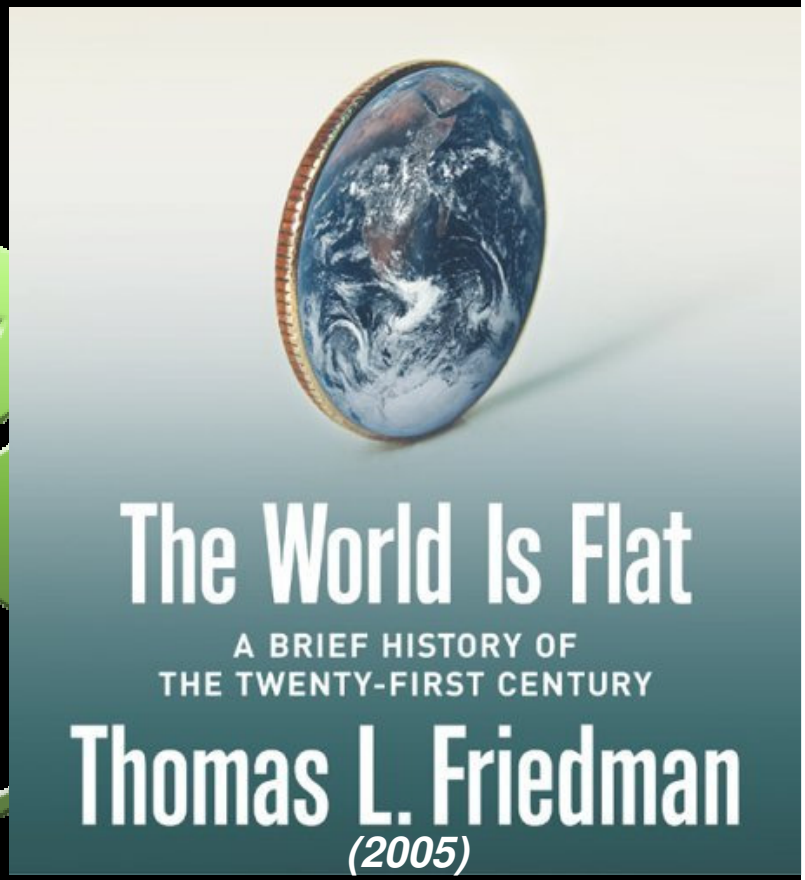

Smarter Products for a
SMARTER PLANET
Stefano Stinchi
Director of Rational SW IOT
Rational. software
IBM

The world is smaller and flatter and is getting smarter

Solutions for a small planet (1996)

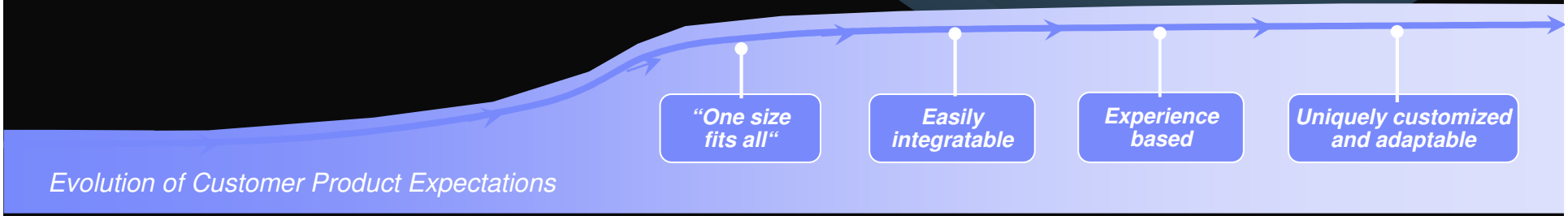


(2005)

Products Are Getting Smarter Every Time We Look *Sometimes in Ways We Can't Even See*

Products are getting increasingly smarter to meet more demanding and ***unique*** needs of their custom

- Demand for more customizable products unique to the needs of individual people or businesses
- Customer desire to better integrate into multi-product 'experiences' or workflows
- Leverage of information and environmental conditions to achieve desired outcomes
- Improved use of scarce resources such as time, energy and money



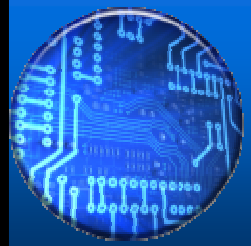
Evolution of Customer Product Expectations

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.

