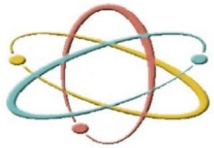
Logic Models for Strategic Planning & Evaluation

ERC Model Development Practicum

October 14, 2020



OFFICE OF INTEGRATIVE ACTIVITIES (OIA)

INTEGRATIVE ACTIVITIES | EVALUATION & ASSESSMENT CAPABILITIES | EPSCOR

Learning Objectives

Session attendees will be aware of the:

- Pre-kick-off Introduction
  - Evaluative inquiry cycle
  - Role of models in strategic planning and evaluation
  - Terms used in creating a theory of change and logic model
- Kick-off-Model Development Practicum
  - Concepts and terms from the introductory material
  - Steps in creating models
  - Steps to align models and strategic plan
  - Role of feedback and refinement

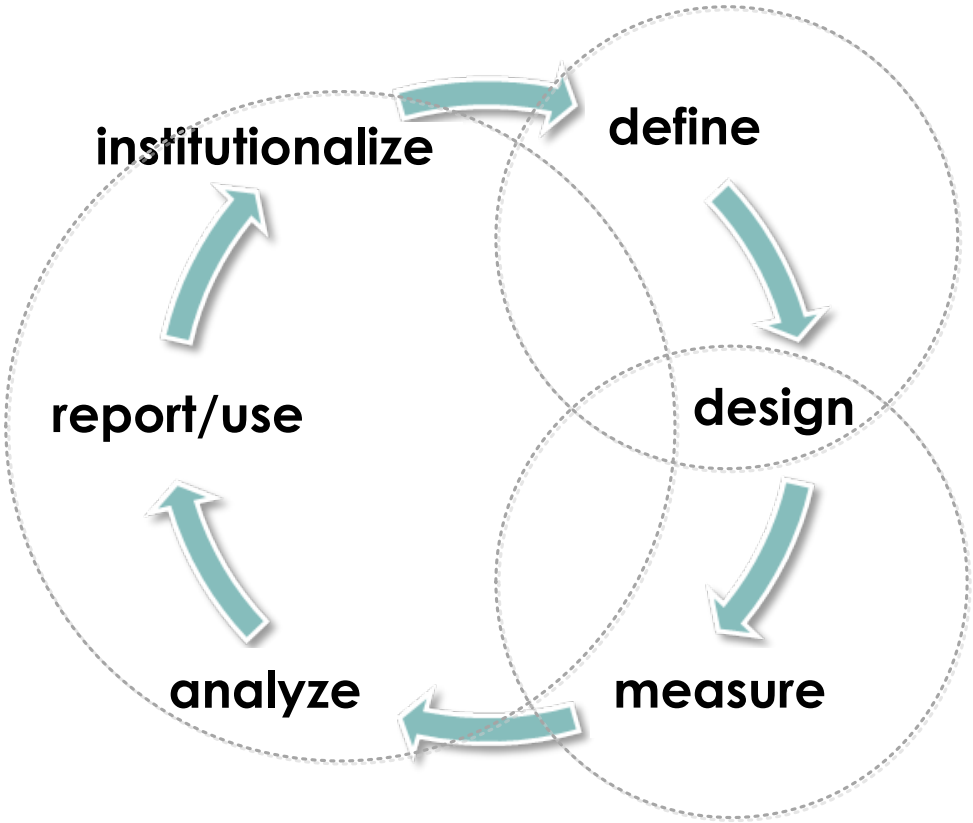
Introduction Refresh

Evaluative Inquiry Process

Strategic Plan

criteria for what constitutes evidence

1



3

how evidence, once analyzed and synthesized, can be used

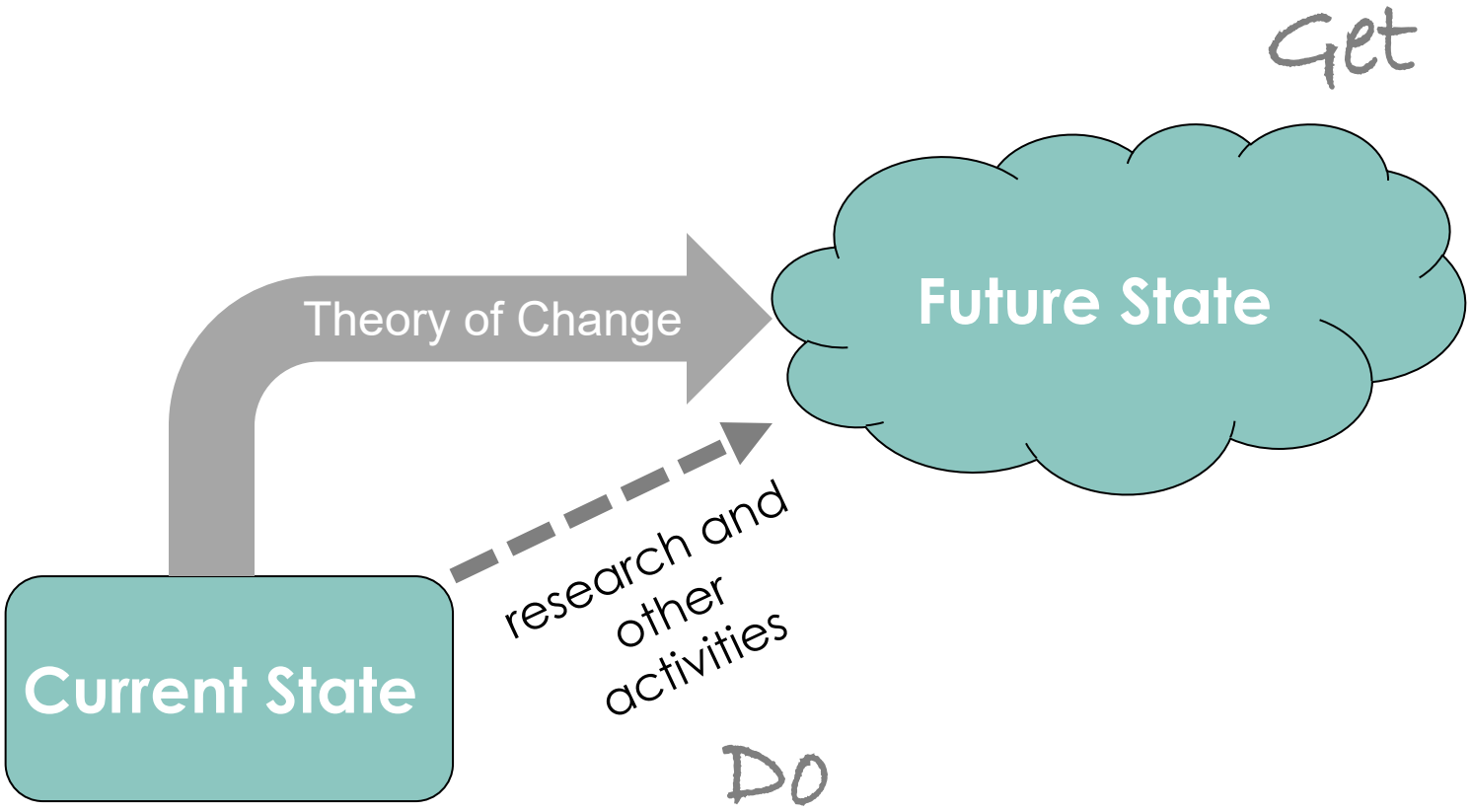
Annual Report

Evaluation Plan

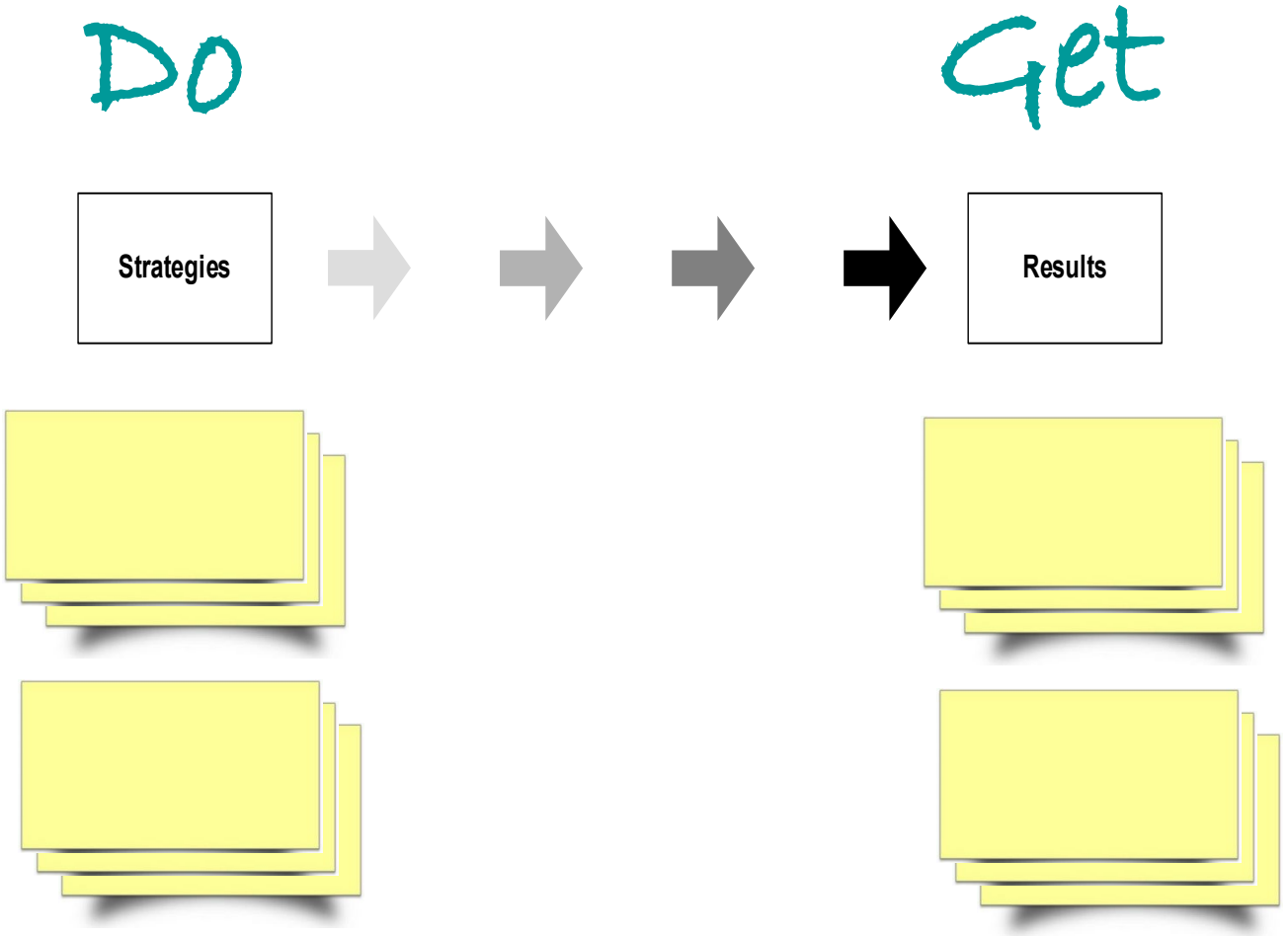
2

processes & methods for obtaining evidence

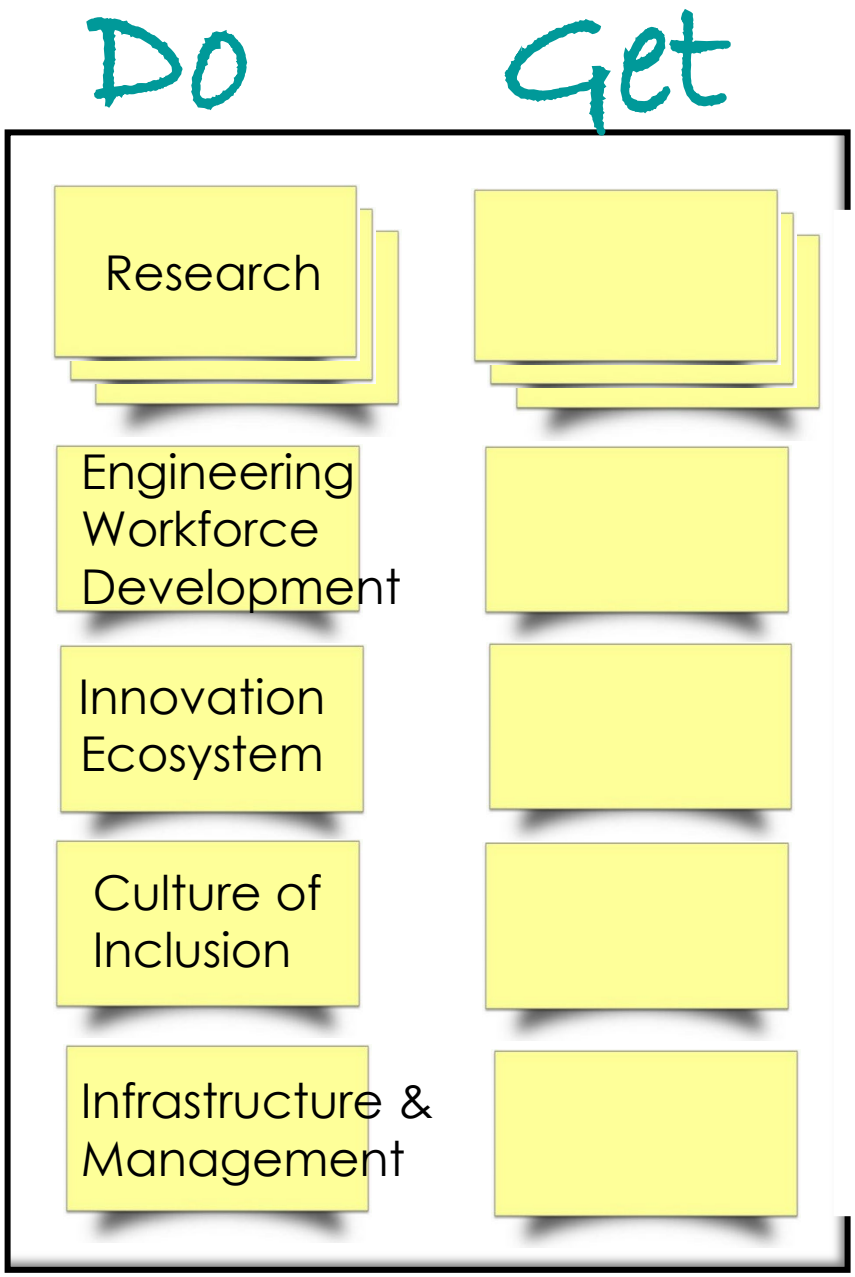
Mapping & Assessing Progress



Theory of Change (ToC)



