Open Government Costing Framework and Methods

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Rationale for Open Government Costing

"Open government" is built on the idea that citizens have the right to access government information, to actively participate in government decisions that affect their livelihoods, and to hold government officials and/or service providers to account when they fail to govern properly (Heller, 2012; McGee and Edwards, 2016). Open government reforms aim to make government more transparent, more accountable, and more responsive to its own citizens, with the ultimate goal of improving the quality of governance, as well as the quality of services that citizens receive (OGP, 2015). The umbrella of open government programs and reforms includes initiatives such as open data systems, 311 systems for reporting government fraud, e-procurement, participatory budgeting, citizen scorecards and citizen audits, as well as many other adjacent reform efforts.

According to the World Bank Group, when embraced, open government reforms can contribute to the twin goals of ending extreme poverty and promoting shared prosperity in low- and middle-income countries (GGP, 2016). First, open government reforms can help increase the effectiveness of both domestic and donor-funded development spending, thereby improving the allocation and use of public resources (UN, 2008). Second, open government reforms can facilitate more inclusive decision-making processes and more effective management of public utilities, and in so doing improve the delivery of government services, which are disproportionately used by the poor (Grandvoinnet, Aslam, and Raha, 2015; Rocha, Menocal and Sharma, 2008). Finally, open government reforms can increase trust between government and citizens; such social capital is crucial for the success of a wide range of public policies (Brixi, Lust, and Woolcock, 2015).

A review of the extant literature, however, raises more questions than answers as to whether these three statements hold in practice and the extent to which the potential gains associated with open government reforms are greater than the costs of implementing them. In particular, there exists a large gap in understanding the value for money of specific subtypes of open government reforms. Low- and middle-income governments are now expected to use the "billions" in official development assistance and development resources to attract, leverage, and mobilize "trillions" in investments of all kinds (Badré, 2015). However, analysis on the specific costs needed for implementation of specific government reforms, as well as the return on investment of these reforms, has yet to be conducted.

Given the reality of increasingly limited development resources from external funders, being able to weigh the full costs of open government initiatives is critical to ensuring that governments are allocating and using resources in the most efficient and effective manner possible. A better understanding of which open government reforms can be achieved for what price can be used to tailor and sequence open government components to the specific needs of low- and middle-income countries, particularly within the context of striving towards fulfillment of the Sustainable Development Goals.

Analysis of the total costs of implementing open government reforms also provides a first step towards conducting a cost-benefit analysis of open government reforms. Thus far, the growing global political momentum behind open government reform programs has often relied on rights- based arguments (Heller, 2016); understanding the costs and potential returns on investment associated with open government reforms is an important next step towards making the case for why opening up government matters for instrumental gains as well.
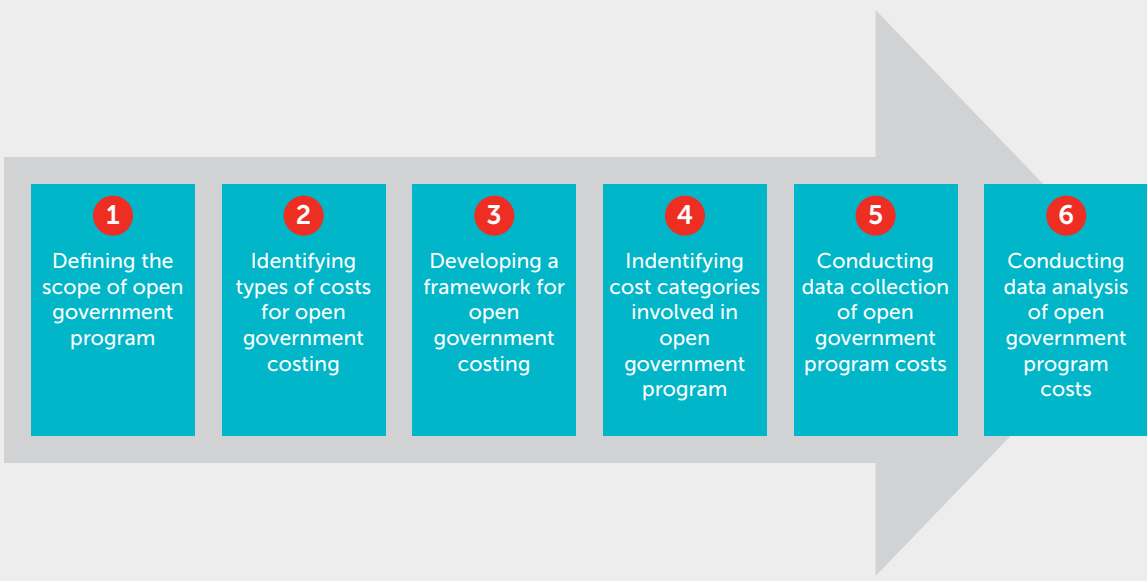
Introduction and Purpose of Open Government Costing Framework and Methods

This open government costing framework outlines the critical components needed to conduct cost analyses of open government programs, with the ultimate objective of putting a price tag (or at least a cost range) on key open government reform programs in various countries. As the methodology takes a high-level, conceptual approach to costing, we believe it can be adapted to cost open government programs of many types and potentially other governance programs.

This framework is based on a high-level costing process employing essential steps for conducting a cost study, including defining the scope of the program, identifying which costs to assess, developing a framework for costing, identifying key components and outlining each line item by inputs and activities (Figure 1 below). In the sections below, we present the costing process in more detail, as well as the general methodology and detailed guidance for each of the steps within this construct.

In addition to information about the methodology itself, each section includes examples from three case studies that were undertaken to test the validity and adaptability of the framework: the ProZorro e-procurement program in the Ukraine, the open data program in Sierra Leone, and the EDE Este 311 program in the Dominican Republic. These are valuable cases as standalone costing analyses; at the same time, they provided important information regarding the challenges and complexities of utilizing this methodology on actual open government initiatives. Ultimately, the first two cases were completed and developed into individual reviews, while the final case (EDE Este) was not completed due to challenges that we outline in the sections below. The experience of all three examples provides valuable lessons to those seeking to undertake such work in the future; as such we have included lessons from each of these cases in boxes throughout the subsequent sections.

