A Formula for Smarter Asset Management

IBM's Asset Management Center of Excellence
Helping You Rethink the Way You Do Your Business ……

Steve Hornsby *IBM UKI*

IBM Software

PCTY2010

Pulse Comes to You

Optimising the World's Infrastructure

[27 May 2010 London]

IBM Vision for a Smarter Planet …

"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."*

The world is flatter.

The world is smaller.

The world is getting smarter.

Because it can.

Because it must.

Because we want it to.

Asset management becomes ever more important…

To drive an effective return, many organizations work to maximize their effectiveness of their capital assets across the asset lifecycle

Asset management is a business discipline related to managing an enterprises assets over their lifecycle from design, build, procurement, operation, maintenance, modification, and disposal.

…across all Asset Classes…

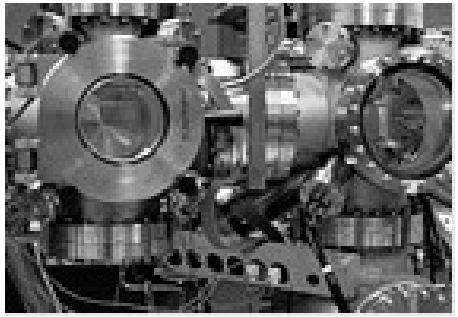
Real Estate and Facilities

Facilities, buildings, warehouses

Infrastructure

Railways, Electric / Gas Distribution, Highways, Telecom, Water

Plant and Production



Manufacturing, Chemical, Petroleum, Electronics, Food

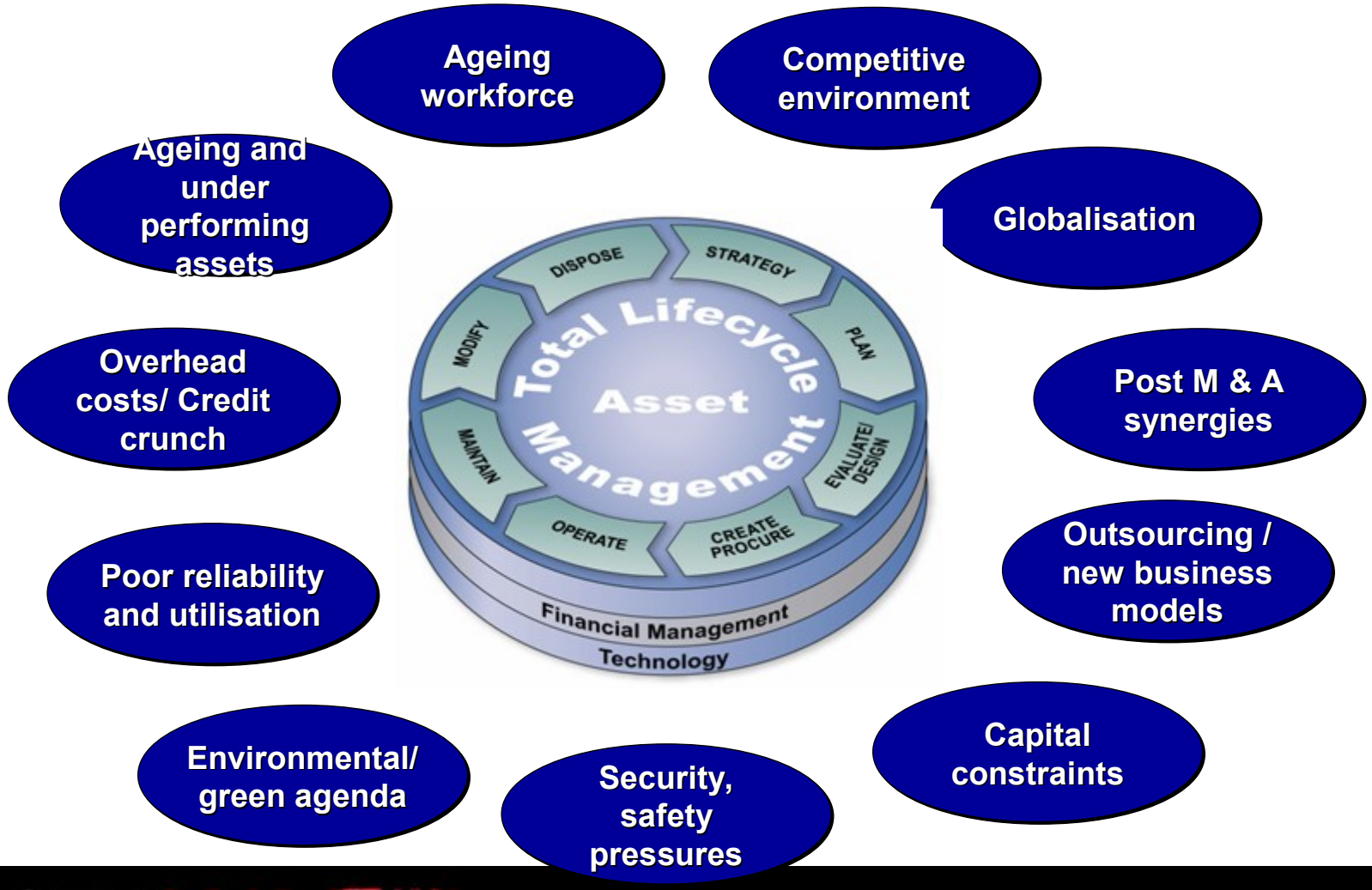
Mobile Assets

Military, Airlines, Rail

Information Technology

PCs, Networks, Routers, Applications, Auto Discovery, Service Desk

…with major areas of concern common across industries within an rapidly changing world …



…raising questions across the asset life-cycle… How can I….

…reduce the number of systems our staff must work with? …exploit the benefits of emerging technologies (RFID, GPS, SOA, pervasive devices)?

…become world class with more efficient and cost-effective operations?

…reduce total cost of ownership over the asset lifecycle?

…obtain more intelligence about the condition of our assets? …make more timely decisions?

…balance between opex and capex? …make fixed costs variable?

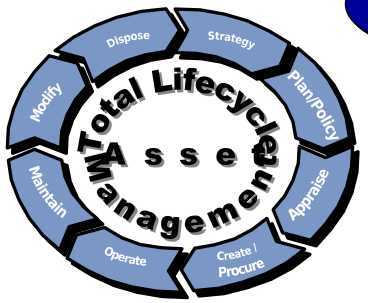
….transform our relationship with our suppliers? …know if we have the "right" assets and inventory ?

…improve reliability and safety performance? … reduce unplanned outages?

