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Innovate2010

The premier software and product delivery event



More interconnected, more instrumented, more intelligent

Software is the invisible thread enabling systems-of-systems

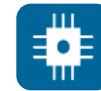
Software & systems delivery has fiscal and societal impact



Creating desired fiscal and societal outcomes



Healthcare



INTERCONNECTED



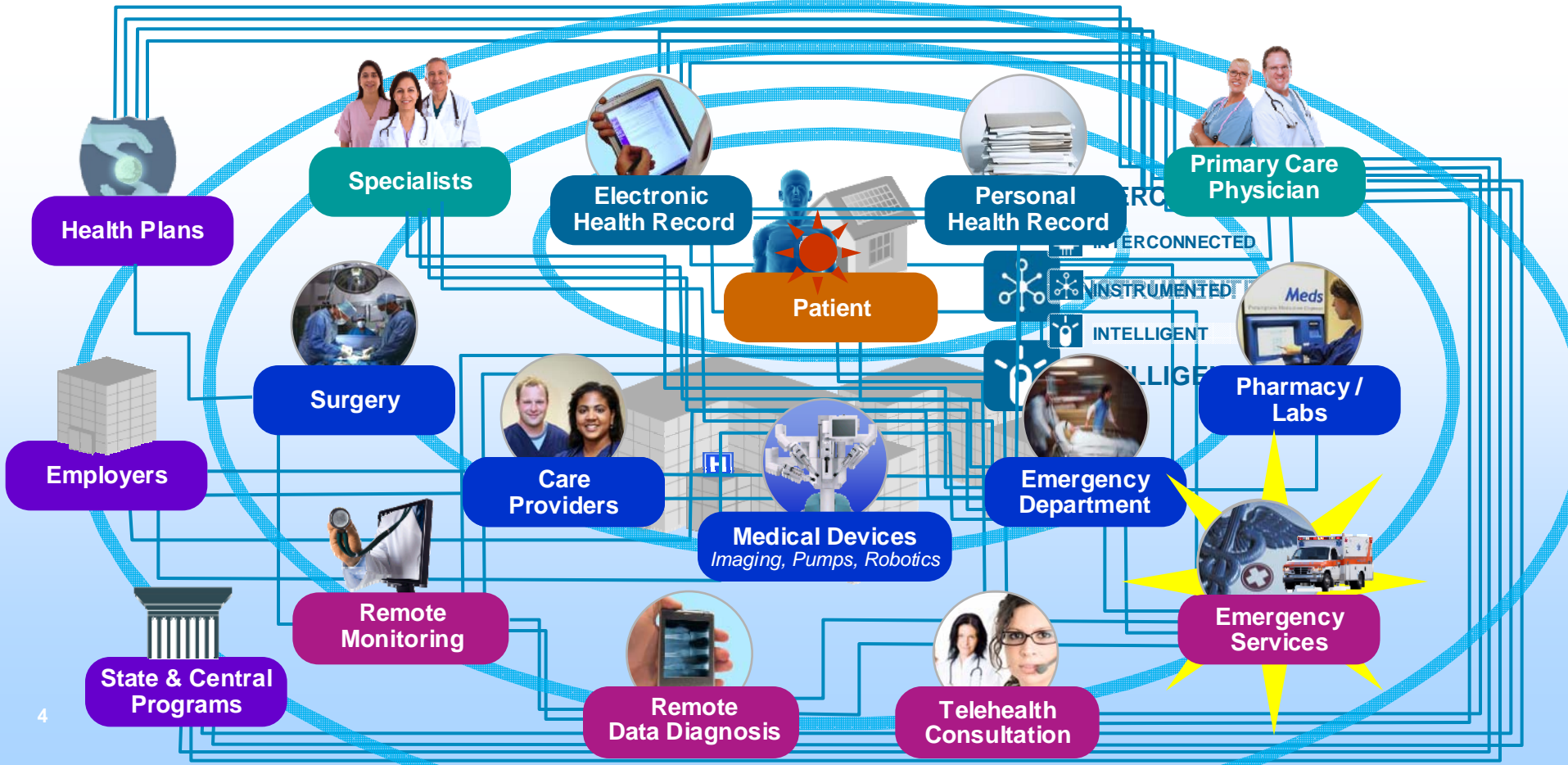
INSTRUMENTED



INTELLIGENT

Healthcare delivery becoming mission-critical system-of-systems

Key objectives around efficiency, quality, innovation



Emergency services system-of-systems

- Heart disease is *the* leading cause of death
- In 2010, heart disease will cost the U.S. more than **\$316 billion**
- With congestive heart failure cases, **30–50% of patients are readmitted within 3 months**



Patient

Emergency services system-of-systems

1. Implanted medical device generates event that notifies cardiac center

Enabled by:

- 200,000 lines of software code in the device
- Wireless transmissions (alarm signal, data stream from device)
- Monitors and sensors (event duration, thresholds)
- GPS for location of implanted device



