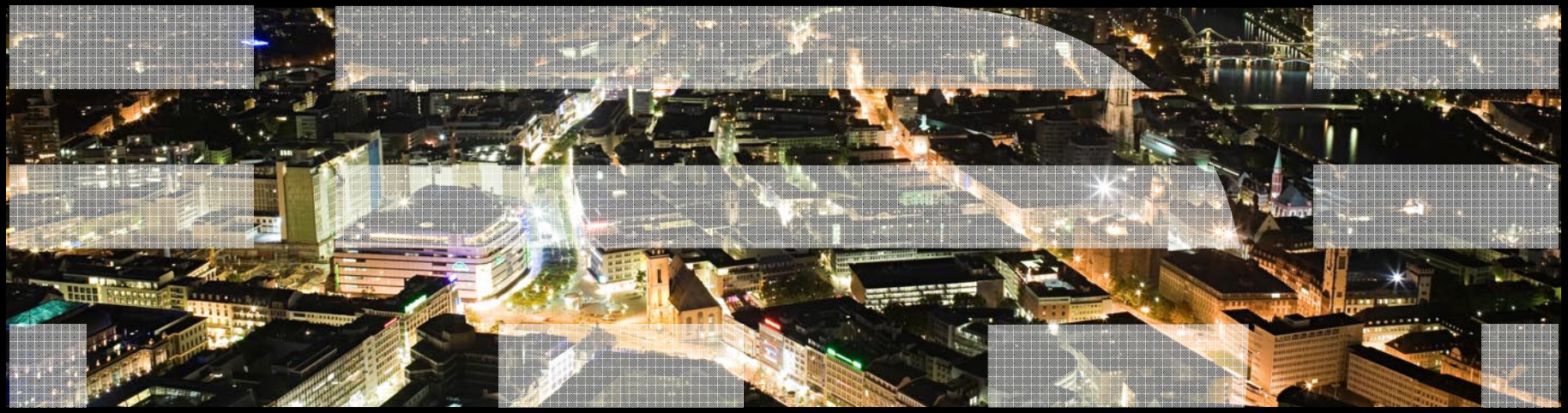
Dan Cohen, Managing Director, IBM UK Ltd. August 2010

Let's Build a Smarter Planet: Smarter Cities



The need for progress is clear.

170 billion

Kilowatt-hours wasted each year by consumers due to insufficient power usage information.

The opportunity for progress is clear.

10%

REDUCTION IN ENERGY COSTS

Utility networks: Pacific Northwest National Laboratory
In the Smart Grid project, consumers decreased their overall peak load on the grid by 15% when offered the opportunity to save an average of 10% on their electricity bills.[1]

The need for progress is clear.

3.7 billion lost hours

2.3 billion gallons of gas

Annual impact of congested roadways
in the U.S. alone.[1]

The opportunity for progress is clear.

20%
LESS TRAFFIC

Traffic system: Stockholm, Sweden
The city cut traffic by 20%, lowered emissions by 12% and reported 40,000 additional daily users of public transportation.[1]

The need for progress is clear.

100 million

People worldwide pushed below the poverty line by personal healthcare expenditures.[1]

The opportunity for progress is clear.

$30 million in cost savings

Smarter healthcare: University Pittsburgh Medical Center
This renowned academic medical center projects a $30 million reduction in capital and operating cost reductions over eight years, enabling it to meet an ambitious clinical agenda

