



Metrics for Entrepreneurship Centers

A Guide for Practitioners

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Innovation Policyworks

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Metrics for Entrepreneurship Centers: A Guide for Practitioners

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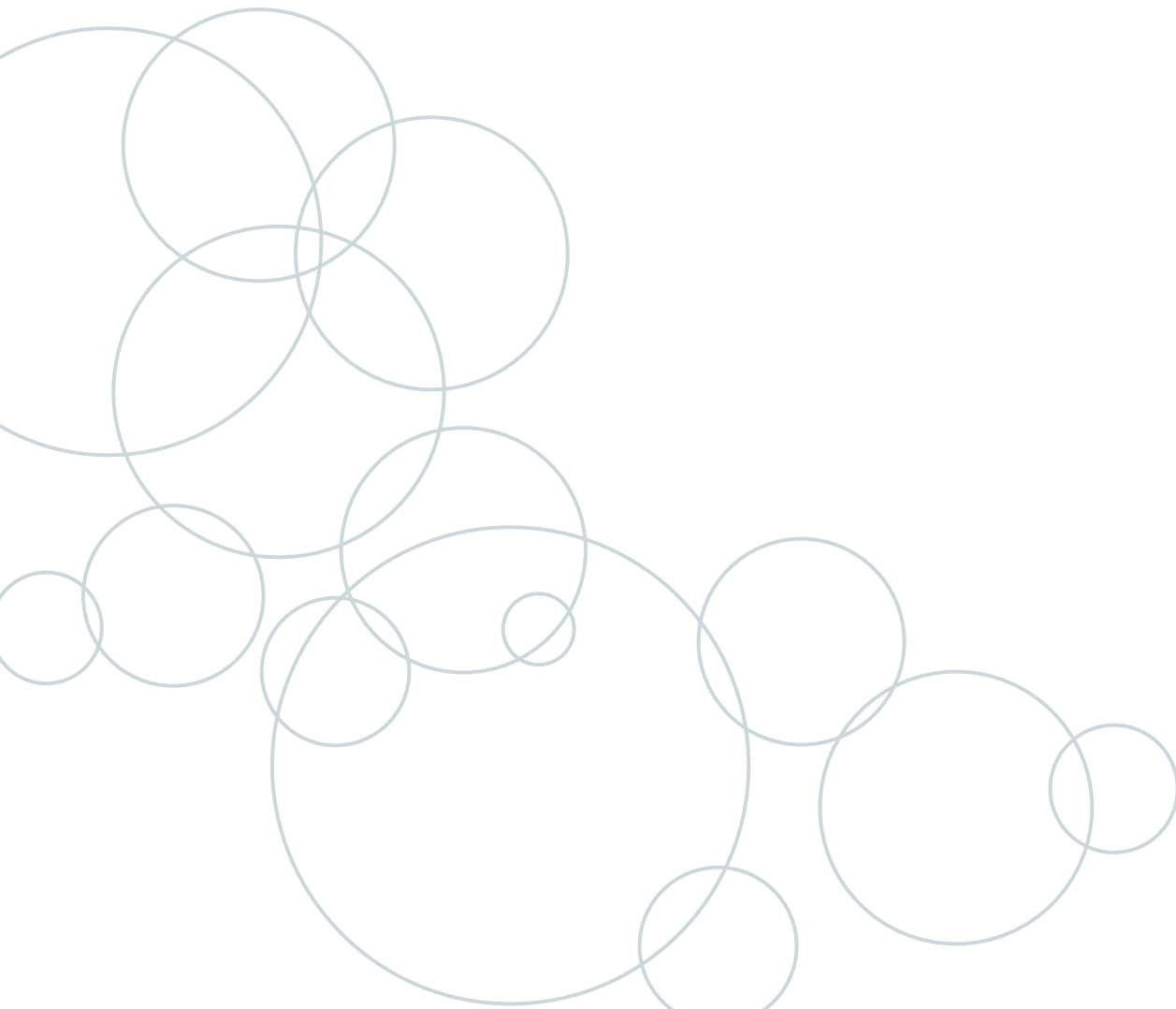


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Preface

As a young incubator manager, I clearly remember being challenged to prove that the assistance we provided to client companies enhanced their success. It wasn't enough to talk about incubators in general; I needed to be able to demonstrate the value of our work in order to maintain our funding. A few years later, as the director of a statewide entrepreneurship program, I needed to be able to document the outcomes of our initiative, and prove the impact of the significant state investment that had been made.

I suspect that many managers of entrepreneurship centers – incubators, accelerators, coworking spaces and other entrepreneurial support organizations – share my experience. Being asked to evaluate, monitor or measure the results of our programs seems like an enormous task. Perhaps this is because most of us don't have the training to even know where to start, never mind being sure of how to ensure that the results show the kind of success that we believe we're having.

The organizations I worked for got through the challenges by instituting an annual evaluation process performed under contract by a local university research center. But, I decided I want to know how to do this myself, and that was a big motivation for me to go to graduate school in public policy at the University of North Carolina-Chapel Hill.

This book is designed to give program managers who support entrepreneurs the basic information that can enable them to either undertake an evaluation themselves or be an informed consumer of research done by others. My intent is to share what I learned in graduate level evaluation research design classes in a way that is accessible and useful. You will learn:

- How to frame your stakeholders' questions into a cogent research project
- How to identify the most relevant metrics
- How to capture the data you need
- How to analyze the data and present it

Throughout the book, we have provided hints, examples and resources to make your journey easier. If, after reading this material, you want to learn more, a short list of authoritative evaluation resources is included in Appendix C.

Happy evaluating,

Catherine S. Renault
Brunswick, Maine

I. Why Evaluate?

The first time someone asks you for the outcomes of your entrepreneurship center, your first reaction may be concern, fear or something in between. “Why do they want to know?” you might ask. “How am I going to get this done? I’m already too busy,” is another reasonable response. “What are their expectations? What does success look like?” may be other questions you have.

Regardless of your instincts, being able to tell your story means being able to document your results. If someone is asking the question, it probably means you haven’t yet figured out how to collect, analyze or communicate the impacts of the work you do in your entrepreneurship center. We recommend you consider this an opportunity to take care of an inherent program task: understanding and communicating the results of your work.

In the for-profit world, results are usually captured through an accounting system. Revenues, expenses and the bottom line show how the business is doing. Comparing these numbers to budget demonstrates a company’s progress against its plan. By projecting these numbers out into the future, a company can tell a story about its anticipated trajectory, potentially gaining investors or raising debt capital to help reach business goals.

In the nonprofit and/or government world, especially one like entrepreneurship with public policy goals, an accounting system can track and measure the organization’s financial sustainability, but rarely does it give information about how the organization is doing relative to its mission or goals.

So, the process of evaluating your program as described in this book allows you to answer the important question: Are we achieving our mission?

Different stakeholders want different things

All nonprofits and governments have stakeholders who support the program financially or as volunteers. These can be partners, contractors or community members who have stakes in the program’s mission.

Common stakeholders are state, regional or local government entities, such as economic development organizations. Other stakeholders may be legislators or city councils that have program oversight or provide funding. Universities and community colleges are common stakeholders for all types of entrepreneurship centers. Sometimes industry groups like Chambers of Commerce or trade associations are stakeholders, as are partners that serve small businesses like Small Business Development Centers or Manufacturing Extension Partnership Centers (in the United States).

Evaluation can be a challenge if a program’s stakeholders have different desired outcomes. This can occur if you have a variety of funding sources, for instance, with differing objectives. Or, it can occur if your program becomes politicized and desired outcomes suddenly change.

An important outcome of the evaluation process itself is to illuminate clearly the outcomes desired by various stakeholders, and to identify alignment and consistency among them. The evaluation process may also uncover inconsistencies in stakeholder expectations, which will help program staff manage the situation better.

Differences between evaluation, audit, benchmark, and return on investment

When stakeholders ask questions about a program, they often use imprecise language. Sometimes that is because they don't know the subtle implications of different words. It's important to understand exactly what stakeholders are asking, in order to best answer their questions.

For example, if they ask for an evaluation of your program, this suggests not only collecting data on outcomes, but also tying those outcomes to your activities – in other words proving causality. Is your program doing what it was designed to do? However, the stakeholders may not understand that this language implies a more intensive study in order to prove causality.

More often, stakeholders ask questions tied to efficiency and effectiveness. Efficiency means how much a program is accomplishing per resource. A common version of this question is “How much does it cost this program to create a single job?” Effectiveness, on the other hand, is related to evaluation – is your program doing what it set out to do—and implies the need to address causality.

A related question is “What is the return on investment?” Often stakeholders who ask this type of question are trying to compare various economic development programs to each other with the goal of eliminating the lowest performing ones. They define the return differently, as well. In some states, it's defined as tax revenue returned to the state compared to the state's appropriation. In other states, the quantitative results of an economic impact analysis are compared to the investment. Take care in these situations, as not all economic development programs have the same goals, and so comparing the efforts involved ignores broader issues, such as the importance of entrepreneurs in the ecosystem.

Some stakeholders will ask for an audit. This is quite a different question, relating more to financial management, and whether expenses are justified. In rare circumstances stakeholders may want to audit outcomes, ensuring that clients have indeed achieved what a program claims they have achieved.

Benchmarking is another variant of the comparison question. How is your program doing compared to others like it? This is an extremely difficult question to answer in many cases simply because the data do not exist nationally on all entrepreneurship centers. So, you cannot simply go to U.S. Census Bureau tables and see what outcomes other programs have achieved. Nor is it simple to ensure that you are comparing your program to similar programs. You can, however, benchmark your state or region or city to other similar areas in terms of demographics, and potentially the size of your entrepreneurial community.

