Creating digital urban interactions. The Industry landscape and market analysis.

UrbanIxD Industry Report Summary

28/11/2014

Telecom Italia Future Centre

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FOREWORD

The UrbanIxD Project is a FP7 coordination action project, running from 2013 to 2014, for the European Commission under the Future and Emerging Technologies programme, which aims to define a coherent multidisciplinary research community working in a new research and/or application field called Urban Interaction Design.
The present work is framed in the Industry Landscape & Liaison work package of the UrbanIxD project in charge of Telecom Italia and with the main propose of assess the current state of commercial activity and players, discussing the value for the industry to invest in this field, describing the biggest challenges, and identifying the most promising outcomes.

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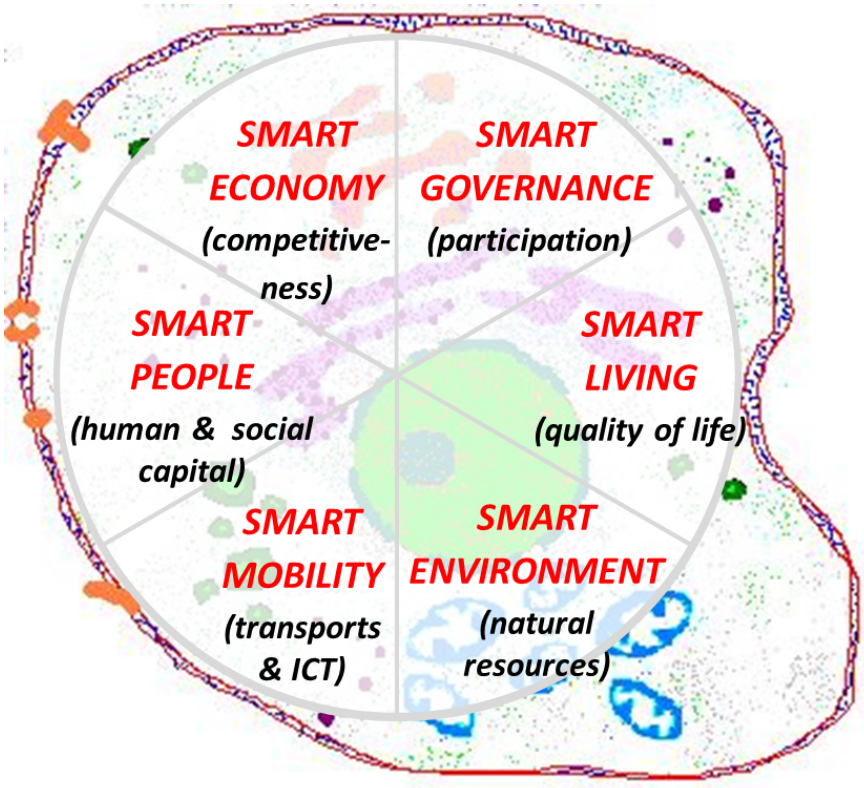
INTRODUCTION

Urban Interaction Design (Urban IxD) addresses the question of how we, as physical beings, will interact with the technologically augmented, data-rich urban environments that increasingly characterize cities. As an emergent field very little analysis have been conducted so far from the point of view of the Industry. In the present work we describe the Industry landscape, briefly introducing the main approaches to the Smart Cities and discussing the need to a new approach. In order to better seize this field, we conducted a survey making direct contact to over 100 experts worldwide and assessed their opinion on several aspects related to the introduction of IxD to innovate the urban context. The result is the first to our knowledge market analysis in this field, covering issues and opportunities and describing some successful best cases already drawing upon it.



The Smart City as a complex living organism. Ri-elaborated from [TU WIEN, 2007].

THE TREND TOWARDS THE SMART CITIES

The trend towards urbanization is well known. More than two-thirds of the global population is expected to live in urban contexts by 2050. Nowadays estimations are saying that 80% of global GDP is generated in cities. Market revenues from technologies and services needed to make Cities “Smart" will grow from $8.8 billion annually in 2014 to $27.5 billion in 2023 (Smart Cities, Navigant Research Report, 2014).
Smart Cities are a complex organism addressing several functional areas, touching governance, living, environment, mobility, people, economy.

The global trends for making Smart Cities a reality are:

- In North America, projects often focus on a single functional area, with structured programmes from big industrial players, such as, IBM, Cisco and Siemens. Currently is the market generating more revenue.
- In Europe, the is focus on energy and entrepreneurship & human capital policies; it is expected a market growth after recession with slowly increasing investments in infrastructures to improve public facilities
- In APAC and MEA, projects are based on creating new infrastructures, rather than replacing legacy systems - the so called Smart Cities from scratch; nowadays, it represents the most attractive market for the players operating in this market because of their high investments in the Smart Cities projects

Currently, there are several big players acting in this market, the major ones being IBM, Alcatel-Lucent, Accenture, ABB, Cisco, Cubic, Honeywell, Intel, Siemens and Oracle.