Figure 1: Step-wise Capitalize Breakdown of Costing Process

1	2	3	4	5	6
Defining the scope of open government program	Identifying types of costs for open government costing	Developing a framework for open government costing	Indentifying cost categories involved in open government program	Conducting data collection of open government program costs	Conducting data analysis of open government program costs

It is important to note that while this document presents a general methodology for costing many types of open government programs, one of the biggest challenges in creating an adaptable framework is the variation in context and reforms in different country settings. Given the diverse range of open government initiatives, each type of open government program may have different structures, key components and players, as well as different economic and financial requirements and costs. Furthermore, even within the same type of reform (e.g. two similarly-structured open contracting reform programs in two adjacent countries), implementation and structure of the reform may vary significantly from country to country and population to population. This framework is meant to present a modifiable, adaptable scaffold for open government cost analysis, but by no means is it all-inclusive. For certain programs, specific activities or components may take precedent and contribute far more significantly to total costs while others may be less relevant.

1. Defining the Scope of Open Government Programs

Defining the components and boundaries of the open government program one seeks to cost is a critical first step in conducting a costing analysis. One of the challenges faced in costing open government reforms (as opposed to other sector-specific reforms, in health, nutrition, or education) is that in many cases open government reforms are novel and experimental initiatives; therefore, the definition and purpose of the initiatives are often vague, broad, fluid, or even contested. The breadth of possible goals of open data initiatives is highlighted by the definition of such goals by Open Knowledge International (a leading open data proponent): transparency and democratic control, participation, self-empowerment, improved or new private products and services, innovation, improved efficiency of government services, improved effectiveness of government services, impact measurement of policies, and new knowledge from combined data sources and patterns in large data volumes (Open Knowledge International, 2016). Suffice it to say that attempting to cost the full potential spectrum of impact ascribed to open data initiatives can quickly become a daunting task.

Determining Purpose and Perspective

When determining the scope of the program, it is essential to first outline the purpose and perspective of the cost analysis. The purpose encompasses the goal of the cost analysis: what will the cost analysis be used to accomplish? The answer should drive the design of the costing and help to limit the universe of elements to be costed. Here, examples include economic evaluation and priority setting, financial planning and resource requirement estimation, budgeting, and efficiency analysis (GHCC, 2016). The purpose of the study will often dictate the components and timeline of the program in question that should be included. For example, if the purpose of the cost analysis is budgeting for a program that is already in place, capturing earlier stages of the program or previously incurred sunk costs, such as one-off planning, may not be necessary for the costing exercise.

Perspective, or who the target or client of the costing study is, is also key to determining the scope of the cost analysis. The perspective of the study and the lens that the cost analysis takes could range from narrow to wide; the cost analysis could look at costs to society, costs to the provider of the service, costs the recipient of the service, or costs to a specific funder of the service. If the purpose of the cost analysis is to estimate the cost to the government department implementing the program in question, this would likely suggest a narrower requisite scope for costing the program relative to estimating total costs to society, for example. In addition to determining the scope of the cost analysis, purpose and perspective also help determine the types of costs used in the analysis (as explained in the following section).

Defining Program Components and Boundaries

After determining the purpose and perspective, the next step is to describe the program. This comprises of asking key questions that fully describe the components of the open government program, including the who, what, when, and where of the program. The "who" involves identifying the key players: who is responsible for designing, managing and implementing the open government program, and who is the target client or beneficiary of the program. If we take for example the costing of an open data program, identifying the key players would mean identifying (1) the implementers of the program, (2) the funders of the program, and (3) the clients or users of the program (i.e. those utilizing the data that is now available through this program or engaging with the program itself).

Box 1. Defining the Scope: Example from EDE Este 311

The case of the EDE Este 311 program reveals important information about challenges that can arise in conducting costing studies that are so great that they ultimately prevent the completion of the analysis. We include information and lessons about the challenges associated with each component of the framework as guidance to those conducting their own costing studies.

In 2011, EDE Este (an electricity distribution company in the Dominican Republic) developed a customer service system in response to public outcry regarding the provision of services to ensure open communication channels between the company and its customers. In the scoping phase of costing EDE Este 311, many of components of the key activities were difficult to determine. The core issue in completing this component of the work was that there was ultimately only one source of data that we were able to access to complete the costing; despite conducting iterative interviews and reviewing program documents from the EDE Este online portal and provided by EDE Este to the World Bank, the only source of data was a single contact at EDE Este.

Lessons for Future Cases and Researchers

- The costing analysis is more likely to be successful if more than one source of cost data can be identified. Only having one source of data increases the potential that there are critical data gaps that cannot be filled and that estimates for different cost items cannot be verified and thus are more likely to be inaccurate. For the EDE Este 311 costing, we had only one key source of data, which presented a significant challenge to capturing all activities and costs of the program. While challenging, this is also not surprising; key informants for scoping the case and collecting data often have very little incentive to provide this information. As such, it is important to outline the benefits of and create buy-in for the costing study early in the processes.

- In addition to data sources, it is incredibly valuable to have descriptive literature and write-ups of program history. Access to documentation across the phases of the case supports the identification of timelines, key activities and players. When this information can be gathered from other sources, program literature can also validate the collected data and help close data gaps.

- Upon identifying all willing informants and available data sources, researchers should review the program component questions (who, what, where, when, and why) and consider if all of these prove challenging to answer. In the case of EDE Este, the single data source left us with serious questions regarding even basic elements of the program (such as timeline, the order of steps, and key implementing agents). As such, we were left without the full understanding of the program or program costs. We were also not able to reach other potential key informants who might have possessed important cost or activity data. In completing similar costing analyses of other programs, these early questions may be a sign that a full accurate costing will ultimately be difficult to complete.

