Pulse2011

Asset Management Maturity:
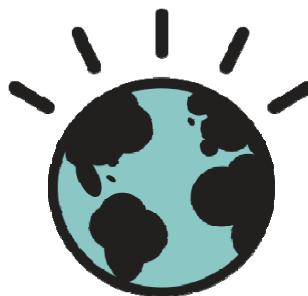## Realising the Promise of a Smarter Planet

Phil Gruber and Alex Towns

IBM Enterprise Asset Management/
Maximo Professional Services

Agenda

- Introduction: What's Behind a Smarter Planet?
- Assessing Your Company: How "Smart" Are You?
- Case Studies: Assessing "Smart" Companies
- Next Steps: Where do You Start?

Something meaningful is happening…

"Every human being, company, organization, city, nation, natural system and man-made system is becoming **interconnected, instrumented and intelligent.** This is leading to new savings and efficiency—but perhaps as important, new possibilities for progress."

Remarks Delivered by Sam Palmisano, Chairman, CEO and President, IBM, To The Council on Foreign Relations, Nov. 6, 2008

IBM.

Consider how our world is changing:
Our world is becoming more…
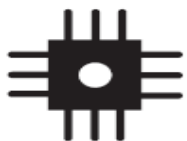
INSTRUMENTED

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

What's behind a Smarter Planet?
Instrumented, Interconnected, and Intelligent Assets…
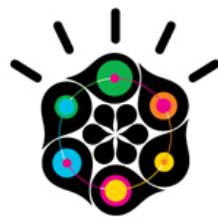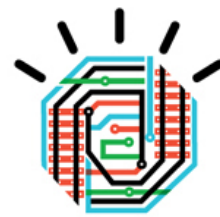

