an additional ventilation	I can protect the most sensitive parts of my body with an additional layer of air against heat



These use cases have been assessed by dozens of expert users

Belgium



~20 officers
from
different cities

France



~15 officers
from dept
Bouches-du-Rhône

UK



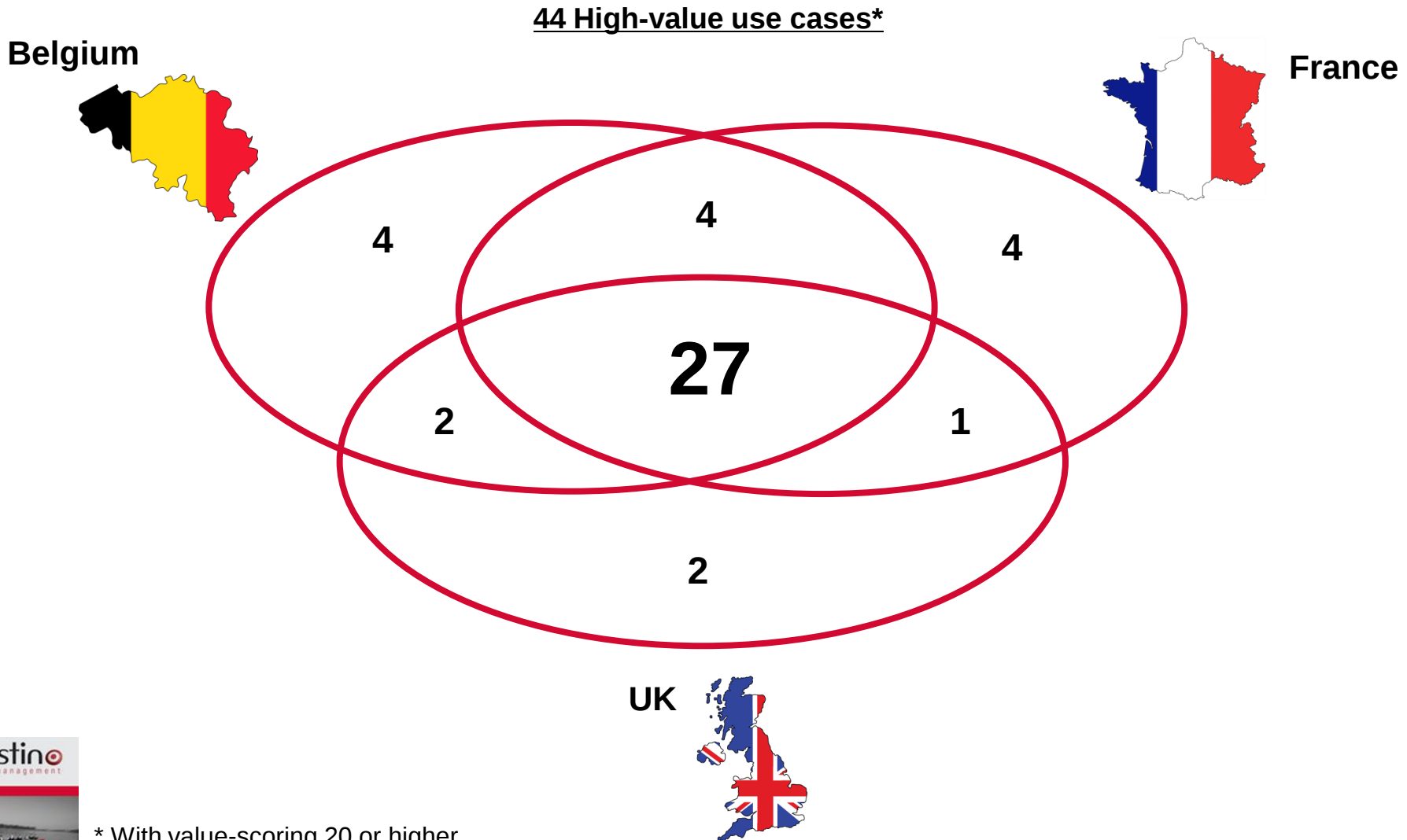
~35 officers
from
all over UK



Using moderated “planning poker” session to

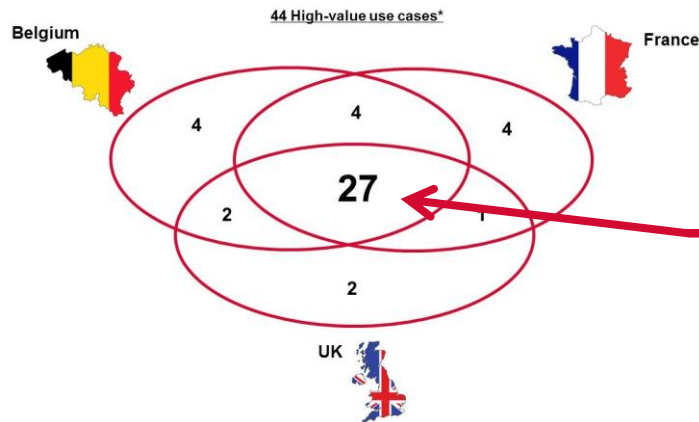
- objectively prioritize use cases
- understand the drivers/reasons behind it
- discuss and clarify differences between audience

