



**umec**

SMART APPLICATIONS &  
INNOVATION SERVICES

ON 1/10/2016 IMEC AND IMINDS HAVE MERGED



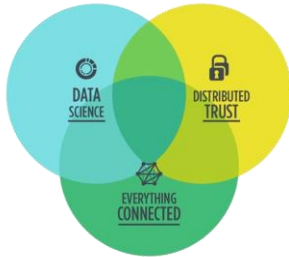
embracing a better life

# ON THE MENU

- Overview of imec “Smart Applications and innovation services”
- Collaboration options
  - imec.icon
  - imec.istart
  - Bilateral contracts
- Services
  - Living Labs
  - Prototyping
- Innovation platforms
  - City of Things
  - Krook

# Smart Applications & Innovation Services

## Smart Applications



## Innovation services

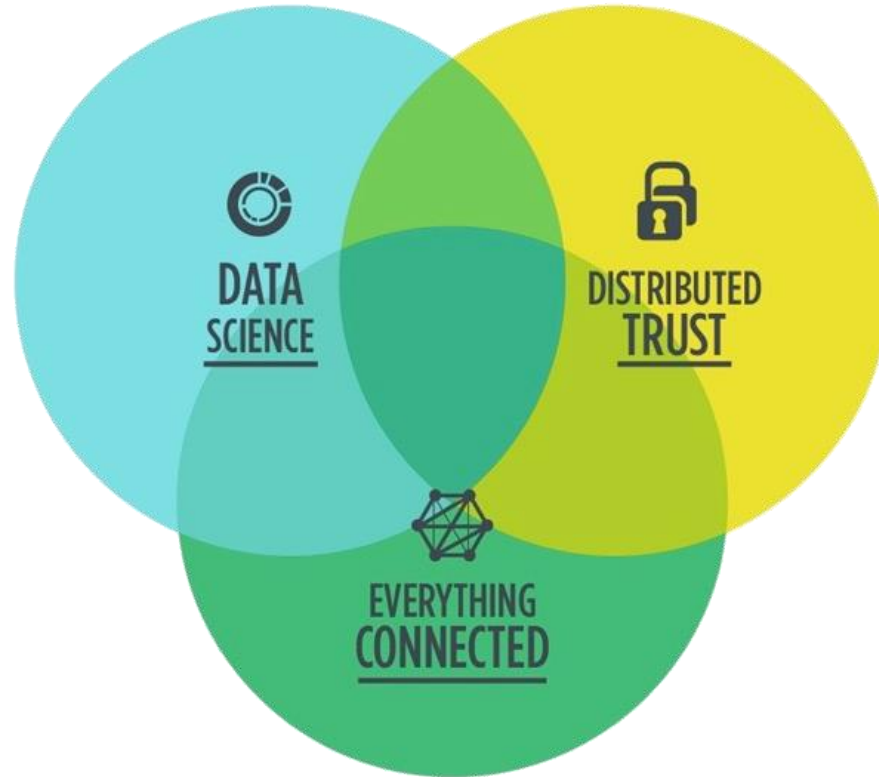
imec.icon

imec.istart

imec.livinglabs

## Outreach Flanders

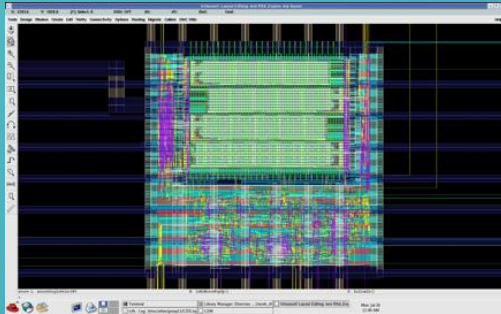
# SMART APPLICATIONS – RESEARCH PROGRAMS



# SECURITY FOR IoT CONSTRAINED DEVICES



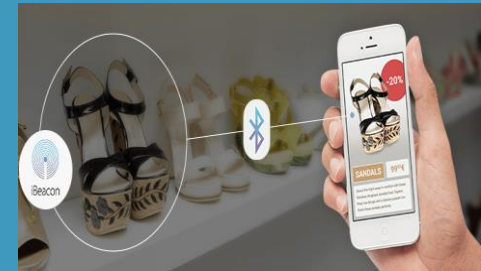
## Lowest power Elliptic Curve Cryptography