Generic ERC ToC



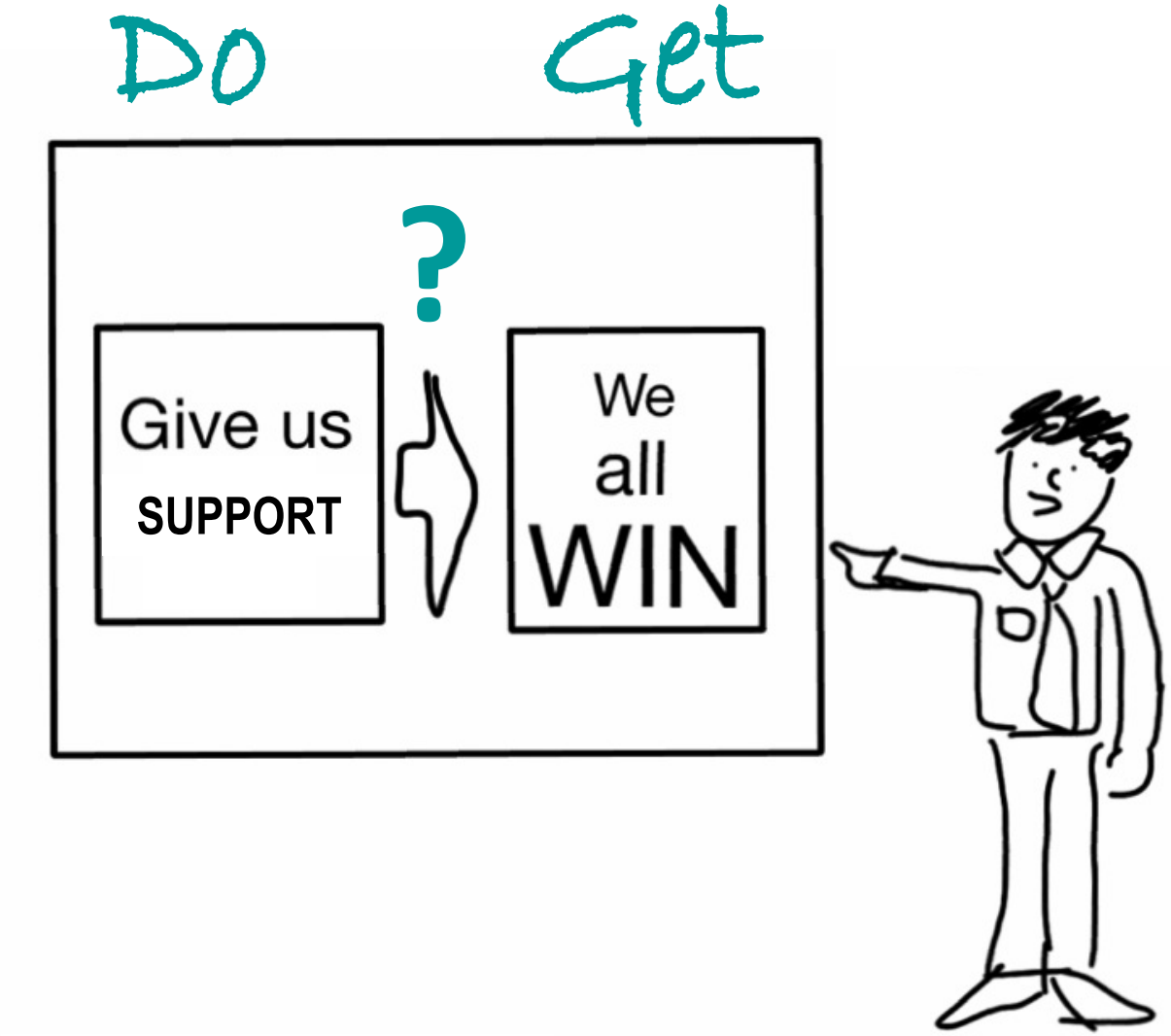
Increased research capabilities and new knowledge

Diverse, globally competitive, team-oriented workforce

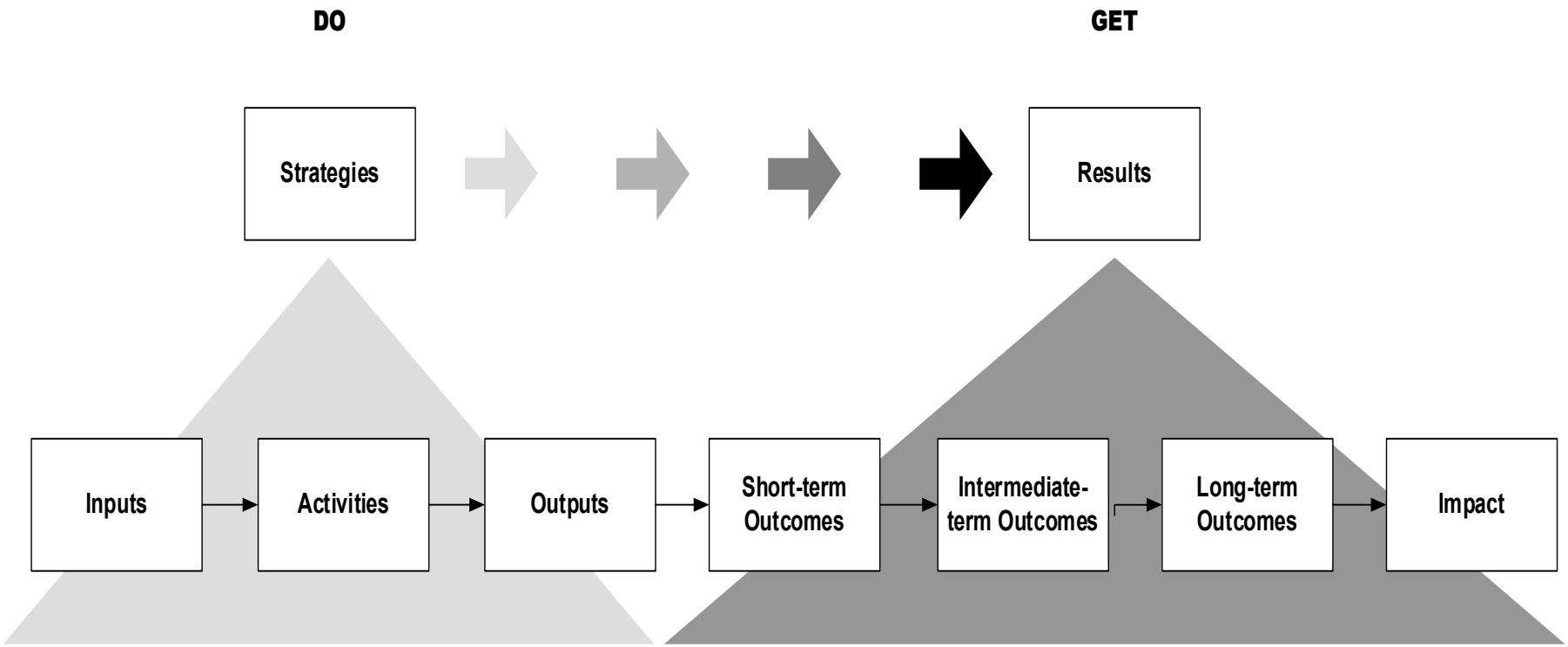
Improved value chain, technology transfer, and entrepreneurial culture

Increased engagement of underrepresented groups at all levels

Improved management, infrastructure, and implementation


Do
Get
?
Give us
SUPPORT
We
all
WIN
freshspectrum.com

Simple Logic Model



Logic Model Component Definitions

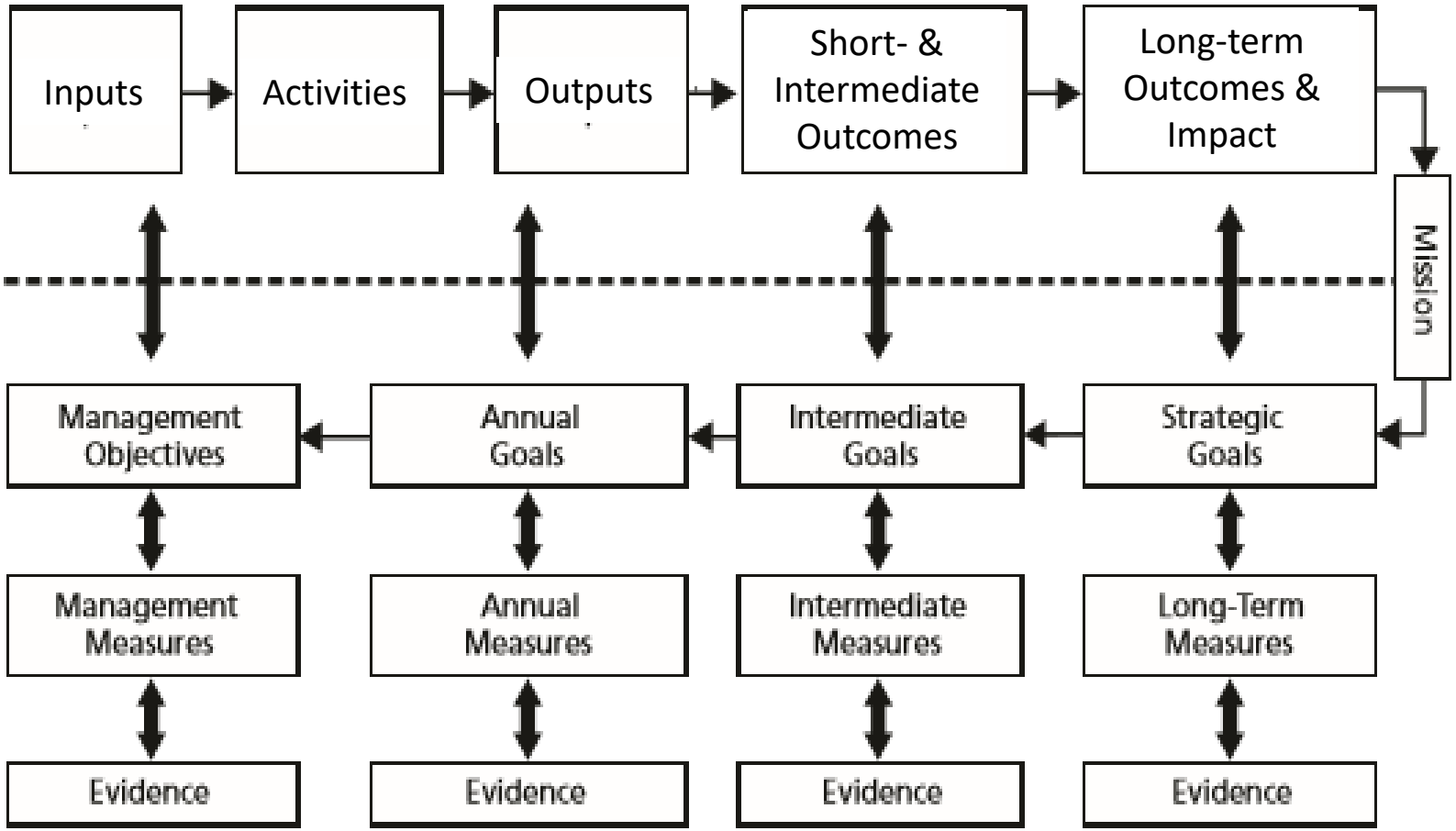
Term	Definition
Inputs	Include financial, human, organizational, community or systems resources essential to implement the project.
Activities	The specific actions that make up the project. They can include tools, processes, products, events, technology and other aspects of the intervention deployed to achieve desired results.
Outputs	Include descriptions of the types, levels and audience or targets for the project. Countable attributes of the activities if accomplished. (Frequency, Intensity, Targets)
Outcomes	The changes in project participants or organizations, as a result of the project. Can include changes in awareness, knowledge, skill, and behavior. (Specific, Measurable, Actionable, Realistic, Timed)
Impact	The ultimate change in an organization, community or other system. Often occurs after the grant cycle has ended.