Regardless of the question stakeholders ask, it is important that you ask for clarification, learn specifically what the questioner wants to know, and find out how they intend to use the answer.

Common Measurement Requests

Measurement/Monitoring: What are the outcomes of the program? How big are they?

Impact Measurement: Calculating the effect of the program on the economy.

Program/Project Evaluation: What outcomes did the program/project cause? How are those outcomes related to the goals of the program?

Why do metrics matter?

Often people say, “Why do metrics matter? Isn’t that like driving a car looking through the rearview mirror?” Good question.

There are many reasons to use metrics to collect and analyze data in the management of your program. Three important reasons are as follows:

1. **Metrics will help you manage your work.** Having data about your program activities and outcomes can help you figure out which of your actions produce the outcomes you desire and which do not. The for-profit corollary is knowing which products are profitable and which are not. Metrics can also help you measure the effectiveness of your staff and your partners, providing an important feedback loop to help you deliver better quality products and services.
2. **Metrics help you communicate with your stakeholders.** Being able to demonstrate positive results can help document the value of a program, and thereby the importance of stakeholders’ continued support. The for-profit corollary is showing an income statement to a bank or investors, in order to document the path to achieving their objectives – getting paid back or having a successful exit.
3. **Metrics help justify requests for support.** Outcome data are essential to proposal writing for grants, as well as making the case to potential sponsors and new stakeholders.

No one can guarantee that being able to provide data-driven answers to questions about an entrepreneurship center’s outcomes, will ensure its continued support, but it is more common for programs that lack performance data to be closed than it is for programs whose activities are well documented. The best example is the Ben Franklin Technology Partners program in Pennsylvania, which has produced regular reports¹ about its outcomes for over thirty years and has retained significant financial support from the Commonwealth of Pennsylvania. It remains one of the most respected and successful entrepreneurial support programs in the country.

The Ben Franklin example illustrates another critical aspect of metrics. Programs should do evaluation on a regular basis, documenting results year after year, and showing a long-term track record of success. These types of longitudinal data sets are extremely powerful, since they allow organizations to show impacts of external events such as recessions and recoveries, rather than guessing whether a single year’s results are representative of all years. Those who view evaluation as a single event also miss out on the opportunity to use the data for internal program improvement, and to strengthen the support of existing stakeholders over time.

**Evaluation is
a process, not
an event.**

What will it cost? Is it worth it?

For entrepreneurship centers that watch every penny of their expenses, evaluation and metrics may seem like an unaffordable luxury. But given the downside of not having outcome data, that is a shortsighted approach.

The cost of evaluating an entrepreneurship center depends entirely on the program scope, necessary data and the evaluation approach. Luckily, with inexpensive survey tools available online, the cost of collecting data is dramatically lower now than it was even ten years ago; this used to be the most expensive part of the process.

If you design your program with evaluation in mind from the beginning, this work can be a seamless part of your everyday activities. When evaluation is an event, and you have to do the work all at once, it can be burdensome.

Is it worth it? What's the value of having products and services that are consistently improved? What's the value of having supportive stakeholders? What the value of being able to explain your program and its outcomes to potential supporters? When you look at it this way, evaluation and metrics are essential to successful program operation.

¹The Ben Franklin Technology Partners 2015 Impact Report is here: <http://benfranklin.org/impact2015/>.

II. Understanding Your Own Context

This section is designed to help you get started with an evaluation process. Use this section to assemble the building blocks for the process. Start by assembling your program's key documents, such as strategic plan(s) and governing documents. If a government started your program, you will want to have a copy of the statute that lays out the mission and objectives of your work. Plan on having a detailed conversation with your key stakeholders to understand their perspectives as well.

What is your mission?

Before beginning any evaluation process you must understand your program's mission. What is the purpose of your organization? Only then will you be able to decide what to measure in order to understand how you are performing against that mission.

For some organizations, this is contained in legislative documents that helped start the program. Often this is included in a statute, or occasionally in legislative testimony given by proponents of your program. These documents may be at the state level, or at a municipal level, e.g. city council or county government.

Another place to look for information relating to your organization's mission is in the original documents that were prepared when the program began. There likely is a feasibility study, business plan or proposal that outlined the activities of the program and why the program was necessary.

If your program is more than a few years old, the original mission may have been altered by subsequent events, so you will want to look at current strategic plans, board minutes and similar documents.

If none of these exist, and there is any question about what the mission is, a strategy session with your board and/or stakeholders is a good next step. Without agreement and alignment on the mission, further progress on evaluation and metrics is challenging.

Sample Mission Statements

Our goal is to accelerate technology development and commercialization and to create high-paying, sustainable Pennsylvania jobs.

Ben Franklin Technology Partners

Support technology entrepreneurship and emerging technologies by marshaling the resources of NC State University and the surrounding community, and teaching early-stage technology entrepreneurs how to succeed, grow, and thrive.

North Carolina State Technology Incubator at Centennial Campus

Cultivate an eco-system of like-minded Entrepreneurs, Mentors, Investors and solution providers that establish Silicon Beach as the hottest hot bed of startups surpassing Silicon Valley.

Cal-Xelerator

To diversify and strengthen the economy of northern Arizona by transforming local start-up companies into successful business ventures.

Northern Arizona Technology and Business Incubator

Another issue may be that the mission is too general or vague. It might say, “to create jobs” or “for the economic benefit of our state.” In these cases, talking with your board and stakeholders would be beneficial as well. Does it matter what kind of jobs are created? Are you supposed to be creating high-quality jobs in the technology sector? Or, are you supposed to be supporting the local foods industry? Is your mission to foster spinouts from the university or to support Main Street retailers or artists?

A good tool to use when having these discussions is to continually ask, “Why?” Ask your stakeholders to dig deeper and explain their thought processes.

Stakeholder: The mission of your program is to create good jobs.

You: Why? Can you tell me more?

Stakeholder: We want jobs for the citizens of our city.

You: Why? Can you tell me more?

Stakeholder: Because the manufacturing plant closed, and we need to have new companies to take its place.

You: Why? Can you tell me more?

Stakeholder: We’re going to have to transition our economy from manufacturing textiles to manufacturing medical devices that are being invented at the university.

You: Why? Can you tell me more?

Stakeholder: The manufacture of medical devices will yield many jobs that will pay higher than the average wages in our area.

You: So, if our program supports medical device manufacturing companies that are based on university technology and have jobs that pay more than the average wage, we will be successful?

Stakeholder: Yes, of course. That’s what I said in the beginning.

What is the scope of your activities?

Another consideration when planning your evaluation process is the scope of your program. Do you operate in one location or several? Do you have one product or service or a variety of offerings? Are the offerings distinct so that they have very different objectives, or are they all targeted to the same clients? How many clients do you have? How long do you work with them?

These questions all get to the question of scope. As we will discuss later, programs that serve hundreds of companies through a multi-location effort will have a different data collection strategy compared to small, single-location programs. If you need talk to only ten companies or entrepreneurs to understand your impact, you are facing an entirely different project than if you have a very large and geographically diverse program.

What is the objective of your evaluation?

As discussed in the previous section, clearly understanding the objective of the evaluation will result in a more successful metrics project. Questions to ask the sponsors of the evaluation include:

- What do you want to know?
- What will you do with the information?

For instance, if the objective of the evaluation is to decide whether to expand, continue, improve or curtail your program, you must rigorously measure the impacts and be prepared to defend the linkage between your work and client outcomes. On the other hand, if the objective is to choose among various elements of your program, perhaps for further investment, you must design an evaluation that is detailed enough to distinguish between results from one element versus another. If you are being asked to demonstrate the impact of your program, you will need to include an economic impact analysis, while a request for your return on investment calls for a cost-benefit type of analysis.

You should probe your stakeholders as much as possible to understand whether their desire for an evaluation comes from a basic belief in “good government” – meaning they want to know that your program is meeting its goals – or if someone is questioning whether there is a need for the program at all. Sometimes requests for evaluations come because there is a belief that your program is either ineffective or not cost effective. The more you understand about the motivation, the better.

If the motivation for the evaluation is your own desire for good metrics, then you have more latitude in designing your research. But making informed guesses about what types of questions your stakeholders might ask you in the future will allow you to prepare for most inquiries.

Who is the audience?

This is another critical question. If you have primarily an internal audience, meaning your board and your management team, then you may be planning to focus on the efficacy of your different product offerings.

In contrast, a legislatively mandated evaluation should be more formal, and as rigorously as possible deal with questions of causality.

Some stakeholders, especially those with a business background, often ask questions like, “What’s the return on investment?” and you will want to understand what kinds of comparisons they intend to make with the data you collect.

Is this a single event or a process that will be ongoing?

This is another critical question. If you envision an ongoing process, then you need to spend more time thinking about how you will collect data, because you will want to be able to do it over and over again, with a consistent methodology. You should collect longitudinal data (that is, year after year, or month after month) in the same manner, from the same sources, to the greatest extent possible.

Will you use in-house resources or hire a consultant?

Many entrepreneurship center managers face the decision of whether to make program evaluation an in-house project or to use a consultant. There are pros and cons to each approach.

It's instructive to think through the different phases of an evaluation before making this decision. The first phase is to **plan the evaluation**. Some decisions, like what indicators to use (Section III) and what methodology to use (Section IV) may seem daunting, and could be outsourced relatively easily to a professional with experience in evaluation research design. Outsourcing this one step can potentially protect you from innocent errors of design that could make the whole project inconclusive or biased.