THE NEED FOR URBAN INTERACTION DESIGN IN THE SMART CITY

As presented in the former paragraph the approach to Smart Cities is weakly addressing the whole wicked problem [KORSGAARD H., 2013], as it presently and more commonly starts either from a technology available solution, a policy recommendation, or from scratch project that is not directly involving the user of the city.

Question	Technology	People	Design
"Technology is the answer. But what is the question?"	"The most profound technologies are those that disappear. They weave themselves in the fabric of everyday life until they are indistinguishable from it."	"We don't make cities in order to make buildings and infrastructure but to come together, create wealth, culture, more people."	"Design is the difference between having a digital project in a lab or out in the real world."
			
[Cedric Price, Architect]	[Mark Weiser, Computer Scientist]	[Dan Hill, CEO]	[Lord Inglewood, House of Lords, UK]

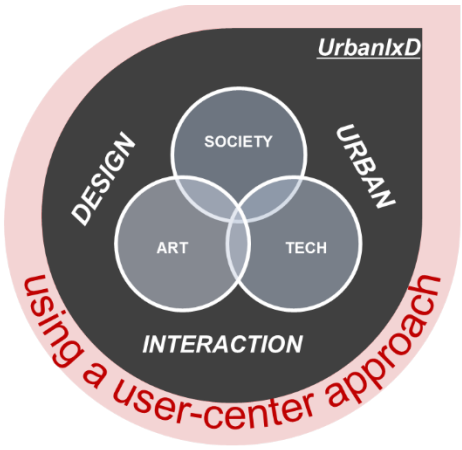
Urban Interaction Design can explore what is needed from the user point of view, which technologies can be used and how to humanize them, and finally how to design an answer.

The use of design into the creation process has been proved effective in terms of return on investment: according to a UK Design Council research in 2008, the most commonly reported rate of return from Great Britain companies calculating a % return on design investment was 15%; yet in Great Britain an average design investment has been calculated to multiply the turnover by 2.25 when compared with the invested resources (2007); in the USA companies who effectively invest in industrial design outperform their competitors by 75% on net sales and have increased profits (2005); in Denmark companies investing in design have gained a growth 22 % greater than companies that have not invested in design, and the difference will rise up to 40 % when talking about continuous investing (2003).

We have also to bear in mind that people living in the cities, the "Urbanes", have a different attitude as for their consumer approach: the lifestyle of urban Chinese consumers has changed from a "survive" mentality to an "enjoy life" one, with 54% now pursuing a more fun lifestyle according to a GfK Roper study (2010) and that the average Manhattanite household spends 59% of their USD 13,079 food budget on dining out, compared to the average American household that spends only 42% of their USD 6,514 food budget on dining out (source: Bundle, May 2010).

Urban IxD draws upon knowledge and approaches from a range of disciplines involved in the design of urban spaces, connecting them and establishing their interactions as a principle. It is also rooted in the wider field of IxD, from which it takes much of its emphasis on behaviors at the human scale, putting the user and the citizen at the center of the process of creating services, products and solutions in networked urban spaces.

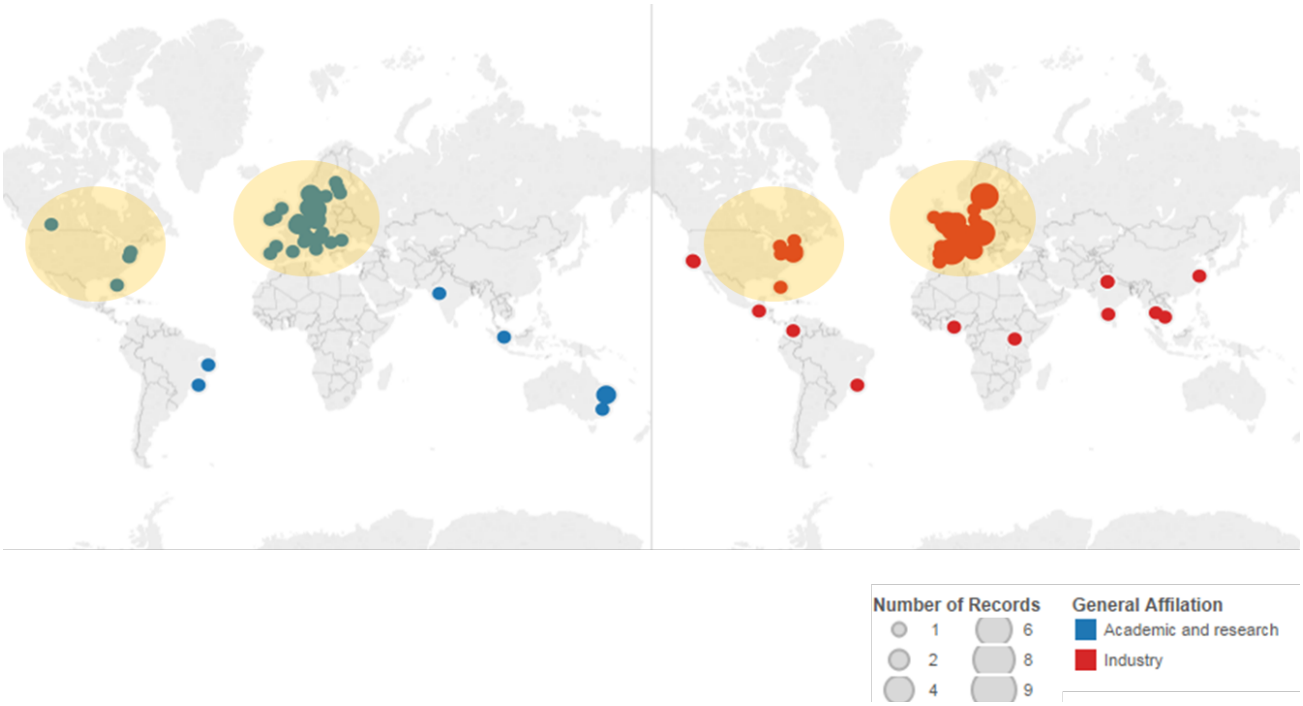
Urban IxD pillars, as seen in terms of clusters of traditions, rely on Arts, Society and Technology [BRYNSKOV M., 2014]. The collaboration of these fields produce results in the interaction, urban and design domains, all having a user centric approach.