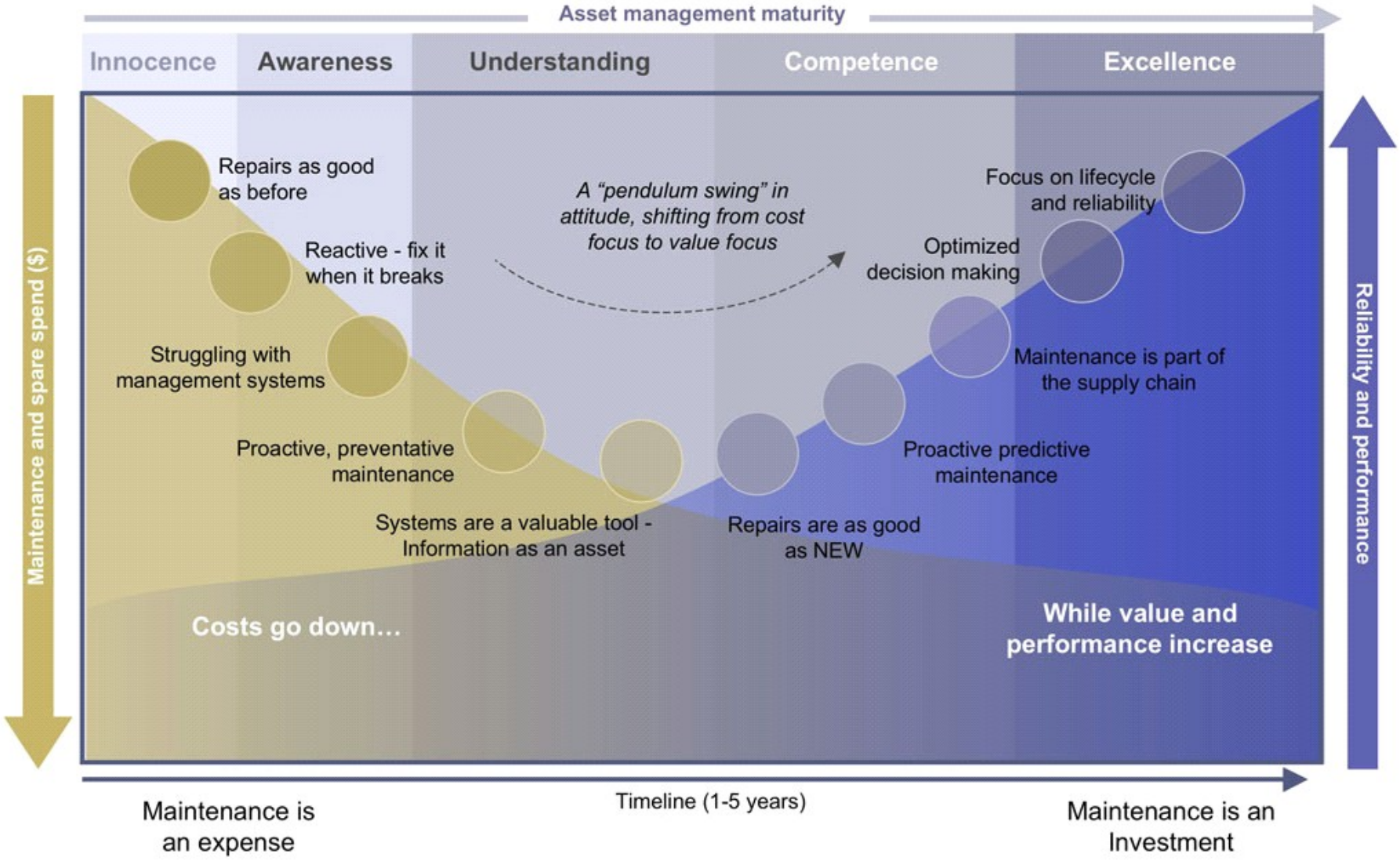
…ensure compliance with regulators? …improve customer feedback?

…implement best practice organisation and processes across the enterprise? … improve the productivity of our field-force?

…design, procure and coordinate our large capital programmes?

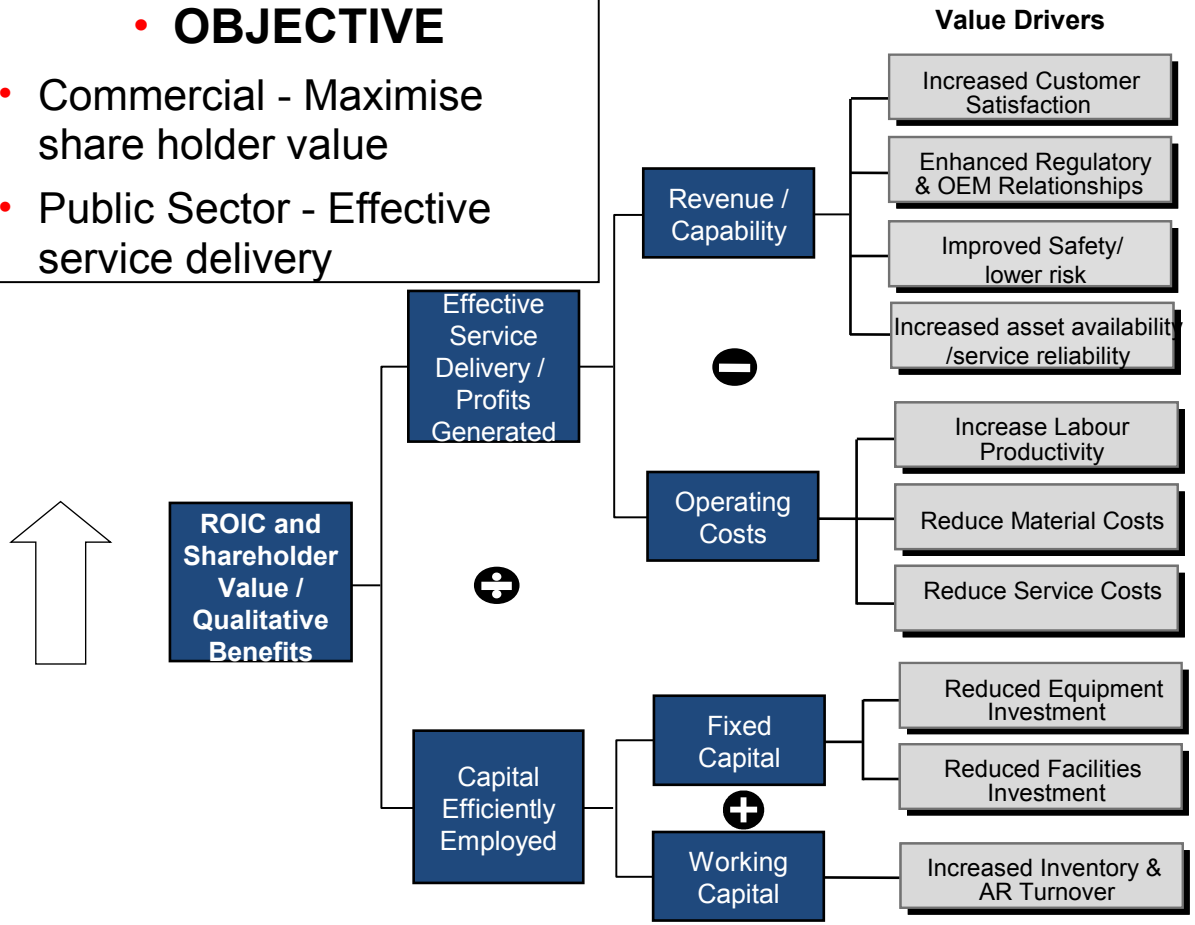


IBM has helped leading companies around to globe to travel the Maturity Path from Innocence to Excellence



Experience dictates that a focus on Asset Management can significantly help an asset intensive organization's bottom line.