Patient



Remote
Monitoring and
Data Diagnosis



Cardiac
Center

Emergency services system-of-systems

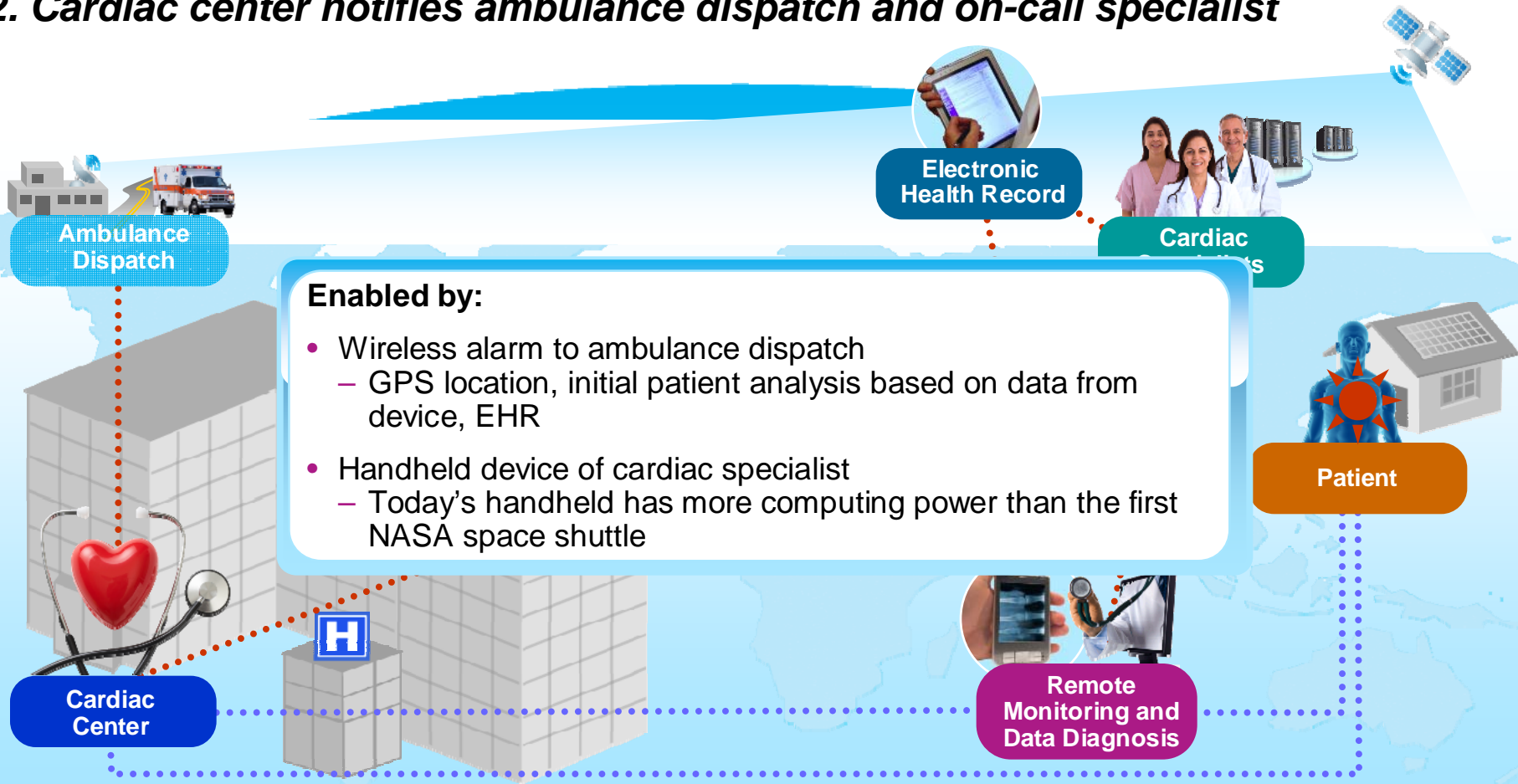
- Patient whose heart has short-circuited **has six minutes to live**
- **National standard is four-minute response time** to 90% of all emergencies



Patient

Emergency services system-of-systems

2. Cardiac center notifies ambulance dispatch and on-call specialist



Emergency services system-of-systems

3. Ambulance dispatch prioritizes response based on patient criticality, location, ambulance readiness

- Most ambulance services report that **only 10% of calls are true life and death situations**
- More than **80% of false alarms are due to human error**

Enabled by:

- Ambulance queuing system – analyzes available health, situational data
- Decision support system – selects resources (Fire, Air Support, etc.)
- Assign ambulance based on vehicle service readiness, onboard staffing skills

Ambulance
Dispatch

Cardiac
Center

Remote
Monitoring and
Data Diagnosis

Patient

Emergency services system-of-systems

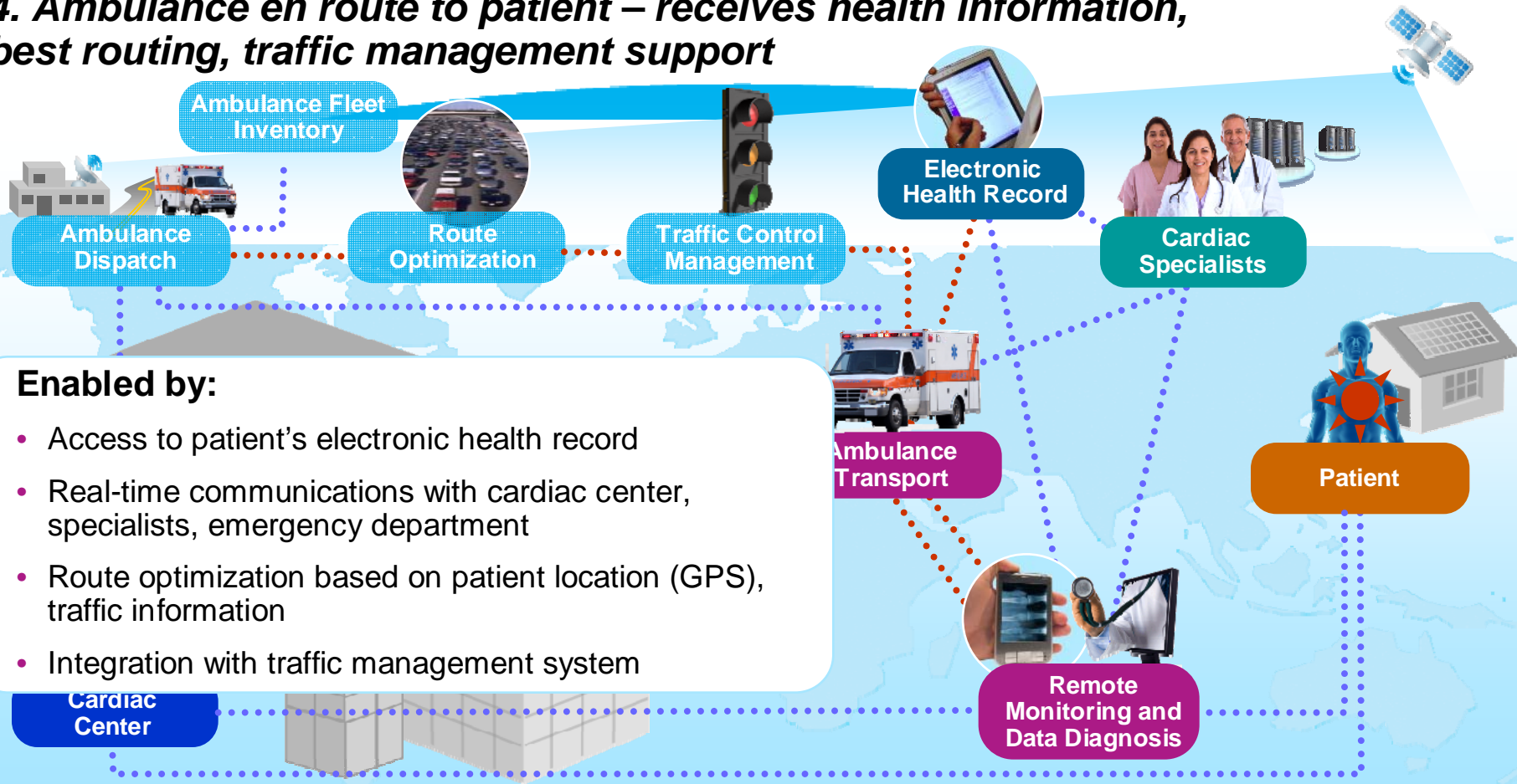
- There are **8,500 ambulance collisions** per year in the U.S.
- Ambulance transport **costs range from \$300–\$700**, plus **\$10 per mile**



