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The University of Texas at Austin

Best Practices for Evaluating CI and Modeling Environments

PRESENTED BY:

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STEM Evaluation Services
Expanding Pathways in Computing (EPIC)
Texas Advanced Computing Center (TACC)
The University of Texas at Austin (UT)

EPIC STEM Evaluation Services

Types of Services

- Culturally responsive evaluation
- User experience evaluation
- Evaluation capacity building and training
- Dashboard development

Evaluation and Research Projects

- Cyberinfrastructure systems
- Research institutes
- Education and outreach programs

HYDROSHARE

DESIGNSAFE-CI
A NATURAL HAZARDS ENGINEERING COMMUNITY

IFML
Institute for Foundations of MACHINE LEARNING

TACC

Introduction

What is your experience with evaluation?

- How many of you have provided data for an evaluation?
- How many of you have been involved in the design and implementation of an evaluation?

What words come to your mind when you think of “evaluation”?

Agenda

- Introductions
- Overview of Evaluation
- Data Collection Methods
- Using Evaluation Data
- Evaluation Resources
- Panel Discussion on Evaluation

What is Evaluation?

Evaluation:

- A strategy to answer questions about the implementation and outcomes of a program, policy, or system
  - Purpose is to assess effectiveness and attest to impacts
  - Collect data to inform decisions and improvements

How does evaluation differ from research?

- Research primarily addresses questions of theoretical interest
  - Purpose is to contribute to knowledge base and have broader impacts
  - Concerned with generalizability and ability to replicate

Why Conduct Evaluation?

Needs Assessment

- Informs the development of systems

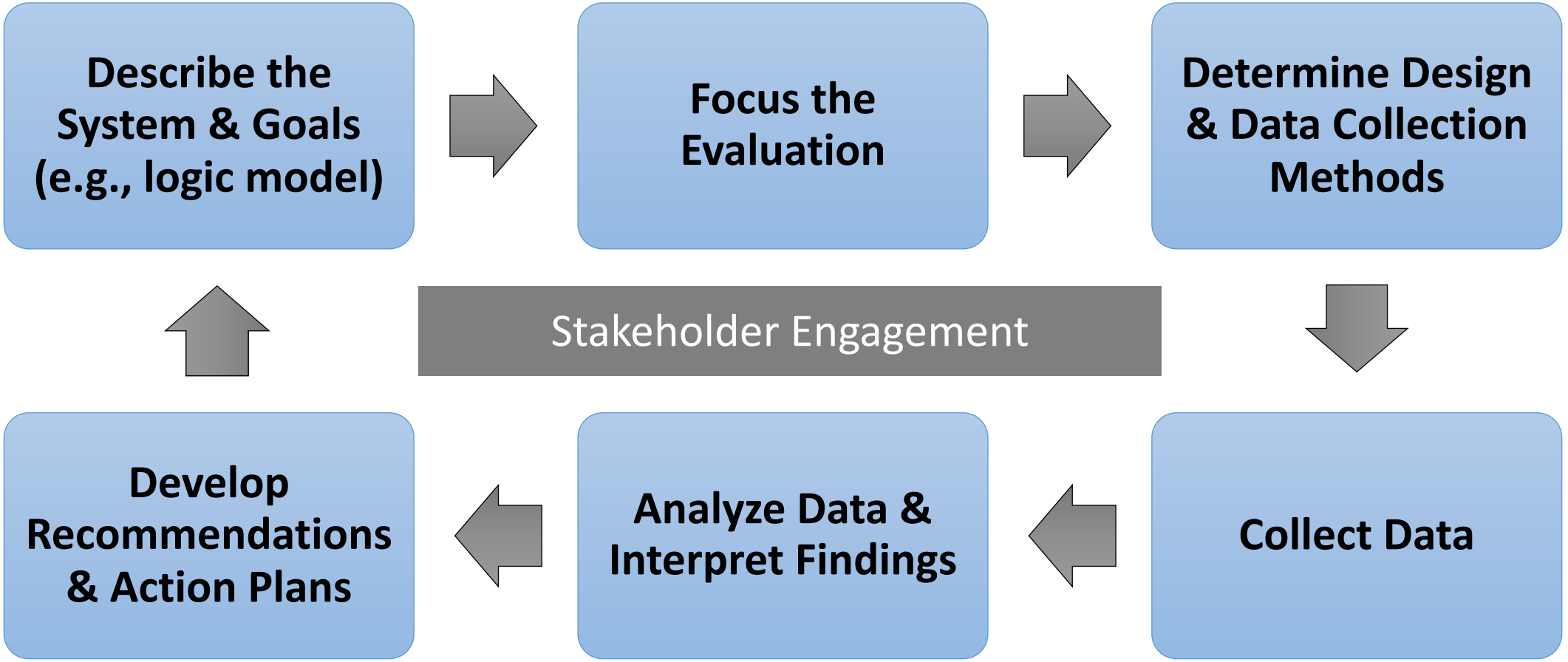
Formative

- Assists in the implementation of systems as they roll out
- Helps identify system strengths and weaknesses to improve
- Increases the likelihood that systems will achieve intended outcomes