The "what" component comprises the identification of the activities that make up the specific open government program. Referring again to the example of an open data program, those conducting the analysis would want to ask themselves questions such as: what are the key steps in implementing this program, and what platforms and systems must be in place for the open data program to function.

The "when" and "where" are key to defining the boundaries of the program, especially in a cost analysis. In many cases, the program may be ongoing; as such, defining the time-period of the analysis will be critical to determining which type of costs are included. The question of "where" is key to determining the reach of the program. In the example of an open data platform, "when" defines the timeline of the program that will be taken into account in the costing (such as one year of operation or alternatively the duration of the program from conception) while the "where" defines the country, state or county coverage that will be taken into account in this costing (which could include the geographic area covered by the open data or the area targeted for users of the data).

The answers to each of these questions will depend on the purpose and perspective described earlier in this section. Defining the components and boundaries is critical to describing the type of program, whether or not to cost the program, and then defining which specific cost elements to include in the analysis. It is important to note that even questions such as these that seem relatively straightforward can be difficult to answer; challenges in answering the question of "when" and how we dealt with this in the Sierra Leone open data program case are shared in Box 2.

Identifying Goals

After defining the purpose, perspective, and components, it is critical to identify the goals of the program – i.e. the why. Why was the program implemented, and what does the reform need to accomplish to be successful? Determining the outcomes of the program is essential in this stage of analysis to set boundaries for the reach of the program. As highlighted by the definition of open data initiative goals above, government reforms often include broad, difficult to measure outcomes. For example, if the goal of an open data platform is to empower data users, determining when and if this goal is reached due to this program would be very difficult and may be dependent on other program goals (such as participation). When defining outcomes of the program, it is essential that the goals included as part of the definition of the program are specific and measurable. Program goal definition is also critical before choosing to cost a particular open government program. Identifying the goals of the open government reform prior to selecting the program for costing helps target data collection during the analysis.

2. Identifying the Type of Costing

The design of any costing analysis should be driven by how the intended audience will use the analysis. Cost data can be used for budgeting, priority setting, resource allocation, improving efficient provision of goods or services, or economic evaluation of new programs. Depending on how the cost analysis will be used, policy makers and program planners may be concerned with different types of costs. Therefore, depending on the purpose and perspective of the cost analysis, those using the costing analysis may be interested in economic, financial, or fiscal costs. While typically the cost categories included across the three types of costs in the analysis do not change, the measurement and valuation of resources and inputs may vary depending on how the cost data will be used, as described in Table 1 below.

Economic Costing

Economic costs reflect the full value of all resources utilized in the production of a good or service. Included with economic costs are costs sometimes referred to as "opportunity costs" because they represent those resources that are consumed and thus prevent the opportunity to devote those resources to another purpose. In terms of personnel time, economic costs would include the total value of all staff time spent on the program, as well as the opportunity cost of any volunteers and unpaid staff members involved in the program. Economic costs are required for economic evaluations, such as cost-benefit analysis or cost-effectiveness analysis. They may also be useful for program planners when considering how a new program will affect current resources or how best to ensure sustained program implementation for long-term planning. Economic costs may also generate information regarding what

Table 1: Definitions of Cost Categories by Type of Cost			
Cost Category	**Economic Costs**	**Financial Costs**	**Fiscal Costs**
Salaried Labor	Included to represent opportunity cost of time of existing staff involved in the program (full time and percentage of time) plus economic value of volunteer labor	Labor costs of new staff hired to accommodate the program	Included if new staff need to be hired
Consultants	Labor costs of consultants hired to accommodate the program	Labor costs of consultants hired to accommodate the program	Included if new consultant needs to be hired
Venue	Included additional cost of venue rental needed for the program	Included if additional venue rental is needed for the program	Included if additional venue rental is needed for the program
Transport	Included	Included	Financial cost of fuel and other transportation
Per Diem	Included	Included	Included
Materials	Cost of all materials needed for program implementation and advocacy	Financial cost of additional materials needed for program implementation and advocacy	Financial cost of additional materials needed for program implementation and advocacy
Overhead	Cost of additional overhead for the program	Cost of additional overhead for the program	Cost of additional overhead for the program
Equipment	Economic cost of technology including depreciation	Financial Cost of technology creation	Financial Cost of technology

it might cost to start a new program in other settings. For example, while volunteers in one country may be willing to conduct trainings free of charge, this may not be the case in another; thus, the full economic costs of the original intervention (including volunteer time) need to be factored into the final price tag. Economic costing of open government programs is most relevant when the researcher wants to assess the full cost of the program, especially in programs where opportunity costs such as volunteer time are high. This type of costing is helpful in modeling anticipated total program costs when starting or scaling new programs.

Financial Costing

Financial costs reflect the total financial outlays for goods and services needed to carry out the open government program. However, in contrast to expenditure data, financial costs amortize capital expenditures and one-time startup costs over time. In addition, financial costs are usually measured for the entire good or service rather than reflecting a particular agent's financial outlays. Financial costs include the total budget cost for the implementation of the program. For example, financial costs of staff time include the cost of time spent by existing staff as well as any consultant fees paid specifically for this program. Financial costing captures the full monetary cost of implementing the program to both the government and external stakeholders.

Financial costing is most useful when planning open government program budgets; this costing is not all inclusive of full program costs, but captures the total anticipated budgetary cost of implementation of a new open government program.

Fiscal Costing

Fiscal costing is the most narrow of costing methodologies and reflects the financial outlay that an agent (e.g., government, donor or individual) spends during a period of time for goods and services toward a specific program. Fiscal cost or expenditure can refer to the entire sum required, or it may pertain only to those outlays incurred by a subset of the organizations involved in delivering the service. Note that expenditure data are usually reported using the cash basis method of accounting; this means that no amortization to capital goods is applied and as such all capital goods expenditures are recorded in full as they are incurred. For example, in terms of staff time costs, only costs for consultant fees or personnel hired specifically for the implementation of this program would be included. Fiscal costs capture only additional costs to the funder for implementation of open government programs. As such, this costing is useful for planning new programs or scale-up of programs, particularily when the program will be added to existing departments or existing fuctions.