On the other hand, your evaluation approach may be so simple because of the work you do that a full-blown evaluation plan may seem like too big an investment. So, a single location incubator with ten clients is likely to decide to collect data from its clients quarterly as part of a regular review cycle, and would not need a complicated plan.

The second phase, **data collection and analysis**, is something many programs successfully undertake themselves, especially if the data is being collected through a survey. However, if a more difficult methodology is planned, such as an econometric model, then using a consultant may be wise.

The last phase, **communications**, should be an internal activity. Talking about your success stories, both individually and in the aggregate, should be part of your ongoing activities. You should broadcast your results on your website, on social media, in annual reports and through news releases. Telling your story is essential to gaining credibility and building up the entrepreneurial ecosystem.

What is the budget?

This last question is critical because some methods are very expensive (and produce extremely useful results). Costs to consider include:

- The time to manage the project
- Research design, data collection and possible costs to acquire data from private sector providers
- The cost of analysis (cost benefit, economic impact, etc.)
- Costs associated with communications including brochures, flyers, websites and public events

Hint

Stakeholders are sometimes skeptical about data collected directly by programs. Some think that staff may alter the data or delete data that is inconvenient or unflattering. Others feel that clients will not tell the truth when talking to program managers, and may feel they need to exaggerate their outcomes.

These concerns may sound far-fetched, nonetheless critics, especially in political environments, often articulate them. Some programs that excel at self-evaluation have lasted for decades, while other quality programs have shut their doors over these types of concerns. If you don't have the trust of your stakeholders, any program evaluation (whether done in-house or by consultants), will be viewed suspiciously. Programs that have political favor will survive regardless of their evaluation process.

What are your program's unique circumstances?

As you can imagine, every evaluation ends up being unique. Every entrepreneurship center's circumstances are singular, the questions being asked often include local contexts, the audiences and stakeholders are contextual, and resources are highly variable. While there are a discrete number of methods commonly used for program evaluation (discussed in Section IV), and common indicators used for entrepreneurship centers, it's also important to understand what makes your situation unique.

Every evaluation design is a tradeoff. A perfect evaluation approach may simply be too expensive to undertake, or the data collection effort impractical. An important part of the conversation between program management, evaluators and stakeholders is how to attain the best possible evaluation given practical constraints, especially budget. During the planning process, involve stakeholders so that they understand what elements of their desired evaluation might need to be postponed or modified in order to be affordable or realistic.

III. What Indicators Are Right for My Program?

Now that you've assembled your statute, articles of incorporation, strategic plan, board minutes and any other documents that contain information about your program's mission, you are ready to undertake one of the two central planning tasks: figuring out what are the right metrics for your program. Essentially you are deciding what type of ruler you will use to measure your results. When you have completed this task, you will be ready to move on to the second planning task: deciding what methodology to use.

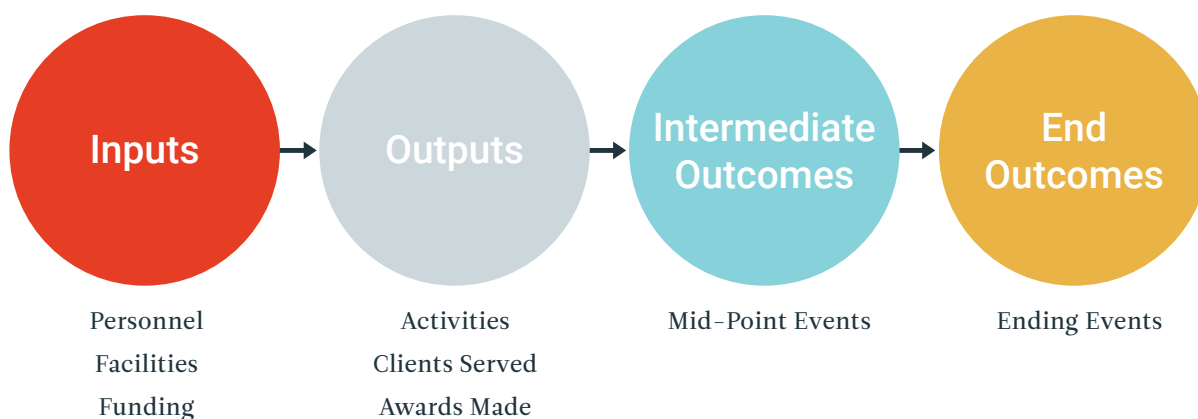
Program theory

While most of us have an inherent understanding of why we do the work we do, making these assumptions explicit is essential for an effective evaluation. Using a method called program theory, the evaluator describes the rationale for the program and its expected results.

Evaluators distinguish among inputs, outputs and outcomes.

- **Inputs** are operational resources such as funding, staffing and capital items like buildings and equipment. From the public perspective, these are the investments that are being made to achieve the goals and mission of the program.
- **Outputs** are the work that you and your team accomplish with the inputs. Think of these as *internal* activities or internal accomplishments, such as client assistance, grant making and educational programming.
- **Outcomes** are the *external* results achieved by the clients you help, such as jobs created, or sales revenues earned by clients. Some are **intermediate outcomes**, such as new venture capital secured by or patents awarded to client companies, indicating that clients are making progress toward desired outcomes.

A logic model links together inputs, outputs and outcomes to describe how your program is intended to work.



In a way, this is the business model for your program. It describes what resources you have to work with, what activities you and your team intend to do, and what results your clients are expected to achieve. Ideally, the end outcomes should link back to the mission and goals of your program.

All types of entrepreneurship centers – incubators, accelerators, coworking spaces and other entrepreneurial support organizations – tend to have similar goals and missions, usually related to economic development. The goals often are focused on job or venture creation, although there are many variations based on geography, targeted industries, and the segment of the emerging and small business economy the program serves.

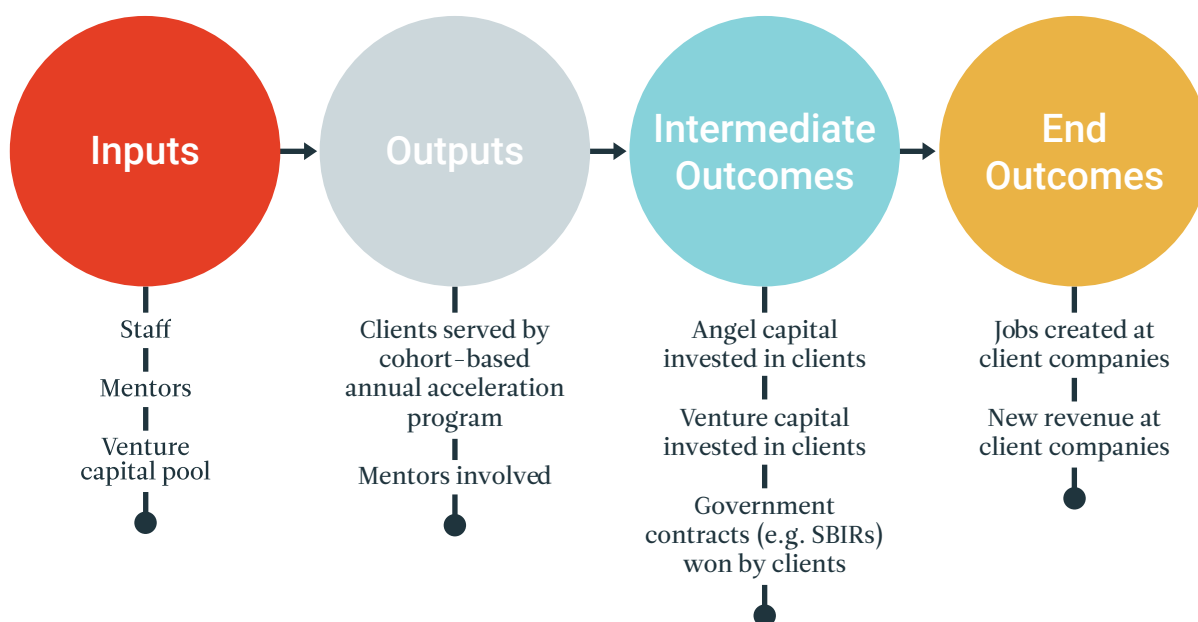
Inputs also are varied, depending on the amount of funding and staff available, whether or not there is a building and/or office space available, and the extent of the pool of mentors or other partners who help provide the support to the clients.

Outputs often include things like number of clients served or number of events hosted (such as seminars, lunch and learns, or other “one-to-many” learning or training sessions). Outputs can include specific programs that operate monthly or annually, such as an annual cohort approach to acceleration.

Outcomes include things like jobs created by the client companies; various types of funding raised, including debt, angel and/or venture capital and grants; and indications of progress such as patents applied for or awarded, or progress on regulatory approvals.

Sales revenue is a great outcome to show, providing that clients will share this information. Sales outside your state and/or country are also useful to document, since these provide greater economic impact than local sales because they introduce new dollars into the local economy.

Here’s an example of a logic model for a cohort-based accelerator program.



The key thing to remember is that inputs and outputs happen within the program, while outcomes happen to your clients. While measuring your activities is useful, it does not fully respond to requests for information about the impact of your program.

The key thing to remember is that inputs and outputs happen within the program, while outcomes happen to your clients.

