Implementing Process Improvement in an Organization

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Introduction

Expectations

Agenda

Agenda

Shared Services- Needs of Customers are Evolving

Innovation & Productivity

Speed & Flexibility

Risk

Quality

Cost

< 1 Year
- 5
- 20
- 30
- 40

2 - 3 Years
- 5
- 20
- 25
- 35

3 - 5 Years
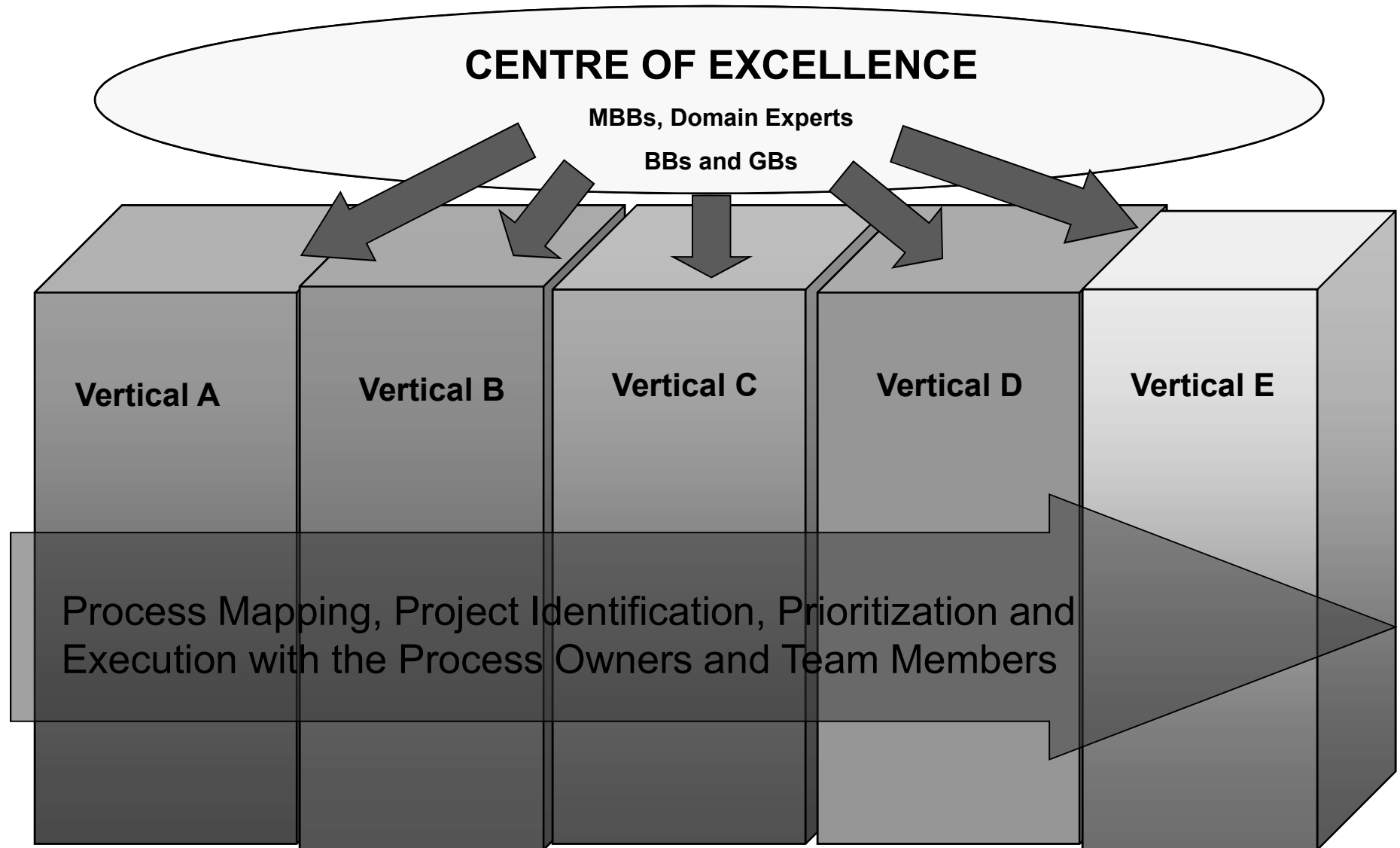- 28
- 15
- 20
- 20

Additional Value

Basic Reqts.
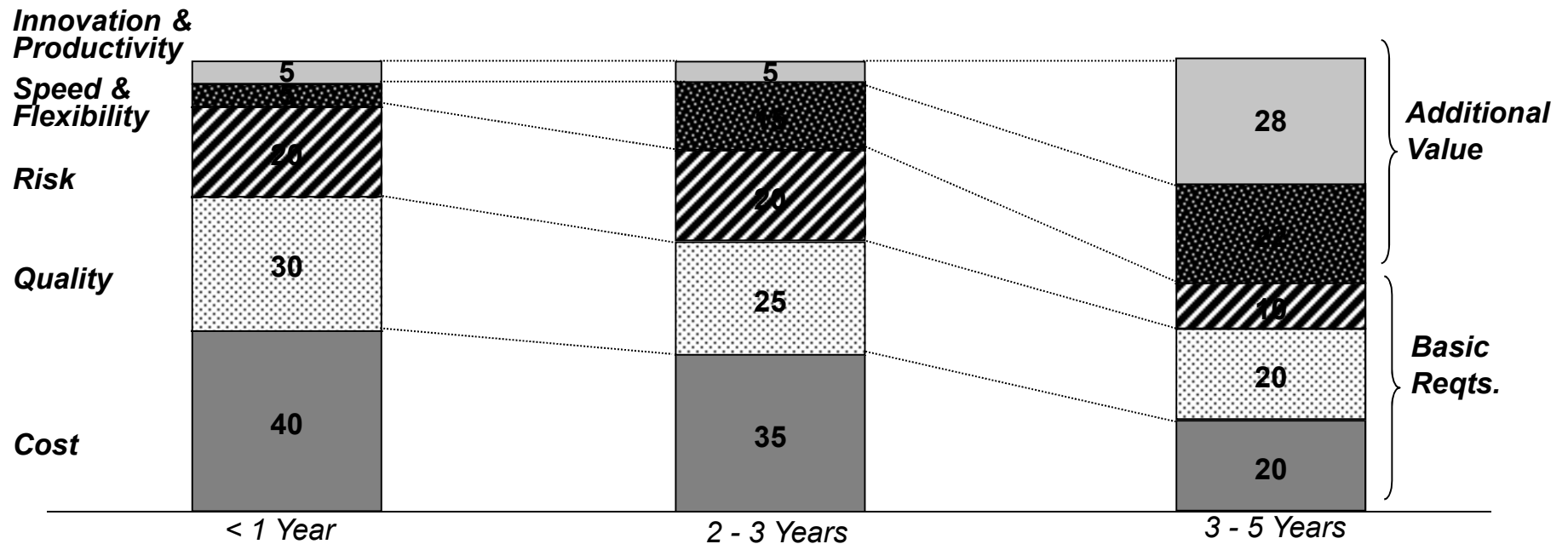
"I am currently most concerned about achieving the highest levels of quality at the lowest cost"
- UK bank

"I would like the Indian Shared Services providers to focus on delivering higher levels of productivity every year" - US cards company

"I I would like to have more focus on innovation and productivity"
- US mortgage bank

Source: process 360 Deg. Benchmarking exercise, Nasscom – Mckinsey Report. 2005

CENTRE OF EXCELLENCE

MBBs, Domain Experts

BBs and GBs

Vertical A

Vertical B

Vertical C

Vertical D

Vertical E

Process Mapping, Project Identification, Prioritization and Execution with the Process Owners and Team Members
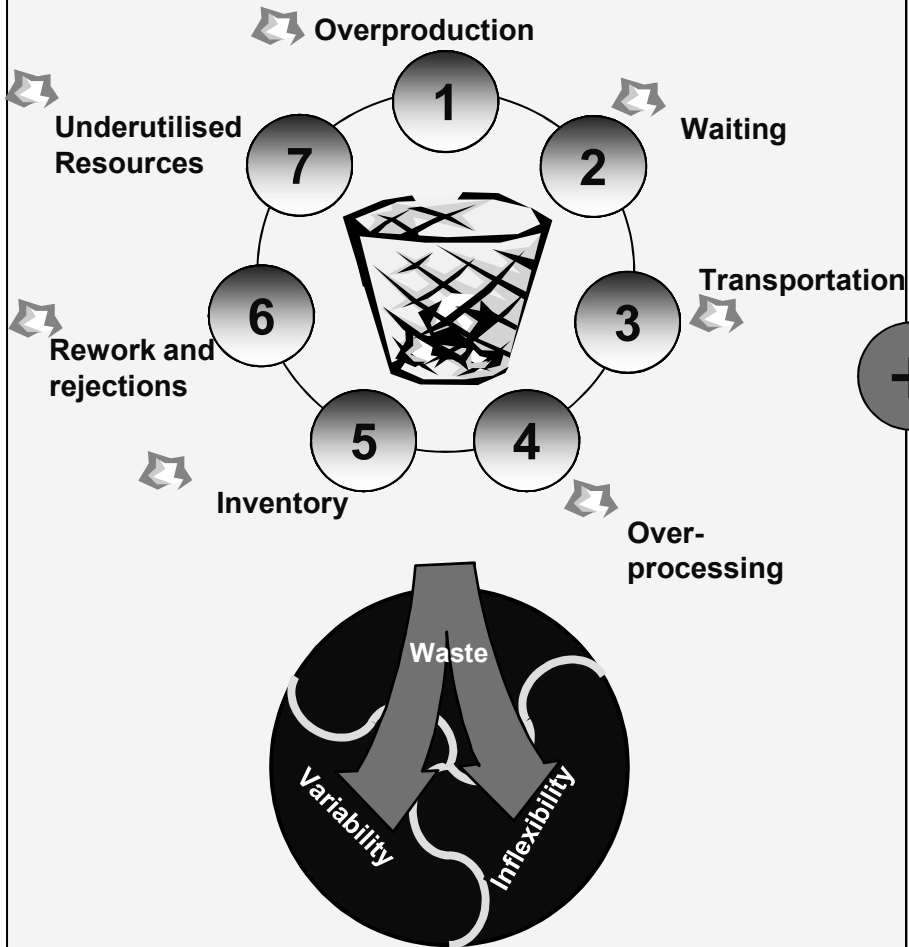
Companywide Efficiency Programs