What Makes a Product Smarter?

Software is Driving Much of the Value in Products Today



Electronics

- Apple's iPhone is completely instrumented, with GPS positioning software that helps the device know where you are

Automotive

- 90% of innovation is based on electric / electronic systems
- 80% of this innovation is based on embedded software

Aerospace & Defense

- F-22 Raptor (2003) contains 1.7 million lines of code
- F-35 Lightning II (scheduled for 2010) will have 5.7 million lines of code

*"Embedded software has evolved from a hidden component driving functionality to the **keystone of product differentiation** and end-user experience."*

VDC Research,
October, 2008

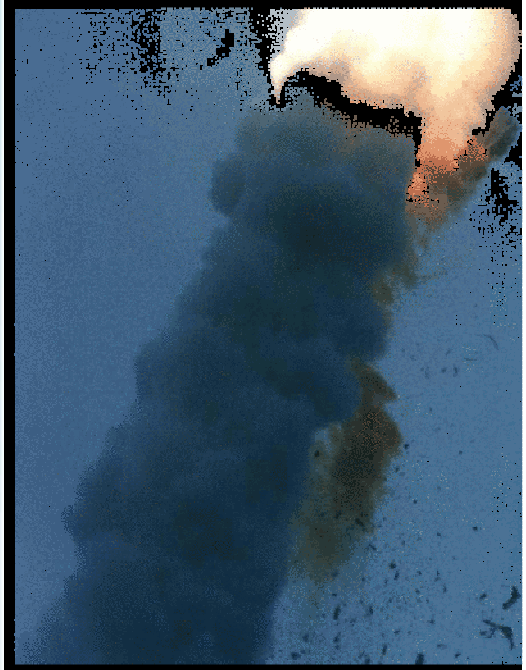
“Our civilization runs on software"

-- Bjarne Stroustrup

Yet the art of creating it continues to be a dark mystery. Never in history have we depended so completely on a product that so few know how to make well.

A small software problem…

- *After 10 years and $7 billion of development, the maiden flight of Ariane 5 on June 4th, 1996, exploded at an altitude of 4000 meters.*
- *The cause of the failure was the total loss of guidance and altitude data 37 seconds after the ignition sequence of the main engine.*
- *The nozzles received the order of an important correction of the trajectory. Therefore, the rocket turned violently and disintegrated because of the high aerodynamic loads. Self destruction has been activated immediately after the beginning of the disintegration.*
- *The internal Inertial Reference System software exception was caused during execution of a data conversion from 64-bit floating point to 16-bit signed integer value. The floating point number which was converted had a value greater than what could be represented by a 16-bit signed integer.*



Product Development Inefficiency Impacts the Bottom Line

Medical Devices

- Recall of 42,000 defibrillator devices due to poor software

Aerospace & Defense

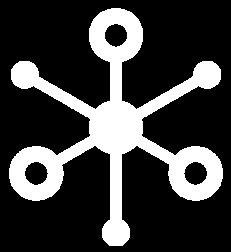
- $1 billion prototype rocket self-destructs due to bug in on-board guidance software

Automotive

- ~50% of warranty costs are related to electronics and embedded software

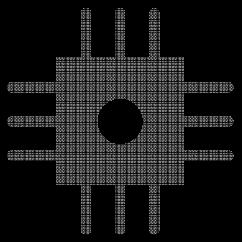
How a Smarter Planet "happen" ……

It requires Smarter Products which are Intelligent, Interconnected and Instrumented



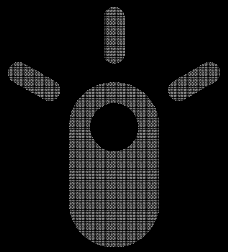
INSTRUMENTED

We now have the ability to measure, sense and see the exact condition of everything.