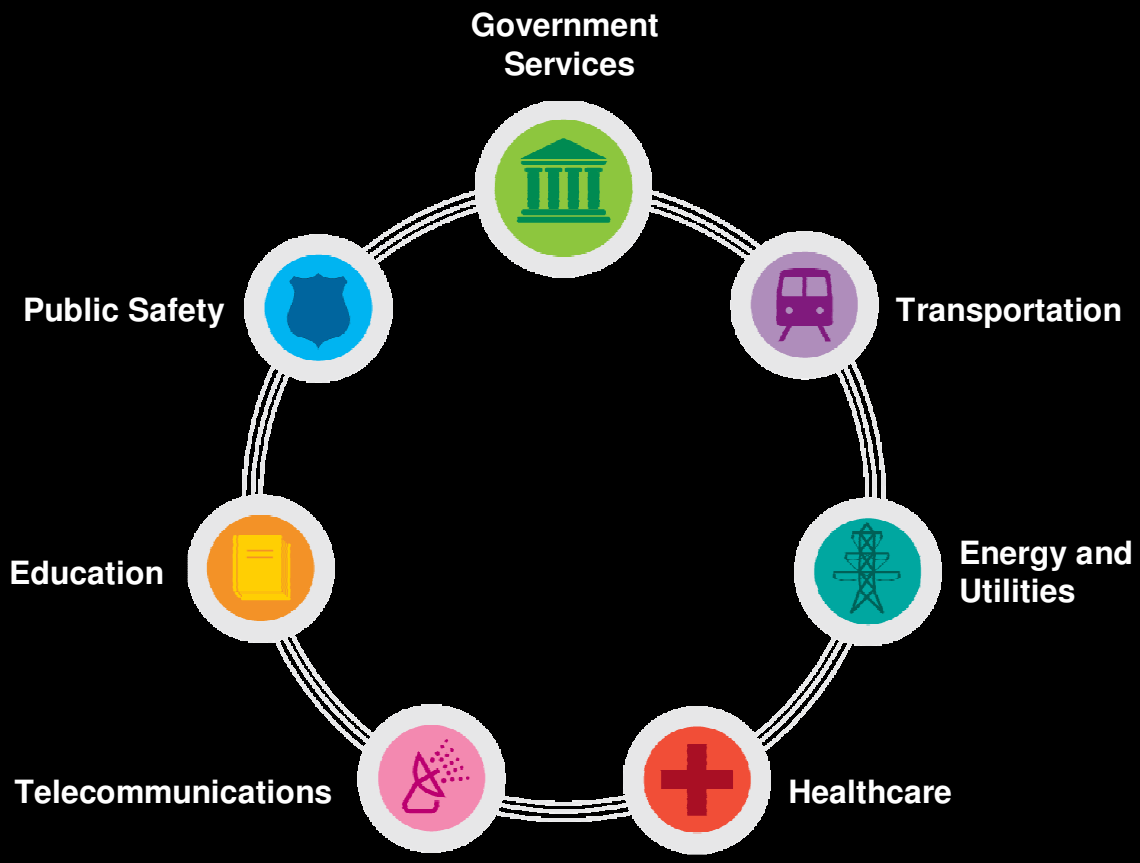
A planet of smarter cities: In 2007, for the first time in history, the majority of the world's population—3.3 billion people—lived in cities. By 2050, city dwellers are expected to make up 70% of Earth's total population, or 6.4 billion people.

A question to Leaders:-

As a city leader, how will you create opportunity in order to be competitive on a global scale?

Dear old Edinburgh and Glasgow must figure out how to be competitive . . .

The city is a microcosm of the major challenges and opportunities facing the planet today—intensified and accelerated. Here, all man-made systems come together and interact with one another.



Time to act: Cities—more than states, provinces or even nations—will increasingly serve as the crucibles where the success or failure of our planet is determined.

We are experiencing the reality of global integration.

The world is connected

ECONOMICALLY.
SOCIALLY.
TECHNICALLY.

A series of shocks:

Climate change	**Energy geopolitics**	**Global supply chains**	**Financial Crisis**

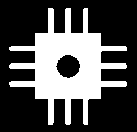
Plus rapidly evolving and ongoing significant trends:

Changing demographics	**Empowered consumers and citizens**	**Impact of technology**

The digital and physical infrastructures of the planet are converging…

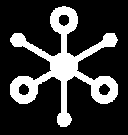
Computational power is being put into things we wouldn't recognize as computers. Indeed, almost anything—any person, any object, any process or any service, for any organization, large or small—can become digitally aware and networked.

…because intelligence is being infused into the way the world works.



Our world is becoming

INSTRUMENTED.



Our world is becoming

INTERCONNECTED.

Virtually all things, processes and ways of working are becoming

INTELLIGENT.

We now have the ability to measure, sense and monitor the condition of almost everything.

30 billion

By 2010, 30 billion RFID tags will be embedded into our world and across entire ecosystems.

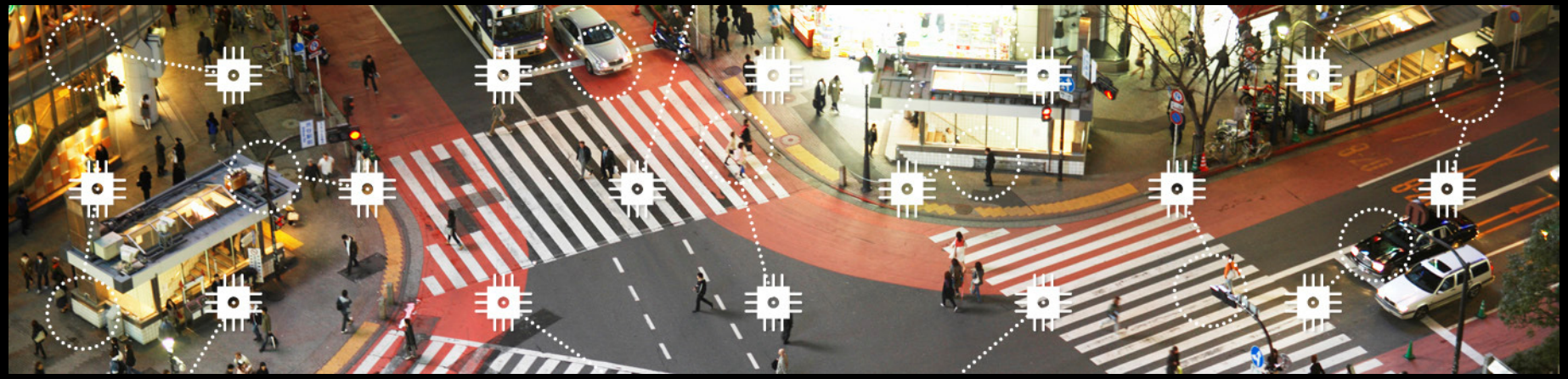
1 billion

By 2010, there will be more than 1 billion camera phones in existence.