Summative

- Provides knowledge about effective practices for the program/system
- Provides evidence of the benefits and impact of systems
- Useful in attracting others to engage with and support systems

Evaluation Process



Describe the System and Goals

Create a Framework or Logic Model:

- Provides a co-constructed visual representation of the system/project and how it achieves it goals
- Illustrates logical relationships among inputs, outputs and outcomes

- Logic models typically include:
  - Resources needed
  - Target users/participants
  - Key activities/components
  - Intended short- and long-term outcomes and impacts
  - Contextual factors

Example Logic Model

Inputs	Activities/ Components	Participation Metrics	Short-Term Outcomes	Long-Term Outcomes	Impacts
Resources • Staff • Funders • Partners Target Users • Researchers • Policy analysts • Students	• Online platform • Conferences/ trainings • Digital outreach (email, social media)	• 2K unique users/year • 500 new users/year • 50 training participants • 600 social media followers	• Increased awareness of platform • Increased access to data • Increased efficiency of data analytics • Use of data in research	• Improve quality of research • Improve field infrastructure for data sharing	• Improve geoscience knowledge base • Improve disaster preparedness capacity
Contextual factors: Data sharing policies, research funding priorities					

Evaluation Questions

Process Questions:

- Who are the system users? How many users are engaged?
- How is the system used?
- What is the quality of the user experience?
- What aspects of the system are most useful/valuable?
- What are challenges or barriers to using the system?
- How could the system be improved? What is the feasibility and priority of potential improvements?

Evaluation Questions

Outcome Questions:

- What changes occurred as a result of the system?
  - **Individual-level changes:** Attitudes, skills, behaviors, use of data/research, improve quality of research
  - **Organization/field/community-level changes:** Policy changes, capacity building, knowledge generated, broadening participation

- What, if any, unexpected changes occurred as a result of the system?
  - Examples: emergent collaborations, technological innovations, availability of new resources

Collect Evaluation Data

Quantitative	Qualitative
• User profile data • Web activity data • Social media analytics • Stakeholder surveys • User surveys	• Tech support logs • Planning documents • User interviews • Stakeholder interviews

Example Data Collection Plan

Component	Data Collection Methods	Indicators
Online platform	• Web analytics • Stakeholder survey • Annual user survey • User micro survey	**Process** • Number of users • User experience quality **Outcome** • Increased user access to data • Use of data in research
Conferences/trainings	• Training survey • Stakeholder survey	**Process** • Number of participants • Participant satisfaction **Outcome** • Increased awareness of platform • Increased knowledge/confidence in use of platform
Digital outreach (email, social media)	• Social media analytics • Newsletter list data • Annual user survey	**Process** • Number of followers/likes • Number of newsletter subscribers **Outcome** • Increased awareness of platform • Increased dissemination of platform resources

Evaluation Planning Considerations

- Prioritize metrics for ongoing assessment
- Decide what to track ahead of time
- Consider data quality (e.g., completeness, up-to-date)
- Engage a range of stakeholders in the evaluation process (internal and external)
- Use an iterative process and build up the evaluation over time

Assessing User Experience

- Consider the broad range of potential users (e.g., needs, field, experience level, active vs inactive, etc.)
- Create relevant survey questions
- Be transparent about data confidentiality and use
- Collect different types of data (e.g., qualitative and quantitative) and use multiple strategies to elicit user input

Using Evaluation Data

- Share and interpret data with stakeholders
- Use findings to improve the system
- Integrate data into planning processes
- Prioritize evaluation recommendations
- Revise evaluation plan over time

Evaluation Resources

- Kekahio, W., Lawton, B., Cicchinelli, L., Brandon, P. (2014). Logic models: A tool for effective program planning, collaboration, and monitoring. https://ies.ed.gov/ncee/edlabs/regions/pacific/pdf/REL_2014025.pdf
- W.K. Kellogg Foundation. (2017). The Step-by-Step Guide to Evaluation: How to Become Savvy Evaluation Consumers. https://search.issuelab.org/resource/the-step-by-step-guide-to-evaluation-how-to-become-savvy-evaluation-consumers-4.html

Questions

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Evaluation Panel:

Integrating Evaluation and Assessment from the Beginning

Panel Members

Emily Clark, Project Manager

Consortium for Universities for the Advancement of Hydrologic Science, Inc. (CUAHSI)

Tim Cockerill, Director of User Services

UT TACC, DesignSafe Deputy Project Director

Stephanie Baker, Research Associate

UT TACC EPIC STEM Evaluation Services

Miriam Jacobson, Research Associate

UT TACC EPIC STEM Evaluation Services

Panel Introductions

- Please introduce yourself and give a brief overview of the cyberinfrastructure (CI) that you work with and of your role in the project and its evaluation

Panel Questions

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Thank you!

Please contact us with any additional feedback or questions:

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