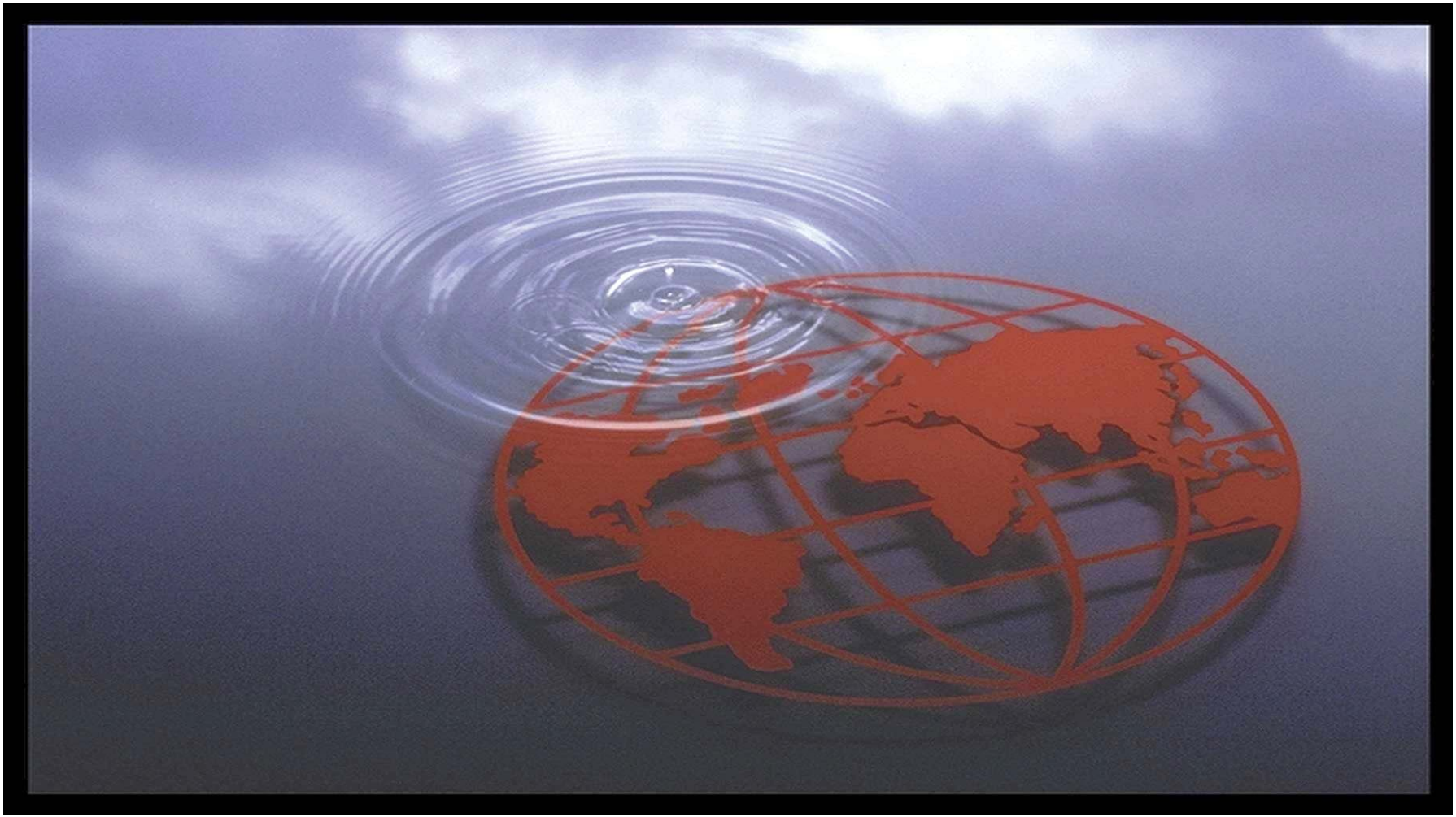
Over Three Decades of Industry-led Collaborative Research



Global Leadership in Cost, Process and Performance Management

Over Three Decades of Industry-led Collaborative Research

Applying ABM to Enterprise System

IT Chargeback & ABC Management Conference

New Orleans 12/4/2006

Ashok Vadgama
President CAM-I

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Discussion Points

- Definitions
- Features
- Output
- Applications to Enterprise Systems
- Typical Data Projects
- How IT can help
- Linkage to Data Quality
- Information Quality
- Performance Measures
- Web Based Approach

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What is CAM-I

Industry-led collaborative research consortium producing the “best-of-the industry” solution, techniques, products, tools, and resources for over 30 years
It is internationally recognized for Best Practice Output

- Process Based Management
- CMS (Cost Management Systems)
- Technical Programs
- Robust Design

The strength of CAM-I is dependent on strong, diverse, large corporate membership and participation

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Current Focus

Two Programs –

Process Based Management

Cost Management Systems –

- Target Costing (TC) Implementation
- Cost Measurement Standards Development
- Public Sector Best Practices Interest Group
- Cost of Quality
- Resource Consumption Accounting Study (RCA)
- Risk Management
- Budgeting and Planning
- Change, Adaptation & Learning

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CAM-I Sponsor Companies

- ALG Software
- Acorn Systems
- Arkonas
- ATI
- Boeing Company
- CALIBRE Systems
- Costvision
- CMA (Canada)
- Delta Solutions
- DFW International Airport
- Executive Management Association
- Gayle Force Consulting
- Grant Thornton LLP
- IBM Corporation
- ISMI
- On Semiconductor
- RGS Associates, Inc.
- Rockwell Collins
- Royal Australian Navy
- SAP AG
- SAS/Better Management. COM
- Transportation Security Administration
- U. S. Air Force
- U. S. Army
- U. S. Coast Guard
- U. S. Marine Corps
- U. S. Navy
- U. S. Patent and Trade Office
- Yorkshire Forward

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Activity Based Costing

Definition:

ABC is the use of software tools and methods to accurately determine the costs of products and services by accounting for people, machines, materials and overhead at the per activity level.

ABC IS NOT THE REPLACEMENT FOR CURRENT ACCOUNTING SYSTEMS

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Features/Benefits of Activity Based Costing

Feature - Assigns the costs of activities to the resulting products.

Benefit - Ability to accurately price products.

Feature - Identifies the relative cost of activities.

Benefit - Ability to identify low or non-value added activities.

Activity Based Management

Definition:

ABM is the management of activities along with linking the outputs of ABC to factory modeling, cost driver analysis, performance metrics and Activity Based Budgeting to improve P & L business performance.

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Features/Benefits of Activity Based Management

Feature - Cost Awareness.

Benefits

Improve awareness of resource costs, capacities, and utilization.
Measure the cost and performance of resources, activities, products and services

Feature - Understanding Costs

Benefits

Understand causal relationships between cost drivers and activities
Understand the impact of product life cycles and SBU profitability.

Feature - Effective Cost Management

Benefits

Support SBU decisions by developing cost models and tying them to performance measures and linking them to design decisions.
Support factory process improvement and cost reduction initiatives.