85%

Nearly 85% of new automobiles will contain event data recorders by 2010.

Instrumented Interconnected Intelligent



People, systems and objects can communicate and interact with each other in entirely new ways.

2 billion

There will be an estimated 2 billion people on the internet by 2011.

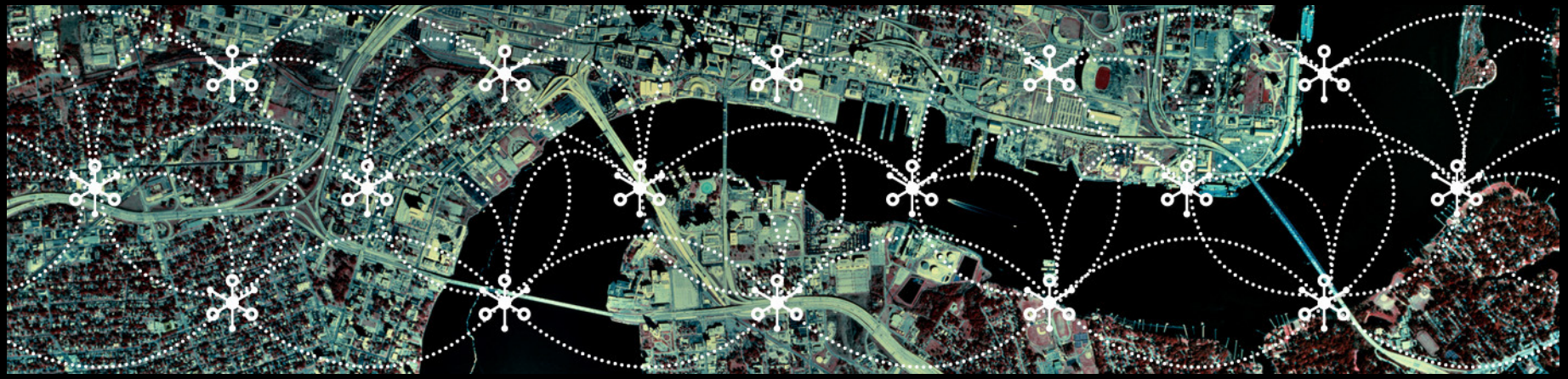
4 billion

There are an estimated 4 billion mobile phone subscribers worldwide.

1 trillion

Soon, there will be 1 trillion connected devices in the world, constituting an "internet of things."

Instrumented Interconnected Intelligent



We can now respond to changes quickly and accurately, and get better results by predicting and optimizing for future events.

15 petabytes

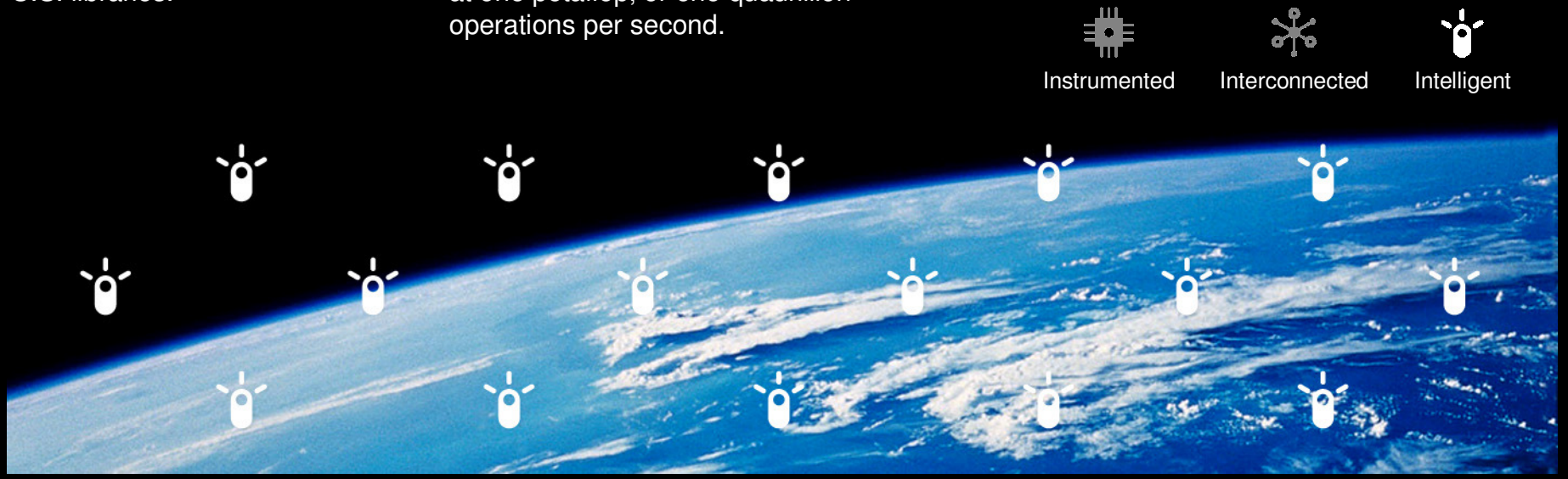
Every day, 15 petabytes of new information are being generated. This is 8x more than the information in all U.S. libraries.