Energy

Water

Buildings

Cities

Infrastructure
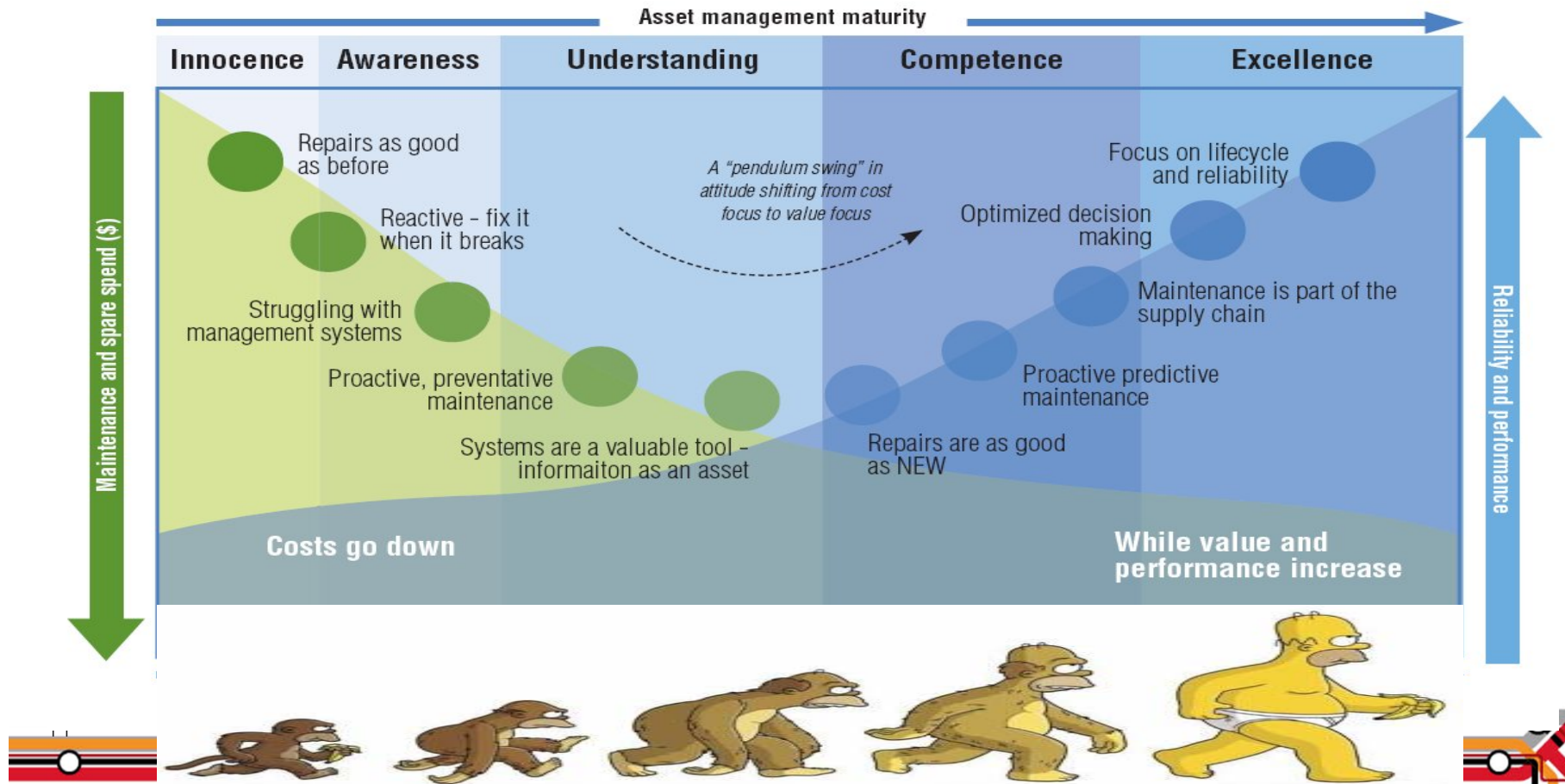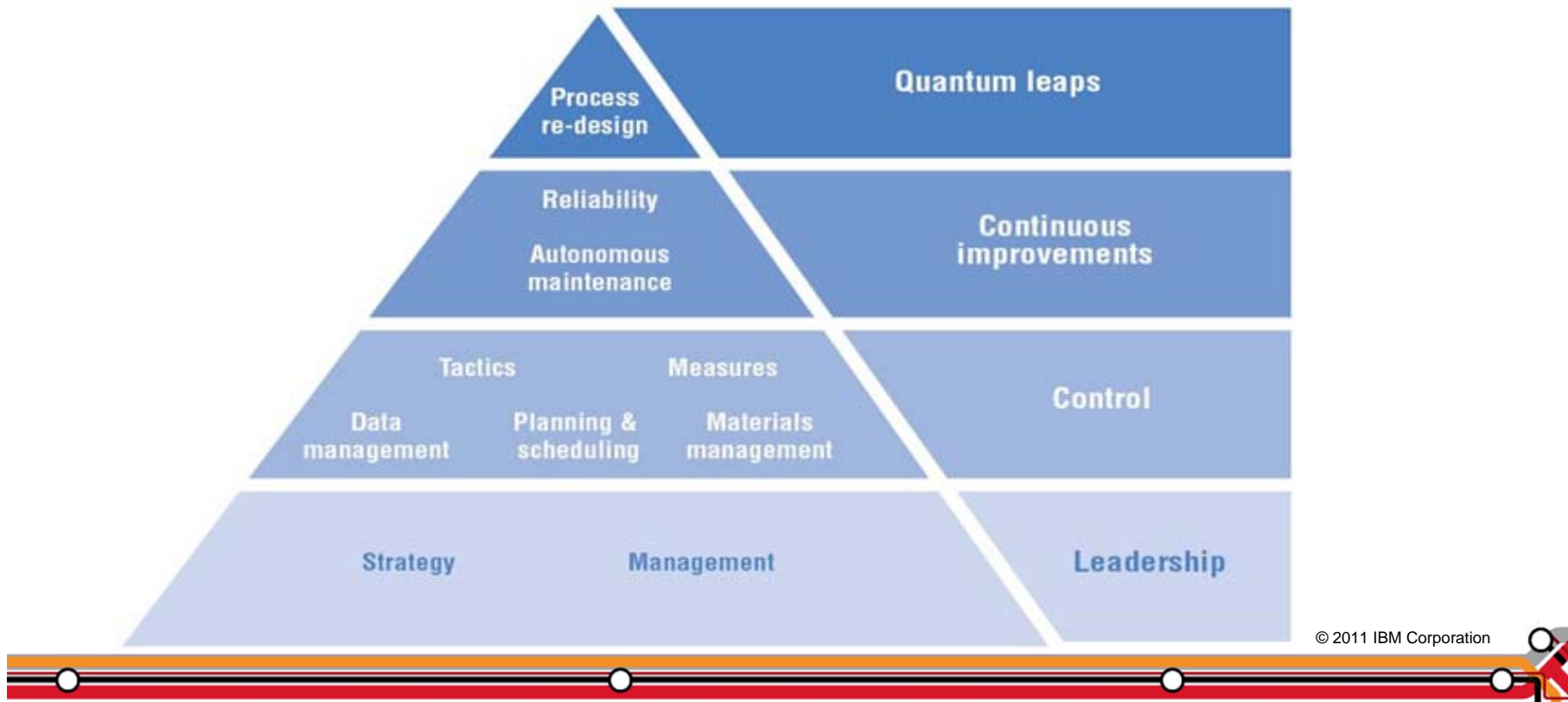
Telcom

