

MTAT.03.231
Business Process Management

**Lecture 12: Process Performance
Measurement**

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Business Process Lifecycle Management

- Process identification
- Process modelling (as-is)
- Process analysis
- Process improvement (to-be)
- Process implementation
- Process execution
- **Process monitoring/controlling**



Outline

1. Principles of process controlling & measurement
2. Hands-on exercise
3. Structured selection of performance measures

Process Controlling

Objective

- To establish a system for controlling the process so that it delivers maximum value to all relevant stakeholders
- Stakeholders include:
 - Customers
 - Shareholders

Premise



“You can’t control what you can’t measure.”

Tom DeMarco

Controlling Software Projects: Management Measurement & Estimation

Process Controlling (cont.)

General Method

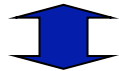
1. Identify performance measures
2. Establish measurement system (incl. control points)
3. Measure the “as is” situation
4. Set targets and objectives
5. Aggregate measures and analyze periodically
6. Provide feedback to process actors
7. When needed, implement corrective actions (incremental process re-design)

Performance Measurement Principles

We ought to start from “strategic goals”
Then link them to measurable objectives

Profit maximizing firms

Overarching goal is usually to maximize long term shareholder value



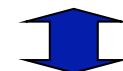
Maximize revenues and minimize costs



Satisfying customer needs in an efficient way

Non-profit organizations

A common goal is survival and growth while satisfying customer needs

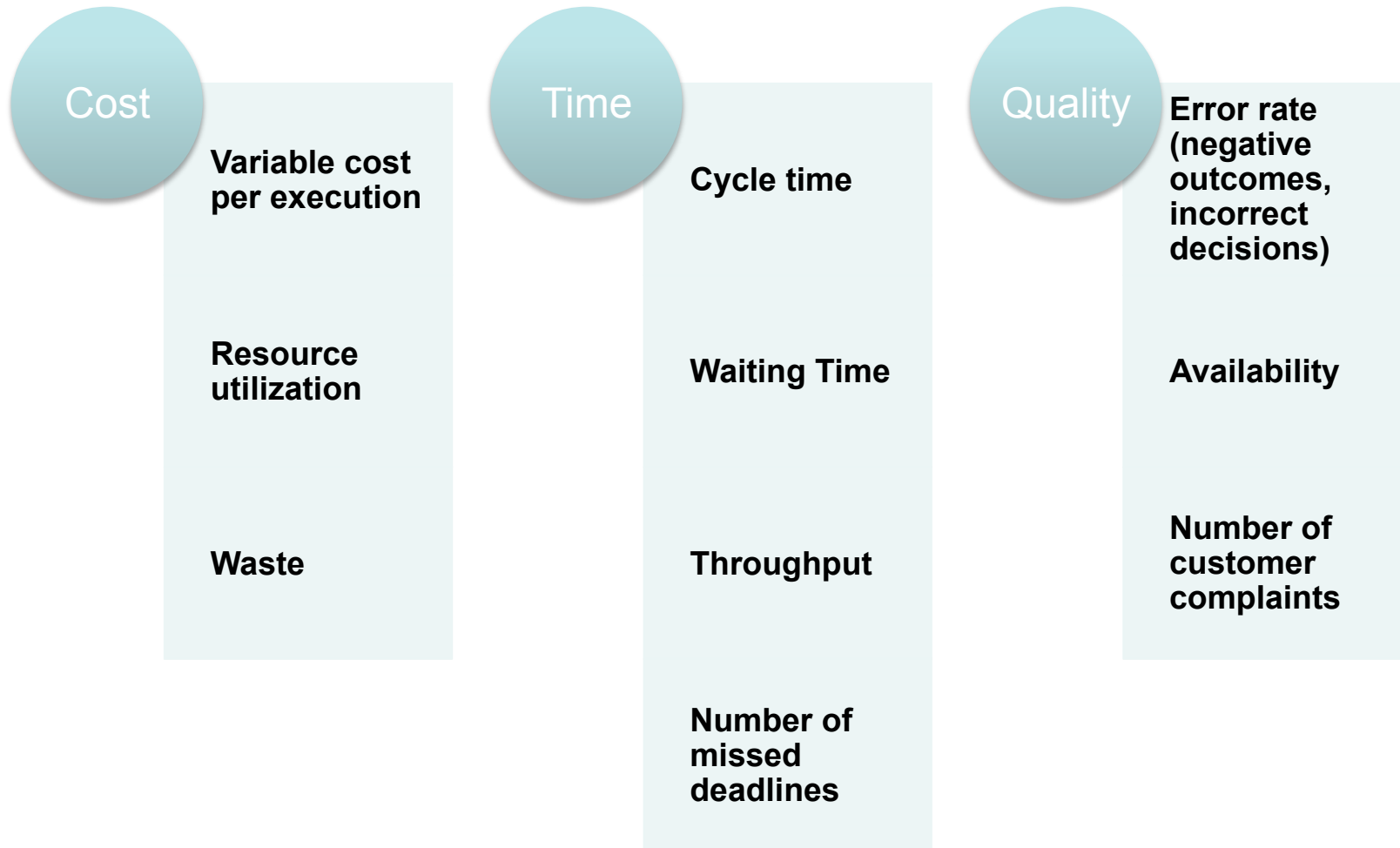