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Activity Based Resource Management

Definition:

ABRM is the process of identifying people activities, duration, inputs, outputs, performance measures, and cost drivers, then applying ABC methods to determine activity cost, and subsequently identifying and classifying the value/non-value added activities.

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Features/Benefits of Activity Based Resource Management

Feature - Identifies what activities people do and why and for whom they do them.

Benefits:

- Ability to tie activities to goals, objectives, and customers
- Understanding the root cause (cost driver) for activities
- Links performance measures against activities for effective measurement of an activity
- Drive dynamic changes through linkage of customer, output and cost
- Redirection or elimination of activities

CAM - I Cross used at Motorola

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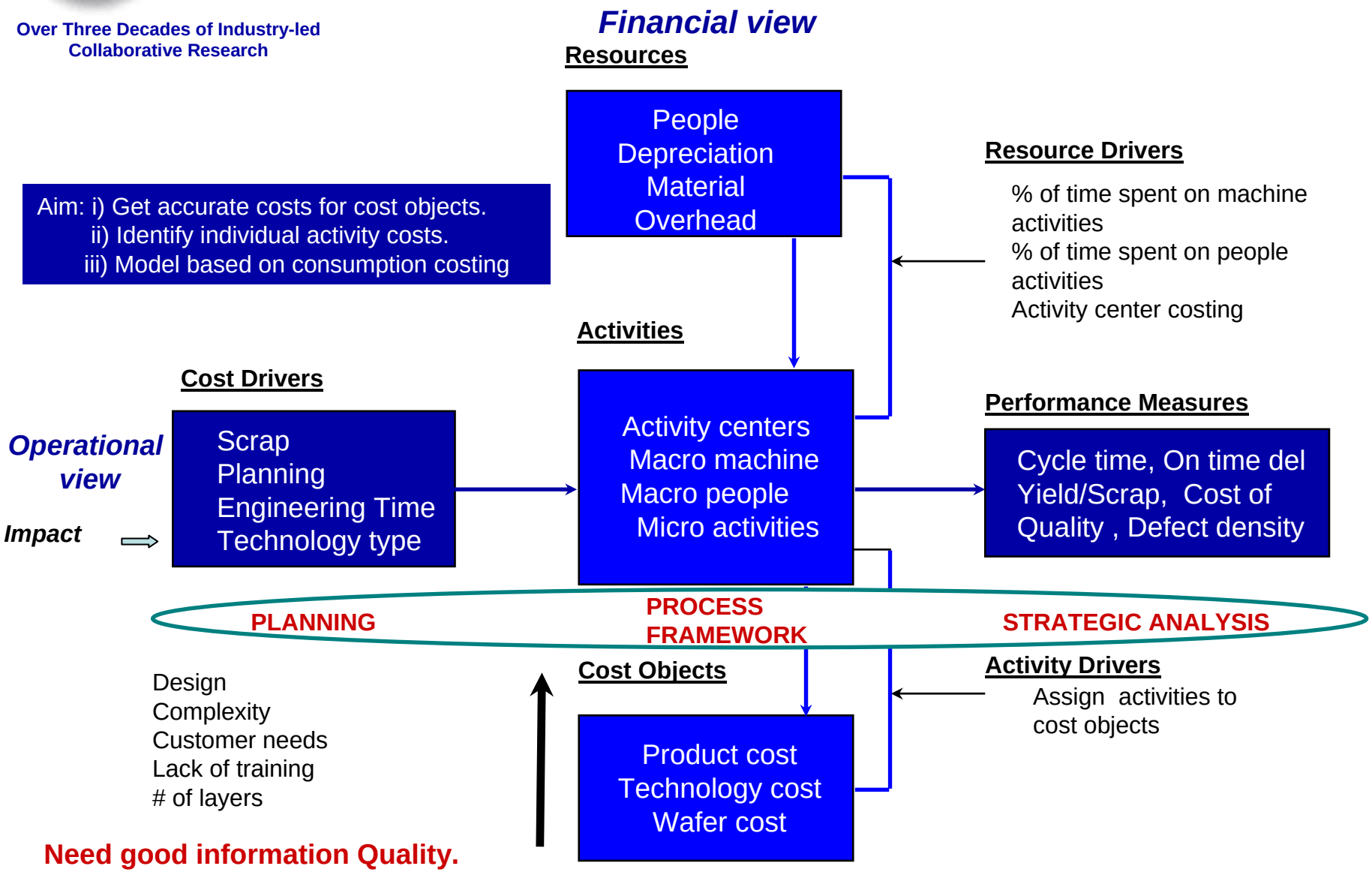

Global Leadership in Cost, Process and Performance Management

ABM output and use of data

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OUTPUT AND INFORMATION	Direct Use	Indirect Use	First cut Model Months	Working Model in Place - Mths	Data used for Decision Mths	BENEFITS OF USE
Product Cost	X		3	6	8	Accurate product cost
Process (Activity Cost)	X		3	6	6	Product cost forecasting/cost per box
Linkage To Improvement efforts		X	3	6	8	Complement improvement initiatives
OEE (Overall Equipment Effectiveness)	X	X	6	8	14	Cycle time and On time delivery
Value Add/NVA classification	X		3	6	12	Continuous improvement
Cost of Ownership	X		5	6	10	Cycle time and On time delivery
TFE linkage		X	5	8	10	Data driven decisions on cost
Performance Measures		X	6	8	12	Individual goal objective alignment/scorecard
Linkage to Cost reduction efforts		X	6	10	12	Complement improvement initiatives
Target Costing		X	6	8	18	Pricing models
Cost Driver analysis (root cause)	X		6	9	10	Effectiveness
Distribution Channel Cost	X		6	9	12	Maximizing value of distribution channels
Category Management	X		6	9	12	Portfolio management
Value Add Services	X		8	12	12	Pricing and customer retention
Factory Modeling		X	8	12	18	Simulation and modeling
Resource Redirection		X	8	12	12	Alignment of resources
Customer segment profitability	X		8	12	15	Customer accounting
Complement Trade Off decisions		X	9	12	15	Cost modeling
Make Buy Decisions		X	9	12	15	Outsource or build here
Activity Based Budgeting	X		10	15	18	Leveraging zero based budgeting
Cost per Touch/Cost per Pick		X	12	15	18	Target focus on specific area
Balanced Scorecard		X	12	18	30	Balanced metrics approach for synergy
Cost of Diversity		X	12	15	18	Optimization
Supply Chain Linkage		X	12	15	20	Understanding cost of SC boxes
Cost of Quality	X		12	15	15	Augment cost to quality efforts
ECR linkage		X	12	15	24	Customer satisfaction
E Com		X	18	24	30	Enable ECR (Efficient Consumer Response)

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Activity Based output used to feed into other models or initiatives

INFORMATION	Senior Mgrs.	Fab/Mfg. Mgrs.	Section Mgrs.	Finance	Design & Tech Groups	TPM/ OEE
Use for target costing	X	X		X	X	
Capacity management by using activities		X	X	X		
Management of costs	X	X	X	X		
Process cost by activity	X	X		X	X	
Portfolio management	X			X		
Resource deployment	X	X				
Improvement agendas	X				X	
Using data for DFM					X	
Increased asset utilization, capital efficiency						X