Specialty programs

If your program is focused on a particular sector, you have the opportunity to expand the usual definition of outcomes for an entrepreneurship center to encompass those related to the strength of a particular sector. For instance, a biotechnology incubator might want to track intermediate indicators that show the progress of clients in obtaining Federal Drug Administration (FDA) approvals. Manufacturing incubators may want to track equipment purchased as a way to document progress towards full production capability. Food-related programs may want to document outputs related to quantities of food sold (e.g. kegs of beer) or the number of local farmers involved in the supply chain.

What makes a good indicator?

In order to assess your work, you need to figure out how to capture information about each of your particular inputs, outputs and outcomes. Using the logic model, you have discovered what you want to measure. Next you will get very specific in identifying the indicators you will use to do the measuring.

Good indicators share five attributes:

- **Valid** – it measures what it is intended to measure
- **Reliable** – it measures the same way each time, e.g. a ruler
- **Understandable** – it is easy to explain
- **Feasible** – it is possible to collect the relevant data
- **Unique** – it does not overlap another indicator

While each of these attributes is important, in practice, feasibility is a huge factor in choosing which indicators or metrics to use. Especially if you expect to conduct the evaluation process on an ongoing basis, you want a source for the indicator that is stable and reliable.

See chart on page 15 for some common indicators for economic development programs such as entrepreneurship centers.

Note that sometimes what we want to measure and the indicator are not the same thing. For instance, how do you measure quality of life or a good job? Often, the indicator for quality of life is something like per capita income for a state and an indicator for a good job is defined as a job paying at least the median income for a state.

Hint

A data source that is a one-time survey conducted by a partisan campaign may be neither reliable nor repeatable enough to be feasible. Federal data sources such as the U.S. Census Bureau, on the other hand, are valid, reliable and feasible.

Some indicators or metrics are proxies– that is they are as close as we can get to the real thing. A good example is the use of “new patents awarded” as a proxy for “new knowledge,” since we can’t measure new knowledge directly. We know that patents are a close proxy, but not a perfect one.

The work of identifying indicators will also help with understanding what stakeholders really want. Look back at the mission statements from actual entrepreneurship centers and think about how you would measure if a place is the “hottest of hot places for startups.” Asking, “How should we measure this?” is a great way to open a dialogue with your stakeholders and board.

Some common indicators for entrepreneurship

Luckily, many of the indicators commonly used to measure entrepreneurship centers are readily available, especially those that come directly from your own operations and your clients.

Operational data, especially for inputs and outputs, can be simple to collect if you already keep good records. Determine what data you need to collect by deciding what you want to report on. For instance, you could start by recording who attends your events, how many inquiries you get and how many hours you spend counseling clients. Keep good records on each client you have, and the interactions you have with them. Customer relationship management software is a good tool to use, such as Salesforce² or incuTrack³.

You can ask your clients directly about the number of employees they have, although this is complicated by questions about whether each person is full-time or part-time, and what to do about independent contractors. Imagine trying to count the number of Uber employees. Do you count all the drivers who are part-time contractors? Document what definitions you decide to use, and be consistent when you ask questions.

You can also ask your clients about funding received, and from whom. Some of this information is public, such as SBIR awards, and you can verify it on public websites⁴.

Example Outcomes	Example Indicators
Quality of life	Average annual per capita income
Economic growth/development	New companies started, new jobs created, retained jobs
Faculty innovation	Peer-reviewed publications, intellectual property disclosures, patent applications
Increased follow-on funding	Number of SBIRs and STTRs received and dollar value; dollar amounts of angel and venture capital investments secured
Firm innovation	Number of startups; patents applied for or received; new products introduced
Firm growth	Increases in business outcomes: revenues, employment, average payroll

² <https://www.salesforce.com>

³ <http://incutrack.com>

⁴ <https://www.sbir.gov>

IV. Sources of Data: Methods

Before you start to think about methods, you should have written down the questions you want to answer, identified the audience for your answers, and have drawn out your logic model. You also want to know what indicators you need to collect data for. Then you can start thinking about what methods you will use to collect the data.

There is a definite interplay between the question(s) you want to ask, the type of program(s) you want to evaluate, and the methods you can use. Some methods are suited to only certain types of programs, while others are simply too expensive or too complicated for everyday use.

Key factors to consider when choosing methods:

- How many program participants do you have? You will need to decide how to define a client or participant – is it a company or entrepreneur who attends a seminar, or is it someone with whom you have a deeper, contractual relationship?
- Do you want to know just the immediate results of your work, or are you interested in following your participants over a longer period of time?
- Are the data you need already available from another source, such as administrative records or data the participants are required to share with other agencies?
- How much time can you spend on this project and how many resources can you devote to the process?

Hint

One benchmark many use to define a client is 8 hours of service and/or a contract (e.g. a service agreement or lease). Having too many participants in your data set who have only a small relationship with your program can negatively impact your results.

Keep in mind that every decision about which method to use is a tradeoff between cost, schedule, data availability and appropriateness.

We will cover seven possible methods: three are quantitative (providing numbers and percentages as answers), three are qualitative (meaning you will get more nuanced, prose-like information), and one is a mixed approach.

The three quantitative methods are:

- Surveys
- Econometric and statistical analyses
- Bibliometrics

The three qualitative methods are:

- Case studies
- Social network analysis
- Expert judgment

The seventh method is a mixed approach.

Surveys

Surveys are a popular data collection method, especially now that internet tools like SurveyMonkey⁵, Google Forms⁶ and Zoho⁷, among others, are available either for free or a modest fee. Online survey tools eliminate some of the tedious parts of the data collection process such as photocopying and mailing the survey and entering response data. This makes the cost of surveying very low. Sample survey questions are included in Appendix A.

Pros and cons

Surveys are good tools to use if:

- You have a large (i.e. more than ten) but manageable number of participants
- You have a deep relationship with the participants, making them more likely to complete the survey
- The questions you want to ask (i.e., the metrics) are related to information they likely have on hand, e.g., number of employees

Surveys allow us to learn about the beliefs, outcomes and activities of relatively large numbers of people and organizations. If the survey is done correctly (i.e., with a large enough representative sample and without bias), you can extrapolate the data and generalize from it. If you survey all of your clients, then you report the sum of the responses, and you would not extrapolate.

From the point of view of entrepreneurship centers, the best thing about surveys is that you can capture information from your clients long before their information shows up in more formal data sets, such as those from the U.S. Census Bureau or other federal sources. If you had to rely on these external sources, the outcomes that your clients have might take years to show up.

Surveys are not as useful if:

- Your participants don't have access to the internet or are not experienced users of computers, e.g., young children, homeless people and some senior citizens
- The data you need are complicated and nuanced, such as describing an entrepreneurial ecosystem
- Security and/or privacy concerns would keep participants from answering the survey, e.g., asking about illegal or illicit activities

One caution about using surveys is that many individuals and companies are suffering from “survey fatigue,” meaning they feel that they are asked to complete too many surveys, and they may be reluctant to spend time to provide you with information.

Hint

To increase your chances of a response to your survey, let participants know in advance that a survey is coming and that it is important to the program that they respond. And, minimize the number of questions that ask for information you already have. Some programs tell clients in advance of program admission that answering the survey is required.

⁵ <https://www.surveymonkey.com>

⁶ <https://www.google.com/forms>

⁷ <https://www.zoho.com>

Tips

Work through the wording of the questions on the survey carefully. You should include one or more questions related to each of the indicators identified in the previous section. Be sure you are clear in what you need to know, and test the survey with a subset of the intended respondents to make sure they understand the questions and how to respond. Also, include demographic questions (e.g., age of company, industry, which of your programs they used) if you don't already have that data. If you do have it, add it to the data set afterwards. As mentioned elsewhere, don't ask for information that you already have on hand.

To get the most out of a survey, you must make the following key decisions. In most cases, there is no right or wrong answer. However, it is critical to document your decisions and carefully word your survey questions – you want to be able to replicate your results, and to collect data over time in the same way. This is critical if you see any value in having a set of data documenting your results year after year.

1. How big will your survey sample be? While you can survey just a few of your clients and extrapolate the results, you can also survey all of them (a “census”) if the numbers are manageable. The latter is recommended for entrepreneurship centers because it is highly likely that you will have a small number of home runs, a small number of failures, and a lot of clients with middling results. If you sample your clients, you might not capture the results from the home runs, while a “census” approach, even without 100 percent participation, is more likely to reflect your success stories.
2. What unit of analysis will you use? Are you looking at the results for a company or of a specific project? In most cases you will want to see how all the help you have provided has assisted the company overall. However, if your program interacts with clients through a series of projects with well-defined scopes of work, you might also want to be able to see how certain products or services are delivering results. In this case, you might want to survey each client at the end of each project.
3. How often will you undertake the survey, and when will you do it? Annual surveys are the most common, while some entrepreneurship centers conduct surveys every quarter. Some survey only every other year or every five years. A related question is how long does a client stay on the list of survey recipients? For many programs, it is essential to keep surveying a company for three to five years after it last received assistance, because it may take some time to realize the results of the assistance.

Hint

Another solution for determining the impact of specific programmatic elements is to track which products and services each company uses, and then use statistical tools to distinguish the contribution of certain programs.

Hint

There is a balance between how often you survey clients and the timeliness of the data you want. Many clients will forget after a year or two that your program was important to them, so capture their information soon after they finish. On the other hand, surveying clients every month is probably too often and could be perceived as burdensome.

Econometric and statistical analyses

Another quantitative methodology is to use existing data, whether your own or government data, to perform econometric and statistical analyses. For example, if you run an SBIR matching program for companies in your state in order to increase their chances of winning a federal award, you could use data from the U.S. Small Business Administration and other federal agencies and your own operational data to calculate the impact of your program.