Must use resources efficiently while fulfilling customer needs



Satisfying customer needs in an efficient way

Classification of Process Performance Measures



Aggregation Methods for Process Performance Measures

- Often, measures are first conceived at the level of “cases”
- We need to lift them to the “process”
- Aggregation functions:
 - Total count
 - Average
 - Std. dev.
 - Percentile

Concrete Performance Measures

- Average amount of time (in days) elapsed from point of intention to place order to receipt of order by vendor
- Percentile of completed transactions to total transactions within a timeframe (e.g. 80% of transactions completed within 2 days)
- Percentage of orders delivered by scheduled due date
- Average resource utilization for a given resource pool (e.g. clerk, manager)
- See e.g. Tallinna Vesi Operations Performance
 - <http://oam.fi.ee/et/download?id=1011>

Data Collection

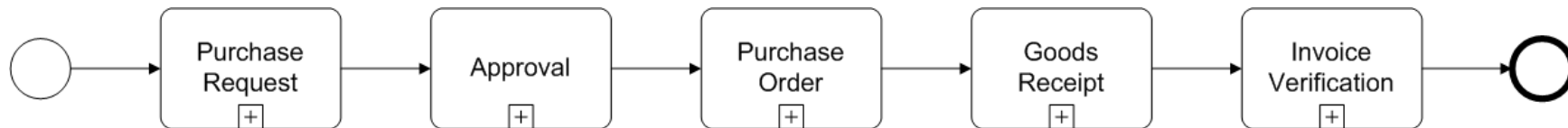
- Information system logs
 - BPM system, ERP system, CRM system, Document Management System, etc.
 - Web Portal/Intranet, FTP server
 - Worst-case is e-mail...
- Manual observation
 - Sample measures taken by the actors themselves
 - Sample measures taken by an “observer”
- Customer feedback questionnaires & complaint forms

Your turn

1. Identify at least six performance measures for:
 - Order-to-cash process in an online computer shop
 - Prescription fulfillment at CVS pharmacy
 - Claims handling process in an insurance company
 - Procure-to-pay process for hiring plants in a construction company
2. Explain how would you collect data for each measure

Procure-to-Pay Process Top-Level View

- Consider a procure-to-pay business process. Which performance measures could we define on this process?



