Logic Models: Uses, Limitations, Links to Methodology and Data

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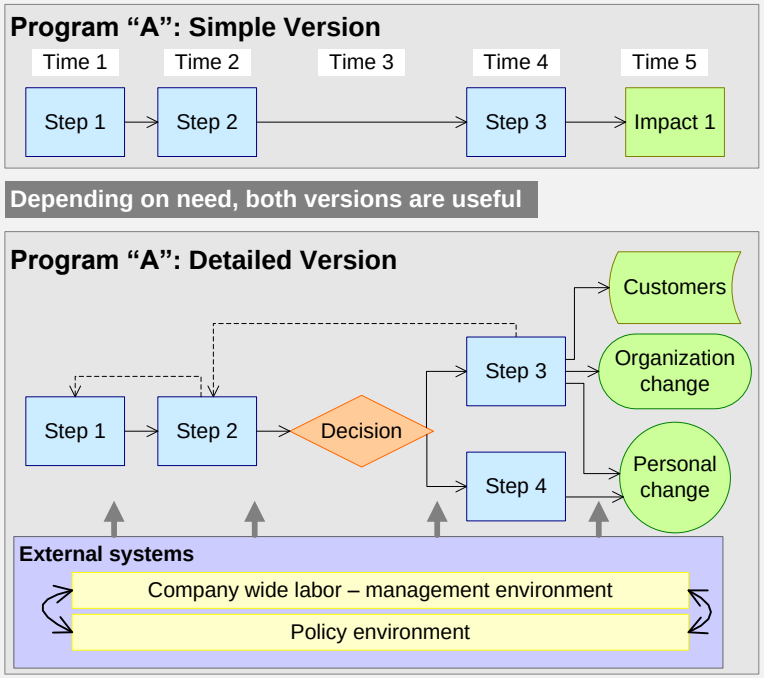


Game plan for workshop

Introductions

Part 1: Building a Logic Model

- **Lecture**
- **Exercise**
- **Lecture**

Part 2: Readability and Information Content

- **Lecture**
- **Class critique**

Part 3: Process for developing an evaluation logic model

- **Exercise**
- **Lecture**

Part 4: Discussion

- **How did this workshop affect your thinking about evaluation?**

Schedule

9:00	9:30	Round table introductions
9:30	12:00	**Part 1: Building a logic model**
9:30	10:30	Lecture
10:30	10:45	Break
10:45	11:00	Open question and discussion
11:00	11:20	Yelena Thomas presentation of her logic model
11:20	12:00	Breakout discussions and report back on Thomas' presentation
12:00	1:00	Lunch
1:00	2:30	**Part 2: Visual clarity and information density**
1:00	1:30	Principles
1:30	2:00	Examples
2:00	2:30	Natalya Kuziak presentation and discussion of her model
2:30	2:45	Break
2:45	3:45	**Part 3: Working with stakeholders to build a model**
2:45	3:00	Mike Coplen: Working with stakeholders from a stakeholder's point of view
3:00	3:45	Process for developing a logic model
3:45	4:00	Discussion of questions summary questions and evaluation

Quick overview

- Draw a picture that describes the program
- Use the picture to guide evaluation and work with stakeholders
- The rest of the day is commentary

Questions we will address at the end of the workshop

- How has your thinking changed about the relationship between logic models and other aspects of evaluation?
- How can logic models be useful for reasons other than getting consensus among stakeholders about program operations?
- When is it useful to use multiple forms of a model for the same evaluation?
- What is the value of making the information content of a logic model more dense and multidimensional?
- What are the different uses of a logic model at different points on the evaluation life cycle?
- Why/when can logic models be useless or counterproductive?

Extending Logic Models: Beyond the Traditional View

- You will learn the basics, but this workshop is about connections.
- What is the relationship between logic models and:
  - Methodology
  - Measurement
  - Program theory
  - Principles of visual display
  - Principles of group process
  - Contours of knowledge about program operations

At the end of this workshop participants will know:

- What an evaluation logic model is
- How to build a logic model
- How to choose appropriate models – detail, content, complexity
- What logical relationships can be modeled
- Types of information that can be included in a model
- How to use logic models along the whole evaluation life cycle: Initial design to → Report writing
- Connections between logic models and data, methodology, and knowledge use
- Using form to affect the trade-off of information density and readability
- Limits of logic models
- How to work with stakeholders to develop a logic model

But depending on people's interests, you may know more about some parts than others

But what good is the knowledge?