Developing Models

Strategic Plans are Roadmaps for Success

Logic Models Show How Success will be Measured

Evidence & Strategic Plan



Evaluative Inquiry Process

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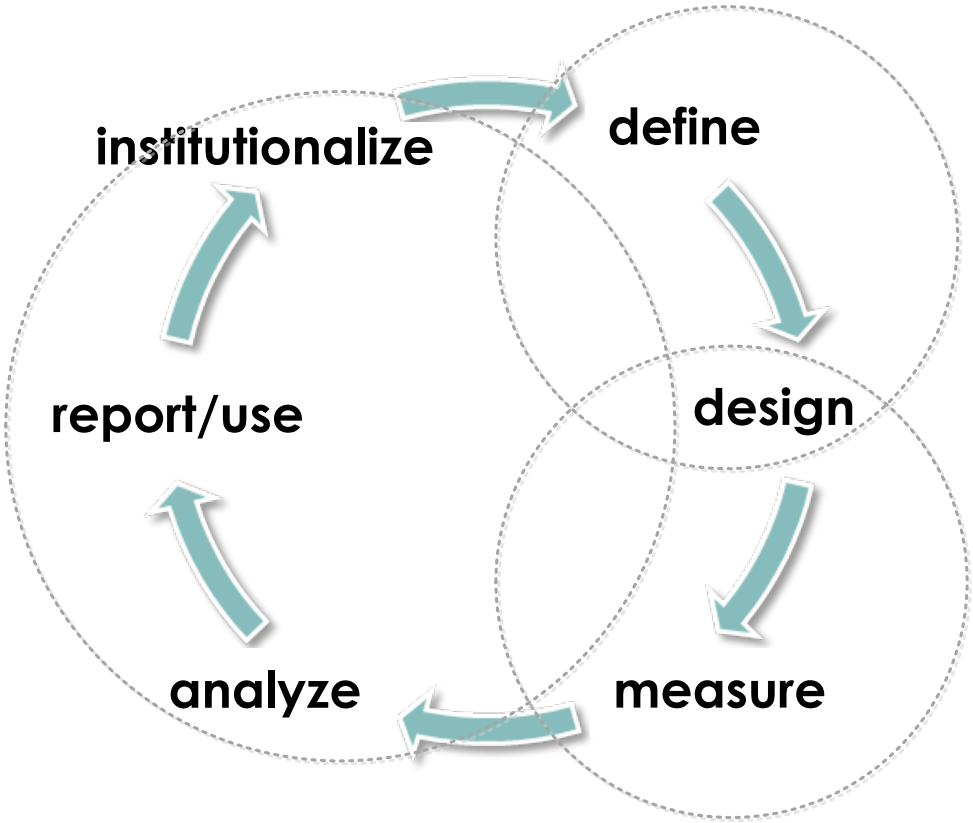