INTERCONNECTED

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



INTELLIGENT

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

We now have the ability to measure, sense and see the exact condition of everything.

30 billion

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

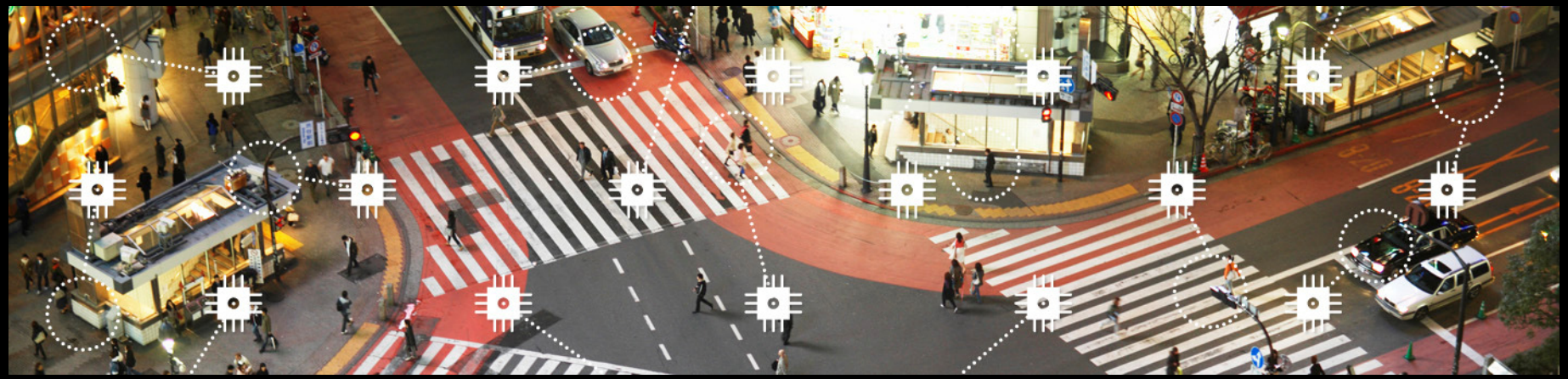
1 billion