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Cost Analysis

	Jan	Feb
	Labor & Fringe	
DATA INFRASTRUCTURE	6233	6722
DDCM GLOBAL CENTER	3478	3646
DDCM DATA TEAM	3462	3657
DATA & DOC CONTROL MGMT	5221	5682
QA SERVICES DFO	4886	5044
PLANNING PROGRAM	4562	5185
QIS/DDCM ADMIN	9875	15259
DOCUMENT CONTROL	2777	2769

Resource	Jan	Total Labor & Fringe	Total Direct Costs	Total Special Items	Facilities	Total
NAME	90%	3,116	631	338	315	4,400
NAME	100%	3,462	701	376	350	4,888
NAME	100%	3,462	701	376	350	4,888
NAME	10%	623	47	29	35	734
NAME	10%	623	47	29	35	734

*Data has been changed to protect Motorola proprietary information

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SEI (Software Engineering Institute) Linkage to WBS structure in IT

Capability Maturity Model (CMM) and ABM comparison

X- ABC Assessment found activity here

Activity	% MSD Time	Not in CMM	Level 2 - Repeatable					Level 3 - Defined								Level
			RM	SPP	PTO	SSM	SQA	SCM	OPF	OPD	TP	ISM	SPE	IC	PR	QPM
Technical Work	16												X			
Standards- Coord., Write, Prod	14.5															
New Project Definition	12		X													
Roadshows and MC Outreach	8.5	X														
Tracking Supplier Progress	7.4					X										
Training	7.4										X					
Project Tracking and Overview	7				X											
E-mail and Phone mail Commur	6.7	X														
Writing Statements of Work	3.24		X			X										
Tech Transfer Report Writing	2.8												X			
Communicate with "My" MC	2.8	X														
Assit other Internal Projects	2.6													X		
Administrative Work	0.81	X														

Requirements Management
Software Project Planning
Software Project Tracking and Oversight
Software Subcontract Management
Software Quality Assurance
Software Configuration Management
Organization Process Focus
Organization Process Definition
Training Program
Integrated Software Management
Software Product Engineering
Intergroup Coordination

Select Appropriate Cost Drivers and Measures

- A cost driver is a factor that has a direct influence in the cost and performance of subsequent activities.
- The traditional cost systems used direct labor as a single universal cost driver (referred to as an allocation basis).
- ABCM takes a proactive approach to identify more appropriate cost drivers which more strongly cause the cost behavior of the activity.
- The most interesting potential cost drivers are those not related to volume and which have the power to explain the growth in overhead and support costs.

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Cost Drivers - Cause of Incremental Cost

- National Demographic - Design
- Airline catering - Sanitation, packaging, weather
- Software - complexity, Time
- Beneton (Customer) - Dying S/B the Last Step
- M&S - Customer, Supplier process
- Motorola - competition, pagers in 3 hours
- Harley Davidson Honda - Cost, use JOT Technology
- Apple - Technology (GUI)
- Tektronics - Every 3 months - update model
- Harris - resource deployment

- # of moves
- Volume
- Lack of procedure
- Policies
- Government legislation - environment impact
- dependency
- # of steps
- recognize customer patterns
- determine how overhead vary with volume\
- pinpoint waste areas
- strategy costs
- brainstorm root cause -w hat causes work\
- profitability by customer - cost driver customer satisfaction - ROI by customer

Activity-Based Cost Management

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Chart of Activities

Chart of Accounts

Salaries

Materials

Supplies

Facility Costs

Transportation Costs

Processes and Activities	Cost Effectiveness			Efficiency			Cost Drivers		Product Line Profitability		
	Value Added	Non Value Added	Total	Output		Cost per Unit of Output	Measure	Volume	Product Line 1	Product Line 2	Product Line N
				Measure	Volume						
Process 1											
Activity 1											
Activity 2											
Activity 3											
Process 2											
Activity 1											
Activity 2											
Activity 3											
.											
.											
.											
Process N											
Activity 1											
Activity 2											
Activity N											

Processes and Activities Examples

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- Facilities Management
  - Maintenance
  - Security
  - Rearrangement and Construction
  - External Compliance
- After Sale Product Services
  - Installation
  - Ongoing Maintenance
  - Warranty Service
- Production Management
  - Production Planning and Control
  - Shop Floor Control
  - Production Monitoring
  - Time Charging
- Strategic Planning
  - Market and Product Forecasting
  - Competitive Assessment
  - Financial Analysis
- Marketing
  - Market Research
  - Pricing
  - Sales Forecasting
- Financial Reporting and Control
  - Coding Transactions
  - Preparation of Financial Statements
  - Cash Disbursements
- Employee Benefits Administration
  - Claims Processing
  - Holiday and Vacation Scheduling
- Human Resource Administration
  - Goal Setting and Monitoring
  - Performance Appraisals
  - Training and Education
  - Recruiting and Hiring
- Production Operations
  - Fabrication
  - Assembly
- Financial Planning and Control
  - Capital Budgeting and Analysis
  - Operations Budgeting
  - Investment Analysis
- Sales Calls on Customers
  - Preparation of Proposals
  - Travel and Logistics
  - Follow Up
- Material Control
  - Procurement
  - Transport/Movement
  - Storage
  - DATA ACTIVITIES
  - AND SYSTEMS

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Value of Information

- **Information = (Data + Definition + Presentation)**
- **Knowledge = (People + Information + Significance)**
- **Wisdom = (People + Knowledge + Action)**

Larry P. English (Improving Data Warehouse and Business Information Quality)

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Impacts of Bad Data

Poor data for:	Results in:
Bill of Materials	• Wrong parts being built or purchased • The inability to build to customer requested ship date due to wrong/missing components • Errors in capacity estimates
Capacity Planning	• Planning for additional inventory to compensate for lack of trust • Product not being built or production delayed
Inter-location Routings	• Product being built in the wrong factory

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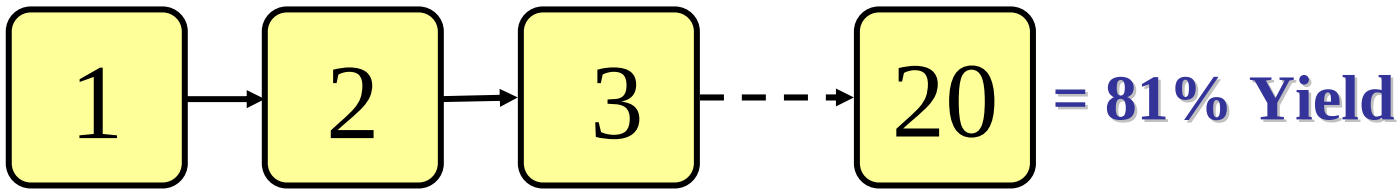
Data Supply Chain Tolerance Analysis



(20 manufacturing steps at 99% Yield each)

- **Chips ~200 steps. 99% Yield at Each Step will Result in Final Yield = 13% Yield**
- ***The Same Relationship is True with Data!***
- **Error Rates are Higher (5-10% is common)**