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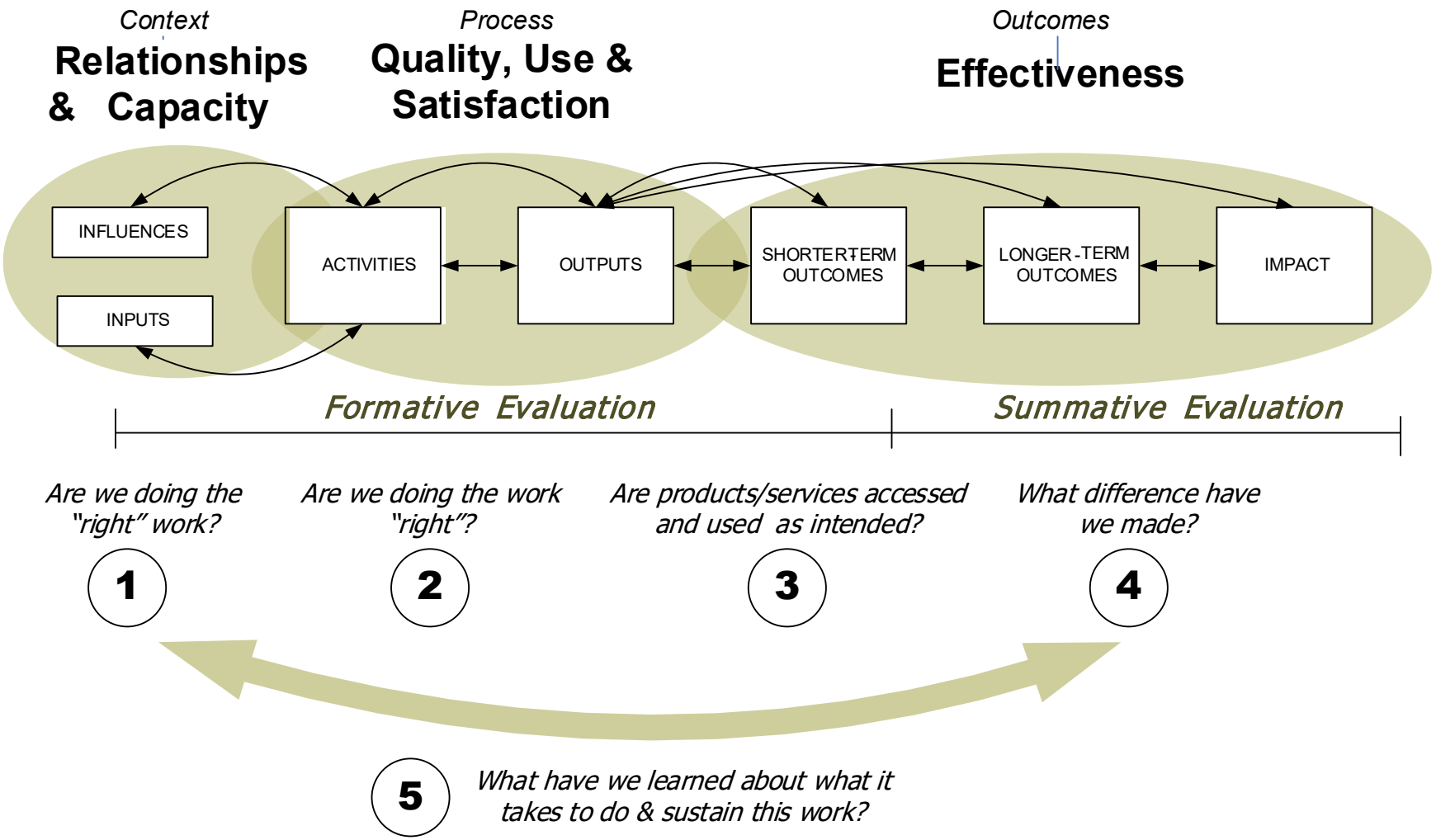
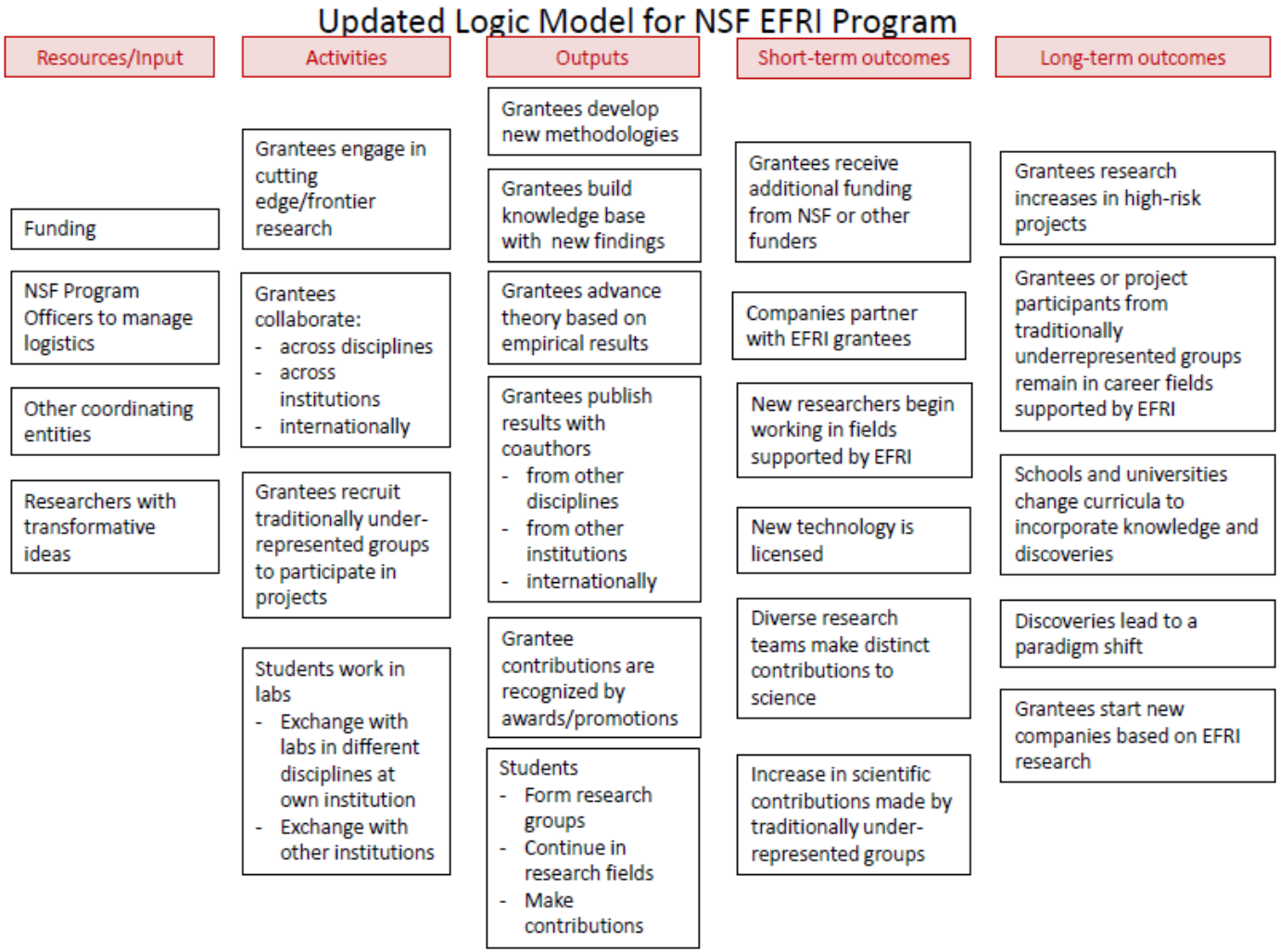
Models for Evaluation Planning



Program-level Logic Model Examples



Insight Policy Research (2015) EFRI Outcome Monitoring System

BIC LONG-TERM LOGIC MODEL

INPUTS

- Initial discovery
- Funding and Logistics (up to $800K for 3 years)
- Expertise of engineers, computer scientists, cognitive, social, or behavioral scientists, and other researchers and industry participants
- Resources to help connect BIC awardees with industry participants
- PI training
- Process, Materials and Resources (facilities contributed by industry and academic)
- Descriptions of the potential impact
- Other coordinating entities
- Student and Postdoc Mentoring Plans
- Cooperative Research Agreements between partners and Partnership Letters detailing their respective commitments

PROJECT ACTIVITIES

- Interdisciplinary research considerations of service systems as they relate to needs of the users and to advance the platform technology
- Inclusion of service industry R&D
- Partners jointly identify possible markets and commercial applications for the platform technology
- Partners jointly identify and overcome technical and/or market barriers to the success of the platform technology
- Establishment of a sustainable relationship between academic research team and industry partners
- Education of students in design process
- Leveraging of additional capital from sources outside the university or NSF

OUTPUTS

- Interdisciplinary publications on platform technology are developed from BIC-funded awards
- Technical barriers to commercialization feasibility are overcome
- Marketing obstacles to commercialization are overcome
- A subset of partners continue the relationship after the life of the award
- Students are trained in interdisciplinary approach to service system engineering
- Memoranda of Understanding or Cooperative Research Agreements between partners are renewed if appropriate for continuation of the relationship
- A business plan for commercialization is developed, where appropriate

IMMEDIATE OUTCOMES

- Feasibility of commercialization is tested
- New research directions are developed
- Patent and license applications of new technology developed from BIC awards (a subset of awardees)
- Researchers and/or students (academic and/or industry) working on BIC research become innovators and/or entrepreneurs in other contexts
- Researchers and/or students pursue further funding for the platform technology
- Students contextualize their attitudes to and proclivities for innovation