Nature of Project	Process Reengineering / Technology Change	Structured Process Improvements	Generic Improvements
Methodology Used*	• DMADV	• DMAIC	• Lean / Kaizen
Capability Building	• TRIZ • Six Sigma • Process Knowledge	• Six Sigma • Lean • Structured Problem Solving Methodologies	• Innovation • Creativity
Change Management	End to end	DBOI focussed	Localized teams
Project Management	• (15 - 20%) of effort • Requires higher level of project management • Completely customized to specific project	• (5 - 10%) of effort • Project management handled by BB / MBB from Transformation team. GB / BB mentored on project management skills so that they are able to manage milestones, estimate sizing, use MS project, etc. • Some amount of customization (Multiple iterations like DMADMAIC, etc.)	• No PM effort • Excel, Access based tool to capture benefits and communicate
Coverage	6 - 8 projects in a year	5 - 10% of employees	60 - 80% of employees

Lean and Six Sigma

Typical primary Lean entry point:
Reduce waste

Overproduction

Underutilised Resources

Waiting

Transportation

Rework and rejections

Inventory

Over-processing

Waste

Variability

Inflexibility

+

Typical primary Six-Sigma entry point:
Reduce variability

Sample distribution

"Voice of the customer"

LSL

USL

LCL

UCL

"Voice of the process"

Waste

Variability

Inflexibility

Project Selection

Inputs

"Voice Of The Customer"
(Surveys / Complaints / CRM inputs)

"Voice Of The business"
(Bus. Strategy, Profitability Analysis))

Other Stakeholders
↗Employees
↗Regulators

Customer CTQ Prioritisation

Stakeholder Requirements

Core Processes And Output Measures

Output and process measures

Core Business Processes

Cross-functional process goals

Supplier Quality

Sub processes And Input Measures

Start | hfrhfuferuche | fezcugugfrvg | sfzeez ? | Oui | vzvvvve | End

Non

Green / Black Belt Projects → Deployment

Transformation Opportunity Document

Business Case

Why is the project worth doing?

Why is it important to do it now?

What are the consequences of NOT doing the project?

How does it fit with the business initiatives and target?

What is the business impact of the project?

What must the team deliver to be successful?

Required deliverable dates

Type of Project

(Tick whatever is appropriate)

❑ *Standardization*
❑ *Value Addition*
    ❑ *Revenue Generation*
    ❑ *Cost Reduction and avoidance*
    ❑ *Customer Satisfaction*
    ❑ *Risk Mitigation*
❑ *People Development*

Contact Person

Sponsor/Reviewer – Who is the owner of the project/process from Business?

SME – Who are the subject matter experts on the process?

Scope

Which are the processes team will focus on?   *What is off limits (in-scope / out-of-scope)?*

Output Sigma
Understanding the Capability of the process

Double click on the spreadsheet and enter data in the the shaded cells.

Define the following
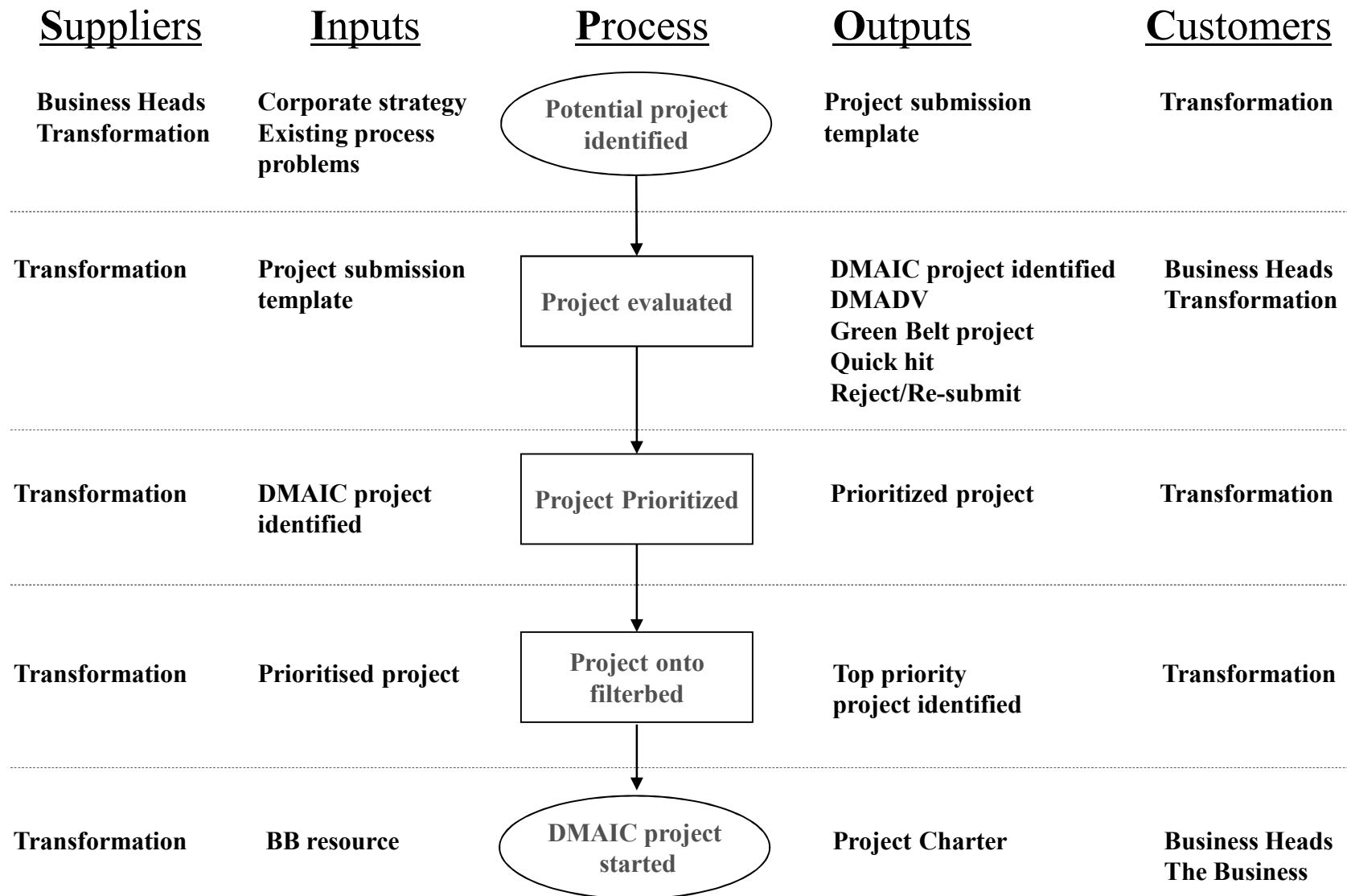|	
CTQ:	Your CTQ
Target:	Your customer required target
Defect:	Describe here how you would identify a defect
Unit:	How do you define a unit
Opportunity:	What is the rationale behind the # of opportunities

DPMO

	enter	
1 Number Of Units Processed	N=	100
2 Total Number Of Defects Made (Include Defects Made And Later Fixed)	D=	30
3 Number Of Defect Opportunities Per Unit	O=	1
4 Solve For Defects Per Million Opportunities		300000
5 Sigma will calculate	Sigma=	2.02

You may need to do more than one sheet (or consolidate in a table) to show other Baseline calculations or summary sigma.
Explain any sampling as appropriate. Hint: Update your problem and goal statements. Did they change based on your findings?