## Secure SW framework & HW/SW co-design



## Proximity as secured authentication service

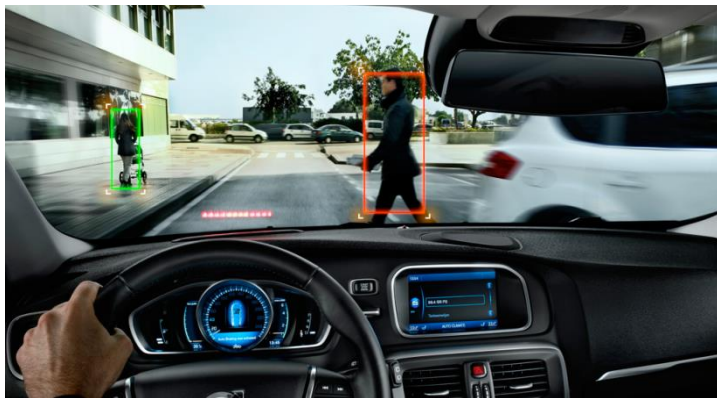


# DISTRIBUTED MACHINE LEARNING FOR *REAL-TIME APPLICATIONS*

## DIANNE TECHNOLOGY



Real-time execution by the AI-enabled point



Knowledge base & Deep learning in the Cloud

Push new samples to experience pool



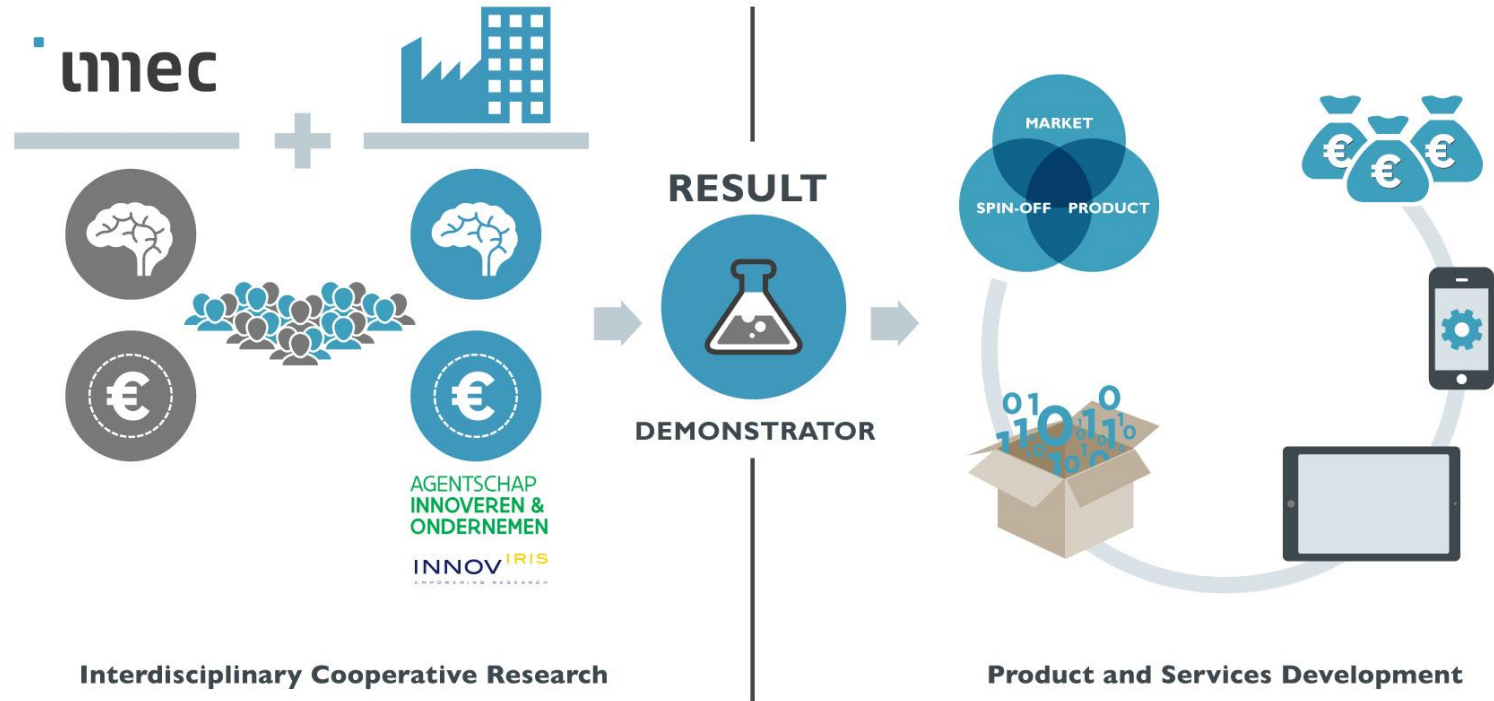
Get optimized NN training results

# COLLABORATION OPTIONS



IMEC.ICON

# IMEC.ICON: R&D COOPERATION WITH FLEMISH INDUSTRY

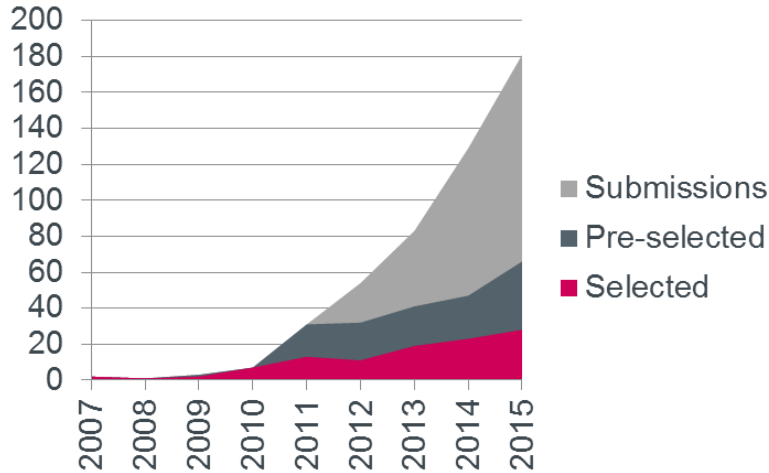


# IMEC.ICON INFO SESSION

- Next Friday, Dec 2<sup>nd</sup>
- Brussels, Royal Library of Belgium
- 10am
- Register via [bit.ly/iconinfo2017-1](http://bit.ly/iconinfo2017-1)

