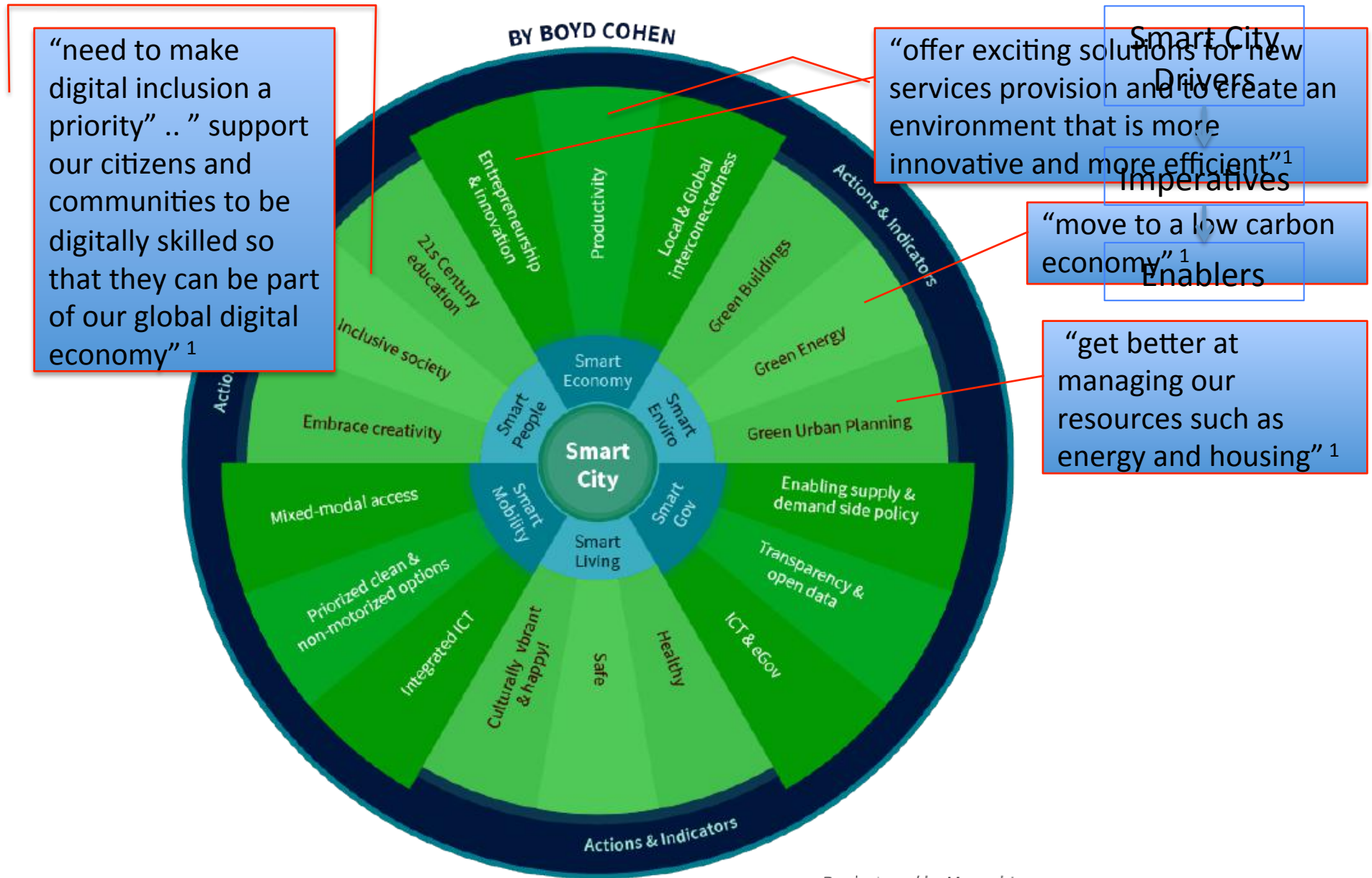


# Digital World 2013: Data Revolution Data Driven Smarter City





# Drivers for Data Driven Smart City



Each core system can be made 'smarter' through intelligence, giving cities unprecedented prediction powers to drive better business outcomes