3. Framework of Open Government Costing

Key Program Phases

Conducting a cost analysis for any program can pose challenges for the analyst, and the challenges in costing open government programs are especially significant, given the vagueness in scope and the breadth of activities across many sectors and stakeholders that can comprise an open government initiative. One way to mitigate some of these challenges is to identify and segregate the activities, inputs and costs into discrete pieces. For the purposes of this costing methodology, we have adopted a program implementation framework (Fixsen et al., 2005) that considers three discrete phases: setup, implementation and operation (Figure 2 below).

1. **Setup:** includes all exploration and adoption/adaption activities prior to implementation of the program. Key activities in this phase include planning, advocacy and any development of systems (hardware, software) or infrastructure investments needed for program implementation.

2. **Installation and Initial Implementation:** includes all activities involved in putting the program in place. This is typically related to changes needed to support implementation of a new program, including with respect to skill levels, organizational mandate and capacity. Key activities would include any one-off requisite legislation, training, and/or promotion required for success of the program.

3. **Operation:** includes all activities associated with the running of the program once in place. Key activities include program management, maintenance of equipment, monitoring and evaluation, utilization and refresher trainings.

Definition of Activities and Resource Use

For each phase, researchers should identify key activities and types of resources required for successful execution of the open government reform. A list of the key activities and types of

Figure 2: Framework of Open Government Costing

Setup
- Planning
- Development of Systems
- Advocacy

Installation and Initial Implementation
- Legislation
- Promotion
- Initial Training

Operation
- Program Management
- Equipment Depreciation and Maintenance
- Monitoring and Evaluation
- Utilization
- Recurrent Training
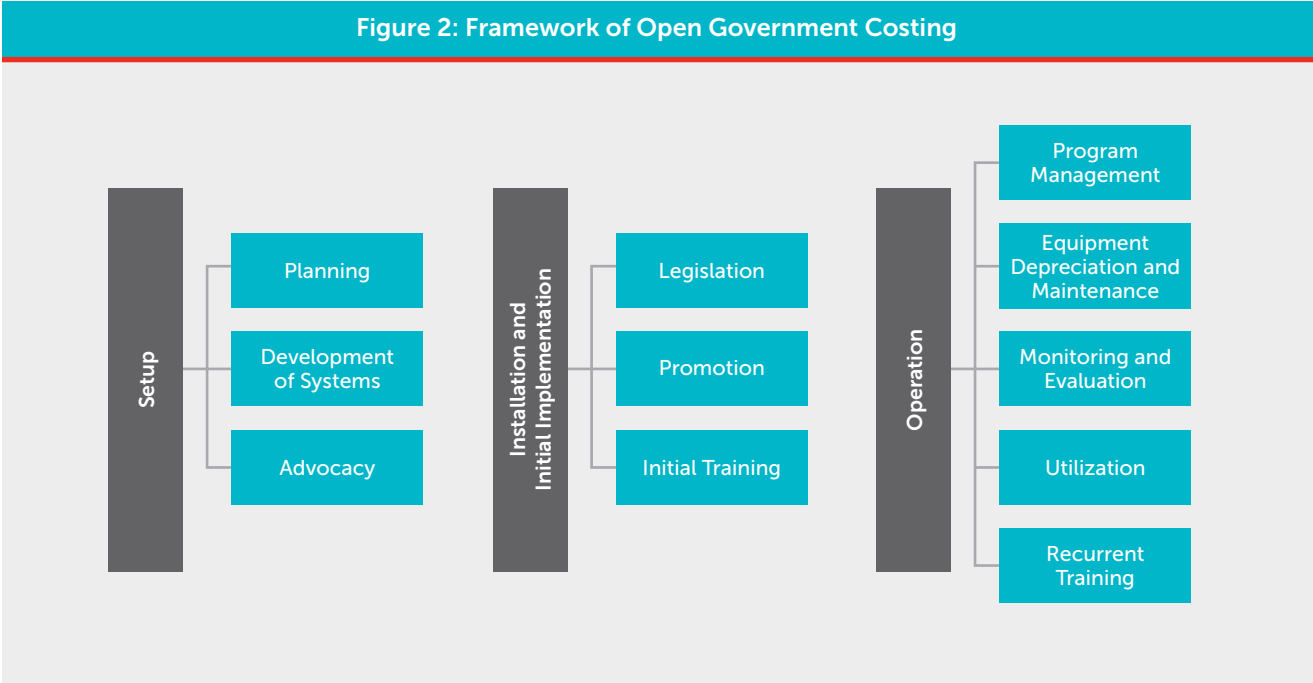
resources that we recommend for open government programs is detailed below. This is not an exhaustive list; depending on the program, there may be other activities that are not included below. Activities and resources should be identified on a case-by-case basis, as the example described in Box 3 below reveals.

Setup

1. **Planning:** including staff, volunteer time and any meetings and events that took place to plan the implementation of the open government program. This would typically include one-time costs incurred at the beginning of the program.

2. **Development of Systems**: including costs of computer infrastructure, such as hardware and software programs for new platforms, websites, and other related costs. These costs may have both one-time capital costs, consultancies, services, licensing fees, as well as recurrent operational costs (such as air time and internet service provider costs).

3. **Advocacy:** including staff, volunteer time and any meetings and events essential to advocacy efforts related to implementation of the open government program. This activity may also include the development of advocacy and awareness raising materials.

Installation and Initial Implementation

1. **Legislation:** including staff, volunteer time, and any meetings involved in drafting and passing legislation (and/or regulatory changes) essential to the implementation of the open government program. These costs should only be included if the program could not have been successfully implemented without the passage of legislation or new/revised regulation.