Oil

Rail

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Asset Management Maturity Model
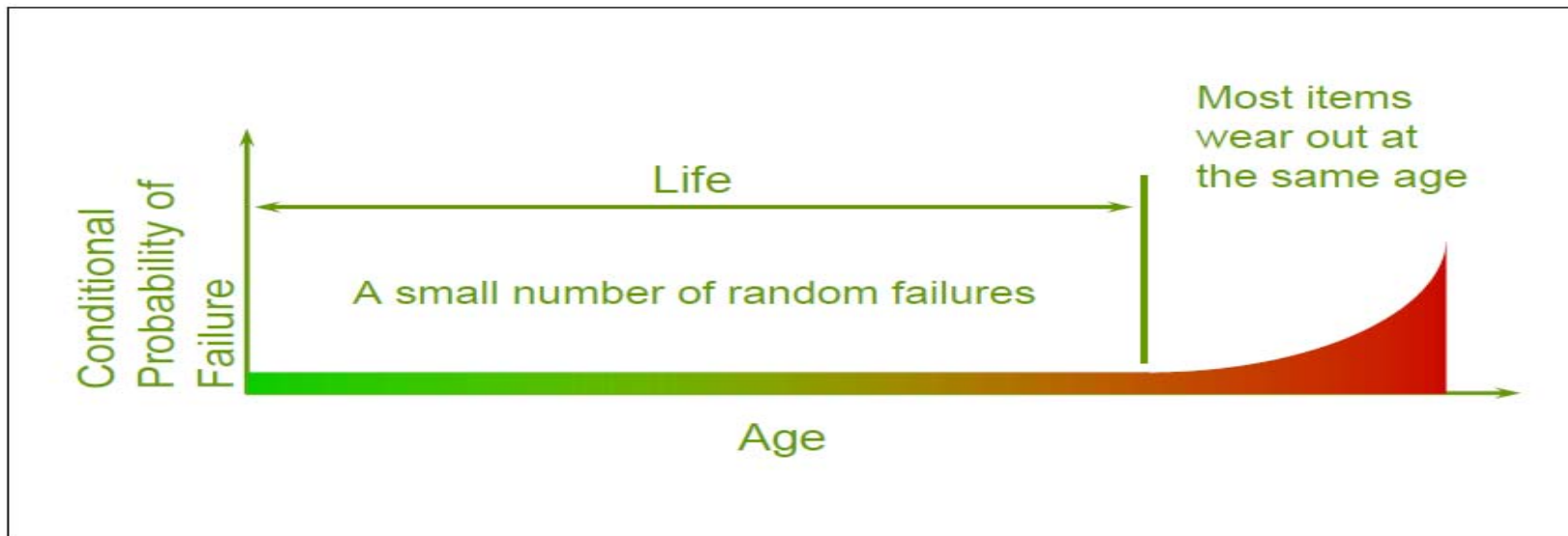
Asset Management Pyramid