Urban Interaction Design approach based on Arts, Society and Technology

URBAN INTERACTION DESIGN BRINGS DISRUPTION

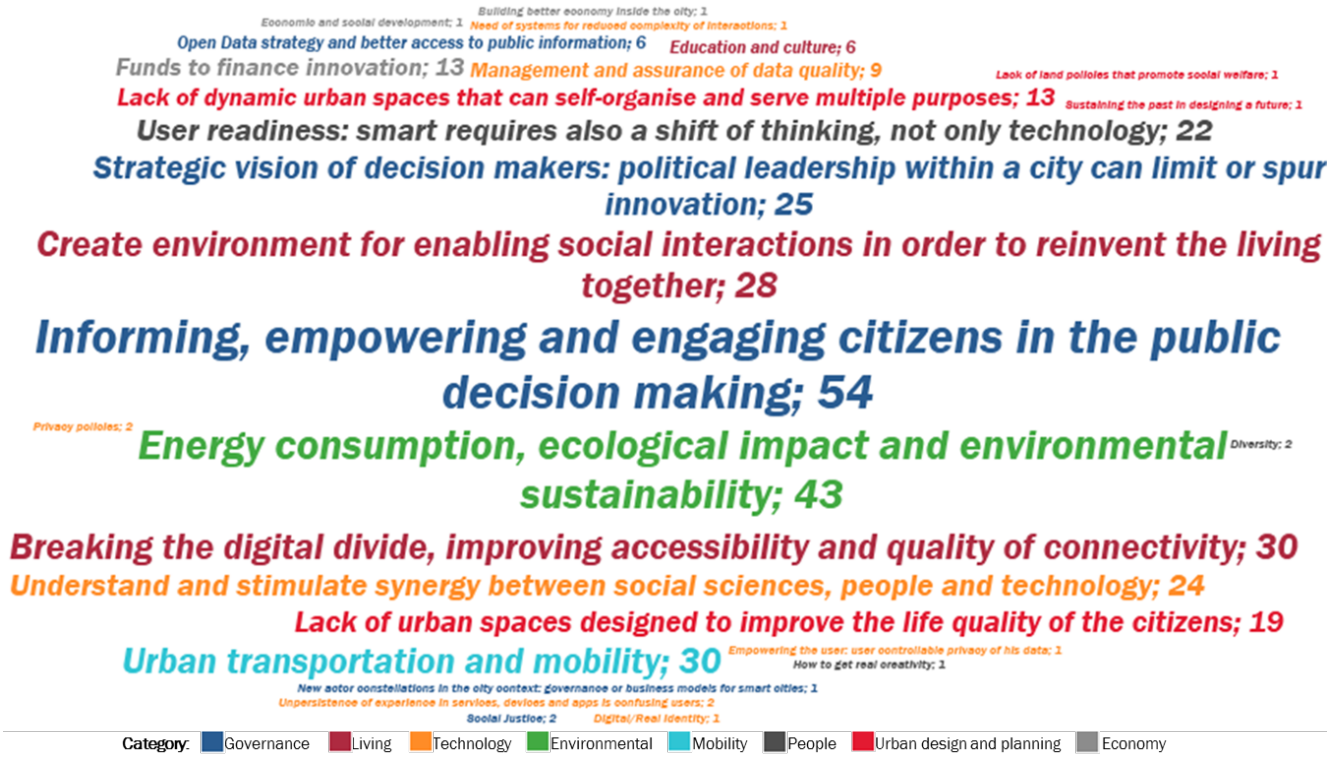
An online survey was instrumented to answer some of the questions arising after the Industry landscape study onto Urban IxD. It was deployed in two phases. The first one was conceptualized as an exploration phase whose main target was to assess the general opinions of the extended community involved and related to the project in the subjects of interests. The second one, which was based on the information obtained in the first stage, was aimed to add an important non-probabilistic but quantitative sense to the consultation, increasing the survey samples and converging the wider ideas gathered in the early phase. The survey reached 122 respondents worldwide mainly in Europe (70%) and North America (13%). Most of them are Industry affiliated (57%). The survey run between February and May 2014.