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

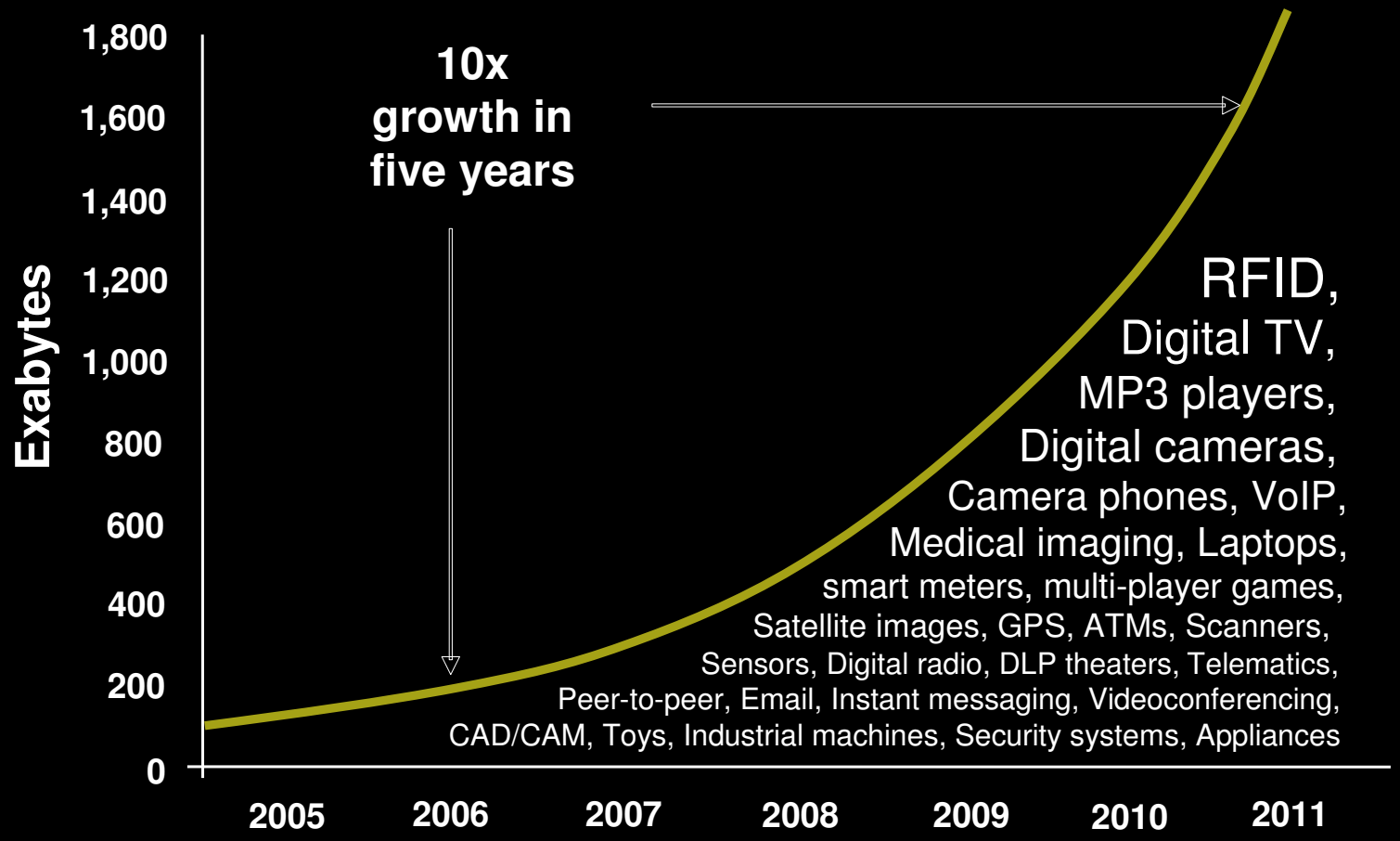
85%

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

Instrumented Interconnected Intelligent



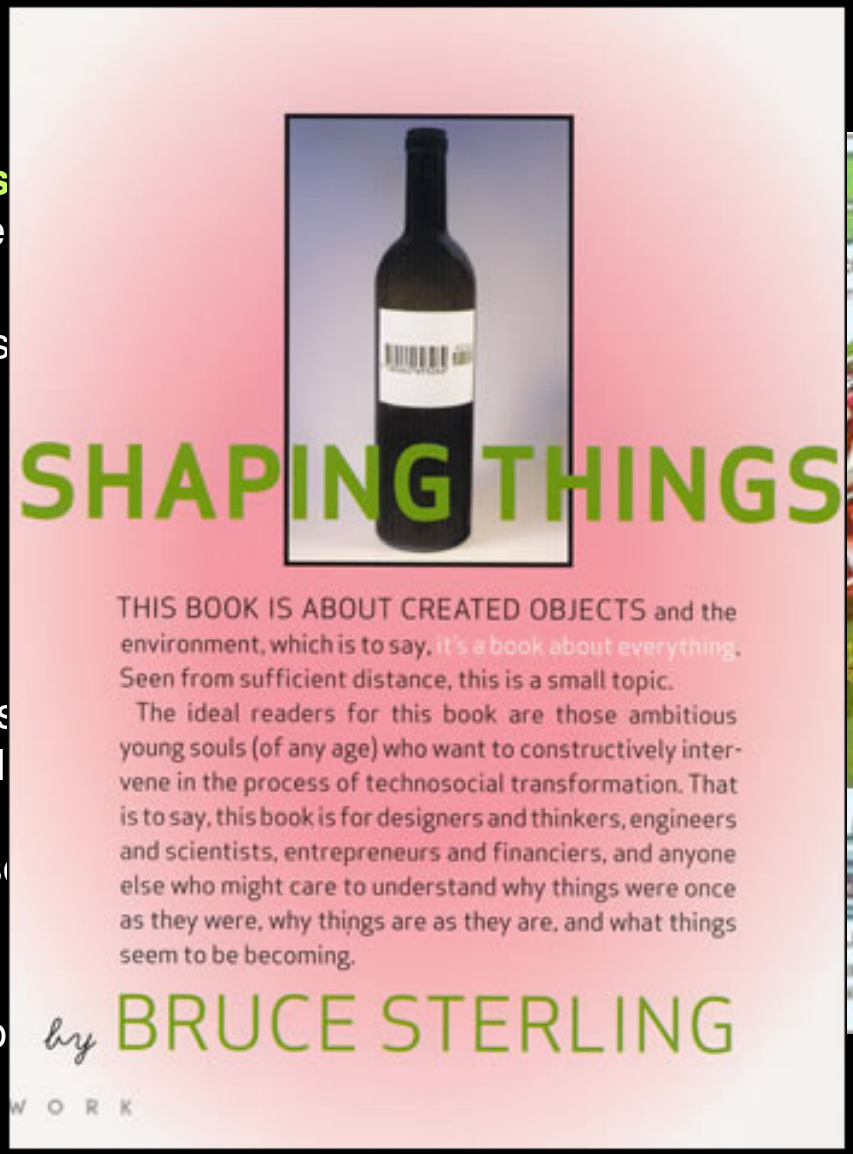
By 2011, the world will be 10 times more instrumented with connected devices leaping from 500M to 1 Trillion