Ambulance
Transport

Emergency services system-of-systems

4. Ambulance en route to patient – receives health information, best routing, traffic management support

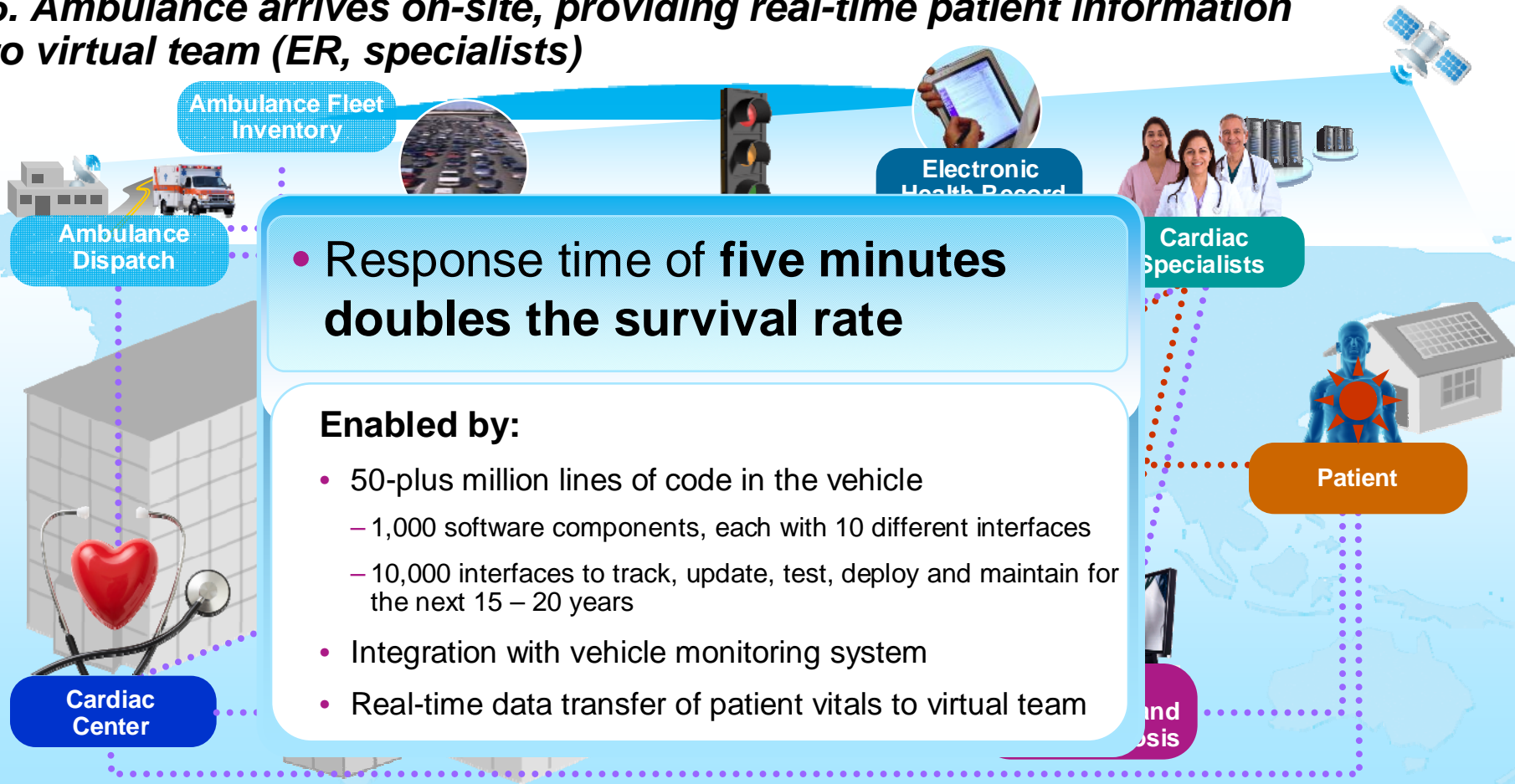


Enabled by:

- Access to patient's electronic health record
- Real-time communications with cardiac center, specialists, emergency department
- Route optimization based on patient location (GPS), traffic information
- Integration with traffic management system