The Urban IxD survey respondents' general affiliation and location.

Urban IxD is definitely an emerging field, currently more acknowledged in the academic & research ambit than in the industry one, putting in evidence the importance of generating and spreading information about it.
From our survey we learned that about 25% of the consulted respondents affirmed to be familiar with the term Urban IxD, not being sure of the meaning.

The main concern expressed by the Industry for innovation in the Smart City addresses the smart governance characterized by informing, empowering and engaging citizens in the public decision making. Academics & researchers are mostly concerned about technology and how it interacts with humans being.
Both communities agree that improving the quality of life (smart living) is one of the most important issues. These statements highlight the relevance of the Urban IxD in creating a Smart City since they insist on the three main components of this field: society, technology, design & art.



Clusters of the main concerns for innovation in the Smart City (number of mentions).

It is a common thought that the major challenge today for Urban IxD is the lack of information, knowledge and trainings available. It is key for the development of this field to really understand it and make it understandable for others, it should become a concept that instinctively everybody could get on the urban life.

From the point of view of the perception of the field in the Industry, a shift of mentality is required. The lack of awareness of the value and contributions that IxD can bring in different sectors and the difficulty to prove the financial benefits early in the project, are two key factors to overcome for its implementation. Urban IxD is often considered a “nice to have” but not a “must have”

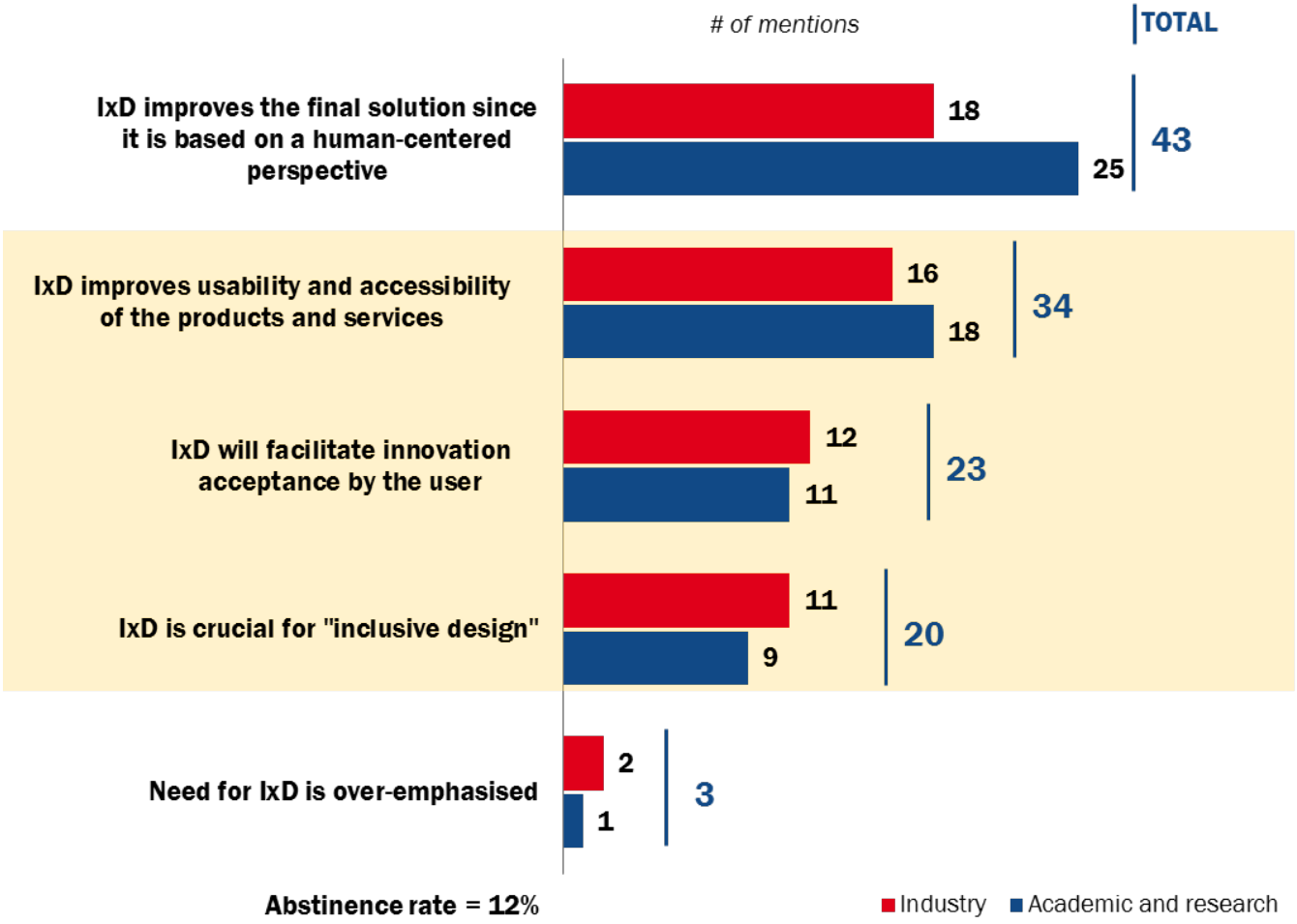
According to our respondents the greatest challenges to the adoption of IxD best practices in the Industry are related to budget, deadline constraints and lack of involvement of the final user on the early stages of the design process
Nowadays, it seems to be more popular the implementation of IxD fundamentals in the private companies, while public offices seem to be more keen on a top down approach for decision making, with occasional public