Approximately 70% of the digital universe is created by individuals, **but enterprises are responsible for 85% of the security, privacy, reliability, and compliance.**

Spimes

- We called these smart Internet devices **"spimes** because they're tractable in space and time.
- The primary advantage is that you no longer inventory your possessions inside your own head.
- That work is done far below your notice by a host of machines. You jus ask where things are and where you bought them and what you paid, and s on.
- You no longer wonder where your shoes are, yo just google them.



Fleet Management
Daimler FleetBoard

"Focal Point helps us discover the optimal set of customer features and balance those against the needs of our business, allowing us to deliver continual enhancements to our telematic solution."

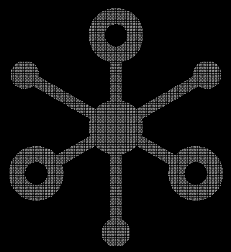
What's Smart?
- Smart end-to-end system optimizing vehicle usage and routing
- Innovative technology for advanced telematic solutions

Smarter Business Outcomes
- 5-10% reduction in fuel consumption due to optimized vehicle management
- 10% reduction in telecommunications costs due to increased automation

How Rational Software Enables Smarter Products
- Improved collaboration in the product portfolio planning process
- Automated release planning balancing cost, risk and reward

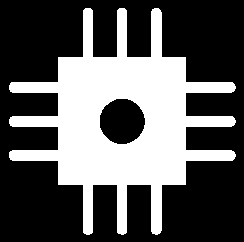
How a Smarter Planet "happen" ……

It requires Smarter Products which are Intelligent, Interconnected and Instrumented



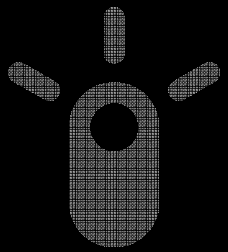
INSTRUMENTED

We now have the ability to measure, sense and see the exact condition of everything.



INTERCONNECTED

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



INTELLIGENT

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

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.

