



Activity Based Costing: Application to measuring economy and efficiency

Greg Mason

Webinar Presentation to CES

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Goal of the webinar

- Present the theory of activity based costing
- Demonstrate its superiority in developing accurate costing profile for typical public sector programs
- Present two examples of application

Origins of ABC

- Traditional costing allocates cost by
 1. Category (*wages, fuel, cleaning supplies, interest...*)
 2. Bureaucratic budgetary classifications (*Vote 1/Vote 10, branch, division....*)
- Shared overhead costs (services) mean that the true cost of an individual product/service can not be calculated.
- To identify sources of profit/loss, business needs to measure costs and productivity for discrete service and product lines
- The core idea of ABC is
 1. Identify discrete products services as comprising a set of common activities
 2. Estimate the costs of the component activities supports the estimation of the cost for individual product/service lines.
- Management determines the number of discrete products/services to be included in the analysis.

Financial statements do not represent economic cost

- Program budgets and typical accounting statements typically do not include all the costs associated with a project.
- FTE's only capture costs at the department level – not the service line
- Most departmental program budgets exclude the cost of overheads, such as rent and utilities.
- Senior management time are often not included in the program's costs.
- Staff often work on multiple projects.
- Public accounting for capital costs may allocate the entire cost to one year, or amortize them, or may not include these costs at all.
- A program budget may be a small element of a departmental budget.

Expenses – Canadian Heritage 2005/2006		
	2006	2005
	\$'000	\$'000
Transfer payments – non-profit organizations	586,669	612,017
Transfer payments – other level of government within Canada	299,913	263,946
Transfer payments – industry	95,785	96,932
Transfer payments – individuals	27,339	21,527
Transfer payments – other countries and international organizations	6,098	3,349
Total transfer payments	1,015,804	997,771
Salaries and employee benefits	190,469	177,495
Professional and special services	55,667	46,324
Accommodation	15,200	14,700
Utilities, materials and supplies	14,570	12,043
Travel and relocation	12,321	11,182
Information	10,868	9,802
Freight and communications	5,781	6,054
Rentals	3,312	2,991
Amortization	2,384	2,217
Purchased repair and maintenance	1,730	1,671
Other operating expenses	971	891
Total operating expenses	313,273	285,370
Total expenses	\$1,329,077	\$1,283,141

The issue is that this budget covers a diverse range of programs and projects

The bulk of the spending is to specific organizations which could be grouped by category such as cultural industries, arts, official languages, etc. .

It is comparative easy to allocate grants and contributions. What ABD does is allocate staff and other inputs to departmental activities.

Typical Format for Public Accounts

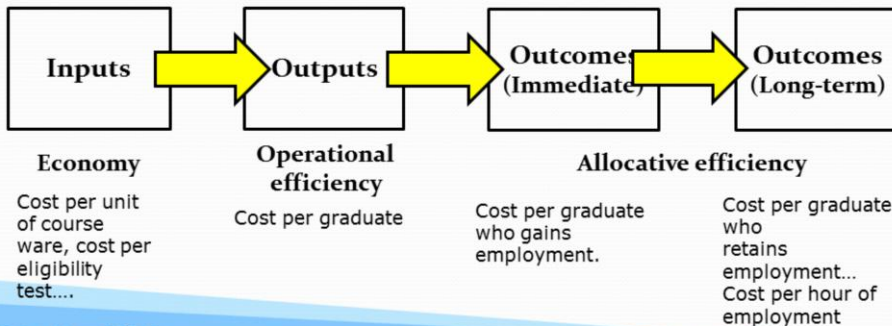
Item	2009-10	2008-09	2007-08	2006-07	2005-06	2004-05	2003-04	TOTAL
(5000)								
XX financial summary								
Salaries/O&M	\$9,808	\$10,677	\$9,181	\$9,042	\$9,336	\$8,266	\$7,666	\$64,068
Grants and contributions Gs&Cs								
X Program	\$2,484	\$10,877	\$102,072	\$92,195	\$91,428	\$81,948	\$55,616	\$646,620
Y Program	\$25,888	\$26,000	\$25,327	\$25,315	\$24,711	\$19,465	\$15,156	\$162,069
Z Program	\$20,687	\$20,687	\$9,236	\$19,460	\$17,672	\$21,481	\$25,270	\$128,166
Total Gs&Cs	\$50,058	\$57,564	\$136,635	\$136,970	\$133,811	\$122,894	\$96,042	\$936,855
TOTAL XX	\$60,866	\$68,241	\$145,816	\$146,012	\$143,147	\$131,160	\$103,708	\$1,000,923
FTEs	114	129	129	97	98	88	81	712
YY financial summary								
Salaries/O&M/EBP	\$1,000	\$1,356	\$1,425	\$1,213	\$1,472	\$1,607	\$1,484	\$9,653
Gs&Cs	\$661	\$661	\$785	\$809	\$661	\$350	-	\$3,953
Special funding	\$1,080	\$1,134	\$890	\$971	\$949	\$958	\$1,089	\$7,071
Total recipient funding	\$1,767	\$1,795	\$1,675	\$1,780	\$1,610	\$1,308	\$1,089	\$11,024
TOTAL YY	\$2,864	\$3,151	\$3,100	\$2,993	\$3,082	\$2,915	\$2,573	\$20,677
FTEs	11	12	12	14	15	15	13	92

