



Achieving Scale in Innovation

**National Science Foundation
ATE Principal Investigator Conference**

Pre-Conference Workshop B

**Concepts, Processes, and Tools for
Successful Scaling**

October 26, 2011

National Science Foundation ATE Principal Investigator Conference

Concepts, Processes, and Tools for Successful Scaling

October 26, 2011 -- 1:00 - 5:00 pm

Congressional AB

WHAT IS SCALING?

1:00 - 1:30 **Trying Out Scale** - Concepts, processes and tools for effective scaling - a panel discussion and Q&A of experiences in trying out scale

- Ann Blackman - CTC
- James Jones - MPICT
- Deb Newberry - Nano-Link
- David McNeel - Facilitator

1:30 - 2:00 **Concepts and language for considering scaling** - A presentation of the rationale, a common framework and language for considering scaling

- Deborah Boisvert - Synergy RPT

HOW ARE YOU GOING TO DO IT?

2:00 - 2:45 **Framing Your Scaling Opportunity** - Small group work to frame projects in the language and dimensions of scale, sharing both in small groups and the larger group

2:45 - 3:00 Break

3:00 - 3:30 **Role of Community and Network**

- Joyce LaTulippe - Synergy RPT

3:30 - 4:15 **Considering the Synergy Processes and Tools for Your Scaling** - Small group work and larger group sharing of how some of these processes and tools might be applied to participants' projects

WHAT DOES SUCCESS LOOK LIKE?

4:15 - 4:30 **What We Have Learned about Knowledge Processes** - A facilitated conversation among the project PI and Co-PIs: Deborah Boisvert, Elaine Johnson, and David McNeel

- Rebecca Zarch - Facilitator

4:30 - 5:00 **New Understandings of Success in Scaling** - Panel discussion and Q&A

- Laurence Clement - Bio-Link
- Patressa Gardner - SCATE
- James Hyder - SCME
- Elaine Johnson - Facilitator

SYNERGY

research • practice • transformation

Programmatic Goals for the Synergy Project:

- Assist participating ATE Centers in developing the skills and competencies necessary to achieve scale within a range of projects.
- Foster and capture the learning occurring in the project.
- Create knowledge and tools to facilitate scaling within the ATE community.

More information about Synergy, our team, and this project can be found at <http://synergyrpt.org/about>

Participating Centers and Corresponding Projects:

BATEC – *Tech Apprentice Program*

Bio-Link – *Bridge to Biotech Program*

CREATE – *Teaching Skills Workshop*

CSSIA – *Cyber Security Competitions for All*

CTC – *Mentored College Program*

GeoTech – *Remote Desktop Access and Remote Application Access for Geospatial Programs*

ICT – *Replicable New Media to Aid Centers and Projects in Enhanced Dissemination*

MatEd – *National Educators Workshop: Call for Papers*

MPICT – *Hybrid/Distributed ICT Education*

Nano-Link – *Getting Nano Technology into High Schools*

RCNGM – *Advanced Manufacturing Expo Expansion*

SCATE – *Technology Gateway Curriculum*

SCME – *Leaning SCME's Pressure Sensor Workshop - Broadening Impact to Academia and Industry*

Additional information about these centers and their scaling projects can be found at

<http://synergyrpt.org/participating-centers>

Value of Synergy to Its Participating Centers:

- Shared vocabulary, concepts and frameworks for improved communication about scaling, both as a community and for their centers.
- New ways of thinking about their teams and partners roles and responsibilities in scaling.
- Deep and ongoing interaction with thought leaders in scaling.
- New relationships and opportunities for collaboration among the participating centers.
- Opportunities to think and learn from multiple perspectives as a community of practice.
- An environment which fosters shared learning, challenging of assumptions, and creativity.
- Opportunities for team building and development within the individual project teams.
- Redefining of success by challenging people to go further in success and deeper into how they understand their success.

For information about the conferences and workshops in which these centers have participated go to

<http://synergyrpt.org/events>.

Going Forward Into 2012:

As Synergy enters the third year of this project, its goals are:

- Continue to support centers in their efforts to scale and capture their learning
- Strengthen the centers' community of practice
- Build knowledge from the individual experiences and learning of the community members
- Engage the broader ATE community

The Story of Synergy RPT

A Collaboratory for Research, Practice and Transformation

Roots - The structures and practices of the prior Synergy conference series and the current Synergy project are rooted in the discipline of problem-based learning. Thus critical thinking, multiple perspectives, problem-solving, communication of complex ideas, and collaboration continue to be practices at the core of this initiative.

2008 - Following a successful Synergy conference on achieving scale in August 2008, the Synergy team was invited and subsequently proposed to consider what it would entail to “operationalize” or “innovate” Synergy’s processes within ATE with a focus of applying them to achieving scale. Coming out of the conference series there was a loose network of members of the ATE community who shared this interest and focus on achieving scale and who would become the core of the subsequent project.

2009 - NSF funded our project to better understand what successful scaling would look like within the ATE community. As more mature and experienced members of the ATE community, its National, Regional, and Resource Centers were invited to participate in this project. Fourteen centers accepted the invitation to apply this work to one of their existing projects, and thirteen have continued through the first two years. The participating centers, the Synergy team and thought leaders have all grown in their understanding in ways unanticipated at the inception of the project.

2010 - The initial meeting of PIs and Innovation Coaches from these centers was held in January 2010. Participants were introduced to a conceptual framework for successful scaling, the roles of logic models and influence networks in the project, and what it would entail to work together as a collaborative, learning community for the next two and a half years. Additional perspectives on scaling and successful practices in scaling were provided by Thought Leaders in an April workshop, and the power of a peer network began to emerge in the review and critique of the initial logic models of the centers’ projects. The summer conference in San Francisco marked the first time that other members of the project teams were invited to join the Synergy community. Building on the prior experiences of the PIs and Innovation Coaches, small group work advanced the expanded community’s level of understanding as well as its level of trust and commitment to working with these concepts, tools and processes. This emergence and coalescence of the community also marked the initial formation of special interest groups (SIGs) within the community and the beginning of broader thinking and application of these scaling principles by the centers beyond just the targeted projects. How these fit into the emerging design for the following year was the challenge the Synergy team faced as it met in November to plan for the next phase of the project and beyond. See <http://synergyrpt.org/events/2010-events> for more details about Synergy events in 2010.