Other Sources of Performance Measures

- Reference models:
 - SCOR, DCOR (supply chain council)
 - ITIL (IT processes)
 - eTOM (telco processes)
 - APQC (general processes, various verticals)

Performance Measures in SCOR

Overall Inventory Turns	Annual cost of goods sold (company info) ÷ average total inventory
Raw Materials Inventory Turns (manufacturing companies only)	Annual cost of raw materials purchased (3) ÷ average raw material inventory
Work-in-Process Inventory Turns (manufacturing companies only)	(Annual cost of raw materials purchased (3) + Annual cost of conversion (4)) ÷ average work in process inventory
Finished Goods Inventory Turns	Annual cost of goods sold (company info) ÷ average finished goods inventory
Percentage of safety stock	Average safety stock ÷ total inventory
Purchase order cycle time (in days for purchasing department and excludes supplier lead time)	Average amount of time (in days) elapsed from point of intention to place order to receipt of order by vendor
Supplier lead time	Average amount of time (in days) elapsed from point of order to delivery
Supplier on-time delivery	Percentage of orders supplier delivers on scheduled due date

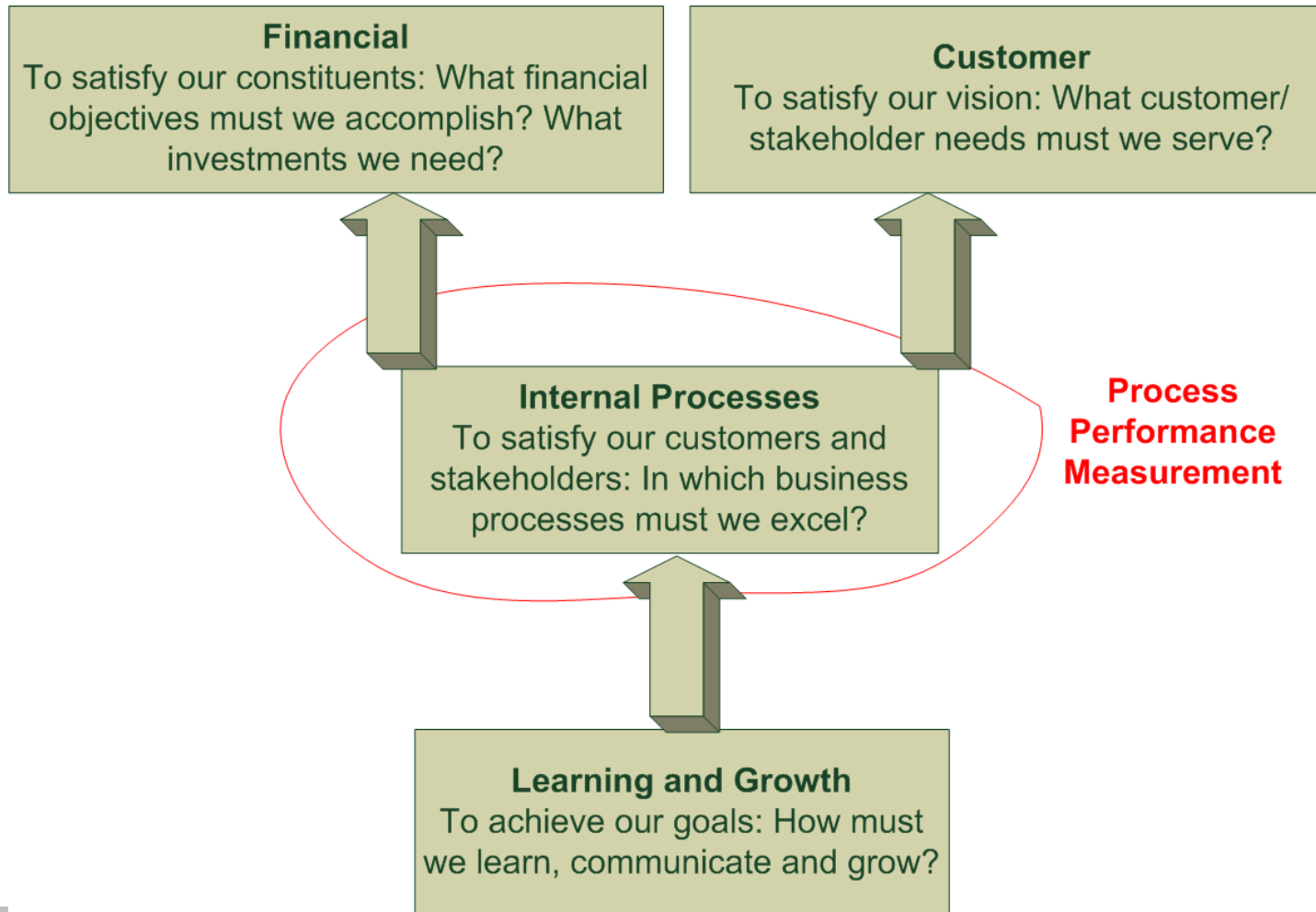
Benchmarking: SCORcards

Rapid Implementation-SCORcard

SCORcard		Actual Performance Versus Consumer Packaged Goods Benchmarks					
	SCOR Level1 Metric	Actual	Parity	Advantage	Superior	Value from Improvements	
Customer Facing	Delivery Reliability	Order Fillrate	98%	76%	87%	97%	Need To Maintain Superior Performance
		Line Fillrate	N/A	90%	96%	98+%	N/A