In some states, you may be able to gain access to employment data that individual companies provide through unemployment insurance reporting (ES 202). This is often not available at the individual company level because of privacy concerns, but you may be able to get aggregate data on your clients. This could be substituted for survey data on employment.

Pros and cons

There are two extremely good reasons to use econometric and/or statistical analysis. The first is that you can test the strength of the relationships between different indicators. You could discover, for instance, that companies that participated in your accelerator program were twice as likely to gain venture capital investment as those who received SBIR assistance. This sort of information is extremely helpful to you as a program manager. While you might be able to discover the amounts of venture capital or SBIR wins from a survey, you would not be able to quantify the likelihood without statistical analysis.

The second reason to use this method is that it is statistically defensible, especially for cause and effect. You will be able to demonstrate that your services were the cause of certain outcomes. This methodology allows you to eliminate other explanations of the outcomes you have documented, something that a survey alone cannot do. (See discussion of causality, below.)

However, there are significant difficulties with this methodology. First, this method is data intensive, requiring a large number of participants to be statistically significant. So, if you have only ten clients a year and have been in operation for only one or two years, you won't have enough cases to get the statistical results you want. You will be able to document your outcomes through a simple survey, but you will not be able to prove that your program caused the outcomes to occur.

Selected Public Secondary Data Sources

Numbers of companies, employment by industrial code (NAICS):

- U.S. Census Bureau, Annual Survey of Entrepreneurs, 2014 only
- U.S. Census Bureau, County Business Patterns

Income, by state:

- Bureau of Economic Analysis, State personal income
- Patents:
- US Patent and Trade Office
- Google Patents for citations

Publications:

- Google Scholar

Angel and Venture Capital:

- Pricewaterhousecoopers Money Tree
- Pitchbook
- Angel Venture Institute
- Center for Venture Research, University of NH

SBIRs:

- Small Business Administration

For programs in other countries, similar datasets are available from StatsCanada and the Organization for Economic Co-operation and Development (OECD). OECD has a fairly extensive set of entrepreneurship statistics organized by country.

In most cases, to get sufficient data, you will need to rely on secondary sources of data, such as federal or some state data sources. These data sets can be difficult to obtain for a specific set of companies. They can also be dated. For instance, the U.S. Census released its first survey of entrepreneurs in September 2016, containing 2014 data. These time lags make the data difficult to use for current-year analysis.

Hint

Other economic data are available from private sources, mostly derived from Dun and Bradstreet records, specifically the National Establishment Time Series (NETS), which is a longitudinal database created by Walls & Associates. This data is widely used by economic researchers to study entrepreneurship trends. You will need to decide whether the cost of the data suits your needs, and whether the data about your client companies is sufficiently accurate to be useful.

The biggest challenge for this methodology is that many audiences for evaluation research, such as many stakeholders, are not well versed in statistics, and may not understand or trust the analyses. As a result, these methods are often used in academic papers studying entrepreneurship, but less often in individual program evaluations. Survey data, on the other hand, seems to be more broadly understood, as most people have participated in a survey before.

Bibliometrics

Bibliometrics are methods to analyze the written word, including studies of books, articles and patents. This is a highly specialized set of methods appropriate for the study of the results of investments in technology transfer and research and development. The main innovation in this methodology in the past twenty years is the focus on the citation of articles and patents, rather than just a count of patents awarded. Both peer-reviewed articles common in academia and patent applications require references to prior work, called citations. Citations are used to determine the impact and importance of the articles or patents, the assumption being that a widely cited patent or article is more important to a field of study than a patent or article that is not cited by others at all.

Pros and cons

This method is extremely useful for a narrowly focused study. For instance, it has been used to document the impact of the Bayh-Dole Act. It could be relevant to a university-related incubator program, for instance, if you wanted to document the academic as well as economic outcome of faculty-led companies. This methodology is appropriate for a narrow number of applications.

There are several challenges: the data collection is daunting. If you only have a few inventors or authors to look up, then this approach is manageable. But large-scale studies require significant resources including access to specialized databases and computational skill. Also, most citation data are contained in private databases that require significant fees to access. The authoritative source for academic article citations is Web of Science⁸; if you are affiliated with an academic institution, you can probably get the data through your library. Some limited data are available through Google Scholar⁹. Similarly, patent citations are available in some private databases, but you may also be able to gain data through Google Patents¹⁰.

⁸ <http://wokinfo.com>

⁹ <https://scholar.google.com>

¹⁰ <https://patents.google.com>

Case studies

Case studies are a methodology that is relatively easy to master, and can be very powerful if there are only a few clients or cases to document. Using case studies, you will be able to tell the stories of each individual case in great detail, preserving the nuances of the context and the individual challenges and opportunities.

Pros and cons

Case studies have several pros. First, they are extraordinarily powerful in filling in the nuances and details missing from purely quantitative analyses. They can help you see the “why” and “how” behind “what happened.”

This level of detail also brings to life anecdotes you may want to use to tell your story to legislators, the press and the general public. Case studies are extremely useful to illustrate trends and other findings from your quantitative research.

On the other hand, case studies are time-consuming and expensive to conduct, and can be intrusive to your clients. Each case study will require multiple interviews, and having more than one interviewer present helps capture both what is said and how it is said. To be really effective, case studies require trained interviewers who will be able to avoid the appearance of bias.

Lastly, it is difficult to extrapolate from case studies, because you are usually doing only a few at a time. So, it would be difficult to say that your entire program generated 15 jobs based on one or two case studies where a few jobs were added.

Tips

Although case studies are stories about your clients, when presented together they can tell your story as well. To maintain objectivity and make the case studies useful in the aggregate, you should follow some specific steps.

Similar to surveying, you need to decide whether to do a case study on every client or just a sample of clients. If you do a sample, you need to present a defensible rationale for who you choose. Common schemes for choosing interviewees are the extremes along some criteria (e.g., best/worst, highest/lowest, biggest/smallest) or examples of each industry segment or category. While it is tempting to interview only your most successful clients, comparing them to your underperforming clients will yield more actionable information.

Another key step is to develop a procedure or protocol to use with all interviewees. Developing a set of questions based on your indicators and logic model is best practice. Essentially, you are gathering data about the indicators from interviewing people rather than through a survey. A sample protocol is included in Appendix B.

You also need to decide whom to interview, usually more than one person connected with each case. The more people you interview, the fuller picture you will get of a specific case.

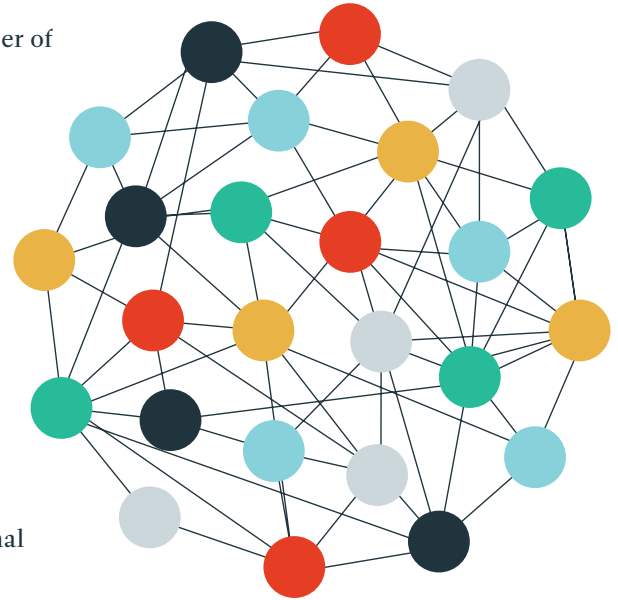
Social network analysis

Social network analysis is a method for depicting relationships among different members of a network or ecosystem in a graphical manner.

Social network analysis is the newest of the approaches mentioned here. Academics have successfully used this methodology to document the relationships in entrepreneurial ecosystems, as well as the density and structure of those relationships. This approach is highly descriptive, and can also yield some objective measures such as density, which can be used to document the evolution of a system over time, or to compare one network to another network.

The illustration is a map of the relationships among a number of individuals or organizations, and is typical of the output of social network analysis. Graphic results like these make it easier to understand and communicate what a network looks like. With today's social networks like Facebook and LinkedIn, the concept of a network personified by a set of linkages is well accepted.

This methodology has several challenges that are likely to limit it to academic exercise for now. The first is that the data collection is extremely detailed. The researcher must gather data from all participants, specifically whom they connect with and how often. The second challenge is that the software available to translate this binary data into a graph such as the one shown here is primarily developed for expert users, not casual or occasional users. There are few manuals and lots of idiosyncrasies.



Expert judgment

Remember the oracle at Delphi from your high school class on ancient Greece? The oracle was a wise man that had all the answers. That's the concept behind expert judgment, a methodology that relies on experts and wise men (and women) to generate answers.

The method is simple. Organize a group of well-respected experts and ask them to review your program. This approach can build credibility for your program among your stakeholders, and the credibility will increase with the credentials of your chosen reviewers. If you think about it, this is how winning proposals are chosen at most federal agencies, and how most peer-reviewed decisions are made; both are examples of using expert judgment to make decisions.

The challenge is that the review is only as good as the experts. How much experience do they have with programs like yours? How much data about your program will you be able to give them? Finally, you need to ensure that the experts are independent and using decision criteria that are consistent with your program's mission and objectives.