Project Selection - SIPOC

Suppliers	Inputs	Process	Outputs	Customers
Business Heads Transformation	Corporate strategy Existing process problems	Potential project identified	Project submission template	Transformation
Transformation	Project submission template	Project evaluated	DMAIC project identified DMADV Green Belt project Quick hit Reject/Re-submit	Business Heads Transformation
Transformation	DMAIC project identified	Project Prioritized	Prioritized project	Transformation
Transformation	Prioritised project	Project onto filterbed	Top priority project identified	Transformation
Transformation	BB resource	DMAIC project started	Project Charter	Business Heads The Business

Selection Process Overview

**DBOI OpCo
Performance Review Boards
Business Verticals
Six Sigma Black Belts**

- Ensure we're tackling the best projects for the Business
- Insufficient resource to tackle every issue
- Prioritization will occur to ensure we are working on the right projects for business impact

Potential Projects

Categorise by Business Area

Quick hit **Light re-engineering** **Heavy re-engineering**

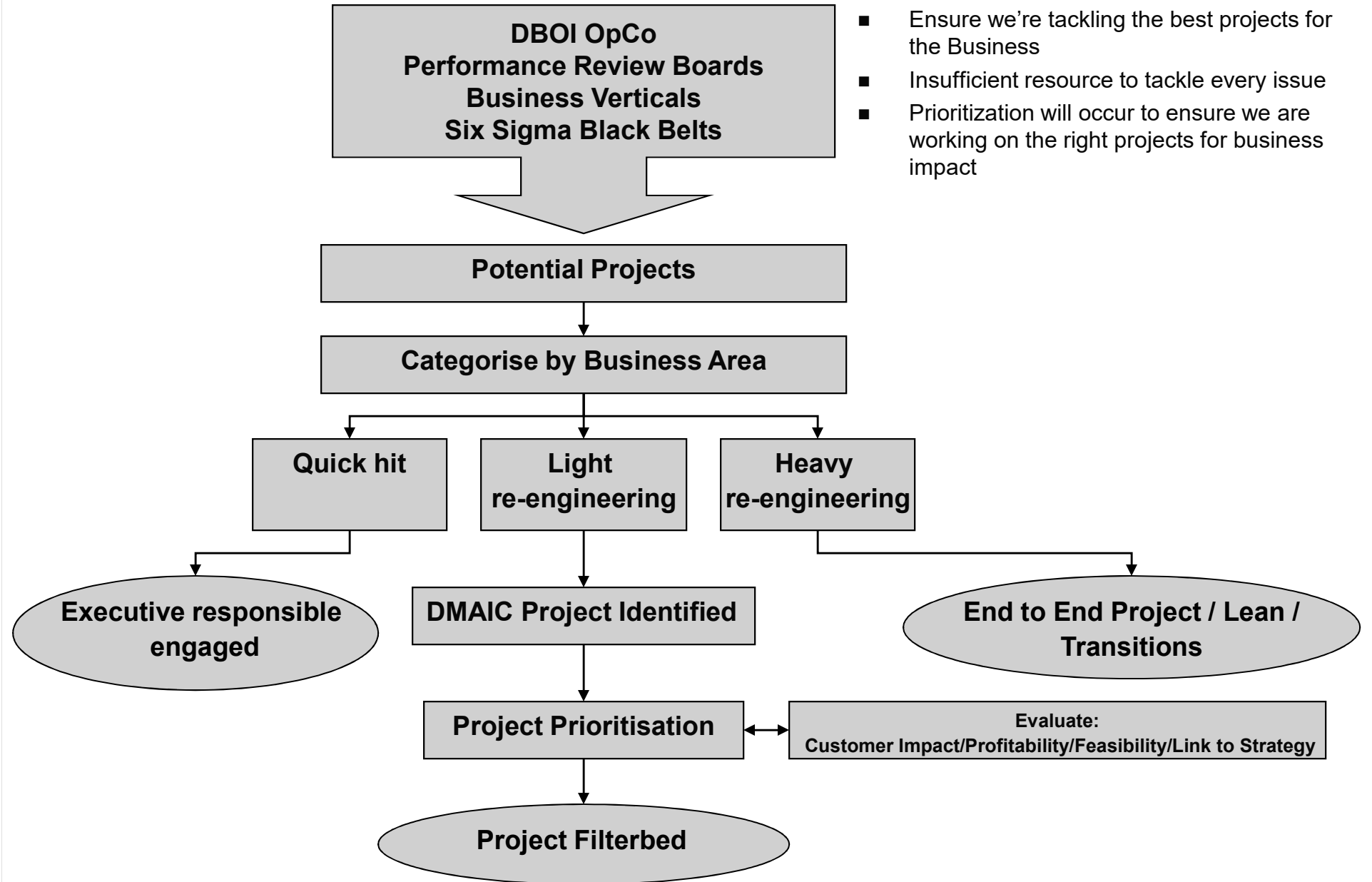**Executive responsible engaged**

DMAIC Project Identified

End to End Project / Lean / Transitions

Project Prioritisation ⟷ Evaluate:
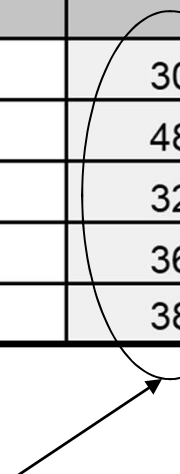Customer Impact/Profitability/Feasibility/Link to Strategy

Project Filterbed

Project Prioritization Matrix

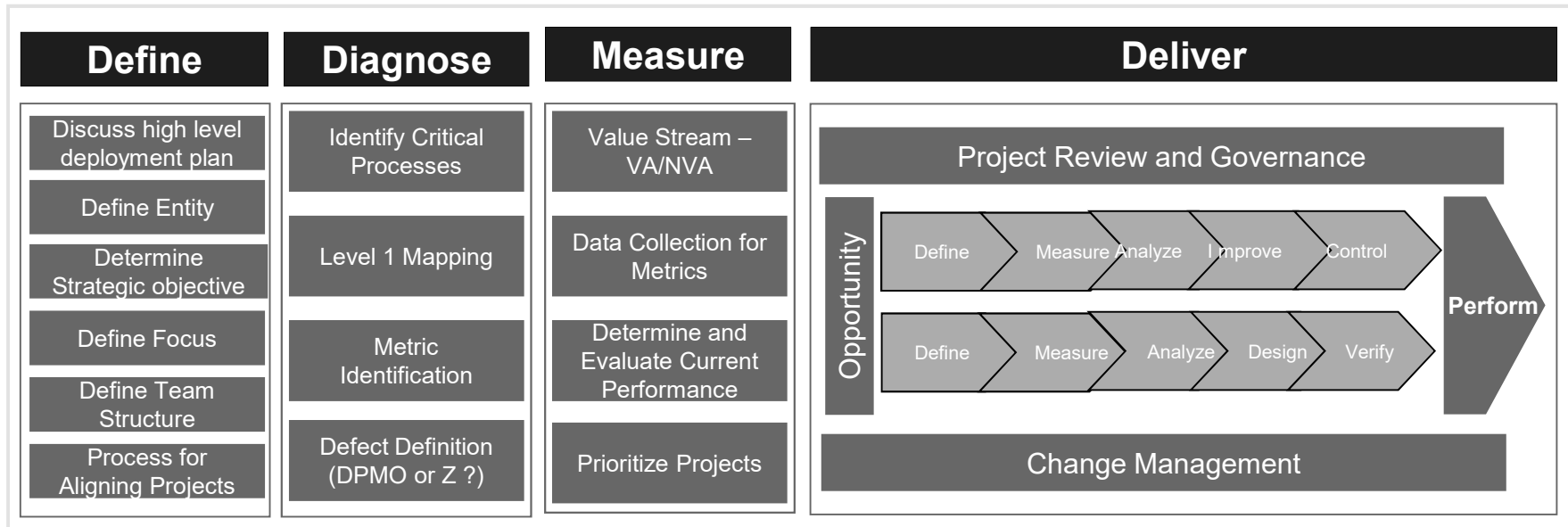| Criteria	Return On Investment	Contribution to Strategic Business Objectives	Addresses Voice of the Customer	Change Management Effort	Overall Rating
Weighting	4	3	2	1	
Scoring Guidelines	> 50% = 5 50% – 20% = 3 < 20% = 1	High = 5 Medium = 3 Low = 1	Yes = 5 Some = 3 No = 1	Easy = 5 Moderate = 3 Hard = 1	
Project 1	3	5	1	1	30
Project 2	5	5	5	3	48
Project 3	5	1	3	3	32
Project 4	5	3	1	5	36
Project 5	3	5	5	1	38

Projects with highest scores addressed on a priority

O = C x F

O : Opportunity
C : Condition
F : Favorability

Approach

From Myth to Facts… Using the best of Six Sigma, Lean and Market Best Practices

Define	Diagnose	Measure	Deliver
Discuss high level deployment plan	Identify Critical Processes	Value Stream – VA/NVA	**Project Review and Governance**
Define Entity			
Determine Strategic objective	Level 1 Mapping	Data Collection for Metrics	Opportunity — Define → Measure → Analyze → Improve → Control
Define Focus	Metric Identification	Determine and Evaluate Current Performance	Opportunity — Define → Measure → Analyze → Design → Verify → **Perform**
Define Team Structure			
Process for Aligning Projects	Defect Definition (DPMO or Z ?)	Prioritize Projects	**Change Management**

DMAIC Overview

A Robust, Scalable and Fact Based Approach

Key Outcomes and Levers

$$Y_{outputs} = f(X_{process}, X_{inputs})$$

Return on investment ($ ROI)

Improved operational performance
(e.g. capacity, productivity)

Enhanced client experience
(e.g. satisfaction)

Increased process transparency
(e.g. performance metrics)

Resources
- Engaged process owners / champions
- Fully committed project leaders
- Sufficient access to process experts & technical advice
- Developing process excellence skills across the organisation

Project management
- Clear alignment to desired strategic outcomes
- Establish early project wins to gain momentum
- Focus on improving operational performance to subsequently achieve financial or client experience outcomes

Decision making
- Data driven decisions & problem solving
- Ready access to empowered leadership
- Stakeholder 'buy-in' regarding key process decisions

Accountability
- Verifiable operational & financial results
- Clearly communicated project timelines
- Champions & process owners accountable for process improvement outcomes
- Measured sustainability of change

Example of 3 Years Plan : 2008 - 2010

2008	2009	2010
Gen I – Initiate Continuous Improvement Culture	**Gen II – End to End Process Improvements**	**Gen III – Organizational Excellence**

Vision

■ Establish process framework for critical processes ■ Seed the process improvement culture within Riyad Bank. ■ Lean Six Sigma as a basis for quick wins	■ Six Sigma culture to be spread across all branches ■ Big cross functional projects leading to substantial positive impact on the profits of the bank	■ Weaving innovation and re-engineering yielding breakthrough improvements ■ Lean Six Sigma as a 'way of doing business' ■ All critical Processes exceeding customer and business expectations

Focus

■ Lean Six Sigma Green Belt Training and awareness training (Yellow Belt)
 	
■ Establish and measure key performance indices and initiate process mapping.
 	