	Flexibility & Responsiveness	Fulfillment Leadtime, (Order Receipt to Customer Receipt)	5 - 12 days	3 days	2 days	1 day	<i>Opportunity for Competitive Advantage</i>
Internal Facing	Cost	COGS, (Cost of Sales % to Net Sales)	34.7%	60.0%	TBD	TBD	Need To Maintain Superior Performance
		Warranty/Returns, (Returns as% of Net Sales)	16.0%	TBD	TBD	TBD	<i>Opportunity for Performance Improvement</i>
		Total Supply Chain Cost, (As a % of Net Sales)	-----	8.0%	7.0%	5.0%	<i>Opportunity for SG&A Reduction</i>
		Order Management, (Customer Service Allocation + Freight + Fulfillment)	8.5%	4.0%	3.0%	1.5%	<i>\$2.5M estimated Home Delivery opportunity</i>
		Material Acquisition	Very Low	3.0%	2.0%	0.5%	Need To Maintain Superior Performance
	Assets	Cash to-Cash, (Inventory days of supply + days sales outstanding - average payment period)	7 days	65 days	40 days	20 days	Need To Maintain Superior Performance
	Net Asset Turns, (Total gross product revenue/ Total net assets)	TBD	2.5	5	7	TBD	

What (else) to Measure?

The Balance Scorecard Framework



Examples of Measurements by Perspective

Stakeholder / Customer

- Current customer satisfaction level
- Improvement in customer satisfaction
- Customer retention rate
- Frequency of customer contact by customer service
- Average time to resolve a customer inquiry
- Number of customer complaints

Internal Processes

- Number of unscheduled maintenance calls
- Production time lost because of maintenance problems
- Percentage of equipment maintained on schedule
- Average number of monthly unscheduled outages
- Mean time between failures