2011 - The importance of story began to emerge as a unifying theme and concept for the next phase of the project. The discussions and reflections of the experiences by the centers as they applied the concepts and practices of scaling to their own projects has begun to generate a body of knowledge, one of project’s key goals. The relationship among community, knowledge, and story would form the basis for the January 2011 meeting. With the growth in depth of this community, there was a commensurate growth in engagement and contributions by its members and an expectation of shared leadership going forward. How these varied interests and commitments to advancing the work of individual projects would align with the goals of the project would emerge as a challenge for the project team. The center-led SIGs would provide sessions for the June 2011 conference, and these along with sharing of stories and experiences in the use of scaling concepts, tools and processes would be central to the June 2011 meeting. The conference featured an address by Chris Dede, a Sr. Project Advisor to Synergy, which pulled together the various strands of the work to date and set out the concept of value-creation stories as a principal method of capturing and sharing the experience and knowledge of the individual centers. The growing body of experience and knowledge would start to form the basis of case studies and workshops in scaling. More information about Synergy events in 2011 can found at <http://synergyrpt.org/events/2011-events>.



Achieving Scale in Innovation

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SYNERGY PARTICIPATING CENTERS

(BATEC) Boston Area Advanced Technological Education Connections

Tech Apprentice Program

Deborah Boisvert, Principal Investigator
Felicia Vargas, Project Leader
Cecelia Oyedian, Innovation Coach
www.batec.org

The Tech Apprentice program is designed to place technology-skilled high school or college students in paid internships with local IT companies. Businesses benefit by employing students with strong technical skills while students get the opportunity to apply their skills in real-world business applications and learn about career options in IT.

(Bio-Link) Advanced Technological Education Resource Center in Biotechnology

Bridge to Biotech Program

Elaine Johnson, Principal Investigator
Laurence Clement, Project Leader
John Carrese, Innovation Coach
www.bio-link.org

The Bridge to Biotech (B2B) program at City College of San Francisco will enable more colleges across the country to offer this vocational biotechnology program which serves underprepared students who want to enter the Biotechnology field. Upon completing B2B, over 80% of students enroll in a Biotech Certificate Program.

(CREATE) California Regional Consortium for Engineering Advances in Technological Education

Teaching Skills Workshop

Kathleen Alfano, Principal Investigator
Mary Slowinski, Innovation Coach
www.create-california.org

The California Regional Consortium for Engineering Advances in Technological Education (CREATE) project is a joint effort between seven community colleges and over 30 large high tech engineering/technology employers. Its purpose is to develop a regional approach to workforce preparation and training, and to meet emerging needs for innovative, flexible strategies to educate the workforce in new, technological advances in a wide range of high demand engineering technology fields. A few of these fields are: Mechatronics, Manufacturing, Computer Servicing, Computer Networking, Electronic Technologies, and Robotics.

(CSSIA) National Resource Center for Systems Security and Information Assurance
Cyber Security Competitions for All

Erich Spangler, Principal Investigator

Ted Mims, Innovation Coach

www.cssia.org

This project will provide students with real-world learning experiences in information assurance and network security through expanding and enhancing cyber security skills events and competitions. In building a national infrastructure we will deliver faculty workshops and establish mentoring programs for secondary and post secondary faculty. The operation of a national infrastructure for skills events is based on the creation of a scalable and affordable virtual environment.

(CTC) Convergence Technology Center
Mentored College Program

Ann Beheler, Principal Investigator

Ann Blackman and Helen Sullivan, Innovation Coaches

www.greenitcenter.org

Convergence Technology Center's Synergy project is the scaling of its Mentored College Program. The CTC targets six new colleges to add to its cohort program yearly, but must establish successful mentoring without increasing grant staff.

(Geo Tech) National Geospatial Technology Center of Excellence
Remote Desktop Access and Remote Application Access for Geospatial Programs

Phillip Davis, Principal Investigator

Ann Johnson, Innovation Coach

www.geotechcenter.org

GeoTech is seeking to find ways to provide faculty and students alternative methods for accessing geospatial software using Remote Access (Remote Access Technology refers to both Remote Desktop and Remote Application technologies) or RA. By employing Remote Access (RA) technology, in lieu of installing software on individual computers or maintaining on-campus computer labs, students and faculty can have 24/7 access to software on any type of computer connected to the Internet using only a web browser or a small software client.

(ICT) Information and Communications Technologies Center
Replicable New Media Model to Aid Centers and Projects in Enhanced Dissemination

Gordon Snyder, Principal Investigator
Nina Laurie, Innovation Coach
www.ictcenter.org

The ICT Center is building a replicable new media and search engine optimization (SEO) model that will aid centers and projects in further dissemination of their work. This model focuses on using new and emerging web-based social media technologies including blogging, micro-blogging, audio and video to reach out regionally, nationally, and internationally.

(MatEd) National Resource Center for Materials Technology Education
National Educators Workshop: Call for Papers

Mel Cossette, Principal Investigator
Frank Cox, Innovation Coach
www.materialseducation.org

The project which they are scaling ensures the development of an organized, structured, peer review process that will assist MatEd (National Resource Center for Materials Technology Education) to promote and expand its reach. Increasing the number of quality submittals for presentations will result in added participation at the annual NEW event and enhance MatEd's collection of resources on their site.

(MPICT) Mid Pacific Information and Communication Technologies Center
Hybrid/ Distributed ICT Education

Pierre Thiry, Principal Investigator
James Jones, Innovation Coach
www.mpict.org

MPICT is working on a distributed ICT education system to enable more advanced, specialized and available California community college ICT courses to benefit students, workforce, enterprises and economies. This system is enabled by hybrid in-person, synchronous and interactive online, and archived course deliveries.

(Nano-Link) Midwest Regional Center for Nanotechnology Education
Getting Nano Technology into High Schools

Deborah Newberry, Principal Investigator
Kristi Jean, Innovation Coach
www.nano-link.org

Their project will develop nano-based educational modules that are high-school teacher demanded, vetted, and promoted. These resources are supported by hands on educator workshops and classes. We also work with various industry partners to ensure our curricula help students gain skills, knowledge and abilities required to support the economic growth of companies involved in nanotechnology.

(RCNGM) Regional Center for Next Generation Manufacturing
Advanced Manufacturing Expo Expansion

Karen Wosczyzna- Birch, Principal Investigator
Krista Reichart, Innovation Coach
www.nextgenmfg.org

RCNGM seeks to scale the previous successful statewide “Manufacture Your Future” expo into three regional expos that capture a local audience of students, industry, legislators, agencies, and associations to increase the awareness of advanced manufacturing throughout Connecticut using targeted messages for broader impact.