consultations. According to our respondents, this last point is, in fact, the most important issue to tackle for a Smart City to take off. Here it comes the importance of positioning Urban IxD in a way that is understandable for city governments and decision makers.

Urban IxD is recognized for its human-centered approach and methodology more than for its clear boundaries, which are still in definition.
The use of IxD on the development process of products/ services brings some positive impacts:

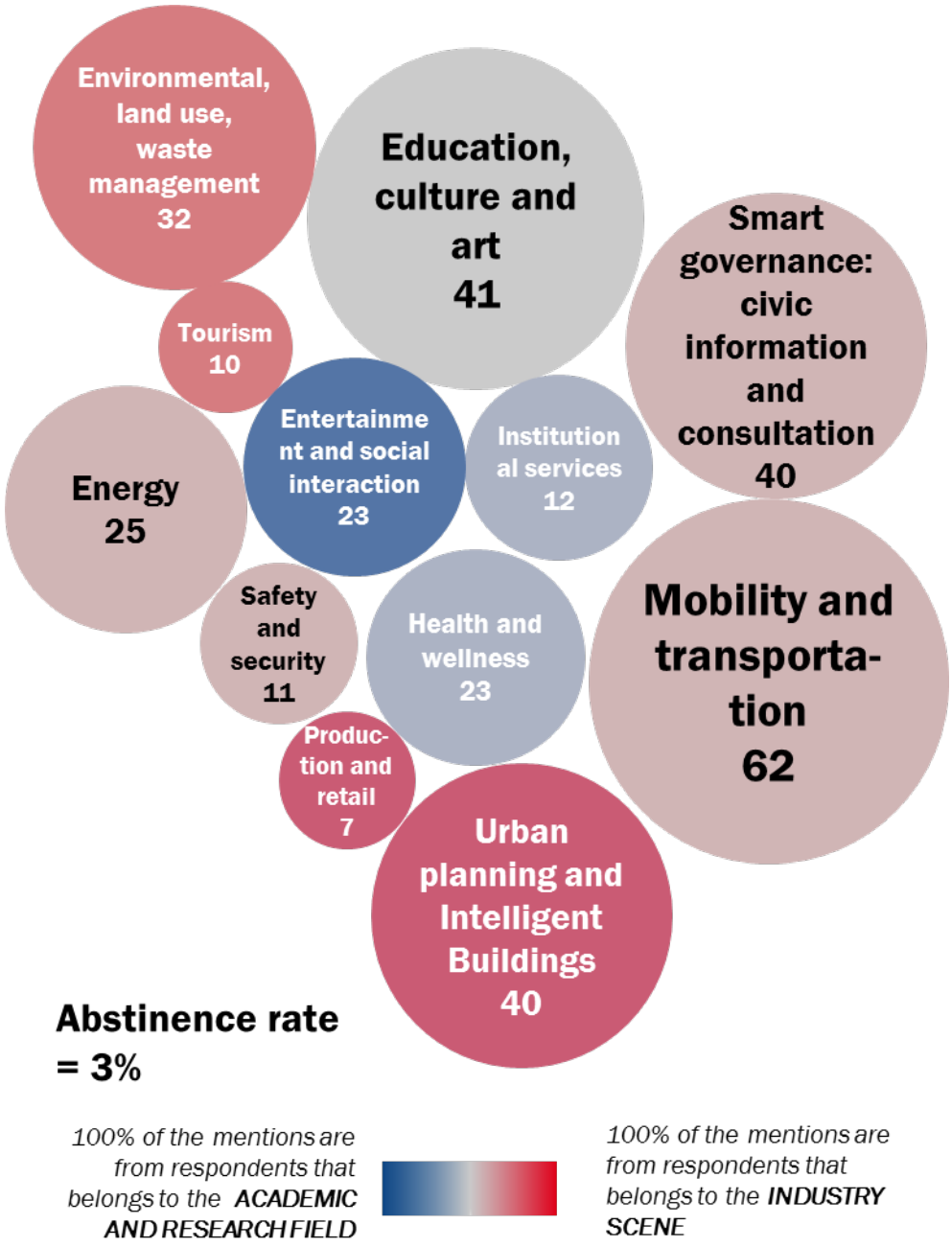
- it drives and facilitates innovation acceptance
- it improves usability and accessibility
- it is key to generate an "inclusive" product

One of the most relevant aspect of Urban IxD is that it can support bottom up innovative solutions for the Smart City.