■ Project engagement with various divisions and Departments
	■ End to end process mapping of critical processes in various business areas,.
	
	■ Project selection based on
	   • Performance of critical processes
	   • Pain areas
	
	■ Project focused training
		■ Building resilience
		
		■ Improvement projects driven by core process leaders
		
		■ Designing the new processes using six sigma tools

Measures

■ 30 fully trained Green Belts & 200 Yellow Belts ■ Deliver critical LSS infrastructure support in select product / process groups (e.g. Retail Banking, Consumer Finance, Operations etc.) ■ Benefits associated with initial six sigma improvement projects	■ SAR XX m annualized benefits achieved ■ Fully trained 15Black Belts, 90 Green Belts and 1000 Yellow belts ■ KPI dashboards deployed across critical processes	■ SAR XX m annualized benefits achieved ■ Breakthrough results from end to end process analysis leading to breakthrough improvement. ■ Completely redesigning the processes to achieve maximum utilization of resources and facilities. ■ Performance dashboards deployed across 100% of core transaction processes ■ Every employee trained as Yellow Belt

Agenda

Maintaining Momentum and Energy Levels

- Quick wins through process mapping and automation

- Companywide involvement

- Efficient project governance and reviews

- Project duration under control

- Roadmap created for at least next 3 years

- Efficient training programs and enthusiastic trainers

- Certifications and importance attached to them

- Six Sigma and Best Practices Forum as periodic events

- Publicizing Success

- Updating Senior Management on the results of efficiency programs

- Ensuring that adequate resources are available

- Measuring Benefits

- Statistical applications to process improvement programs

Start with all critical processes

Why only Critical Processes ?

Based on empirical experience, it is expected that 20 – 30 % of processes will contribute towards bulk of business value. We should focus on these processes.

How do we know, if a process is critical ?

This should be a joint decision driven by the Process Owners, Six Sigma Transformation Team and Business representatives.
Processes identified will be evaluated against its impact on customer value and business value for that business division.
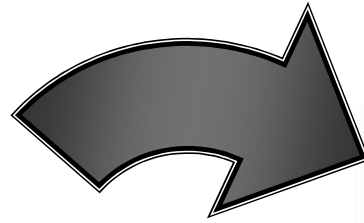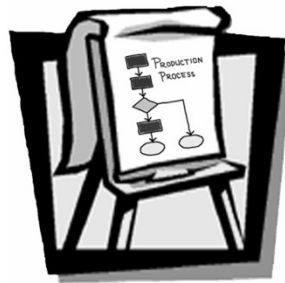
Outsourced processes to 3rd parties.
Review SLAs, identify critical processes and determine process capabilities using SLA metrics/ updated CT tree.
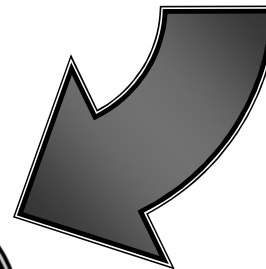
VISUALIZE

ANALYZE
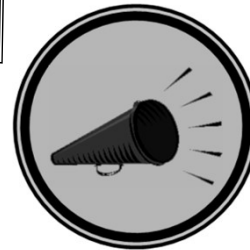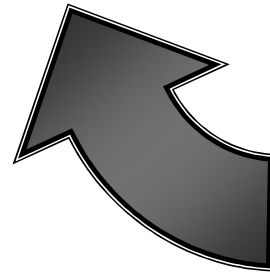
COMMUNICATE

Efficient Process Mapping means:

- All Processes mapped on system

- Linkage shown between similar :

  - Process steps

  - Roles

  - Activities

  - Resources

  - Applications

  - Skill levels

  - Information consumption

- Linkages amongst resources, applications and activities

- Trend analysis of the operating parameters

- KPIs mapped with processes

- Simulation of processes for optimization

- Linkages of the processes to the objectives

- All the above published on web for global accessibility

$$U = (T-K)/T$$

U : Uncertainty
T : Total
K : Known

Approach for Spotting : TAGGING

- A Common Tag which is placed to all the similar Processes.

- The Tag name is kept in a layer of abstraction or based on a common thread of the process definition.

- Each activity definition has a property called TAG where there is a facility to link the activity to one or Multiple TAGS.

```
  Common                         Common
  Activity                       Activity

                TAGS

  Common                         Common
  Activity                       Activity
```

Spotting

Exploring the Interrelationships

KPI

Common Applications used by all e.g. Bloomberg

Common data sources

Roles and skill levels

Policies

Organization and Process Objectives
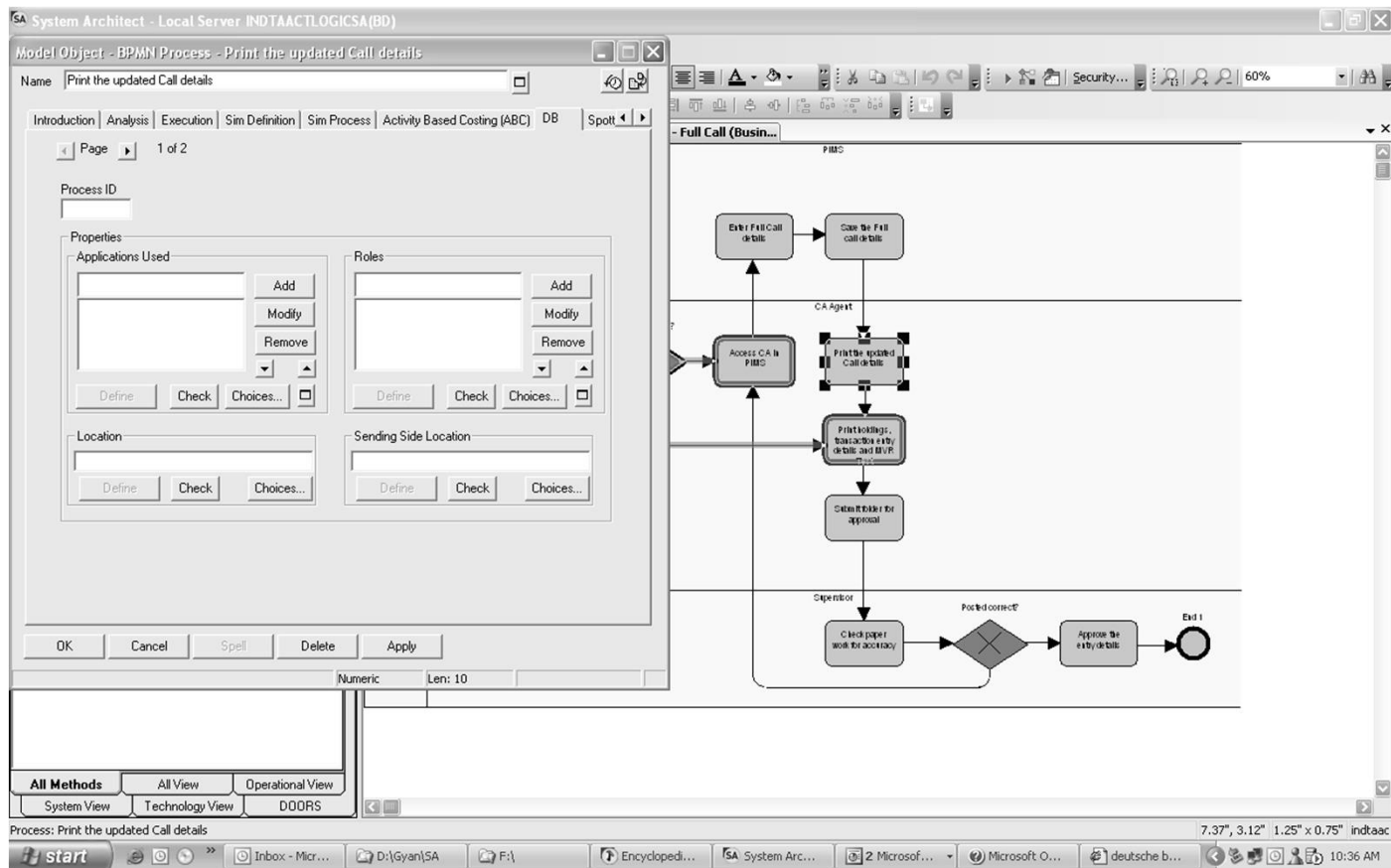
Decision Support System

Common activity Identification
Activity to Application relation
Roles to Skill relationship
Org Goal to Process relationships etc.