(SCATE) South Carolina Advanced Technological Education Center for Excellence
Technology Gateway Curriculum

Elaine Craft, Principal Investigator
Joshua Phiri, Project Leader
Patressa Gardner, Innovation Coach
www.scate.org

The SC ATE Center is scaling up implementation of the industry scenario-based Technology Gateway curriculum, which is designed to increase the mathematics abilities of underprepared students while introducing them to problem solving and technology. It has proven effective in retaining students through the remediation process at the college level and promotes success for “at-risk” high school students.

(SCME) Southwest Center for Microsystems Education

Leaning SCME's Pressure Sensor Workshop – Broadening Impact to Academia and Industry

Matthais Pleil, Principal Investigator

James Hyder, Innovation Coach

<http://scme-nm.net>

Through the lessons catalyzed from the Synergy Project and “lean manufacturing-oriented” training/education methodologies faculty participants of SCME’s Pressure Sensor Workshop have demonstrably increased understanding of the materials . In addition faculty have received a template to follow when they facilitate lessons with their students. Utilization of SCME’s materials are increasing from 20% to an anticipated 80%!

CONCEPTS, PROCESSES AND TOOLS FOR SCALE OF INNOVATION

1. **Project Identification:** Identifying a project with depth (evaluation and research used to understand the innovations effectiveness) and sustainability (robust-design to enable adapting to shifts in context).
2. **Needs Assessment:** Identifying the demand for the innovation that will lead to spread through examining industry and academic needs.
3. **Depth** – Evaluation and research to understand and enhance causes of effectiveness.
4. **Sustainability** – Robust-design to enable adapting to negative shifts in context.
5. **Spread** – Modifying to retain effectiveness while reducing resources and expertise required.
6. **Shift** – Moving beyond “brand” to support users as co-evaluators, co-designers, and co-scalers.
7. **Evolution** – Learning from users’ adaptations about how to rethink the innovation’s model.
8. **Innovation Attributes:** Understanding the characteristics that add up to positive or negative perceptions that affect diffusion of that innovation:
 - a. Compatibility
 - b. Cost
 - c. Simplicity
 - d. Adaptability
 - e. Effectiveness
 - f. Observability
 - g. Trialability
9. **Logic Model:** The program logic model is defined as a picture of how your organization does its work - the theory and assumptions underlying the program. A program logic model links outcomes (short and long term) with program activities/processes and the theoretical assumptions/principles of the program.
10. **Use of Story:** The practice of organizational storytelling is a way to share knowledge sharing and build community. It makes explicit organizational barriers and enablers to scale. In the telling of organizational stories, knowledge of the organization and its success in scaling is also captured and can thus be shared with others.
11. **Continuous Improvement:** The process of formative evaluation establishes and uses feedback loops to continually test and assess the success of a project and innovation during its implementation.

12. Network Analysis: The practice of understanding centers of influence, and decision makers that impact the field of your innovation, is essential to the adoption of an innovation for scale.

13. Evidence of Scale: The process of finding evidence that you are meeting the articulated outputs and outcomes expressed in your logic model can be part of formative and summative assessment.

14. Communications Planning: The practice and process of reaching out to an audience with a compelling and targeted story and message is more than standard dissemination. This interactive process helps you to better communicate and target your message and story based on audience feedback.

15. Synergy Community of Practice: The participation in a community of Synergy participants provides a forum to explore the processes and tools related to scaling. This includes knowledge capture and use among and between teams.

16. COP among your (potential) adapters:

CoP can be identified as a group of people who share a vision in which everyone can make a contribution; actively participate and undertake activities in a coordinated way; capture and reflect on their knowledge and evolving insights and work together to continuously improve performance.

You have a proven innovation you want to scale...



Exploring the Process of Scaling Up

What are the steps—and traps—in moving from innovation to broad-based adoption and consequential change?



<p>Dimensions of Scale</p> <p>Taking an educational innovation completely to scale involves five dimensions that reflect different aspects of making an intervention effective in one setting useful across a wide spectrum of contexts.</p>	<p>Depth</p> <p>Getting to scale produces deep and consequential changes in practice. Requires evaluation and research to understand and enhance the causes of effectiveness.</p>	<p>Sustainability</p> <p>Sustaining scaled growth means maintaining these changes in practice over substantial periods of time. Requires robust design to enable adapting to negative shifts in context.</p>	<p>Spread</p> <p>Scaling up is achieved by diffusion of the innovation to large numbers of users. Requires modifications to retain effectiveness while reducing the resources and expertise required.</p>	<p>Shift</p> <p>Ownership of the innovation is assumed by users, who deepen and sustain the innovation via adaptation. Requires moving beyond “brand” to support users as co-evaluators, co-designers, and co-scalers.</p>	<p>Evolution</p> <p>The innovation as revised by its adapters is influential in reshaping the thinking of its designers. Requires learning from users’ adaptations about how to rethink the innovator’s model.</p>
<p>Sources of Leverage</p> <p>Each dimension provides leverage for the scaling process by evolving the intervention to increase its power, durability, applicability, and flexibility.</p>	<p>Evaluation and Research</p> <p>What are the sources of the innovation’s effectiveness? What conditions does each source depend on for success? How sensitive is each source to these conditions? How consistent is the innovation with the current political and cultural context of educational improvement?</p>	<p>Robust Design</p> <p>How can the innovation be modified so that it functions in various types of inhospitable conditions? How typical is each condition for success in the target population of users? How can developers support varied users while evolving toward conditions for success that enable full effectiveness?</p>	<p>Reducing Resources and Expertise</p> <p>How much is the overall power of the innovation affected by reducing its cost or the knowledge required to implement it? How much power is retained in a light version that requires fewer resources or less expertise of its users? How can developers support light users to achieve full effectiveness?</p>	<p>Moving Beyond Brand</p> <p>How can developers support users going beyond what the originators have accomplished? How can developers build users’ capacity as co-evaluators, co-designers, and co-scalers? How can users form a “community of practice” that helps answer questions about scale?</p>	<p>Rethinking the Model</p> <p>How can developers unlearn their initial beliefs, values, and assumptions about the innovation, and generate willingness to start the innovation process over again? How can developers facilitate reconceptualization and discontinuous evolution? How can developers form a “community of reflective redesign” with other innovators?</p>
<p>Traps to Avoid</p> <p>Evolving along each dimension requires the developers of the innovation to overcome traps that have both cognitive and affective aspects.</p>	<p>Trap of Perfection</p> <p>Developers should not seek an unattainable goal of perfection at the cost of deflecting resources from other dimensions of scale. (The great should not be the enemy of the good.)</p>	<p>Trap of Mutation</p> <p>Developers should ensure that the ways they modify the innovation to adapt to various inhospitable contexts do not undercut its core conditions for success.</p>	<p>Trap of Optimality</p> <p>Developers should realize a somewhat less powerful innovation that reaches much greater numbers of users is a step forward.</p>	<p>Trap of Origination</p> <p>Developers should not attempt to control the original innovation in ways that deter adaptation and further innovation by users.</p>	<p>Trap of Unlearning</p> <p>Developers’ unwillingness to take a fresh look can prevent genuine evolution.</p>