- Sometimes evaluators have no choice because "logic models" are reified into a required form
  - Input → throughput → output →outcome → impact
  - If → then statements
    - People are familiar with the form
    - Funders expect or mandate its use
    - It really does work very well in many cases
    - Simplicity and face validity are accessible to people with limited evaluation knowledge
- But there is good reason to go beyond the common form
  - Sometimes we do have choices about the forms of our models
  - Practice what we preach. Conceptual use is valuable even when instrumental use is limited
  - Trap of defining the construct by a particular operational definition precludes opportunity for improvement
  - In depth understanding of logic models teaches us something about evaluation even if we never made a model
- Multiple versions are useful

Part 1

Building a Logic Model

Models and evaluation logic model

What is a model?

A model is an abstraction designed to identify important elements and relationships within a system

What is an evaluation logic model?

- A model to understand relationships between program activities, its consequences, and its environment
- *Usually* a picture that addresses any or all of three questions
  - If a program works as intended, what will be different? (Summative evaluation)
  - What does it take for a program to work as intended? (Formative evaluation)
  - What is needed to sustain a program after start-up? (Sustainability evaluation)
- Represents views (consensus?) of some (all?) stakeholders
- Work in progress, evolves with program, evaluation findings

Incompleteness and error: The system behavior view

- Because a deterministic model cannot fully specify an open system, logic models are always incomplete approximations
- Error potential increases with:
  - Length of causal chains
  - Number of feedback loops
  - Network richness (nodes:edges)
  - Accuracy of assumptions (e.g., does an element really belong in the model? Is there really a feedback loop? Does "A" really cause "B"?)
  - Program's departure from previous solutions
    - Small change + proven program + known setting vs.
    - Innovative program + innovative solution + novel setting
    - Rate of change in program or its environment
- If logic models are always wrong, why do we make them?
  - Because they are good enough to guide practical decisions

Incompleteness and error: The domain expertise view

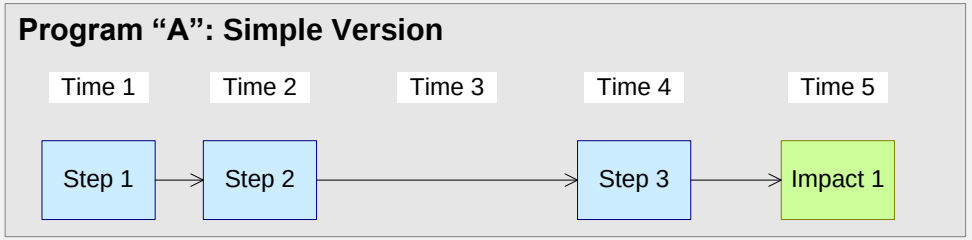
- Reasonable people may think of program theory by drawing on different experience and bodies of research
- Can we really say who is right?
- Is there much likelihood that any of them will get it completely right?

- Do we really think all these people will have the same program theory?