Process - Activity relationship
Role to Activity relationship
Process to KPI relationship
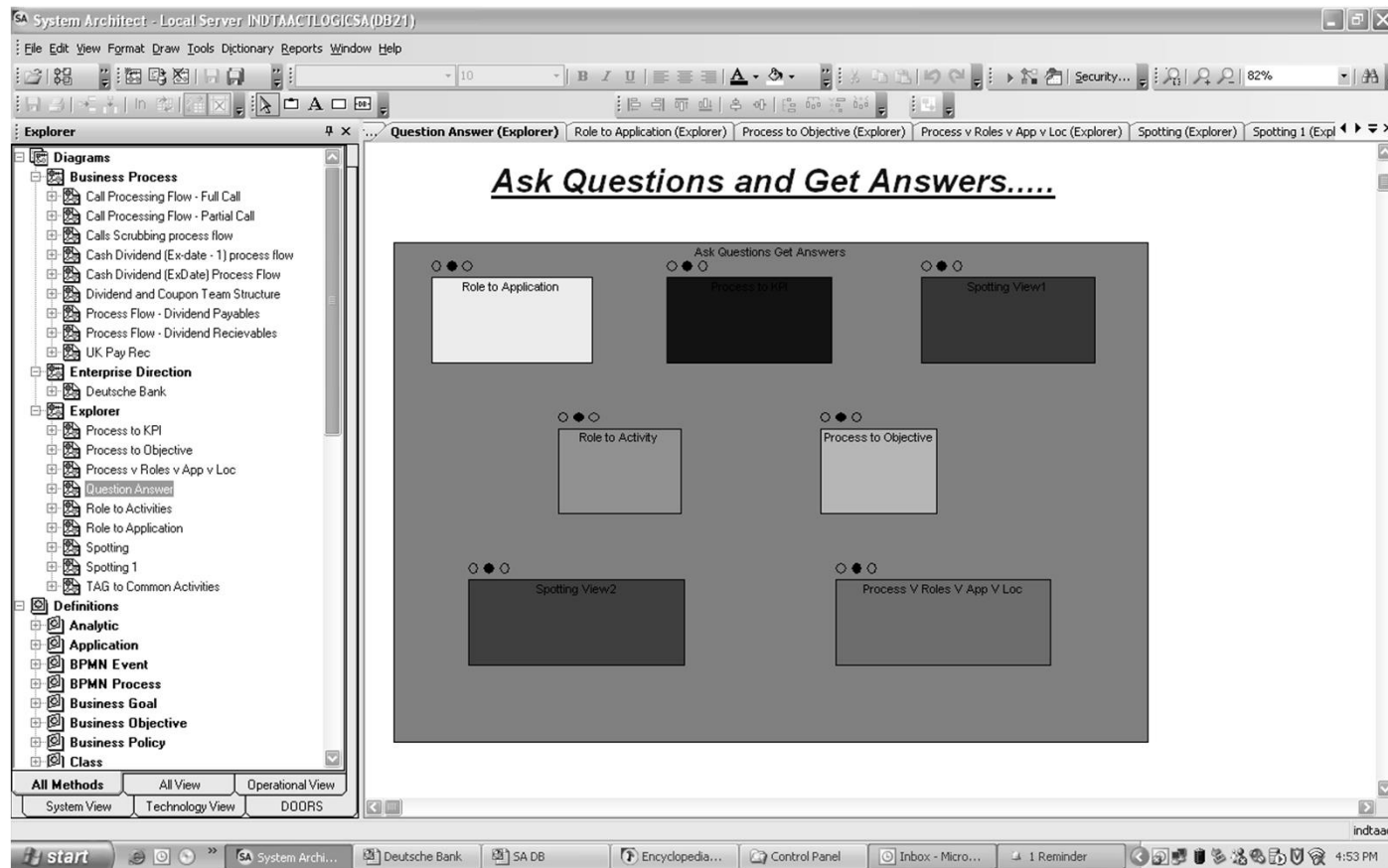
What Happens If….?

Discover the Impact of Change
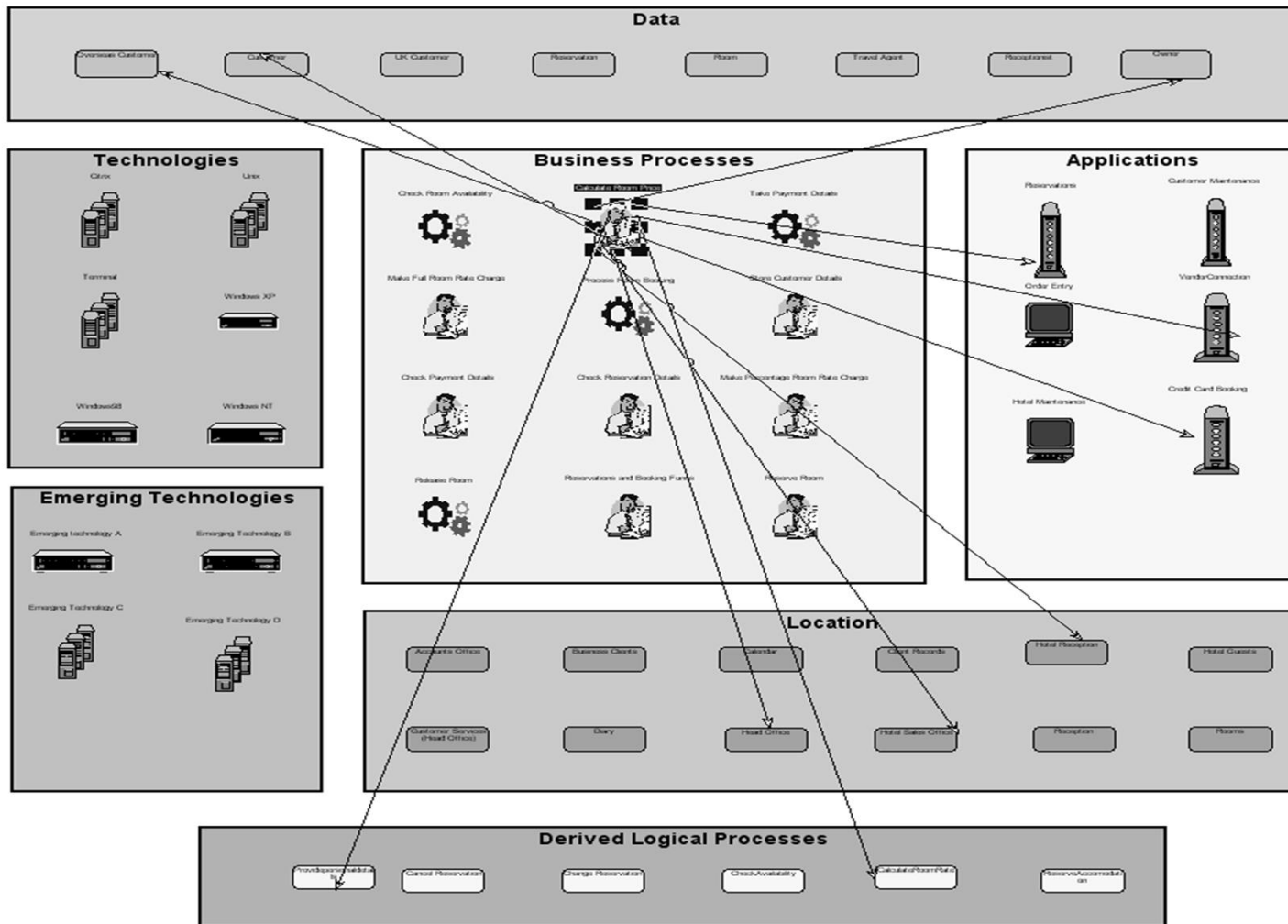
Process among different verticals

Asset Management	Capture Event Notification	Consolidate and scrub	Post to system	Reconciliation and resolution of breaks	
Securities Ops - Hong Kong	Download information	Email notification		Verify dividend details	Dividend advise sent
UK Asset Services	Capture Data	Scrub data	Enrich data	Pay / Receive dividends	
US Asset Services	Receive Information	Validate data	Pay / Receive dividends	Position Reconciliation	Resolution of breaks
SCO Income Processing	Determine Payment type	Reconcile for cash dividend	Queue for validation and payment		
Sec Ops - Japan	Receive dividend file	Verify dividend entries	Send dividend advice		

- Different terminologies across different functions for similar activities
- Spotting is difficult
- Need for a Standard process definition

Corporate Actions – End to End*

Done in DBOI AMSOM

Done in DBOI IBO

Announcements	Notification	Entitlements	Instruction	Compensation	File Closure

- The capture of corporate event announcements

- The notification to clients of events and their options

- The calculation of dividend entitlement based on position

- Calculation of non – monetary benefits (rights, bonus, etc.)