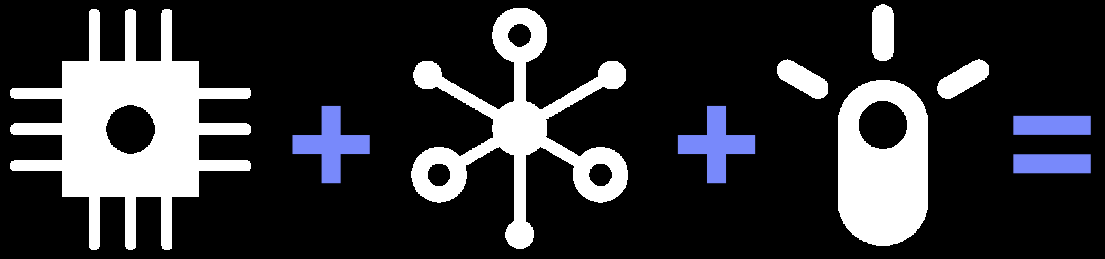
1 petaflop

Scientists are working to prevent influenza pandemics by modeling the viruses with a supercomputer that can operate at one petaflop, or one quadrillion operations per second.

1 square kilometer

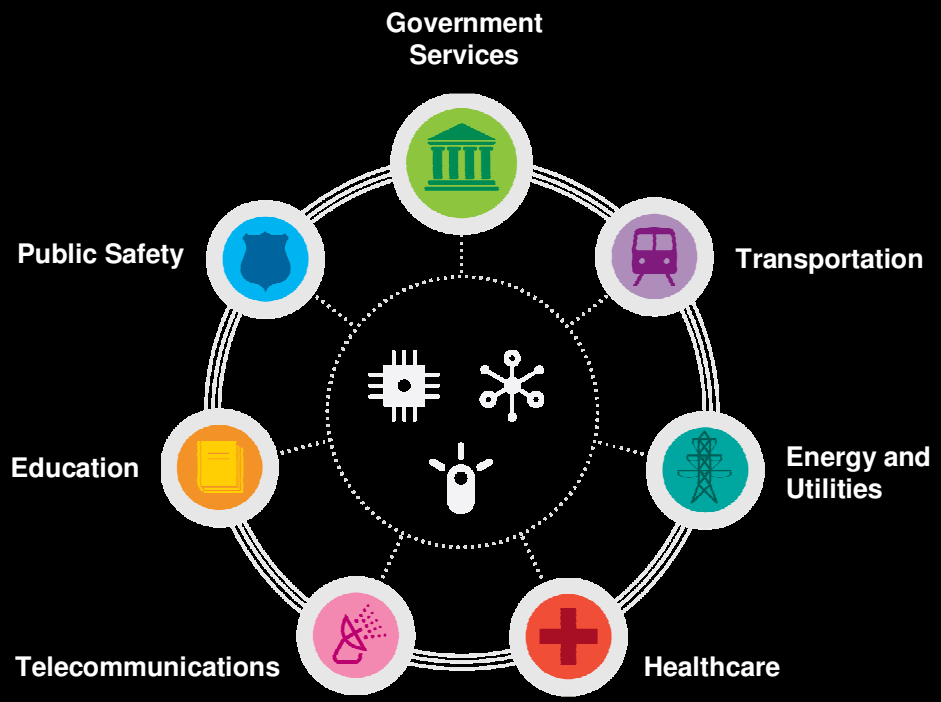
New analytics enable high-resolution weather forecasts for areas as fine as 1 to 2 square kilometers.





An opportunity for cities to think and act in new ways.

Smarter cities are working to infuse intelligence into each of their core systems.



Examples

Real examples of how cities are on the Journey to ‘smarter’

Smarter transportation: An opportunity to improve the transit experience, reduce congestion and encourage a modal shift among users

Cities can infuse intelligence into their entire transportation system, improving drivers' commutes, giving better information to city planners, increasing public transportation usage and the productivity of businesses, and raising citizens' quality of life.

ROAD USER CHARGING
Employ a dynamic toll system based on the flow of vehicles into and out of a city to reduce traffic.

ELECTRONIC FARE MANAGEMENT
Enable rail, bus and road customers to purchase fares via SMS or online and have the fare collected automatically.

TRANSPORTATION INFORMATION MANAGEMENT
Gain real-time traffic prediction and intelligent route planning capabilities.

Smarter transportation: Client transformations

Stockholm implemented an intelligent toll system in the city center, which resulted in 20% less traffic, 40% lower emissions and 40,000 additional users of the public transportation system.

To encourage citizens to use multiple modes of transportation and make it easier to align the cost of transit with its impact on the environment, the **Singapore Land Transport Authority** implemented fare management with smart cards that can be used to pay for buses, trains, taxis, road-use charging and parking.