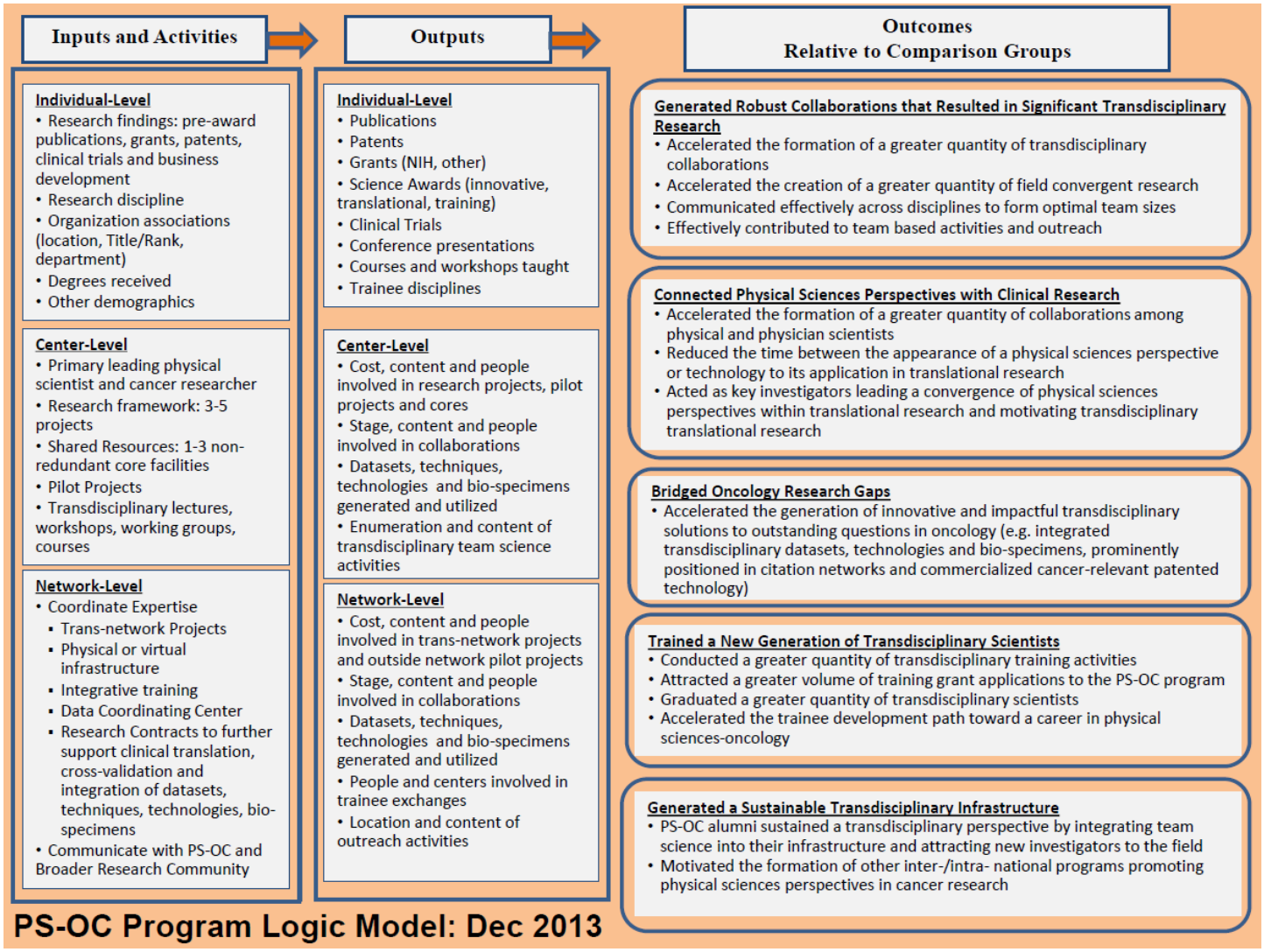
INTERMEDIATE OUTCOMES

- Platform technologies tested in new contexts considering needs of customers
- Platform technology iteration cycle shortened due to involvement of industry participants and customers
- Licensing of platform technology to industry
- Partnerships from BIC awards sustained over time to work on new technologies
- New academia-industry partnerships formed by BIC awardees
- Student participants pursue career in similarly interdisciplinary research
- Research and partnership increase academic institutional reputation as an "innovation hub"
- "Best practices" for academic-industry partnerships established and disseminated
- Workforce development as new positions or employee training opportunities are created by BIC partnership

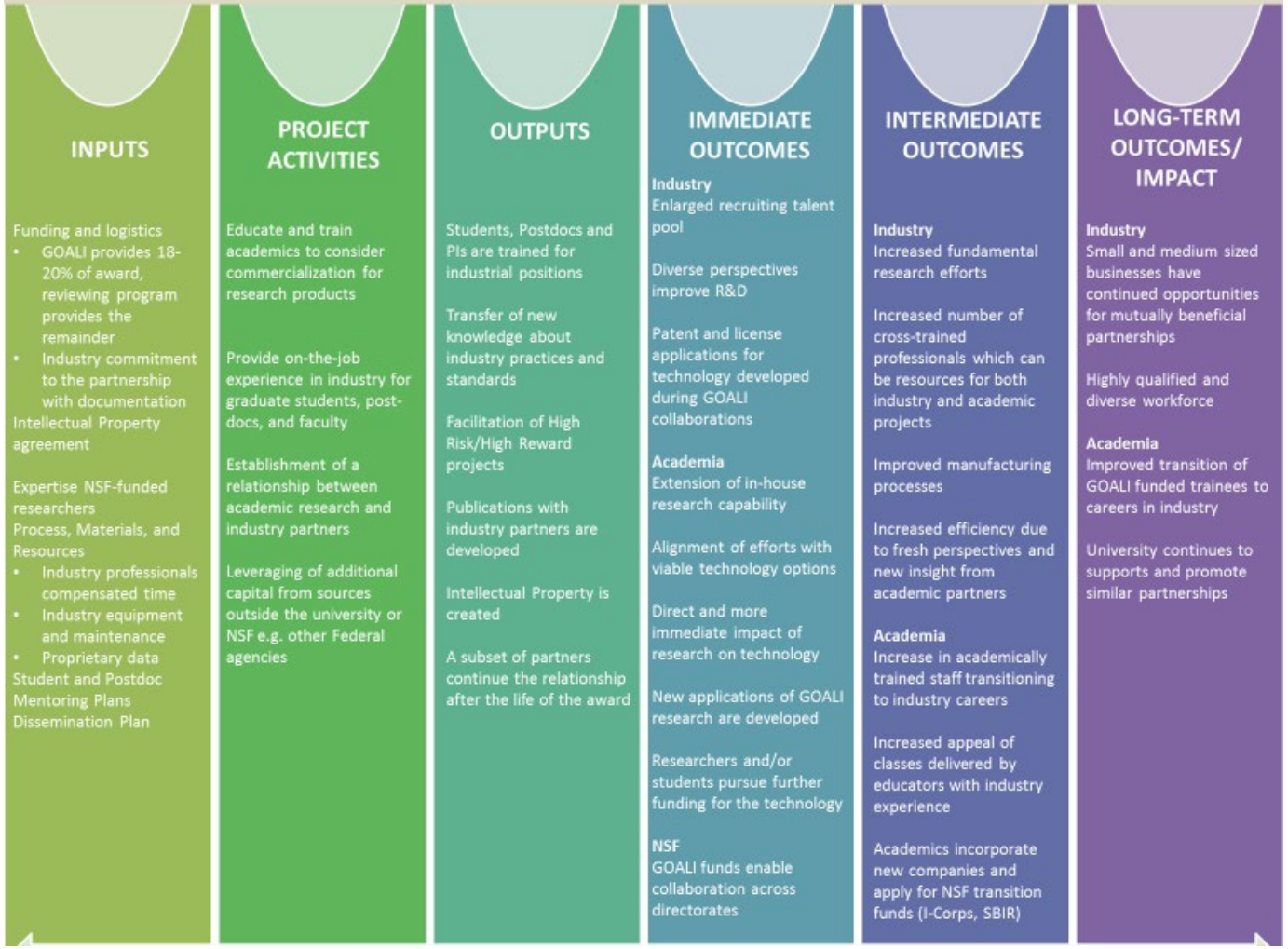
LONG-TERM OUTCOMES/ IMPACT

- Improved "smart" technology available to the service industry
- Increased retention of BIC-funded students to engineering careers/research and/or entrepreneurship
- A subset of BIC awardees form start-up or spin-off companies
- Continuation of the cycle of innovation as BIC funded students become PIs with industry partnerships or industry researchers with academic partnerships
- University continues to promote and support similar partnerships via BIC or other avenues
- Adoption/dissemination of the BIC partnership model by other institutions