Asset Management Maturity Profiles

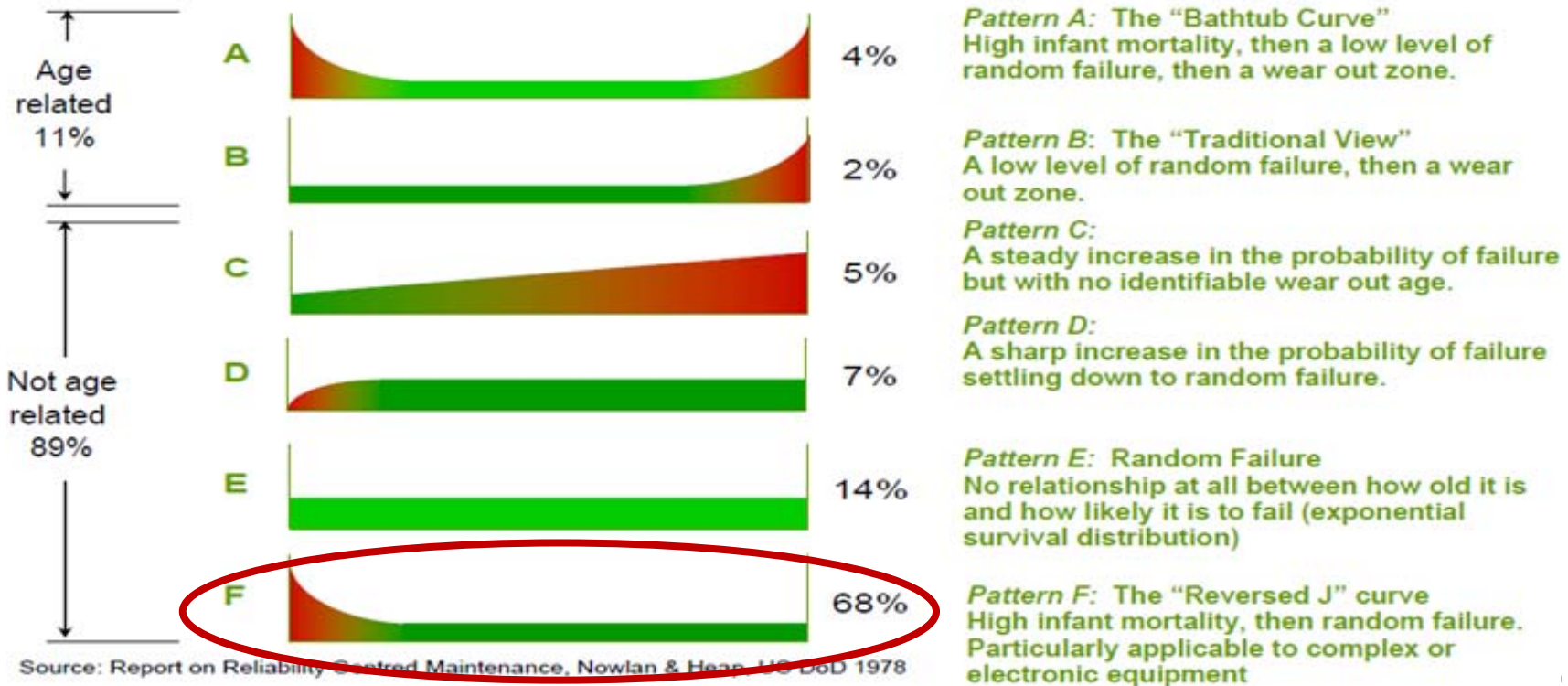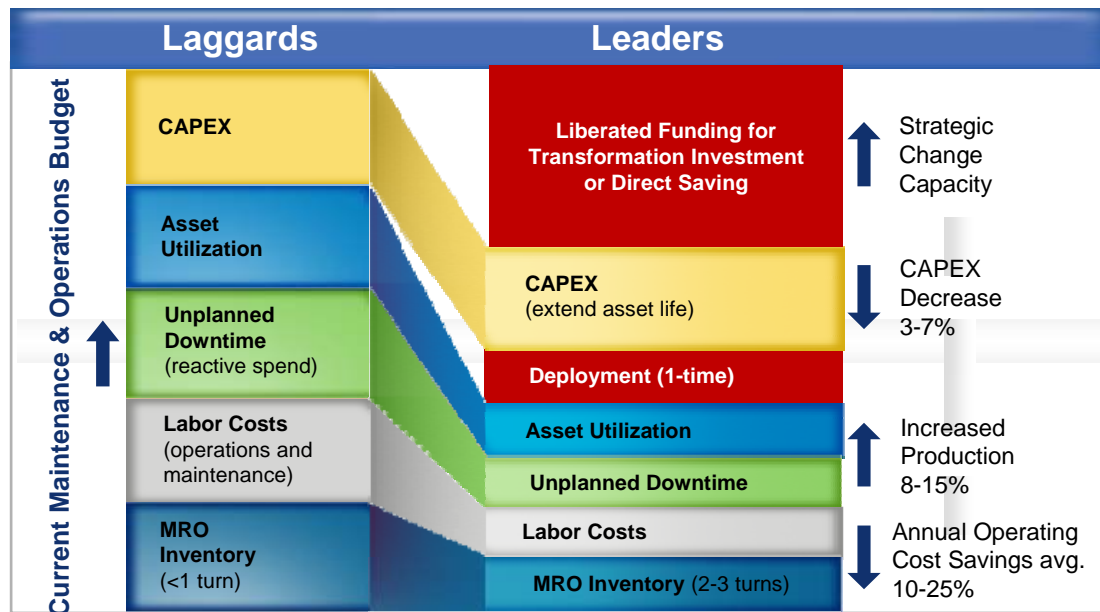|	Strategy	Organization Management	Planning & Scheduling	Maintenance Tactics	Performance Measures	Information Technology	Reliability Engineering
Excellence	Set corporate mtc. strategy/ asset strategy	Multi-skilled, independent trades	Long term & major project planning & engineering	All tactics based on analysis	OEM; bench marking, full cost database	Fully integrated, common database	Full value, risk analysis, RCM and root cause analysis
Competence	Long term improvement plan	Some multi-skilling	Good job planning scheduling & eng'g support	Some CBM, some PM, few surprises	MTBF/MTTR availability, separate mtc. costs	Fully functional; linked to financials & materials	Some FMECA used
Understanding	Annual improvement plan	Decentralize, mixed trade teams	Planning group established; ad hoc eng'g	Time and use based inspections. Some NDT	Downtime by cause; Mtc. costs available	Fully functional; stand alone	Good failure database; well used
Awareness	PM improvement program	Partly centralized for some trades	Troubleshooting support; inspection scheduling	Time based inspections	Some downtime records; mtc. costs not segregated	Basic mtc. scheduling, some parts records	Collect data but make little use of it
Innocence	Mostly reactive breakdown mtc.	Highly centralized	No planning, little scheduling & no engineering	Annual s/d inspections only	No systematic approach; mtc. cost unavailable	Manual or ad-hoc specialty systems	No failure records