Smarter energy and utilities: An opportunity to manage supply and demand

By providing real-time information about the flow of energy, an intelligent utility system helps citizens and utilities make smarter, more responsible choices about the way they buy, sell and manage utility services.

SMART GRID
Monitor the health and stability of the grid at all times, identifying an outage or issue as soon as it happens and dispatching crews to address it immediately. Enable customers to monitor energy prices and their own energy use in real time.

BUILDING EFFICIENCY ASSESSMENTS
Reduce energy consumption and CO_2 emissions, and save water usage, using sensors to monitor everything from motion and temperature to humidity, precipitation, occupancy and light.

WATER MANAGEMENT
Use the right tools to optimize consumption, monitor quality and model past and future water basin behaviors.

ENERGY PORTAL
Store and quickly access energy consumption data, customer data, device monitoring and sensor data at all times—empowering the consumer.

Smarter energy and utilities: Client transformations

CenterPoint Energy in **Houston** is installing over 2 million smart meters and in some cases an energy controller for household devices. Homeowners will be able to access their usage information in home displays or on a personal website to make smarter consumption decisions.

DONG Energy in **Denmark** installed monitoring devices across their distribution network. The increased insight into the grid's performance will potentially lessen outage times by up to 50% and reduce maintenance investments by up to 90%.

Smarter healthcare: An opportunity to achieve better quality and outcomes, increase value and improve accountability and sustainability

A smarter healthcare system forges partnerships and makes better use of data in order to deliver excellent care, predict and prevent disease and empower people to make smarter choices.

HEALTH INFORMATION EXCHANGES
Enable patients, consumers, health practitioners and insurers to securely share clinical information across organizational boundaries, enabling safer, more timely, efficient and effective patient-centered care.

CONSUMER PORTALS
Encourage consumers to assume responsibility for health and chronic disease management through transparency of healthcare costs, quality of care and prescription drug costs, empowering them to make wiser health and financial decisions.

DISEASE SURVEILLANCE
Prevent and manage threats to the health of a community by capturing, sharing and modeling data to spot trends and identify causes, detect disease outbreaks early, efficiently manage cases and take action as needed to protect the public.

Smarter healthcare: Client transformations

A regional healthcare provider in France, created a regional information communication and management solution that improved the efficiency of patient care, reduced the risk of medical error and improved emergency response coordination.

A public healthcare organization, **Servicio Extremeño de Salud** in Spain, has built a regionally integrated system that lets patients go to many health centers within the region, knowing a doctor there can have the patients' complete, up-to-date records for faster and more accurate treatment.

Smarter telecommunications: An opportunity to interconnect the systems of a smarter city and lay the groundwork for longer-term economic growth

Enhanced broadband infrastructure is the critical backbone of smarter communications and will spur advances in everything from science and medicine to business and technology, and will help billions of people join the global economy.

SMARTER TRAFFIC SYSTEMS
Connect the elements of the transportation system—streets, bridges, intersections, signs, signals and tolls—with a strong telecommunications backbone.

SMARTER HEALTHCARE SYSTEMS
Automate patient records, share patient data, conduct remote diagnostics and more with fast and robust telecommunications infrastructure and systems.

SMARTER FOOD SYSTEMS
Provide end-to-end visibility across the entire global supply chain to allow farmers to obtain better real-time market pricing for produce and supplies and enable retailers and manufacturers to more efficiently integrate product demand with supply replacements.

Smarter telecommunications: Client transformations

Electrical cooperatives in Alabama, Indiana, Michigan and Virginia are bringing broadband Internet access to nearly 200,000 customers in rural communities via existing power line infrastructure. Broadband over power line technology modifies radio signals to transmit voice and Internet data over electric utility power lines.

A southwestern city in the U.S. transformed its IT infrastructure and launched a wide-reaching wireless mobility project in order to increase safety, security and access to city services for all its citizens. Now city employees can work from anywhere while connected to the city's computing system, enabling a new level of collaboration with first responders, improving access to city applications and increasing productivity.

Smarter education: An opportunity to nurture our most valuable resource

Smarter cities take a systemic view of their education systems, evaluating students in multiple dimensions throughout their lifetimes and equipping them with the skills and knowledge they need to contribute to employers, communities and society.

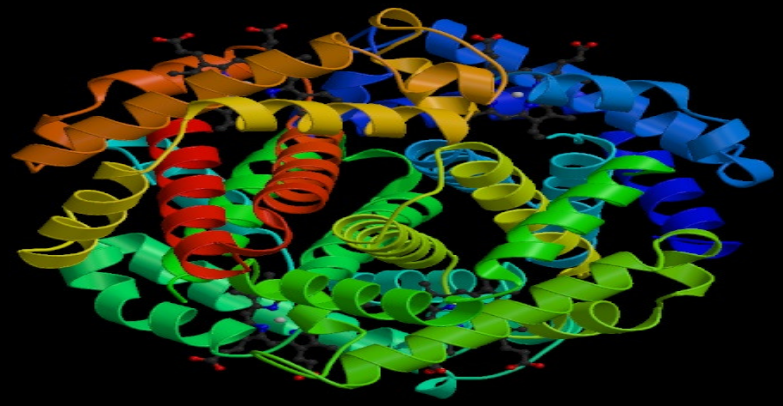
SMARTER CLASSROOM
Deliver effective learning content and tools to every student and teacher according to their needs, preferences, abilities, technology and aspirations.