Cost of Bad Data

- **Cost of bad data could equate up to 15% to 18% of total operating expense**
- **Studies show that as much as 25% of IT budget can be attributable to bad data**
- **The data must be cleaned up and standardized for a global effort. *We cannot keep on massaging the data and using spreadsheets to hide our inability to provide data quality.***
- **Configuration Management is the way a business documents, controls and manages all its procedures, data and processes**

Cost of Bad Data

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This exercise at ……. validated the benchmark that more than 15% of total IT cost is due to bad data

Updated by Alvin Lee, Oct08,1999	Transactions*		Total Time Spent* (Client Side)			Total Time Spent* (I.T. Side)			Financial Cost of Bad Data*	
Applications*	# transactions Per Week	# of Human Interactions	# of end users	% spent on data	% spent on bad data	# of I.T. support	% spent on data	% spent on bad data		
CIM System										
HTND			1000	10%	4%	20	30%	10%	$ 9,332,224	$ 3,016,489
ASDF			1000	10%	2%	20	30%	10%	$ 8,663,728	$ 1,564,875
FINANCE										
SDFD			100	10%	4%	1	10%	2%	$ 713,000	$ 281,640
SEDD			100	10%	3%	1	10%	2%	$ 713,000	$ 211,580
ERTY	7	37	1	1%	3%	1	1%	1%	$ 6,700	$ 2,630
W3ER	54	0	10	50%	10%	2	10%	5%	$ 370,000	$ 77,600
Planning										
SD23	10000	0	156	10%	1%	5	50%	25%	$ 1,387,000	$ 197,900
WESD23	10000	0	500	25%	3%	3	15%	7%	$ 8,901,500	$ 1,068,300
SEER	315,000	242,000	450	40%	4%	24	30%	10%	$ 13,224,000	$ 1,432,800
WET	65 65	5000	450	65%	1%	7	10%	2%	$ 20,644,000	$ 326,000
QWTY	500,000	0	1000	2%	0.50%	3	95%	5%	$ 1,719,500	$ 361,100
WYUU	10000	15	50	30%	4%	5	20%	4%	$ 1,126,417	$ 154,257
Operation										
XCDF	60830	1155775	2500	4%	2%	8	40%	25%	$ 8,749,092	$ 3,670,502
SWE	4000	1000	200	0%	1%	6	0.01%	0.00%	$ 120,042	$ 141,200
TYU	140,000,000	0	1400	5%	3%	2	30%	15%	$ 5,482,204	$ 2,977,206
GJJ	700	35	4	30%	2%	1	80%	40%	$ 260,000	$ 36,000
FGJ			200	10%	2%	10	0.3	0.1	$ 10,771,340	$ 533,227

ABM Data Collection Methods

- Existing Records
- Individual Interviews
- Group Interviews
- Questionnaires

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Global Leadership in Cost, Process and Performance Management

Enterprise Architecture & Tools

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Business Architecture

Linking IT to the business to ensure both vertical & horizontal alignment with strategies, goals, & initiatives

Data Architecture

Developing & deploying data standards, models, & processes for ensuring trustworthy, timely, & seamless data that enables informed business decisions

System/Application Architecture

Driving application strategies and roadmaps that automate the use of the information resource in support of ”integrated” business functions

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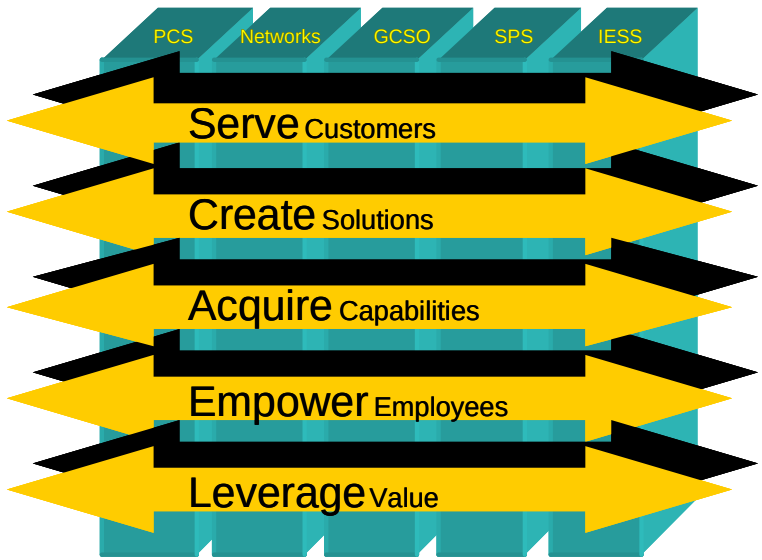
Horizontal Capabilities & Domains

- **What are capabilities?**

  High-level functions a company must perform to compete as an integrated business in the digital economy

- **We have grouped capabilities into 5 Domains:**



Domains are not separate from our businesses - they are a horizontal approach to our business and their purpose is to improve our business capabilities.

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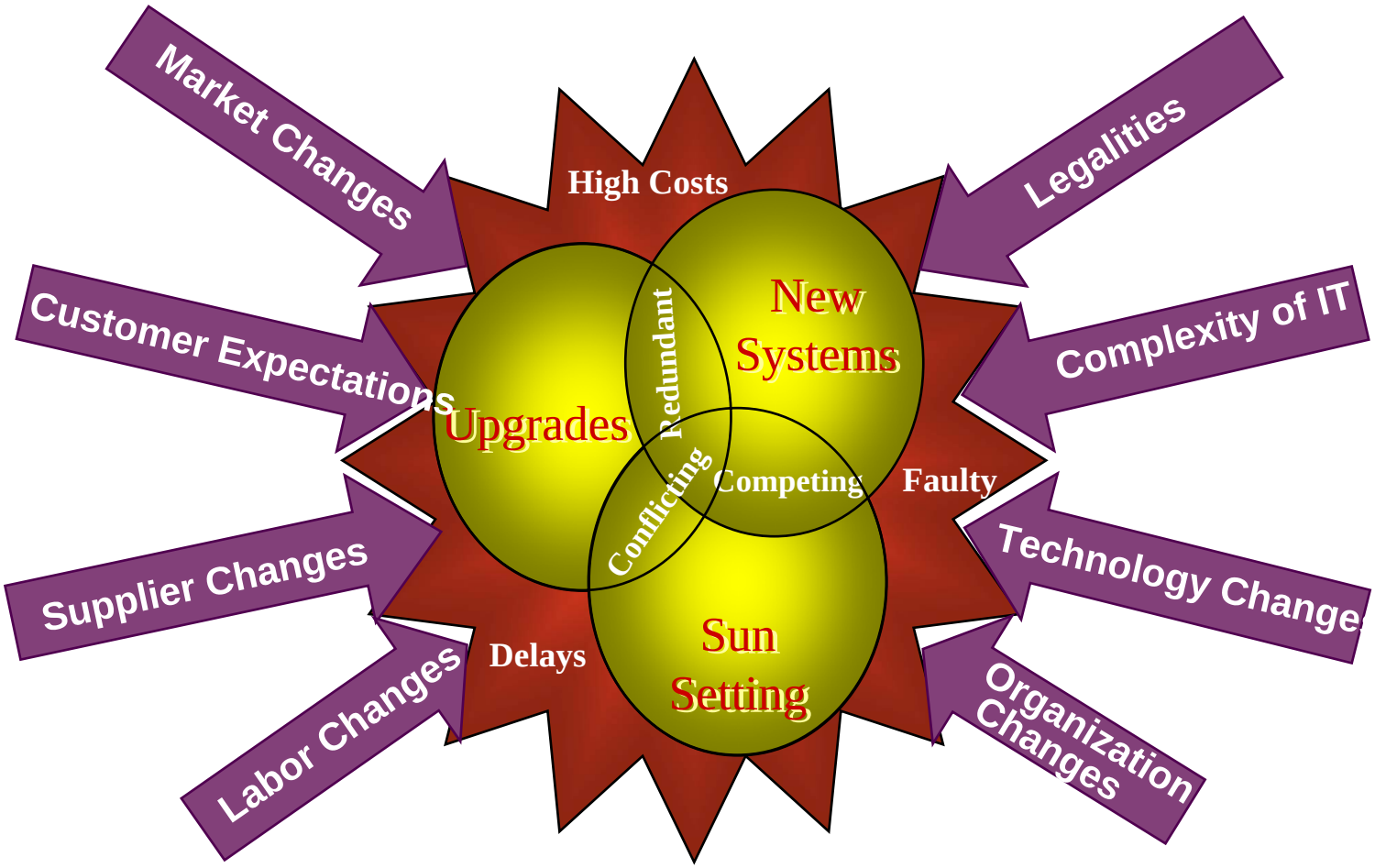
Internal and external factors forcing a multitude of concurrent IT system changes driving the need for comprehensive project and architecture management.