Why IxD is perceived as important or not to the development of urban products and services.

It is clear for our respondents that all application areas could benefit from the use of IxD, being the more popular ones "mobility/transport", "education, culture and art", "governance", and "urban planning and intelligent buildings".

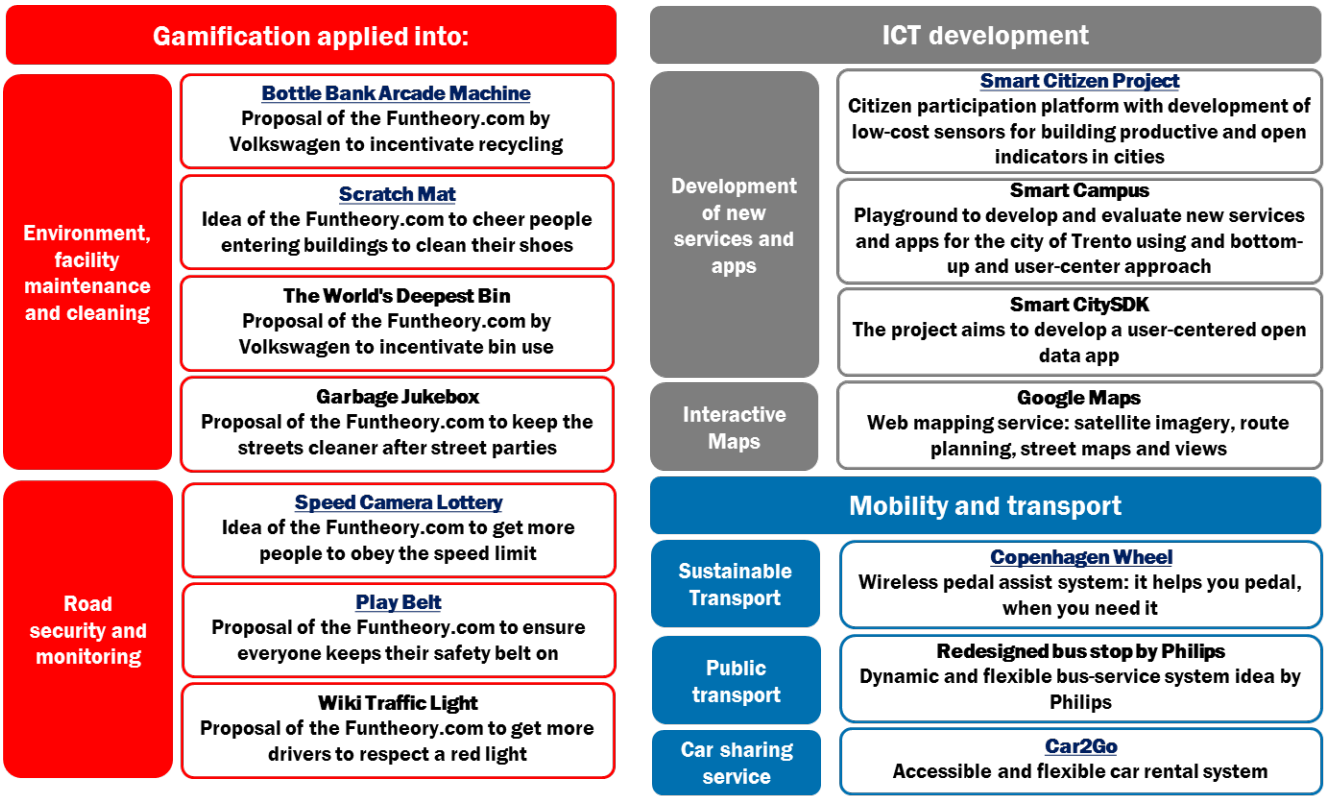


Application areas that most benefit from IxD. The bubble size depends on the number of mentions received and color is tied to the respondent's affiliation.

