A “Rapid Ride” Through Input to Output Costing and Options for Measuring Efficiency

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Presentation Agenda

• Current Drivers for Improved GOC Cost Information
• The Role and Value of Logic Models and Business Process Mapping
• The “Efficiency Management Continuum”
• Fundamentals of Activity-Based Costing (ABC) and Activity-Based Planning (ABP)
• The Role and Value of Technology for Costing
• Linking Costing to Lean and Six Sigma

…and like Pizza Pizza “in 30 minutes or Less”!
Blueprint/Destination 2020

- Effective and **efficient business processes** that draw on collective expertise to achieve economies of scale in areas of common interest across the Public Service while maintaining high standards of quality, accessibility and equity of services to Canadians.

- Regular **review of programs and services** to help the Government determine whether they are still required and whether adjustments are needed to ensure that they are effective, **efficient** and focused on the needs of Canadians.

- Interoperable systems to ensure **timely access to information and management data** needed to support trend analysis and scenario-building.
MRRS guidance issued in 2012 requires departments to demonstrate the efficiency of their programs.

- **Aims:**
  - Gain insights into **program delivery costs** relative to the work performed
  - Provide **trend information** into program delivery costs to facilitate decision making
  - Identify **opportunities for efficiency gains**
- One efficiency indicator (EI) for each lowest-level program in departments’ Program Alignment Architectures (PAA)
- EIs in 2014-15 Performance Measurement Frameworks (PMFs)
- Lead time to 2014-15 to be used to build capacity to measure efficiency and develop initial set of EIs.
Policy on Evaluation and Supporting Directives

**Performance:** the extent to which effectiveness, efficiency and economy are achieved by a program.

**Effectiveness:** the extent to which a program is achieving expected outcomes.

**Efficiency:** the extent to which resources are used such that a greater level of output is produced with the same level of input or, a lower level of input is used to produce the same level of output. The level of input and output could be increases or decreases in quantity, quality, or both.

**Economy:** minimizing the use of resources. Economy is achieved when the cost of resources used approximates the minimum amount of resources needed to achieve expected outcomes.


Core Issue #5: Demonstration of Efficiency and Economy

Assessment of resource utilization in relation to the production of outputs and progress toward expected outcomes

Why Measure Resource Utilization?

What is the assessment of resource utilization?

An assessment of resource utilization generally involves asking questions like:

- Did the program have enough resources?
- How did the resources the program had affect the results achieved?
- What resources are being used by the program?
- Does the level of resources being used ‘make sense’ in light of the observed results and context?
- Are there alternatives ways to use the same or fewer resources to get the same, similar or better results?
- Could the program have used fewer resources?
- How well are resources being used by the program?
- Can the resources being put into this program be used differently?
- Were resources optimized to achieve results?

Techniques for Measure Resource Utilization

Examples of Tools to Guide Assessments of Resource Utilization

- **Logic models**
  - Help identify units of analysis for assessing the cost of inputs, outputs and outcomes

- **Theories of Change**
  - Build on logic models to clarify mechanisms, assumptions, risks and/or context
  - Frames the conclusions on how the costs incurred at the inputs stage (economy) link to the cost of outputs (operational efficiency) and outcomes (allocative efficiency)

- **Business Process Maps**
  - Details the key delivery processes

Logic Models Help Chart the Course

Business Process Mapping (BPM)

"Operational or Work Plan"

Source: Logic Model Development Guide
W.K. Kellogg Foundation (Dec/01)
Activities

Activities are the atoms of strategic advantage

*Michael Porter – Competitive Advantage (1985)*

“Questions can only be answered by analyzing the activities that are needed to attain objectives.”