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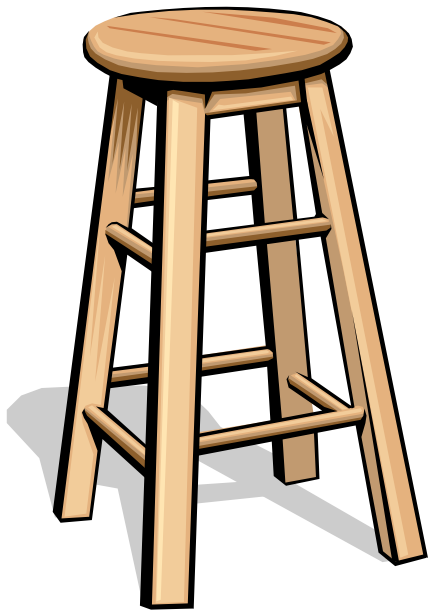
Typical Data Projects

Four types of Data Projects

- **Data Readiness**
- **Data Processes**
- **Data Systems**
- **Data Architecture**

Data Purge
Data Rationalization
Data Creation
Data Conversion



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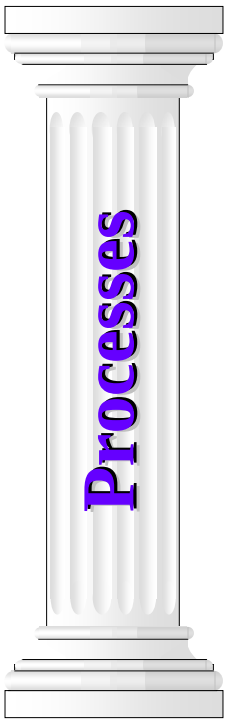
Data Readiness Process



CONCEPT BUY-IN

DEFINE SCOPE

CUSTOMER BUY-IN

CHOOSE PROJECT LEADER

GATHER PROJECT REQMTS

IDENTIFY PROJECT MEMBERS

Business Rules

IDENTIFY DATA DEFINITION

DATA THREAD ANALYSIS

Mediated Tools

FUNCTIONAL SPEC BUY-IN

IDENTIFY SOR

Data Tractability Integrated Tools

METRIC

DEFINE AND SUBMIT IT REQUIREMENTS

PROCESS/ SYSTEM PILOT

CLEAN UP EFFORT

Institutionalization

BUY- OFF FROM CUSTOMER

TRAINING IS IDENTIFIED

DATA STEWARD IS IN PLACE

PROJECT CLOSED

Measurement

Business Process Understanding

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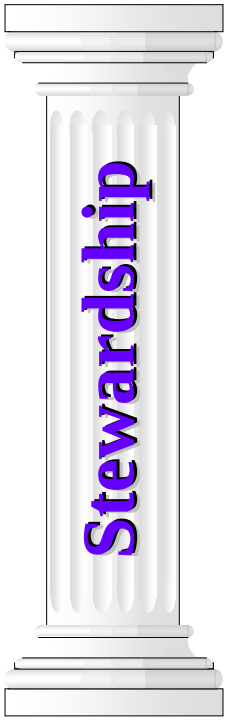
Prioritizing Data Projects



- **Priority Cube**
  A method to calculate the relative priority or opportunity by domain of addressing data readiness.
- **Requirement**
  Opportunity prioritization must be based on the business value or ROI of the data readiness effort and relative importance to the successful execution of the sector's business goals.
- **CODR: Cost of Data Readiness**
  The cost by domain of making the data "clean". The cost to purge, rationalize, create, convert or otherwise make the data ready for the domain.
- **COBD: Cost of Bad Data**
  The cost by domain if the data is incorrect, missing etc., (Bad Data). Comparison of COBD vs. CODR yields an ROI.
- **Criticality**
  The relative importance to the sector's goals / scorecard. How critical is "good data" within a given domain to the successful execution of the sector's goals. (Essential, Important, Nice to have)

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Prioritizing Data Projects

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Critical Need for Information Quality

- **Data Quest report on IT failure - # 2 problem is Data**
- **Information which is used by decision makers to create competitive advantage**
- **The focus on outsourcing – need good information**
- **Bottom line impact - reduce budget, savings**
- **Financial and statutory**
- **Quantify your projects for ROI etc**
- **Activity Based Planning & Budgets**
- **Your suppliers want to know things like – purchase, sent where, timing of order, status of order, price, product etc.**

Prioritizing Data Projects

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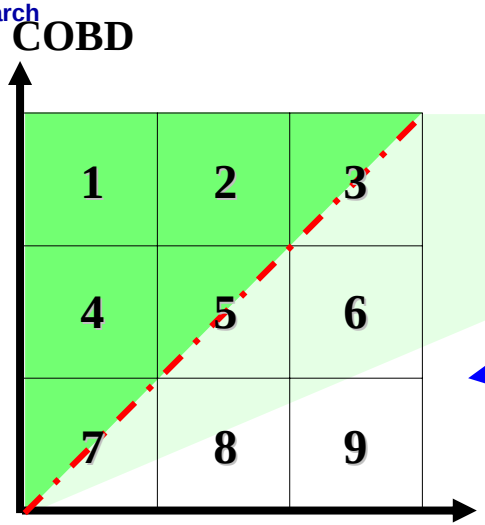
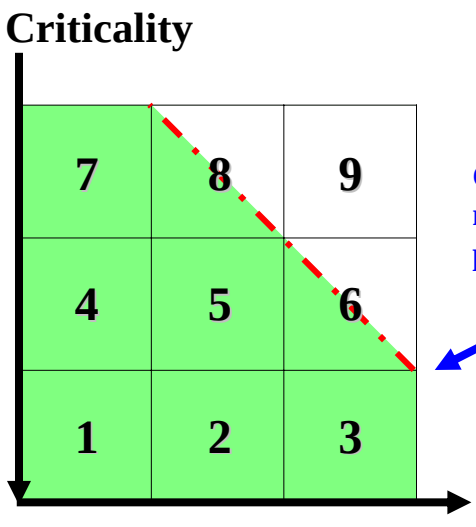
Stewardship

