RE-THINKING THE SMART CITY
HOW TO BE SUCCESSFUL

SMART CITIES
THE CHALLENGE OF PEOPLE AND PROCESS

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APRIL 2017
THE WHAT
THE WORLD IN SENSORS

- **SENSORS**: 212B
- **DEVICES**: 50B
- **NETWORKS**: 2.5B
- **APIS**: 75%
- **APPS**: 4.4B
- **ANALYTICS**: 16EB
CONNECTED CITIZEN

... 26x SENSORS

... 6x DEVICES

... 3x WIRELESS NETWORKS
By 2019 - 1.8 Billion devices shipped per year

**CONNECTED HOMES**

By 2019 – The connected buildings market is estimated to be worth $17 Billion

**CONNECTED BUILDINGS**

By 2020 – The connected cities market is estimated to be worth $1.1 Trillion

**CONNECTED CITIES**

$44 Billion retail sales driven by beacons, 10X greater than 2015

**CONNECTED ‘OTHER’**

WILL BE **CONNECTED**
THE HOW
EVOLUTION OF THE INTERNET OF THINGS

DEVICES AND APPLIANCES DRIVING EACH OTHER
NAKED AND AFRAID
THE INTERNET OF THINGS

now makes it possible
to maximize productivity & happiness

by satisfying people’s basic human needs

THROUGH TECHNOLOGY
A City as a... united living productive
-- and, yes, a ‘happy’ organism.
CITIZENS COME FIRST

LOCAL TAILORING SOLUTIONS TO LOCAL NEEDS

CONNECTED SEAMLESS INTERACTION WITHIN AN OUTSIDE GOVERNMENT

RESPONSIVE KEEPING YOU INFORMED, ALWAYS

ENGAGING MAKING YOUR FEEDBACK COUNT

SIMPLE CONNECTING THE DOTS

TRUSTED SAFEGURDING YOUR PRIVACY
**USE CASE DESIGN PARADIGM**

Key to success is leveraging initial use cases to integrate foundational technology that will enable scalability, modularity, and extensibility.

**USER-CENTERED DESIGN**
- Installation & Commissioning
- Weather Analytics
- Public Safety
- Smart Parking
- Non-Emergency Integration
- Guided Lighting

**ENABLING TECHNOLOGY**
- Field Force Management
- Machine Learning
- Video Cameras
- Beacon Technology
- API Integration with City
- Motion Sensors

**EXTENSION USE CASES**
- City Issue Identification
- Traffic Management
- Asset Tracking
- Smart Retail
- Smart Tourism
- Smart Healthcare
- Contextual Commerce
- Wayfinding
THE WHY NOW
CITIES UNDER PRESSURE...

TRENDS DRIVING OPPORTUNITIES FOR POLICY MAKERS

- POPULATION GROWTH
- BUDGET PRESSURES
- DIGITAL CITIZENS
- COMPLEX SYSTEMS
- INFRASTRUCTURE DEGRADATION
... ARE FINDING WAYS TO DELIVER

- FEDERAL GOVERNMENT SEED FUNDING
- HOLISTIC APPROACH
- COMMUNITY COLLABORATION
- NEW FUNDING MODELS
THE OPPORTUNITY FOR YOU IS RIGHT UNDER YOUR NOSE
Making sure that the City of Chicago

WORKS FOR RESIDENTS IN EVERY NEIGHBORHOOD

is critical to the continued growth of our city and its economy.

With the support of academia and the private sector,

we believe that CityWorks will help us improve upon

Chicago’s already world-class infrastructure for

residents in neighborhoods throughout the city.

- RAHM EMANUEL
  MAYOR OF CHICAGO
City Digital is a collaborative partnership among leading corporations, research institutions, and the public sector that:

- Establishes and prioritizes critical areas of need
- Develops innovative solutions
- Deploys solutions leveraging Chicago as a pilot test-bed
- Facilitates scale-up and global implementation
UNDERGROUND INFRASTRUCTURE:
CITY OF CHICAGO

- 234 square miles of land
- 5,000 miles of streets and roads
- 27 underground asset owners
- 120,000 permits per year
- 9,000 miles of water and sewer mains
- 5,000 miles of natural gas pipes
- 390 miles of underground circuit miles of electric transmission
- 250,000 manholes and catch basins
In the US, an underground infrastructure, such as pipes and cables for water, waste water, power, gas, oil, steam, and telecommunications, is hit on average **every 60 seconds**. The total cost to the national economy is estimated to be in the **billions of dollars**.
UNDERGROUND INFRASTRUCTURE: THE PROBLEM

The problem is due to:

• Existing records are typically **15-30% off mark**

• Existing records are **incomplete** (90% don’t have depth dimension)

• Maps are **not updated** after relocation of assets

• Underground assets are **not mapped and digitally managed** in a single database
The rate of return for underground mapping projects ranges from 3.4X to 21X.
RETURN ON INVESTMENT

- Citizen Satisfaction
- Safety Costs
- Construction Costs
- Information Retrieval
- Design Costs
- Data Sharing
- Information Security
- Economic Impact
- Construction Delays
Scanning technology to transform regular video or photos into point clouds and then transforming point clouds into 3D objects.
3D MODELS AND VISUALIZATION
MOBILE APPLICATION

Super-impose 3D utility data on the live view from the rear-facing camera on mobile device

Displays **spatially accurate 3D utility data** using mobile device sensors such as GPS, magnetometer, accelerometer and gyroscope
Mapping and scanning technologies are underpinned by new processes and data governance.
Coordinate collection and verification of data containing underground structure from disparate sources of information:

- Existing GIS data in Excel, CAD, or other industry formats
- Field tools such as lidar and high-definition cameras

Create virtual mapping and cataloging of underground structures
Continually maintain and enhance data to include available updated asset information
Manage & maintain secure public/private data exchange

An online portal (for desktop and mobile) provides true underground asset location (x, y, z) information to utilities, government, construction crew
The “Divining Rod” mobile application geolocates the users and displays underground assets at the user’s exact location (or any other location)
Export data from the database into CAD files for use in design
Open the data to 3rd parties to develop new services and create new revenue streams
A DIVINING ROD FOR THE FUTURE ROLE OF UTILITIES IN IOT?
DIGITAL TECHNOLOGY IS SHAPING SMART CITY SOLUTIONS LIKE NEVER BEFORE
QATAR SMART NATION

The Ministry of Information and Communication Technology has a mandate to foster the use of digital technologies. However, the ICT sector is underdeveloped and current policies are not conducive to private sector growth. Accenture thus defined an overarching Smart Nation vision for Qatar, including key priorities, a framework, and articulation of the enablement of cross-sector smart services via a nationwide data aggregation & processing platform. This work resulted in a clear actionable roadmap to develop a digital cluster, a Smart Nation Mandate and Framework, and an outline of Qatar’s Smart Nation governance model.
Accenture has partnered with the City of Austin, Cisco, and Nokia to help deliver a transportation Proof of Concept in the Riverside Corridor, an auto-centric arterial with a diverse population. This PoC will utilize **Autonomous Vehicle (DSRC), Crowd Analytics, Video Analytics, and Fleet Management Solutions**. In addition, the initiative will create a **visualization platform** for identifying the areas with the highest payback potential from new investments in retrofits. Looking forward, this work will provide the City of Austin with new insights and data sets that will be utilized in their transportation planning and give the city a blueprint to execute future PoCs.
CITY OF ATLANTA SMART WATER

The City engaged Accenture to implement a Smart Water Analytics solution to track Consent Decree project completion, leveraging predictive analytics to prevent spills and overflows in the sewer network, and to allow geospatial visualization of the City’s sewer assets and real-time sewer flow and level data to plan both pipe rehab prioritization and preventive maintenance to maintain both smooth operations and successful consent decree closeout. An analytics platform was implemented, allowing the City to view a number of data sets for more comprehensive decision making in real-time.
Smart Water Analytics Client Story

City of Atlanta, Department of Watershed Management

**Context and Challenge**
The department of Watershed Management for one of the largest metro cities in US supports the largest & complex water and wastewater utility to support City and adjacent counties with their water needs. The Department has two drinking water plants, four wastewater treatment plants, six combined sewer overflow treatment facilities, and 16 sewage pump stations. There are approximately 1,600 miles of water distribution pipelines lines and roughly 2,000 miles of wastewater and combined sewers. The city’s wastewater system serves more than 1.5 million people within Atlanta and the neighboring counties.

The City engaged Accenture in the implementation of a Smart Water Analytics solution to track Consent Decree project completion, leveraging predictive analytics to prevent spills and overflows in the sewer network, and to allow geospatial visualization of the City’s sewer assets and real-time sewer flow and level data to plan both pipe rehab prioritization and preventive maintenance to maintain both smooth operations and successful consent decree closeout.

**Solution**
An analytics platform was implemented, and allowed the City to view a number of data sets: some relatively static (from GIS, hydraulic model results), some changing less frequently (contractor project completion data) and some dynamic (SCADA, flow and level monitoring) to allow more comprehensive decision making in real-time. Predictive analytics, based on large data analysis and statistical regression analysis on sewer level, allow operators to see if there are any actions that need to be taken at specific points in the network, reducing the amount of spills.

Additionally, daily spill information, shown overlaid with completed projects show the effectiveness of completed projects, while also helping prioritize upcoming projects. These types of analytics enable the City to be more proactive, and in some cases, predictive in their analysis of data being produced from their systems, allowing them to make better, more timely decisions.

**Value**
The potential benefits of the platform include:

- Reduction in sewer overflows and spills using predictive analytics
- Prioritized pipe rehab and maintenance within the sewer network to address recurring and potential issues, thus reducing customer impacts
- More effective capital spending based on analytics using historical data
THANK YOU
Accenture’s Safe City Solution integrates advanced analytics into existing sensors and systems to maximize situational awareness, streamline operations and enhance response to safety and security concerns.
Accenture has partnered with Abertis and GDF Suez to manage the operating system for the city, City Os, over the next 3 years. This integrated urban management system will allow for improved city management, enriched services for citizens, and enhanced opportunities to build a new economy based on data. City Os will connect various technical systems in Barcelona, including Sentilo, which manages multiple sensors across the city (like irrigation systems, acoustic management systems and more).
Accenture is a strategic and long term partner in the Amsterdam Smart City context, helping in the development and running of the program. Alliander, a local electricity grid operator, the City of Amsterdam and the Amsterdam Innovation Motor (AIM) needed to come together to meet Amsterdam’s ambitious sustainable energy and carbon reduction goals. Accenture was a strategic partner in the development of the ASC program by providing the vision and strategy, concept development, value delivery and execution.
As one of the partners for the Sustainable Smart Town (SST) project, Accenture developed a masterplan for a unique smart town concept that will lead the way by installing solar panels and home-use storage batteries in every household. Fujisawa had a vision for a “town that is connected from the start” through the optimal design and introduction of infrastructures and equipment in all city blocks.