Life of award | 1 yr post-award | 2-5 yrs post-award | 5-10 yrs post-award


Inputs and Activities
Outputs
Outcomes
Relative to Comparison Groups
Individual-Level
• Research findings: pre-award publications, grants, patents, clinical trials and business development
• Research discipline
• Organization associations (location, Title/Rank, department)
• Degrees received
• Other demographics
Center-Level
• Primary leading physical scientist and cancer researcher
• Research framework: 3-5 projects
• Shared Resources: 1-3 non-redundant core facilities
• Pilot Projects
• Transdisciplinary lectures, workshops, working groups, courses
Network-Level
• Coordinate Expertise
▪ Trans-network Projects
▪ Physical or virtual infrastructure
▪ Integrative training
▪ Data Coordinating Center
▪ Research Contracts to further support clinical translation, cross-validation and integration of datasets, techniques, technologies, bio-specimens
• Communicate with PS-OC and Broader Research Community
Individual-Level
• Publications
• Patents
• Grants (NIH, other)
• Science Awards (innovative, translational, training)
• Clinical Trials
• Conference presentations
• Courses and workshops taught
• Trainee disciplines
Center-Level
• Cost, content and people involved in research projects, pilot projects and cores
• Stage, content and people involved in collaborations
• Datasets, techniques, technologies and bio-specimens generated and utilized
• Enumeration and content of transdisciplinary team science activities
Network-Level
• Cost, content and people involved in trans-network projects and outside network pilot projects
• Stage, content and people involved in collaborations
• Datasets, techniques, technologies and bio-specimens generated and utilized
• People and centers involved in trainee exchanges
• Location and content of outreach activities
Generated Robust Collaborations that Resulted in Significant Transdisciplinary Research
• Accelerated the formation of a greater quantity of transdisciplinary collaborations
• Accelerated the creation of a greater quantity of field convergent research
• Communicated effectively across disciplines to form optimal team sizes
• Effectively contributed to team based activities and outreach
Connected Physical Sciences Perspectives with Clinical Research
• Accelerated the formation of a greater quantity of collaborations among physical and physician scientists
• Reduced the time between the appearance of a physical sciences perspective or technology to its application in translational research
• Acted as key investigators leading a convergence of physical sciences perspectives within translational research and motivating transdisciplinary translational research
Bridged Oncology Research Gaps
• Accelerated the generation of innovative and impactful transdisciplinary solutions to outstanding questions in oncology (e.g. integrated transdisciplinary datasets, technologies and bio-specimens, prominently positioned in citation networks and commercialized cancer-relevant patented technology)
Trained a New Generation of Transdisciplinary Scientists
• Conducted a greater quantity of transdisciplinary training activities
• Attracted a greater volume of training grant applications to the PS-OC program
• Graduated a greater quantity of transdisciplinary scientists
• Accelerated the trainee development path toward a career in physical sciences-oncology
Generated a Sustainable Transdisciplinary Infrastructure
• PS-OC alumni sustained a transdisciplinary perspective by integrating team science into their infrastructure and attracting new investigators to the field
• Motivated the formation of other inter-/intra- national programs promoting physical sciences perspectives in cancer research
PS-OC Program Logic Model: Dec 2013

GOALI LONG-TERM LOGIC MODEL



Goals Characterized by Measurable Outputs & Outcomes

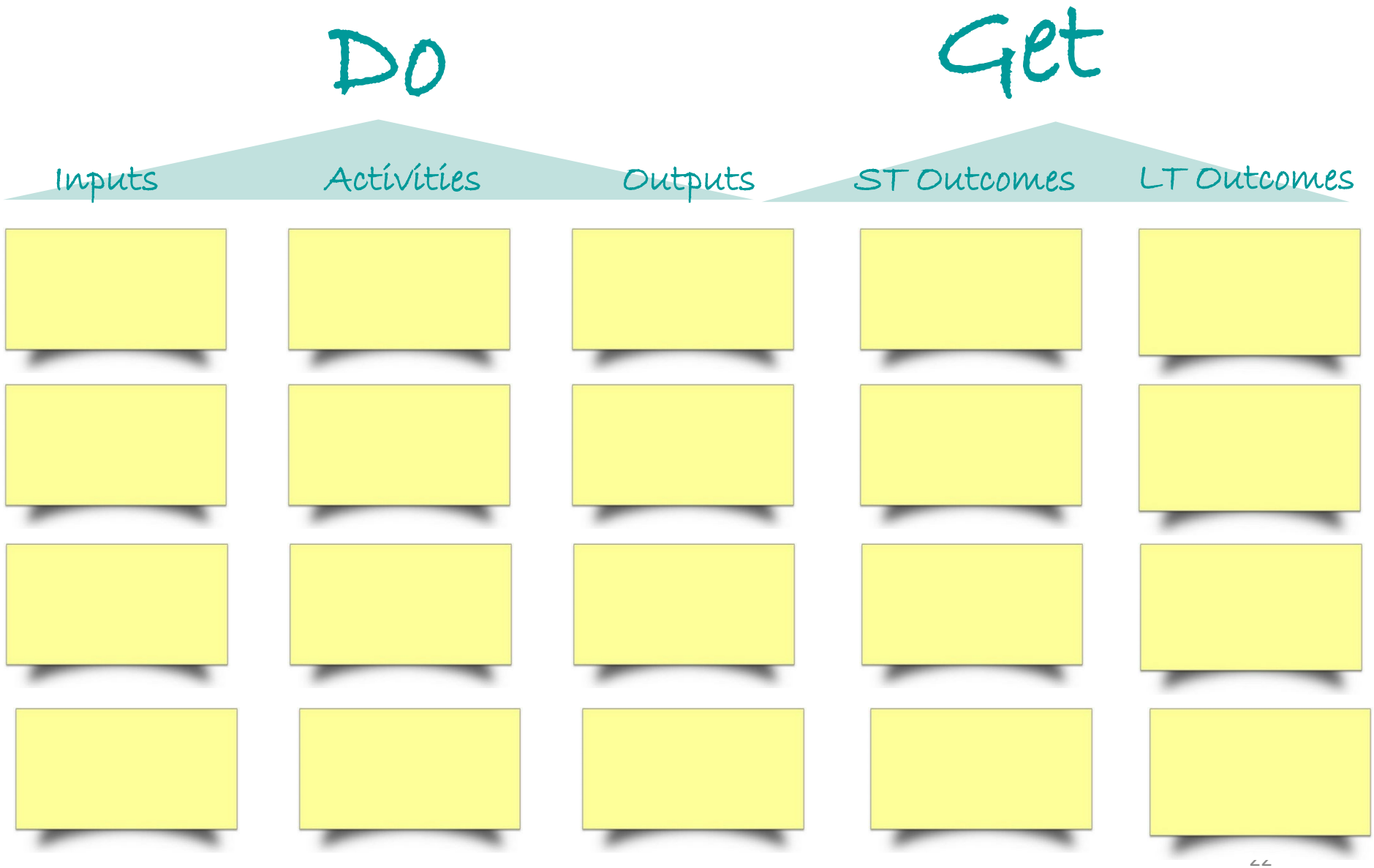
Goals	Outputs & Outcomes	Metric
Breakthrough Technologies	New products	#/5 years/#university partners
	New methods	
	New processes	
	Papers	# of journal publications/5 years/# partners
Stakeholder Satisfaction	IAB member satisfaction	% of membership renewals averaged over a 4-year period
	Leveraged funding	$ other new sources : $ NSF/5 years
	Researcher satisfaction	Likert scale satisfaction
Student Outreach	Graduate research grants	# of grants for theses and dissertations
	Student participation	# of student members/5 years
Student Development	Student projects	# of student publications/presentations/5 years
	Mentorships	Median ratio researcher : graduates/5 years
Technology Commercialization	# Degrees	# (BS + MS + PhD)/5 years
	Licensing	# of new licenses/5 years
	Students hired by IAB member	% of participating graduates hired by IAB member firms averaged/5 years
	Consulting	# of consulting contracts for researchers to IAB member companies/5 years
Knowledge Transfer	Website	Quality of information dissemination on website
	Prof org memberships	# of professional memberships held by IAB members/5 years
	Papers	# of co-publications (researcher and industry member)/5 years
	Conference presentations	# of conference presentations/5 years
	Workshops	# of seminars and workshops held

Gibson, E. and Daim, T. (2016). A measurement system for science and engineering research center performance evaluation. *Engineering and Technology Management. 2016 Proceedings of PICMET '16: Technology Management for Social Innovation.*