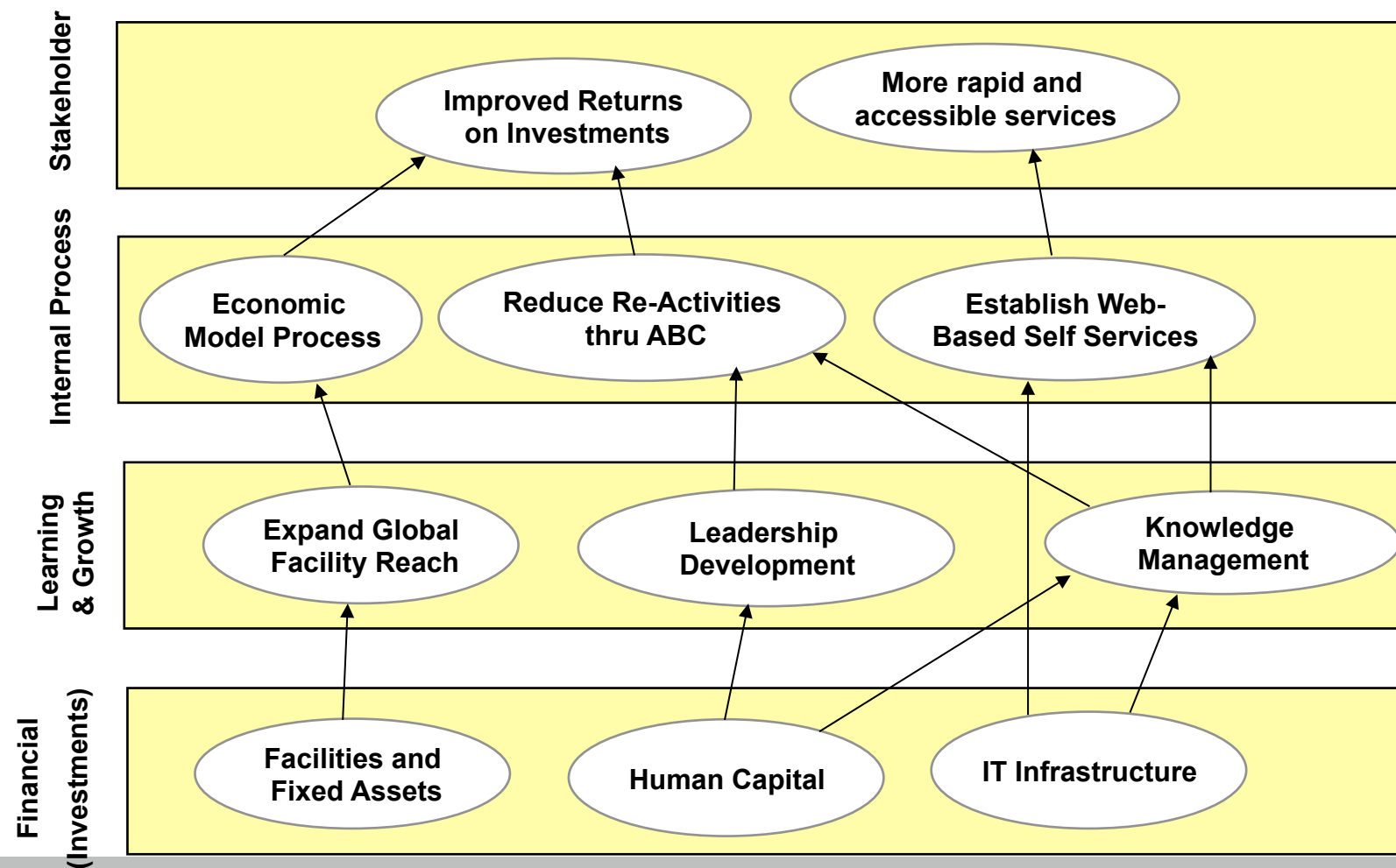
Learning and Growth

- Percentage employee absenteeism
- Hours of absenteeism
- Job posting response rate
- Personnel turnover rate
- Ratio of acceptances to offers
- Time to fill vacancy