Limitations

- No allocation of resources to programs
- Unclear whether programs comprise additional service streams
- The complexity of processes used to delivery Gs & Cs not apparent
- The FTEs cannot be attributed to programs or service streams
- Factors in variability of FTEs unclear

ABC and the results chain (Training Program)

Training programs for economically disadvantaged (EI clients, social assistance recipients and disabled persons.) Training involves determination of eligibility, aligning trainees to suitable programs, creating training modules (courseware), delivering the training (directly or under contract), certifying skills acquisition, etc. to create the "output" – the graduate



Economy reflects the unit cost of engaging in activities, such as trainee assessment, preparation of resumé writing courses, case planning for clients, or creating and managing job exchange. A CEA applied to this element might measure the number of resources (primarily staff time) used in a specific activity, such as counselling hours for long-term social assistance clients. This is useful for design/delivery issues.

Example: Cost of counseling (wages + overhead + materials)

Example: Cost of processing applications (time from receipt to final approval)

Efficiency is the unit cost of producing an output, such as the costs of all the activities needed to produce a trainee who "graduates" from a program.

Example: Cost of graduate (number of grads divided by the total program cost)

Example: Cost of awarding a dollar in a grant/contribution program

Effectiveness (also termed cost-effectiveness) becomes the unit cost of obtaining one unit of outcome, such as the total costs of moving an unemployed client into a permanent part- or full-time job for a specific period. Measurement of net impact (program attribution) is the main challenge.

Example: Cost of moving a social assistance recipient off welfare into a full-time job for six months

Example: Reduction in the incidence of flu as a result of vaccination

Business Process Mapping: The first step in measuring economy and efficiency

- Business process mapping charts the steps in transforming inputs into outputs.
- Business process mapping explains the “line” between inputs and outputs.



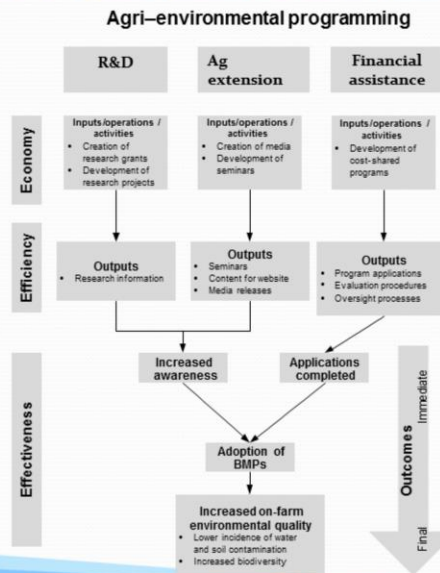
- Each product/service that defines a “program” needs to be identified as a separate results chain.

Logic Model – a sequence of results chains for each service line

Agri-environmental programming attempts to repair environmental damage caused by agriculture using a three prong approach (service lines):

- R&D to develop new farming techniques
- Ag extension to teach farmers about better techniques (best management practices – BMPs)
- Financial assistance for new infrastructure

The logic model anchors the results chain for each service line comprising a program



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Example 1: The logic of agri-environmental programming

Managing the environmental impact of modern agriculture is of growing significance, especially as the scale of farms increases.

Federal, provincial, and third-party organizations assist farmers to reduce the environmental impacts of farm operations through basic and applied research, agricultural extension (technical advice), and financial assistance. The goal is to support the implementation of changes termed *best management practices* or *BMPs*.

The main activities (referred to as service or business lines) can be classified as:

Research and development – undertaken by government research stations, private contractors, and universities to identify effective farm management practices

Agricultural extension – disseminate information on BMPs through farm media, seminars, web-based, model farms, and on-farm advice to promote and demonstrate these practices

Financial assistance – partially support the costs to make the changes, usually through cost-shared programs

Each of these service lines uses inputs to produce one or more outputs. In turn, the outcomes that result from these outputs include:

Increased awareness of the problems and effective mitigating practices (**immediate outcomes**)

Adoption of the practices (**intermediate outcomes**) leading to ...