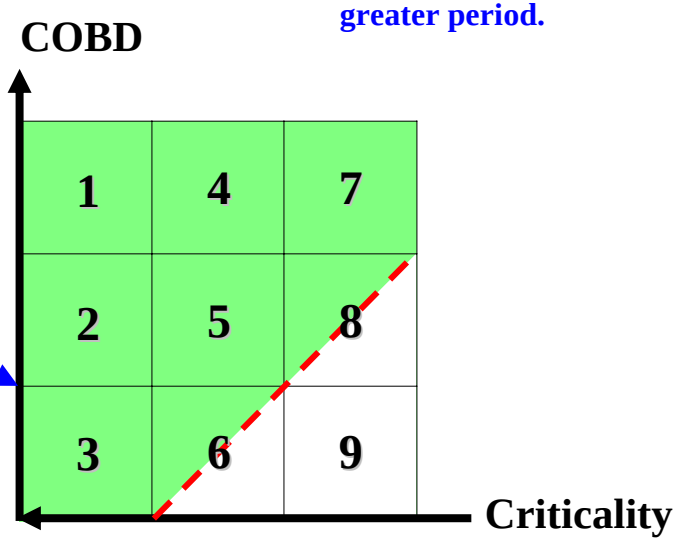


Domains that fall above the line have positive ROI within the period of the effort but because CODR is fixed and COBD usually increases over time the indicated prioritization is used.

Represents +ROI area when measured over greater period.



Criticality usually carries more weight than cost for projects.



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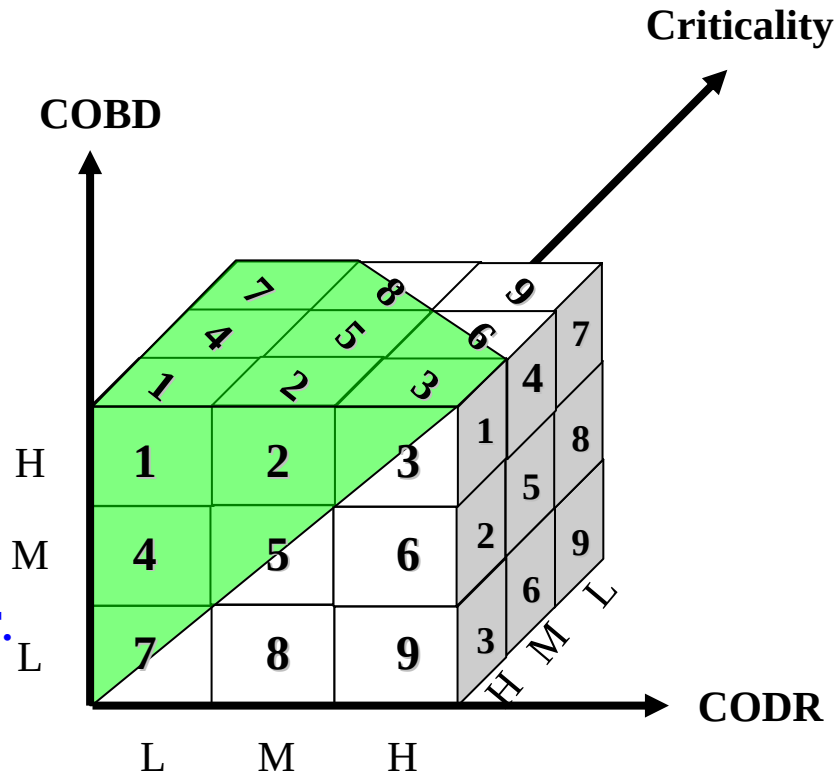
Prioritizing Data Projects

Calculated domain priority is a product of the three grid rankings:

Priority = COBD * CODR * CRIT.

= ROI * CRITICALITY

= Business Benefit * Business Goals



e.g. Top opportunity would be a domain with high COBD, low CODR and high Criticality.

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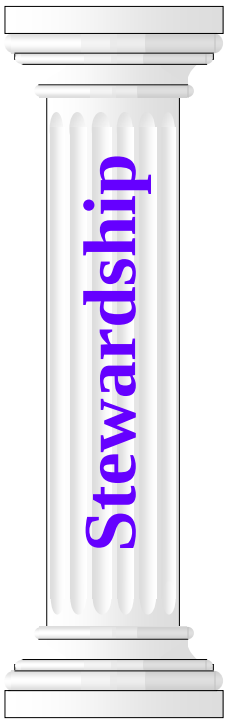
Prioritizing Data Projects



Domain	COBD	CODR													Criticality							Calculated Priority
Price	H	H	M	M	M	H	M	L	M	L	L	L	L	H	H	M	H	L	H	H	M	1
Materials / BOM	H	H	L	H	M	H	H	L	L	L	M	L	M	L	H	L	H	H	H	H	M	1
Customer DB (Thru Cus5)	H	H	H	M	M	M	M	M	M	M	M	L	M	M	H	H	H	M	H	M	H	2
Cost Data	H	M	H	H	M	H	M	H	H	M	M	M	H	H	H	M	H	M	M	H	M	3
NPI Data	M	H	H	M	M	L	M	M	H	M	M	L	H	M	H	H	H	L	H	M	H	5
Inventory	M	M	L	H	M	H	M	H	M	M	H	H	M	M	H	L	H	H	M	H	M	6
Mfg Data	H	M	H	M	M	H	H	H	H	H	M	H	H	H	M	L	H	M	M	M	H	6
Logistics	M	M	M	M	H	M	M	L	L	H	L	H	L	L	M	L	H	L	M	M	M	8
Document Data	M	M	H	L	L	M	M	M	M	H	M	M	L	M	M	M	M	L	M	M	M	10
Customer Contact	M	L	M	H	L	L	H	H	H	M	H	L	H	H	M	H	H	M	L	L	H	12
Vendor	M	M	H	M	L	M	M	L	M	M	L	L	M	M	L	M	M	L	L	M	L	12
Quality Data	M	M	M	L	H	M	L	H	M	M	M	H	H	H	M	M	M	L	H	M	M	12
Finance Fixed Assets	M	L	H	H	L	M	L	L	M	M	L	M	L	M	L	L	M	M	L	L	L	12
HR Data	M	M	M	H	L	L	M	L	L	M	L	L	M	L	L	L	H	H	L	L	L	12
Product Line	L	L	L	L	H	H	L	L	M	L	M	L	M	M	M	M	M	L	H	H	L	14
Data Book	L	H	M	M	L	L	L	M	H	M	H	L	L	H	M	H	M	M	L	L	H	16