Mixed approaches

A mixed approach means that you use more than one methodology at a time. This is a sound way to overcome the weaknesses of any given methodology, for example by pairing a quantitative approach with a qualitative approach.

Some example pairings:

- Survey and case studies. Use the survey to capture your headline numbers, and the case studies to explain the why and how. The case studies personalize the results, while the survey gives you defensible data.
- Econometric/statistical analysis and case studies or expert judgment. The case studies or experts can illuminate the statistics and convey them with authority.
- Social network analysis and case studies. Use the case studies to explain how the network works or how it has evolved over time.

Special cases

As entrepreneurship centers have expanded the services they provide and the roles they play in their communities, the industry has developed some activities that are easy to model but difficult to measure.

One example is programs to **enhance entrepreneurial ecosystems**. The logic is clear: use public and private resources to broaden and deepen connections within an ecosystem in order to develop more and stronger startups. Activities include networking events, gatherings, websites, public relations, advocacy and making connections. So while you can count your outputs (e.g. number of attendees), it is much more difficult to measure the outcomes, e.g., the increased density of the network. Social network analysis can accomplish this task, but it is not simple, nor inexpensive, and may therefore not be feasible in many instances.

The Kauffman Foundation looked at how to best measure entrepreneurial ecosystems, describing a number of ways to measure density, fluidity, connectivity and diversity. However, many of the data sources they reference are not public, suggesting that this question is not easily answered¹¹. For instance, they suggest that network data showing connectivity in a region are hard to come by.

Another difficult question is what are the outcomes of programs that play an **intermediary** role? One example is toll-free hotlines that some state governments offer small businesses for referrals to resources and technical assistance. Another example is matchmaking services that link companies with partnership or revenue opportunities.

In these cases, it is likely that the manager can identify a desired outcome, whether it is the client gaining a new customer and therefore new revenue, or solving a problem. What is difficult is identifying an indicator that is valid, reliable and feasible for capturing these outcomes. And, will the client remember or attribute the solution of their problem to the intermediary or to the actual provider of the assistance?

¹¹ Stangler, Dane and Bell-Masterson, Jordan. March 2015. "Measuring an Entrepreneurial Ecosystem." Kauffman Foundation, <http://www.kauffman.org>

Similarly, social media platforms are a special case of intermediary, where websites, Twitter and Facebook, among others, are used to provide general information or even specific assistance to clients. While there is a significant industry devoted to measuring the effectiveness of social media efforts, such as analytics to measure site traffic and understand how people interact with your site (e.g. page visits, duration of visits and conversion rates – do they make a purchase?), it is difficult to interpret these actions and associate them with client outcomes.

The answer may be to design specific actions in the program that can be tied to the use of social media and/or the intermediary. Think about parallels to purchasing an item from a website. Entrepreneurship centers or intermediary programs may want to capture how many times a client “clicks through” from general information and

- Signs up for a seminar or webinar;
- Signs up for a individual session with a counselor; or
- Provides information that contributes to an assessment and subsequent referral.

All of these actions create intermediate outcomes, and two of the three should feed into later, in-depth engagements that would be measured through more traditional means. Having action steps that mimic purchasing decisions on your social media allows you to quantify the connections built and value added by these channels.

V. Now That I Have the Data, What Do I Do?

Section IV described the various methodologies that can be used to collect data for evaluations. In most cases, the methods dictate the next step – the type of analysis to do. This section discusses analysis options for each type of research.

Analyzing various types of data

Surveys

Survey data analysis should contain several elements. First, you should summarize the attributes of the respondents, and compare those to the total pool you sent surveys to. This means comparing the total number of responses to the total surveyed to yield the response rate (as a percentage), and to look for bias.

So, if your surveys went to thirty companies, ten each from three years of your program, but all eight respondents were from year two, you have a bias in your data – all of the years are not equally represented.

Similarly, you may want to look at elements such as industry sector, company age or programs used to detect any biases. Ideally, your sample of respondents should match your pool. The illustration below shows an unbiased sample, because the average age of the company, average number of employees and years in the program of the respondents is quite close to the attributes of the overall pool of clients.

Attribute	All Clients Surveyed	Respondents Only
Number	100	30
Average Age of Company	2.5 years old	2.3 years old
Average Number of Employees	10	8
Years in Program	1.5	1.6

If you detect a bias in your data, you may want to try to get additional responses by resending your survey or encouraging clients to respond.

Second, for each question, you should capture the data, including minimum response, maximum response, mean and total, if all are relevant. Questions about current employment, or number of jobs added in a specific time frame, should include all of that information. For instance, you might report that the minimum response to a question about jobs added is zero, while the maximum is ten and the mean three, while the total for all respondents might be fifty.

For questions where you are asking for an opinion on a 5- or 10-point scale, (e.g., “How useful was the assistance you received from ABC Program, where 0 is not useful at all, and 5 is very useful?”) you will need to calculate weighted averages. To do so, record value of each response (e.g. 5), and then multiply by the number of respondents who gave that response (e.g. 10) to get the weighted score. Then you add up all the weighted scores and divide by the total number of responses for a weighted average. For instance, in the table that follows, the weighted average is 3.25.

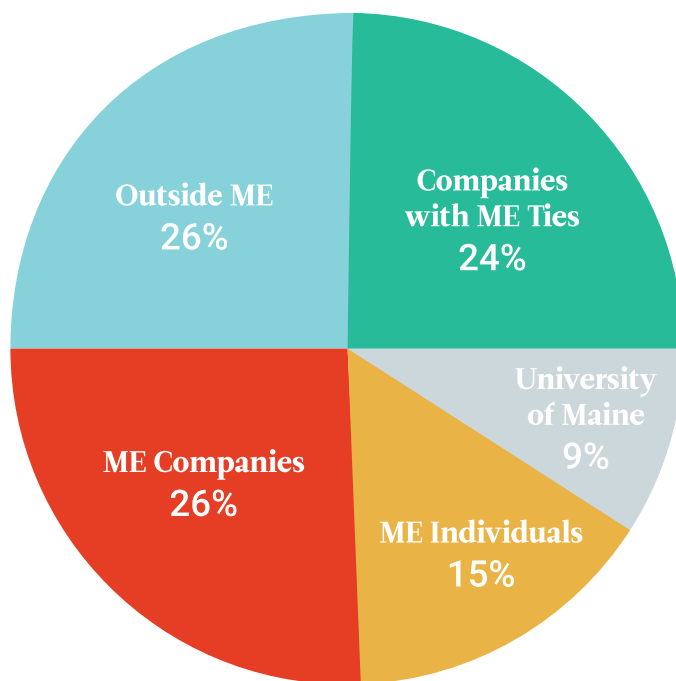
How useful was the assistance your company received from ABC Program, where 0 is not useful at all, and 5 is very useful?

Score	Number of responses	Weighted Average (Score x Number)
0	1	0
1	1	1
2	2	4
3	6	18
4	8	32
5	2	10
Total	20	65
Weighted Average (sum of weights/ number of responses)		=65/20 =3.25

If you have questions that were open-ended and ask for comments, you might consider listing all of the comments in an appendix. Sometimes this information is shared with the public; often these comments are most useful for staff and management to identify opportunities for improvement.

These suggestions summarize the basic methods for reporting data received from surveys. Further statistical analysis can be done if desired. Consult one of the resources in Appendix C, or any standard statistics reference.

Assignment of Clean Tech Patents Awarded to Maine (ME) Inventors, 2007-2012



Econometric and statistical analysis

Evaluation researchers use regression analysis to understand the data collected with this method. There are multiple types of regression analysis possible, and many different programs to use from simple Excel calculations to sophisticated programs like SPSS or Stata. We recommend working closely with a university research group or consultant if you don't already know how to do these analyses.

Bibliometrics

The analysis of bibliometric data can be difficult, but a simple tabulation of the number of citations for a group of researchers or inventors can be effective. Don't be surprised if this data is highly skewed – that is a few people are responsible for 80-90 percent of the results. This type of results can be nicely shown in graphic format, as shown in this chart.

Source: Innovation Policyworks analysis of US Patent and Trademark Office data

Case studies

By nature, case studies are not quantitative, but you can analyze their content in a quantitative way. For instance, you can summarize the answers to the questions in the protocol in a manner similar to a survey, where you are giving the survey orally, rather than through a form or through the Internet. You can also present lists of comments on a particular subject, and point out areas of agreement and dissimilarities.

There are some software programs that will parse out the prose in the case study or in a transcript, and look for patterns, but this is likely too complex for the purposes of a program evaluation. This method was developed for anthropological studies where language and communications patterns inform the understanding of a culture.

Social network analysis

As mentioned earlier, there are software programs available to analyze the data collected from participants in a network. The software's outputs include graphs of the network connections and numbers indicating the density and centrality of the network. The latter measures how critical a single node is to the network, and is useful if your program is trying to be the key intermediary in a network.

Expert judgment

In most cases, these data are prose, often written comments on questions posed by the researcher. In some cases, a rubric is developed with the questions that weights the various questions by importance, and asks for the experts to provide a score on a scale. The rubric will then dictate how the results of the expert judgments should be shown.

Economic impact analysis

In addition to or instead of evaluating program outcomes, some entrepreneurship centers want to measure the economic impact of their work. Programs can use employment data (collected from surveys or from public-sector sources) to calculate their economic impact, usually with the aid of a software program such as IMPLAN¹² or EMSI¹³. These programs use input-output models to understand and quantify the economic impacts of net new jobs and investment on a local, regional or state economy.