Traditional View of Failure Patterns

Based on this view, maintenance programs mostly comprised scheduled overhauls and refurbishments where equipment was removed from service and sent to workshops for maintenance at specific intervals – the estimated 'life'

Actual Failure Patterns Based on Research

Pattern A: The "Bathtub Curve" High infant mortality, then a low level of random failure, then a wear out zone. — 4%

Pattern B: The "Traditional View" A low level of random failure, then a wear out zone. — 2%

Pattern C: A steady increase in the probability of failure but with no identifiable wear out age. — 5%

Pattern D: A sharp increase in the probability of failure settling down to random failure. — 7%

Pattern E: Random Failure No relationship at all between how old it is and how likely it is to fail (exponential survival distribution) — 14%

Pattern F: The "Reversed J" curve High infant mortality, then random failure. Particularly applicable to complex or electronic equipment — 68%

Age related 11%

Not age related 89%

Source: Report on Reliability Centred Maintenance, Nowlan & Heap, US DoD 1978
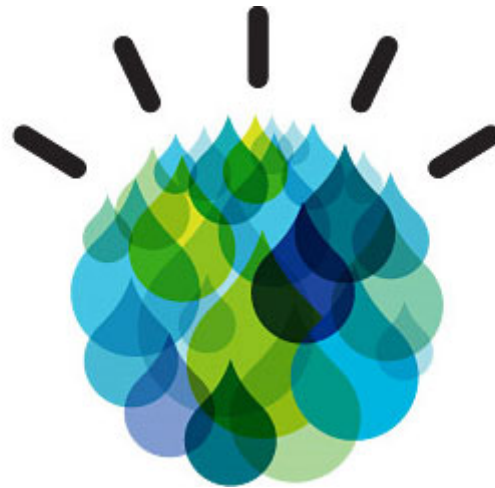
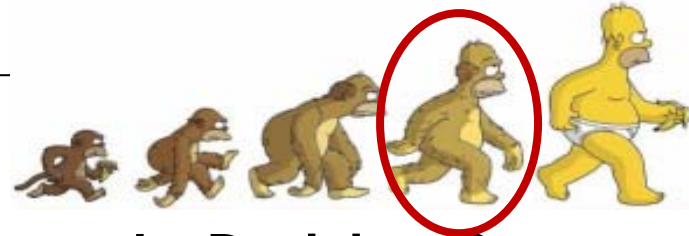# Benefits of Smarter Asset Management

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DC Water Case Study – Smarter Water

DC Water Case Study

How are they using Information to make Decisions?

The answer doesn't lie in expensive infrastructure projects or overhauling of water management systems — it lies in connecting the dots with relevant data. Predictive analytics is helping DC Water analyse enormous amount of data on weather conditions, maintenance and hundreds of other variables to uncover usage patterns and spot problems, like water main breaks, before they occur.

## What are the Business Benefits?

- *36 percent reduction in customer calls through significant reduction in asset downtime;*

- *Increased percentage of emergency investigations dispatched within 10 minutes from 49 percent to 93 percent;*

- *Ability to generate reports for management review in seconds versus days*

City of Corpus Christi – Smarter City

City of Corpus Christi
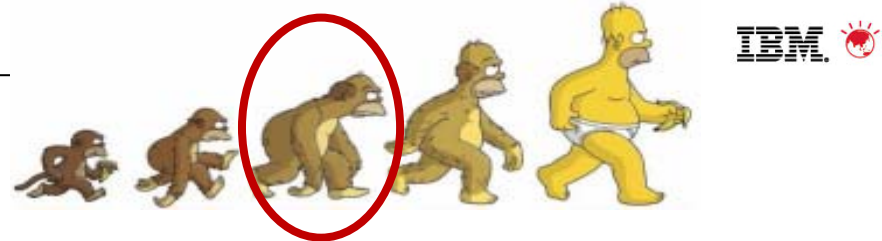
How are they using Information to make Decisions?

- *Use one data repository to manage all assets: parks, airports, streets, water and waste water, gas and electric utilities*
- *Analyze history of related problems*
- *Spatial analysis related to work and assets*

What are the Business Benefits?