Result: very strong commonality in user priorities across countries



* With value-scoring 20 or higher
Total: 54 use cases, of which 10 of low value

What generates “WOW” for all users, all countries



Location, Location, Location

- In buildings and in open areas
- Map for firefighters with location of team
- Also available to officer

Remote parameter monitoring and logging

- Intuitive dashboard for officer (e.g. map), with history log
- Full status about his team, their PPE, the environment
- To set thresholds, generate alerts, interpret data

Environmental temperature

- For firefighter
- Measuring external T over time
- Seeing via integrated IR camera

Specific PPE enhancements

- Avoiding sweat being turned into steam
- Active illumination

Robustness and maintainability

- Easy repair, cleaning
- Easy connection of ICT on PPE
- Self-assessment & reporting

What does not have priority

Firefighter	consult my vital body functions (body temp), which are normally shielded to me due to my Personal Protective Equipment	I can better make an assessment and decide what to do
Firefighter	consult my vital body functions (heart rate), which are normally shielded to me due to my PPE	I can better make an assessment and decide what to do
Firefighter	consult my vital body functions (dehydration level), which are normally shielded to me due to my PPE	I can better make an assessment and decide what to do
Firefighter	have my PPE leave marks on the building where I walked	I can find my way back, or others can find me
Firefighter	activate an additional airbag (e.g. inflatable jacket)	I can protect the most sensitive parts of my body with an additional layer of air against heat
Firefighter	activate an additional heating/cooling	I can protect the most sensitive parts of my body with an additional layer of air against heat
Firefighter	consult the status of the fire detectors in the building	I can have a better understanding of where the danger is located
Firefighter	set individual thresholds on parameters of myself	I'm sure that automated alarms are generated when the situation gets critical without generating too many false alarms
Department Head	impose the threshold levels according to my policies to the different teams	I'm sure they will always comply to the policies
Representative of Internal Affairs	have access to similar info as the Department Head	I can take over control when necessary in case of large scale crisis

Recommended key focus areas for market consultation

Location, Location, Location

- In buildings and in open areas
- Map for firefighters with location of team
- Also available to officer



Understanding vendors' capabilities:
"ICT localization systems embedded in PPE".

Remote parameter monitoring and logging

- Intuitive dashboard for officer (e.g. map), with history log
- Full status about his team, their PPE, the environment
- To set thresholds, generate alerts, interpret data



Understanding vendors' capabilities:
"ICT solutions for remote connectivity and visualization systems in PPE"

Environmental temperature

- For firefighter
- Measuring external T over time
- Seeing via integrated IR camera



Understanding vendors' capabilities:
"PPE sensors (T) and their integration in smart textiles".

Specific PPE enhancements

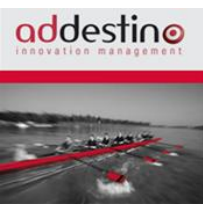
- Avoiding sweat being turned into steam
- Active illumination

Robustness and maintainability

- Easy repair, cleaning
- Easy connection of ICT on PPE
- Self-assessment & reporting



