ECHORD++

European Clearing House for Open Robotics Development Plus Plus
(http://www.echord.eu)

ECHORD++: PCP Pilot presentation. Urban Robotics and Healthcare

Speakers: Ana Puig-Pey (UPC)

Bristol// October 23th, 2014

ECHORD++

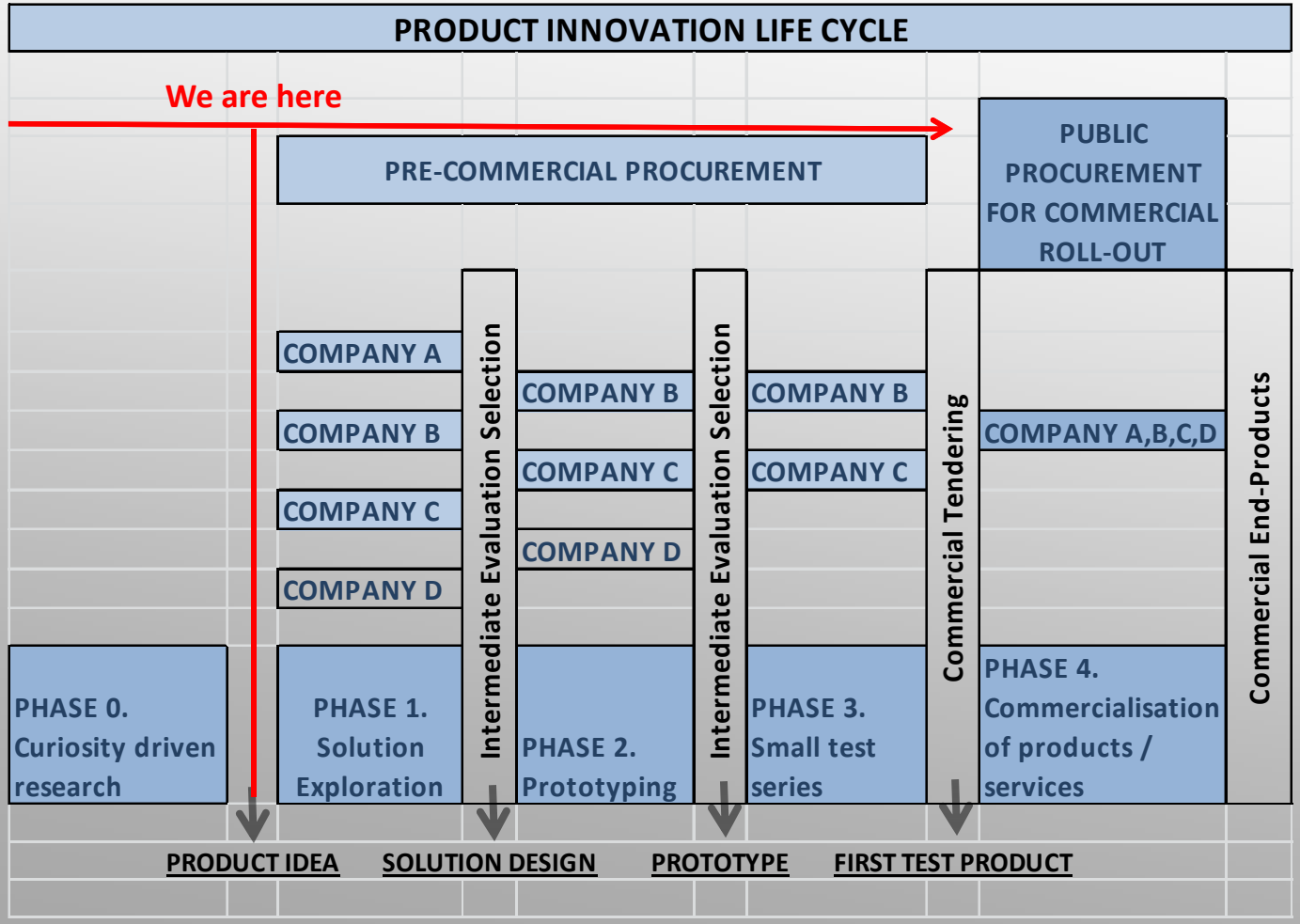
PCP Pilots in Urban Robotics and Healthcare