- Inbound client election handling
- Client chasing
- Uninstructed event management (high risk[1])
- Client makes a decision and communicates

- Cash payments
- Stock booking

- Dividend claims
- Breaks clearing

* From Asset Servicing Utility

Corporate Actions

| Announcements | Notification | Entitlements | Instruction | Compensation | File Closure |

Process in DBOI

| APAC Japan - Equity CA tasks | Asset Management Calls | Asset Management - Cash Dividend | Hongkong - Book Close | Hongkong - CA Meetings | Hongkong - Dividend Payments |

| Hongkong - Warrants | SCO - Income Processing | UK Asset Services - Announcement | UK Asset Services - Pay-Rec | US Asset Services - Announcement | US Asset Services - Pay-Rec |

US Asset Services - Position Reconciliation

Data Sources

| Agent | Crest | DTC | Euroclear | Exshare |

| Fidelity | HK Exchange Website | Telekurs | Xcitek |

Applications Used

| ADP | Business Objects Amsterdam | CAM | CCASS | COOL | DB Internet Production | DB Sire |

| DTC | ERGV | Espear | Euclid | Excel | Global1 | PIMS |

| SDM | SSR | StorQM | XSP |

Validation Sources

Bloomberg

IDC

38%

Corporate Actions

| Announcements | Notification | Entitlements | Instruction | Compensation | File Closure |

Validation
Sources

Bloomberg

Process in DBOI

- APAC Japan - Equity CA tasks
- Asset Management - Calls
- Asset Management - Cash Dividend
- Hongkong - Book Close
- Hongkong - CA Meetings
- Hongkong - Dividend Payments
- Hongkong - Warrants
- SCO - Income Processing
- UK Asset Services - Announcement
- UK Asset Services - Pay-Rec
- US Asset Services - Announcement
- US Asset Services - Pay-Rec
- US Asset Services - Position Reconciliation

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IDC

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| SDM | SSB | StorQM | XSP |

Validation Sources

Bloomberg

IDC

38%

System Architect Guidebook   **Dig 3 (Explorer)**

Corporate Actions

Announcements	Notification	Entitlements	Instruction	Compensation	File Closure

Process in DBOI

APAC Japan - Equity CA tasks	Asset Management - Calls	Asset Management - Cash Dividend	Hongkong - Book Close	Hongkong - CA Meetings	Hongkong - Dividend Payments
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US Asset Services - Position Reconciliation

Data Sources

Agent	Crest	DTC	Euroclear	Exshare
Fidelity	HK Exchange Website	Telekurs	Xcitek	

Applications Used

ADP	Business Objects Amsterdam	CAM	CCASS	COOL	DB Internet Production	DB Sire
DTC	ERGV	Espear	Euclid	Excel	Global1	PIMS
SDM	SSR	StorQM	XSP			

Validation Sources

IDC

Bloomberg

Select Drawing ▾   ⊕ ⊖   ↗ ⚒

AMSOM   Call Process (40%)

Dashboard Summary

Summary Results for :   **All**

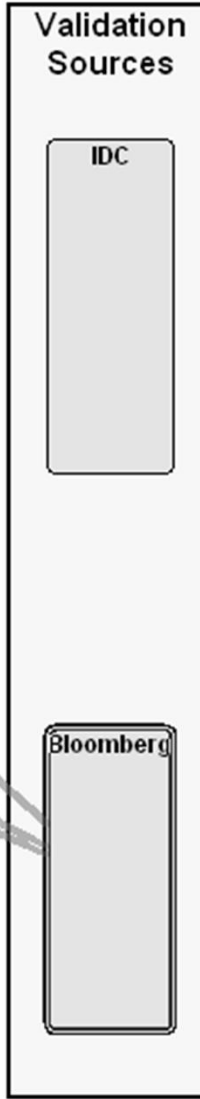|			
Total Profit or Cost USD	17287.08	🗄
Profit / Cost Per entity	1016.89	
Throughput	17	📈
Average Resource Utilization %	50.17	🗎
Service Level Achievement %	58.82	☰
Six Sigma Quality Rating	6.00	6σ
Six Sigma Service Level Rating	1.72	
Queue Statistical Report		☰

Time

Weeks 0
Days 0 Hours 12

■ ▮▶ ▶ ▶▶ ⏱ 168   ⏃ ◀ ⬛   ▶ 12.60
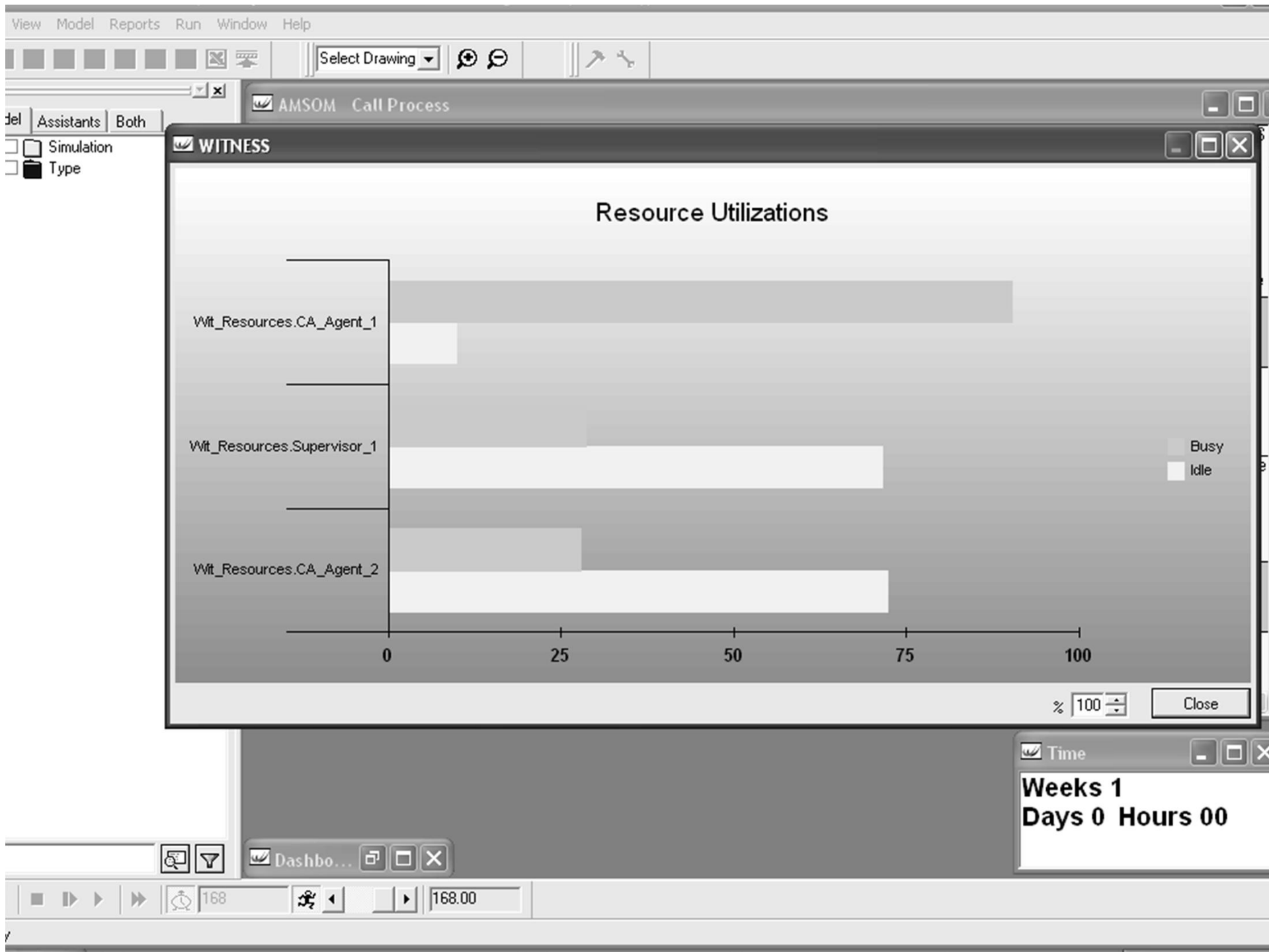
Processes in DBOI - Summary
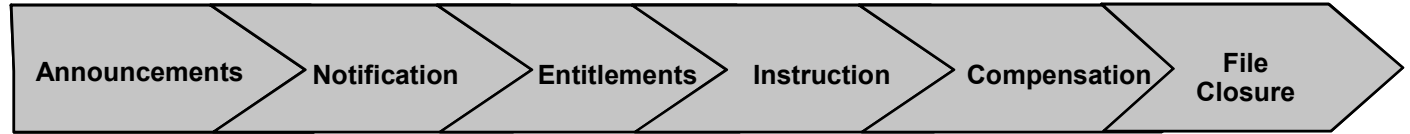
	Announcements	Notification	Entitlements	Instruction	Compensation	File Closure
UK Asset Services						
Dividend Payments	■				■	■
APAC Japan						
Equity CA Tasks			▨			
US Asset Services						
Dividend Payments	▨		▨		■	■
Hong Kong						
Warrants	■	▨				
Book Close		■				
CA meetings	■	■				
Dividend Payments			▨			
SCO						
Income Processing					■	■
Asset Management						
Cash Dividend	■		■		Not Needed	■
Calls	■		■		Not Needed	■