- **OBJECTIVE**
- Commercial - Maximise share holder value
- Public Sector - Effective service delivery



Increased asset availability and greater in-service reliability to provide a basis to improve service delivery/ grow more revenue from the same asset base

More timely and precise interventions improves productivity and reduces material use and in turn overheads

Increased asset lives and less downtime enables higher utilisation and requires less investment in facilities/assets

IBM Approach for Smart Asset Management – comprehensive methodology and unique capabilities to achieve excellence in asset management

IBM's Maturity profile of Asset Management can help our clients look a level deeper, focusing on 10 Strategic Categories

Thought leadership in asset management: increase the value perception of maintenance and its contribution to ROA

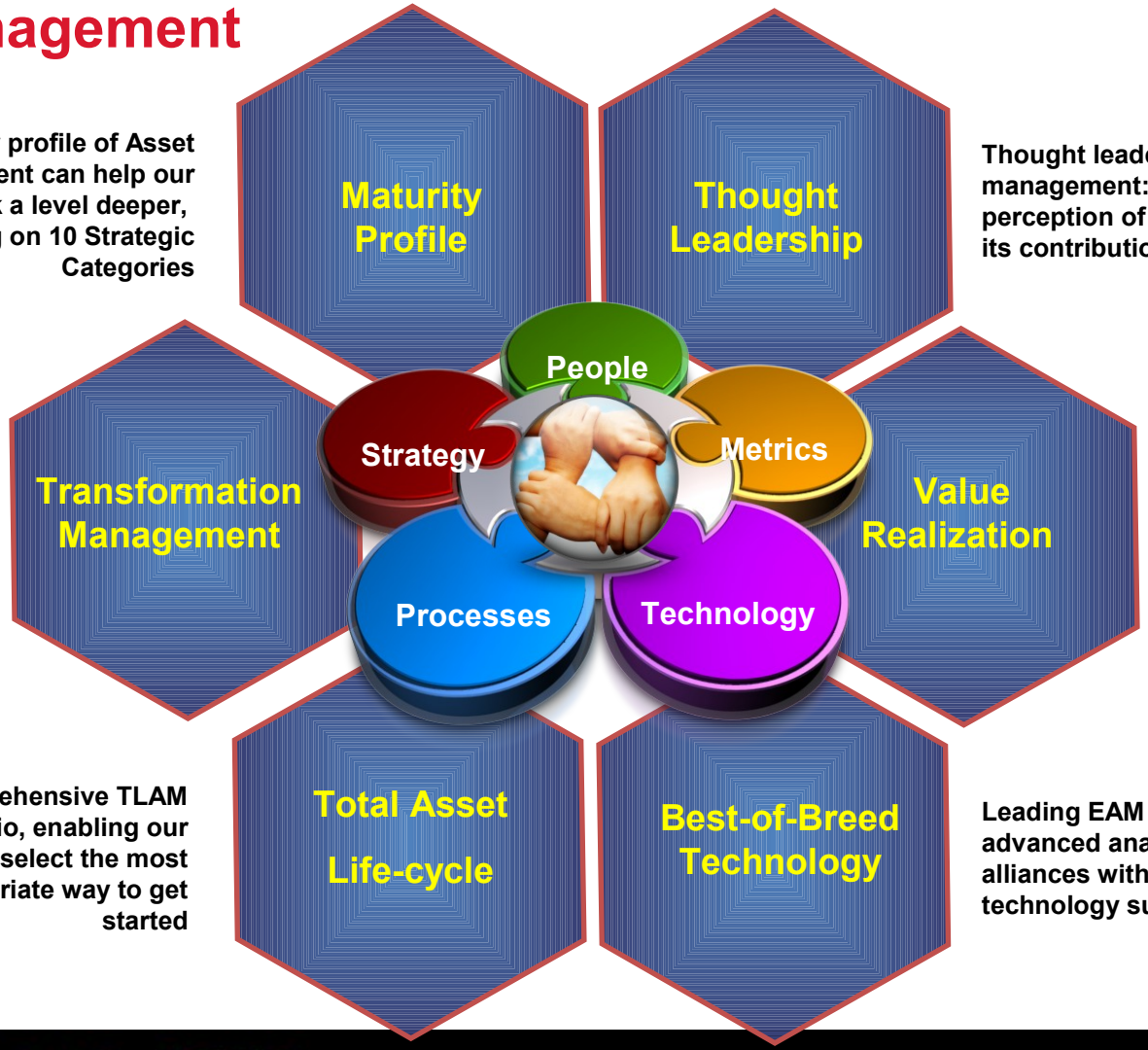
Unique understanding of people dynamics in asset management

Leading Program Management Techniques

From value driven implementation to track the realization of benefits

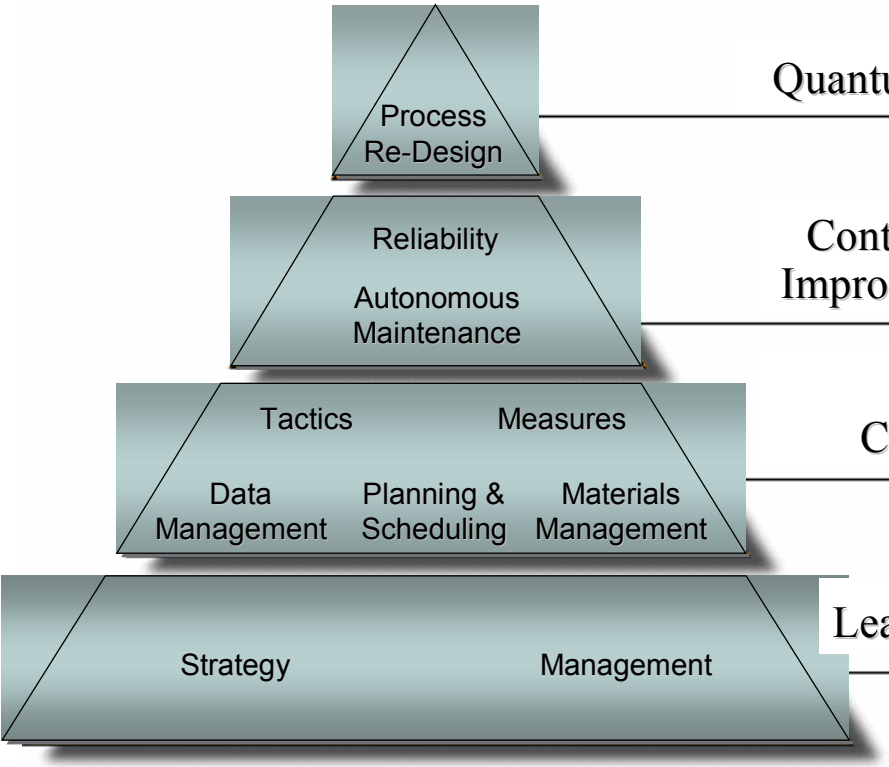
A comprehensive TLAM portfolio, enabling our clients to select the most appropriate way to get started

Leading EAM Solutions, advanced analytics and alliances with all relevant technology suppliers



IBM's Maturity Profile for Asset Management can help our clients look a level deeper, focusing on 10 Strategic Categories

Maturity Profile



Asset Management Center of Excellence Pyramid

Strategic Categories

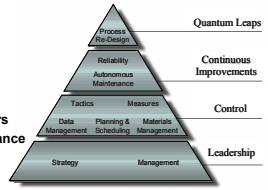
1. Strategy
2. Management
3. Data Management
4. Materials Management
5. Planning & Scheduling
6. Tactics
7. Measure
8. Autonomous Maintenance
9. Reliability
10. Process Re-Design

amcoe
Asset Management Center of Excellence

amcoe

Asset Management Center of Excellence

1. Strategy
2. Organization/Management
3. Data Management
4. Maintenance Tactics
5. Materials Management
6. Planning and Scheduling
7. Key Performance Indicators
8. Reliability Center Maintenance
9. Autonomous Maintenance
10. Process Re-design