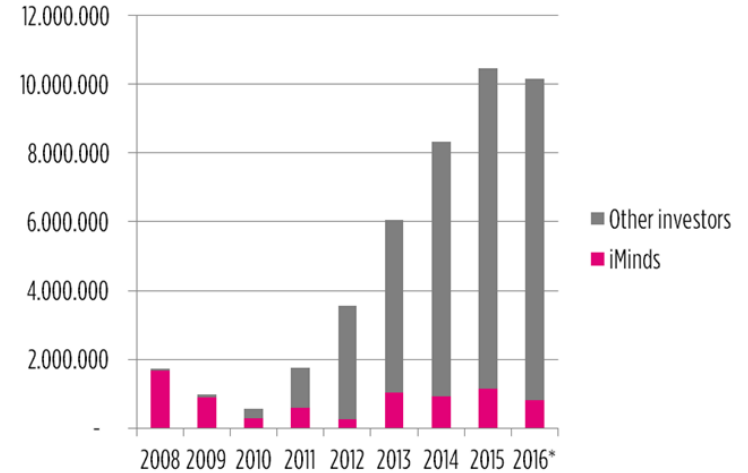
IMEC.ISTART

# IMEC.ISTART: THE DIGITAL SEED INCUBATOR FOR FLANDERS



imec.istart submissions & selections

non-cumulative



€1 iMinds → €7.5 follow-up investments

\* First 6 months of 2016

# IMEC.ISTART

SUBSET OF PORTFOLIO COMPANIES WITH + €1M FOLLOW-UP INVESTMENTS



Molecubes



Viloc



Ontoforce



Seaters



Datacamp

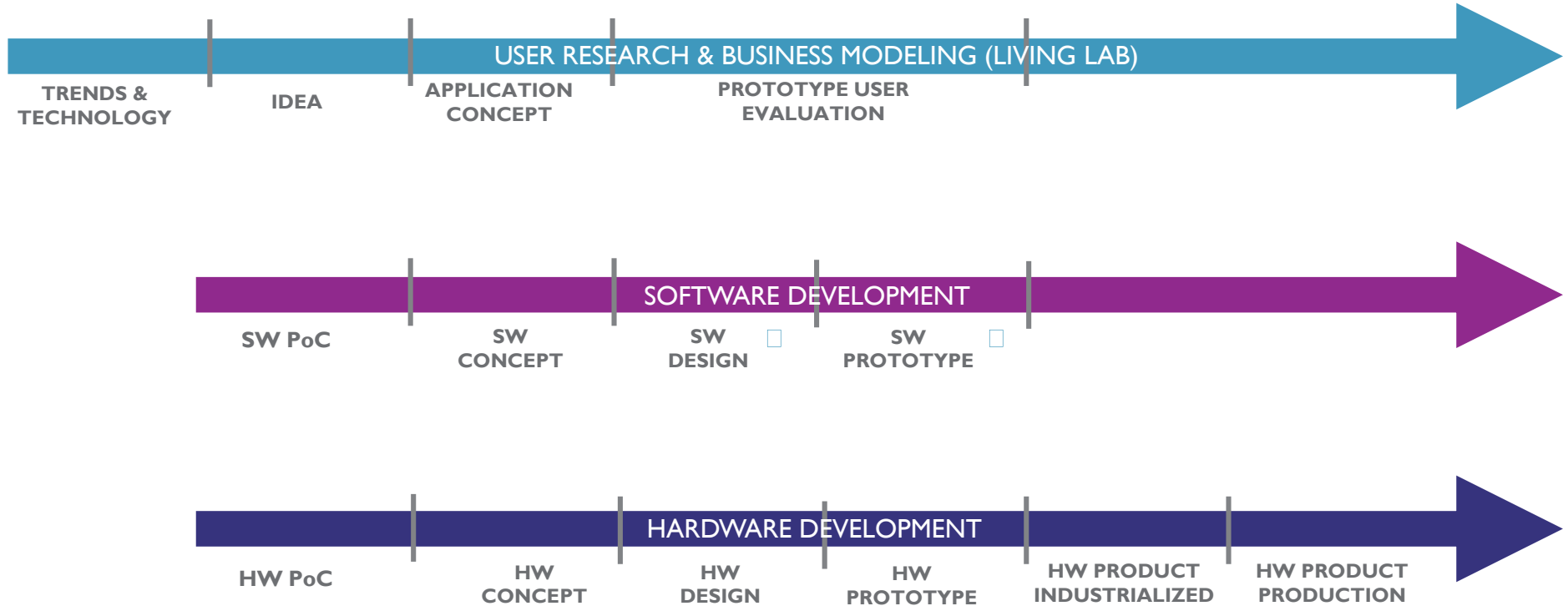
More info: <https://www.iminds.be/istart>

Next call deadline: **09/02/2017**

# BILATERAL PROJECTS

- Custom contracts
- Services based on combined offering of
  - Living Lab
  - Software development
  - Hardware development

# WORK IN PROGRESS: IMEC SW/HW PROTOTYPING OFFERING





## FOCUS ON

- One stop shop approach
- Objectivity
- Learning effects => white box prototyping
- Bridging the gap between research and implementation

SERVICES

# LIVING LABS

**IMPROVE DIGITAL INNOVATIONS BY ACTIVELY INVOLVING USERS & STAKEHOLDERS THROUGH CO-CREATION & REAL-LIFE INTERVENTION**

EMPOWERING  
USERS TO  
IMPACT THE  
INNOVATION  
PROCESS

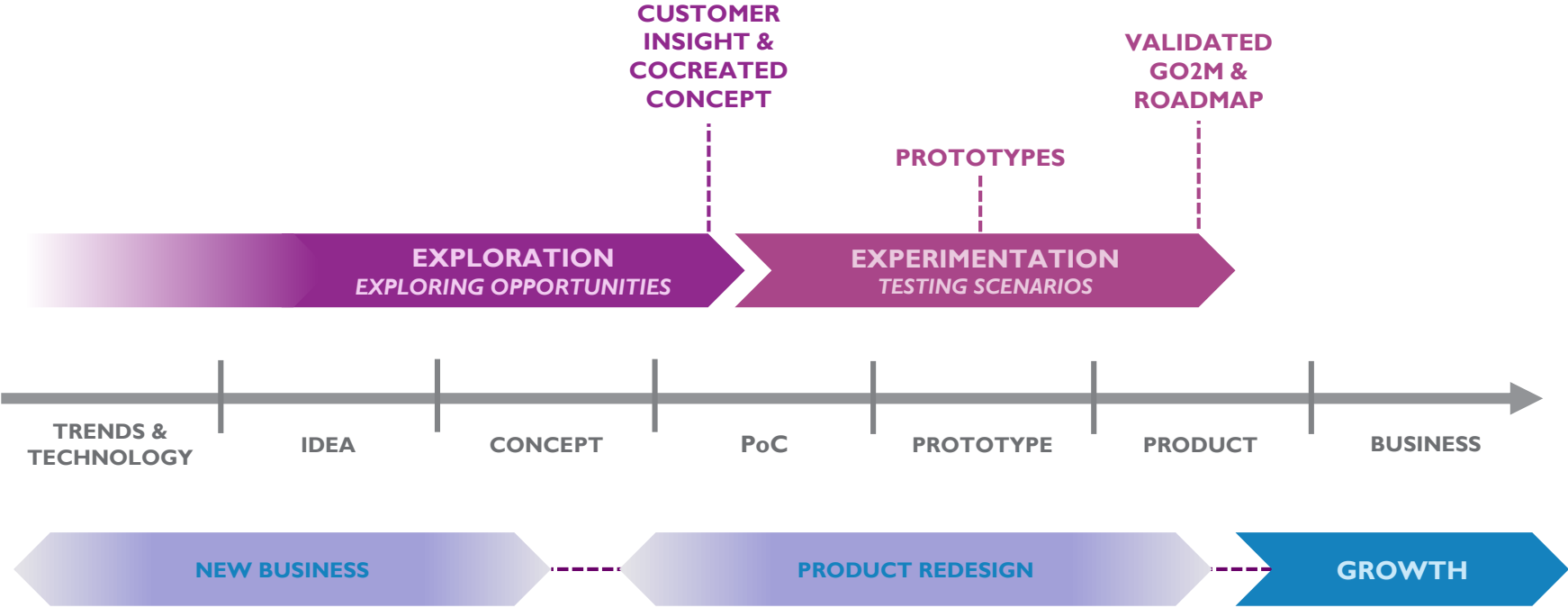
## IMPROVE DIGITAL INNOVATIONS BY ACTIVELY INVOLVING USERS & STAKEHOLDERS THROUGH CO-CREATION & REAL-LIFE