2. **Promotion:** including costs associated with advocacy, awareness raising, and social mobilization. The relevant costs may include the capital costs of developing media spots (such as TV, radio, or print), costs of events and productions related to the program, costs of distributing messages, and costs of any media equipment or staff time (such as payment of celebrity spokespeople). In addition, estimates should include the cost of air- and radio-time for messages, transportation costs associated with sensitizing communities, printing costs of flyers and posters, and other communications costs.

3. **Initial Training:** including costs associated with orientation training of staff and training of trainers. Initial training cost should be treated as a one-time cost until retraining is to take place; however

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Box 3. Defining the Framework: Example from EDE Este 311

The EDE Este 311 case provides an important example of how attempting to employ the costing framework can reveal that an open government program is not a good candidate for costing. In the early scoping phase of EDE Este 311, we were unable to identify the key activities in the setup and implementation phases of EDE Este 311. Only program elements within the operation phase were identified. Further, even for those activities in the operation phase, we were only able to identify lump sum costs (such as total call center costs) and not components within these lump sums (such as the costs of training of call center staff). Due to the lack of the data, it was unclear which activities in the costing framework were relevant to the case.

Suggestions for Future Cases and Researchers

- As noted in the previous EDE Este 311 example (Box 1), costing analysis is more likely to be successful if more than one source of cost data can be identified. Even when there are multiple sources of data, it is ideal to have diverse data sources even within each phase to increase the likelihood that all activities across the timeline and within the scope of the study are captured in the analysis.

- In addition to having data sources that can speak to different phases of the program, it is also beneficial to have data sources across the different levels of program management. One of the challenges that prevented the complete costing of the EDE Este 311 program was the fact that there were some costs to which our single data source could not speak. Pairing information from high-level managers and directors of the program with data from staff members involved in the various activities in day-to-day operation can be very helpful in closing gaps in activity identification.

recurrent training is included in a separate activity under Operation (below). Training costs include venue rental, per diems for participants, accommodation and travel for participants, cost of training materials development and cost of reproduction of materials.

Operation

1. **Program Management:** including time and resources spent on managing and maintaining the program at various levels. The main costs here should include staff hours involved in management of various levels of the program itself as well as management of program staff. The key line item in this activity is often staff time as a direct and recurrent cost.

2. **Equipment Depreciation and Maintenance:** including costs of additional equipment and personnel needed for maintenance of any technology or platform used for implementation of the open government program. This includes recurrent supply and labor costs.

3. **Monitoring and Evaluation:** including staff and volunteer time for the monitoring of the program as well as any meetings regarding the planning, budgeting and management of the monitoring

and evaluation of the program. This may include recurring supply, transportation and labor costs.

4. **Utilization:** including costs to clients, partners and beneficiaries involved in the utilization of the platform, where relevant. For example, in an e-procurement program, this would include any cost to procurers and suppliers that ultimately use the system to bid on government tenders. Costs associated with this activity would include any fees for participation in the programs as well as costs in staff time and resources incurred by program users or beneficiaries. Fees should be considered capital costs if paid at one time and recurrent if payment is required at regular intervals. All other costs should be considered recurrent.

5. **Recurrent Training:** including costs associated with training staff, clients, beneficiaries, and partners on the use of the program. Training costs include venue rental, per diems for participants, accommodation and travel for participants, and costs of reproducing developed materials. This should be considered a recurrent cost after the first year of the program, to accommodate staff turnovers, training new staff, refresher training and regular on-going training for clients, beneficiaries, and partners.

Box 4. Defining the Framework: Example from the Sierra Leone Open Data Program

The costing framework is an important starting point for data collection; however, the case of Sierra Leone reveals that the costing framework can and should be adjusted depending on the context. During our discussions with key stakeholders for the open data program, we learned that users of the portal do not incur any cost. As such, we were able to remove the Utilization costing category from the program-specific framework in this case.

Suggestions for Future Cases and Researchers

- Once the timeline and activities of the program are established, the researchers should identify if and how each of the activities in the timeline fit into the costing framework. Every case is different; some cases may not have all activities included in the framework while others may have key activities that are not present in the framework. Researchers should use the definitions of the various phases and activities presented in this chapter as a guide when categorizing relevant activities into the framework and should feel comfortable adapting this framework to the specific case they are analyzing.

4. Identifying Cost Categories of Open Government Programs

Once the key activities and resources are identified as described in the previous section, costs can be further categorized by inputs, such as salaried labor and transport.   Within a particular activity, there can be detailed line items for quantifying a resource use and valuing the resource to generate a cost per line item. While there are many ways to identify and categorize costs within a particular activity, we recommend identifying and describing these costs according to standard inputs that may be applicable to any activity. Table 2 provides an example of how to categorize unique, non-overlapping costs by implementation phase, input and activity.

In this section, we provide a list of key input cost categories found in open government programs. This is not an exhaustive list; depending on the open government program in question, there may be other key line items that should be considered that are not included in the list below. However, using this list as guidance may help researchers to take into consideration many of the costs that are associated with these types of programs.

1. **Salaried Labor:** the allocation of salaried labor to program-related activities including fringe and benefits, measured by the quantity of labor multiplied by appropriate average wage rates for different types of personnel.

2. **Consultants:** the cost of additional consultants hired and paid specifically and only for program activities.

3. **Contracts:** the cost of services contracted to external partners.

4. **Volunteer Labor:** the economic value of volunteer labor time spent on program activities, measured by the quantity of volunteer labor multiplied by relevant average wage rate for volunteers.

Table 2: Matrix of Cost Inputs by Program Activity

	Setup			Implementation				Operation				
	Planning	Advocacy	Platform Development	Training	Integration	Legislation	Promotion	Program Management	Platform Maintenance	Monitoring and Evaluation	Utilization	Training
Salaried Labor	■	■	■	■	■	■	■	■	■	■	■	■
Consultants	■	■	■	■		■	■			■		■
Volunteer Labor	■	■			■	■			■			
Rent				■								■
Transport		■					■			■		
Per Diem	■	■										
Materials				■	■	■			■		■	■
Overhead					■			■				
Equipment			■		■				■	■		

5. **Rent:** the cost of rental of venues used for program activities including trainings and meetings.