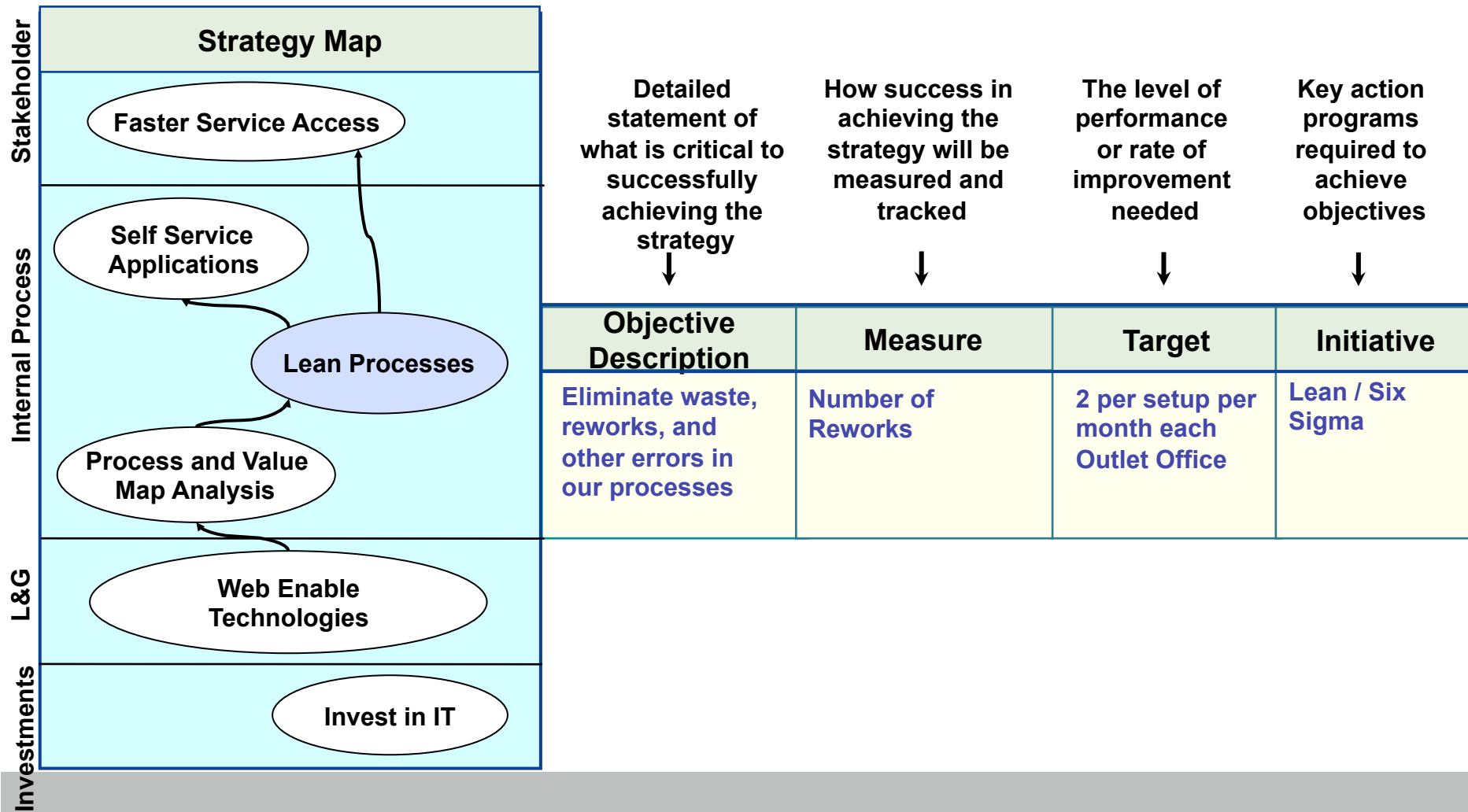
Financial / Investments

- % of facility assets fully funded for upgrading
- % of IT infrastructure investments approved
- # of new hire positions authorized for filling
- % of required contracts awarded and in place

Strategy Map: Capture a Cause Effect Relationship from the Bottom Up



Extending the Map into Measurements, Targets and Initiatives



Alignment of Scorecard Components

Make sure the components of your scorecard fit together. We want to create a tight model for driving execution of your strategy.

Goal	Objective	Measurement	Target	Initiative
Achieve Agency operational efficiencies with best practices in the private sector	Reduce Operational Service Costs by 50% over the next 5 years	Cost per Outlet Office, Cost per Region, Cost per FTE	5% - Year 1 10% - Year 2 15% - Year 3	Activity Based Costing / Management
	Reduce identified re-activities within primary processes by 80% over the next 3 years	Waste Volume Charts, Rework Tracking, Cycle Time End to End in S-LX (5 of 7 Regions)	Waste stream reductions of 5% each year, Reworks cut in half for next 3 years, cycle time cut by 75%	Lean / Six Sigma

Guidelines for Performance Measures

- At least one measurement per objective.
- Measurements define or explain objectives in quantifiable terms:
 - Vague => We will improve customer service
 - Precise => We will improve customer service by reducing response times by 30% by year end.
- Measurements should drive change and encourage the right behavior.
- Should be able to influence the outcome.

Recap: The Layers of BPM Activities