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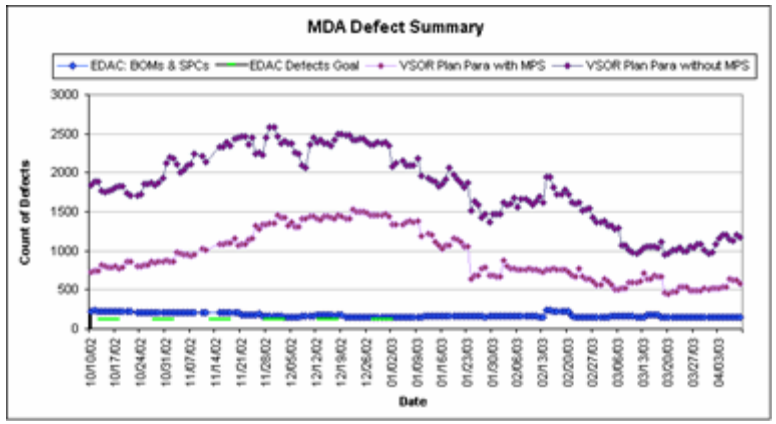
Performance Criteria and Measurement Systems

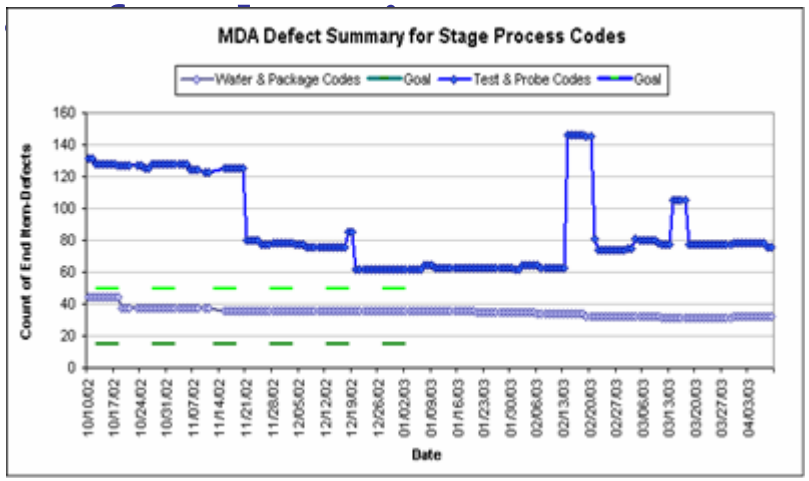


Analyze your financials and Data -

- **Performance to business rules**
- **Data quality trends**

Continuous improvement through root cause analysis to drive corrective actions

Executive Dashboards



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Other Performance Measures

- Collapsing multiple systems of record
- Contact List
- Web based tools linkage
- Bill of Material line items
- Portfolio Pruning
- Sequester

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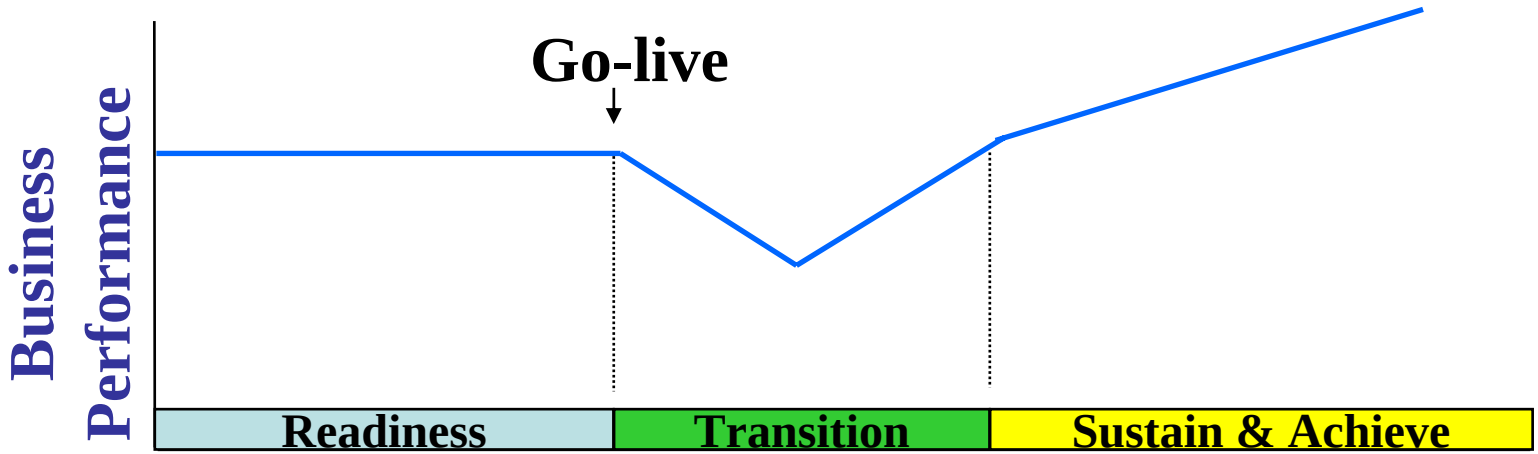
Change Readiness