Experiments

Robotics Innovation Facilities (RIF)

Pre-Commercial Procurement Pilots (PCP Pilots)

Pre-Comercial Procurements (PCP)



Pre-Comercial Procurements (PCP)

Total EU-contribution: 2.35 Mio. €
One Open Call for RTD

- **Active Search for Public Body- Phase 0**
  - **Runtime. 10 months**
  - **Budget for each PB: 176k€**

- RTD Activities – **Phase I**
  - Solution Design
  - Runtime: 6 months
  - Consortia: 3/scenario
  - Budget: 253k € (42k €/consortium)
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  - Prototype Development
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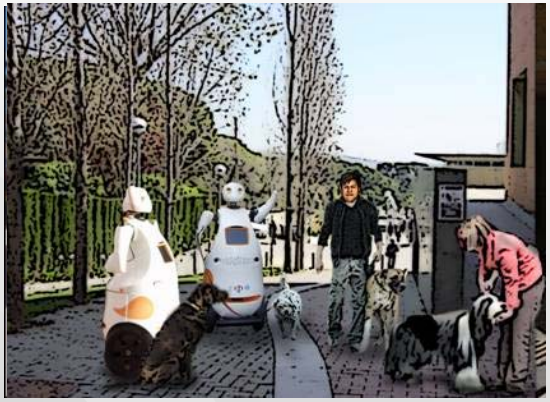
PCP in Healthcare and in Urban Robotics

Healthcare

Urban Robotics



To analyze and select from Public Demand Needs to Public Challenges (Networking + Academy rounds)

Call for Public Body Challenges in Healthcare and Urban Robotics

List of 18 Healthcare Robotic Challenges

List of 14 Urban Robotic Challenges

Expert panel Selection of one Healthcare Robotic Challenge and Urban Robotic Challenge

Call for 3 RTDs in each Challenge (January 2015)

List of 18 specific Healthcare challenges from European PB

Topic	Healthcare Challenges
Surgery	Robot assisted orthopedic surgery.
ICT-Communication	Doctor-Patient communication interface.
Transportation	Hospital bed transportation mechanism.
Patient Washing	Bed bathing of heavy people.
Patient Assistance	Robot assisted patient with dropped foot.
ICT	Virtual reality for stationary bikes.
Rehabilitation	Rehabilitation robot for lower extremities.
Rehabilitation	Rehabilitation at home.
Patient Assistance	Robot assisted hemiparesis.
ICT	Skin photographer for remote diagnosis.
Rehabilitation	Rehabilitation robotics.
AGV	Healthcare AGV.
ICT- Brain Control	Brain controled robot.
Geriatric	Geriatric test by robot.
Rehabilitation	Rehabilitation Robotics.
Rehabilitation	Pediatric rehabilitation robot.
Automated PCR Chamber	Automated PCR chamber.
Rehabilitation	Rehabilitation robotics for upper limb.

PCP in Healthcare and in Urban Robotics

E++ UR Challenges

Energy. Increase the production from distributed and renewable energy sources and approach the uptake and storage of energy in the place of consumption, boosting energy production on an urban scale.

Robotic infrastructure for cleaning and maintenance of solar panels.
Robotic infrastructure for distribution of electric rechargeable batteries

Mobility. There is a new city planning, refocusing on how to make cities more pedestrian, bicycle and public transport friendly, while an expansion of new infrastructures to facilitate the mobility far of the car centered city planning.

Robotic system for automatic detection of damaged road surfaces.
Goods distribution robot technology. Robots for sewage networks.