■ Complete process being carried out   ▨ A part of the process being carried out

Infrastructure Summary

	Market Data Sources	Validation Sources	Applications
UK Asset Services			
Dividend Payments	Crest, Fidelity, Agent		SDM, CAM, E Spear
APAC Japan			
Equity CA Tasks	NA	NA	Excel
US Asset Services			
Dividend Payments	Euroclear, DTC	Bloomberg	ADP, DTC, Global1, SSR, COOL
Hong Kong			
Warrants	Hong Kong Exchange Website	Not Needed	E Spear, CCASS
Book Close	NA	NA	E Spear, CCASS
CA meetings	Hong Kong Exchange Website	Not Needed	E Spear, CCASS
Dividend Payments	NA	NA	Excel
SCO			
Income Processing	NA	NA	StorQM, ERGV, EUCLID, DB Sire, DB Internet Production, Business Objects Amsterdam
Asset Management			
Cash Dividend			
Calls	DTC, Exshare, Telekurs, Xcitek	Bloomberg, IDC	XSP, PIMS, SSR

Success needs company-wide involvement

Centralised Coordination & Training

Operations Leadership
- Owns vision, direction, integration
- Responsible for business results
- Leads change
- Aligned to Six Sigma

Champions
- Responsible for Six Sigma in business unit
- Part time position
- Should be GB trained
- Selects and approves projects with MBB
- Visibly supports programme
- Ensures resources available
- Aligns programme to business unit strategies

Process Owners
- Project owner
- Implements solutions
- Owns financial results
- Part time – part of job
- Owns the process
- Sustain improvements

All Employees
- Basic understanding of Six Sigma
- Should be White or Yellow belt trained
- Work on teams in own area
- Part of reward system

Green Belts
- Part time lead belt or team member
- Applies DMAIC to daily work
- Participates on projects relating to own role
- Good knowledge of tools

Master Black Belts
- Trains Black and Green belts
- Coaches BB's and GB's
- Leads Lean projects
- Full time
- Mastery of tools
- Leads change
- Leads programme in Business unit

Project Team Members
- Provide process specific support
- White / Yellow / Green belt
- Includes SME's
- Part time on project

Black Belts
- Leads DMAIC and Lean projects
- Full time
- Trains and coaches GB's and team
- Skilled in tools
- Change agent

3 – Level Governance Structure
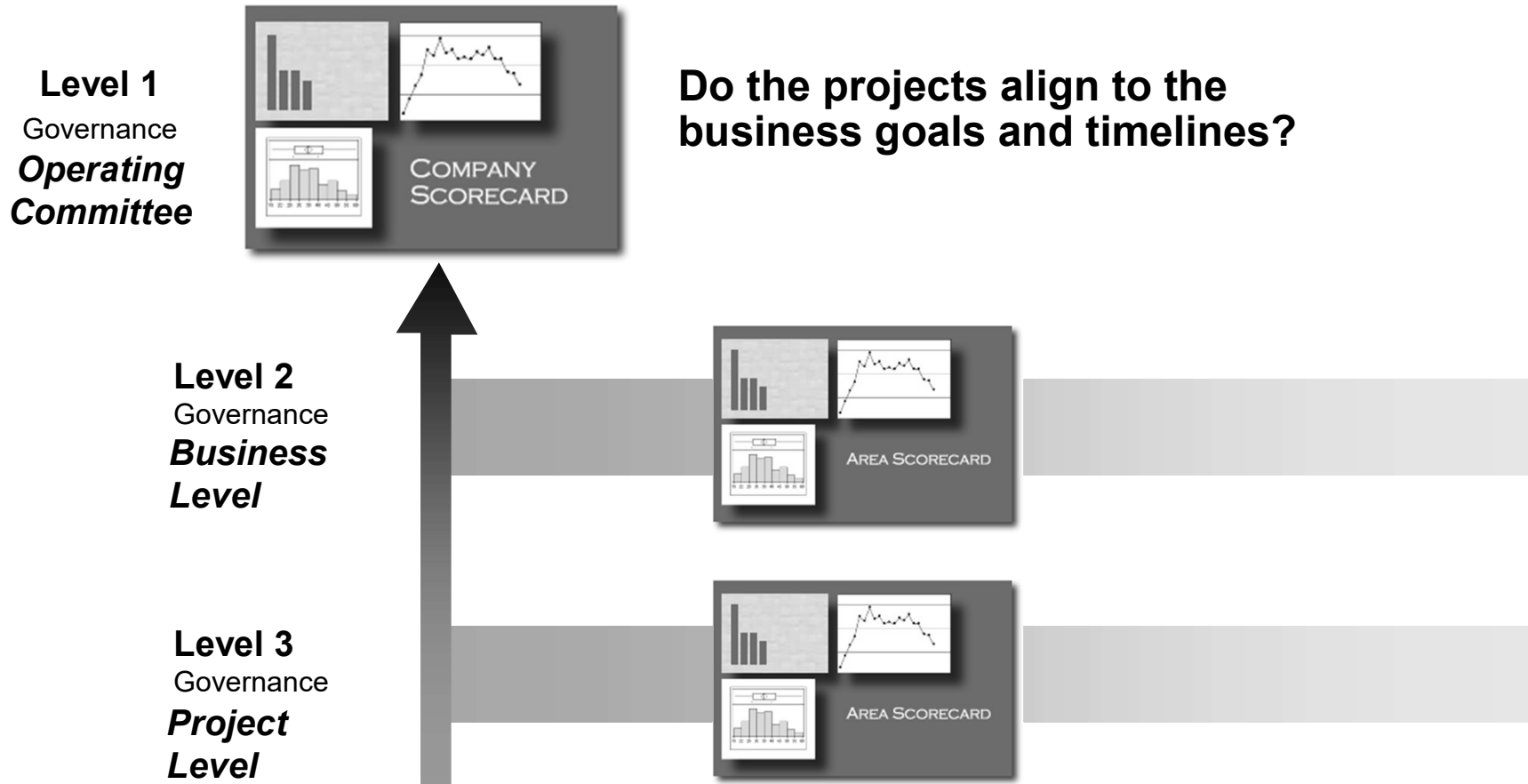
Level 1
Governance
Operating Committee

COMPANY SCORECARD

Do the projects align to the business goals and timelines?

Level 2
Governance
Business Level

AREA SCORECARD

Level 3
Governance
Project Level

AREA SCORECARD

Toll-gate Reviews Maintain the Momentum

Agenda

1. **Project Duration**
2. **Publicizing Success**
3. **Role Definition**
4. **Complexity of Six Sigma**
5. **Resource Availability**
6. **Measurement System Analysis**
7. **Link with Strategic Objectives**
8. **Middle Management Resistance**
9. **Buy-in from Senior Management**
10. **Validation of Savings**

Project Duration

Some projects take too long, scope of projects is too broad. Six Sigma has developed a reputation for taking too long, being too complex for the value it adds

M = O x S

M : Measurement
O : Observation
S : Scale

- •**Desire to do too much – solve all problems at once**
- •**Some projects are "hijacked" and become vehicle for managers to pursue personal agenda**
- •**Confusion over difference between improvement projects and process management**

Maintaining the energy levels

- •**Focus on project charter – make sure it is always up to date and reflects reality**
- •**Do not let new tasks to be included into the project unless they are fully reflected in the project mission, scope, timetable and financial effects**
- •**Make sure any new tasks are related to the project and are explicitly approved by the Business Quality Council**
- •**Check project presentations to make sure they focus just on the project**

It is observed that the success of an improvement program is not adequately publicized in organizations

$$U=(T-K)/T$$

- •Failure to identify and "package" the success of each individual project
- •Too rarely do BBs stop and take stock of what they have accomplished
- •When the workload increases, publicity seems like a "nice to have" when it is really a "must have"
- •No full use of Communications/PR function

U : Uncertainty

T : Total

K : Known

Maintaining the Momentum

- •Monitor awareness of how the program is doing – use opinion surveys or conduct discussions with groups of employees.
- •Pay attention to signals that people are unaware of what you are doing or have false understanding of what you are doing
- •Publicize all successes – even small ones

Projects should be evaluated for their impact before they are approved i.e. you are making a business decision on how to spend company resources, so you should understand the cost/benefit of the project

Monetary
- A – Impacts Income Statement or Cash Flow
- B – Impacts the Balance Sheet (Working Capital)

Non monetary
- C – Avoid expense (or investment) due to known events that will occur in the future
- D – Risk Management/Insurance projects which reduce/prevent severity of unpredictable events (also may include the ability to capitalize on a market opportunity)

Measuring benefits objectively helps sustain the momentum . Tangible benefits 'energize' the initiatives.

Agenda

A survey was conducted with 5 participating shared services organizations to study the impact of time spent on reviews on the performance of improvement projects.

The data collected is displayed:

Review time per Week	PROJECT PERFORMANCE		
HOURS	Low	Medium	High
< 0.1	17	21	12
0.1 - 1	31	53	21
> 1	17	42	71

Chi-Square test conducted to test if review time is related to project performance.