Sources: Christopher Dedd, Harvard University Graduate School of Education; Cynthia Coburn, “Rethinking Scale: Moving Beyond Numbers to Deep and Lasting Change,” *Educational Researcher* (2003).

Illustration by Patrick Corrigan

The Scaling Framework

DIMENSIONS OF SCALE	DEPTH	SUSTAINABILITY	SPREAD	SHIFT	EVOLUTION
POWER OF DIMENSION	EVALUATION AND RESEARCH	ROBUST DESIGN	REDUCING NEEDS FOR RESOURCES AND EXPERTISE	MOVING BEYOND BRAND TO CO-OWNERSHIP	RETHINKING THE MODEL
TRAPS TO AVOID	TRAP OF PERFECTION	TRAP OF MUTATION	TRAP OF OPTIMALITY	TRAP OF ORIGINATION	TRAP OF UNLEARNING
ROLE OF TECHNOLOGY	CREATING POWERFUL LEARNING	MEETING SPECIAL NEEDS	PROVIDING EFFICIENCIES AND SUPPORTS	ADAPTING AND SHARING	STUDY OF ADAPTATIONS
NEXT STEPS TO EXPLORE	UNDERSTANDING EFFECTIVENESS	COPING WITH DIFFICULT SETTINGS	DEVELOPING "LIGHT" VERSIONS	FOSTERING CO-DESIGNERS	EVOLVING DESIGN ASSUMPTIONS

SCALE FRAMEWORK WORKSHEET

INTRODUCTION: Use the following worksheet to think through your project and to structure a dialog with your team and internal stakeholders who are involved in your project. Your discussion may change the way that you view – and speak about – your project as an innovation. First, write your project description below. Second, endeavor to uncover each innovation attribute in relation to your project (using the questions as your guide). Finally, revise your project based on your discussion and what you have learned about your project as something that others may want to adopt.

Provide a one-paragraph description of your project below.

Project Description:

Dimension of Scale: DEPTH	Questions for Discussion	Notes from Discussion
<p>Deep change goes beyond materials and activities to altering teachers' beliefs, norms of social interaction and underlying pedagogical principles.</p> <p>Source of Leverage: Evaluation and Research</p> <p>Traps to Avoid: Trap of Perfection prevents Depth</p>	<p>What kind of impact do you think that your innovation and project may have on your target audience of adopters?</p> <ul style="list-style-type: none"> ➤ What are the sources (roots, foundations, research, data, and understanding) of the innovation's effectiveness in your organization? Would it be the same for your potential adopters? ➤ How consistent is the innovation with current political and cultural context of educational improvement? <ul style="list-style-type: none"> ○ What conditions does each source depend on for success? ○ How sensitive is each source to these conditions? ➤ Is there an aspect of your innovation that is taking more than its proportional share of resources? 	

Adapted from Microsoft's Scaling Framework: <http://www.microsoft.com/education/demos/scale/index.html>.

Dimension of Scale: SUSTAINABILITY	Questions for Discussion	Notes from Discussion
<p>Sustaining scaled growth means maintaining these changes over time; requires robust design to enable adapting to negative shifts in context.</p> <p>Source of Leverage: Robust Design</p> <p>Traps to Avoid: Trap of Mutation prevents Sustainability</p>	<p>What aspects of your innovation are oriented towards sustainability by your target audience of potential adopters?</p> <ul style="list-style-type: none"> ➤ How can the innovation be modified so that it functions in various types of threatening conditions? ➤ How typical is each condition for success in the target population of users? ➤ How can developers support varied users while evolving toward conditions for success that enable full effectiveness? 	

Adapted from Microsoft's Scaling Framework: <http://www.microsoft.com/education/demos/scale/index.html>.

Dimension of Scale: SPREAD	Questions for Discussion	Notes from Discussion
<p>Scaling up is achieved by diffusion of the innovation to large numbers of users. Requires modifications to retain effectiveness while reducing the resources and expertise required.</p> <p>Source of Leverage: Reducing Resources and Expertise</p> <p>Traps to Avoid: Trap of Optimality prevents Spread</p>	<p>What is the size and scope of your audience as potential adopters?</p> <p>How much is the overall power of the innovation affected by reducing its cost or the knowledge required to implement it?</p> <ul style="list-style-type: none"> ➤ How much power is retained in a “lite version” that requires fewer resources or less expertise of its users? ➤ How can developers support “lite users” to achieve full effectiveness? <p>Is there any conflict between the size and scope of your audience and the Trap of Optimality?</p>	

Adapted from Microsoft’s Scaling Framework: <http://www.microsoft.com/education/demos/scale/index.html>.

MEASUREMENT OF INNOVATION ATTRIBUTES

Dr. James W. Dearing
Kaiser Permanente

Innovation attributes are most often measured as the perceptions by potential adopters of the characteristics associated with a particular innovation. An innovation is broadly construed as anything perceived to be new by a potential adopter, inclusive of information, ideas, practices or techniques, programs or interventions, technologies, processes, and policies.

Rogers (1963; 1983; 1995; 2003) and Rogers & Shoemaker (1971) synthesized studies of innovation attributes as a set of codified factors that affect the rate at which innovations are adopted. Other variables affect rate of adoption too, but the attributes of relative advantage, complexity, compatibility, observability, and trialability have been shown to explain significant variance in adoption decisions. Of this standard set of five attributes, relative advantage, complexity, and compatibility have been most strongly associated with adoption decisions.

Operationalization of innovation attributes has not been consistent nor led to the creation of consistently used validated measurement scales. This situation has occurred because researchers have most often wanted to ask perceptions concerning specific innovations which they typically want to name in the item wording. Also, given the broad definition of an innovation, certain attributes and additional attributes are more or less relevant depending on the innovation of study. Tornatzky and Fleischer (1990) developed a 2×2 matrix for characterizing innovations as radical vs. incremental innovation, and product vs. process innovation.