... lower contamination of water, soil, and air, and increased biodiversity (**final outcomes**)

Tracking public sector resource use

- Public programs combine raw resources, infrastructure, and personnel to plan and deliver outputs.
- Wide variation exists in the types of inputs and activities used by public programs:
 - some are personnel intensive
 - others are capital intensive
 - some involve flow through transfers
 - some initiatives require coordination of many players and much of the resources are consumed in the process
- Standard financial statements of expenditure often offer little insight into the costs of individual processes and products.

Example: Training for social assistance recipients: economy and efficiency

Evaluating the economy and efficiency of a training program for social assistance recipients (SARs) needs to calculate the cost of program elements such as:

- *Training materials* (These are usually direct costs of the program and usually pose little problem for the cost calculations.)
- *Securing contractors to deliver the training* (Provided the training is uniquely delivered to the program clients these can be associated with the program. However, many training programs combine several client groups such as Employment Insurance and persons with disabilities, and only those associated with SARs should be included.)
- Legal and administrative analysis to develop eligibility guidelines (Most often, lawyers and administrators deal with multiple programs and issues, only a fraction of which are assignable to the program.)
- *Costs of ongoing social assistance payments while clients receive training* (These costs are uniquely assignable to the program. It might be argued that these costs are borne anyway and should not be included. This is an example of a judgment call needed in assessing costs.)
- *Child care* (Child care is typically a cost of the program to allow participants to study.)
- *Outreach and promotion* of the program to SARs as well as counseling to align training to client needs and to deal with impediments to successful training (Many counselors deal with a broad spectrum of clients—only time directed to SARs should be included.)
- *Promotion and liaison with employers* to increase chances that graduates will secure employment (The costs and staff time related to the program are all that are relevant here.)
- *Planning and management of the program* (The time spent by management on the program is the only relevant cost.)
- *Overheads such as rent, information technology, and utilities* (These overhead costs are typically apportioned to the program based on some formula, typically in proportion to staff costs as a fraction of total costs.)
- *Counselling costs*

Stages to ABC

- **Identify the service lines** and component activities
- **Create business process models**
- **Create time recording process** for staff (who complete weekly reports on time spent in each activity/sub-activity area)
- **Calculate total labour cost** (time in an activity multiplied by wages) for each resource (staff person)
- **Total the cost** for each activity to derive an aggregate cost for each service line
- **Prorate indirect costs** (rent and other overhead) by service line cost totals
- **Sum to obtain cost for each service line**

Example 1 – Advanced Payments Program (APP)

- **Advanced Payments Program** provides an advance on the crop, allowing farmers increased freedom to time sales to maximum advantage.
- Producers apply through 60 designated producer associations (“administrators”) that deliver the program for AAFC.
- AAFC manages the administrating organizations.

Main process elements

- Program support (meetings, design, financial reporting, promotion ...)
- Administrator support
- Client issues (interest payments, defaults, recovery of over-payments)

Steps

1. Obtain management buy-in
2. Define activities
3. Create questionnaire
4. Distribute and analyze



Example 1 – AAFIC Advanced Payments Program



ADVANCE PAYMENTS PROGRAM (APP) ACTIVITY-BASED COSTING QUESTIONNAIRE

This survey is being conducted as part of a program efficiency evaluation of the Advance Payments Program (APP). The purpose of the survey is to assist Agriculture and Agri-Food Canada in determining how staff resources are being used to administer the APP. This is not an exercise for analyzing the efficiency or productivity of individuals, and your identity will not be associated with your response.

The survey includes two sections: the first asks for basic information about your role in the APP and the second asks what percentage of your working time is spent on 13 different activities. All information you provide will be strictly confidential between you and PRA.

You may complete the form electronically (click or type the appropriate response) or you may print it out and fill it in using pencil. Please email your completed form to info@pra.ca or fax it to 1-800-717-5456.

SECTION 1: RESPONDENT INFORMATION

1. What is your current role in the APP? (please check one only)

a) Director b) Assistant director c) Program manager

d) Program officer e) Administrative/clerical

f) Other (please specify) _____

2. When did you first start working in this position? _____ month _____ year

3. In your current position, how many hours per week do you typically spend working on the APP? _____

4. Thinking of the past 12 months, has your role in the APP changed? Yes No

SECTION 2: ACTIVITY TIME ALLOCATION

This section asks you to record what percentage of working time you spent on 13 APP activities over the past week and over the last 12 months. Please read the entire set of activities listed and think about whether your responsibilities fall within them. Then, for each activity, please answer the following questions:

1. First, thinking of your current position:

a) During your last full week at work, what percentage of the week did you spend on each activity?

b) During the past 12 months, what percentage of your time did you spend on each activity?