Emergency services system-of-systems

5. Ambulance arrives on-site, providing real-time patient information to virtual team (ER, specialists)

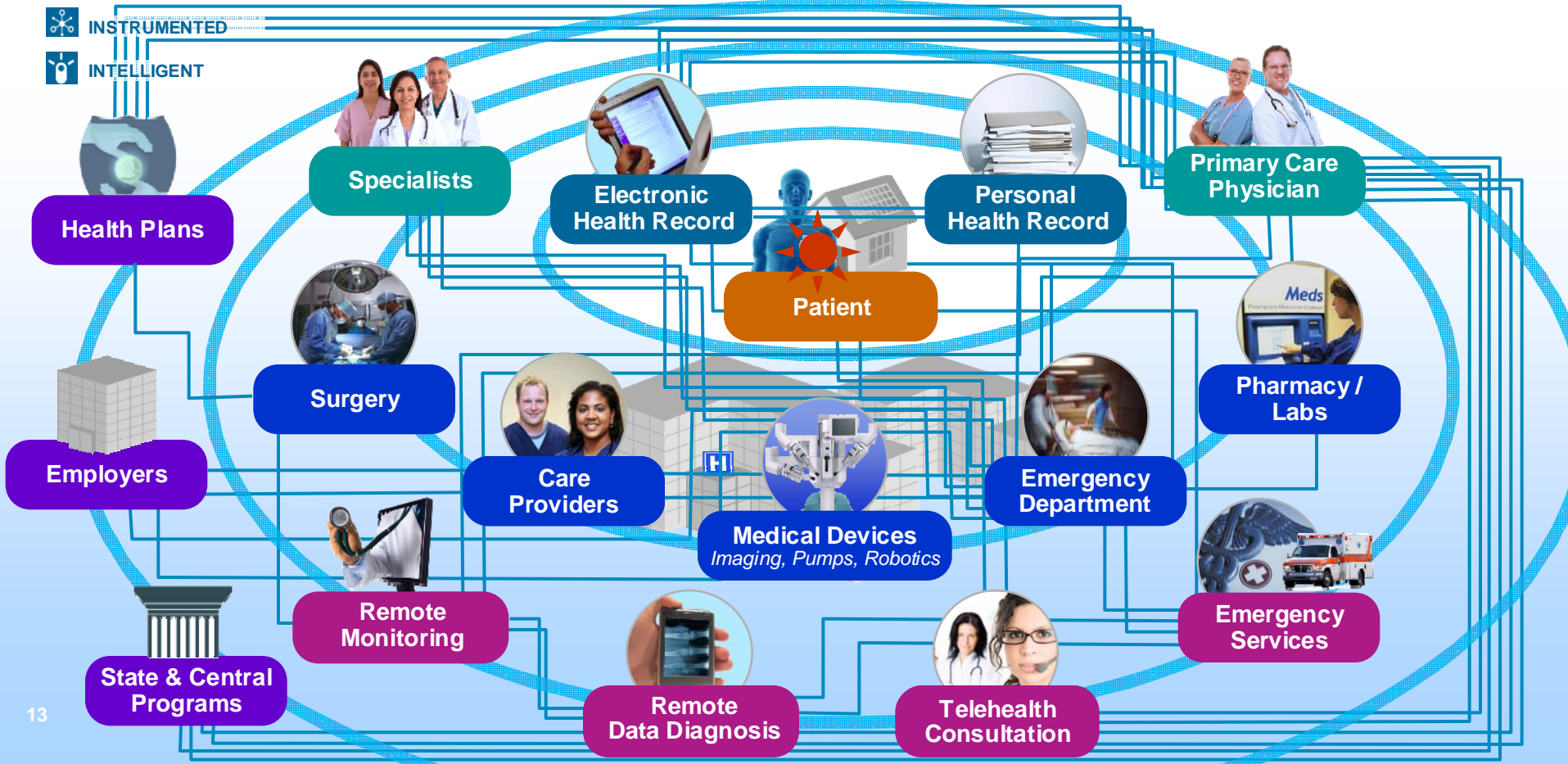


One industry, thousands of systems-of-systems scenarios

 INTERCONNECTED

 INSTRUMENTED

 INTELLIGENT



Software patch prevents thousands from filing tax returns electronically – \$2.4 million to fix

- ZDNet



**A better approach to addressing
complexity and innovation**



How will this impact your industry?

Driving systems-of-systems thinking, skills and strategies

Unique delivery challenges

*Heterogeneous ecosystem
with dynamic supply chains*

Emergent behaviors

*Outcomes difficult to trace,
understand and predict*

REQUIRES

Software is the invisible thread

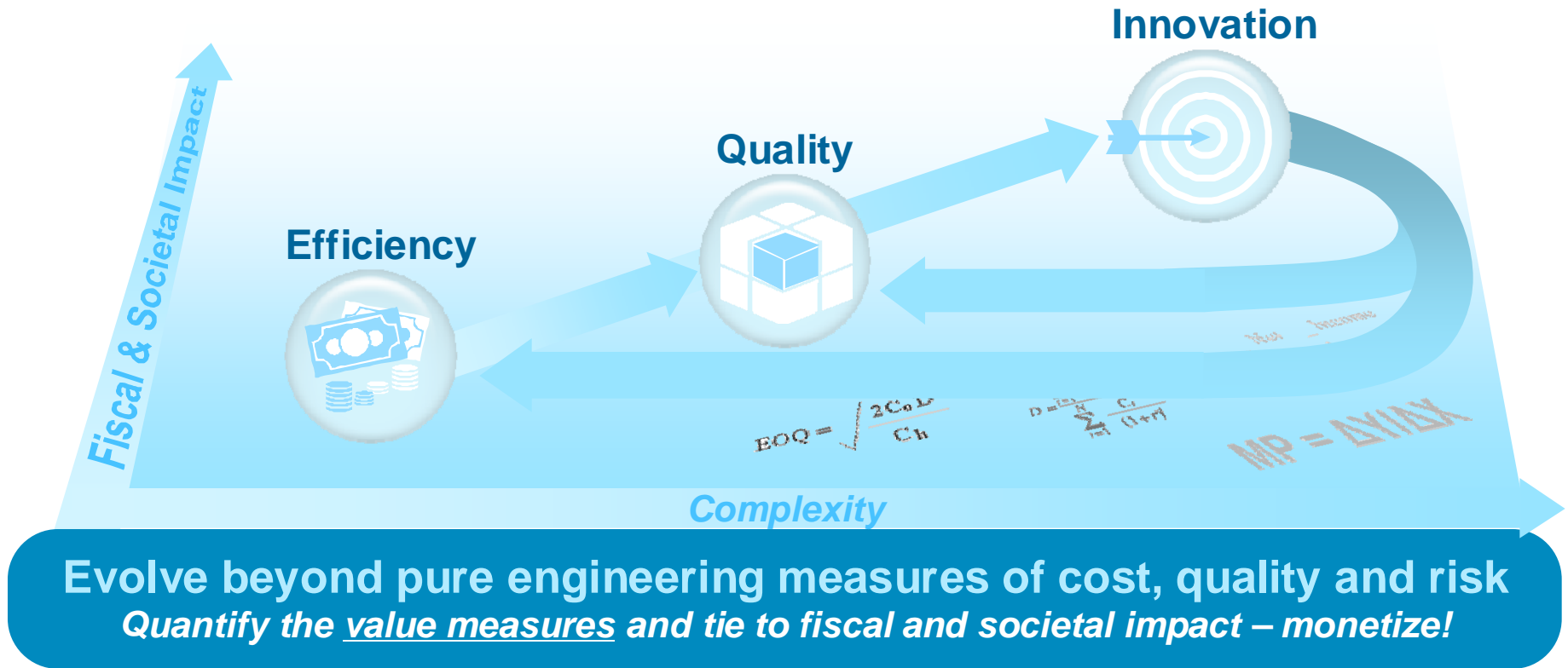
- Quantify emerging opportunity and risk
- Design for flexibility and extensibility
- Manage new collaborators in value chains
- Configure for multiple, diverse linkages
- Deliver perceived quality sustained over long periods