Tornatzky & Klein (1982) reviewed 105 publications that assessed innovation attributes and derived 10 attributes. For example, in measuring perceptions of large-scale environmental remediation technologies for removing or converting hazardous waste, the attribute of applicability, the degree to which an innovation has more than one use or has use in more than one context, was found to be important in discussions about innovations, since soil and weather conditions vary considerably across polluted sites (Dearing, Meyer & Kazmierczak, 1994). In addition to measuring innovation perception by potential adopters, this study measured how creators thought about their innovations, and how they talked about their innovations, in terms of attributes.

Marketing scientists, in focusing on consumer services and products, have conceptualized different and additional attributes. Management scientists, too, have contributed to this work. Moore & Benbasat (1991) created an instrument used expert judges to sort 75 items used in previous studies into factors representing the five standard attribute categories and three others of voluntariness, image, and result demonstrability. Three tests of convergent and discriminant validity were conducted and items and scales refined. Scales proved reliable; their validity was checked via factor analysis and discriminant analysis. Their result is a 38-item instrument comprising eight scales, with a shortened 25-item version of the strongest items (listed here below) also suggested.

From my own reviews, I have noted that the attribute relative advantage is often somewhat of an omnibus category. Researchers have tended to lump together rather different referents into it. Yet this attribute is most often operationalized more narrowly, as cost. Thus, I prefer to separate out what I think are the two dominant meanings of this attribute, effectiveness (performance) and cost (in money or other resources such as staff time). This parsing out of this attribute results in six basic innovation attributes:

1. Effectiveness
2. Cost
3. Compatibility
4. Simplicity (the inverse of complexity)
5. Observability
6. Trialability

INNOVATION ATTRIBUTES WORKSHEET

INTRODUCTION: Use the following worksheet to think through your project and to structure a dialog with your team and internal stakeholders who are involved in your project. Your discussion may change the way that you view – and speak about – your project as an innovation. First, write your project description below. Second, endeavor to uncover each innovation attribute in relation to your project (using the questions as your guide). Finally, revise your project based on your discussion and what you have learned about your project as something that others may want to adopt.

“Innovation attributes are most often measured as the perceptions by potential adopters of the characteristics associated with a particular innovation. An innovation is broadly construed as anything perceived to be new by a potential adopter, inclusive of information, ideas, practices or techniques, programs or interventions, technologies, processes, and policies.”
-Jim Dearing: *Measurement of Innovation Attributes*

Innovation Attributes	Questions for Discussion	Notes from Discussion	Relative Weight
<i>These 7 attributes are based on Jim Dearing's work</i>	<i>These questions can help you to identify the parts of your project that others may adopt</i>	<i>Your notes will provide a rationale for how others might perceive your project as an innovation</i>	<i>Rank the attributes based on your discussion</i>
Effectiveness better outcome, results good, better than alternatives	<ul style="list-style-type: none"> • How has your innovation helped you and your organization to do things better? • What kind of positive changes have resulted from your innovation? • What criteria would you use (or did you use) to determine how your innovation is better than alternatives? 		
Cost better, faster, cheaper	<ul style="list-style-type: none"> • What have you used to measure the cost of your innovation? • Have you gotten actual numbers or data to measure cost? • How will you measure the <i>relative</i> value and cost of your innovation? 		
Compatibility with existing beliefs and practices, fits goals or mission of adopters	<ul style="list-style-type: none"> • How would you go about determining if your project would be useful to others based on what they are already doing? • How would you go about identifying what the pre-existing routines, missions or goals are? • How might you gathering data on this question? 		

Innovation Attributes	Questions for Discussion	Notes from Discussion	Relative Weight
Simplicity easily understood (not complex), easy to apply/use	<ul style="list-style-type: none"> How can you (or did you) determine that your innovation is easy to understand or use? How might others measure the simplicity of your project and innovation? What are the criteria? How do you measure <i>ease of use</i>? 		
Adaptability can be applied in different situations	<ul style="list-style-type: none"> What parts of your innovation might be used in new or different ways by others? What criteria would you use (or did you use) to determine how your innovation is suitable to and for others? 		
Observability impact/result can be observed	<ul style="list-style-type: none"> What can be easily seen or understood about the benefits of your innovation? What results can others see or measure? 		
Trialability can be “tried” without committing fully	<ul style="list-style-type: none"> Is your innovation easy for others to adapt right away? How? What parts of your innovation might provide “quick wins” for others who may be interested in adopting it? 		

Revised Project Description with innovation insight:

LOGIC MODEL EXECUTIVE SUMMARY

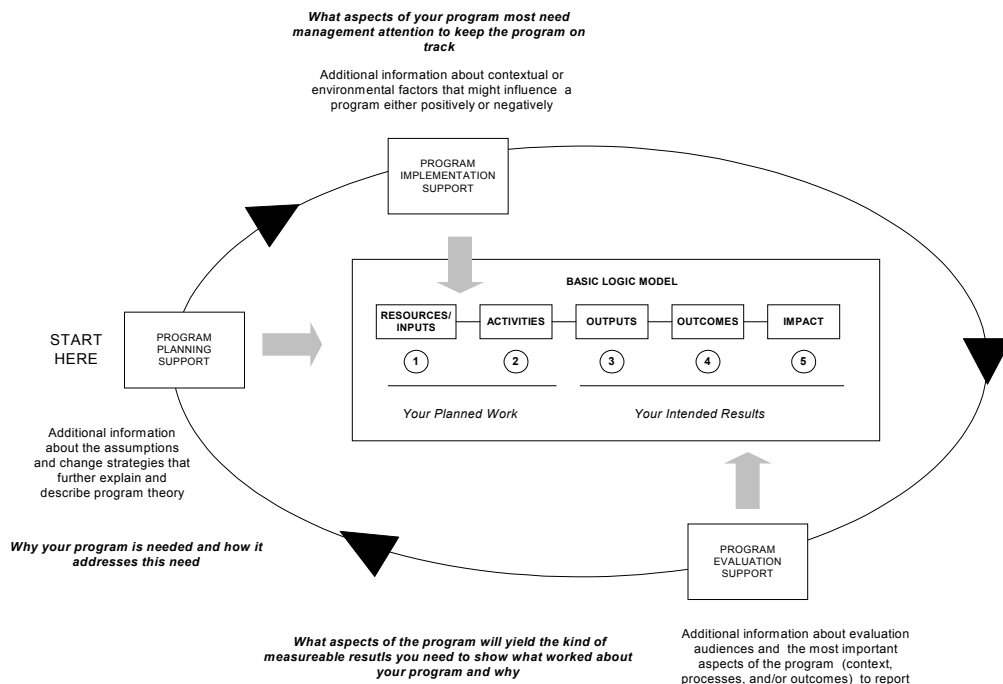
Executive
Summary

Executive Summary

Introducing Program Logic Models

- **Definition:** A program logic model is a systematic, visual way to present a planned program with its underlying assumptions and theoretical framework. It is a picture of why and how you believe a program will work. Logic model methodology causes you to describe, share, discuss, and improve program theory – in words and pictures – as you develop (plan, implement, and evaluate) a program.
- **Purpose:** Logic models are tools for program planning, management, and evaluation. They can be used at any point in the evolution of a program and can lead to better programs. Program logic models describe the sequence of events for bringing about change and relate activities to outcomes.
- **Logic models have many applications for programs.**
 Program stakeholders (staff, participants, funders) can use logic models at every stage of a program.
 - ***During program design and planning:*** To clarify program strategy, find “gaps” in the theory or logic of programs, build a shared understanding about the program and how components work together, identify outcomes, and establish timelines.
 - ***During program implementation:*** To develop a program management plan, emphasize connections between actions and results, make program adjustments, and provide an inventory of assets and what is needed for program operation.
 - ***During program evaluation and strategic reporting:*** To document accomplishments, organize data, prepare reports, and define any variance between the planned program and the actual program.
- **Logic models have many benefits to program development, implementation, and evaluation. Logic models:**
 - Strengthen the case for program investment;
 - Develop a simple image that reflects how and why a program will work;
 - Reflect group process; and
 - Can change over time.
- **Logic models offer *if...then* information that help us think through our programs.**

LOGIC MODEL EXECUTIVE SUMMARY

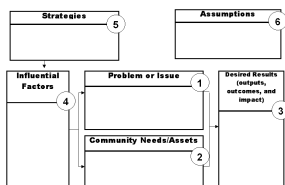


- The basic components of a program logic model are linked** causally by either the time order or the sequence of actions leading from **Resources** to **Impact**. They are depicted numerically by steps 1 through 5:

 - Resources** include the human, financial, organizational, and community resources a program has available to direct toward doing the work. Sometimes this component is referred to as **Inputs**.
 - Program Activities** are what the program does with the resources. **Activities** are the processes, tools, events, technology, and actions that are an intentional part of the program implementation. These interventions are used to bring about the intended program changes or results.

YOUR INTENDED RESULTS include all of the program's desired results (outputs, outcomes, and impact).

 - Outputs** are the direct products of program activities and may include types, levels and targets of services to be delivered by the program.
 - Outcomes** are the specific changes in program participants' behavior, knowledge, skills, status and level of functioning. Short-term outcomes should be attainable within 1-3 years, while longer-term outcomes should be achievable within a 4-6 year timeframe. The logical progression from short-term to long-term outcomes should be reflected in impact occurring within about 7-10 years.
 - Impact** is the fundamental intended or unintended change occurring in organizations, communities or systems as a result of program activities within 7-10 years. In the current model of WKKF grantmaking and evaluation, impact often occurs after the conclusion of project funding.
- There are varied approaches to logic models.** Each one clarifies program assumptions. There is no single, best approach.

LOGIC MODEL EXECUTIVE SUMMARY**Using the logic model throughout the life of your program****① PROGRAM PLANNING****CLARIFYING PROGRAM THEORY:**

1. **PROBLEM OR ISSUE STATEMENT:** Describe the problem(s) your program is attempting to solve or the issue(s) your program will address.
2. **COMMUNITY NEEDS/ASSETS:** Specify the needs and/or assets of your community that led your organization to design a program that addresses the problem.
3. **DESIRED RESULTS (OUTPUTS, OUTCOMES AND IMPACTS):** Identify desired results, or vision of the future, by describing what your program is expected to achieve (short term and long term expectations).
4. **INFLUENTIAL FACTORS:** List the factors you believe will influence change in your community.
5. **STRATEGIES:** List general successful strategies or “best practices” that have helped communities like yours achieve the kinds of results your program promises.
6. **ASSUMPTIONS:** State the assumptions behind *how* and *why* these change strategies will work in your community.

② PROGRAM IMPLEMENTATION

RESOURCES	ACTIVITIES	OUTPUTS	SHORT & LONG-TERM OUTCOMES	IMPACT
Resources to accomplish the goal of addressing the problem or issue and meet the community's needs.	Activities to address the problem or issue and meet the community's needs.	Outputs that are measurable and can be used to track progress.	Short-term and long-term outcomes that are measurable and can be used to track progress.	Impact that is measurable and can be used to track progress.
5	4	1	2	3

DEMONSTRATING YOUR PROGRAM'S PROGRESS:

- ① **OUTPUTS:** For each program activity, identify what outputs (service delivery/implementation targets) you aim to produce.
- ② **OUTCOMES:** Identify the short-term and long-term outcomes you expect to achieve for each activity.
- ③ **IMPACT:** Describe the impact you anticipate in your community in 7-10 years with each activity as a result of your program.
- ④ **ACTIVITIES:** Describe each of the activities you plan to conduct in your program.
- ⑤ **RESOURCES:** Describe the resources or influential factors available to support your program activities.

③ PROGRAM EVALUATION

Evaluation Focus Area	Audience	Question	Use
1	2	3	4

Focus Area	Question	Indicators	Technical Assistance Needed
		5	6

PROGRAM EVALUATION QUESTIONS AND INDICATORS:

- ① **FOCUS AREA:** From your program theory logic model, list the components of the most important aspects of your program.
- ② **AUDIENCE:** Identify the key audiences for each focus area. Who has an interest in your program?
- ③ **QUESTIONS:** For each focus area and audience, list the questions they may have about your program.
- ④ **INFORMATION USE:** For each audience and question you have identified, identify the ways you will use the evaluation information.
- ⑤ **INDICATORS:** Describe what information could be collected that would indicate the status of your program and its participants for each question.
- ⑥ **TECHNICAL ASSISTANCE NEEDED:** Indicate the extent to which your organization has the evaluation and data management expertise to collect and analyze data that relates to this indicator.