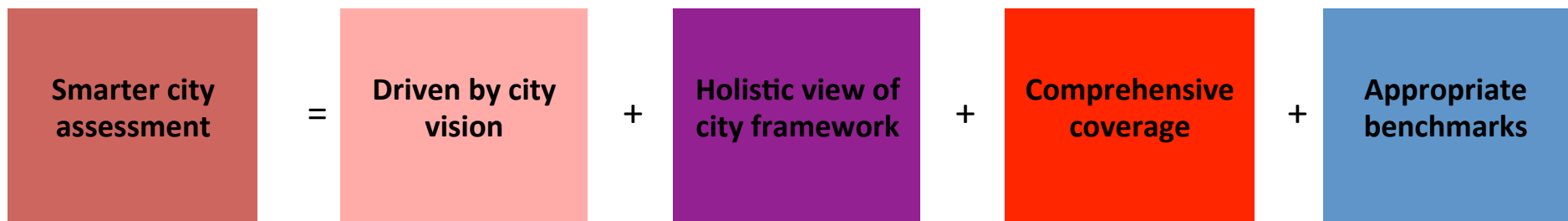


System	Elements	Instrumentation	Interconnection	Intelligence
<b>City Services</b>	<ul style="list-style-type: none"> <li>Public service management</li> <li>Local government administration</li> </ul>	Creation of local authority management information system	Interconnected service delivery	Immediate and joint-up service provision
<b>Citizens</b>	<ul style="list-style-type: none"> <li>Health and education</li> <li>Public safety</li> <li>Government services</li> </ul>	Patient diagnostic and screening devices	Interconnect records for doctors, hospitals, and other health providers	Patient-driven pre-emptive care
<b>Business</b>	<ul style="list-style-type: none"> <li>Business environment</li> <li>Administrative burdens</li> </ul>	Data gathering about use of online business services	Interconnect stakeholders across city's business systems	Customized service delivery for businesses
<b>Transport</b>	<ul style="list-style-type: none"> <li>Cars, roads</li> <li>Public transport</li> <li>Airports, seaports</li> </ul>	Measuring traffic flows and toll use	Integrated traffic, weather, and traveller information services	Real-time road pricing
<b>Communication</b>	<ul style="list-style-type: none"> <li>Broadband, wireless</li> <li>Phones, computers</li> </ul>	Data gathering via mobile phones	Interconnect mobile phones, fixed line, broadband	Information for consumers on city services in real time, on their own time
<b>Water</b>	<ul style="list-style-type: none"> <li>Sanitation</li> <li>Freshwater supplies</li> <li>Seawater</li> </ul>	Gather data for water quality monitoring	Interconnect businesses, ports, energy users of water	Real-time quality, flood, and draught control
<b>Energy</b>	<ul style="list-style-type: none"> <li>Oil, gas</li> <li>Renewable</li> <li>Nuclear</li> </ul>	Fit sensors to gather data on usage across the energy system	Interconnect appliances & devices between energy consumers and providers	Optimise the use of the system and balance use across time

- **City Operations Systems**
- **City User Systems**
- **City Infrastructure Systems**