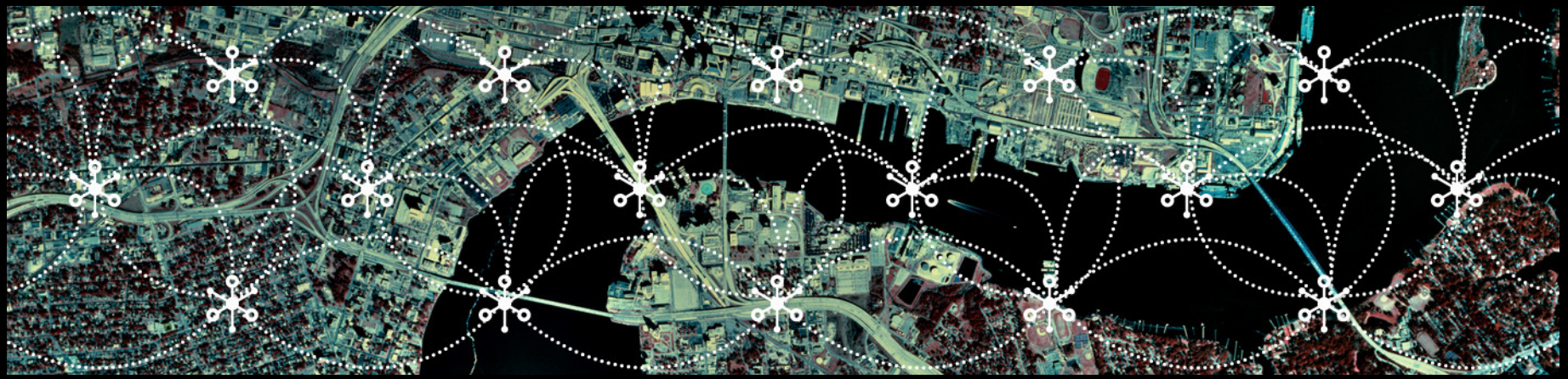
4 billion

There are an estimated 4 billion mobile phone subscribers worldwide.