Systematic management for desired outcomes and failure avoidance



New thinking: software & systems econometrics

Optimized outcomes driven by processes towards measured innovation

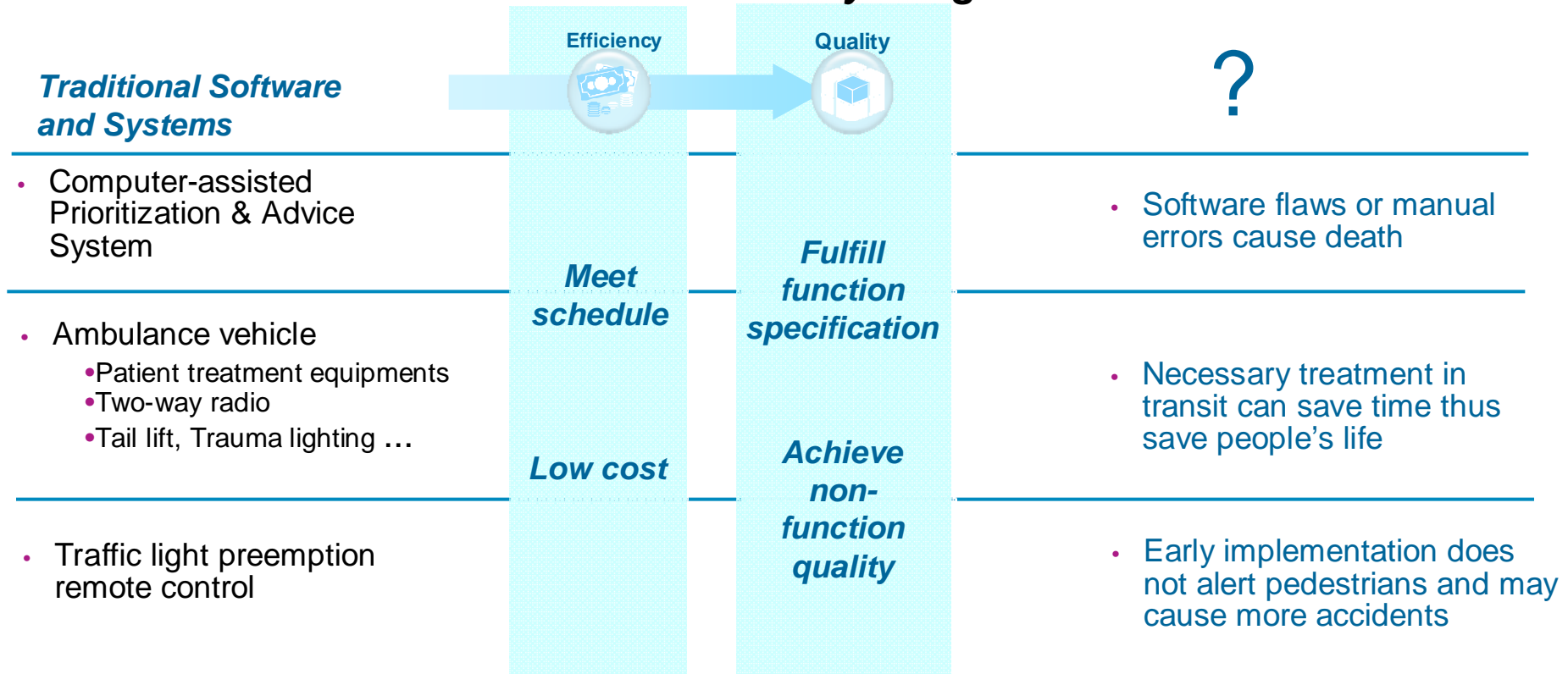


Evolve beyond pure engineering measures of cost, quality and risk
Quantify the value measures and tie to fiscal and societal impact – monetize!