MULTI-  
STAKEHOLDER

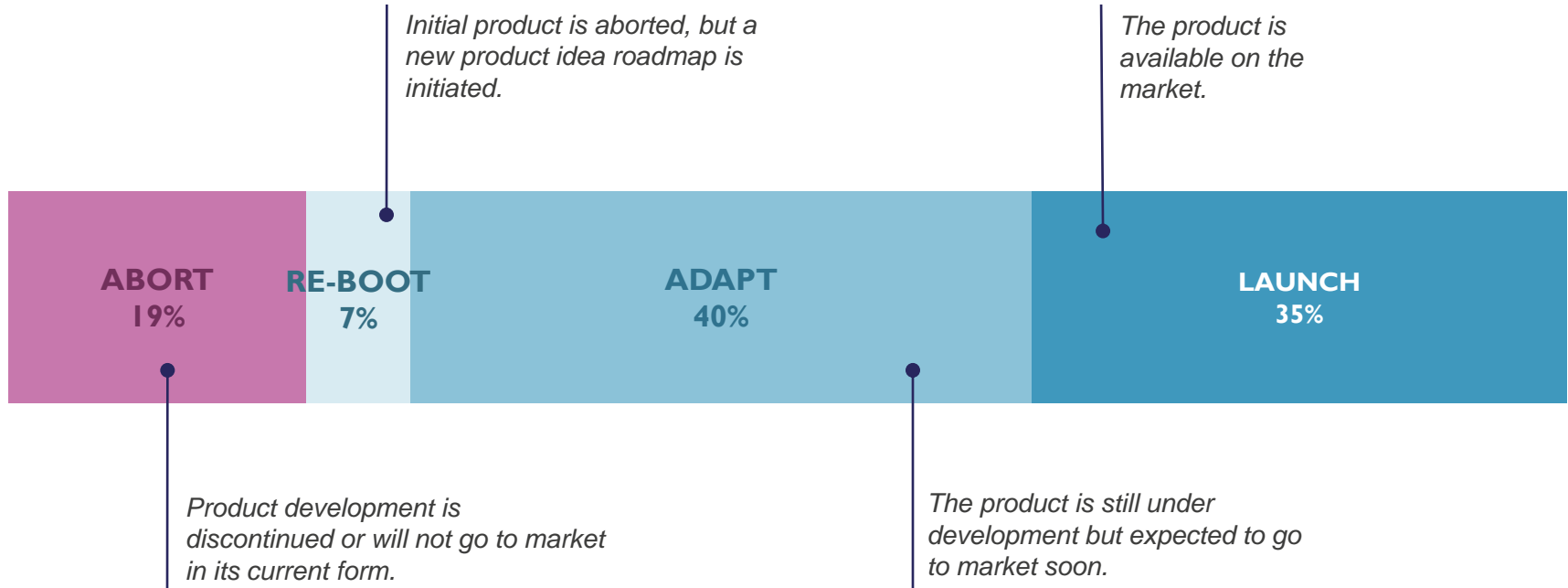
ITERATIONS OF  
DESIGN CYCLES

OUTSIDE OF  
CONTROLLED  
LAB

# LIVING LAB SERVICE OFFERING

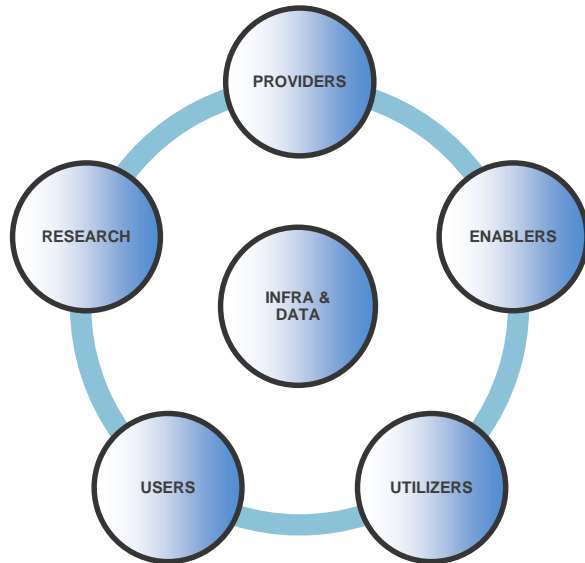


# LIVING LAB INSIGHTS HAVE BEEN USED TO



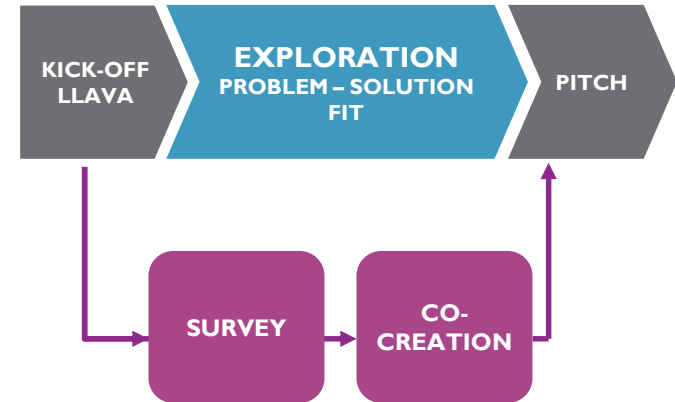
# LIVING LAB STRATEGY

- HOW TO SET UP YOUR OWN LIVING LAB ACTIVITIES  
– STRATEGY DEFINITION
- *BRAINPORT EINDHOVEN, CARE LIVING LABS*



# LIVING LAB BOOTCAMP

- SELECT & DEVELOP IDEAS AND IMPROVE ENTREPRENEURIAL SKILLS THROUGH A WEEK-LONG LIVING LAB TRACK
- *FLEMISCH GOVERNMENT*





# LLAVA MATRIX

iMinds  
Living Labs  
Assumption & Validation Matrix

CUSTOMER SEGMENT				
KEY MARKET TRENDS				
COMMON NEED				
CURRENT PRACTICES				
VALUE PROMISE				
BARRIERS TO ADOPT				
DIGITAL SOLUTION				
VALUE CAPTURE (WTP)				
KEY PARTNERS				

**Set priorities,  
manage & track  
progress.**

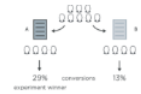


# LIVING LAB & DESIGN THINKING TOOLS



## Thinking aloud protocol

A test method used to gather insights into the experiences, ideas and reasonings people have when executing a task or solving a problem →



## A/B-testing

A comparative usability test method to determine the more efficient of two interfaces →



## Cognitive walkthroughs

A task-based usability test method used to gain insights into the reasonings people have when executing a task or solving a problem →



## Heuristic evaluation

A usability evaluation method based on expert reviewers and a list of design guidelines (heuristics) →



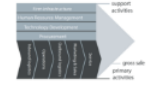
## Wizard of Oz

In the Wizard of Oz the experimenter (Wizard) tests an iterative design by simulating the behavior of the intelligent application in a lab environment →



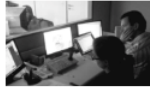
## Persona

Fictional archetypal characters that represent your target customers →



## Value chain analysis

A strategic management framework to achieve competitive advantage in your industry →