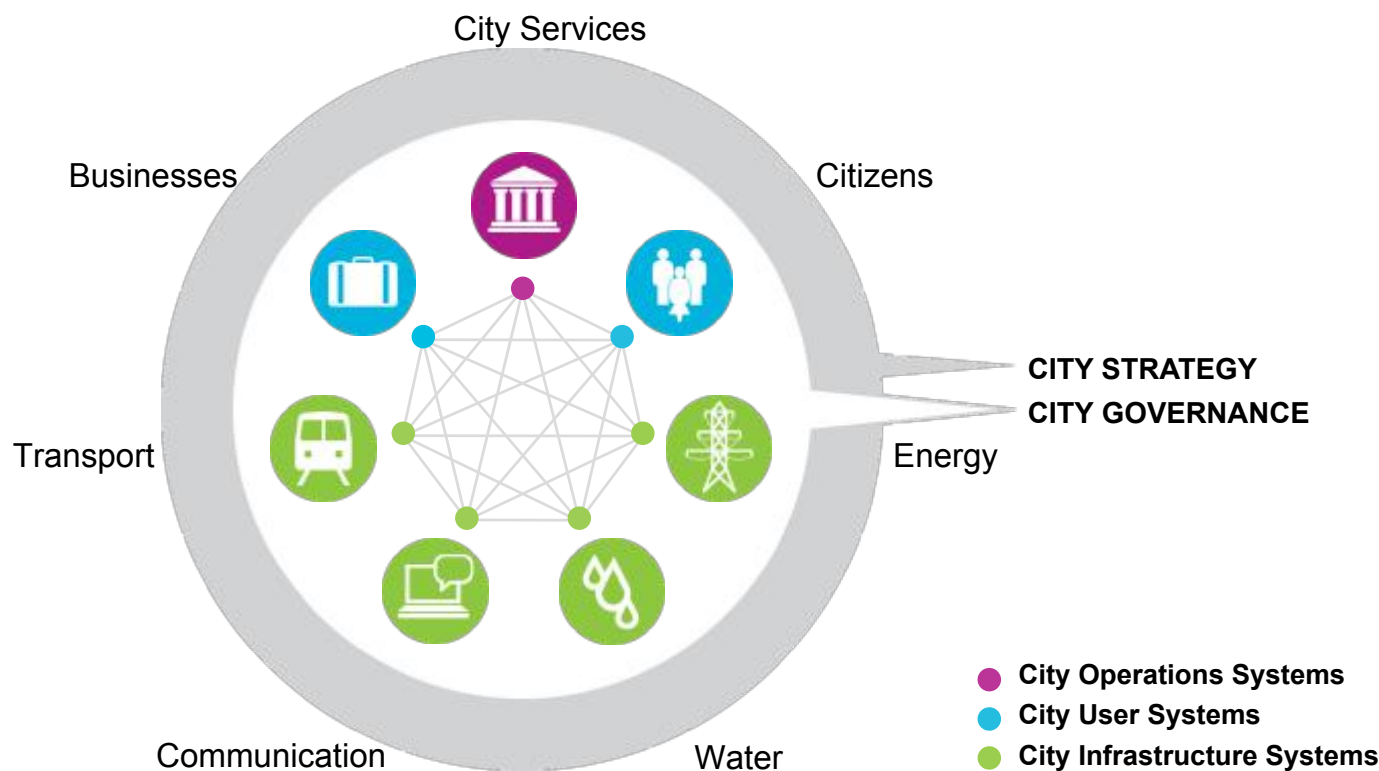
## Assessment should be guided by four key principles

- Driven by city vision
- Provide a holistic view of the city framework
- Have comprehensive coverage of the transformation of each system
- Benchmark against relevant peer cities