- Work that is performed in the organization
- Has identifiable start and ending points
- Consumes resources or other activities (Inputs)
- Supports an output(s) or other activities
- Typically defined using action orientated verb-noun construction (i.e. Processing Applications)
**Activity-Based Planning – Operational View via Business Process Mapping**

**Inputs**
“Resources we pay for”
- Field Team (Workforce)
  - Capacity = 720
  - Actual = 504
- Equipment (Asset)
  - Capacity = 4000
  - Actual = 3800
- Contractors (External)
  - Capacity = 720
  - Actual = 504
- Resource Utilization (Available Capacity)

**Activities**
“What we do”
- Site Visit
  - Labour Hrs
  - Visits
  - Activity Consumption Rate = Labour Hrs / Visit
- Support Call
  - Eq. Hrs
  - Calls
- Surveys
  - Surveys

**Outputs**
“What products & services we supply”
- Inspection
  - # Inspections
- Assessment
  - # Assessments
  - Output Cycle Time = days per Assessment

**Efficiency Indicators**
- Time-Based
- Process-Based

**Program/Client Demands**
Efficiency Management Continuum

Cost Focus
- Cost per Client, Output or Activity (using documented costing methodology)

Process Focus
- Resource consumption rate (throughput)
- Activity consumption rate (throughput)
- Resource utilization (focus on value added processes)
- Rework (reduction of)
- Non-value added activities (reduction of)

Time Focus
- Output/service delivery time (cycle time)
- Response time (proxy related to capacity and efficiency)

Other options
- Conversion or success rate (proxy related to efficiency of a process. i.e. risk assessments vs. plan)
- Usage of optimal service delivery channels (i.e. web vs. phone)
- Cost savings or ratios (functional costs vs. total organizational costs)
- Execution of plans to improve overall process efficiency
- Efforts to improve capacity and ability to execute

* Adapted from TBS’s Spectrum of Efficiency Indicator Effort and Usefulness (2013)
Insightful References on Resource Management ....

Doing Things Right - *Operational Changes*
- Reduced Costs
- Improved Efficiencies
- Resource Capacity Planning
- Resource Constraint Management

Doing the Right Things – *Strategic Changes*
- Program / Services Rationalization
- Business Process Design
- Impact on Outcomes
- Shared Service Opportunities
- “Value for Money”
Evolution of Cost Management

Traditional Costing & Budgeting

Allocations & Percentages

Programs & Services

Resources

$?

Activity-Based Costing (ABC)

Cost Decomposition

(push)

Programs & Services

Activities

Resources

$?

“Top Down”

Activity-Based Planning (ABP)

Demand Based

(pull)

Programs & Services

Activities

Resource Capacity

#?

Resources

$?
Activity-Based Costing

Directly Traceable Cost

Indirect Costs

$ Resources

Activities

Drivers

Programs/Services/Customers
Some Examples of Indirect Activities in Government

Indirect Activities (Overheads)

- Management
- Procurement
- Information Systems
- Client Support
- HR Management
- Real Property
- Environmental
- eGovernment

Indirect Costs in Government Services can exceed 80%!
ABC - A Different View of Costs

Traditional Costing

Purchasing Department
Salaries $200,000
Benefits $75,000
Supplies $30,000
Travel $10,000
Total $315,000

Activity Based Costing

Purchasing Department
Certify 10 new vendors $65,450
Issue 450 purchase orders $184,640
Process 275 releases $64,910
Total $315,000

Activity Based Management

*Unit Costs
By Division

Activity Based Analysis

Certify 10 new vendors
Salaries $37,000
Benefits $13,250
Supplies $5,900
Travel $9,000
Total $65,450

- Cost development needs to be comparable year-on-year, therefore it is critical to fully define and document the costing approach

Cost Base
- Program costs
- Internal Services support
- OGD costs (joint or horizontal initiatives)
- Externally managed costs (i.e. accommodation, EI & WC premiums, legal services)
- Centrally managed funds (i.e. EBP)
- Amortization costs for assets
- Financing costs

Cost Types
- Direct - touches the activity, output, product, service, client
- Indirect - supports direct resources and activities (i.e. training, security, admin)


Cost Behaviors
- Fixed - does not vary with quantity of output (i.e. occupancy, salaries, depreciation)
- Variable - varies with quantity of output (i.e. supplies, overtime, external fees)
- Semi-variable - has a fixed to variable “break point” (i.e. service contracts)
Activity-Based Planning – Financial View via Business Process Mapping