<Boundary condition>



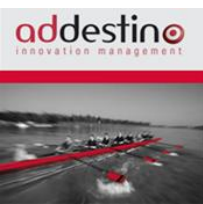
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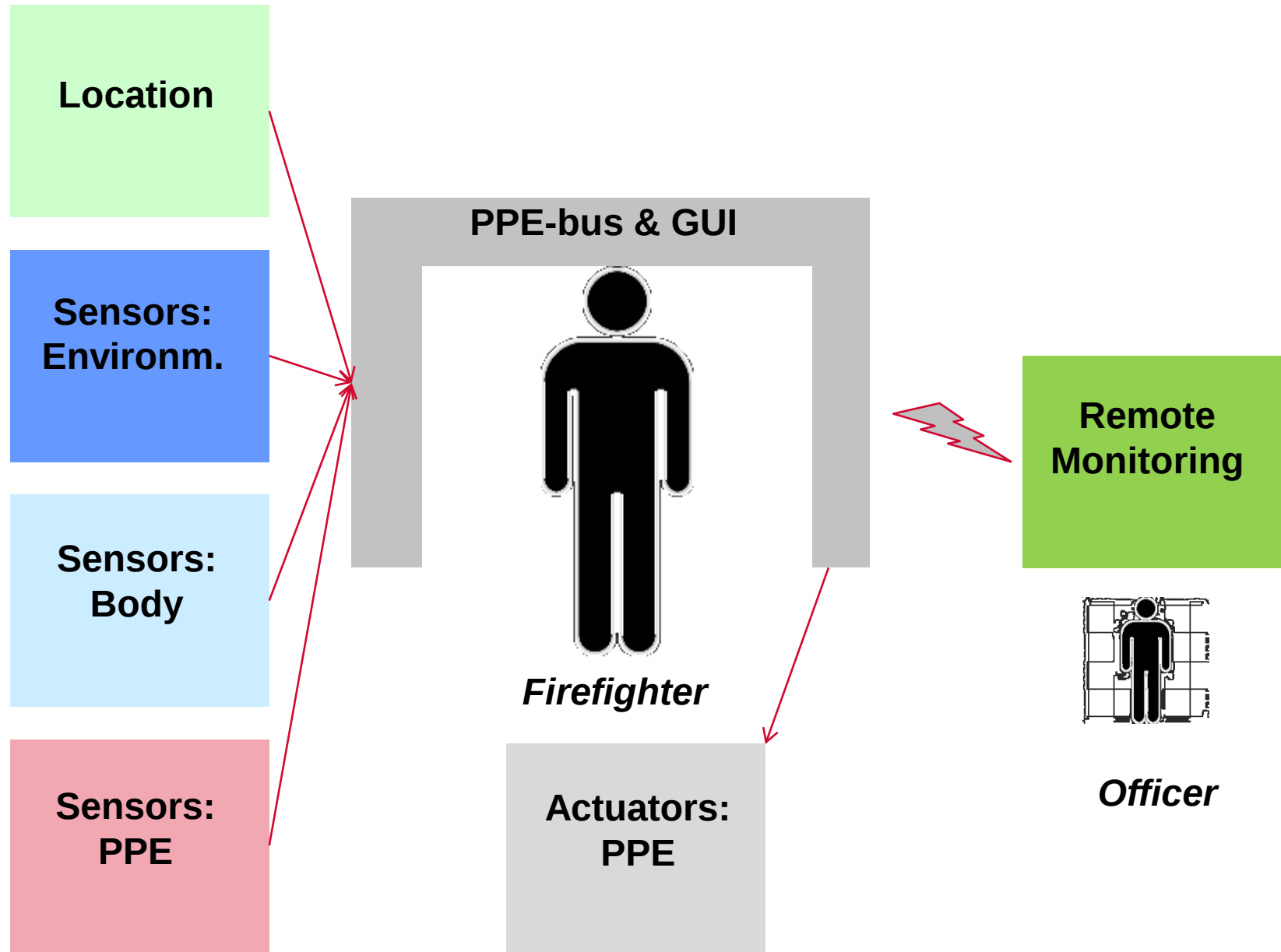
Starting point: the 54 use cases

Sample

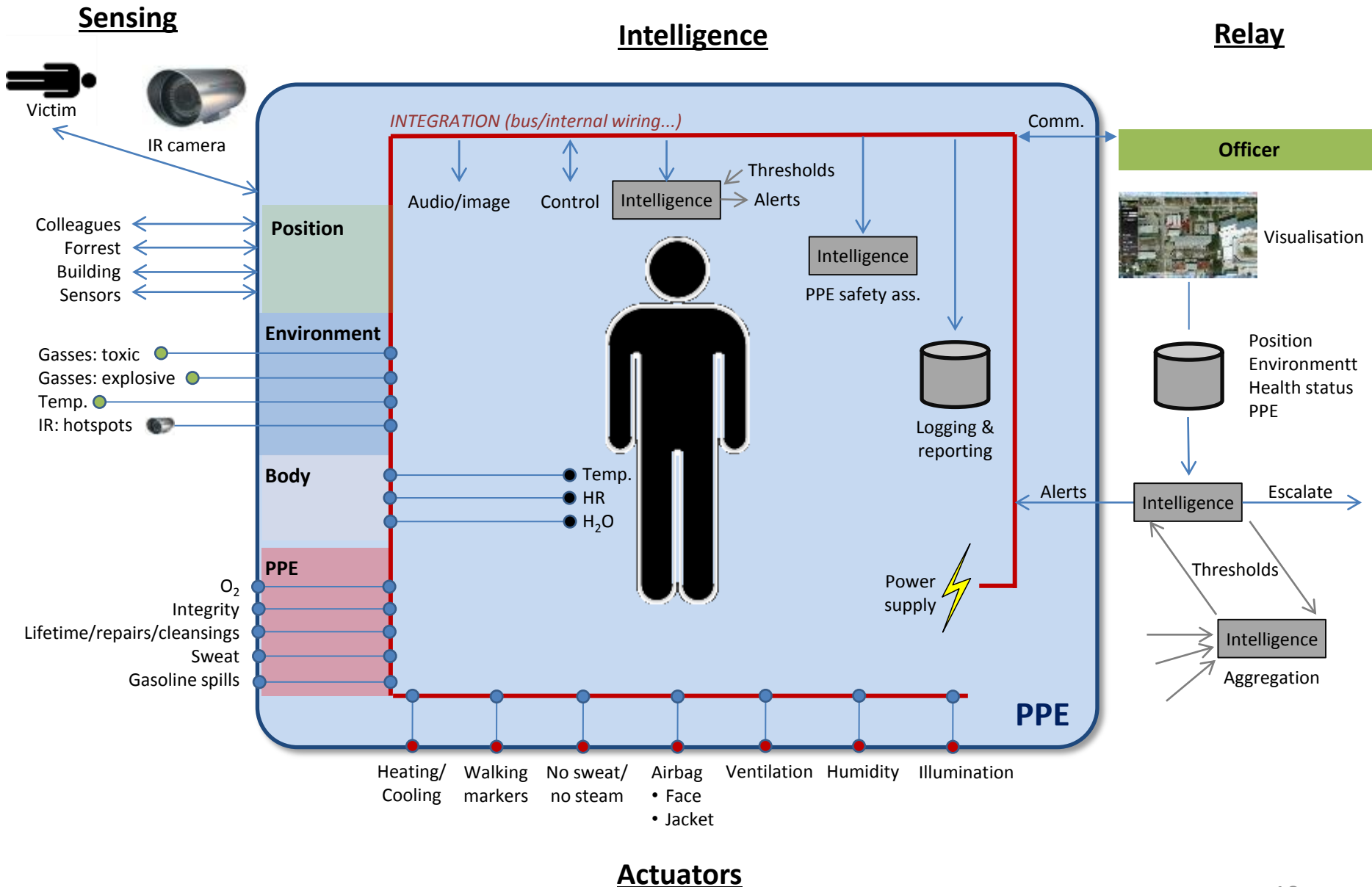
Nr	As a...	I can... <do something>	so that... <value is created for me>
1	Firefighter	consult my vital body functions (body temp), which are normally shielded to me due to my Personal Protective Equipment	I can better make an assessment and decide what to do
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19	Firefighter	have my PPE leave marks on the building where I walked	I can find my way back, or others can find me
21	Firefighter	activate an additional ventilation	I can protect the most sensitive parts of my body with an additional layer of air against heat