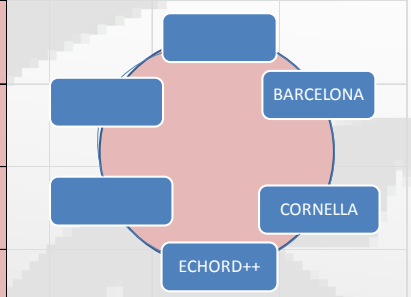
ICT Technology. Improve the quality of connectivity in cities. To efficiently respond to the challenges in areas such as mobility, energy and environmental protection, cities must establish systems capable of handling the massive amount of data and become more resilient.

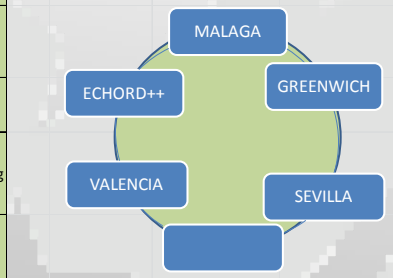
Mobile robotic repeaters to enlarge the connectivity in large agglomerations.
Robot technology to provide maps: acoustic, contamination and pest maps.

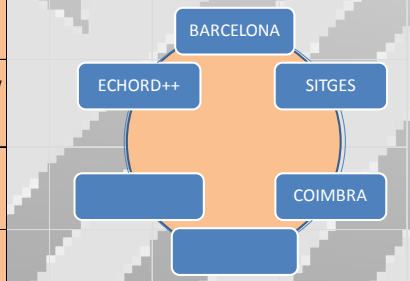
List of 14 specific Urban Robotics challenges from European PB

Topic	Cities Challenges
Infrastructure	Traffic infrastructure inspection and maintenance.
ICT- Tourism	Improving tourist services at the city.
Infrastructure	Improving the management, planning and urban city observations.
ICT-Planning	Planning and information of urban accessible routes.
ICT-Mobility	Personalized mobility support for pedestrian areas.
ICT-Survillance	Providing safe and secure environments for citizens.
ICT-Good Distribution	Goods distribution technology to improve local retail.
Infrastructure	Automatic detection and road surface damage warnings.
ICT-Mobility	Personalized mobility support for pedestrian areas.
Infrastructure	Improving waste management and street cleaning.
ICT-Monitoring	Utilities infrastructures condition monitoring. Sewer Inspection.
ICT-Monitoring	Environmental monitoring and control.
ICT-Survillance	Providing safe and secure environments for citizens.
Infrastructure	Improving the management, planning and urban city observations.