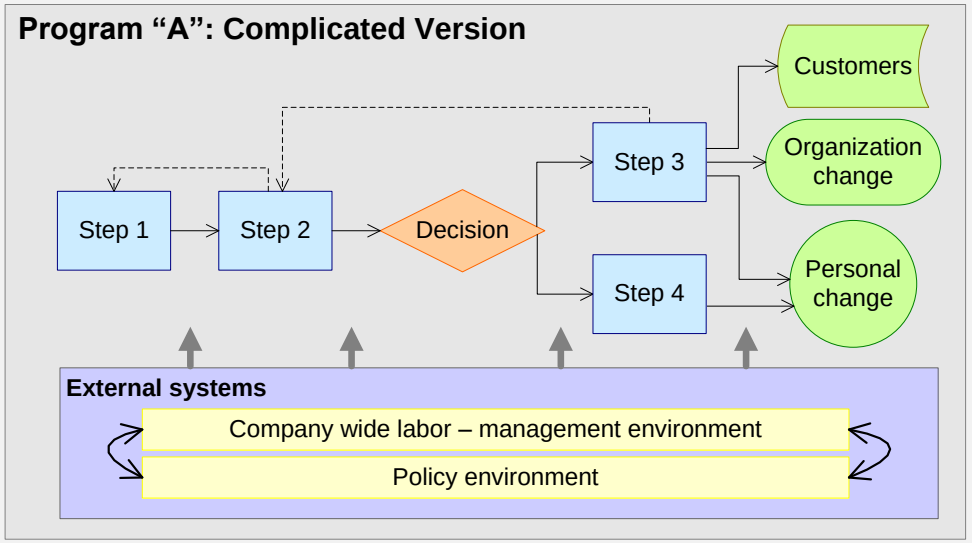
Stance toward program	**Intellectual Lens**				
	Economics	Education	Anthropology	Liberal	Conservative
+					
-					

Depending on use, logic models can be simple or complicated

- Scale and complexity of program
- Diversity of information needed to design the evaluation
- Number of
  - Elements represented
  - Systems represented
  - Nested models of different scales
  - Feedback loops
- The same evaluation might need multiple versions, e.g.
  - Technical development vs.
  - Explanation to outsiders