6. **Transport:** the cost of transport for program activities including meetings, training, and promotion. This includes costs of bus fare, plane travel, and the cost of vehicle depreciation, fuel, and maintenance for program-related activities.

7. **Per Diem:** the cost of allowances and honorariums given to salaried personnel and volunteers for program-related activities.

8. **Materials:** the cost of any printing or other production of materials used in the program such as training materials and manuals.

9. **Overhead:** the portion of total overhead costs attributed to the program such as building maintenance, utilities, telephone, and internet connections.

10. **Equipment:** the value including depreciation for all equipment, such as computers, printers, and furniture, used for program-related activities.

5. Conducting Data Collection of Open Government Program Costs

After identifying which activites and cost input categories are relevant for a particular open government program (using Table 2 above as a guideline), researchers will then need to collect data on the relevant cost categories. There are a variety of cost data collection methods that can be used to estimate open government program costs. The choice of method will depend on two key factors: (1) the purpose and perspective of the costing and (2) the availability of data (specifically to what extent data are available from implementing agents, the resources available to collect data, and the timeliness of data needed to meet decision maker's objectives). Typically, cost data collection uses a mix of data collection methods, which we describe in this section. The two main approaches are gross-costing and micro-costing methods.

A gross-costing approach estimates all relevant costs and is typically a top-down approach that draws from the collection and analysis of program expenditure data. A top-down costing occurs through capturing expenditures on the program through reviewing expense reports and interviews with program managers. This type of data collection helps surface and capture costs that cannot be directly observed by an outside analyst, such as indirect costs or costs associated with already-completed program phases. In this approach, total costs may first be allocated to specific open government programs, and then unit costs would be estimated by dividing total costs by the number of outputs or outcomes associated with program impact. In the absence of detailed program expense data, gross costing may also be done using tariffs and fees.

Micro-costing methods focus on a more granular accounting of inputs associated with each program activity and collects the quantities and prices of resources used for each activity. More often than not, micro-costing is a bottom-up process that relies on an ingredients-based (or activity-based) approach. Bottom-up costing captures costs through first defining each program activity and the main ingredients for each activity. Data collection then occurs though interviews and direct observations of people directly involved in program implementation. This level of costing is more accurate but significantly more time consuming.

In practice, these cost data collection methods (gross and top-down costing, micro and bottom-up costing) are complimentary and will often be used together. For instance, some data are easily obtained from expense report records and provide either total costs or quantities and prices for key activities (such as costs of hardware installation, software development, advocacy, training or overhead administrative costs). For other inputs, such as personnel time used, it may be required to use micro-costing techniques to measure the quantity and value of labor time.

Collecting cost information requires both primary and secondary data about the program itself. When conducting a costing study, there are generally four main sources of cost data: budget and expense reports, planning documents, interviews, and observations; each is detailed below. While these are generally the data sources required for a full costing of an intervention or program, other sources may also be useful (or required) depending on the particular program in question. Before data collection methods are selected, it may be valuable to conduct a rapid assessment of the program itself and the amount and types of cost data available.

Budgets and Expense Reports

Budgets and expense report documents include any record of the financial inputs already incurred or planned for the program thus far. These budgets and expense reports can come from various sources; depending on the program, some may provide more information than others.

One key source of budget documents and expense reports is implementing agents. Typically, open government programs are funded by donors and implementing partners, such as non-governmental

organizations (NGOs), working in partnership with key government partners. In low- and middle-income countries, it is unlikely that open government programs are funded by existing government financing. Government agencies may receive additional funds from donors or NGOs to participate in activities, and these costs should be captured in the donor or NGO budget or expense reports. As such, a good starting point for capturing costs is the project or program specific budget and/or expense reports from the implementing donor or NGO. There may be a single report or multiple reports depending on several factors, including the number of implementing agents and whether costs are incurred at a single or multiple levels of the governance system.

If the initiative includes government partners, these agencies may also be contributing personnel time, infrastructure, vehicles, equipment and buildings to the program; as such, researchers should ensure that they are including information on the costs of shared government contributions (resources). These data may be included in the budgets and expense reports of the implementing agents, but if this is not the case, it should be captured using information from relevant government sources, budgets or expense reports. Ideally expenditure data will capture actual financial outlays; however, these data are not always available. In these cases, budget approval and budget request documents may provide useful information.

In the event that other donors or external stakeholders have provided critical services or made donations of goods and services, it will also be important to obtain budget or expense data on all donations. For example, if there is an organization that was involved in developing systems or training materials used in the program but that was not directly paid a consulting fee by the government or donor funds, a share of the costs to develop those systems or training materials should also be included in the cost analysis.   In the case of donations for which there is no data, market values may be used.

It is worth noting that even clear and comprehensive budget and expenditure reports may not capture accurate expenditures in the cost categories captured in those reports. An example of this challenge is detailed in Box 5 below.

Planning Documents

Planning documents include any documents that note key activities involved in the implementation of the program. Planning documents often include the budgets that were estimated before or during the setup phase of the program and are generally used in creating the primary request to the department of finance or donor for program funding. These documents are very useful in identifying the key activities involved in the program, including the setup phase. They may also be particularly useful if the open government program being costed is not yet

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Box 5. Conducting Data Collection: Example from the Sierra Leone Open Data Progdram

Fixed priced contracts can be cost-effective for funders, though their total economic cost may be larger than anticipated. In conducting a costing analysis, it is critical to consider not just the contract value but also opportunity costs when vendors spend more time on the project than the cost allocated in the contract. In the case of Sierra Leone's first open data portal, the technical vendor's contract for portal's development was fixed for 50 hours labor; however, the vendor spent far longer than that in back-and-forth discussions with the government, and therefore lost money in the process. While this unexpected fInding was not a cost for the donor, it was important for us to capture this cost to provide an accruate reflection of the economic costs associated with this program

Suggestions for Future Cases and Researchers

- Often, looking at a budget documents alone does not provide all costs incurred in the implementation of the program, especially when conducting an economic costing. Conversations with key players and managers can help identify key costs and resources that were donated, such as volunteer hours or other costs not captured in budget data. In this case, we noted these additional hours spent on portal development as an opportunity cost in the volunteer labor category. Future cases should keep in mind that fixed-price contract fees may also have hidden opportunity costs which may only come to light during discussions with participants.