Real Estate and Facilities

Plant and Production

Infrastructure

Mobile Assets

Information Technology

Maturity Model

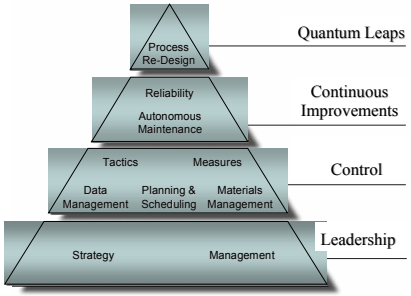
Maturity Profile

Rating Levels	VI Innocence	IV Awareness	III Understanding	II Competence	Excellence
1.Strategy	Mostly Reactive Breakdown Maintenance	Prevent Maintenance Improvement Program	Annual Improvement Plan	Long Term Improvement Plan	Established and Communicated Maintenance and Asset Strategy
2. Organization / Management	Highly Centralized	Partly Centralized for Some Trades	Decentralized Mixed Trade Teams	Some Level of Multi-Skilled Staff	Multi-Skilled Independent Trades
3. Data Mgmnt / IT	Manual or Ad-hoc specialty Systems	A "System" that Allows for Some Scheduling and PartsTracking	Fully Functional Asset Mgmnt. Stand Alone System	Fully Functional Asset Mgmnt System liked to Financials and/or Inventory Systems	Fully Integrated to common databases Data Standards in Place
4. Maintenance Tactics	Annual S/D Inspections Only	Time Based Inspections	Time and Use Based Inspections Some - NDT	Some CBM Some Prev. Maint. Few Surprises	All Tactics Based on Analysis
5. Materials Management	*Absence of storeroom management practices	*Some storeroom controls *Lack of performance measurements *Turns less than 1.0	System computerized Stock levels set – no Maint. Input. Lead time and Safety Stock Levels set – Rare;	*Alliances developed *(Free Issues) *Streamlined processes *Material Delivery Process Established *Automatic Matching of Invoices *Compurtized inventory control system	*Service levels 95%+ *On line material requisitioning *Turns exceed 1.5
6. Planning and Scheduling	Little or No Formal Planning, Scheduling, or Engineering Support	Some Troubling Shooting Support Inspection Scheduling	Maintenance Planning Group Established Ad-hoc Engineering	Solid General Planning and Scheduling Job Planning with Engineering Support	Long Term Major Project Planning for both Maintenance and Engineering
7. Performance Measures	No Systematic Approach. Maint. Cost Not Available	Some Downtime / Reliability Records Maint. Costs Not Segregated	Downtime by Cause Maintenance Costs Available	Mean Time to Failure / Repair Records Available Separate Maintenance Costs	OEM Benchmarking Full Cost Database
8. Reliability Centered Maintenance	No Failure Records	Collect s Failure Data but make little use of it	Failure DB Established. Used for Analysis	Some FMECA used	RCM Program in Place Risk and Root Cause Analysis Program
9. Autonomous Maintenance	Directed Workforce No Teamwork Maint & Production relationship strained	Directed Workforce No Teamwork Good cooperation of Maint. And Production	Directed Workforce Some Teamwork Maint./ Production cooperation at working level	Self Directed teams Maint. / Production cooperation at all levels. Team work at organization levels	Decentralized teams Business based decisions Excellent cooperation with Maint. / Production Teamwork a hallmark of entire organization
10.Process Redesign	Processes not documented. Some procedures available High Reactive Work Percentat	Some processes documents. Moderate amount of procedures available High PM Workload	Processes Documented Planning and Scheduling disciplines are prevalent Medium amount of Reactive and PM Workload	Processes documented Evidence of periodic review. Procedures well documented and organized	Processes documented and coodinated with support areas (Inv. / Purc) Evidence of regular review eve

Analyze your maturity and prioritize opportunities

Maturity Profile

Standard

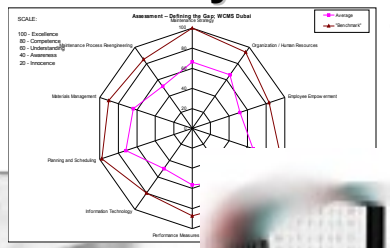


AMcoe Pyramid

Your Company

Maintenance Staff

Analyze

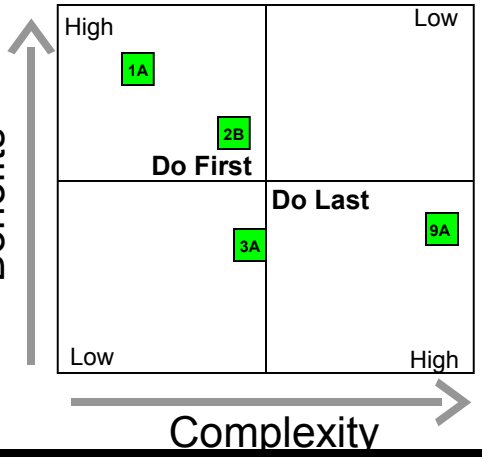


Trend

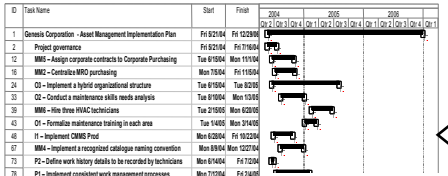
Questionnaire

Interview

Strategy



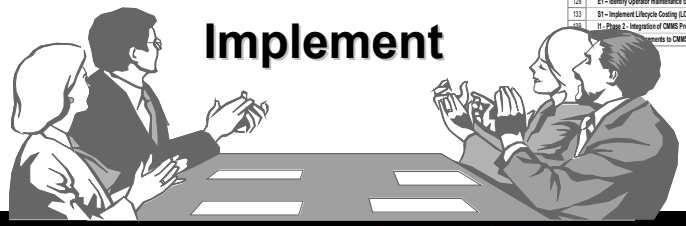
Plan



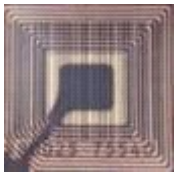
Prioritized Initiatives

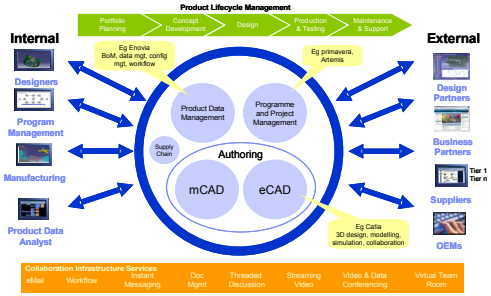
- Governance Model
- Prioritized Initiatives
- Benefits Determination
- Budget by Initiative

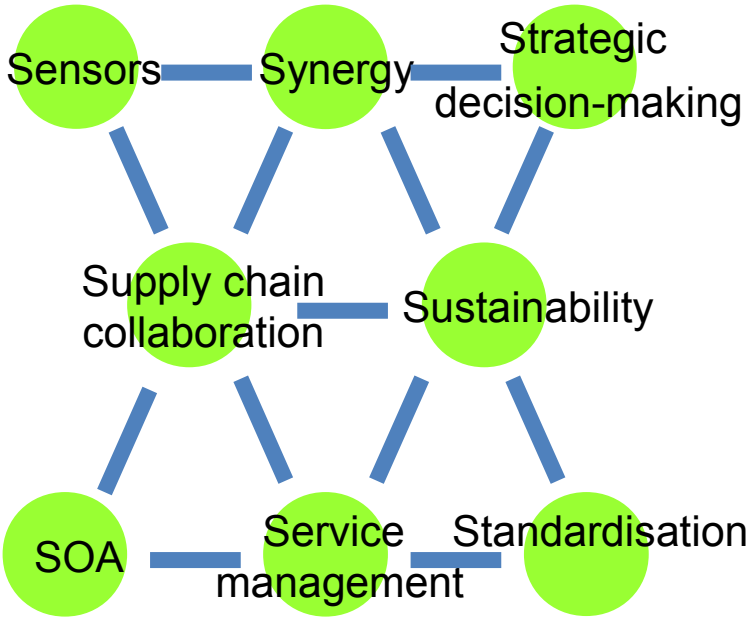
Implement

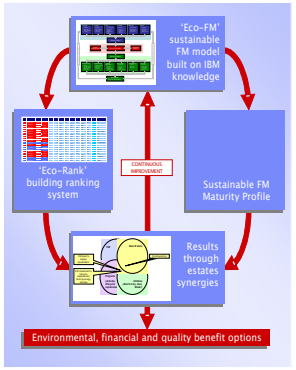


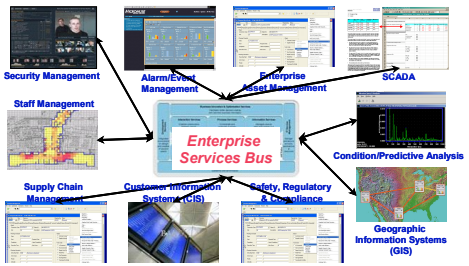
The Asset Management Eightfold path to for a Smarter Planet