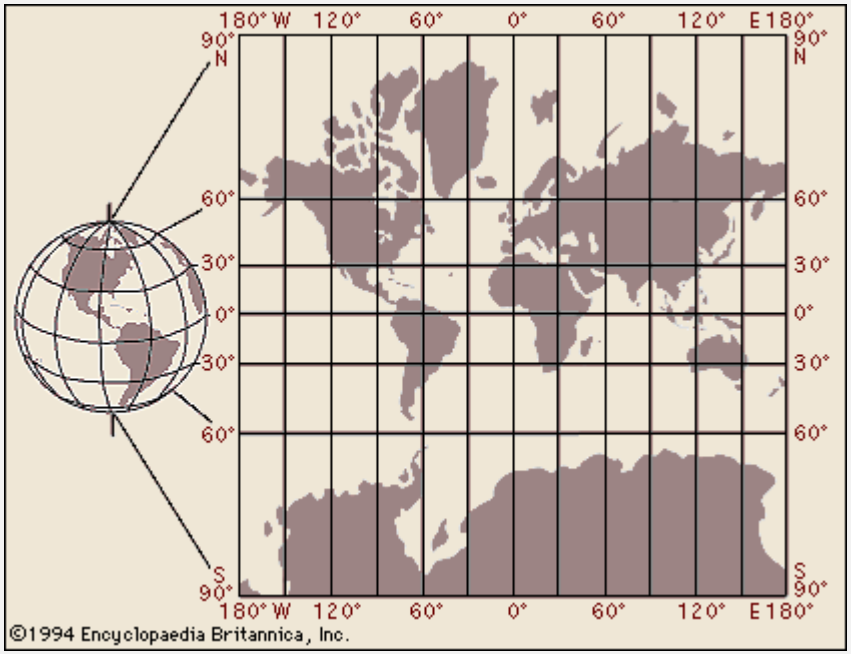


Depending on need, both versions are useful

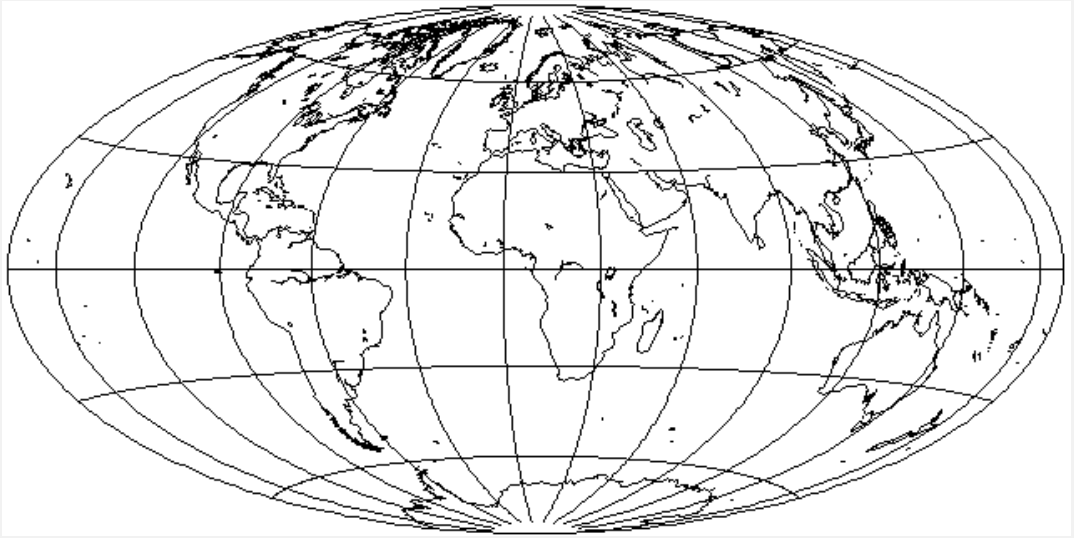


Different versions for different reasons

Areas get larger with distance from equator, but straight lines are rhumb lines, you can use the map to navigate. (Mercator)



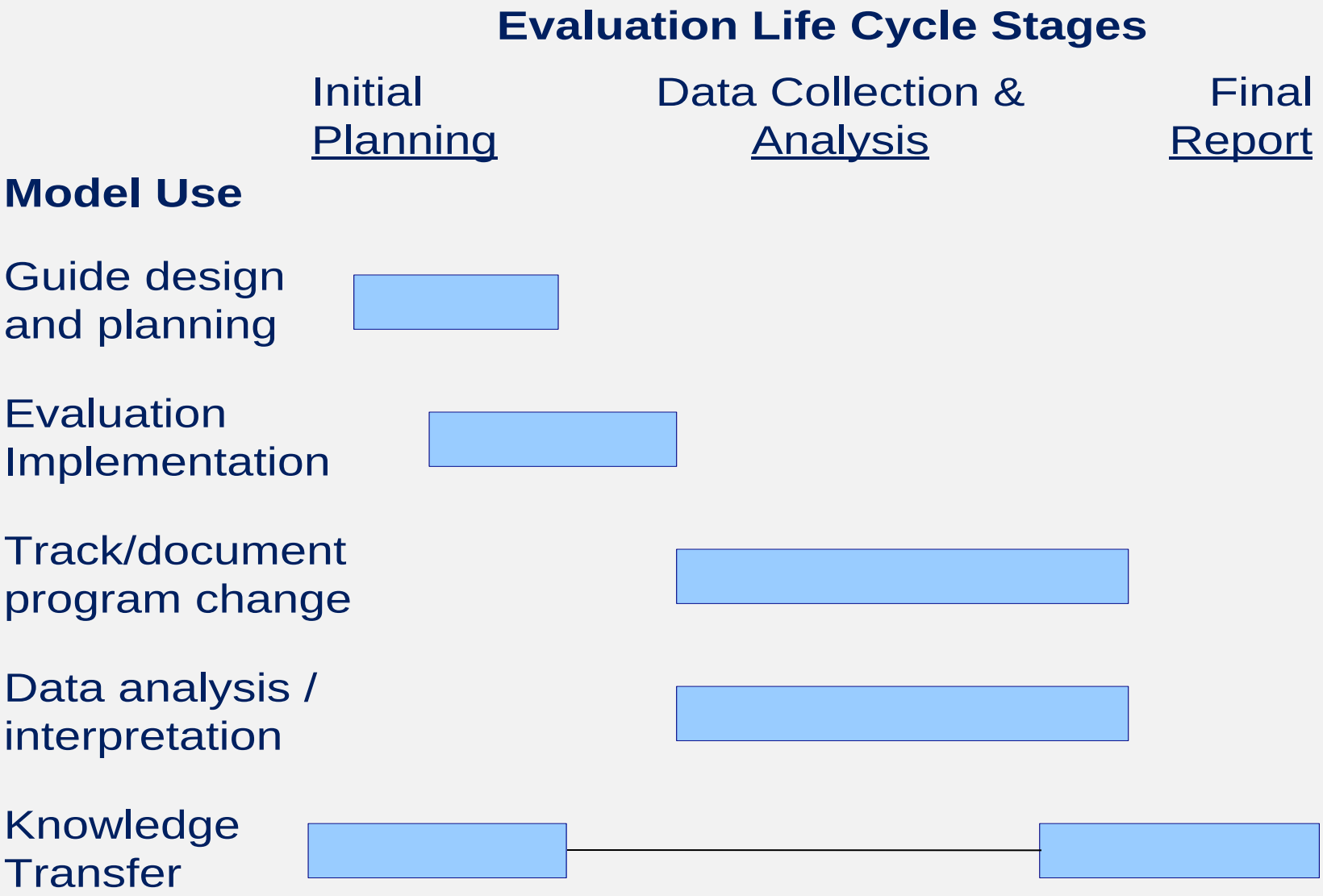
Areas are correct with respect to each other, but charting courses is problematic. (Hammer – Aitoff)