SMART ADMINISTRATION
Incorporate data across education systems to optimize operations, improve services and lower costs.

INNOVATION IN RESEARCH
Accelerate innovation, knowledge creation and the economic impact of science with powerful tools for researchers.

Smarter education: Client transformations

North Carolina State University provides computing lab resources to schools and colleges throughout the state via a central service. Students, faculty and teachers are able to receive a customized image of the content and applications to meet their learning needs.



A leading research group at a prestigious university in Massachusetts obtains the powerful computing environment it needs when it leverages the IBM-powered World Community Grid to perform its innovative energy research..

Smarter public safety: An opportunity to turn data into insight to protect citizens and communities

A smarter city uses advanced technologies and community-based approaches to anticipate and prevent—not just respond to—crimes and emergencies.

CRIME DATA AGGREGATION
Put decades worth of crime information at the fingertips of law enforcement officers at all times.

EMERGENCY MANAGEMENT INTEGRATION
Connect police, fire departments, ambulance services and other first responders so all are instantly alerted when an emergency takes places.

SMART SURVEILLANCE SYSTEMS
Use digital cameras to continuously monitor urban areas and automatically alert authorities when a suspicious event occurs or when a license planet, vehicle or other entity is recognized.

Smarter public safety: Client transformations

The **NYPD Crime Information Warehouse** gives officers mobile access to more than 120 million criminal complaints, arrests and 911 records, as well as 5 million criminal records, parole files and photographs—resulting in a 27% reduction in crime.

The **City of Madrid** has developed a new Emergency Response Center, which aggregates emergency call data and instantly alerts the proper authorities, including police, ambulance services and the fire brigade. The city has experienced a 25% reduction in response time as a result of the implementation.

Smarter government services: An opportunity to infuse intelligence into needed services, stimulate economies and save taxpayer time and money

Increased information sharing and collaboration drives smarter decision-making.

CITIZEN-CENTERED DESIGN
Shift towards a citizen-centered business model to improve services, experiences and outcomes while lowering costs.

INTEGRATED DELIVERY OF SERVICES
Connect people to needed programs with speed and accuracy. Enable cities to predict potential issues so preventative measures can be taken.

BUSINESS AND CITIZEN SERVICES
Interconnect dynamically with citizens, communities and businesses to spark growth, innovation and progress. Enable online license renewals and validation of license holders.

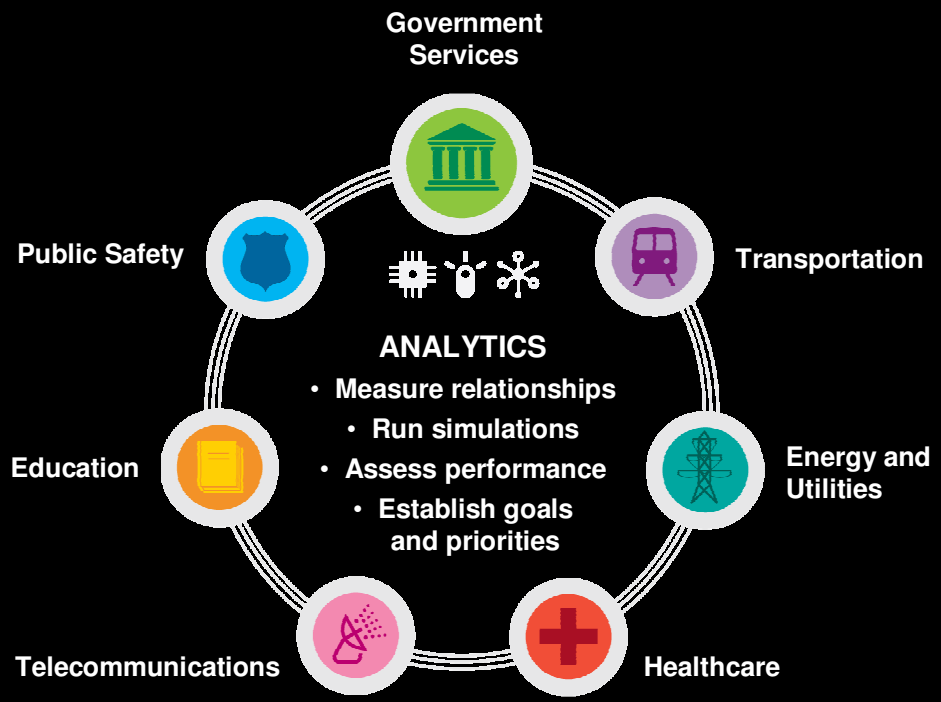
GOVERNMENT ACCOUNTABLITY
Results-driven agencies manage, monitor, analyze and report on key initiatives, with measurable outcomes.