## Usability research

A set of research methods to study and optimize the usability of an innovation →

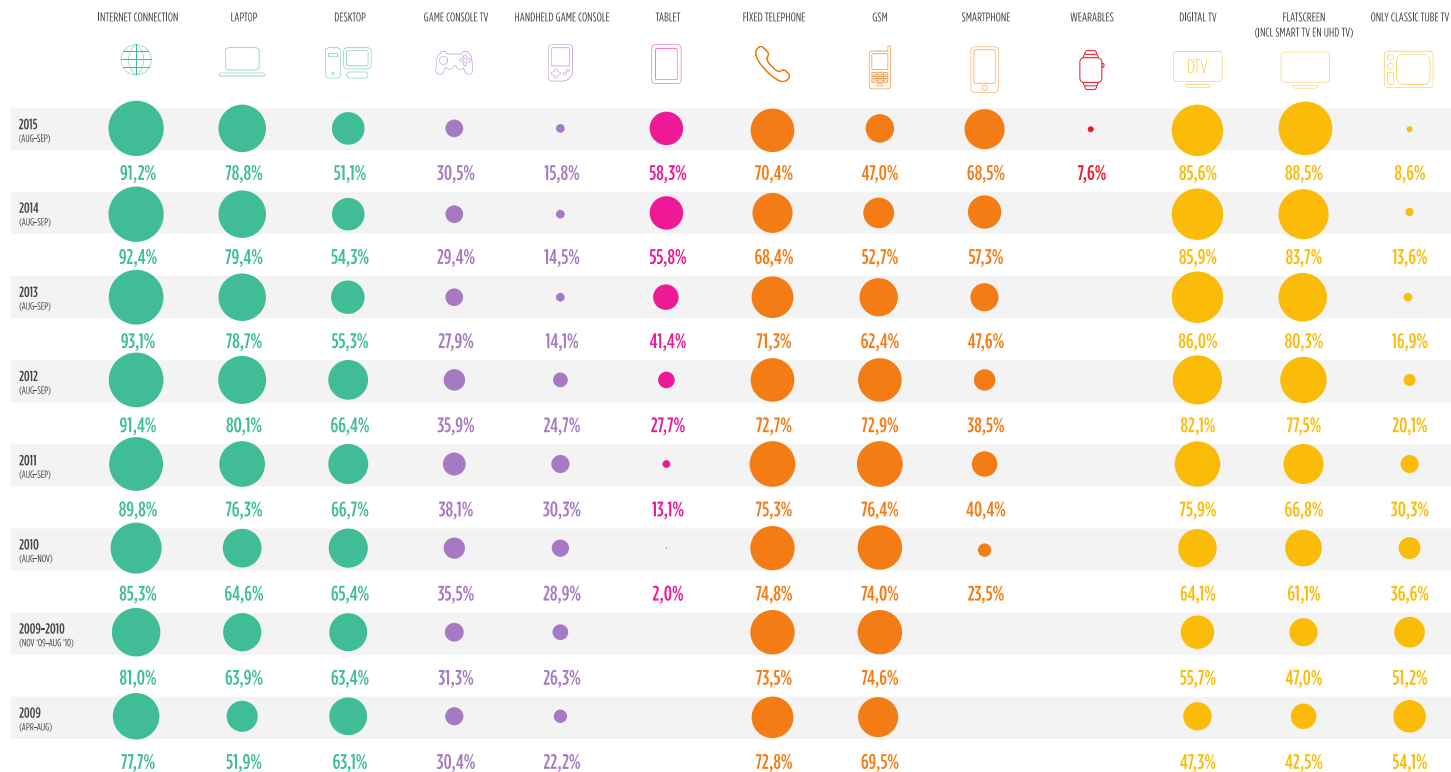


## Segmentation surveys

A survey-based method to identify customer segments based on a set of parameters →

...

# digiMeter



# APPLICATION PROTOTYPING

“A **PROTOTYPE** IS AN **EARLY** SAMPLE, MODEL, OR RELEASE OF A **PRODUCT** BUILT TO TEST A CONCEPT OR PROCESS OR TO ACT AS A THING TO BE REPLICATED OR **LEARNED** FROM.”

([HTTPS://EN.WIKIPEDIA.ORG/WIKI/PROTOTYPE](https://en.wikipedia.org/wiki/prototype))

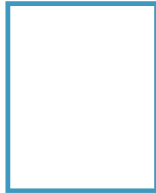
# FOCUS ON 2 ACTIVITIES

Prototyping



Tools for prototyping support





## PROTOTYPING



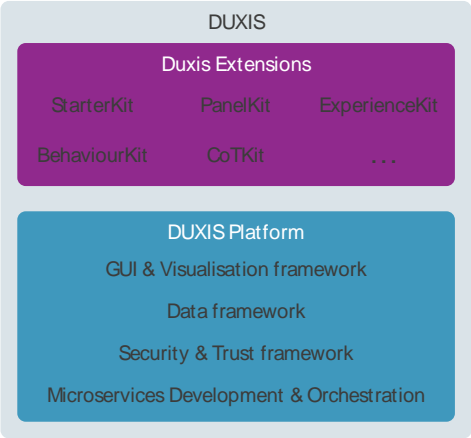
Transition	Prototyping service
Trends & technology => Idea	<ul style="list-style-type: none"> <li>• Technology scoping</li> <li>• Insights on tech state of the art</li> </ul>
Idea =>Concept	<ul style="list-style-type: none"> <li>• Proxy technology assessment (PTA) assistance</li> <li>• Scenario development assistance by spotting technological opportunities</li> </ul>
Concept => PoC	<ul style="list-style-type: none"> <li>• Identification of critical technological unknowns</li> <li>• Agile project management coaching</li> <li>• Functional PoC development</li> </ul>
PoC => Prototype	<ul style="list-style-type: none"> <li>• Architecture creation</li> <li>• Wireframes creation</li> <li>• Mockup creation</li> <li>• Functional prototype development</li> <li>• Agile project management coaching</li> </ul>
Prototype => Product	<ul style="list-style-type: none"> <li>• Architecture creation</li> <li>• Behavior measurement support</li> <li>• Real-time experience sampling support</li> <li>• Development coaching</li> </ul>
Product => Business	<ul style="list-style-type: none"> <li>• Agile project management coaching</li> <li>• DevOps consultancy <sup>36</sup></li> </ul>