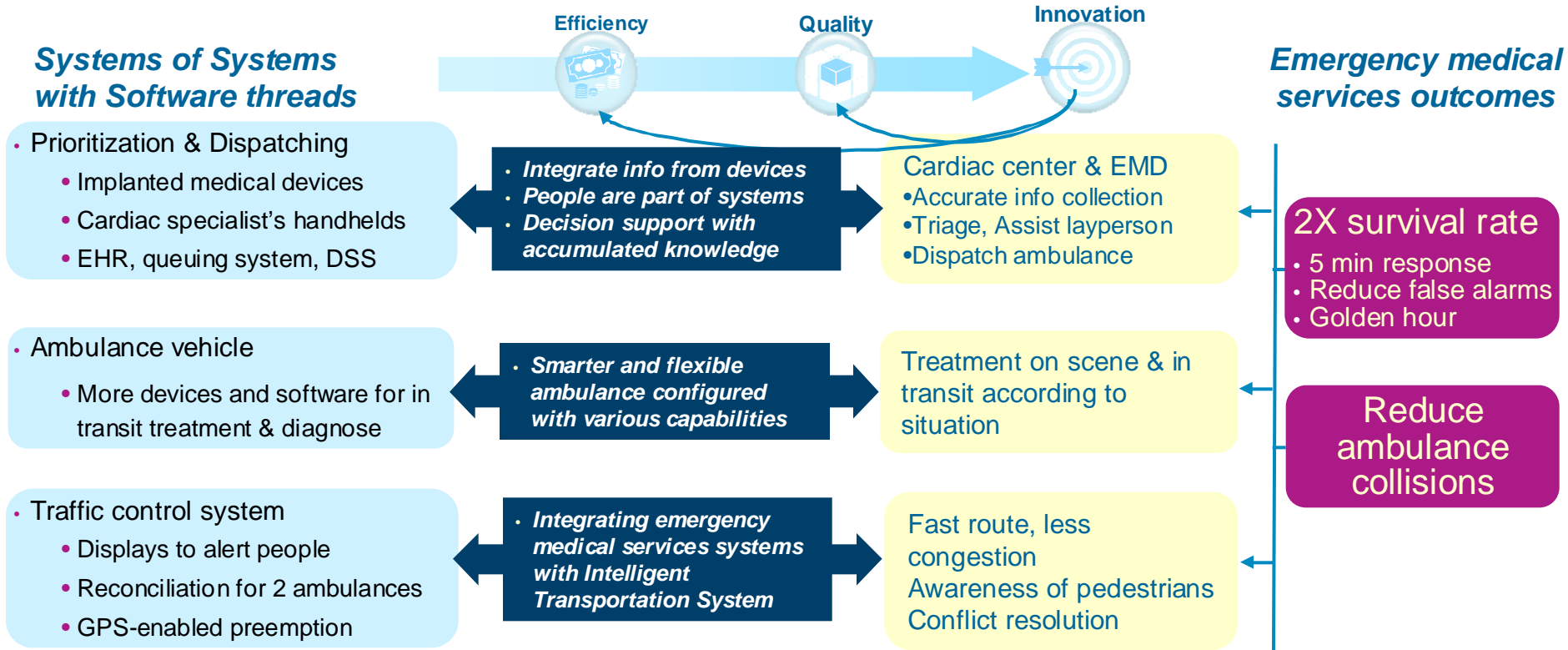
Traditional engineering approach

Measurements based on internal focus may not generate real value



From the angle of social and fiscal impact

Innovation is part of the delivery process



From the angle of social and fiscal impact

Key elements to map economic measurements to delivery process metrics

Systems of Systems with Software threads

- Prioritization & Dispatching
 - Implanted medical devices
 - Cardiac specialist's handhelds
 - EHR, queuing system, DMSS

- Ambulance vehicle
 - More devices and software for in transit treatment

- Traffic light preemption
 - Displays to alert people
 - Reconciliation for 2 ambulances
 - GPS-enabled preemption

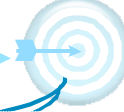
Efficiency



Quality



Innovation



A holistic view of extended lifecycle and a continuous improvement process

Dispatch center & EMD
 Real-time & rich info collection
 Assist layperson
 Enhance ambulance

Quality and Value measures across supply chain across multiple disciplines

Response time on scene & in transit
 according to situation

**Risk & cost dynamics
 Uncertainty in satisfaction
 Variance in estimate**

Optimized Route
 Congestion
 Awareness of pedestrians
 Conflict resolution

Emergency medical services outcomes

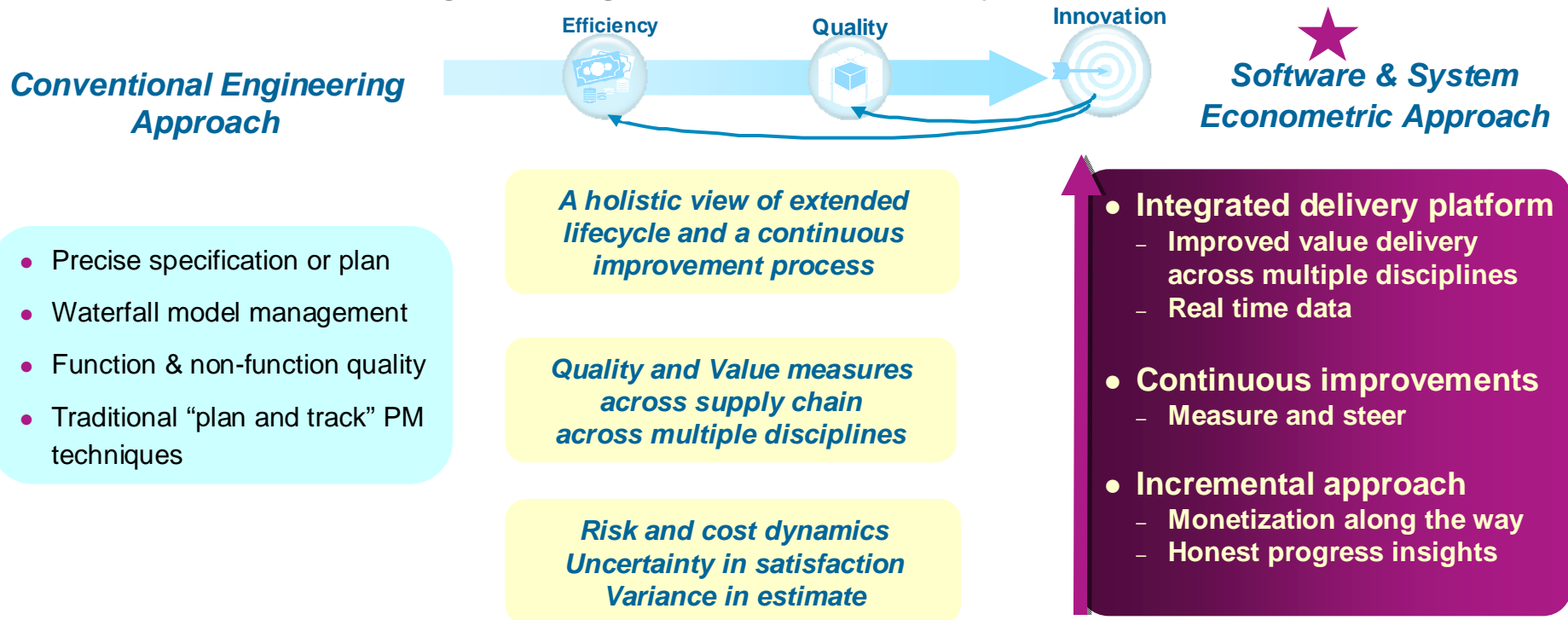
2X survival rate

- 5 min response
- Reduce false alarms
- Golden hour

Reduce ambulance collisions

Efficiency & quality measurement paradigm shift

from Conventional Engineering to Software and System Econometrics

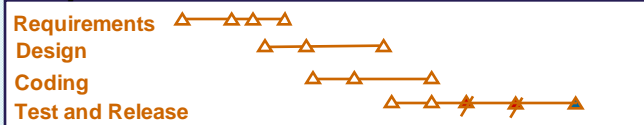


Software & systems econometrics – incremental approach

Core metrics for honest progress insight

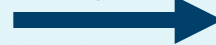
Conventional Engineering Governance

Sequence of documents and artifacts



Activity based—document baselines

Planning Progress



Modern Economic Governance

Sequence of demonstrable results



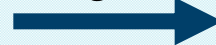
Result based --Code and test baselines

Dishonest early optimism



False precision in early artifacts

Technical Progress



Honest earned value



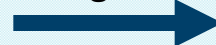
Demonstrated and measured capability/quality