LOGIC MODEL EXECUTIVE SUMMARY

Developing a logic model for your program

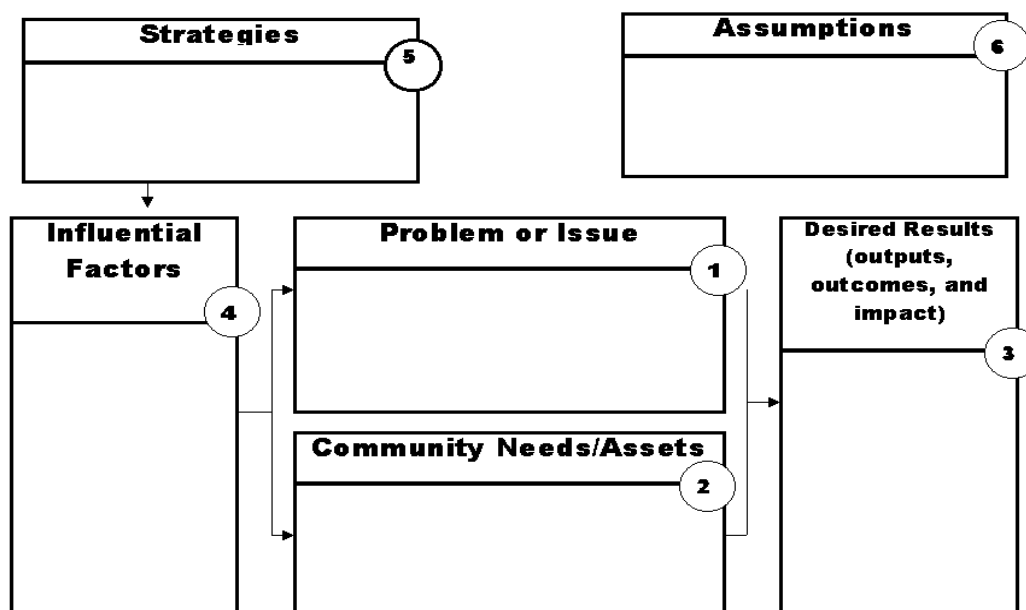
- **Program plans are built upon a program's theory.**

Constructing a program theory answers important questions:

- What is the problem your program is attempting to solve/what issue does the program address?
- What needs or assets led to addressing this issue?
- What are the program's desired results?
- What influential factors could influence change in your community?
- Why do you believe the program will work? What has worked in other communities?
- Why will your program's approach be effective?

- **During program implementation, the ends inform the means.**

- Consider how you will demonstrate progress toward change.
- *Do the outcomes first!* Defining what you plan to accomplish will help you design a stronger plan and demonstrate to funders why they should invest in your program.
- Define desired results. Specify program outputs, outcomes, and impact – both short term and long term.
- Connect your program's theory to program activities and outcomes.
- What activities are planned?
- What resources will be needed to implement program activities?



LOGIC MODEL EXECUTIVE SUMMARY

Using your logic model to plan for evaluation.

- **It's important to ask questions that prove and improve your program's success.**
 - *Formative evaluation questions*—provide information that can improve program activities and short-term outcomes. Answers to formative questions can generate periodic reports.
 - *Summative evaluation questions*—demonstrate the impact of your program based on results. They are often asked at the end of a program.
- **Consider your evaluation from various vantage points:**
 - *Context*—how the program functions within the community.
 - *Implementation*—the extent to which activities are executed as planned.
 - *Outcomes*—the extent to which the program generates intended changes in individuals, organizations, communities, or systems.
- **Determine what you will evaluate**
 - There is real benefit in establishing a clear purpose for your evaluation. Your evaluation should benefit your program.
 - What is your focus area?
 - *Context*—Relationships or capacity?
 - *Implementation*—Assessing quality or quantity?
 - *Outcomes*—Measuring effectiveness, magnitude, or satisfaction?
- **Evaluation should provide information that is helpful to your program's audiences. Describe your program's audiences**—staff, board, clients, funders, volunteers, etc.
 - Ask your audiences what information they need or want. Involve them in setting program evaluation priorities so the data gathered will answer the questions they will ask.
 - As you prioritize the questions evaluation will answer, decide how evaluation information should be used. Ask evaluation questions that will benefit your program.
- **Establish indicators that describe what success will look like.**
 - Keep indicators as simple as possible.
 - Design ways to gather the data you need to compare against indicators chosen.
- **Determine the types of technical assistance your organization may need to gather and analyze program data and evaluate program success.**

LOGIC MODEL EXECUTIVE SUMMARY

Flowchart for Evaluation Question Development

Evaluation Focus Area	Audience	Question	Use
1			

Focus Area

What is going to be evaluated? List those components from your theory and/or logic model that you think are the most important aspects of your program. These areas will become the focus of your evaluation.



Audience

What key audience will have questions about your focus areas? For each focus area you have identified, list the audiences that are likely to be the most interested in that area.



Question

What questions will your key audience have about your program? For each focus area and audience that you have identified, list the questions they might have about your program.



Information Use

If you answer a given question, what will that information be used for? For each audience and question you have identified, list the ways and extent to which you plan to make use of the evaluation information.

