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

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

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What Makes a Product Smarter?
How Will Your Company Deliver Value?

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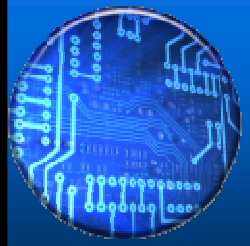
Software is Driving Much of the Value in Products Today



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

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“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.

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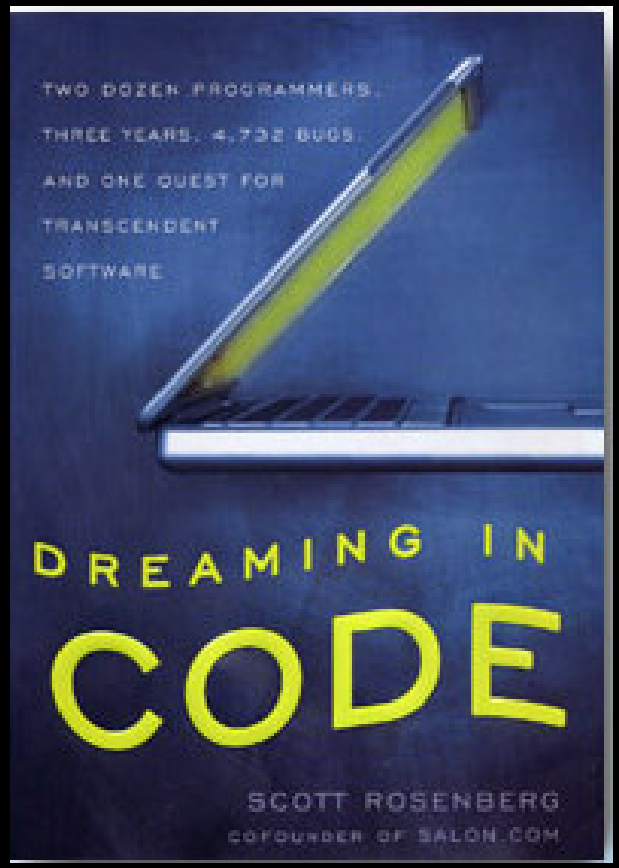
"Code is hard" Knuth

- Software is more than the program you use to send email or compose a report; it has seeped into every cranny of our lives, without many of us noticing.
- The stuff of our daily existence hangs from fragile threads of computer code.
- Software errors cost the U.S. economy about $59.5 billion annually, according to a 2002 study by the National Institute of Standards and Technology
- Computing pioneer Maurice Wilkes wrote of the moment in 1949 when, hauling punch cards up the stairs to a primitive computer called EDSAC in Cambridge, England, he saw the future: **"The realization came over me with full force that a good part of the remainder of my life was going to be spent in finding errors in my own programs."**



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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

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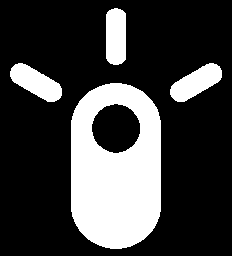
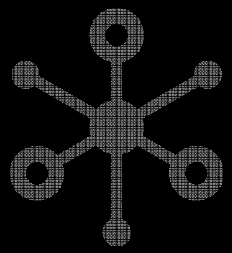
How a Smarter Planet "happen" ……

It requires Smarter Products which are Intelligent, Interconnected and Instrumented



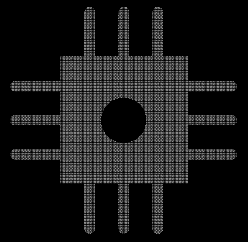
INTELLIGENT

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



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.

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Smart Products need to be first CREATED

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

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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

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Complex Systems for Automotive

Delphi Corporation

"DOORS has helped Delphi improve development team communication, resulting in meeting customer requirements faster and more accurately."

What's Smart?

- First prepackaged airbag assembly within a steering wheel
- Teams in 35 countries collaborating on parallel releases using shared requirements

Smarter Business Outcomes

- 2008 introduction of prepackaged airbag/steering wheel in the Smart Fortwo vehicle made by Daimler

How Rational Software Enables Smarter Products

- Requirements sharing across globally distributed teams and projects
- Component reuse enabled by automated requirements management

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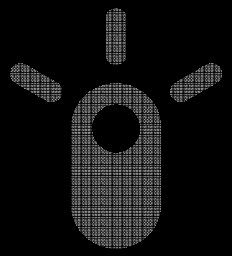

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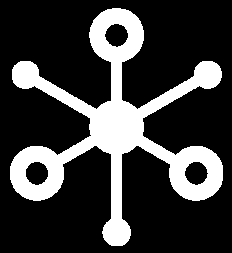

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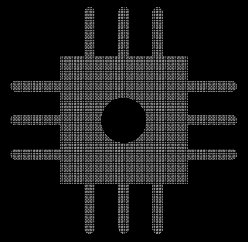

INTERCONNECTED

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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 just ask where things are and where you bought them and what you paid, and so on.
- You no longer wonder where your shoes are, you just google them.