Dishonest early optimism

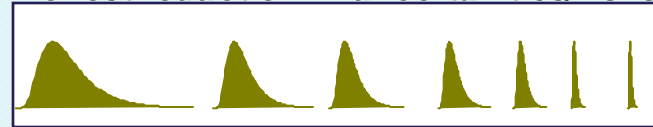


Postponed understanding of architecturally significant risks

Economic Progress



Honest reduction in uncertainties/risks



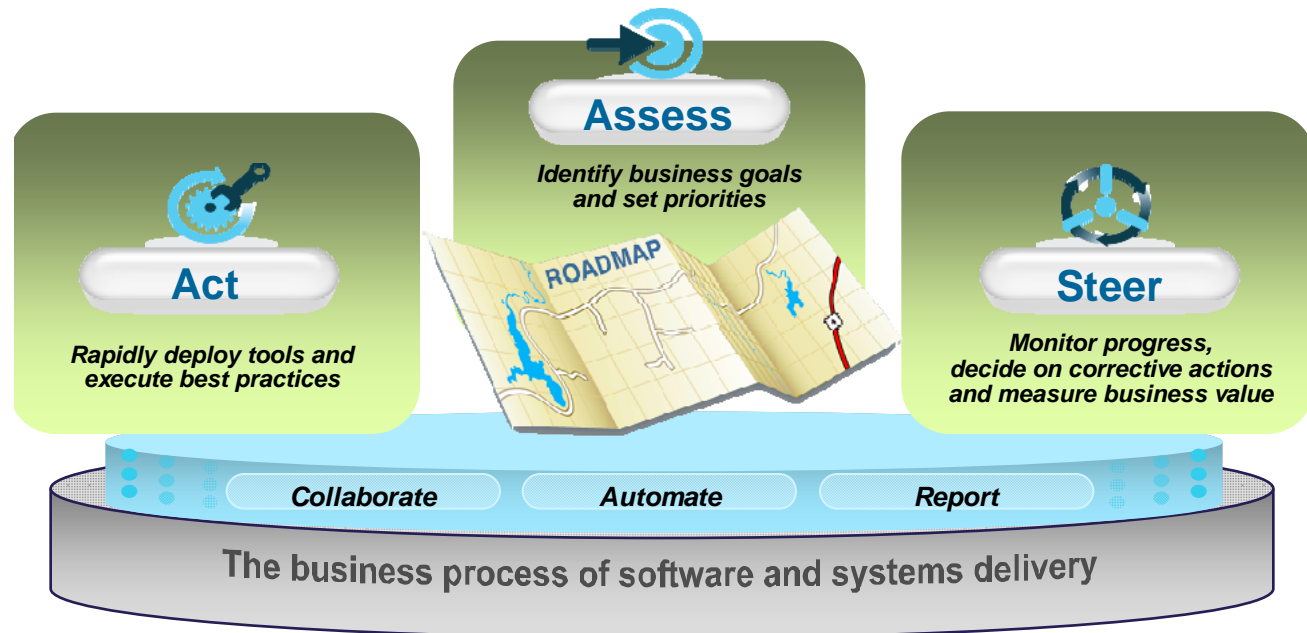
Reducing the variance in the estimated cost to complete

Software & Systems Econometrics - Measured Improvement

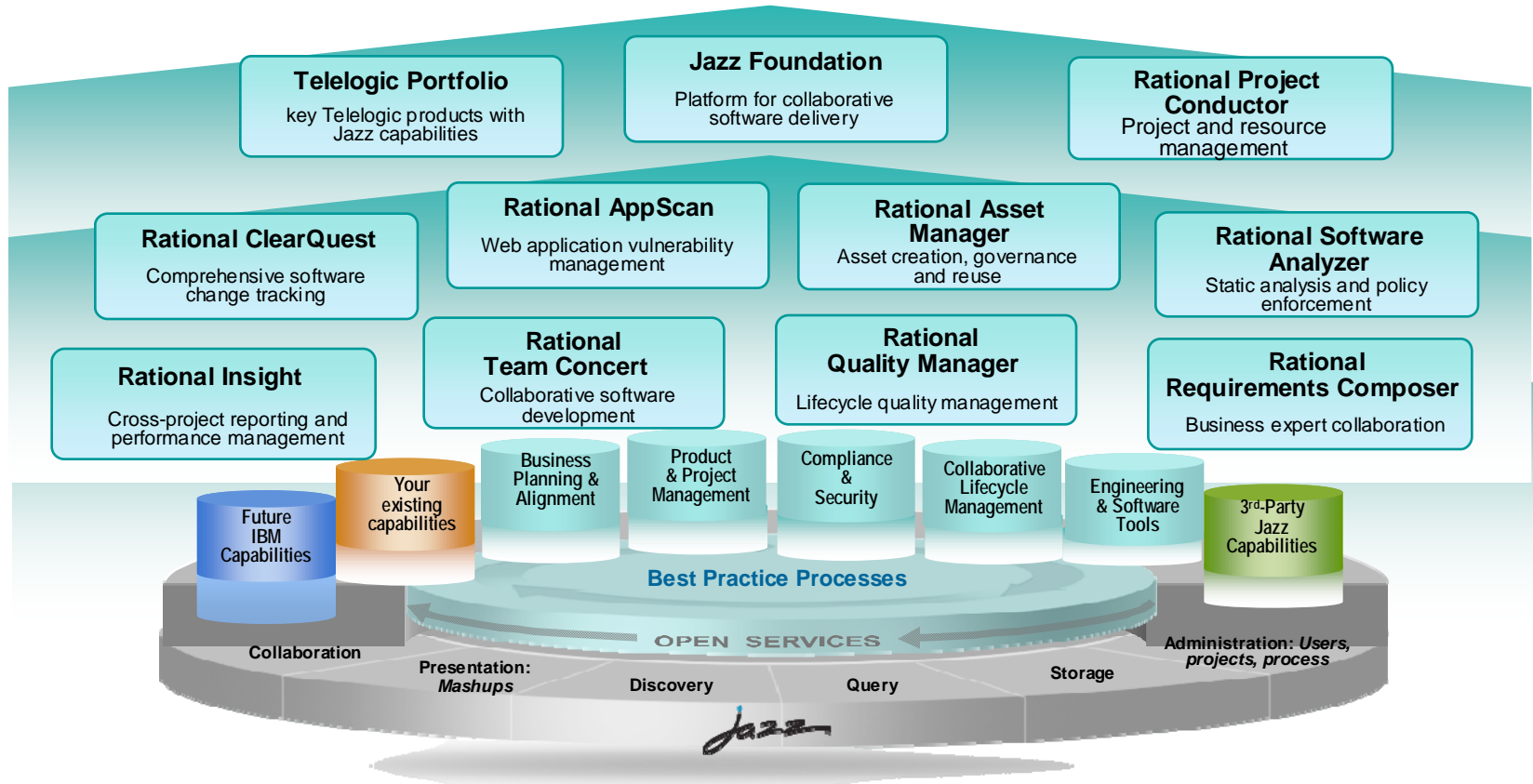
Drive business innovation through measured & continuous process improvement