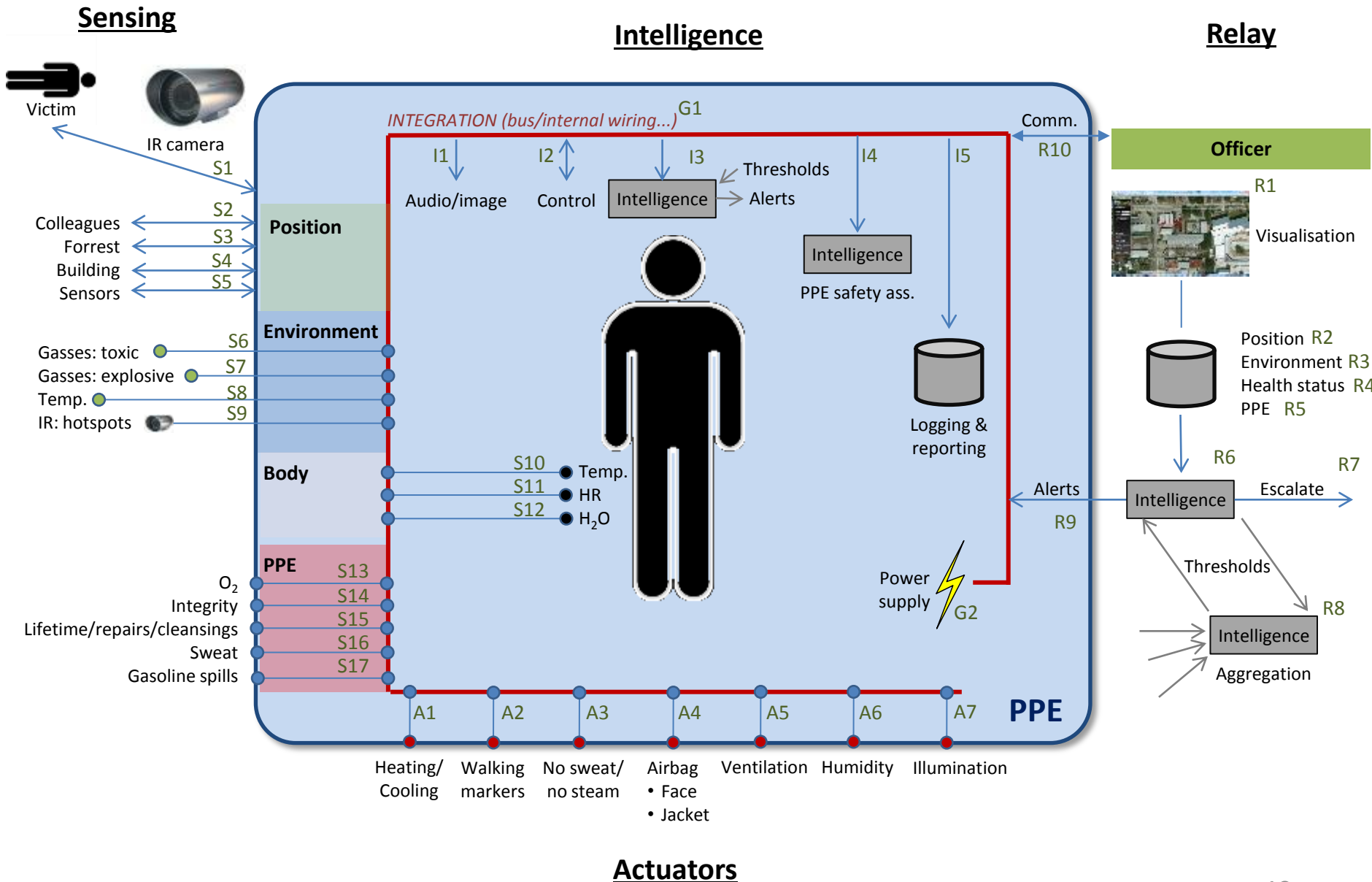
Use cases have been mapped on reference architecture