2. Next, thinking of your previous position (if applicable):

a) During your last full week at work, what percentage of the week did you spend on each activity?

b) During the past 12 months, what percentage of your time did you spend on each activity?

Please note that 100% of your time should be allocated to the activities listed. If you did not participate in the activity listed, please enter 0%.

Activity	Time spent per activity in CURRENT position		Time spent per activity in PREVIOUS position	
	% of previous week	% of past 12 months	% of previous week	% of past 12 months
a. Meetings (management meetings, meetings with other divisions/departments)				
b. Policy and program design issues (background research, ad hoc working groups, working papers)				
c. Ministerial documents/ATIP requests (briefing notes, letters from the Minister, "green" dockets)				
d. Performance and financial reporting (weekly status reports, RPP/DPR, service standards, progress reports, APPEDS)				

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Goal is to identify the costs of the program

Number of staff = 32

Questionnaire developed with the staff and management

Senior management must communicate intent and value

Third party hosting is essential

Example 1 – AAFIC Advanced Payments Program

b) During the past 12 months, what percentage of your time did you spend on each activity?

2. Next, thinking of your previous position (if applicable):

a) During your last full week at work, what percentage of the week did you spend on each activity?

b) During the past 12 months, what percentage of your time did you spend on each activity?

Please note that 100% of your time should be allocated to the activities listed. If you did not participate in the activity listed, please enter 0%.

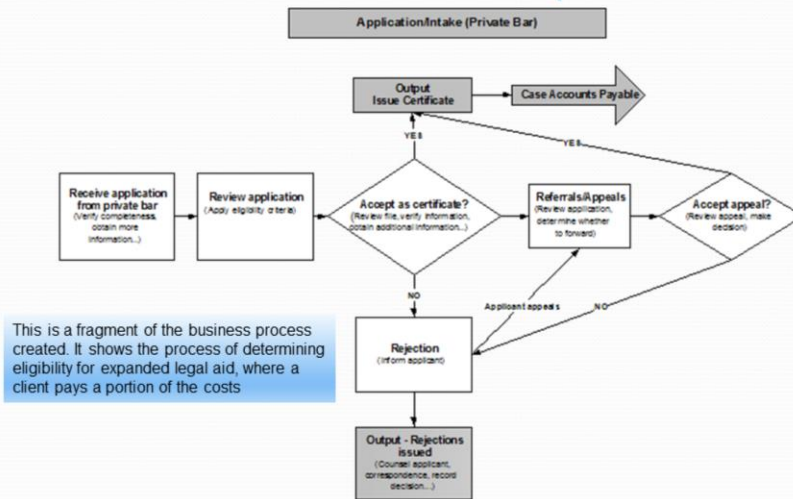
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c. Ministerial documents/ATIP requests (briefing notes, letters from the Minister, "green" dockets)				
d. Performance and financial reporting (weekly status reports, RPP/DPR, service standards, progress reports, APPEDS)				
e. Administrator applications (ensuring applications are complete, setting up administrator IDs in APPEDS, reviewing committee activities, obtaining advance rates, preparing AGAs)				
f. Other interaction with administrators (responding to questions about program guidelines, resolving APPEDS issues)				
g. Interest claims (requesting/reviewing Monthly Interest Claim Summaries, reconciling reports, calculating interest payments, authorizing payments)				
h. Defaults (requesting/reviewing Monthly Default Reports/Default During Production Period Reports, Default Working Group, Default Improvement Project, processing claims)				
i. Recoveries (sending files to recoveries, liaising with recoveries personnel and administrators)				
j. Recipient audits/compliance visits (audit plans, administrator risk ratings, arranging third-party audits, reviewing results, preparing for/conducting compliance visits, follow-up)				
k. Stay of advance/default (forwarding requests to the Minister, monitoring industry conditions)				
l. Awareness/promotional activities (trade shows, presentations)				
m. Human resources (human resource planning, learning plans)				
Please specify any other APP activities you perform that are not already covered in the above categories.				
n. _____				
o. _____				
NON-APP ACTIVITIES				
p. What percentage of time did you spend on non-APP activities? (other programs, special projects)				
TOTAL AMOUNT OF TIME: *Each column should total 100%.	100%	100%	100%	100%

Example 2 – Legal Aid Services

- Legal aid services are offered based on an income and asset test (similar to that used in determining social assistance eligibility).
- Accused (federal assistance for legal aid is confined to serious criminal matters) apply either through the courts (usually their first appearance) or through a lawyer that takes legal aid cases.
- Some jurisdictions use staff counsel to deliver service; in other cases, private lawyers handle the case under a tariff schedule; and some jurisdictions use a mixed model.
- Business process models cover all aspects of case management from
 - eligibility determination
 - case management by staff counsel (research, representation....)
 - case management by private counsel (negotiation of fees, payment of fees, etc.)
 - recovery of costs (where clients are responsible for a portion of costs)
 - etc.
- ABC used to:
 - compare staff versus private productivity (cases per dollar expended)
 - costs of different types of cases (serious criminal, minor criminal, family law, poverty law, ...)

