CIB and SPARCS webinar, June 29th

Welcome, Don Ward, CEO, CIB

What is a smart city, Dr. Miimu Airaksinen, CIB TG88, CEO, RIL

Designing and implementing Positive Energy Districts, Dr. Francesco Reda, SPARCS coordinator VTT

Intelligent and Responsive Buildings, Prof. Derek Clements-Croome, Reading UK

Smart Construction Process, Prof Geoffrey Shen, Chair and Assoc. Dean, The Hong Kong Polytechnic University
What is a smart city?
Dr. Miimu Airaksinen, CEO at Finnish Association of Civil Engineers RIL
Urbanisation is a big megatrend

- 54% of the global citizens are living in cities and the trend is increasing (78% in Europe)
- 70% of the GDB is created in cities (85% in Europe)
- 90% of all innovations are created in cities
- At the same time over 70% of all CO₂ emissions are originated from cities
- Need for smart buildings and infrastructures to support sustainable and convenient living and working in cities
Cities benefits:
• The ability to share inputs and infrastructure, such as roads, rail and street lights
• The ability to recruit from a deep pool of workers with relevant skills
• The ability to exchange ideas and information, known as ‘knowledge spillovers’

Source: ONS Business Demography Database
The economic losses caused by weather- and climate-related extremes in the 33 European Environment Agency member countries between 1980–2016 was over 450 billion euros.

Main reasons were:

- floods ~40%
- storms 25%
- droughts ~10%
- heat waves ~5%

The insurance coverage is 35 %.

Regarding impacts on human health, heat waves are the deadliest.

Why smart buildings and infrastructures are important? Because of resilience
Forecasting and preventing sensors inside structures and monitoring outdoor conditions early warnings based on evidence
THE URBAN COMPETITIVENESS MAZE

Standard of living/quality of life

Employment rate

Productivity

URBAN PERFORMANCE

Top-down sectoral trends and 'macro' influences

Company Characteristics

The Business Environment

Capacity for innovation and learning

Source: Begg I. (undated), Cities and Competitiveness
Efficiency = \frac{Quality of Life}{Environmental pressure \times Use of Resources \times Costs}
What citizens want?

People are adaptable

- Privacy
- Green, blue areas
- Services close
- No time-consuming commuting
- Affordability
- Open space
What kind of city and to whom?

• Existing buildings and infrastructures in cities
• Long life span of buildings and infrastructure
• We are designing city structures for inhabitants who are not even born yet!
• Adaptability of buildings and infrastructures
Adaptive and context aware cities are resilient
Everything is connected
Every second 127 devices are connected to the internet
Real time construction site management and digital construction

Cloud system

Automatic schedule update

BIM model automatically updated

Mobile robot

Quality inspection

Progress automatically monitored

Project Team

Laser scanner

Drone with camera

Kuva O Seppänen Aalto Yliopisto
City-wide data must generate real insights (resilience)
Combining data from different sources

Since many systems are connected the decision making and leadership processes need to change.

In addition, the business models are in transition (many stakeholders, new ecosystems)
Services

Future services like Living as a service

Just like a garden, the services are changing their color and form and they are perceived differently by different persons. Need for evolution of services.
CIB and SPARCS webinar, June 29th

Welcome, Don Ward, CEO, CIB

What is a smart city, Dr. Miimu Airaksinen, CIB TG88, CEO, RIL

Designing and implementing Positive Energy Districts, Dr. Francesco Reda, SPARCS coordinator VTT

Intelligent and Responsive Buildings, Prof. Derek Clements-Croome, Reading UK

Smart Construction Process, Prof Geoffrey Shen, Chair and Assoc. Dean, The Hong Kong Polytechnic University