Who and what is a logic model good for?

- For evaluators
  - Organize data
  - Understand how the program works
  - Guide data collection plans (if it's in the logic model, it's a candidate for measurement)
- For stakeholders
  - By starting with an understanding of program logic, stakeholders are prepared to understand results
  - Even knowledgeable stakeholders often gain insight from developing and seeing the model
- Evaluator / Stakeholder relationships
  - Knowledge transfer
  - What will be evaluated
  - Topics to be covered in the analysis
  - Assistance with evaluation implementation
- Promote understanding
  - Causal
  - Explanatory

Uses of logic models over the evaluation life cycle



Logic model can change over time

- New stakeholders
- New stakeholder needs
- Bad management or process control
- Emerging connections among related programs
- Change in program e.g., new staff mix, funding, clients, services
- Findings may change views of program, e.g., Culture change happens earlier than expected
- But keep the old ones. Tracking the evolution is good data in its own right

We usually assume that program theories will be stable over time unless they are buffeted by fate. But sometimes they are planned to be fluid.

Some evolutionary logic models

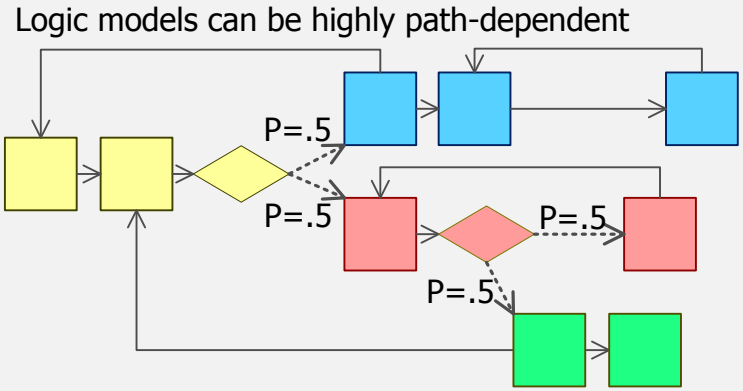
The **Kalamazoo Promise** is a pledge by a group of anonymous donors to pay up to 100 percent of tuition at any of Michigan's state colleges or universities for graduates of Kalamazoo's public high schools.

What might happen when a program like this is unleashed?

One possibility :

- Rotary Club starts a program to work with the parents of school age children
- Tutors detect mental health issues
- Cooperative arrangement pop up between the mental health system and the schools.

- Many other innovations are bound to arise
- Each may depend on what went before
- Connections among some/many of them will further change the landscape of possibilities
- Possibilities are limitless and unpredictable



Except at the highest and most abstract level, it is *impossible* to develop an a priori logic model

What can be in a logic model?

- Feedback loops
- Verbal description
- Outside influences
- System boundaries
- Stakeholder priorities
- Timeline for observation
- Estimates of measurement feasibility
- Relationships among program elements
- Program content , process, and structure
- Guess as to whether parts of the model are correct
- Any other useful information

What kinds of relationships can a logic model show?