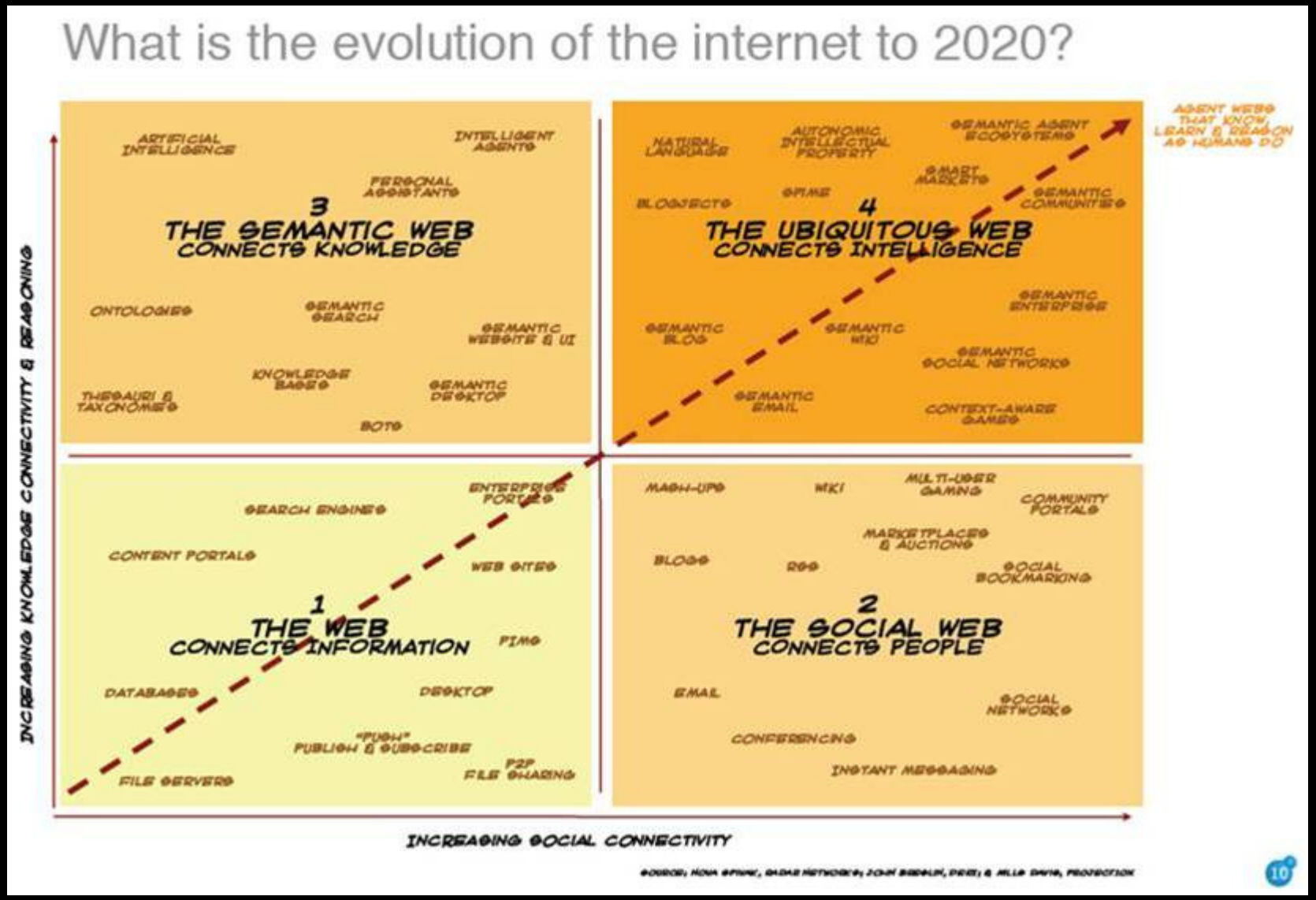
1 trillion

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

Instrumented Interconnected Intelligent



The internet of things



Car2Car

WiFi is coming to the fast lane as European automakers like DaimlerChrysler make progress on in-car networking systems designed to make driving safer.
Cars equipped with the system can relay information about temperature, road conditions, fog, or road obstructions to vehicles within 500m, warning other drivers about problems so that they can take corrective actions.
This project uses existing vehicle sensors such as the anti-lock braking system, electronic stability control, thermometer, or navigation system to detect black ice and road problems, and it can integrate with in-car radar and collision systems to report the location of road obstacles or disabled vehicles.

Mobile Access to Medical Images

Merge Healthcare

"We rely on Synergy and Change to manage the complexity of the software and to ensure that our global development teams operate as one, for the best result to our customers. This software from IBM is part of our livelihood; it's our DNA."

What's Smart?

- Provides medical professionals access to complex medical images on mobile devices
- Helps ensure prompt emergency diagnosis – anytime or anywhere

Smarter Business Outcomes

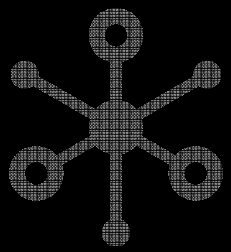
- Reduced hospital operations costs
- Reliable, secure, scalable delivery of medical images and reports

How Rational Software Enables Smarter Products

- Collaboration across globally distributed development teams
- Change management across the end-to-end software lifecycle

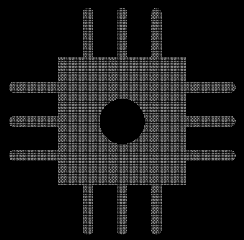
How a Smarter Planet "happen" ……

It requires Smarter Products which are Intelligent, Interconnected and Instrumented



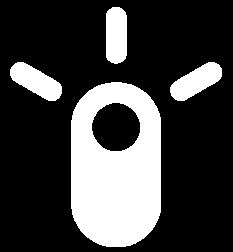
INSTRUMENTED

We now have the ability to measure, sense and see the exact condition of everything.



INTERCONNECTED

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



INTELLIGENT

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

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

50 terabytes

Agricultural consultancy Lanworth crunches more than 50 terabytes of satellite images, digital soil maps and weather forecasts to make more accurate crop forecasts.