- *Established a City One-Call Center*
- *Identity reoccurring problems*
- *Increased percentage of customers experiencing continuous service*
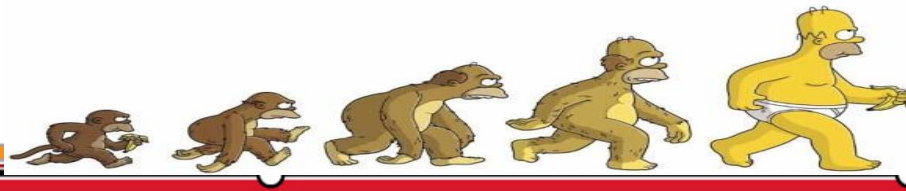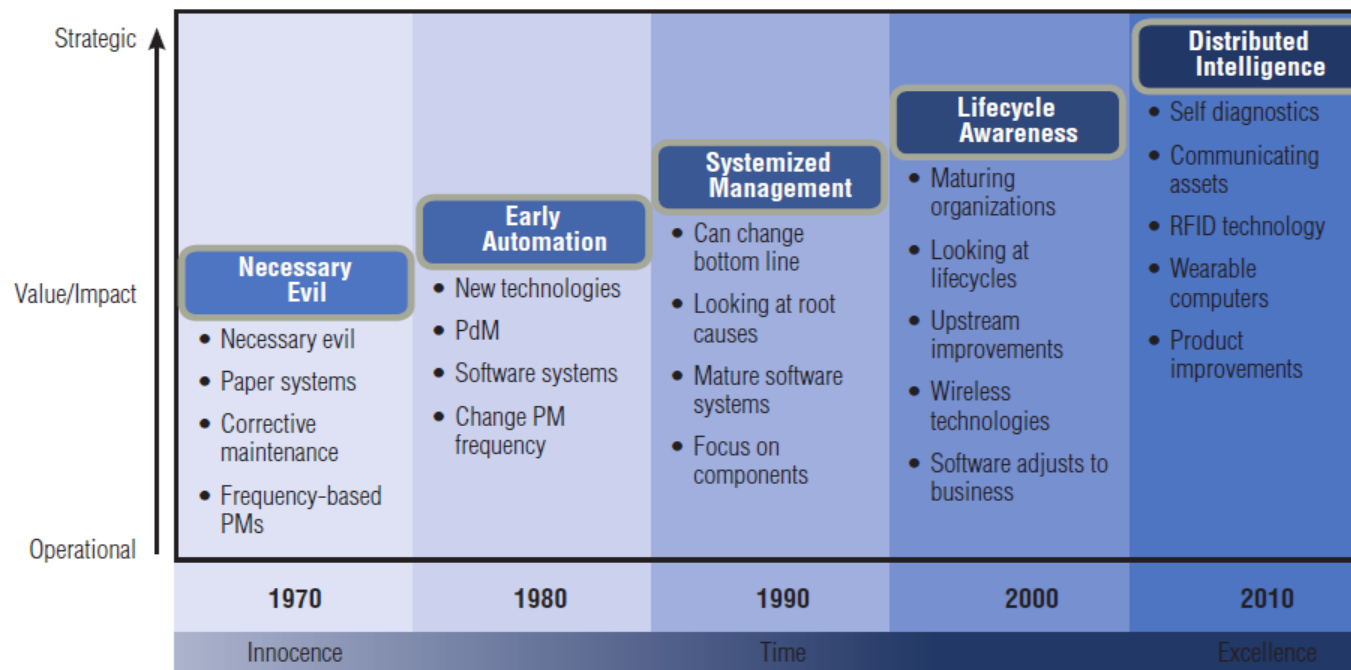- *Improved efficiency and customer satisfaction*

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Evolution of Asset Management and Corporate Thinking

	1970	1980	1990	2000	2010
	Necessary Evil	**Early Automation**	**Systemized Management**	**Lifecycle Awareness**	**Distributed Intelligence**
	• Necessary evil	• New technologies	• Can change bottom line	• Maturing organizations	• Self diagnostics
	• Paper systems	• PdM	• Looking at root causes	• Looking at lifecycles	• Communicating assets
	• Corrective maintenance	• Software systems	• Mature software systems	• Upstream improvements	• RFID technology
	• Frequency-based PMs	• Change PM frequency	• Focus on components	• Wireless technologies	• Wearable computers
				• Software adjusts to business	• Product improvements

Strategic — Value/Impact — Operational

Innocence — Time — Excellence

IBM.