Null Hypothesis : Project performance is independent of review time, i.e. not related to time spent on reviews

Alternate Hypothesis : Project performance is related to time spent on reviews

```
Chi-Square Test: Low, Medium, High

Expected counts are printed below observed counts
           Low      Medium       High      Total
   1        17          21         12         50
          11.40       20.35      18.25

   2        31          53         21        105
          23.95       42.74      38.32

   3        17          42         71        130
          29.65       52.91      47.44

Total      65         116        104        285

Chi-Sq =  2.747 +  0.021 +  2.138 +
          2.077 +  2.465 +  7.825 +
          5.396 +  2.250 + 11.702 = 36.622
DF = 4, P-Value = 0.000
```
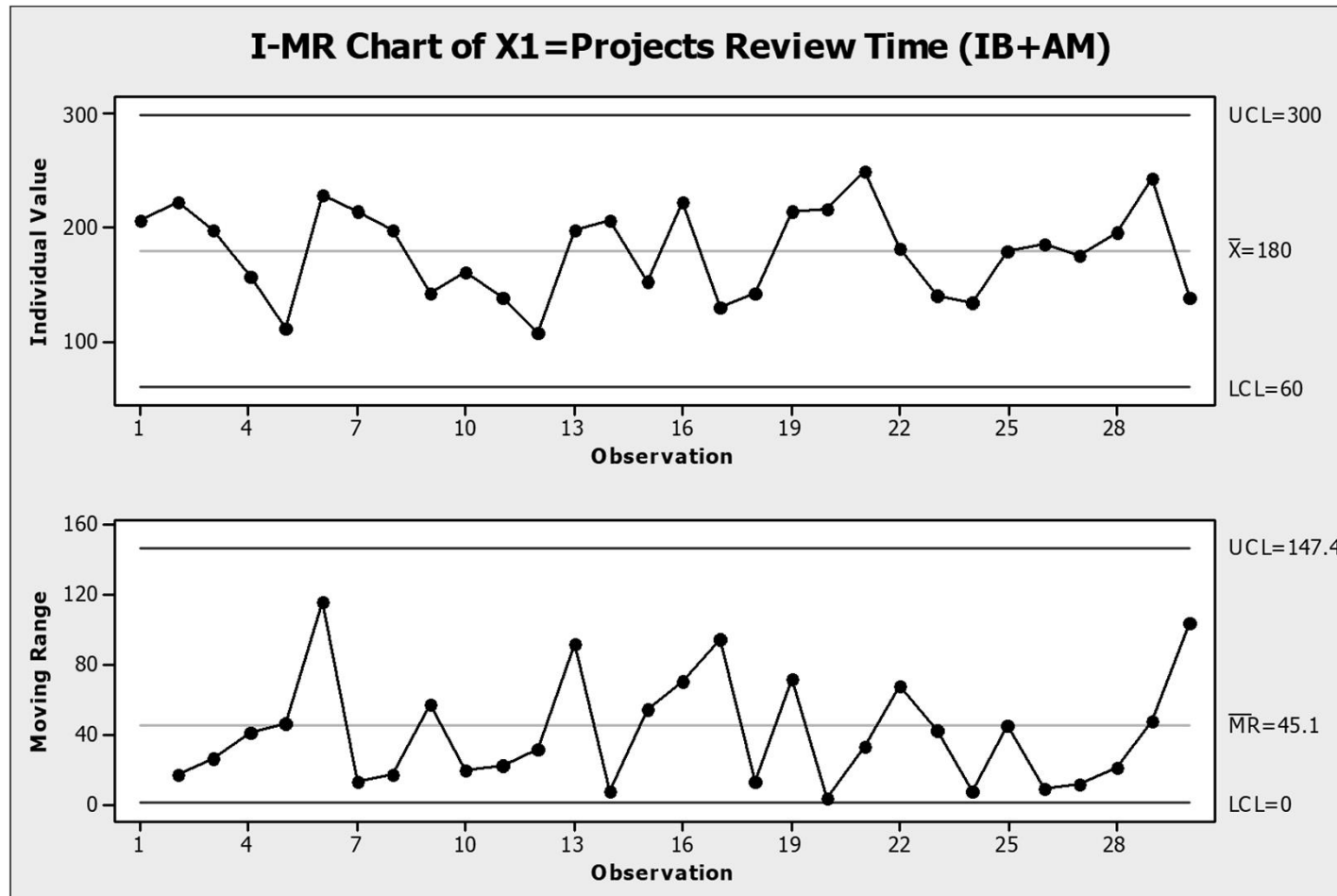
Interpretation:
- **p-value = 0.000**
- **p-value < α-risk (0.05): reject H$_o$**
- **Infer H$_a$: Sufficient evidence that process improvement project performance and and time spent on reviews are dependent**

Control Charts for Review Time

I-MR Chart of X1=Projects Review Time (IB+AM)

- Minutes spent of project review in IB Ops and Asset Management Ops are collected on weekly basis
- The values are added to get number of minutes spent on review in DBOI
- Theses values are plotted on I-MR chart
- Special causes are investigated and acted upon
- Out of Control points are indicative of potential failure of improvement initiative

Muda – The Seven Wastes

Overproduction

Too many GBs and BBs trained,
Trained BBs and GBs not doing projects

Underutilised Resources

BBs hired in the organization, but assigned other roles

Waiting

Employees waiting for the training to be conducted even after getting the projects assigned

Rework

Projects not passing through the tollgates in the first tollgate review.
Iterations : Analyze to Measure phases
Faulty measurement system

Transportation

Back and forth emails for tollgate approval

Pipeline of process improvement projects waiting to be started

Data Collected but never used,
Overuse of statistical tools,
Too many meetings / reviews

Inventory

Over-processing

1 2 3 4 5 6 7

Wastes can be identified in the Continuous Process Improvement Efforts

PNI and ROI Ratings

Regression Analysis: PNI versus ROI Rating

The regression equation is
PNI = - 20555 + 35528 ROI Rating

```
Predictor     Coef  SE Coef     T     P
Constant    -20555     9627  -2.14  0.047
ROI Rating   35528     2903  12.24  0.000
```

S = 18358.6   R-Sq = 89.3%   R-Sq(adj) = 88.7%

Analysis of Variance

```
Source          DF         SS          MS            F    P
Regression       1  50488130250  50488130250  149.80  0.000
Residual Error  18   6066657125    337036507
Total           19  56554787375
```

Unusual Observations

```
      ROI
Obs  Rating    PNI    Fit  SE Fit  Residual  St Resid
 10   5.00  201550  157083   7110     44468      2.63R
```

- Data for PNI and the ROI rating given before starting the projects collected for 2006 (Slide 38)
- Regression done to check if the project net income is related to the ROI ratings given initially
- High R-Sq indicates that the two values are related
- The equation used to predict the estimated PNI for 2007 projects in the pipeline
- New guideline is proposed to give rating based on the estimated PNI instead of ROI
- Regression also carried out for PNI and project completion time and it was found that they were not correlated

Multiple Regression

PNI	Overall Rating	Location	Mumbai	Bangalore
201500	49	Mumbai	1	0
183500	46	Bangalore	0	1
171300	42	Mumbai	1	0
136350	38	Mumbai	1	0
132060	34	Mumbai	1	0
22000	30	Bangalore	0	1
108500	31	Bangalore	0	1
99500	27	Bangalore	0	1
23560	16	Bangalore	0	1
37000	10	Bangalore	0	1
137500	35	Mumbai	1	0
98950	26	Mumbai	1	0
116500	29	Mumbai	1	0
173450	49	Bangalore	0	1
178000	43	Mumbai	1	0

- Data for PNI collected for projects with tangible benefits completed in 2006
- Multiple Regression performed to correlate PNI with Overall Ratings and Location
- As location is Attribute data, indicator variables created for Mumbai and Bangalore

Regression Analysis: PNI versus Overall Rating, Bangalore

The regression equation is
PNI = - 9304 + 4211 Overall Rating - 23937 Bangalore

```
Predictor        Coef    SE Coef    T      P     VIF
Constant        -9304    24204   -0.38  0.707
Overall Rating  4211.5    610.4   6.90  0.000  1.1
Bangalore       -23937    13467  -1.78  0.101  1.1
```

S = 24619.6   R-Sq = 84.5%   R-Sq(adj) = 82.0%

Analysis of Variance

```
Source          DF      SS           MS           F     P
Regression       2  39748366662  19874183331  32.79  0.000
Residual Error  12   7273474111    606122843
Total           14  47021840773
```

- Multicollinearity checked and found ok (All VIF values are less than 5)
- High R-Sq indicates that the PNI can be expressed in terms of overall rating and the location
- The equation indicates that projects completed in Mumbai give a higher PNI of approx USD 24,000
- The equation used to predict the estimated PNI for 2007 projects in the pipeline based on location as well

Conclusion

- A process improvement program should be designed such that it caters to the strategic objectives of the organization

- Value Stream Mapping, elimination / reduction of NVAs and spotting of similar processes delivers quick successes, which energize the transformation initiatives

- Efficient governance model is essential for transparency, timeliness and sustainability. Reviews are necessary to maintain momentum.

- Project duration should be monitored to avoid negative impact on the program due to delays

- Measuring the benefits and publicizing successes helps the initiative

- Statistical tools can be applied to continuous improvement process

Know where you are going!

Thank You!

Questions?

Example of a Strategy Document

Always Stay Focused