Captures over 10 years of Rational experiences in incremental adoption

- Used in over 80 IBM agile projects
- Used in conjunction with RUP, XP, Scrum and other processes
- Demonstrated in the Rational Executive Dashboard



Jazz Platform and Capabilities



IBM client results - Gain efficiency in development & production

Collaboration and automation driven by standardization to reduce cost, and drive more predictable, measurable outcomes

“Reduced product development time by 60% – from five months to two months”

“Reduced development costs by 25%, reduced development time by a factor of 10”

“Reduced project overrun costs 20% by making project deliveries more repeatable and predictable”

“Achieved 30% productivity gain on global projects”



Efficiency

On-Time Delivery Risk
Fixed and Variable Costs
Process Adoption

Staffing Variance
Technical Debt
Schedule Fidelity

Productivity
Project Velocity
Burn-down

STANDARDIZE, MEASURE AND IMPROVE

Cloud Deployment

Open and OSLC
Specs

C/ALM Adoption

Project
Management

Application
Security

ibm



IBM client results - Improve product quality & flexibility

Deliver more perceived value at lower cost of ownership

“Six-fold increase in targeted promotion effectiveness, more than 95% reduction in time and cost of developing new promotions”

“Achieved 50% reuse of services”

“Saved more than \$25 million in defects, plus \$7 million a year in defect avoidance”

“Improved insight is helping managers improve predictability and mitigate business risk”



Quality

Reuse **Release Cycles** Customer Attrition
Warranty and Defect Costs Rework **TCO**
Acceptance and **Adoption** Breaches

STANDARDIZE, MEASURE AND IMPROVE

Change Management

Modeling and Design

Asset Management

Quality Management

Security and Compliance

Jazz

IBM client results - Drive new value and faster innovation

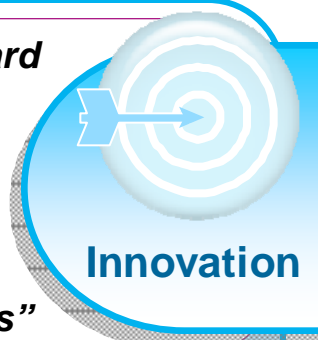
Reduce financial, market and organizational risks – make innovation through software the driver of opportunity

“Saved \$20 million by finding and avoiding risk in the consolidation of merchandising operations”

“Improved fuel economy 60 – 70%, according to EPA, 40% reduction in CO2 emissions”

“Regulators removed industry-standard 15% ‘risk premium,’ providing competitive advantage”

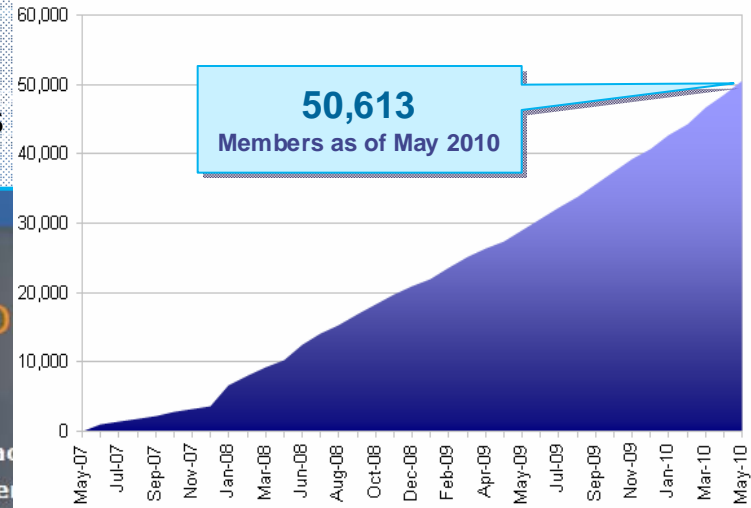
“Recovered £10 million in costs by using enterprise planning to optimize IT landscapes and processes”



What we do - Jazz.net



- Agile planning – half month iterations
- Agile development
- Agile response to requests in the next iteration
- Community drives faster adoption of our products



Free RTC developer licenses
Rational Team Concert is now more affordable for small teams

Raising the bar
Top rating for Rational Team Concert

One tool for collaboration
Bugs, source control, planning, reporting, and more

Managing quality

IBM Rational Team Concert earns top rating

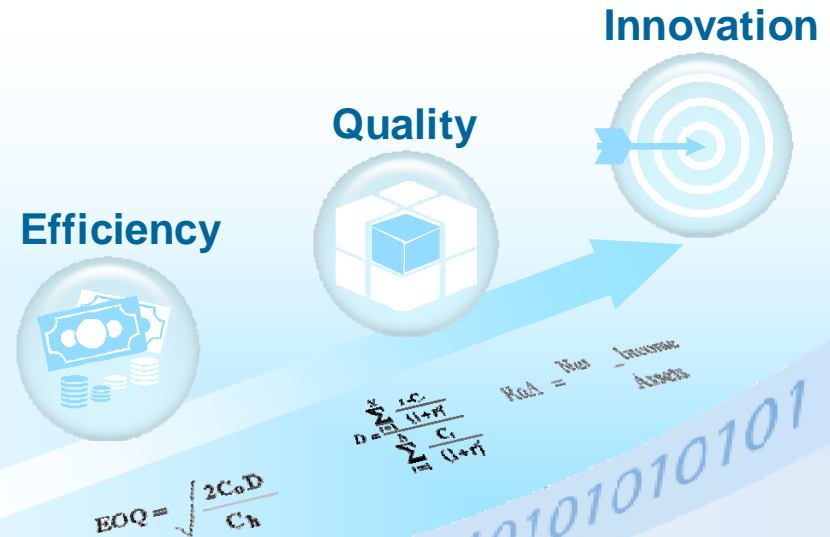
IBM Rational has the best current offering according to the The Forrester Wave™: Agile Development Management Tools, Q2 2010 (May 2010). IBM, focusing on collaborative development, adds strong project management and analytics.



Econometrics: a discipline to optimize software delivery processes towards continuously measured innovation

Systematic management for desired outcomes and failure avoidance

- Quantify emerging opportunity and risk
- Manage new collaborators in value chains
- Design for flexibility and extensibility
- Configure for multiple, diverse linkages
- Deliver perceived quality sustainably



Quantify value measures, and tie to fiscal and societal impact – monetize!



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