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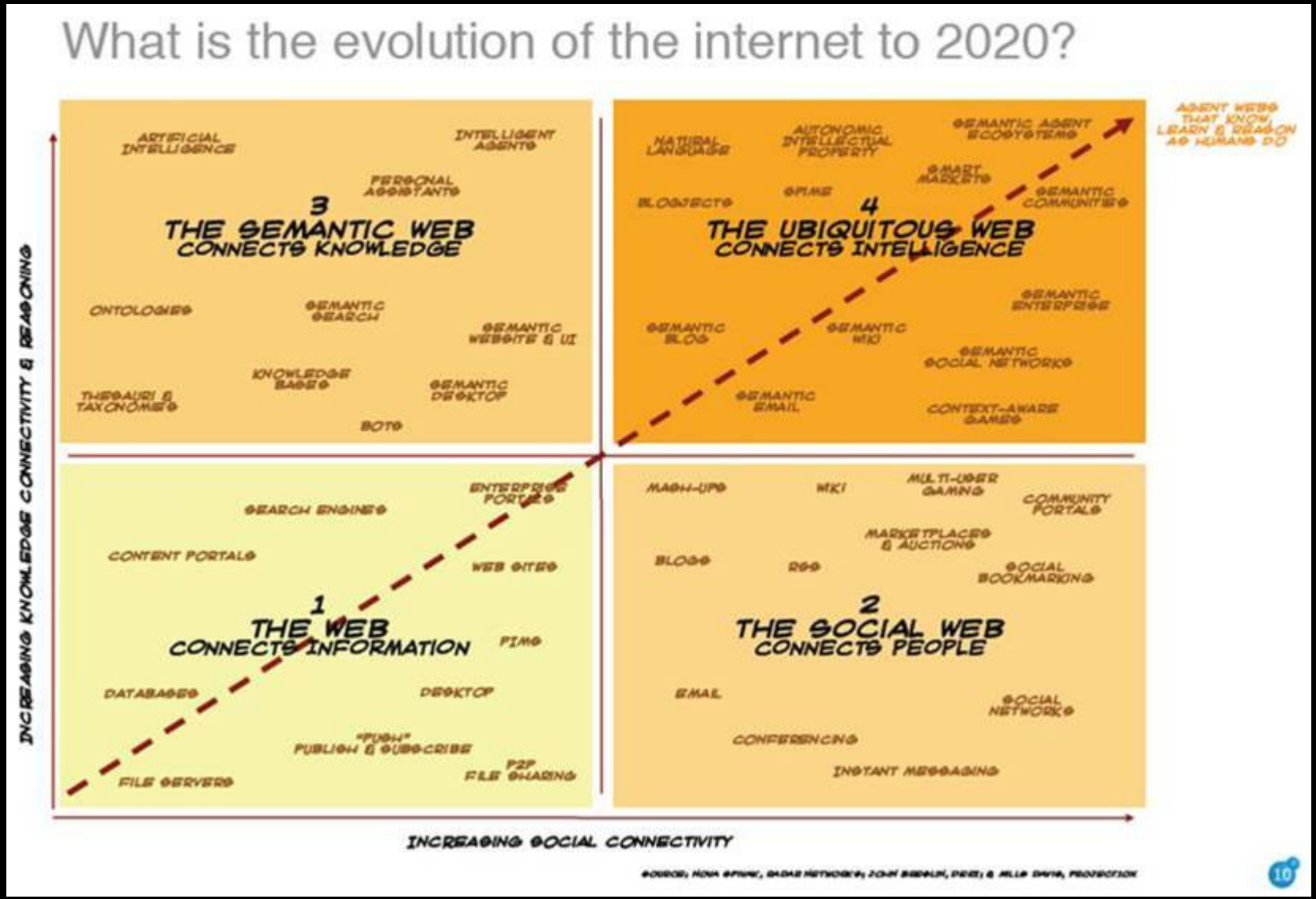
The internet of things



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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

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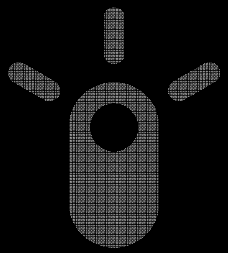

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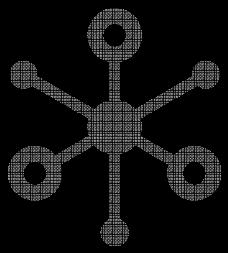

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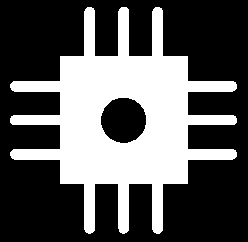

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Integrated Systems Are Creating New Business Models

Delivering Competitive Advantage and Sustained Value

mp3 devices are at the center of a vast ecosystem of products & services

Music libraries

Streaming video

Applications

Messaging

Entertainment/ edutainment

Location services

Games

Automobiles are rapidly becoming a network device

Roadside assistance

Vehicle-to-vehicle communication

GPS services

Internet connectivity

Systems Engineering and Architecture are key to creating value in the marketplace

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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.

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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

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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

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What do *you* think?

How do *you* see the future?

What smarter steps will you take?

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