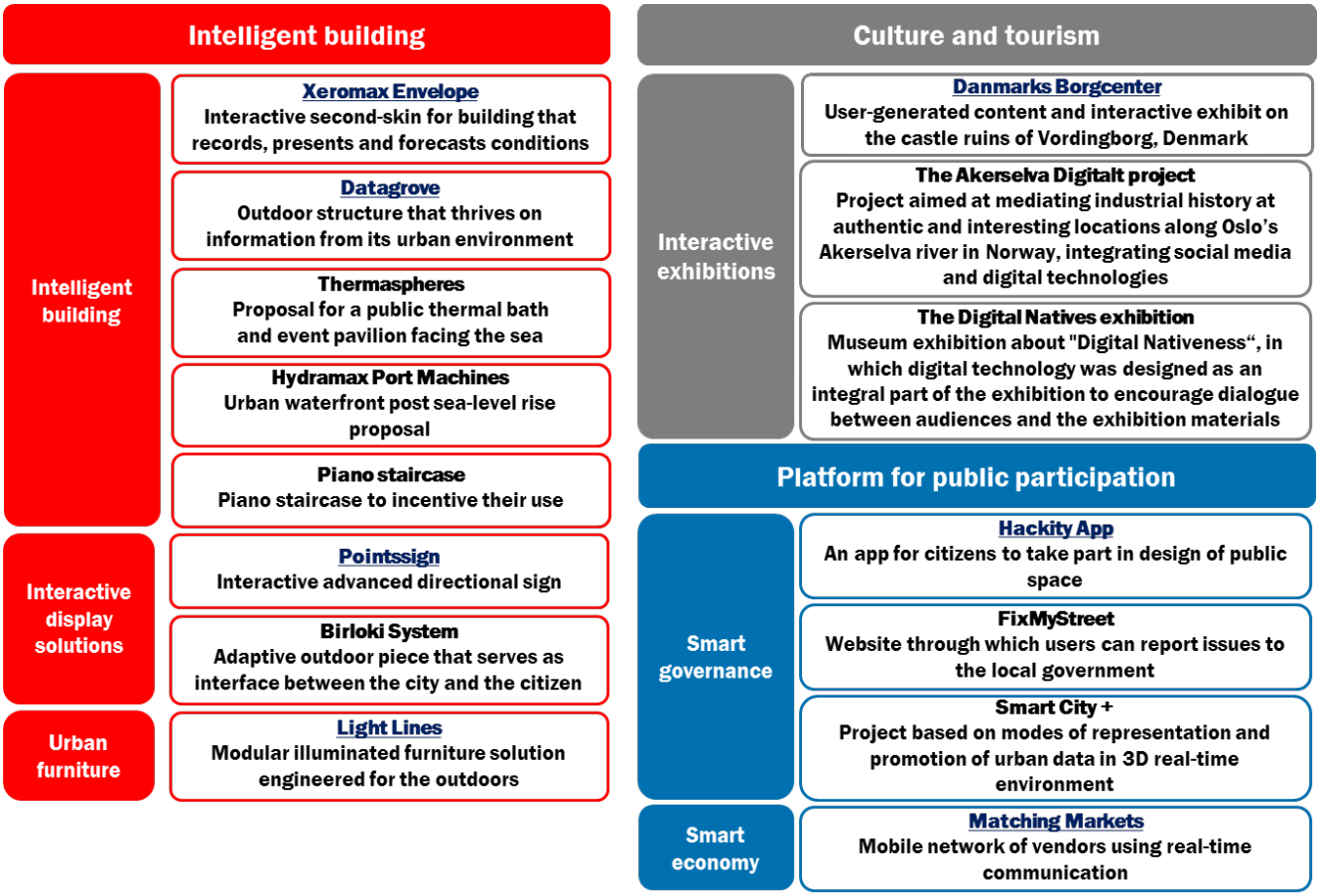
Respondents agree that even when the inclusion of IxD will bring changes on the project cost structure also it will have a positive impact on the final result, such as, client satisfaction and higher sales. Specifically, the most popular believe is that the adoption of IxD brings higher upfront investment, but potential cost-savings in the long-run.

BEST CASES WHERE URBAN INTERACTION DESIGN HAS BEEN APPLIED

The survey was also aimed at identifying the most relevant solutions where the respondents acknowledge an approach drawing from Urban IxD. We received more than a hundred cases, but not all of them were really complaint to the general scheme shown before, thus insisting on the three pillars of the Urban IxD - technology & data, society, design & arts - and showing a user-centered approach. Therefore we pruned the list down to 29 best cases, clustering them according to the following areas: civic gamification, ICT development, mobility & transport, intelligent building, culture & tourism, public participation.



Mapping of the most relevant best cases of innovative solutions for the Smart City with a Urban Interaction Design approach. (first part).



