Converging Policies, Practices and Processes through Public Private Partnership

Hinnerk Gildhoff, SAP HANA Spatial Lead, SAP
25th May 2015
Disclaimer

This presentation outlines our general product direction and should not be relied on in making a purchase decision. This presentation is not subject to your license agreement or any other agreement with SAP. SAP has no obligation to pursue any course of business outlined in this presentation or to develop or release any functionality mentioned in this presentation. This presentation and SAP's strategy and possible future developments are subject to change and may be changed by SAP at any time for any reason without notice. This document is provided without a warranty of any kind, either express or implied, including but not limited to, the implied warranties of merchantability, fitness for a particular purpose, or non-infringement. SAP assumes no responsibility for errors or omissions in this document, except if such damages were caused by SAP intentionally or grossly negligent.
Industries
Demand for geospatial

- Aerospace and Defense
- Automotive
- Chemicals
- Banking
- Defense and Security
- Healthcare
- Engineering, Construction, and Operations
- Insurance
- Higher Education and Research
- Mill products
- Mining
- Media
- Oil and Gas
- Public Sector
- Professional Services
- Retail
- Public Sector
- Utilities
- Wholesale Distribution
- Telecommunications
- Industrial Machinery and Components
- Travel and transportation
- Life Science
- Sports and Entertainment
Digital Transformation
Digital Transformation
The Building Blocks

Cloud  Mobile  Data  Network
Examples
Examples
Public Projects & Partnerships

ESA / DLR
• ESA App Camp Challenge (EO, Cloud, HANA)
• Exchange knowledge, Research, …
• Co-innovation (joint-venture model)
  • ESA (provides satellite data / EO expertise)
  • SAP (Business enabler / IT expertise)

State Offices
• Environmental Data Online
• SAP Cloud (simplify maintenance and infrastructure)

Universities
• Cologne / EURAD (European Air Quality and Dispersion Model) / Air Quality Forecast
• Heidelberg / GIScience / Create City 3D Models with point clouds out of satellite images
• Heidelberg / Max Planck Institute for Astronomy (MPIA) / (ALMA In search for our cosmic origins)

Additional Public Areas
• Police & fire departments
• City of Boston, Cape Town, Shanghai, …
• …
Urban Platforms for Smart Cities
Solution Overview
Innovation Center Network, Research & Innovation

SAP SE
### Why Cities need to be Run Better

#### Challenges and Opportunities

<table>
<thead>
<tr>
<th>Infrastructure Challenges</th>
<th>Resource Challenges</th>
<th>Global Competition Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Infrastructure bottlenecks/ inadequacy</td>
<td>- Providing adequate and reliable healthcare to citizens</td>
<td>- Attract and develop the best talents</td>
</tr>
<tr>
<td>- Transportation problems (Traffic congestion) and related carbon emissions</td>
<td>- Efficient waste management</td>
<td>- Nurture cutting edge businesses</td>
</tr>
<tr>
<td>- Increasing urbanization/migration from rural areas to large cities, and the daily demands of the resident</td>
<td>- Meeting growing demand of services required by residents</td>
<td>- Entice visitors and champion events</td>
</tr>
<tr>
<td>- New Urbanism to dissolve work/live dispersal</td>
<td>- Continuous shift in high demand of business relevant skills – shorter lead time to employ and develop the relevant workforce</td>
<td>- Evolve and innovate more quickly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Thrive sustainably</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Provide a healthy city ecosystem in combination of living and working</td>
</tr>
</tbody>
</table>

- ~50% of the world’s population currently lives in cities. This is expected to be ~60% by 2030 and ~65% by 2040
- There are 21 megacities (>10 million population; only three megacities existed in 1975). ~29 new megacities by 2025
- Sustainability targets to reduce climate and energy footprint by 20% until 2020 and at the same time cities are likely to create 47% of the world’s GDP until 2025

Key Topics, Key Stakeholders
Ecosystem Of Service Providers

Urban Transportation  Jobs & Education  Healthcare & Well-being  Housing & Energy  Public Safety & Security  Citizen Services

Mobile APP

City Government Agencies
Municipalities
Public Safety Department
Transportation
Retail Enterprises
Energy Provider
Logistics Provider Enterprises
Health Provider Enterprises

Cloud

© 2015 SAP SE or an SAP affiliate company. All rights reserved.
Smart City Platform powered by SAP HANA
Enabling the city eco-system

<table>
<thead>
<tr>
<th>Applications</th>
<th>CityApp</th>
<th>Smart Traffic</th>
<th>City Development</th>
<th>Disaster Prevention</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Enablement</td>
<td>Open City Services</td>
<td>Open Data</td>
<td>Open APIs Framework</td>
<td>Identity and Authorization Management</td>
<td>User Interface &amp; Transaction Services</td>
</tr>
<tr>
<td>Data Orchestration</td>
<td>Open Standards Data Ingestion, Storage, Consolidation, Harmonization, Assimilation, Federation</td>
<td>Smart Data Streaming</td>
<td>Smart Data Integration</td>
<td>IoT Time Series</td>
<td>Meta Data Modelling</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>IoT Enablement</td>
<td>City Data Sources</td>
<td>ICT Infrastructure</td>
<td>Government Devices</td>
<td>Utility Devices</td>
</tr>
</tbody>
</table>

© 2015 SAP SE or an SAP affiliate company. All rights reserved.
Understand Your City’s Pulse
Explore, Visualize and Gain Actionable Insights

- **Resource Utilization**
  - Analyzing utilization of public transport resources

- **Commuting Behavior**
  - Identify high utilized localities, impact of policies, etc.

- **Real-time Operations**
  - Deliver optimal services with highest efficiency by knowing the city in real time

- **Measuring Efficiency**
  - Measure and monitor service efficiency with continuous feedback from citizens

- **Preference Analysis**
  - Segment citizens’ groups, understand preferences and offer differentiated services

- **Causal Analysis**
  - Perform in depth causal analysis with help of spatial and behavioral data analytics
How to Monetize? Open Eco-System Platform

Local administration

„Official Enabler“

Local companies

Local citizens

„Buyers“

„Market Place“

City App

„Seller“
SAP HANA

MULTICORE + SIMD + RAM
SAP HANA platform
More than just a DATABASE

The SAP HANA platform converges database, data processing, and application platform capabilities and provides libraries for predictive, planning, text, spatial, and business analytics to enable business to operate in real time.
Thank you

Spatial Processing with SAP HANA
http://www.saphana.com/community/about-hana/advanced-analytics/spatial-processing

SAP HANA Spatial Reference

hinnerk.gildhoff@sap.com

© 2015 SAP SE or an SAP affiliate company. All rights reserved.