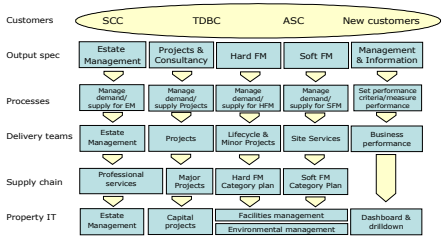


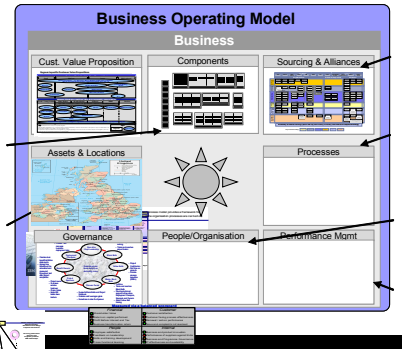












Thought leadership in asset management: increase the value perception of maintenance and its contribution to ROA

Thought Leadership

Maintenance Philosophy Related Issues

Traditional Approach	New Approach
Maintenance is about preserving physical assets	Maintenance is about preserving the functions of assets
Routine maintenance is about preventing failures	Routine maintenance is about avoiding, reducing or eliminating the consequences of failures
The primary objective of the maintenance function is to optimize plant availability at minimum cost	Maintenance affects all aspects of business effectiveness and risk – safety, environmental integrity, energy efficiency, product quality and customer service, not just plant availability and cost
The maintenance department on its own can develop a successful, lasting maintenance program	A successful, lasting maintenance program can only be developed my maintainers and users of the assets working together

Leading Practices in Asset Management: a sample

Thought Leadership

- Workforce – Motivated Technical trades are shrinking or retiring
- Teaming – Maintenance, Operations, Engineering and Shared Services aligned and working together
- Skilled Workforce Culture – Recognize full value of Maintenance craft role

- Clear Enterprise Mission, Vision, Goals
- Corporate Standards - Standard Approach for Business Processes
- Long Term Strategic Plan (4 Years)
- Proactive maintenance approach

- Asset related costs well tracked
- Maintenance process KPIs contribute to a Balanced Scorecard
- Training leveraged where practical
- Benchmarks, Baselines used where practical

- Maintenance Planning – High compliance to plan and schedule
- Parts Management – High service levels and Inventory effectiveness, Inventory Turns managed
- Strong Sustainment, Health and Safety results
- Maintenance Execution – High levels of 2 calls and repeats
- Maintenance Planning –Emergency less than 5% planned maintenance more than 80%
- Processes – Well communicated to staff or upward
- Effective use of RCM, TPM and BPR methods

- Systems – Fully functional and integrated Asset Management systems
- Parts Management – High service levels and Inventory effectiveness, Inventory Turns managed
- Efficiency Tools – Leverage where practical
- Analysis Tools – Leveraged where practical

Value Realization: typically there are four initial areas that drive ROA – Driving costs down while we drive production, safety, environmental and regulatory compliance up

Value Realization

High Value Areas

- Effective planning and scheduling of work
- Spares & support materials management driven by planning & scheduling activity
- Proactive definition of what maintenance should be done to manage reasonably likely failures
- Process Automation and Optimization

Key to Success

Mindset

From traditional thinking to scientific, business-based thinking

Integration

Maintenance Planning and inventory must work as one

Eliminate Barriers

Cooperative approach among production, operations and engineering

Strategic Approach

Leading a well planned and managed change program

Knowledge

Understanding best practices in planning, scheduling, proactively identifying

IBM's asset intensive clients have benefited from our Value Realization approach

Business Scenarios	ROI Points	Customer Examples
Labor Utilization	**Up 10-20%**	• A major US railroad saved US $5M by better tracking labor to specific work
Asset Utilization	**Up 3-5%**	• A large OEM reduced overhaul process time from 56 days to 21 days
Equipment purchases	**Down 3-5%**	• A fleet management company saved US $9.5M by meeting 100% availability
Warranty recoveries	**Up 10-50%**	• A consumer products company increased warranty recovery 50%
Inventory needs	**Down 20-30%**	• A large passenger railroad was able to identify US $18M in excess or obsolete inventory
Inventory carrying costs	**Down 5-20%**	• A nuclear power conglomerate reduced inventory value and associated carrying costs by 26%
Material Costs	**Reduced 10-50%**	• A rail maintenance service company reduced costs 20% by optimizing material purchases.
Purchasing labor	**Reduced 10-50%**	• A fleet management company reduced purchasing staff by 20%

"By unifying the management of all our IT and operational assets using IBM solutions, we can maintain an industry leadership position and improve quality of service for travelers. IBM asset management software has also helped us realize a higher percentage of recoverable fees and directly improve revenue as a result."
McCarran International Airport

Value Realization is a structured, repeatable process applied to Asset Management Initiatives to maximize return on investment.