Smarter government services: Client transformations

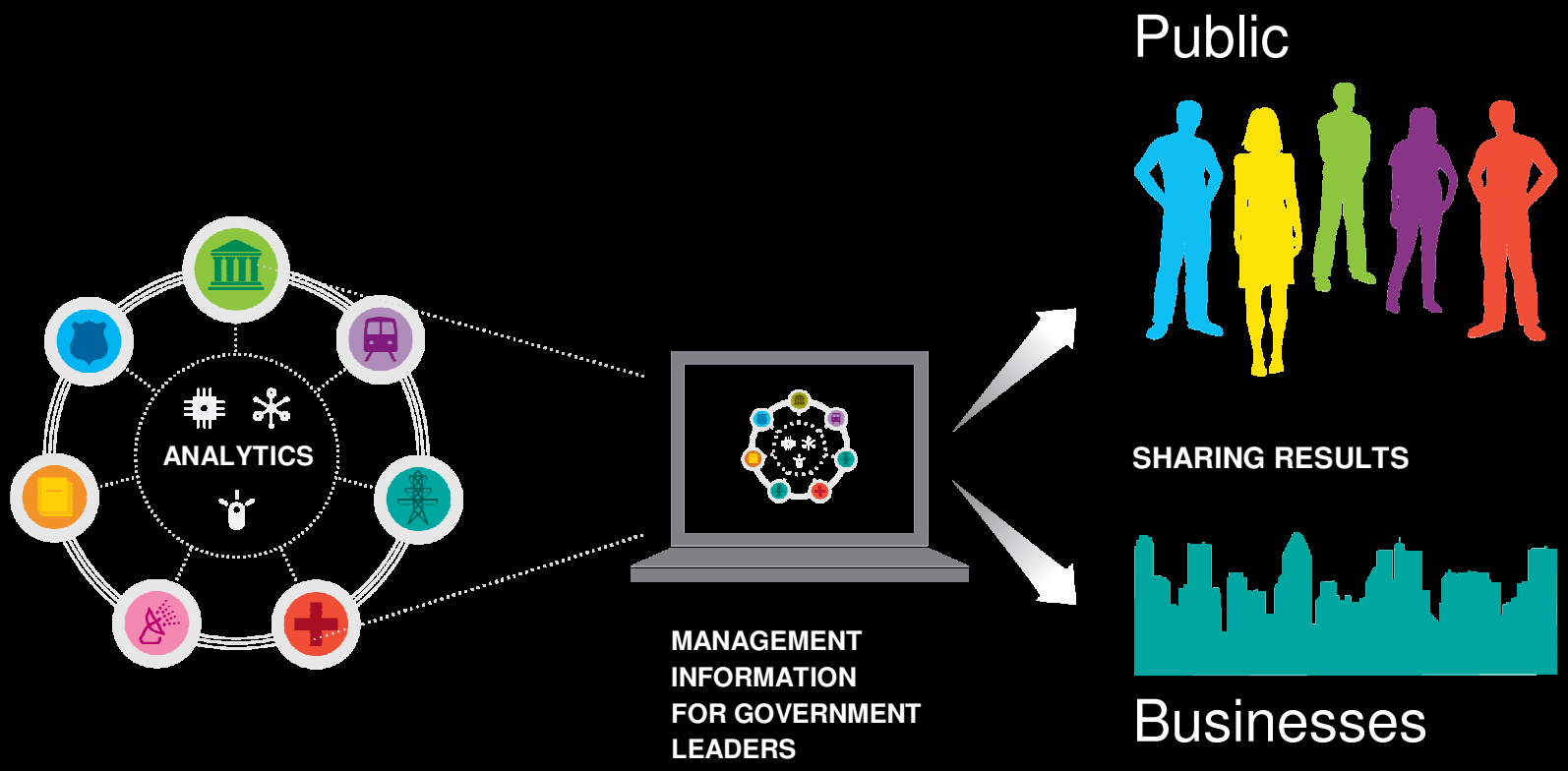
City of Albuquerque introduced a performance management system that reduces manual data collection from disparate sources while enabling actionable, timely information for citizens, emergency personnel and others—realizing an initial cost savings of almost 2,000% ROI.

The **Cheshire County Council** achieved a 20% reduction in time and cost required to perform in-home senior visits, improving the ability to proactively manage the course of health and social care for senior citizens.

Advanced analytics can identify challenges and potential efficiency gains across all systems.



Performance management gives cities the ability to set priorities, assess progress and share results with the public.



Smarter cities focus on the economic health and welfare of citizens and businesses—providing needed services, creating an economically sound environment and improving the quality of life for all.