Box 6. Conducting Data Collection: Example from ProZorro

A key lesson from the ProZorro e-procurement platform case study is the importance of specific and granular interviews. In the case of ProZorro, we were very lucky to have contacts and key players who were bought into the study and willing to spend hours of time in conversation with us over the course of the study. As such, it was essential that our research team developed detailed and specific interview protocols to make these discussions as efficient and productive as possible, especially given that key players in open government programs often have little incentive to share timeline or cost data with the researcher and may be discussing activities conducted years prior to the study.

Suggestions for Future Cases and Researchers

- To make the time spent in interviews efficient, interview questions should be as specific as possible. In the scoping phase, the researcher should first identify any program documents that are available publically or through key informants. After analyzing these documents when available, the first interview should be with a key player involved throughout the process to help validate the timeline established though the literature review. In this first conversation, it is often helpful to leave questions open ended and have the interviewee talk through the entire history of the program. After the timeline and scoping are established, interview questions should be more targeted to specific cost data. Questions such as "what was the frequency of meetings related to the platform," "how many hours were each of these meetings," and "how many people attended and from which organizations" will provide more precise answers than a question like "can you estimate how much time you spent in meetings for the portal's management?"

- Often, it is difficult to keep conversations focused on cost data. For interviewees, it is often easier to focus on general activities or challenges rather than focus specifically on costs of activities. In the ProZorro case, we dealt with this issue by sending the timeline established in the scoping phase to interviewees ahead of time. This served to validate our timeline and help narrow conversation to specific activities within the timeline. Sending questions ahead of time also helped to keep the conversation focused using the interview questions as a guide and allowed the interviewee to reflect on the more granular level of cost data before the conversation with the researcher.

- Several interviews with volunteers in ProZorro were conducted with players who had not worked on the platform in several years. This served as a reminder that some costs are reliant on participant memories. As such, interviewees may not be able to identify the exact number of hours they worked or the exact number of meetings attended and with how many participants. In these cases, the researcher should ask for an approximation of time and hours spent and then triangulate this approximation with others in the program.

in place or if there are any changes to the program structure planned in the future, such as scale up. In the absence of program and other budgets, estimates found in these documents can be used as an estimate of costs.

Interviews

Interviews of key implementing agents and beneficiaries are essential for both context and costs. While budget and planning documents provide details on some of the key costs and components of the program, key informant interviews can help lay out the landscape of the program geographically, operationally and politically. Knowing this context and the various stakeholders involved in operating and financing the program is an important first step in costing analysis to determine the key activities for each phase of the program to be included in the costing framework. Interviews are also an important step in identifying who should be approached for budget and planning documents, both in terms of

key government personnel involved in the program as well as external organizations involved in program implementation and funding.

In addition to providing important contextual information to help define scope and activities, interviews are also crucial when estimating financial and economic costs. Interviews and the use of structured data collection forms may be the only way to capture information on the quantity of inputs used. This method is typically useful for capturing information on staff personnel time, equipment inventory and usage, and transportation modes and frequency of use. For example, interviews with key personnel may be one way to identify the number of hours or percentage of time spent on the implementation of a program. This is particularly key in identifying the percentage of time spent by upper management on the particular program versus other responsibilities and portfolios, an estimate that may be difficult to capture from budget or expenditure records. The same is true for staff that work across multiple programs, where the open government

program may be one responsibility among many others. The value of this method of data collection is described in more detail in Box 6, highlighting the case of the ProZorro e-procurement platform in Ukraine.

Observations

A final useful source of data is direct observation of the program and staff. Shadowing or following staff members involved in the implementation of the program at various levels can help identify the process of implementation, the key activities, and the line items to be included in the framework.

Observation, unlike interviews, is often more accurate as it is not as susceptible to contamination bias, recall bias and other issues involved with gathering secondary data. Observations are also one of the best ways to assess percent of staff (or volunteer) time spent on a project. Following and noting the time spent on the program by various types of staff on an average day can provide an accurate estimate of labor costs, and without the biases that may be associated with interviews. It is worth noting that one major drawback to direct observation is that this process is often time and cost intensive as described in more detail in the case of the EDE Este 311 program (Box 7).

Box 7. Conducting Data Collection: Example from EDE Este 311

Establishing costs broken down by cost category is essential for the application of this costing methodology because this allows the researcher to establish that all costs are being accounted for and no costs are being double-counted. However, in the case of EDE Este 311, we were unable to identify disaggregated costs of program activities. For example, EDE Este costs were identified by program component such as contact center, rather than cost of materials for the contact center. In this case, there were also sensitives around this level of cost data because EDE Este is managed through a private company and therefore has less incentive to share budgets and disaggregated data. Ultimately we were unable to identify distinct input-specific costs and thus unable to verify the accuracy of cost estimates.

Suggestions for Future Cases and Researchers

- When available, the best sources for costs disaggregated by input are itemized budget or expenditure documents. These documents are likely to be easier to obtain when the program in run exclusively by the public sector. When the private sector is involved in the open government program, getting buy-in for the costing work early with high-level program managers increases the likelihood that the researcher will have access to the data they need to conduct the analysis.

- When total costs are not captured by budget documents and top-down interviews, one can employ a mixed-methods approach by supplementing top-down data with bottom-up data collection, such as direct observation of operational activities, number of staff hours on the activity, and equipment. This type of costing, however, is more time consuming and would require significant time and resources to observe program activities. Our work on this case did not afford us the time or financial resources to invest in observational research, which could have been at least partially effective in overcoming data access challenges that we faced.