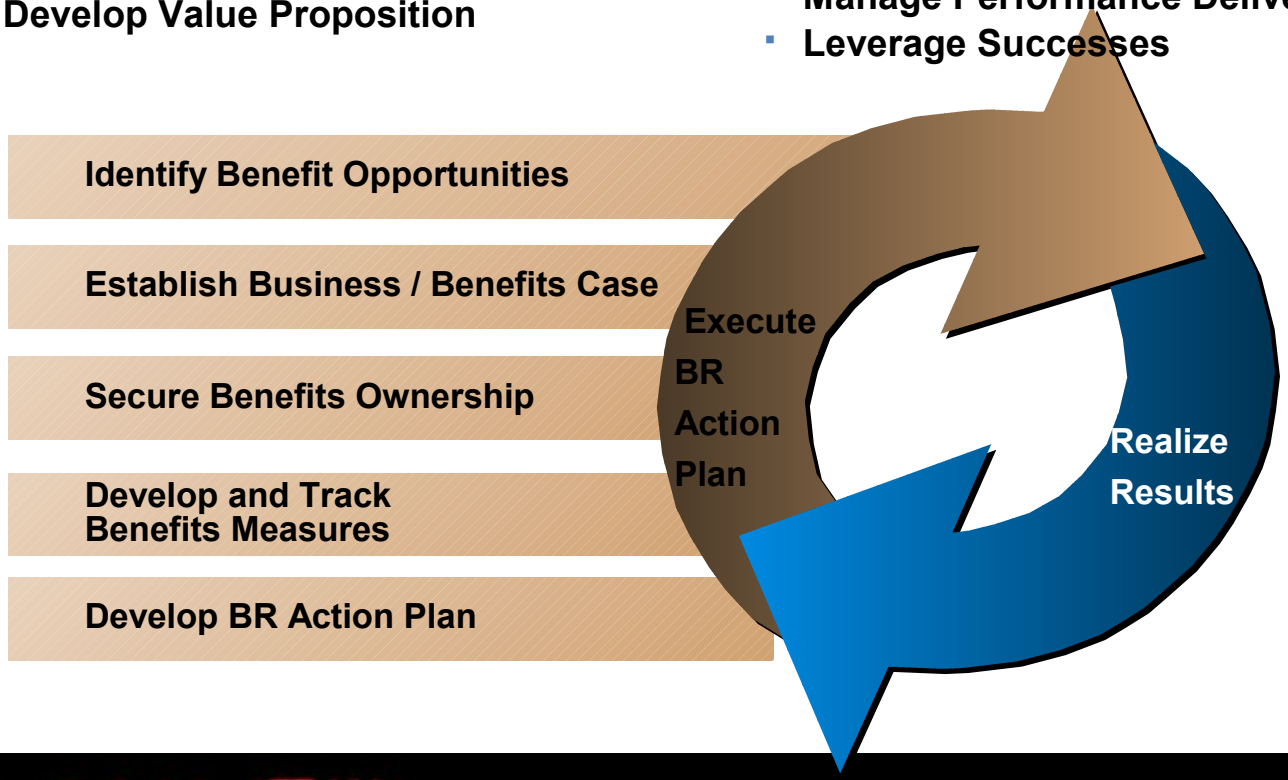
Value Realization

Identify Value

- Review Strategic Priorities
- Analyze Performance
- Evaluate Opportunities
- Develop Value Proposition

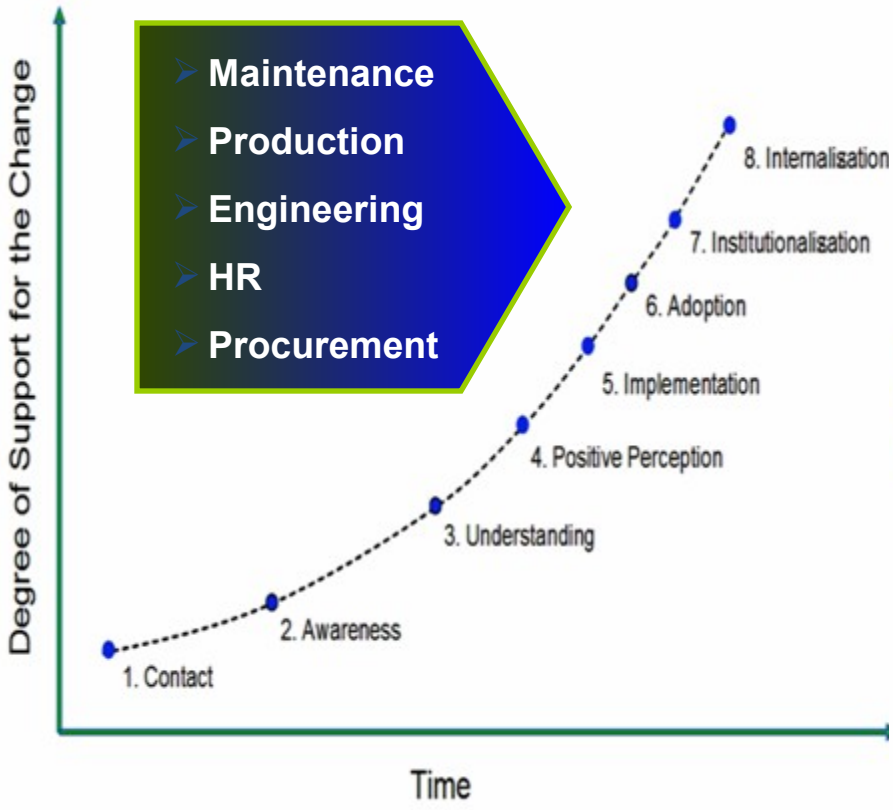
Drive and Realize Value

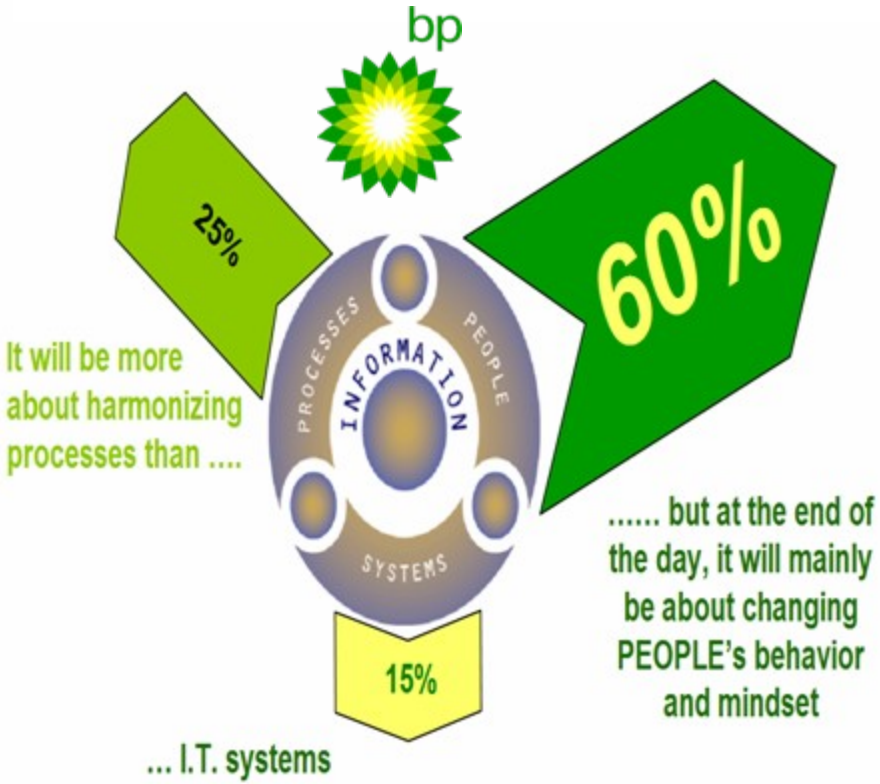
- Establish Performance targets Accountability
- Drive Value Delivery Actions
- Manage Performance Delivery
- Leverage Successes



Addressing the Transformation Management:
understanding where each Stakeholder group is in their acceptance of the process change is key in determining to what degree risk actions should be to drive success