# The assessment of a city's smartness needs to be holistic and cover all elements of the city's overall framework...

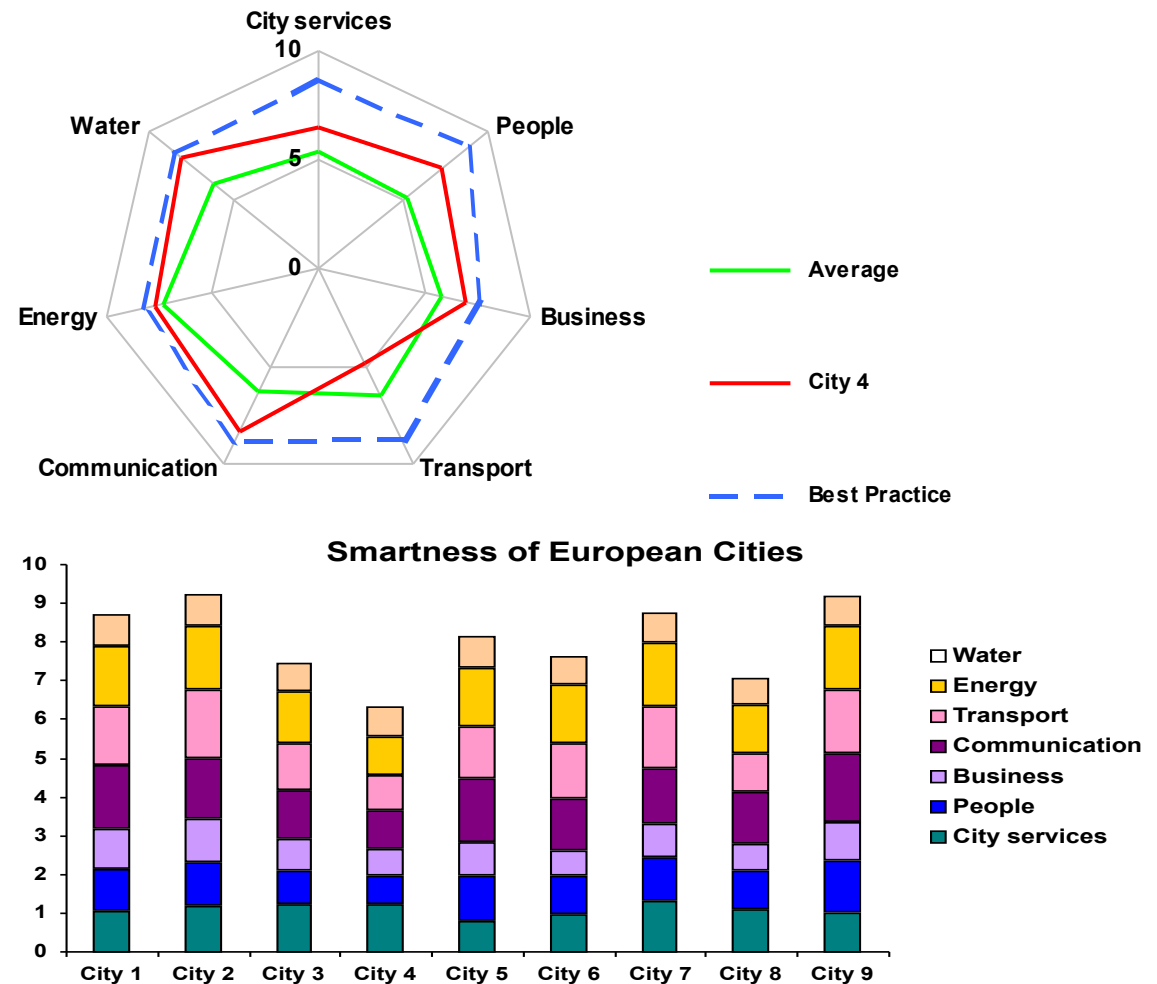
- Cities should strive for a complete picture of their city performance
- Partial measurement may result in wrong conclusions and misallocation of resources and effort



... and use the findings as input for action

### Smarter City Measurement Methodology

- Offers evidence-based assessment of requirements and smartness features
- Provides in-depth understanding of strengths and weaknesses
- Highlights challenges that cities face and specifies where improvements can be made
- Provides input for action plan to support city agenda
- Enables monitoring of progress



# Data Challenge for Data Driven Smart City

BY BOYD COHEN

## Big Data (Data Rich to Insight Rich to Action @ Speed of Thought)

- **Volume:** 4.1 terabytes per day per square kilometre of urbanized land area by 2016.
  - Birmingham City estimate: 267.8 km<sup>2</sup> ≈ 1098 TB/day ≈ 1.07 PB/day
- **Variety:** Unstructured (video, audio, CDR, telemetry, UHF/VHF)
- **Velocity:** Streaming real-time (CCTV, traffic sensors, utility m