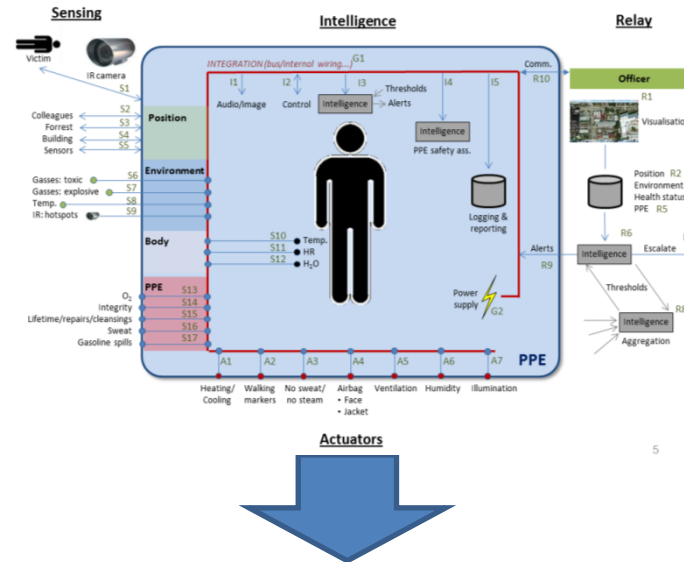
Result: PPE Reference architecture



PPE Reference architecture



PPE Reference architecture used to map players



41 ICT capabilities

		3	8	1	4	2	7	6	6	1	9	8	7	1	2	2	1	0	2	0	0	1	0	0	3	5	3	3	1	1	10	0	6	6	1	7	3	4	0	6	6	5
		Position					Env.				Body			PPE					Actuators					Intelligence					Relay													
IR: victims	Colleagues	Forrest	Building	Sensors	Toxic	Explosive	Temp.	IR: hotspots	Body temp	Body HR	Body H2O	PPE O2	PPE integrity	PPE lifetime	PPE Sweat	PPE spills	Heating/cooling	Walking markers	No sweat/no steam	Airbag	Ventilation	Humidity	Illuminatin	Audio/image	Control	Int. thresholds alerts,	Int. PPE integrity, ale	Logging	Visualisation	Mon. Position	Mon. Environment	Mon. Health	Mon. PPE	Intelligence	Escalate	Aggregation	Alerts	Communication	Integration: ICT > Te:	Energy supply		
S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	A1	A2	A3	A4	A5	A6	A7	I1	I2	I3	I4	I5	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	G1	G2		

+20 typical
players:
Industry,
research, ...

<Players mapped on capabilities>

PPE Reference architecture used to map players

(screenshot)

State-of-the-art scan

no. found

no. found		State-of-the-art scan																																											
		3	8	1	4	2	7	6	6	1	9	8	7	1	2	2	1	0	2	0	0	1	0	0	3	5	3	3	1	1	10	6	6	6	1	7	3	4	0	6	6	6	5		
		Position	Env.	Body	PPE	Actuators	Intelligence	Relay																																					
Nr	Company/ Organization/ Patent filer	IR: victims	Colleagues	Forrest	Building	Sensors	Toxic	Explosive	Temp.	IR: hotspots	Body temp	Body HR	Body H2O	PPE O2	PPE integrity	PPE lifetime	PPE Sweat	PPE spills	Heating/cooling	Walking markers	No sweat/no steam (Active THL)	Airbag	Ventilation	Humidity	Illuminatin	Audio/image	Control	Int. thresholds alerts	Int. PPE integrity, alerts	Logging	Visualisation	Mon. Position	Mon. Environment	Mon. Health	Mon. PPE	Intelligence	Escalate	Aggregation	Alerts	Communication	Integration: ICT > Textile	Energy supply			
1	Globe		1		?					?	1	1	1													1						1	1		1	1	1		1	1	1		1	1	
2	Viking								1		1																	1																	
3	TRX Systems		1		1																											1	1				1	?	1		1				
4	Motorola																									1	1	1				1	1	1		1	1	1		1					
5	Worcester Polytechnic University		1				1				?	?	?													1	1					1	1	1	1		1								
6	Karlsruhe Institute of Technology		1		1																					1	1					1	1	1		1	1								
7	Honeywell	1	1		1	1	1	1		1				1	1	1																1	1	1		1	1			1	1	1			
8	i-Protect						1	1	1		1	1	1																		1			1	1					1	1	1			
9	Zephyr Technology Corporation										1	1	1																		1			1	1	1					1	1	1		
10	Coalesenses					1			1																																				
11	Universidad de Castilla-La Mancha			1					1																	1	1				1		1												
12	Safibra										1	1	1																																
13	Aerosekur										1	1	1						1			1												1											
14	Ionscience						1	1																																					
15	RAE Systems						1	1																																					
16	MN8																																												
17	Streamlight																									1																			
18	Gore																			1																									
19	University of Wuppertal														1	1	1												1																
20	Ohmatex						1	1	1		1	1	1													1																	1		
21	Sagem	1	1																																						1	1	1		
22	CNR Istituto Nazionale di Ottica	1																																											
23	Equival		1								1	1	1													1		1		1	1			1											
24	TNO		1		1		1	1	1		1	1															1		1				1	1									1		