The idea behind an economic impact analysis is that the addition of new jobs or investment in an economy creates additional economic activity. People with a new job spend new money at the grocery store, the dry cleaners and the local coffee shop. This creates new jobs at these locations as well. In addition, a company that is expanding in an area also purchases goods and services, and this multiplies their impact. Input-output models allow you to quantify these impacts.

The most crucial element of an economic impact study is that it should focus on new dollars in an economy, usually from investment or revenues from outside the region or state. Economics teaches us that if your client is generally buying and selling within your region, they are not usually contributing to net new economic activity.

If you are only going to do this analysis periodically, it may be more cost-effective to hire a consultant or local university to perform this work, as the software license and data for your locality can be relatively expensive, and the analysis is complex.

¹² <http://implan.com>

¹³ <http://www.economicmodeling.com>

Cost–benefit analysis

Another common analysis done in the public sector is cost–benefit analysis. The researcher compares the costs of a program (e.g. the program budget) with the benefits (e.g., the outcomes and economic impact of those outcomes). A comparison between these two leads to a statement, for instance that the benefits are some multiple of the costs: If the cost to operate the program is \$1,000,000, and the benefits are quantified as \$10,000,000, then the cost–benefit ratio would be 1:10.

When performing this type of analysis, be sure to include all the relevant costs and benefits. In some cases, it is difficult to quantify the economic value of all the benefits, such as new patents. New jobs and investment, when quantified as an economic impact, can stand in for the total benefit to an economy.

Hint

Stakeholders with strong business and corporate backgrounds may suggest that you calculate the return on investment for a program. We suggest that you demonstrate all the types of outcomes of your program, and think about how to best summarize them. Most outcomes will be related to each other, e.g., employment and revenues, so you would use one or the other to compare to the investment. Some people use state taxes paid by employees to compare to state investment, for example. Others look at the total economic impact and compare that to the investment, likely a better assessment of the overall picture.

Causality and attribution

A critical piece of analysis you should consider is if and how you want to try to prove causality. Did the outcomes your clients experienced come as a result of the work you did with them?

As you can imagine, this is a difficult question. However, you can prove causality as long as the following four criteria are in place:

1. **The desired outcomes must exist.** Obviously, if you are running an entrepreneurship center, and every company in it fails and closes, then no positive outcomes exist.
2. **The outcomes must come after the program’s work.** If one of your clients gains a large venture capital investment before they join your accelerator, then you can’t reasonably claim that you contributed to that outcome.
3. **The work you do must be related to the outcomes.** If one of your clients wins a trophy in a baseball league in his or her hometown, this is likely not related to your entrepreneurship center.
4. **All other explanations must be accounted for.** This is the most difficult aspect of causality. You need to control for the inherent characteristics of your clients, the surrounding economic conditions, the political environment, the local geography, and anything else that might have helped the client achieve the desired outcomes.

To prove causality, you are working to eliminate other explanations. The drug-testing process is a good example. There is a group of people with a disease. Some get the trial drug; some get a placebo. If the folks with the trial drug have better outcomes, then the conclusion is that the drug works.

Unfortunately, in entrepreneurship work, we rarely have the opportunity to assign companies to two groups, one of whom gets no help. So, researchers have devised other ways to tackle this problem. The main approach is with control groups, also known as matching. If one group participates in your program, and another identical group does not, it follows that the program causes any differences in outcomes.

One example of this approach was a national analysis of the SBIR program¹⁴. Researchers compared SBIR winners to companies that just barely missed out on winning. Their rationale was that the difference between the winners and almost winners was very small, whereas the difference between the winners and companies that didn't even consider applying for SBIRs was much larger. However, this approach also requires that you are able to track the results of companies you didn't help, as well as those you did, so this is rarely done for program evaluations in the entrepreneurship support field.

One more feasible strategy for entrepreneurship support professionals is to compare cohorts, especially if you run a program that operates yearly, like an accelerator. Compare the year-one results of the various cohorts, for example, to see if program design changes made a difference in outcomes.

Obviously, proving causality is very difficult. Therefore, many programs decide to simply address the question with attribution, instead of causality.

Attribution means a client attributes their outcomes to your assistance. To demonstrate attribution, you need to meet four criteria, three of which are exactly the same as in proving causality:

1. **The desired outcomes must exist.** Obviously, if you are running an entrepreneurship center, and every company in it fails and closes, then no positive outcomes exist.
2. **The outcomes must come after the program's work.** If one of your clients gains a large venture capital investment before they join your accelerator, then you can't reasonably claim that you contributed to that outcome.
3. **The work you do must be related to the outcomes.** If one of your clients wins a trophy in a baseball league in his or her hometown, this is likely not related to your entrepreneurship center.
4. **Clients say that the program helped them attain their results.**

In order to demonstrate the fourth part of attribution, many researchers ask companies to assert that the program contributed to their results. Some ask this question on a scale of 0-5, or 0-10, for instance, to gauge how strong the attribution is.

There are two important implications of this strategy. One is that you want to be sure that the pool of clients you are studying contains companies with which you have substantial relationships. If you include companies that attended a single seminar, for instance, they are not likely to attribute their outcomes to your program, skewing your results.

The second implication is that attribution goes along with surveys and case studies in which you asked your clients questions directly. If you gather your employment data from Department of Labor ES-202 forms¹⁵, for instance, you have no way of knowing which, if any, of the new jobs could be attributed to your assistance.

¹⁴ Wessner, C.W. (ed.). 2000. The Small Business Innovation Research Program: An Assessment of the Department of Defense Fast Track Initiative. Washington, DC: National Academies Press. <https://www.nap.edu/read/9985/chapter/1>.

¹⁵ http://lmi2.detma.org/lmi/lmi_es_a.asp

Communicating the data

Recognizing that you have diverse audiences for your research, you should consider presenting and communicating data in multiple ways.

Assuming that your evaluation is part of a process that is done annually or on some other regular basis, the following types of documentation are evidence of your professional approach to the work, and provide a long-term archive of results.

Written report

Preparing a full, written report documenting your evaluation is of fundamental importance. Suitable for posting on your website, and potentially for printing for certain audiences, this should include the following:

1. Executive summary. No more than two pages, with the highlights of the research. Assume many will only read these pages.
2. Introduction. Describe the question(s) to be answered, provide background on the program, and describe the logic model.
3. Methodology. Describe what you did, including details such as who you studied, and how and why you chose the subjects.
4. Results. In this section, lay out the data, starting with the basic demographics of the respondents, and then show the detailed results, including both raw data (in aggregate) and analyses.
5. Conclusions. What did you learn from the results? What are your recommendations?

Short version

In most cases, it is useful to have a very short version of the report. This could be a standalone version of the executive summary, or something like it written in a more accessible style. Like a press release, this version should start with the results, discuss the question/s you tried to answer, briefly touch on the methods, and conclude with your conclusions and recommendations.

This version also is suitable for posting on your website, blogging, submitting as an opinion piece to a local newspaper, providing as a report to your board and/or legislative committee, etc. Make it punchy, focused on results and conclusions, and easy to read. You can also use this version for fundraising and as a “leave-behind” when visiting potential clients, partners, stakeholders, etc.

Press release

An even shorter version is a press release, usually contained on a single page. Focus this tightly on the headline results, giving a sentence or two about the context of the study, and conclude with your boilerplate information about your program. Quotes from the most senior person in the organization, a board member and/or legislator can be good inclusions as well. Such quotes should echo the conclusions and recommendations from the report. A quote from a successful client can also be a useful element.

Hint

Never show individual company results unless data are publicly available (i.e., distributed by the company itself).

Distribute a press release to local and regional press and release it via your website and social media. Also share it with key community members, including your clients, board and stakeholders. Everyone will want to know that they are associated with a successful program.

Presentation

Depending upon your situation, it may also be useful to prepare a presentation (e.g., PowerPoint), to summarize the work and present it to boards, committees of oversight, etc. This is an opportunity to use the most dramatic of your graphics, and the most salutatory quotes from clients.

VI. Critically Reading Evaluation Reports: 10 Questions to Ask

You may be reading this material, but never intend to do an evaluation study yourself. But you may want to understand a proposal from a consultant or read an evaluation report about another program.

Here are 10 questions to ask yourself as you are reading.

1. What's the stated goal of the report? Is it clearly stated or are too many questions rolled into one? And, critically, does the methodology match the question?
2. Does the report or proposed report show the logic model or describe the reasoning behind the program's approach? Does the report link the approach to the legislative intent, statutory language and/or strategic mission of the program?
3. Are the metrics used appropriate for the evaluation? Are they clear, valid and reliable?
4. Are data sources appropriate? Would another person be able to duplicate the work and get the same results?
5. Does the method(s) chosen make sense for the type of program being evaluated? Is the data being collected likely to answer the questions being asked?
6. How is the data collected? If by survey, what is the response rate? Is there bias in how respondents are chosen, or in how they self-selected? Similarly, for case studies, how are the interviewees chosen? Are they representative? If experts are used, how are they chosen?
7. Does the analysis follow from the data? Does it make sense?
8. Do the conclusions follow from the data? Are there conclusions that are not linked to the data?
9. What about the recommendations? Are they logical extensions of the questions asked, logic model, metrics, data and analysis?
10. What is the background of the researchers? Do they have experience with evaluation research? Do they have a formal education in evaluation research design? Are they familiar with the type of program being evaluated?

