BIM Digital Twins for sustainable design of smart cities

Brussel, 17.01.2019 Tone.Stanovnik@spica.com
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Agenda

Challenge

Advantage

Solution

BIM – Digital Twins project
TOP3 Challenges

SQUEEZED IN BETWEEN TWO DOMINANT INTERNET WORLDS, EUROPE MUST STRENGTHEN ITS ICT INDUSTRY

Market capitalization of the top 20 internet firms [2014; USD bn; %]

**Europe**
- Current share of market capitalization of the top 20
- Target 2025: 13%

**USA**
- USD 1,500 bn
- 83% of the top 20’s market capitalization

**Asia**
- USD 300 bn
- 17% of the top 20’s market capitalization

**TERRA NUMERATA**
- European and national initiatives must be coordinated: Juncker plan, Horizon 2020, Digital Agenda, Platform Industry 4.0, etc.

Source: Roland Berger
TOP3 Slovenia Advantages

1. Small country
2. Living on the edge
3. The only permanent thing is Continuous Changes
TOP3 BIM Advantages

1. Ability to impact cost and performance
2. Cost of design changes
3. Drafting-centric workflow
4. BIM Workflow

Effect Cost/Benefit

Preliminary Design Detailed Design Construction Documentation Construction Operation

Knowledge Plan Design Build Operate

Repository approach Traditional approach

25% of a building’s life cycle cost is financing and construction.

75% of a building’s life cycle cost is operational.

CABA building life cycle costs are based on U.S. data.
BIM Digital Twins Project

- Expand BIM specifications with:
  - object performance data,
  - environmental impact data
  - health impact data
- Explore sufficient level of details in description of entities
- Create link between the data that sensors are gathering to BIM data structure
- Create and extend interfaces for specific building products
- Improvements of
  - open source IFC
  - proprietary BIM interfaces
  - converters in expanded BIM
- Develop a user platform to share experiences and data related to BIMs
- Explore the platform for further BIM object future ideas
BIM Digital Twin STACK

BIM

CLOUD

IoT Zone Infrastructure

Sensors
Infrastructure

Azure

Processing service
SQL DB
API
Revit

mqtt

ZoneSpot

Bluetooth

ZoneSpot

Bluetooth

Bluetooth

Blockchain
IoT ZONE Infrastructure
BIM
Thank you for your time.