Assess Your Current Maturity

Asset Management Strategic Assessment:

- Assessment of maturity and opportunity in 10 strategic areas

- Begin with a self-assessment and benchmarking

- Rank results against leading industry practices

- Opportunity matrix for decision making and planning

- Recommendations and high level action plan
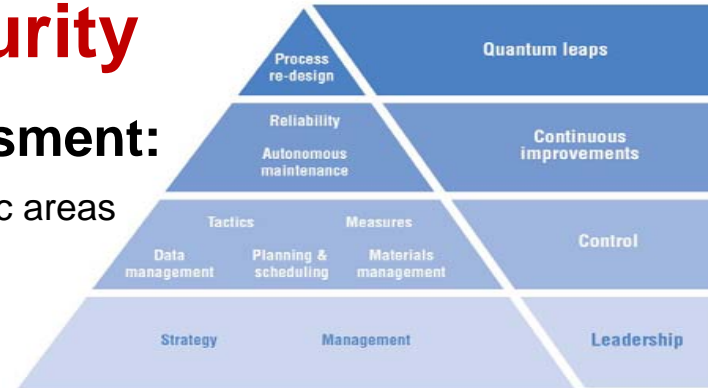
From John Dixon Campbell's, *Uptime, Strategies for Excellence in Maintenance Management* (Productivity Press, 1995).

Opportunity	Business Importance	Area of Impact	Effort to Implement
Failure Analysis	High	Planning of Asset Lifecycle	Low
Interfaces to Control Systems	Medium	Data capture / minimise errors	Low
Interfaces to GIS	High	Data capture / minimise errors	Low
Condition Monitoring	High	Improved decision making / data capture	Medium
Dashboard KPI's	High	Improved focus / change tool to drive outcomes	Medium
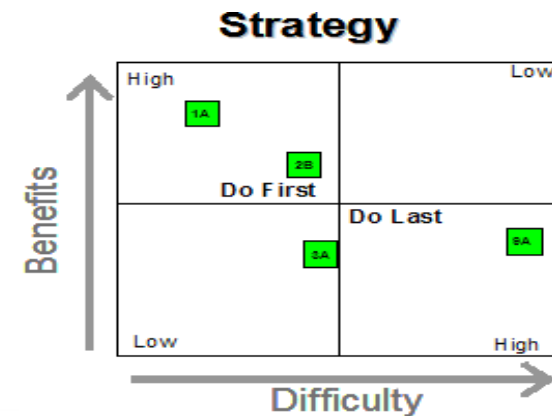
# Asset Management Excellence: Optimizing Equipment Life-Cycle Decisions, 2nd Edition

The world has continued to evolve and so has asset management….

Changes in time, technologies and tools have driven some new thinking that builds upon existing principles for achieving maintenance excellence. It has also driven business and people in the discipline to think differently.

The book provides theory, concepts, principles and formulas presented as a blend of practical to deep information.

Regardless whether you are new to world of maintenance and asset management or a seasoned veteran, there will be something in this edition to help you, your organization or your enterprise evolve and move to the next generation of asset management and maintenance excellence.

http://www.crcpress.com/product/isbn/9780849303005;jsessionid=Q-6kh3-EMnopCMHKvyKuIA
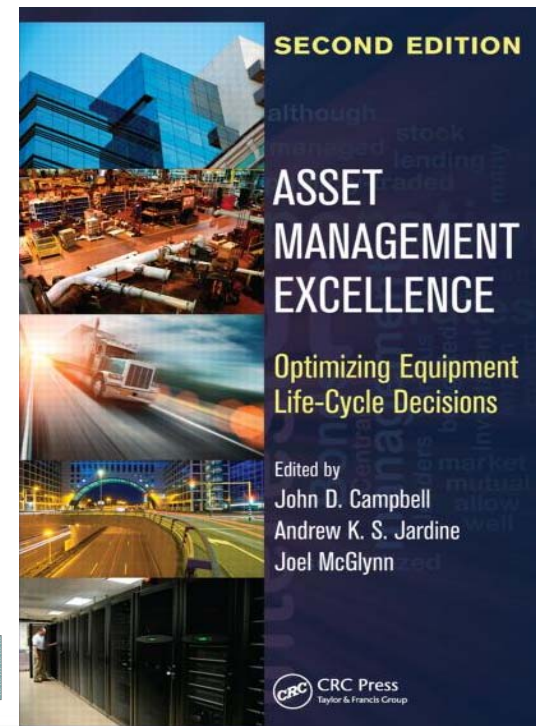
Questions

Our assets are _talking to us_….

….we just aren't listening!

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