Hexagon: Shaping the Future of Smart Cities

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An introduction to Hexagon – a global leader in information technologies
MISSION
Hexagon is dedicated to delivering actionable information through information technologies that enable customers to shape smart change across diverse business and industry landscapes.

VISION
Hexagon aspires to play a leading role in the effort to solve the challenges our world is facing by providing groundbreaking information technologies that make a positive and lasting impact.
WHAT IS HEXAGON?

Hexagon is a leading global provider of information technologies that drive dynamic decision making across industrial and geospatial applications.

Head offices in Stockholm and London
Turnover of close to 2.5 billion EUR
Shares listed on Nasdaq Stockholm

More than 15,000 employees in over 40 countries
More than 3,300 employees engaged in R&D
More than 3,200 active patents in patent portfolio

2.5bn EUR turnover
11% of net sales invested in R&D
8% long-term growth
above 20% operating margin
The Hexagon Advantage

Shaping smart change with information technologies
Fuelled by information, Hexagon’s information technologies are a driving force behind many of the transformative solutions shaping our future.
Fusing the real and digital worlds

Fusing the real and digital worlds delivers dynamic data and actionable information

CAPTURE
(as-is/as-built)

REAL World

DIGITAL World

ACTION
(as-planned/as-designed)
Shaping change in some of the largest and most vital industries in the world...

- Energy & Utilities
- Automotive
- Safety & Security
- Aerospace & Defence
- Infrastructure & Construction
- Surveying
- Industrial & Manufacturing
- Other Industries
Digital City / Safe City / Smart City
Core Competency

- Sensor Integration
- Mobile Workforce Management
- Standard Operating Procedures
- Integration to other Enterprise Systems
- Image Capture, Processing & Analysis
- Automation of Manual Work Processes
- Real-Time Data Management

GIS
Hexagon’s Smart City DNA

Smart Safety & Security

Smart Utilities

Smart Transportation

Integrated Operations Command Center

Digital City
Renaissance 2.0
A smart co-design methodology

As in the Renaissance ("Rinascimento" in Italian) it was conceived the ideal city, Renaissance 2.0 is proposed as the methodology for the “ideal” Smart City. Renaissance 2.0 presents itself as essentially Socratic method, which was developed to help identify a shared vision of the “New” Town. This vision - in which the innovative paradigms of Smart City are applied in accordance with the traditions and vocations of the territory - is expressed by administrators and citizens and implemented in the project.

To set a good Smart City project, it is necessary to identify a shared Smart Engine, which is a factor that let an investment to be sustainable and compatible with the Genius Loci of the city.

The credibility and reliability of the financial plan of the project will be a major factor in the awarding of the public funds (i.e. HORIZON 2020 funds).
According to the Italian National Digital Agenda, a Smart City is composed of 9 domains:

1. Mobility, Transportation and Logistics
2. Energy and Housing
3. Tourism and Culture
4. Environment and Natural resources
5. Urban Safety & Security
6. Intelligent Health Care
7. e-Education
8. Public spaces and social inclusion
9. e-Government

The 9 domains interact with 4 tipology of fruition figures/users:

a. Institutional operators
B. Private traders
c. Tourists
d. Citizens
The model identifies no. 36 Compound Areas, each of which containing the problems of particular intersection domain/ user. For every Area, the project must find the solutions (at territorial, regulatory, organizational, structural, infrastructural level) to the identified problems. Each solution must be accessible through a dedicated app, that is an online service that can be delivered thorough mobile connectivity, to enhance the efficiency, according to the Smart City paradigm.
The resulting 36 Compound Areas are spread over 5 different operational layers, identified by the Method (structural, infrastructural, organizational, regulatory and territorial/geospatial layer); then 180 Complexes Areas are generated, which represents the problems of the city and their solutions, inspired by the citizens will and easily accessed by mobile services. In each operative layer, must be found the n. 36 solutions (territorial/geospatial, regulatory, organizational, structural, infrastructural) to the identified problems, repeating the process of finding solutions, to be delivered via the App accessible using mobile connectivity.
The WorkGroup and the procedure

The **WorkGroup** is the working group that interprets the Smart City vision of the citizens and the administration and transforms it into the final design to be proposed for funding.

- **Project Management** is made up of experts in the application of the method and the use of the machine Renaissance 2.0
- **Quality Assurance and Advisory** should be an expression of the private enterprises involved in the project.
- The **domain specialists** should be representatives of the professions and local businesses.
The Machine

WorkGroup

Open Standard - based Geospatial Framework

GIS/Semantic Engine Interface

Action Engine

Analisisys Engine

Renaissance 2.0 (semantic engine & matrix)

The Machine

Laws & Regulations

Recommendations & Guidelines

Economics

Knowledge

Mobile & Fixed Sensors

Open-Linked & Structured DataBase

Unstructured DB & Social Network

Technologies
The Machine will be composed by data mining tools, business intelligence and meaning computing, semantic inference engines, integrated into the same platform with a powerful GIS framework, based on already established standards for interoperability. The Machine processing starts from an open data baseline and real-time data provided by Spatial Data Infrastructure (SDI), in compliance with the INSPIRE Directive (2007/2/EC), open returned and according to the standards of interoperability of SDI.

The Machine operates according to the following basic requirements:

- Geospatial framework which processes the acquired data and, using the standard Web Services of the Open Geospatial Consortium, returns solutions in a standard and open format;
- Interoperability of GIS with business intelligence and sentiment analysis engines;
- Cloud Operativity and interfacing to any database:
  - Linked Open Data (LOD)
  - Structured and unstructured Database
  - Social Network
- Sensors network, with particular reference to the position of the users;
- Smart City project support in all its phases:
  - preliminary study, with built-in assistance for the preparation of SEAP
  - sentiment analysis & business intelligence
  - finding solutions
  - implementation dashboard
The City chooses the future and plans using the Machine in three steps

1. Initial Report

2. Determination of Priority

3. Identification of the project in the scheme 9x4x5, synthesized by the Machine using a WBS and a GANTT
The City monitors the implementation of the project

Using the Analysis Engine of the *Machine*, the Workgroup can evaluate and make available data related to the services provided, which can be represented on a dashboard that represents the actions related to n. 9 Areas and n. 4 Figures of fruition.

The ratings must be objective, provided by measurement instruments, by predetermined criteria of status or by analysis of the sentiment of users.

The dissemination of these data should be wide and on regular basis, through every form of media and can also be seen as a tool for local marketing.
Smart Cities Are...

- Intelligent
- Connected
- Visible
- Efficient & Effective
- Controllable
- Safe & Secure
Smart Cities are...complex!! Technology is not enough: A *smart* approach to Smart Cities is needed.
Thank You!
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