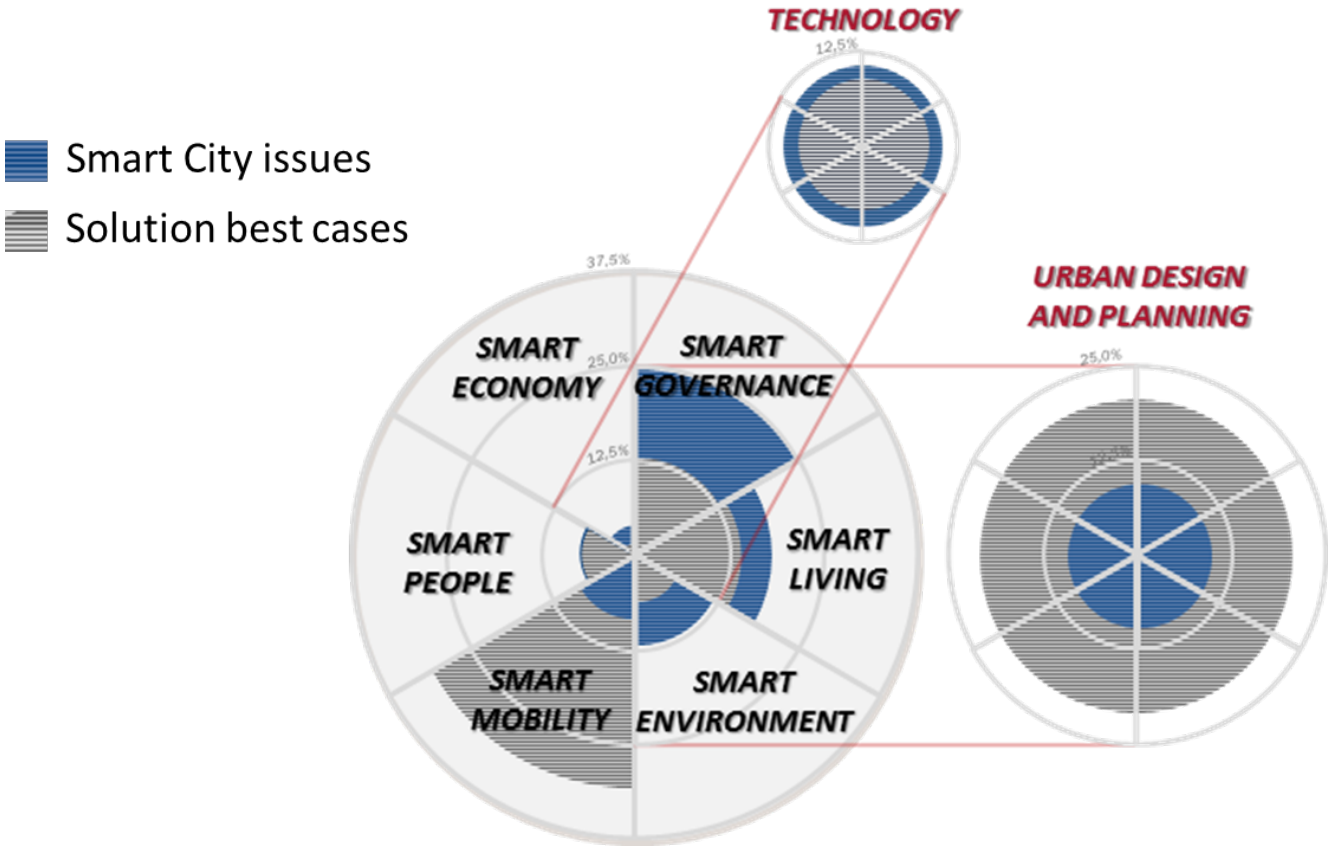
Mapping of the most relevant best cases of innovative solutions for the Smart City with a Urban Interaction Design approach (second part).

The most representative examples of the application of Urban IxD in the Smart City context were found on intelligent buildings, including public interactive displays and smart furniture, the use of gamification to nudge people toward better behaviors, platform for public participation, both governance and economy oriented, interactive exhibitions for culture & tourism, sustainable solutions for mobility and transport.

MARKET OPPORTUNITIES TO BE FURTHER ANALYZED

By confronting issue occurrences for innovation in the Smart City to the existing solutions for the same category, we identified some area of opportunities. The assumption made here is that those areas where few solutions were suggested require more attention and effort in terms of future developments. These areas fall in the categories of smart governance, living, environment,

where the percentage difference in issues and solutions identified in the survey is correspondingly 25% to 13%, 18% to 14%, 12% to 6%.



Percentage mapping of known innovative solutions (in blue) with a Urban IxD approach vs suggested issues (in grey) in the Smart Cities, as stated in our survey.

CONCLUSIONS

In order to push the adoption of Urban IxD best practices all research and innovation projects related to the Smart City should include IxD as one building block in their work plan. The main idea with this action is to make Urban IxD a "must to have" instead of "nice to have", starting from European funded projects.

Anyway to support the European Commission to set the former requirement Urban IxD must be prior to it recognized by the scientific and industry community as key element. Thus strategic support should be created to nudge academic bodies to create papers, books, training and education courses. The main idea with this action is to spread the knowledge about the field of Urban

IxD, starting from its theoretical and empirical foundations and finally reaching out the main stream within industry and society.

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UrbanIxD: Designing Human Interactions in the Networked City

Coordination Action project, funded by the European Commission under the FP7-ICT Work Programme 2013. Project Number: 323687