Appendix A: Sample Survey Questions

Jobs

There are two ways to measure your clients' employment growth. First, if you have ascertained the baseline number of each of your clients' employees before they start working with you, you can periodically ask them for their employment totals. To get the gain, simply subtract the initial value from the new value.

This is complicated by virtual companies and companies with part-time or contractual workers. It is further complicated by the fact that policymakers are often interested in full-time equivalent employees who are paying taxes. So, if you have a lot of clients with contractors, you might want to ask about that separately, and identify what percentage are in your state or locality.

Another question is whether or not to consider someone as an employee if they are not receiving a paycheck. This is common among entrepreneurial startups where the owners may not yet be paying themselves. There is no right or wrong answer to how to count these people, but it is important that you are consistent and that you define your terms when you ask the question.

So, one question might be:

On [date], how many full-time equivalent employees did you have, including yourself?

A related question could be:

On [date], what was your payroll (annualized)?

It is convenient (and probably more accurate) to ask your clients for data at the end of a fiscal year, so that they have the answers to these questions in their accounting systems.

If you ask for payroll, you can divide by number of employees to ascertain the average salary. Often it is useful to compare this number to the average per capita income in your state or region. It is possible that your companies are paying higher than average wages.

Sales/revenues

Questions about clients' sales are really about changes over time, so like jobs, should be asked relative to a baseline (i.e., starting revenue, or revenue reported in last survey). It is often useful to ask clients to document where sales come from, such as in your state, out of state and out of country. It also can be important to document the sources of income, especially for R&D companies, distinguishing sales of products and services from grants received. You may also be interested in knowing when new products and services were introduced and what impact they had on your client's financials.

For the year ending December 20__ , what was your gross revenue? What percentage came from grants?

For the year ending December 20__ , what percent of your sales were made in (state), what percent were out of state, but in the U.S., and what percent were from outside the U.S.?

For the year ending December 20__ , what percent of your sales were derived from new products and services introduced in this year?

Startups

Some programs try to measure the number of companies they help get started. This is more difficult than it sounds. If you are literally involved with assembling a team around a new technology, for instance, then you can likely keep track of that activity and present the total number of startups and/or licenses as factual.

In most cases, however, the entrepreneurs are less likely to say that you "helped them get started." What does that mean exactly? Do you get credit if you helped them incorporate their business? What if you helped with a business plan? The exact question you would ask here depends entirely on what work you are doing for companies at the startup stage.

If you are a university-sponsored entrepreneurship center, and you are interested in encouraging startups based on university intellectual property, you might ask:

When did your company incorporate? _____ (date) _____

Did the company license university intellectual property? Yes or No

If your program actually assembles management teams, for instance, you could ask:

Did [the program] assist your company with incorporation, assembling the management team, securing the technology or otherwise get started? Yes or No

For more general startup assistance, you could ask:

What types of assistance did [the program] provide during your startup phase? (Provide a list of possibilities, including the services you advertise.)

Investment and new capital

Questions about new investments and capital clients have raised are fairly straightforward. The key is to differentiate among sources of capital, and to be sure to capture data that reflects a specific period of time.

During the period [date] to [date], how much money did your company receive in equity investment? What percent came from angel or individual investors, from professional venture capital firms, or from other investors?

During the period [date] to [date], how much new debt financing did your company secure?

During the period [date] to [date], how many SBIR/STTR awards did your company receive? What was the total dollar value of these awards?

During the period [date] to [date], how many other federal awards (non-SBIR/STTR) did your company receive? What was the total dollar value of these awards? Please identify the agencies involved.

When collecting data on federal awards, be sure to ask for the total face value of the award, not for the amount the company actually received in that year, especially if it's a multi-year contract.

If you have important funding programs in your state, you may want to ask a question related to receipt of funds from those programs, phrased in a similar fashion to the SBIR question.

Intellectual property

The level of intellectual property (patents, trademarks, copyrights, etc.) detail necessary to include depends on your program's objectives. For programs that focus on innovation and high growth companies, intellectual property is a commonly used intermediate outcome that indicates a company's progress in obtaining protection for its ideas, and is a common precursor to investment and sales.

As a general guideline, you are probably interested in collecting information about applications for intellectual property protection, grants of intellectual property protection, and licenses granted or obtained. While trade secrets are also interesting, there is no way to uniformly count when a trade secret is protected.

When collecting data about your clients' patents, you may also be interested in counting protection obtained outside of the U.S. If your program operates outside the U.S., you may want to word the questions related to patents so that they refer first to protection in your country and/or the European Union, and then in the U.S. and/or other markets.

Sample questions:

From [date] to [date] how many U.S. patents did you apply for (including Continuations in Part [CIP])?

From [date] to [date], how many U.S. patents were awarded to your company?

You may want to ask clients to give you a list of patents awarded by number, so that over time you reduce the risk of double counting.

Customer satisfaction

You probably want to ask your clients how happy they are with your assistance. We also recommend that you ask about the importance of your assistance, as this helps establish attribution (see section on causality, page 28.) Below are some recommended questions. You can use either a 5-point or 10-point scale.

On a scale of 1-5, with 1 being very poor and 5 being excellent, how would you rate the quality of the assistance you received from XYZ Program from [date] to [date]?

On a scale of 1-10, with 1 being not satisfied at all and 10 being extremely satisfied, how satisfied were you with the assistance you received from XYZ Program in 20__?

On a scale of 1-10, with 1 being not important at all and 10 being extremely important, how important was the assistance you received from XYZ Program to your achievements in 20__.

Appendix B: Sample Protocol for Case Studies

The questions below are examples of ones an interview team could use to assess the impact of an entrepreneurship center. In this case, the case studies are being done instead of a survey.

A protocol should begin with a brief description of the evaluation and its goals, so that these can be shared with interviewees. This ensures that each interviewee hears an identical explanation of the evaluation project.

Hint

We recommend that interviews last no more than 45–50 minutes, and that two interviewers participate, to fully capture the information.

Introductions

- Introduce yourself, and explain the purpose of the evaluation and your role
- Ask interviewees to introduce themselves and explain their affiliations and roles
- Indicate that interviews will be kept confidential and reported as findings in the aggregate only

Specific questions for interviewees (presumably clients of the entrepreneurship center)

- Company background: Type of business by industry, location(s), length of time at location(s), employment, markets (who are their customers, suppliers, competition)? Ask about capital raised, intellectual property if relevant.
- Market trends in their industry – what are the opportunities?
- Current and future plans for the business?
- Reasons for company’s affiliation with the program?
- What difficulties and barriers do they have to growing their business?
- What are their perceptions of the entrepreneurship center? What do they like about it? What would they like to see improved?
- Do they have suggestions of other important individuals to interview?

Questions for economic development partners/stakeholders

- Organizational background: What programs and services do you offer? What are your geographic boundaries? Who are your clients/customers/members? How long has your organization been doing entrepreneurship support?
- Current and future plans for the organization?
- What are your perceptions of available economic and business development programs and services in the region to support local businesses? Of the entrepreneurship center under evaluation? What do they like about this center? What would they like to see improved?
- Do they have suggestions of other important individuals to interview?

Appendix C: Selected Readings

If you want to delve deeper into this field, the books listed below are the pre-eminent sources on economic development evaluation. Although some are over ten years old, they are still considered the most comprehensive and best available.

- Feller, Irwin and Ruegg, Rosalie. 2003. A Toolkit for Evaluating Public R&D Investment – Models, Methods, and Findings from ATP’s First Decade. Prepared for the Economic Assessment Office, Advanced Technology Program, National Institute of Standards and Technology. Available at <http://www.atp.nist.gov/eao/gcr03-857/contents.htm>.
- Hatry, Harry. 1999. Performance Measurement: Getting Results. Washington, D.C.: The Urban Institute.
- Organization for Economic Cooperating and Development. 2004. Evaluating Local Economic and Employment Development – How to Assess What Works Among Programs and Policies. Available at <http://www.oecd.org/leed-forum/publications/Evaluating%20Local%20Economic%20and%20Employment%20Development.pdf>.
- Rossi, Peter H., Freeman, Howard E., and Lipsey, Mark W. 2004. Evaluation: A Systematic Approach. 7th Edition. Thousand Oaks, CA: Sage Publications.
- The Urban Institute. 2004. Analyzing Outcome Information – Getting the Most from Data. Available at <http://www.urban.org/research/publication/analyzing-outcome-information>.
- Weiss, Carol H. 1998. Evaluation, 2nd edition. Upper Saddle River, N.J.: Prentice Hall.

About the Author

Catherine Renault is the principal and owner of Innovation Policyworks, a firm that provides research and analysis to enable economic development officials at the state, regional and local levels make data-driven decisions. Her clients focus on innovation and entrepreneurship as critical elements of successful economic development, using evaluation for program improvement and policymaking.



Dr. Renault has 24 years of experience in state technology-based economic development and evaluation. She was the director of the Maine Office of Innovation and science advisor to Governor John Baldacci. She also served as managing director of Virginia's Center for Innovative Technology, where she was responsible for entrepreneurship and access to capital policy as well as statewide technology transfer initiatives. She also spent ten years in the private sector, working at firms including AT&T and Data General.

Renault is originally from Boston and received her undergraduate degree from Harvard, her MBA from the University of Virginia, and her Ph.D. from the University of North Carolina at Chapel Hill.

Renault is past chair of the board of directors for the Maine Center for Entrepreneurial Development and has served as chair of the board of managers for Sea Change Group, a biofuels startup. She also has had a research appointment at the University of Maine with the Foster Center for Student Innovation and taught research design at the University of North Carolina at Chapel Hill.

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