	ECHORD++ Urban Robotic Challenges
INFRAESTRUCTURES	**Traffic infrastructure inspection and maintenance.** Decreasing the cost of maintenance and increasing the area liveability through robotisation of the city's maintenance traffic at the Smart Kalasatama designated smart city area, including both vehicles and installed infrastructure in the area.
INFRAESTRUCTURES	**Automatic detection and road surface damage warnings.** To find a solution that can gather data and analyse the 11Mm2 of asphalt paving surfaces, road, cycle and pedestrian across the whole city.
INFRAESTRUCTURES	**Improving waste management and street cleaning.** Perform tasks with less cost for the maintenance of parks and gardens.
INFRAESTRUCTURES	**Utilities infrastructures condition monitoring.** To mechanize sewer inspections in order to reduce the labour risks, objectify sewer inspections and optimize sewer cleaning expenses of the city.
TIC AND ENVIRONMENT	**Environmental monitoring and control.** This challenge aims at the deployment of a robotic collaborative network for monitoring and mitigating the presence of air pollutants (including pollen), as well as odours that may be unpleasant to citizens.
TIC AND TOURISM	**Improving tourist services at the city.** To provide a cost effective way of interacting with visitors to provide accurate information based on real time management data as well as information on attractions and related services.
TIC AND PLANNING	**Improving the management, planning and urban city observations.** The use of aero robots in the management, planning and urban city knowledge
TIC AND MOBILITY	**Planning and information of urban accessible routes.** The robotic challenge we propose is the realisation of a LAND ROBOT prototype, as the basis for a battery of them deployed around the city taking mobility accessibility data with references that are inherent in the development of the Planner.
TIC AND SURVEILLANCE	**Providing safe and secure environments for citizens.** The new technology should improve the limits of traditional surveillance cameras and should have more features (i.e. proactive action, movement, ...) compared with the actual passive video surveillance/acquisition.
TIC AND MOBILITY	**Improving the management, planning and urban city observations.** An innovative monitoring system applied to urban bus lines to monitor Origin and Destination and sustainable mobility modes.
PEDESTRIAN AREAS	**Personalised mobility support for pedestrian areas.** To create a system or service that will guide the transport or mobility impaired through the neighbourhood. The system must be integrated into the pedestrian area of the new city model raised.
PEDESTRIAN AREAS	**Providing safe and secure environments for citizens.** Incorporing a new robotic infrastructure where now there is an human intensive service. Objectives: noise reduction, surveillance and management of public spaces, specially in crowded events and support to disabled people in pedestrian areas
PEDESTRIAN AREAS	**Goods distribution technology to improve local retail.** To create a sustainable system to make the distribution from the neighbourhood Warehouse to each commerce. This robotic system must to be integrated in the pedestrian areas of new neighbourhoods.
PEDESTRIAN AREAS	**Personalised mobility support for pedestrian areas.** To contribute to the downtown urban life revitalization, improving the existing personalized transport as a key issue to connect activities and people. To select and apply the best mobility solution that can assure an effective transportation role in the downtown.







The ECHORD Plus Plus Consortium acknowledges support by the European Commission under FP7 contract 601116.

Urban Robotics Challenges, Citizen Interest

Citizen challenge interest (answers from 100 citizens)

CITY CHALLENGES	CITIZENS
Providing safe and secure environment for citizens	2,96%
Goods distribution technology to improve local reatil	4,09%
Local energy generation and storage	9,63%
Technological solutions to manage big events	2,05%
Automatic detection and road surface damage warnings*	5,23%
Disease spreed monitoring*	9,17%
Improving waste management and street cleaning	9,93%
Personalised mobility support for pedestrian areas	7,20%
Utilities infraestructure condition monitoring	5,23%
Environmental monitoring and control	9,17%
Improving tourist services at the city	3,18%
Improving disabled people participation in society	17,21%
Traffic infraestructure inspection and maintenance*	5,23%
Improving the management, planning and urban city observations*	
Planning and information of urban accessible routes	

Citizens comments:
4 negative remarks to "Providing safe and secure environment for citizens"
Friendly Robots
Robots for tasks where the human can not arrive
Robots for street cleaning
Robots for blind people
Robots to protect the human being not to destroy it
Problems with robots in human task could represent unemployment

Lessons learned in PCP Pilot. Phase 0

Leaders of the cities were not easy to reach. In some cities we changed three times of contact person. In some cities they have an external consultant for specific areas and it's easy to contact.

The field of our search was too wide. Robot technology can be used in almost all the areas detected in ***smart cities***. It would be easier if we would have focused the search.

Robot technology is unknown for almost all the cities. Some of the cities contact local academy researchers in order to propose their challenge. The synergies between public bodies and research academy were very well received.

Living Labs are important in the process of PCPs. We developed a workshop with two urban labs: Barcelona and Cornella. The workshop with Living Labs was very helpful and we continue in contact with them. We think , they are interested to be involved in the complete project.

The PCP process is unknown for the majority of cities. The cities do not know the mechanisms of the PCPs and how to increase the demand of public innovative technology. The PCP barriers were solved by the financial procedure of ECHORD++ project.