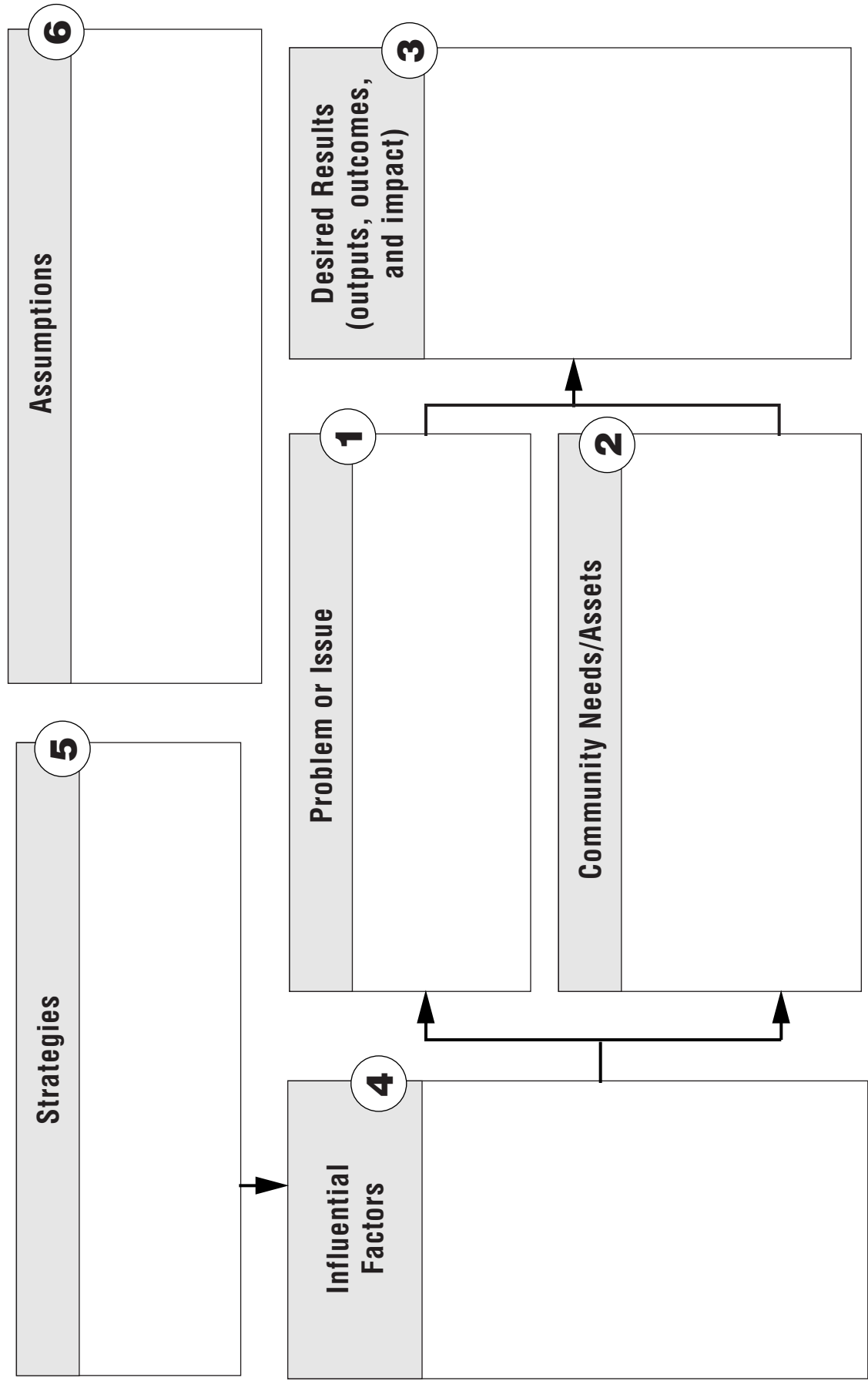
Evaluation Focus Area	Audience	Question	Use
	2		

Evaluation Focus Area	Audience	Question	Use
		3	

Evaluation Focus Area	Audience	Question	Use
			4

- At the ends of Chapters 2, 3, and 4, you will find Exercise Templates filled in with information from the examples provide. These demonstrate how each Template can be used.
- Blank Exercise Templates are available in the *Forms Appendix*.** They are not the only way to create program logic models. We encourage you to adapt the Templates to meet *your* needs. Work on flip charts, make each box of a template into a full sheet of paper, or create a model flowchart on your computer. Be creative! The logic model design should fit *your* program.
- Additional logic model resources are provided in *Resource Appendix*.**

Logic Model Development Program Planning Template – Exercise 3



Forms Appendix

Logic Model Development Program Implementation Template – Exercise 1 & 2

RESOURCES	ACTIVITIES	OUTPUTS	SHORT- & LONG-TERM OUTCOMES	IMPACT
In order to accomplish our set of activities we will need the following:	In order to address our problem or asset we will accomplish the following activities:	We expect that once accomplished these activities will produce the following evidence or service delivery:	We expect that if accomplished these activities will lead to the following changes in 1–3 then 4–6 years:	We expect that if accomplished these activities will lead to the following changes in 7–10 years:

Logic Model Development
 Evaluation Planning Template – Exercise 4

Evaluation Focus Area	Audience	Question	Use

Promoting and Assessing Value Creation in Communities and Networks: a Conceptual Framework
by Etienne Wenger, Beverly Trayner, and Maarten de Laat

Value-creation story: Please Note that the story does not need to start at 1, or go all the way to 5.

Name	
Typical cycles	Your story:
1. <u>Activity:</u> Describe a meaningful activity you participated in and your experience of it (e.g., a conversation, a working session, a project, etc.)	
2. <u>Output:</u> Describe a specific resource this activity produced for you (e.g., an idea or a document) and why you thought it might be useful.	
3. <u>Application:</u> Tell how you used this resource in your practice and what it enabled that would not have happened otherwise.	
4. <u>Outcome:</u> a. Personal: Explain how it affected your success (e.g., being a better professional, job satisfaction,) b. Organizational: Has your participation contributed to the success of your organization (e.g., metrics they use)	
5. <u>New definition of success:</u> Sometimes, such a story changes your understanding of what success is. If it happened this time, then include this here.	

Specific value-creation stories

A typical value-creation story has a sequence of four main steps, and sometimes five: (1) the activity you participated in, (2) what you gained out of it, (3) how you applied it, and (4) what the outcome was.

Sometimes, there is a step (5). This is when an event or innovation changes the way that you define what matters, what consists success, and therefore what “value creation” is. For instance, if you are a teacher, a successful activity may redefine what grades should be about. This type of fundamental reconsideration does not happen very often, but if it does happened to you because of your participation in a network or community, do include it in your story, because these moments tend to be quite significant in our lives

Use of the template: five steps

Use this template for concrete examples of value creation. For instance, if in the first template you said that your network helped you become a better music teacher, then this second template can be used to provide some concrete examples of how the network did that: as an example you might want to describe how someone shared a good idea for an activity which you used in your classroom and which ended up making your lessons more engaging:

1. In the first row you would describe the moment at a meeting or in a conversation when someone shared that idea. Where were you? What happened?
2. In the second row you would describe the idea itself. What was it about? Why did you find it potentially useful?
3. In the third row, describe how you used that idea in your own teaching. How did you apply it and to what purpose? Did you need to adapt it? What happened in the classroom?
4. In the fourth row, describe what the outcome was (a) for your own success and/or (b) for the success of your school or district. Did it improve the student’s understanding? Were they able to become engaged with a new concept? Did they do better on their test? Was their grades affected? Were the metrics of your schools improved?
5. Use row 5 if the event made you reconsider what counts as success.

You can use this storytelling guide for as many specific value-creation stories as you want to share.