Smart City Drivers

Imperatives

Enablers

Big Data

Volume

Variety

Velocity

Veracity

A PETABYTE  
IS A LOT  
OF DATA

1

PETABYTE

20 MILLION

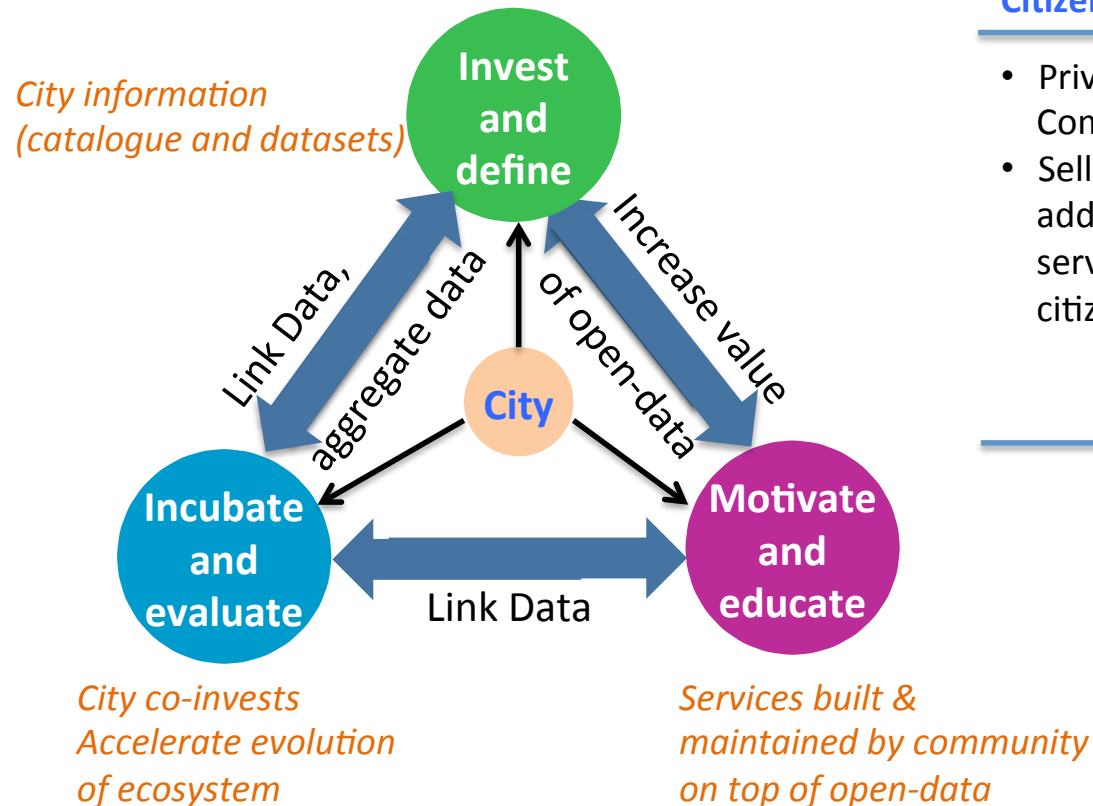
FOUR-DRAWER FILING CABINETS  
FILLED WITH TEXT

# Balancing Between Engagement and Business Models



## Engagement, Ownership and Cost

### Engagement Model



### Business Model

Citizens-Pay	Cities-Pay	Businesses-Pay
<ul style="list-style-type: none"><li>Private Company</li><li>Sell value-added services to citizens</li></ul>	<ul style="list-style-type: none"><li>Private Company</li><li>Sell inexpensive services to city</li><li>Typically cloud-based</li></ul>	<ul style="list-style-type: none"><li>Services free or discounted</li><li>Funded by other parts of the business</li><li>Can be non-profit organisations</li></ul>



# What We Have Learned

## A Comprehensive Set of Capabilities Is Required To Address The Challenge

8 March 2013

- Drills break through into busy London rail tunnel
- Services were stopped after a driver said muddy water had poured on to his roof
- An hour later, two piling drills came through as a train with only a driver and Network Rail manager approached to inspect the area.
- "serious incident" averted.



Rail staff spotted the drills which broke through into the tunnel



# **CLIENT EXAMPLE**

# Smarter Airports play a unique and critical role as major connection points between all stakeholders creating more aviation efficiency and revenues



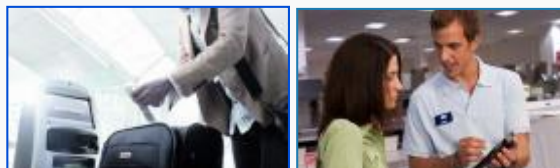
**For efficient operations all stakeholders require accurate and common views of flights & resources**