# TOOLS FOR PROTOTYPING

# DUXIS TOOLSET



Measure user behavior in real time

Select panel members (test users) according to specific needs

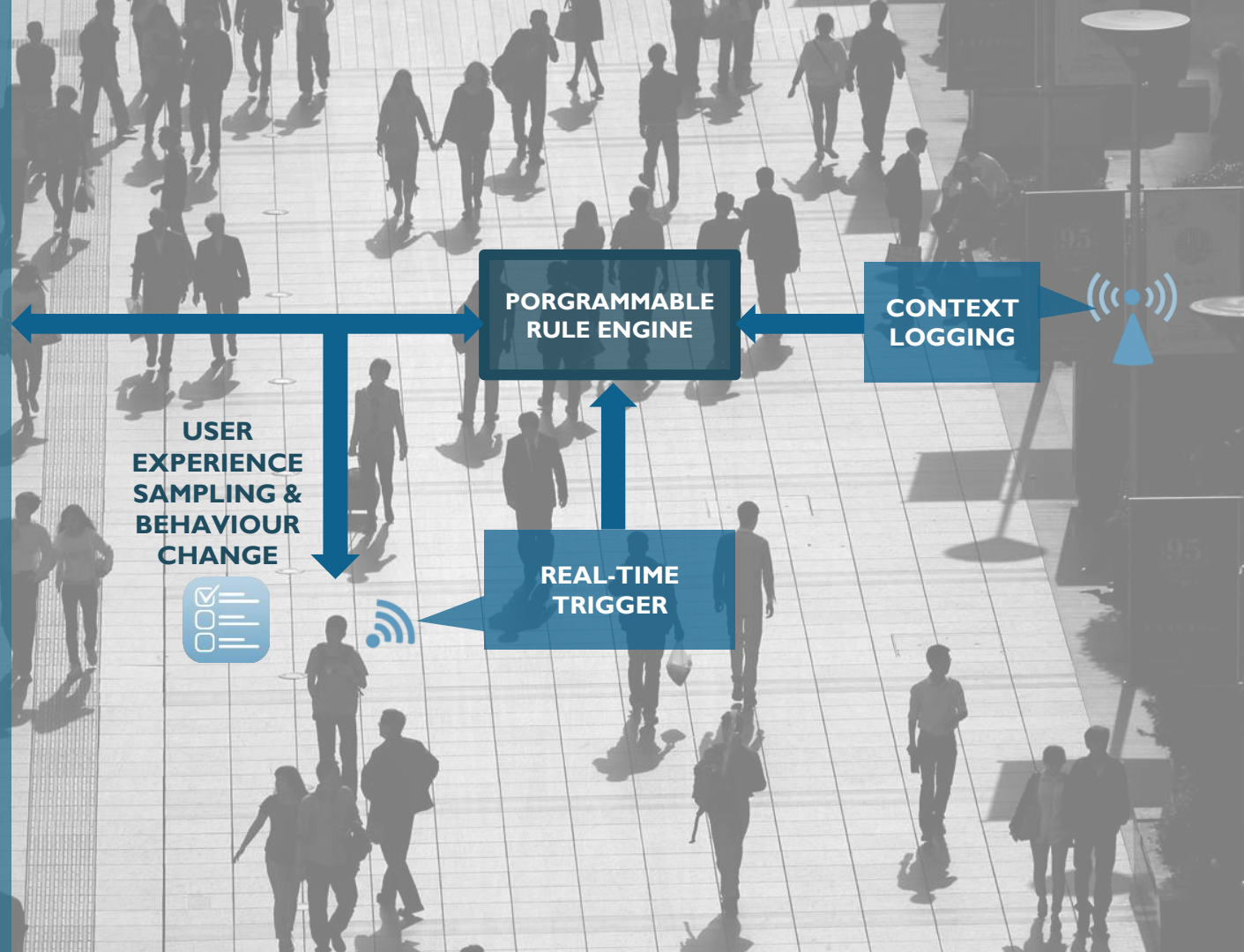
Motivate panel member participation

Make results easy to analyse

# REAL-TIME EXPERIENCE SAMPLING



USER EXPERIENCE & BEHAVIOUR DASHBOARD



# INNOVATION PLATFORMS

# INNOVATION PLATFORMS

- City of Things
- Krook

CITY OF THINGS

# INTERNET OF THINGS



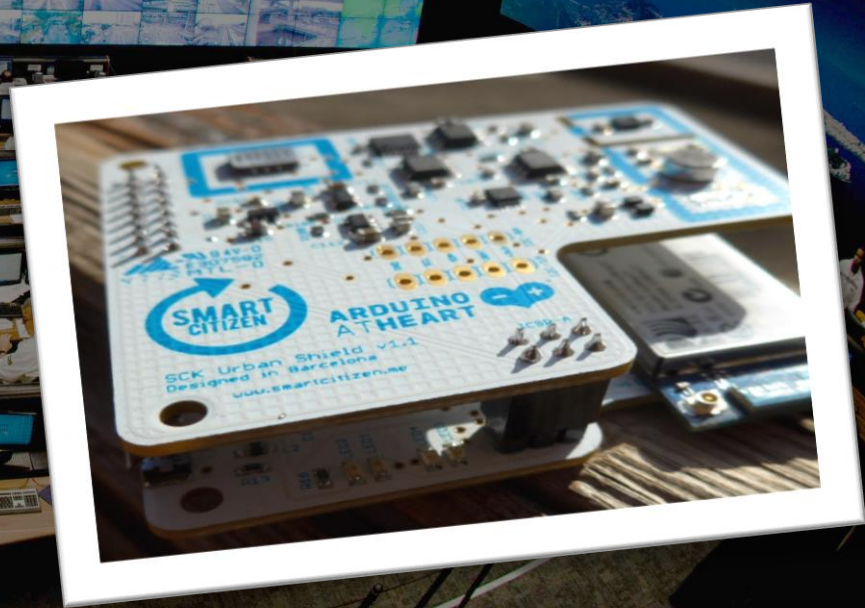
# CAN WE IMPROVE CITIES USING INTERNET OF THINGS TECHNOLOGY ?



# TOP-DOWN VS BOTTOM-UP



CENTRO DE OPERAÇÕES  
PREFEITURA DO RIO



# HOW TO MAKE A CITY “SMART”?

Top-down	Bottom-up
Centrally driven and controlled	Driven by citizens and companies
Efficiency is key	Diversity and relevancy is key
Can be too highly reliant on governmental and commercial control	Governmental and commercial control is optional
Privacy issues tend to surface	Can pose challenges in terms of economic sustainability and regulation