Logic Model Practicum

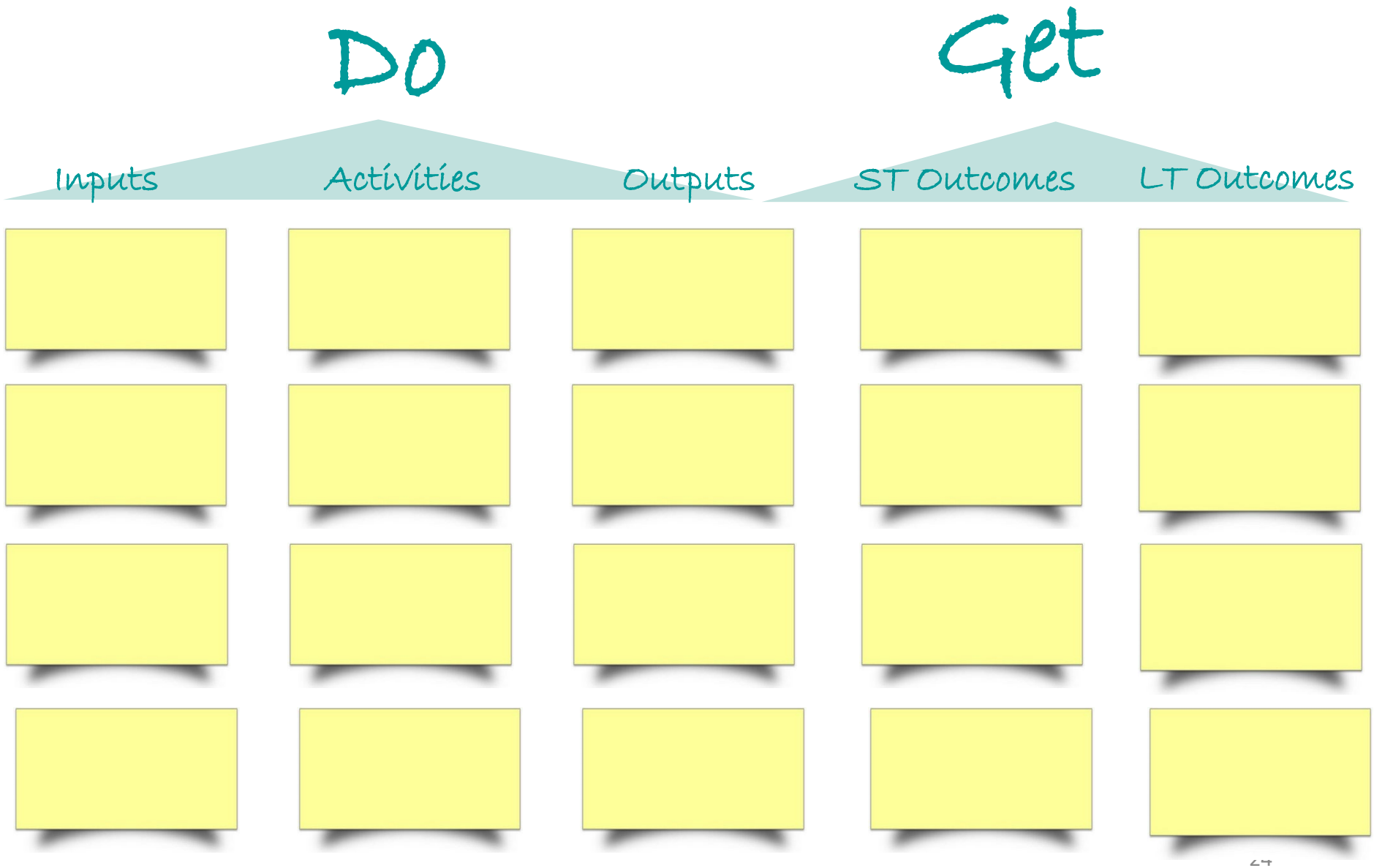
Break out Session

Research Strand



Workforce Development Strand

Innovation Ecosystem Strand



Culture of Inclusion Strand

Infrastructure & Management Strand

Proposal → Logic Model → Strategic Plan Feedback Loop

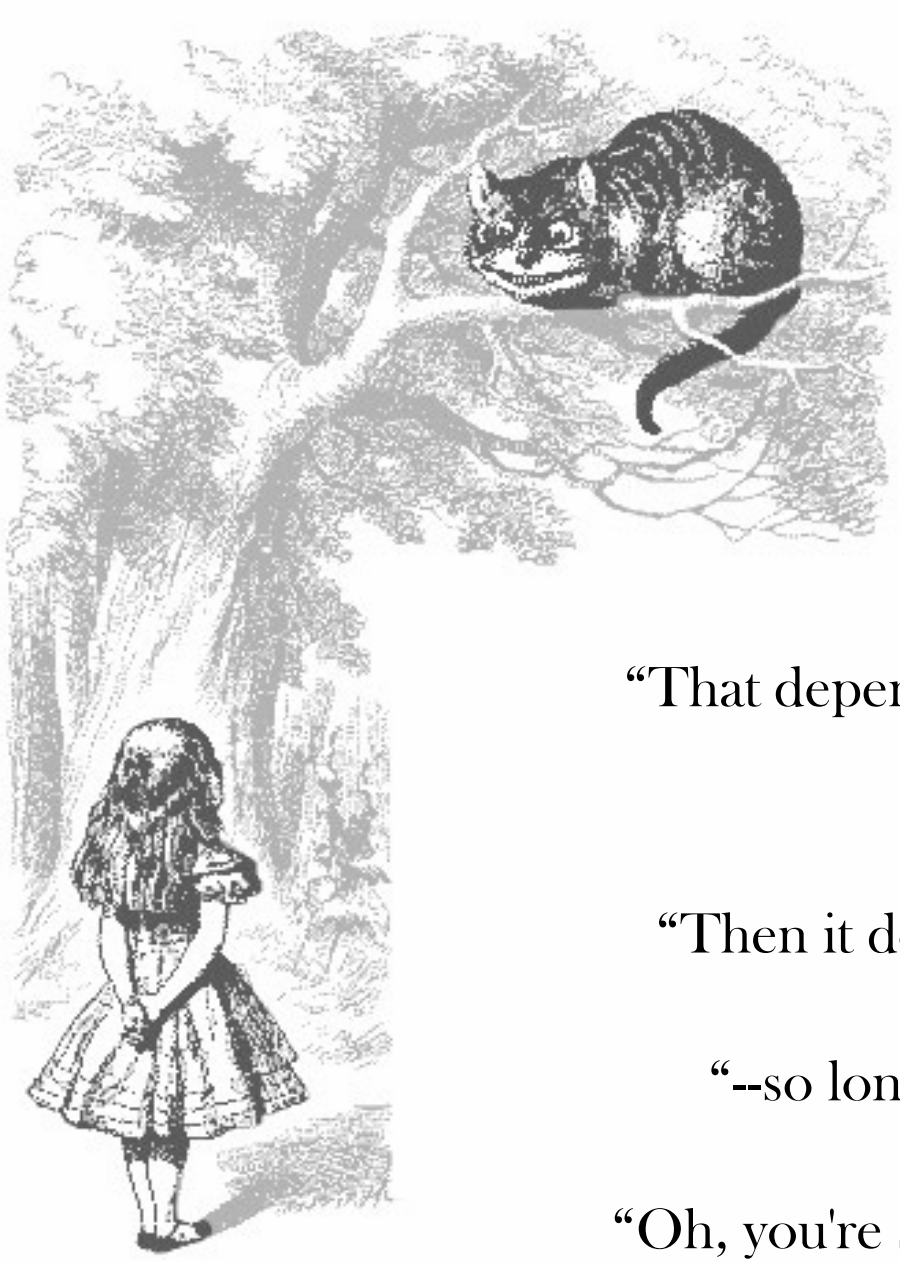
1. For each foundational component and strategy, complete the activities column.
2. List the expected results (goals) and show interrelationships if needed.
3. Fill in the gaps (inputs, outputs, short- and intermediate term outcomes) to show the links between your "do" and "get."
4. Check to assure the links from left to right are in a logical, feasible, sequence.
5. Ensure that the model represents the project (w/o unnecessary detail.
6. Revise and update the model periodically to reflect changes in the project.

Questions to Guide Review of the Logic Model & Strategic Plan

1. Are the major inputs, activities, and outputs consistent and sufficient to achieve desired outcomes?
2. Are the strategic goals outcome oriented?
3. Are there missing strategic goals?
4. How do colleagues not familiar with your project, interpret your model?

Resources

- https://www.wkkf.org/resource-directory/resource/2006/02/wk-kellogg-foundation-logic-model-development-guide
- https://fyi.uwex.edu/programdevelopment/logic-models/
- http://ctb.ku.edu/en/table-of-contents/overview/models-for-community-health-and-development/logic-model-development/main
- http://www.pointk.org/client_docs/File/logic_model_workbook.pdf
- http://www.sagepub.com/sites/default/files/upm-binaries/23938_Chapter_3___Creating_Program_Logic_Models.pdf



“Cheshire Puss,” she began, rather timidly, as she did not at all know whether it would like the name: however, it only grinned a little wider.

“Come, it's pleased so far,' thought Alice, and she went on. `Would you tell me, please, which way I ought to go from here?

“That depends a good deal on where you want to get to,” said the Cat.

“I don't much care where—” said Alice.

“Then it doesn't matter which way you go,” said the Cat.

“--so long as I get *somewhere*,” Alice added as an explanation.

“Oh, you're sure to do that,' said the Cat, `if you only walk long enough”

Thank you!

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