Transformation Management



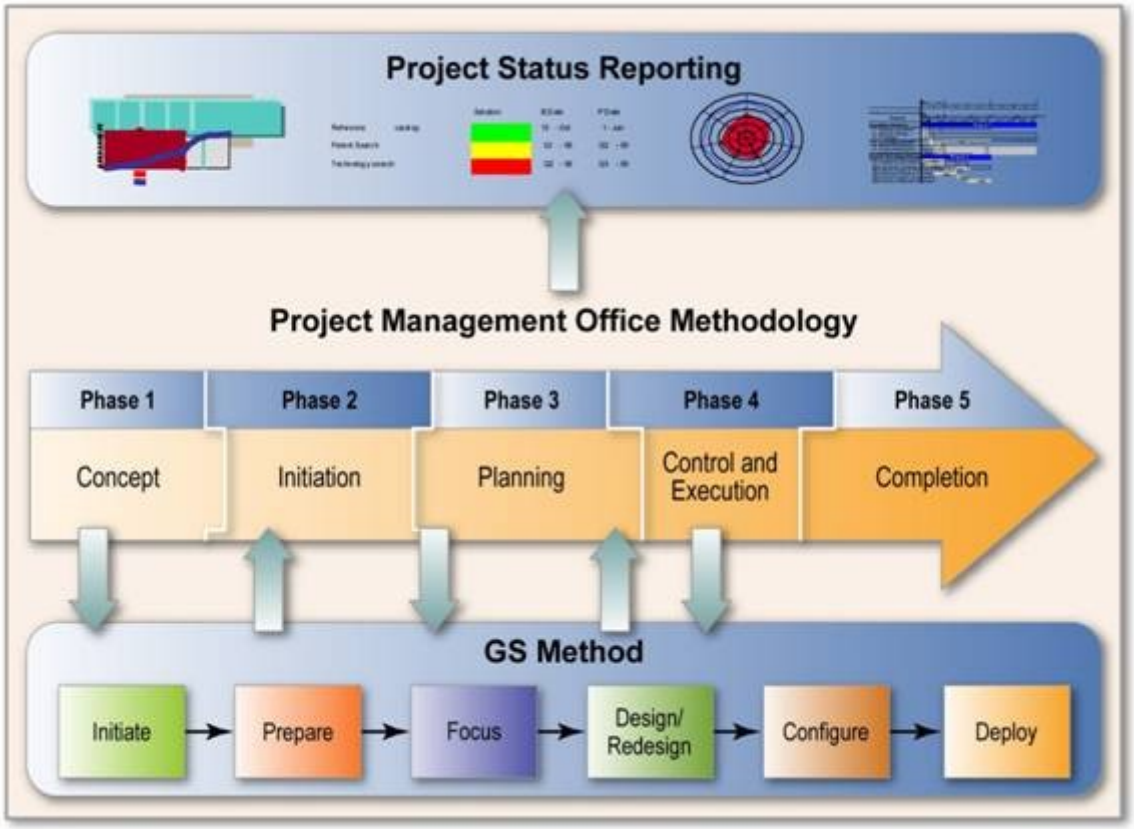


Source: BP Case

Addressing the Transformation Management: managing each Value initiative with a proven disciplined approach

Transformation Management

Program Management



- Project Management
- Schedule Management
- Work Management
- Change Request Management
- Issues Management
- Risk Management
- Finance Management

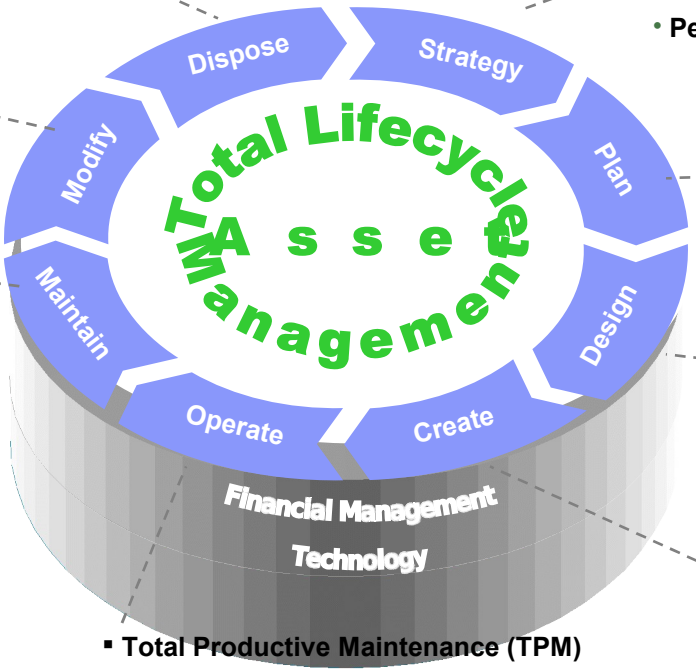
A Total Asset Life-cycle Asset Management view: enables our clients to select the most appropriate way to get started

Total Asset Life-cycle

- Disposal Management Assessment
- Global Asset Recovery Services

- Asset Management Assessment
- Asset Management Strategy Development
- Performance Management and KPI Development

- Total Lifecycle Costing
- Performance Improvement Analysis



- Policies and Standards Development
- Portfolio Asset Management Planning

- Process Improvement Workshops
- EAM Package Selection
- Reliability Centered Maintenance (RCM2)
- EAM Solution Implementation
- EAM Mobile Solutions
- EAM Solutions Operation
- Asset Management Process Outsourcing
- Maximo Licenses and Support

- Capital Program Assessment Model
- Computer Aided Facilities Planning
- RCM2

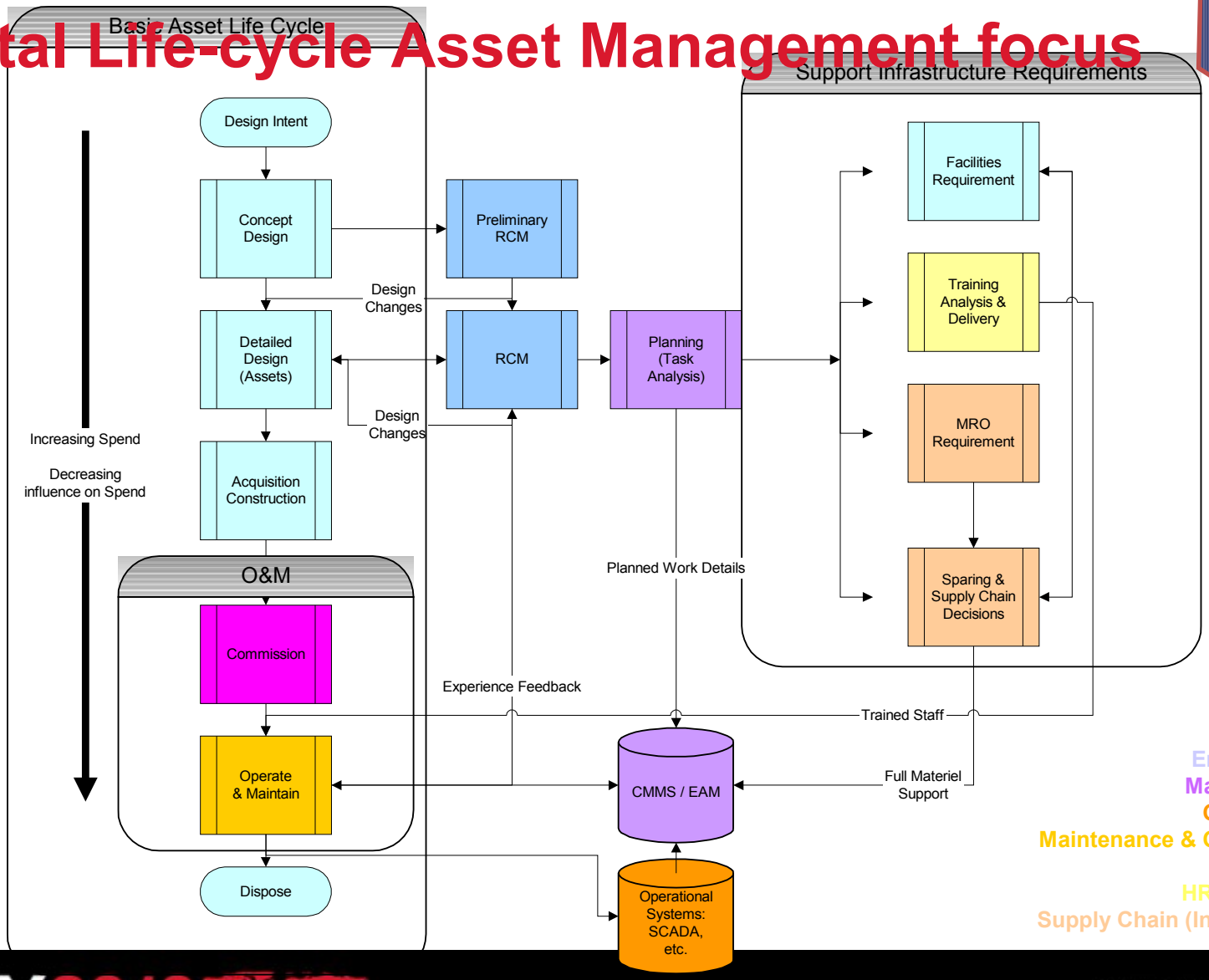
- Capital Project Management
- Procurement / Project Delivery Strategy
- Procurement Process Outsourcing