Government

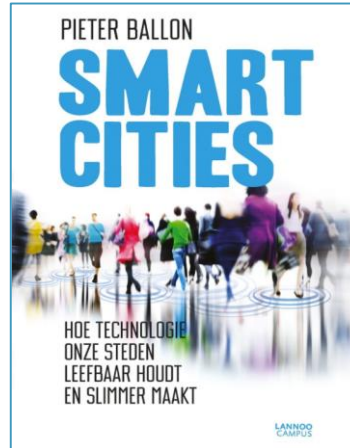
Citizens

Business

Research institutes



Smart City innovation platform





# City of Things - Antwerp


IoT reference **Living Lab** and **technology lab** in Europe

for **international** and **local** stakeholders

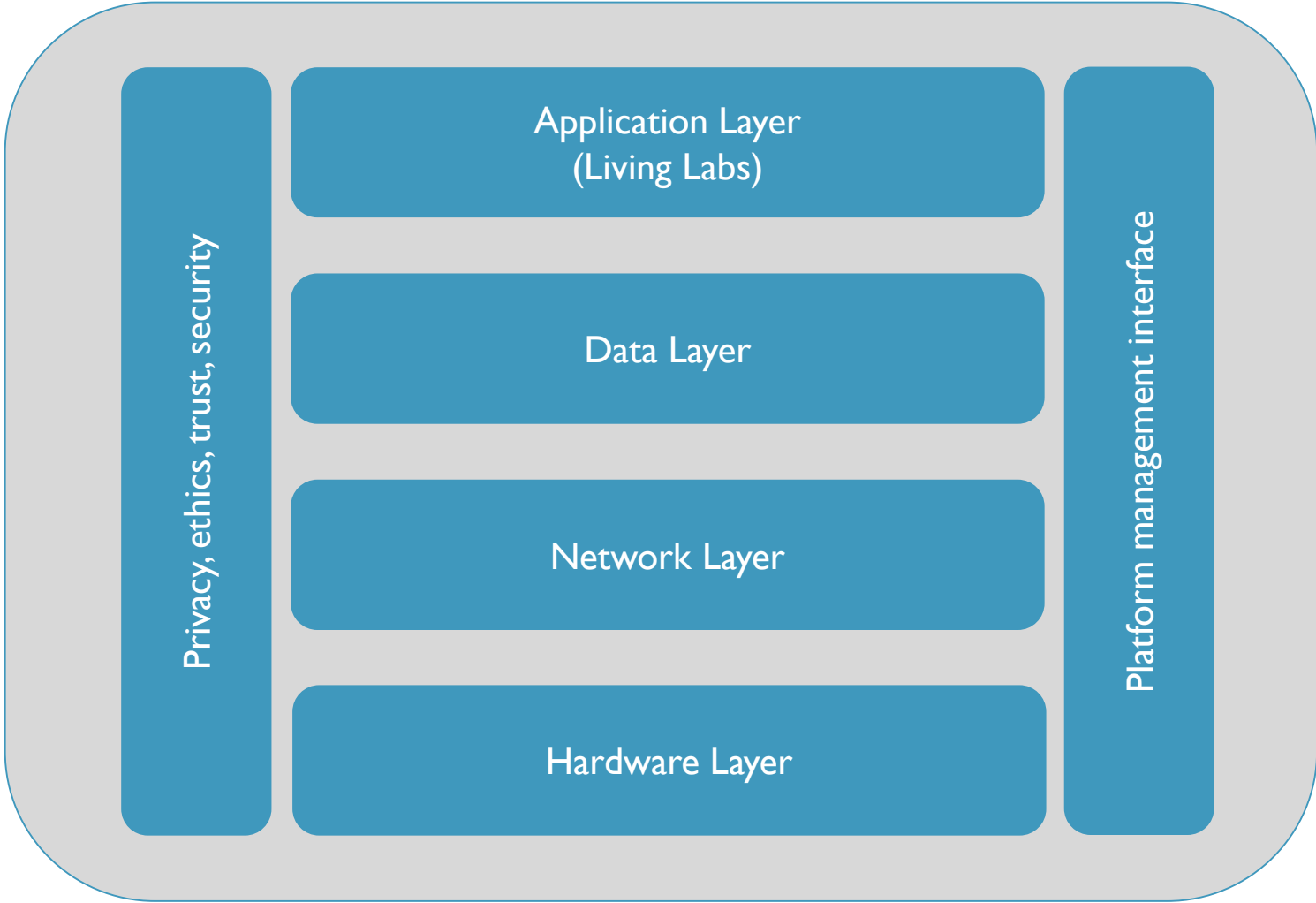
to **create, test and validate** IoT services, applications and technologies

in a **large scale, real life and real time** smart city environment

# CITY OF THINGS SERVICE OFFERING

- 
- 1 **Co-create** new IoT products and services with real prospective users
  - 2 Quickly **deploy** on the existing IoT testbed in the city of Antwerp
  - 3 **Validate** new IoT products and services in a **real-world** environment
  - 4 Leverage imec IoT hardware and software **expertise**
  - 5 Assess **privacy risks** of IoT products or services
  - 6 Guide Smart City IoT **Business model innovation**

CITY OF THINGS  
CONCEPTUAL  
STRUCTURE



# CITY OF THINGS CASES

SMART PLUGS

MEASURES ACTIVITY OF E-BOILER

CITY OF THINGS - VALIDATION

SWITCH OF ACTIVE E-BOILERS

REGULATION OF DEMAND

SWITCH OFF FOR 1 - 2 MIN  
LITTLE COST  
MINIMAL LOSS OF COMFORT

DEMAND > SUPPLY  
POWER SHORTAGE IMMINENT

TEMPORARILY DISCONNECTS  
INDUSTRIAL SITES

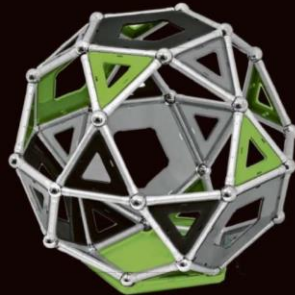
CITY OF THINGS

RESIDENTIAL FOCUS:





**50** Technology Fast 50  
2016 BELGIUM  
Deloitte.



## Het snelst groeiende technologiebedrijf van België is **REstore**

Gisteren maakte Deloitte de winnaar bekend van de Deloitte Technology Fast 50, de verkiezing voor het snelst groeiende Belgische technologiebedrijf. De trofee werd gewonnen door REstore: een Europees energie-technologiebedrijf dat slimme 'Demand Response-programma's' biedt aan verbruikers en cloud-based software aan energiebedrijven.



**Winnaar Deloitte's Technology Fast 50 2016, actief in Clean Technology**  
Vlr: Nikolaas Tahon (Technology Fast 50 Lead), Duco Sickinghe (Voorzitter Rising Star Jury – CEO Fortino)  
Rudi Thomas (Voorzitter van de Raad van Bestuur REstore), Piet Vandendriessche (CEO Deloitte Belgium)