## Passenger Experience

## 1 Self-Service Check in (Web, Mobile, Kiosk, Proximity Reader)



## 2 Self Service Bag Tag (with Roving Agents)



### 3 Self Service Bag Drop (with Roving Agents)



**Customer Counter**  
People Count = 1  
Avg. Duration = 1.00 min  
Max. Duration = 1.00 min

**Lounge Area**  
People Count = 11  
Avg. Duration = 1.00 min  
Max. Duration = 1.00 min

**Kiosk Region 1**  
People Count = 75  
Avg. Duration = 1.40 min  
Max. Duration = 1.40 min

**Kiosk Region 2**  
People Count = 21  
Avg. Duration = 1.40 min  
Max. Duration = 1.40 min

3/10/2009 9:35:26 AM cam10 Cam 01

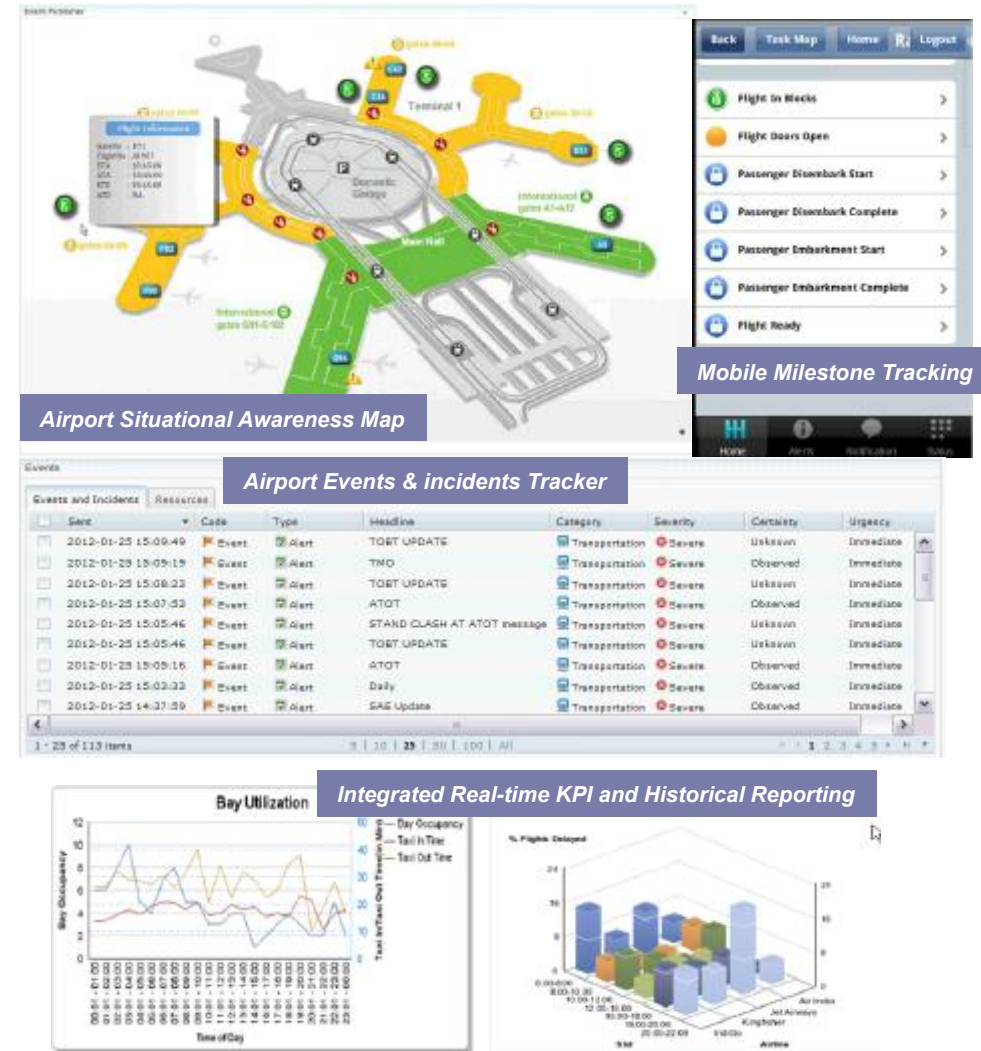
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# “Smart AOCC” powered by Intelligent Operations Center (IOC) IBM’s Smart “Command Center”

## Product Features :

- **Domain services request management system** with Executive, domain Operations, and Agency dashboards that include domain KPI reports with trends and analysis of event and domain data.
- **Centralized environment for planning, organizing, monitoring and sharing information** continuously in response to changing conditions.
- Drill down capabilities on details of service requests, team members and assets assigned and status – which is also available in a **geospatial context for situational awareness**.
- Provides for **integrated collaboration** within the views and as an element on the dashboard.
- Event and directive management is achieved through **integrated incident management**, reporting and collaboration & communication.



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