Capabilities for critical use cases seem to exist

vendors found with this capability

3	8	1	4	2	7	6	6	1	9	8	7	1	2	2	1	0	2	0	0	1	0	0	3	5	3	3	1	1	10	0	6	6	1	7	3	4	0	6	6	5
IR: victims	Position				Env.				Body			PPE					Actuators					Intelligence					Relay										6	5		
S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	A1	A2	A3	A4	A5	A6	A7	I1	I2	I3	I4	I5	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	G1	G2
	Colleagues	Forrest	Building	Sensors	Toxic	Explosive	Temp.	IR: hotspots	Body temp	Body HR	Body H2O	PPE O2	PPE Integrity	PPE lifetime	PPE Sweat	PPE spills	Heating/cooling	Walking markers	No sweat/no steam (	Airbag	Ventilation	Humidity	Illuminatin	Audio/image	Control	Int. thresholds alerts	Int. PPE integrity, ale	Logging	Visualisation	Mon. Position	Mon. Environment	Mon. Health	Mon. PPE	Intelligence	Escalate	Aggregation	Alerts	Communication	Integration: ICT > Te	Energy supply



Positioning:
OK

Environ. Temp:
OK



Remote monitoring:
OK

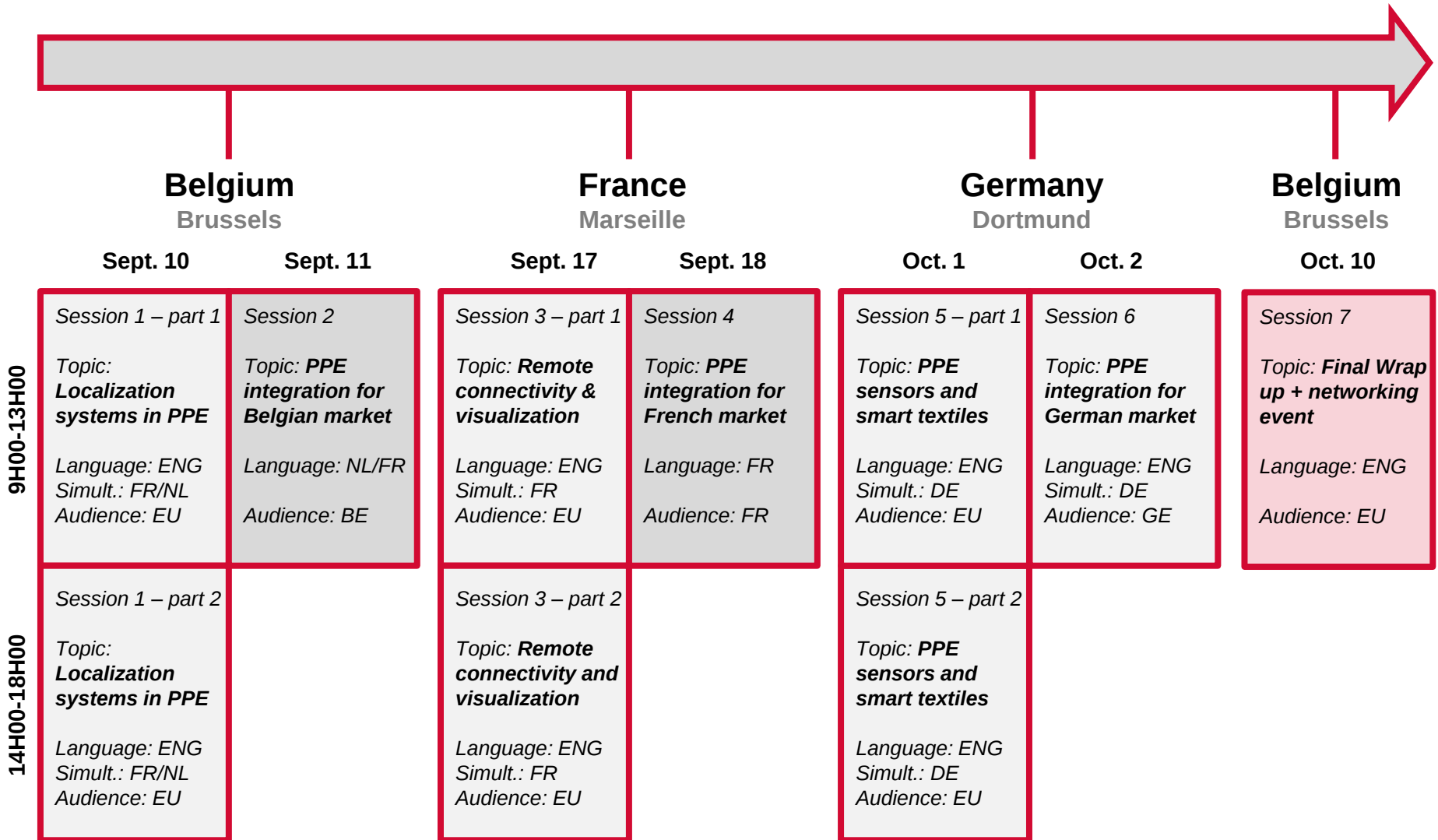
BUT:

- Nearly all international suppliers, way beyond BE, FR, UK
 - And often from US & military origin
- ⇒ ***This will impact our market consultation !***

Smart@Fire: Innovation Platform

1. Innovation potential from user-perspective
2. State-of-the-art analysis - ICT perspective
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3. Resulting market consultation sessions

Resulting market consultation sessions



Smart@Fire: Innovation Platform

Detail – Session 1, Part 1

BE

Brussels

(close to airport)

Session 1 – Part1: Understanding vendors' capabilities towards:
(international audience) ***“Localization systems embedded in PPE”.***

Typical questions:

- “What solutions do exist in terms of localization systems?”
- What is their current development/deployment status?
- What are their strenghts and weaknesses?
- How would they enable the proposed use cases ?
- What are the limitations & risks to enable those use cases ?
- ...

Language: English

Location: Brussels, close to main airport to facilitate travel.

Typical audience:

- Ohmatex (smart textile experts, experience with Viking)
- Honeywell (advanced firefighting equipment provider)
- Globe (advanced firefighting equipment provider, with working positioning solution)
- TRX systems (system provider for indoor positioning)
- Sagem (developer of advanced soldier equipment)
- ...

Timing: Sept. 10, 9H00-13H00



Smart@Fire: Innovation Platform

Detail – Session 1, Part 2

BE

Brussels

(close to airport)

Session 1 – Part2: Understanding vendors' capabilities towards:
(international audience) ***“Localization systems embedded in PPE”***.

Typical questions:

- Using planning poker technique, how severe are the risks to enable the use cases ?
- As a consequence, what would it take to de-risk ?

Language: English

Location: Brussels, close to main airport to facilitate travel.

Typical audience:

- Ohmatex (smart textile experts, experience with Viking)
- Honeywell (advanced firefighting equipment provider)
- Globe (advanced firefighting equipment provider, with working positioning solution)
- TRX systems (system provider for indoor positioning)
- Sagem (developer of advanced soldier equipment)
- ...

Timing: Sept. 10, 14H00-18H00



Smart@Fire: Innovation Platform

Detail – Session 2

BE

Brussels
(close to airport)

Session 2:
(BE audience)

PPE integration for Belgian market: Understanding local PPE vendors' capabilities to integrate 3rd party ICT solutions in PPE.

Typical questions:

- “What type of (ICT) integration is currently done for PPE equipment ?
- What is the product/development status ?
- What would it take to integrate additional ICT functions (cfr use cases) in PPE ?
- What are the associated risks and challenges ?
- How important are those risks and challenges (via planning poker)?
- What would it take to overcome those ?

Language: Dutch & French

Location: Brussels, close to main airport to facilitate travel.

Typical audience:

- Local PPE providers, integrators
- Communication integrators cfr Tetra
- ICT integrators active in other embedded environments e.g. military, police, ...
- ...

Timing: Sept. 11, 9H00-13H00



Smart@Fire: Innovation Platform

Detail – Session 3, Part 1

FR

Marseille

(close to airport)

Session 3 – Part1: Understanding vendors' capabilities towards:
(international audience) “ICT solutions for **remote connectivity and visualization** systems in PPE”.

Typical questions:

- “What solutions do exist to achieve remote (data) connectivity?”
- What is their current development/deployment status?
- What are their strenghts and weaknesses?
- How would they enable the proposed use cases ?
- What are the limitations & risks to enable those use cases ?
- ...

Language: English

Location: Marseille, close to main airport to facilitate travel.