Public

SHARING RESULTS

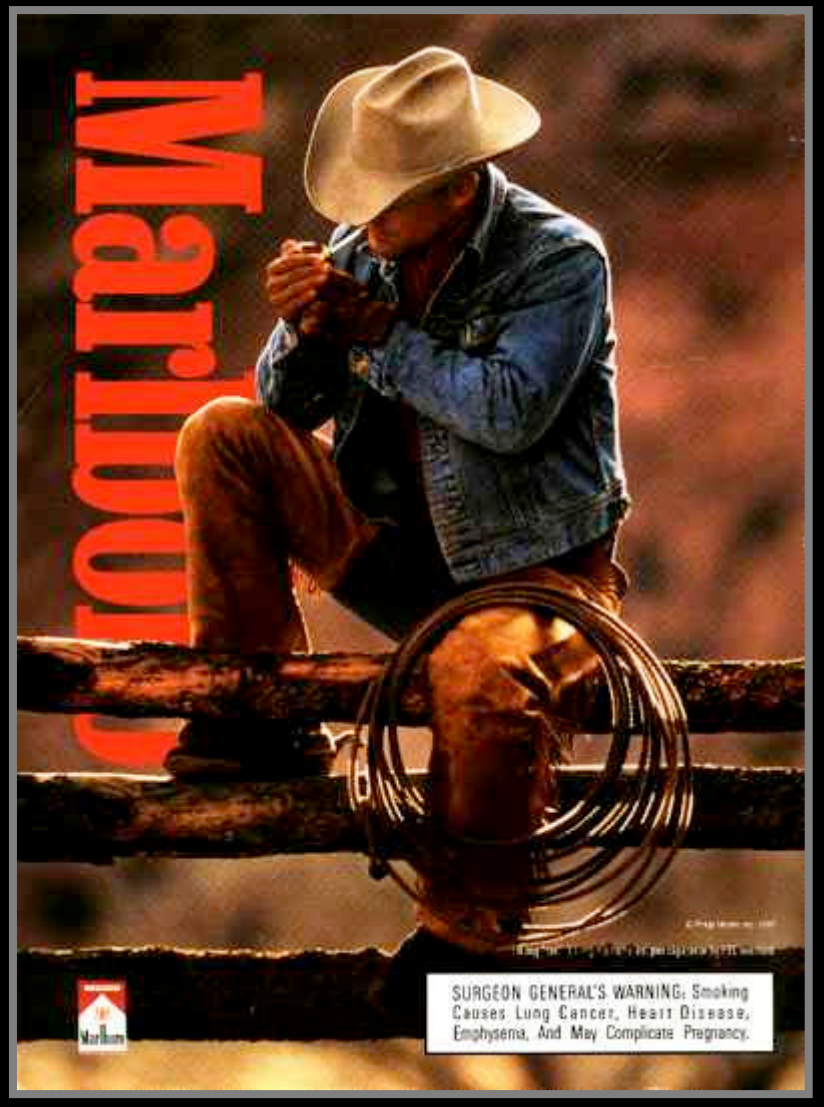
Businesses

Kraft Australia explored a new frontier of customer understanding through advanced analytics

- Deep insight of customer behavior
  - **1.5 Billion posts across 38 languages**
- Cut campaign development time in half
  - **from 4 to 2 months**
- Rejuvenated brand
  - **How do you like your Vegemite? 32+ ways**
- Doubled Sales
  - **"2 jars at a time"**

" The work we did with IBM fundamentally changed our business strategy and how we looked at our own brand."
— Simon Talbot, Head of Corporate Affairs, Australia/ New Zealand, Kraft Australia

The art of the possible



The art of the possible has driven new leadership and collaboration models

PHILIP MORRIS INTERNATIONAL

IBM Research

The new leadership, Business and IT requirements:

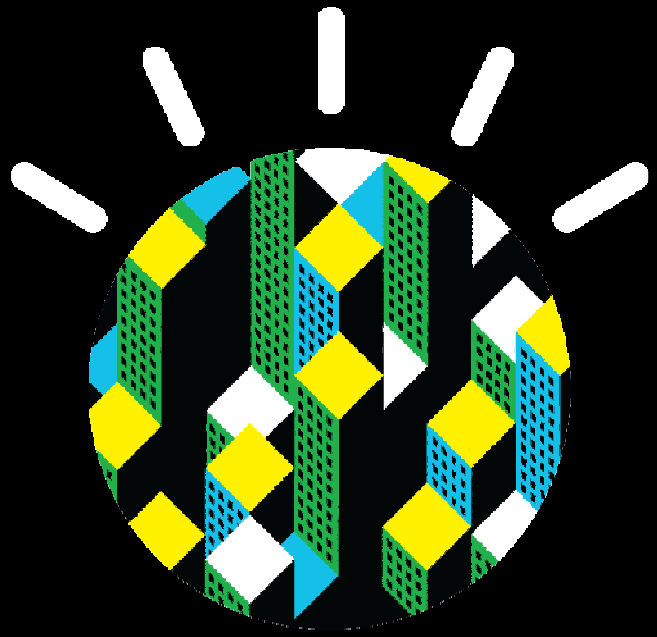
Collaboration

Standards

Openness and innovation

These three elements are key to a city's long-term strategy and road-map to success.

Building a smarter planet



The key precondition for

REAL CHANGE

now exists.

A period of discontinuity is a period of

OPPORTUNITY

for those with courage and vision.

There will be

WINNERS,

and there will be losers.

What will you do?

Thank you!