- Total Productive Maintenance (TPM)
- Asset Performance Management
- Total Asset Visibility
- Logistics Process Outsourcing
- Supply Chain Visibility Services Outsourcing

Business Analytics and Optimization	BAO Strategy	Business Intelligence and BPM	Advanced Analytics and Optimization	Enterprise Information Mngmnt	Content Management

A Total Life-cycle Asset Management focus

Total Asset Life-cycle



IBM's leading Enterprise Asset Management, optimization, advanced analytics and information management frameworks

Best-of-Breed Technology

IBM Maximo

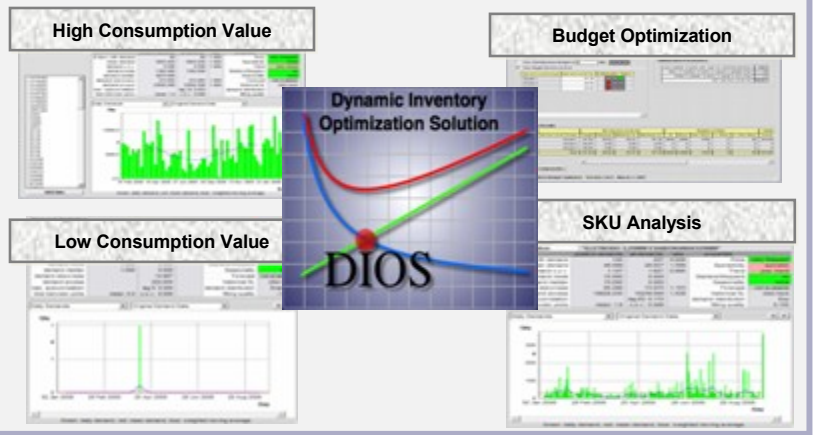
Role-based User Interface

Business Process Configuration

Mobile Architecture

Standards-based Integration

IBM MRO Inventory Optimization



Integration Information Framework

Linking the top floor to the shop floor

Provides the context for the data

Advanced Analytics

From instinct and intuition to fact driven decision

- Business Intelligence
- Event Early Warning
- Condition-Based Maintenance
- Location Awareness and Safety
- MRO Parts Forecasting
- Work Planning and Scheduling
- Predictive Modeling

$$\min_{w_k} \quad \max\{AT_i : i \in PO\}$$
$$s.t. \quad AT_j = \max\{AT_i + d_{ij}(w_k) : j \in \text{input}(i)\}$$
$$w_k^L \le w_k \le w_k^U$$

Mathematical Models

SPSS COGNOS

Maximo is a Complete Asset Management/ Service Management Solution

Best-of-Breed Technology

Allows organizations to seamlessly track and manage assets throughout their entire life cycle.

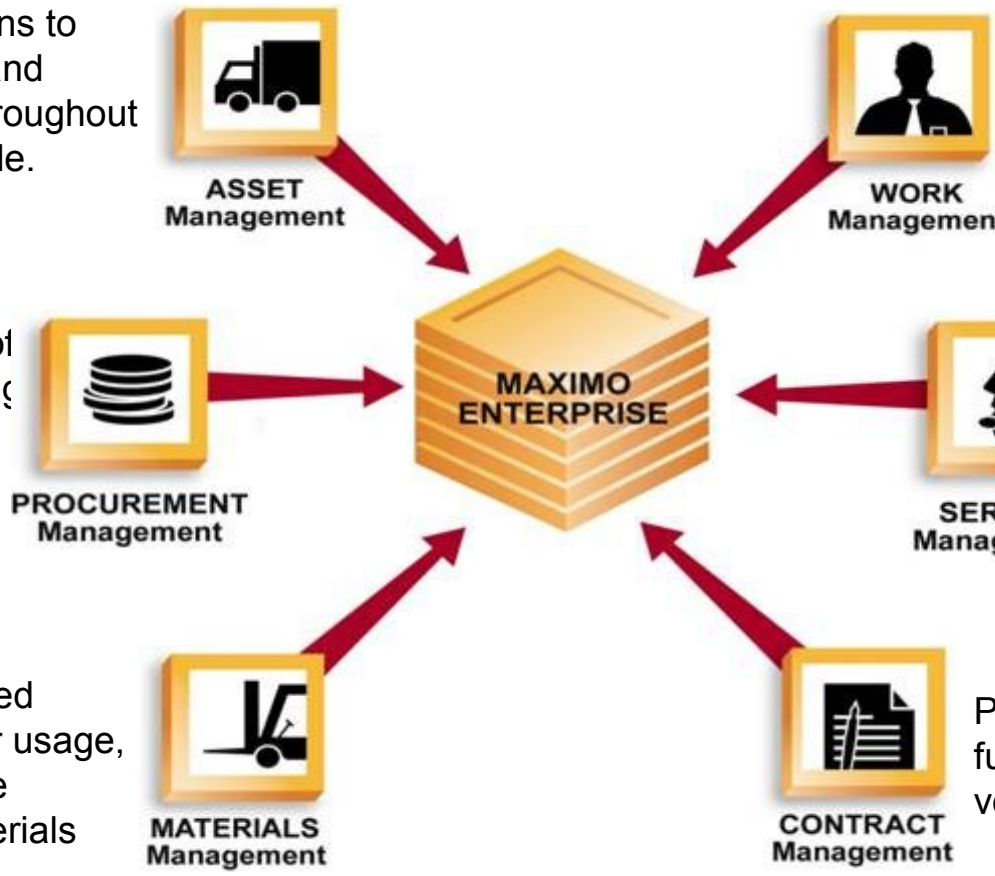
Supports both planned and unplanned maintenance activities, from initial service request and work order generation, through completion.

Supports all phases of procurement, including direct purchase and replenishment of inventory.

Allows end-users to submit new service requests, as well as track and update open service requests.

Tracks asset-related materials and their usage, allows for real-time knowledge of materials status.

Provides comprehensive functionality to fully manage vendor contracts.



J2EE Standards-based Service Oriented Architecture

What is a Formula for Smarter Asset Management?

$$P^3 + \frac{\text{Software}}{\text{Technology}} = \text{am}$$

People/Processes/Procedures PLUS Software over Technology EQUALS Smarter Asset Management[1]

What is a Formula for Smarter Asset Management

- Understand where you are in your Maintenance Maturity
- Prioritize opportunities and execute a formal program

- Consider all aspects of TLAM in Asset planning
- Leverage RCM2 to effect optimal costs across the life-cycle

- Eightfold path to Smarter AM
- Increase the value perception of maintenance and its contribution to ROA
- Apply Leading practices in Asset Management

- Aligned with your maintenance maturity: leverage leading EAM Solutions, advanced analytics relevant technology
- Start with a leading CMMS solution – Maximo

- Target opportunities that positively effect Asset created value and maintenance costs
- Apply a formal benefits realization approach to reaching the target value

- Apply strong transformation Management disciplines to change
- Apply strong Change Enablement disciplines to ensure success