**Inputs**
“Resources we pay for”

- **Field Team (Workforce)**
  - Resource Consumption Rate = Labour Hrs / Visit
  - Resource: $$
- **Equipment (Asset)**
  - Activity Consumption Rate = Visits / Inspection
  - Capacity: 4000
  - Actual: 3800
  - Utilization: 95%
  - Maintenance: M²
- **Contractors (External)**
  - Capacity: 720
  - Actual: 504
  - Utilization: 70%

**Activities**
“What we do”

- **Site Visit**
  - Activity Consumption Rate = Visits / Inspection
  - Visits: # Inspections

- **Support Call**
  - Calls: # Assessments
  - Cycle Time = days per Assessment

- **Surveys**
  - Surveys: # Assessments

**Outputs**
“What products & services we supply”

- **Inspection**
  - Cost per Unit of Work: $ / Call

- **Assessment**
  - Cost per Unit of Output: $ / Assessment

**Efficiency Indicators**
- Time-Based
- Process-Based
- Cost-Based

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- Time-Based
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**Financial Effect**
Activity, Output, & Program Cost or “Cost to Serve”
Benefits of Business Process Modeling

**OPERATIONS MANAGEMENT**
- Resource Allocations & Work Planning
- Capacity Analysis
- Efficiency Indicators

**FINANCIAL MANAGEMENT**
- Planning & Budgeting
- Transfer Pricing
- “Value for Money”

**CLIENT MANAGEMENT**
- Service Standards
- Cost to Serve / Cost Recovery
- User Fee Pricing Strategies

**STRATEGIC MANAGEMENT**
- Program Rationalization
- Scenario Playing – “What-if”
- Shared Services
Linking Efficiency, Effectiveness & Performance

Resources Ultimately Dictate Performance Achievement

Performance Targets Need to be Bounded by Resources!

Departmental Business or Program Plan

Performance Planning (Logic model: Outputs to Outcomes)

Operational Planning (Logic model: Inputs to Outputs)

Effectiveness
Performance Alignment “Value Chain”

1. Organizational Performance Capacity
   - Tools & Techniques
   - Training & Guides
   - Policies, Governance & Support Systems

2. Consistent & Reliable Performance Data
   - Data Governance
   - Data Quality
   - Data Models & Architecture

3. Performance Content Design & Deployment Cycle
   - Planning & Collaboration
   - Business Process Modeling
   - Dashboards/Scorecarding

4. Integrated Performance Planning & Analysis
   - Project>Program>Corp Alignment
   - Risk Management
   - Resource Management

5. Organizational Performance Engagement & Learning
   - Performance Leadership
   - Clear Performance Messaging
   - Performance Understanding for Decision Making

Performance Practices
(application and benefits)

Performance Enablers
(systems & processes)
Corporate Performance Management

CPM is an umbrella term that describes the methodologies, metrics, processes and systems used to monitor and manage the business performance of an enterprise. CPM must be supported by a suite of analytical applications that provide the functionality to support these processes, methodologies and metrics. CPM is also known as Business Performance Management (BPM) or Enterprise Performance Management (EPM).

The expanded application components of a CPM suite are now as follows:
- Budgeting, planning and forecasting (BP&F)
- Profitability modeling and optimization (PM&O)
- Strategy management
- Financial consolidation and close
- Financial and management reporting and disclosure

PM&O includes activity-based costing (ABC) applications that determine and allocate costs at a highly granular level to, for example, determine the cost of each task (activity) that an agent may perform across all channels in a customer service contact center. PM&O applications take this approach one stage further and provide modeling capabilities to enable users to model the impact on different cost and resource allocation strategies. These solutions may also be able to model business processes and provide other advanced features, such as constraint-based, bidirectional and predictive modeling.
Gartner Corporate Performance Management (CPM) Magic Quadrant 2014
PM&O (Costing) Visualization Technology

Oracle HPCM

SAS ABM
Linking Costing to other Efficiency Management approaches used in Government

What is Lean?

• A business improvement approach that creates speed, flow and efficiency by fixing business processes.