Een initiatief van Deloitte in samenwerking met

PREVENTION

SUGGEST MEASURES

MAIN FOCUS ON NEIGHBORHOODS AT RISK



PREPARE FOR FLOODING

REDUCES WATER DAMAGE TO BUILDINGS

REDUCES LOAD ON THE FIRE DEPARTMENT

REDUCES LOAD ON EMERGENCY LINE 112

umec

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REAL-TIME MEASUREMENT OF SEWAGE WATER - LORA SENSORS

APPROPRIATE MEASURES

# INTELLOCITY: LAST MILE DELIVERY

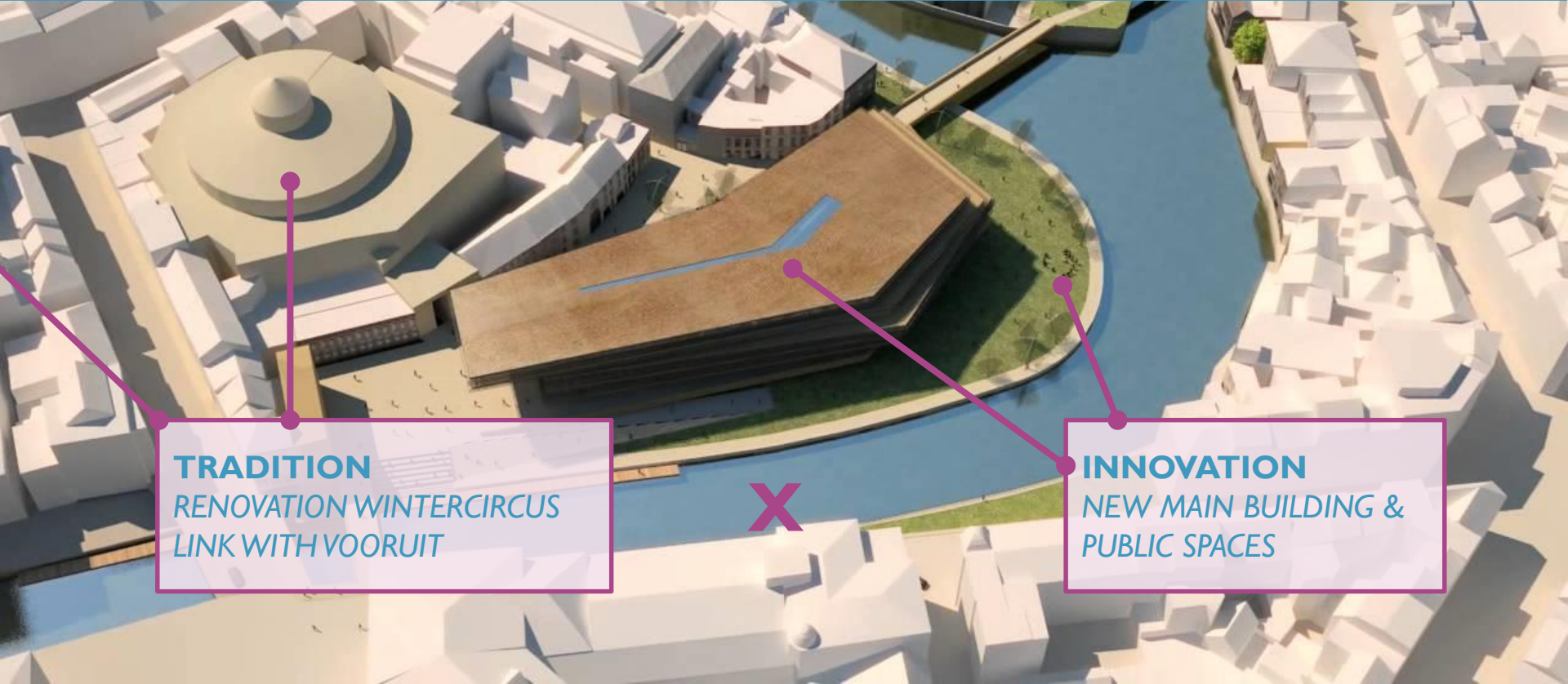
- With Vlaams Instituut voor Logistiek (VIL)
- Optimizing last mile logistics delivery through IoT track and trace

## B-POST

- Moving sensor infrastructure instead of fixed
- Data sent over LoRa every 10 seconds
- Data aggregation at certain locations in the city

DE KROOK

# De Krook as a site – a project enhancing the city's renewal



## **TRADITION**

RENOVATION WINTERCIRCUS  
LINK WITH VOORUIT



## **INNOVATION**

NEW MAIN BUILDING &  
PUBLIC SPACES

# De KROOK

Opening March 2017

Unique ecosystem in the building  
Quadruple Helix

## Public Services

*Stad Gent, Bibliotheek Gent, Digipolis, ...*

## Research

*UGent, IMEC, Hogescholen*

## Industry

Project-wise in residence (on Floor +4)  
vs (Trendwolves, GentBC, GentM, VOKA, Cultuurconnect, De  
Vooruit, Minard, Ministry of Makers, ...)

## Users

*+ 3000 engaged visitors daily*

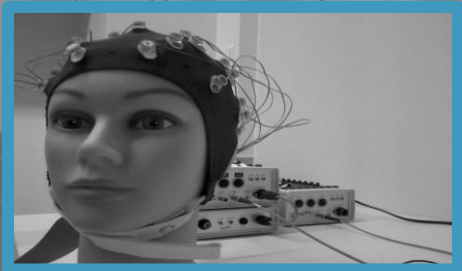


## CO-CREATION SPACE





# MEDIA EXPERIENCE LAB

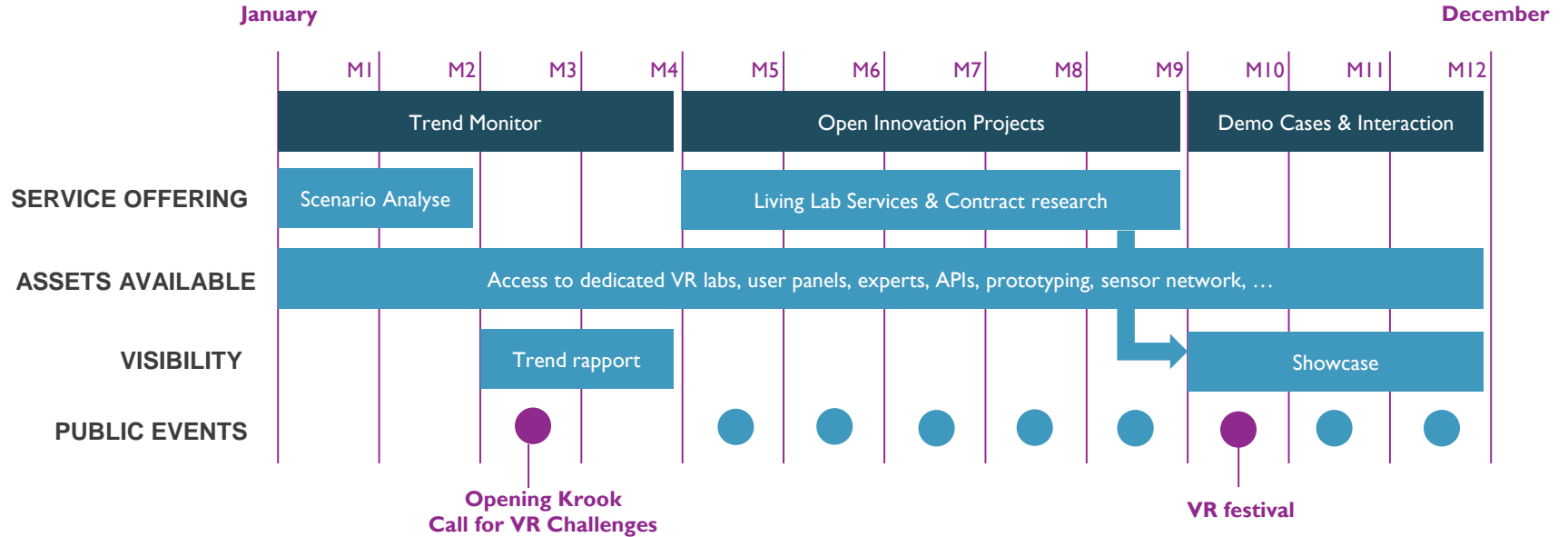


# IMMERSIVE SPACE – RESEARCH IN PRACTICE



# ANNUALLY THEMATICAL INNOVATION CYCLE

- 1<sup>e</sup> theme = virtual reality



# COLLABORATIVE SITUATIONAL AUDIO

VR/AR CYCLE



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