- As discussed in Box 3, data collection through conversations with staff across the different levels of management of the programs can help isolate costs and activities at a granular level. In addition, there are often staff members who are dedicated to specifically manage the budget and finances of the program. These staff members often have the clearest insight into line item expenditures of the program and are a great source of data collection of disaggregated input costs.

6. Conducting Data Analysis of Open Government Program Costs

After completion of the data collection, the final step of the costing methodology is the analysis of the data to produce final estimates. To implement the analysis, the researcher will need to input the key cost outcomes from the data collection, which will include measures such as total costs, incremental costs, and unit costs. After information and data are collected, they can be entered into excel worksheets and organized along costs by activity. To support researchers interested in conducting similar analyses of open government programs, we have developed an excel tool that can be used to automatically generate costs.

Before inputting data into the costing tool, the researcher should assign input and activity codes to data obtained from various sources and various organizations participating in open government initiatives to allow the data to be categorized by activity, input type, and funder. Researchers should expect to collect data from different levels of the system, as well as different implementing partners. In addition to coding costs by inputs and activities, all costs should be coded for the stages of implementation as shown in Figure 2. Ideally for data analysis, users will disaggregate quantities and prices of resources into separate line items when possible. In addition, data should be organized by level of program implementation (national, sub-national, community level) and by implementing organization. As the tool follows an ingredients-based methodology, the researcher should input costs as unit costs and number of units for each line item. Ideally, the cost data is already collected in this format. When that is not the case, unit costs can be estimated by dividing total costs by measures of project outputs and outcomes.

The second step is to clean and adjust costs for discounting, calculating capital depreciation, and annualizing and discounting one-time startup costs. At this stage, it is also critical to develop consistent allocation rules for shared program costs, such as salaried government labor and overhead costs. We provide guidance for cleaning and adjusting costs in Table 3 below.

The third step is to generate cost summaries by level and organization. Once the data is categorized into activity, cost category and number, the researcher can begin to generate total costs for each program activity and funder. In the excel tool, these would be costs totals presented in as cost summaries in each of the input tabs.

The fourth step is to aggregate costs across organizations and levels by activity, input and stage of implementation to generate a full picture of total program costs. Here the researcher would bring together costs across all activities of the program to generate a total cost figure. Depending on the purpose of the study, it may be helpful to generate total costs though the sum of each activity of the framework, as well as through summation of each cost category of the program. Both sums should generate the same total cost of the program, but would allow the researcher to present costs disaggregated in different ways. This provides the researcher different insights into the cost drivers of the program.

Table 3: Process of Calculation per Cost Category

Line Item	Units	Number of Units	Valuation
Salaried Labor	Estimate of salary and benefits	Percent of time spent on program activity or average number of hours or minutes per activity	Gross salary or gross salary per hour
Consultants	Estimate of salary and benefits	Number of consultants and number of days worked per consultant	Consultant fee per day
Contract	Cost of services	Number of services procured	Value of contract
Volunteer Labor	Economic value of volunteer labor	Percent of time spent on program activity or average number of hours per activity	Average wage rate or minimum wage
Rent	Venue rental per day	Number of rental days	Rental cost per day of venue
Transport	Cost of transport (costs of bus fare, plane travel, and the cost of fuel for program related transport)	Number of times transport used and/or number of trips or share of program vehicle allocated to open government program	Cost per transport per transport mode; vehicle depreciation; own vehicle costs related to fuel, maintenance, other per vehicle or trip
Per Diem	Cost of allowances and honorariums per day	Number of days	Per diem rates
Materials	Cost of printing per material	Number of materials printed	Cost of material printed
Overhead	Total overhead costs as building maintenance, utilities, telephone, internet connections	Percent of time spent on the program	Total organizational overhead costs or overhead rate (in percent)
Equipment	Value of depreciation for equipment, such as computers, printers, furniture	Quantity, type, brand, useful life years of equipment	Replacement value of equipment, annualization factor or discount rate

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Annex — Key Terms

Annual cost: The cost of an intervention, calculated on a yearly basis, including all the capital and recurrent costs

Annualized costs: The annual share of the initial cost of capital equipment or investments, spread over the life of the project – usually modified to take account of depreciation.

Average cost: Total cost divided by quantity

Capital cost: The value of capital resources which have useful lives greater than one year

Cost: A general term that can refer to the value of resources/inputs used to produce a good or service. This can refer to financial, economic, unit or average, or other types of costs depending on the inputs included. Costs may be incurred by providers, clients or society.

Discounting: A method for adjusting the value of costs and outcomes which occur in different time periods into a common time period, usually the present.

Economies of scale: Occur when long run average cost decreases as output increases. After minimum efficient scale is achieved, average cost may increase (diseconomies of scale)

Expenditures: The financial outlay that an agent (e.g., government, donor or individual) spends during a period of time for goods and services. Expenditures can refer to the entire sum required by a specified service or intervention, or it may pertain only to those outlays incurred by a subset of the organizations involved in delivering the service. Note that expenditure data are usually reported using the cash basis method of accounting; that is, no amortization to capital goods is applied. All capital goods expenditures are recorded in full as they are incurred.

Fixed costs: Costs that do not vary with scale (changes in the level of output). These costs would be incurred even if the output was zero. Examples may include items such as buildings and equipment but also may include administrative costs that consist mainly of personnel.

Incremental cost: The cost of scaling-up or adding a new service to an existing program.

Indirect cost: The value of resources expended by key players in program essential for program implementation.

Marginal cost: The change in the total cost if one additional unit of output is produced

Overhead cost: Cost that is not incurred directly from program implementation but is necessary to support the organization overall (e.g. personnel functions)

Recurrent cost: The value of resources with useful lives of less than one year that have to be purchased at least once a year.

Shadow price: The true economic price of a good that reflects its value to society.

Total (economic) cost: The sum of all the costs of an intervention or program.

Variable costs: Costs that vary with scale (changes in the level of output). Service delivery personnel costs are usually considered variable, since a substantial scale-up of the program will require more staff, though small increases can often be accommodated within the existing staffing pattern.