• Work that does not add value is identified and removed to reduce complexity, creating flow and allowing resources to focus more on value added activities, increasing capacity without working harder or adding resources.

When should it be used?

• When an organization needs to deliver faster, better and cheaper
Lean Focuses on Non-Value Added Time

Some examples of activities that take time but don’t add value:

- Waiting
- Incomplete files
- Expediting
- Errors and rework
- Unused reports and their data collection
- Unnecessary approvals
- Managing a backlog
- Misunderstandings/poor communication

Lean Focuses on Non-Value Added Time

Mapping Flow
If you took a file, put an imaginary video camera on it and sent it through your process. What would it see?

- bottlenecks
- large batches
- unnecessary approvals
- missing info
- chronic errors
- unbalanced work
- last-in, first-out
- too much travel
- unnecessary approvals
- too many handoffs
- Waiting...
- & waiting...
- & more waiting...

When would it:
- Go forward?
- Stop and wait?
- Back up?

Mapping these interruptions to flow tells you where your end-to-end process is breaking down.

Lean Focuses on Non-Value Added Time
Value Stream Map of a Communications Product

Total Cycle Time (CT) = 8 days
Total Value Added Time (VAT) = 2.5 days = 58.7 hours = 3,523 min
Total Elapsed Time (ET) = 47 days = 376 hours = 22,560 min
Total Wait Time (WT) = 39 days
Total Value of Material (△) = $1150

Battle of the Maps: Value Stream & Business Process

Cost = $$$

Field Team (Workforce)

Capacity = 4000
Actual = 3800
Utilization = 95%

Labour Hrs

Equipment (Asset)

Capacity = 720
Actual = 504
Utilization = 70%

Eq. Hrs

Contractors (External)

Labour Hrs

Create

CT = 1 day
VAT = 660 min

Layout

CT = 2 days
VAT = 360 min

Proof

CT = 1 days
VAT = 67 min

Print

CT = 1 days
VAT = 516

Assemble

CT = 2 days
VAT = 1680 min

Distribute

CT = 1 day
VAT = 240

Total Cycle Time (CT) = 8 days
Total Value Added Time (VAT) = 2.5 days = 58.7 hours = 3,523 min
Total Elapsed Time (ET) = 47 days = 376 hours = 22,560 min
Total Wait Time (WT) = 39 days
Total Value of Material (\(\bigtriangledown\)) = $1150

Operational Cause

Financial Effect
What is Six Sigma (6σ)?

Early Adopters

- Pioneered by Motorola in the mid-80’s
- Popularized by Jack Welch at GE when adopted in 1995

Evolution of Approach

- Brought a “discipline” to Total Quality Management (TQM)
- Initially very manufacturing focused and tied to Statistical Process Control (SPC)
- Broadened to all quality / services / customer initiatives throughout ’90’s

Impact of 4σ?

- 20,000 lost pieces of mail every hour
- 5,000 incorrect surgery operations per week
- No electricity for 7 hours per month
- Unsafe drinking water for 15 minutes per day

3σ = 93.3%
4σ = 99.4%
5σ = 99.98%
6σ = 99.9997%
Why Combine Lean & Six Sigma (LSS)?

• Lean creates **efficiency** and flow
• Six Sigma creates **consistent results**
• Many successful government organizations combine the tools of Lean and Six Sigma in order to achieve both efficiency, flow and speed as well as consistent delivery of results.
• One approach is often to use Lean first to create flow/efficiency and then identify where variation continues to be a problem. Use Six Sigma tools to solve this variation.
• This results in delivering more of your mandate, faster, better and cheaper
Typical Lean in Government Results

- 25 – 100% increase in capacity without adding resources or working harder
- 25-50% improvement in quality and customer satisfaction
- 25-100% improvement in financial performance
- Increased employee engagement
- Improved union-management relations
- Reduced firefighting – more time and resources to devote to core business

A number of Canadian federal, provincial and municipal government organizations have achieved and sustained results such as these…
Thanks for Your Attention
Hope you Enjoyed “The Ride”!
Q&A to Follow...

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