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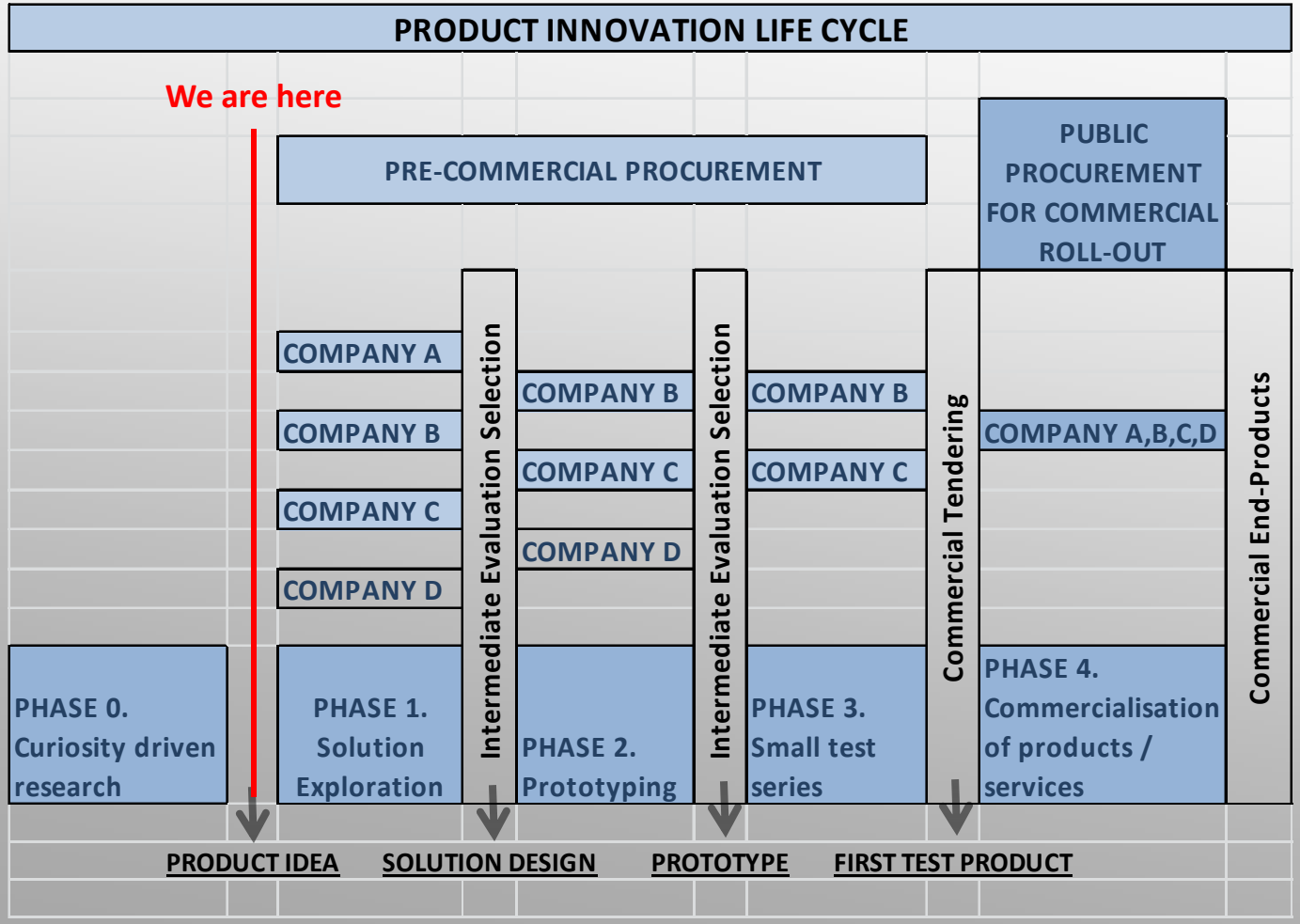

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Save the dates:

Infoday Urban Robotics
Barcelona November 20th 2014

Infoday Healthcare Robotics
Munich December 2-3rd 2014

Call RTD
January 15th 2015-February 28th

www.echord.eu

Thank you

apuigpey@iri.upc.edu

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