Reduces Transition Risks

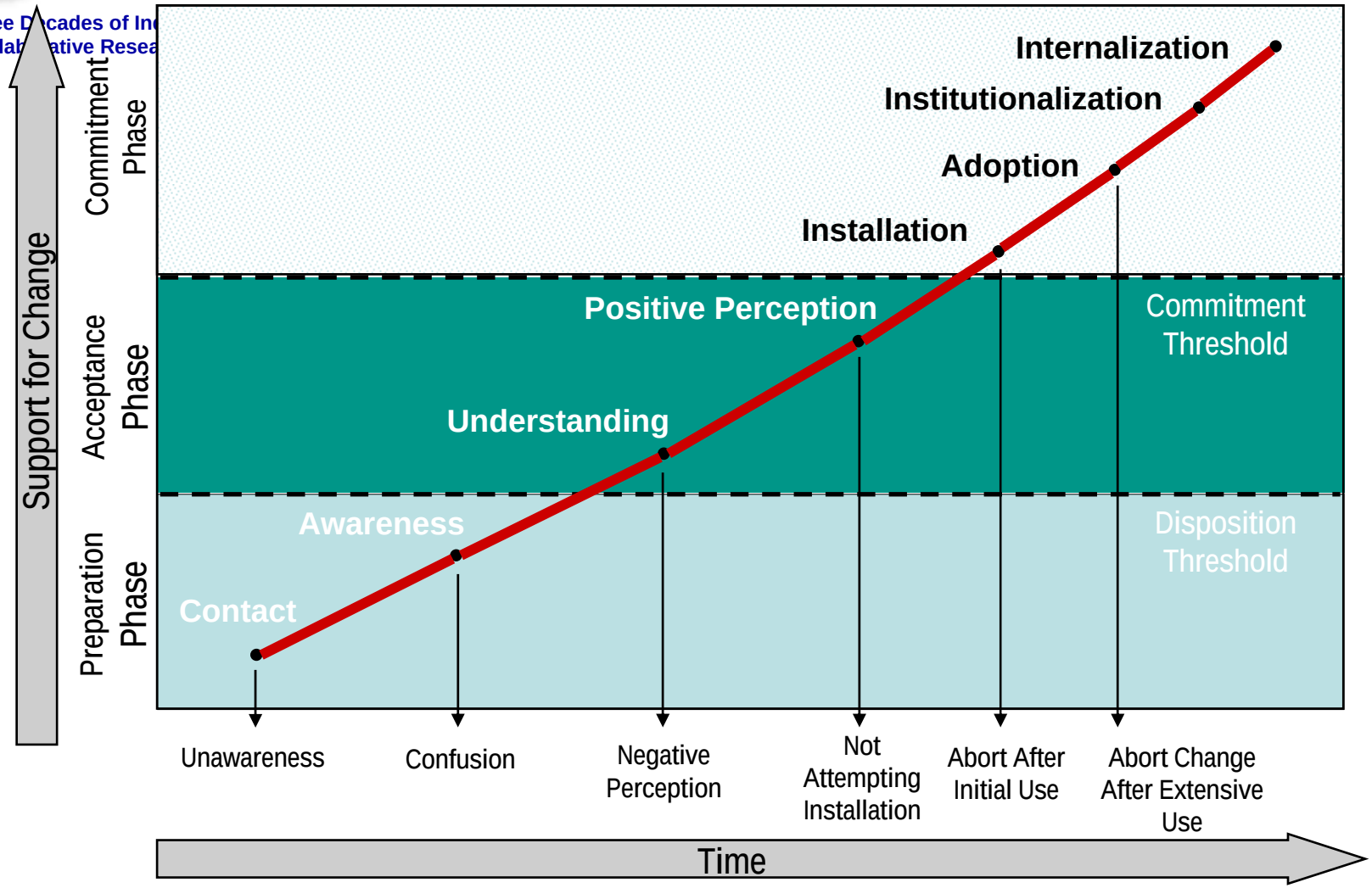


- Metrics/Assessment
- Stakeholder Engagement Plan
- Site Workplans and Checklists
- Go Live Evaluation
- Startup Support Plan

- Metrics/Assessment
- Training
- Site Workplans and Checklists
- Post Implementation Plan

- Post Go Live "Checkout" sessions
- As-needed Training and Help Desk Support
- Change Control Process

Culture Change – Stages of Commitment



These concepts are based on the research and theory of Daryl R. Conner of Organization Development Research (ODR).
The actual change band is developed from the "Commitment Model" as outlined in Conner's book, *Managing at the Speed of Change - 1993.*

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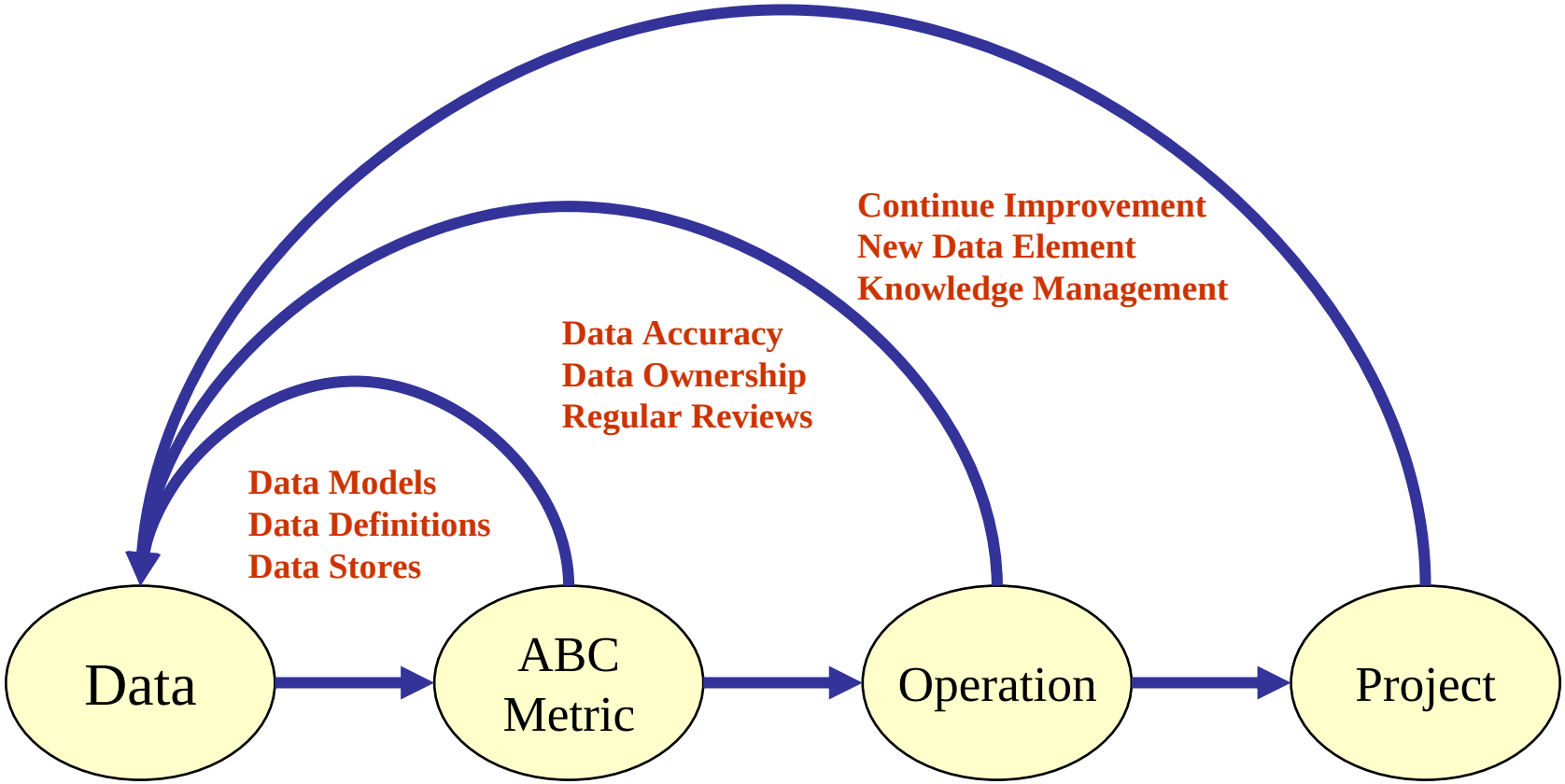
Linkage to Data Quality



Data Recommendations

- **Measure the Quality of Your Business Data**
- **Measure the Cost of Data to Your Organization**
- **Estimate the Cost of Poor Quality Data**
- **Define Data Owners, Processes, Stewards**
- **No Optionalism Mentality**
- **Turn Your Data into an Asset**

Ashok G. Vadgama
Phone: 512-617-6428
Email – ashok@cam-i.org
Main – http://www.cam-i.org