1 petaflop

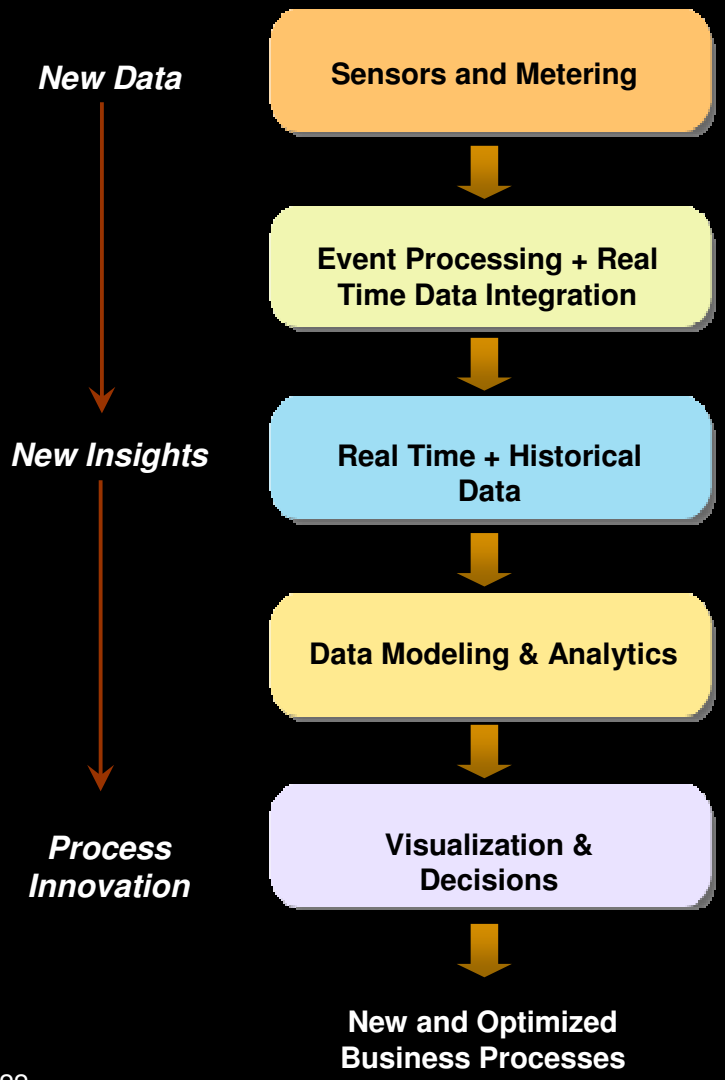
Scientists are working to prevent influenza outbreaks by modeling the viruses with a super-computer that can operate at one petaflop, or one quadrillion operations per second.

100,000

Electronic medical records could prevent an estimated 100,000 deaths a year from medical error.

Instrumented Interconnected Intelligent

Instrumentation, Interconnected Smart Products Help to Delivery more Intelligence, Adaptive Solutions



- Data collection
- Data Integration
- Comparison of historical data, with newly collected data
- Data modeling and analytics to create insights from data to feed decision support and actions

Leading businesses today are benefiting from new sensor data when combined with business process management, event processing and business optimization capabilities

Intelligence will be created through integration

Vehicle Services
- Vehicle Monitoring
- Roadside Assistance
- Advanced Diagnostics
- Software Fault Analytics
- Service & Warranty Data

Traffic Services
- Police/Emergency
- Traffic Congestion
- Weather
- Concierge
- Insurance ("pay as you drive")

Personal Services
- News
- Entertainment
- Banking
- Government
- Utilities

Vehicle to Vehicle

Dealer

Tolling

Electric Vehicle/ Hybrid Charging

GPS

Vehicle to Roadside

Smart reduction of fuel consumption and emissions
Eaton corporation

What's smart?

- Innovative hydraulic hybrid technology for urban delivery trucks
- Smart software to optimize energy usage and reduce greenhouse gases

Smarter business outcomes

- 60-70% increase in fuel economy (per EPA)
- 40% reduction in CO_2 emissions

Software tools are needed to:

- Model and optimize system performance
- Automatically generate in-vehicle software code

Meeting the "Smarter Products" Challenge

- How will businesses use innovation to ***create value*** in challenging economic times?
- What is the impact if software development is ***disconnected*** from electronic and mechanical development?
- How can the development process ensure flawless ***quality*** in spite of shrinking budgets and schedules?

The challenge is to differentiate your products and seize new opportunities ahead of the competition

Smarter Products for a Smarter Planet

In Summary…

- Software is driving the value and differentiation in products and systems
- The development of smarter products requires: Innovation, Collaboration, Efficiency
- IBM Rational provides an integrated software platform dedicated to helping companies develop and deliver smarter products and to develop software that can benefit from smarter products

- IBM can offer the software, hardware, expertise and services to help you get ahead of the competition

Things that never change