Example 2 – Legal Aid Services

Client Intake: Business proces



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Example 2 – Legal Aid Services

Table 1: Major areas of activities for LAM

Activities related to:	Service line			
1. Application Intake (Formal certificate applications – private and LAM)	Criminal adult	Criminal youth	Civil	
2. Application Intake (Certificate equivalent, informal LAM cases)	Criminal adult	Criminal youth	Civil	
3. Case Assignment Process (within LAM)	Criminal adult	Criminal youth	Civil	
4. Duty Counsel (LAM) or Drop-in Centre	Criminal adult	Criminal youth	Civil	
5. Case Conduct (LAM – informal cases, certificate equivalents and certificates)	Criminal adult	Criminal youth	Civil	
6. Accounts Payable (Invoices by private bar – taxation)	Criminal adult	Criminal youth	Civil	
7. Accounts Receivable (Clients on partial or full contribution, charge on land)	Criminal adult	Criminal youth	Civil	
8. IT systems support (Use all service lines if time cannot be allotted between criminal adult, criminal youth, and civil cases)	Criminal	Criminal youth	Civil	All Service Lines
9. Internal support – Not case related (Use all service lines if time cannot be allotted between criminal adult, criminal youth, and civil cases)	Criminal adult	Criminal youth	Civil	All Service Lines
10. External relations – Not case related (Use all service lines if time cannot be allotted between criminal adult, criminal youth, and civil cases)	Criminal adult	Criminal youth	Civil	All Service Lines
Activities unusual for a typical day (Use all service lines if time cannot be allotted between criminal adult, criminal youth, and civil cases)	Criminal adult	Criminal youth	Civil	All Service Lines

Example 2 – Legal Aid Services

Table 2: Activities related to application intake

Activities related to:	Time by service line		
	Criminal adult	Criminal youth	Civil
1. Application Intake (Formal certificate applications – private and LAM)			
a. Clarify application with the person that took the application (calling back to ask questions about application)			
a. Determining eligibility and making eligibility decisions (gathering facts, meeting/interviewing applicants, consulting with senior management and/or intake officers, responding to applicant enquiries, computer searches, court registry, Internet, telephone advice)			
a. Inform applicant of decision and respond to inquiries on decisions (issue certificate or amendment/issue rejection of application and appeals)			
a. Review appeal			
a. Monitoring/supervising staff			
a. Review staff operations			
a. Allocate workload			
a. Correct mistakes			
a. Office support for application intake (e.g., pulling files, filing, faxing, or photocopying)			

This is an overly detailed breakdown of activities in the general category of "Application Intake"

FAQs

Q: Does everyone involved in the program need to complete the questionnaire?

A: *Ideally, yes. Sometimes senior management refuses to participate. Interview support staff to create proxy estimates of the senior management time.*

Q: When does ABC work best?

A: *Programs with a high proportion of staff, relatively few overhead and indirect costs, and well defined, discrete steps in the business processes, will support ABC best.*

Q: When does ABC work less well?

A: *Simple programs with few discrete steps to create outputs, and high capital/indirect costs, will not support ABC well.*

Q: For Gs & Cs does one need to get each of the grantees to complete an ABC?

A: *Generally no. In these cases, economy and efficiency can be combined into one and the real issues are operational efficiency (quantity of output delivered per dollar allocated) and allocative efficiency (quantity of outcome realized per dollar allocated). The only ABC that is relevant is for the funding unit.*

Q: What role does ABC play in performance measurement

A: *Regular application of ABC becomes a useful method for tracking resource use as management makes process changes.*

Readings

- Cokins, G. (1998) *Activity-based costing: making it work*. Chicago, McGraw-Hill.
- Cooper, R., (1989) The rise of activity-based costing (Parts 1 – 3), *Journal of Management*, Volume 2, # 1 – 3.
- Kaplan, R. and Anderson, S. (2007) *Time driven activity-based costing*, Boston, Harvard University Press.
- US Department of Energy, (2007) *Activity based costing* (November) Directives.17.11.2007