Typical audience:

- Motorola (*communication provider, large experience with first-responders*)
- Honeywell (*advanced firefighting equipment provider*)
- Sagem (*developer of advanced military equipment*)
- Istituto Nazionale di Ottica (*IR holography*)
- ...

Timing: Sept. 17, 9H00-13H00



Smart@Fire: Innovation Platform

Detail – Session 3, Part 2

FR

Marseille

(close to airport)

Session 3 – Part2: Understanding vendors' capabilities towards:
(international audience) “ICT solutions for **remote connectivity and visualization** systems in PPE”.

Typical questions:

- Using planning poker technique, how severe are the risks to enable the use cases ?
- As a consequence, what would it take to de-risk ?

Language: English

Location: Marseille, close to main airport to facilitate travel.

Typical audience:

- Motorola (*communication provider, large experience with first-responders*)
- Honeywell (*advanced firefighting equipment provider*)
- Sagem (*developer of advanced soldier equipment*)
- Istituto Nazionale di Ottica (*IR holography*)
- ...

Timing: Sept. 17, 14H00-18H00



Smart@Fire: Innovation Platform

Detail – Session 4

FR

Marseille

(close to airport)

Session 4:
(FR audience)

PPE integration for French market: Understanding local PPE vendors' capabilities to integrate 3rd party ICT solutions in PPE.

Typical questions:

- “What type of (ICT) integration is currently done for PPE equipment ?
- What is the product/development status ?
- What would it take to integrate additional ICT functions (cfr use cases) in PPE ?
- What are the associated risks and challenges ?
- How important are those risks and challenges (via planning poker)?
- What would it take to overcome those ?

Language: French

Location: Marseille, close to main airport to facilitate travel.

Typical audience:

- Local PPE providers, integrators
- Communication integrators cfr Tetra
- ICT integrators active in other embedded environments e.g. military, police, ...
- ...

Timing: Sept. 18, 9H00-13H00



Smart@Fire: Innovation Platform

Detail – Session 5, Part 1

DE

Dortmund
(close to airport)

Session 5 – Part1: Understanding vendors' capabilities towards:
(international audience) ***“PPE sensors and their integration in smart textiles”***.

Typical questions:

- “What solutions do exist in terms of smart textiles and sensors ?”
- What is their current development/deployment status?
- What are their strenghts and weaknesses?
- How would they enable the proposed use cases ?
- What are the limitations & risks to enable those use cases ?
- ...

Language: English

Location: Dortmund, close to main airport to facilitate travel.

Typical audience:

- Viking (provider of sensor integrated firefighter equipment)
- Ohmatex (smart textile experts, experience with Viking)
- Equivital (medical monitoring)
- Honeywell (advanced firefighting equipment provider)
- Karlsruhe Institute of Technology (sensor specialist)
- Zephyr Technology (medical monitoring)
- ...

Timing: Oct. 1, 9H00-13H00

Smart@Fire: Innovation Platform

Detail – Session 5, Part 2

DE

Dortmund
(close to airport)

Session 5 – Part2: Understanding vendors' capabilities towards:
(international audience) ***“PPE sensors and their integration in smart textiles”***.

Typical questions:

- Using planning poker technique, how severe are the risks to enable the use cases ?
- As a consequence, what would it take to de-risk ?

Language: English

Location: Dortmund, close to main airport to facilitate travel.

Typical audience:

- Viking (provider of sensor integrated firefighter equipment)
- Ohmatex (smart textile experts, experience with Viking)
- Equivital (medical monitoring)
- Honeywell (advanced firefighting equipment provider)
- Karlsruhe Institute of Technology (sensor specialist)
- Zephyr Technology (medical monitoring)
- ...

Timing: Oct. 1, 14H00-18H00

Smart@Fire: Innovation Platform

Detail – Session 6

DE

Dortmund
(close to airport)

Session 6:
(GE audience)

PPE integration for German market: Understanding local PPE vendors' capabilities to integrate 3rd party ICT solutions in PPE.

Typical questions:

- “What type of (ICT) integration is currently done for PPE equipment ?
- What is the product/development status ?
- What would it take to integrate additional ICT functions (cfr use cases) in PPE ?
- What are the associated risks and challenges ?
- How important are those risks and challenges (via planning poker)?
- What would it take to overcome those ?

Language: English (translated to German)

Location: Dortmund, close to main airport to facilitate travel.

Typical audience:

- Local PPE providers, integrators
- Communication integrators cfr Tetra
- ICT integrators active in other embedded environments e.g. military, police, ...
- ...

Timing: Oct. 2, 9H00-13H00

Smart@Fire: Innovation Platform

Detail – Session 7

BE

Brussels
(close to airport)

Session 7: *Final Wrap up + networking event*
(international audience)

Agenda

- Summarizing conclusions and networking.
- Companies / stakeholder can meet each other and have the opportunity to form a consortium.

Language: English

Location: Brussels, close to main airport to facilitate travel.

Typical audience:

- All stakeholders

Timing: Oct. 10, 9H00-13H00