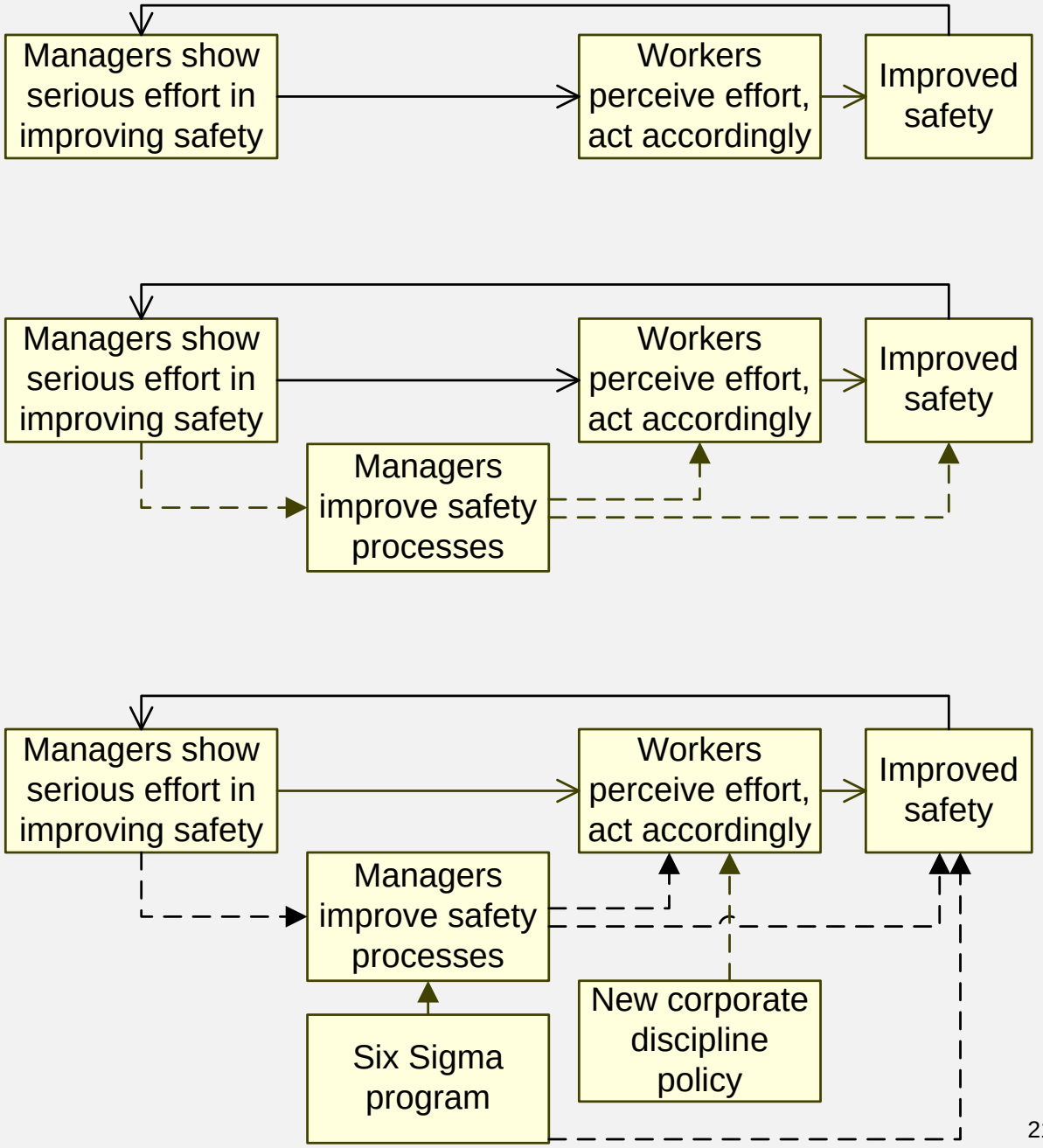
- 1 : 1
- 1 : many
- Many : many
- Precedence
  - A before B
  - A & B simultaneously
  - Agnostic with respect to precedence

Which of these do we want to use?

Let's illustrate with an example

Should we use 1:1 relationships for all variants of a management training program to increase worker safety?

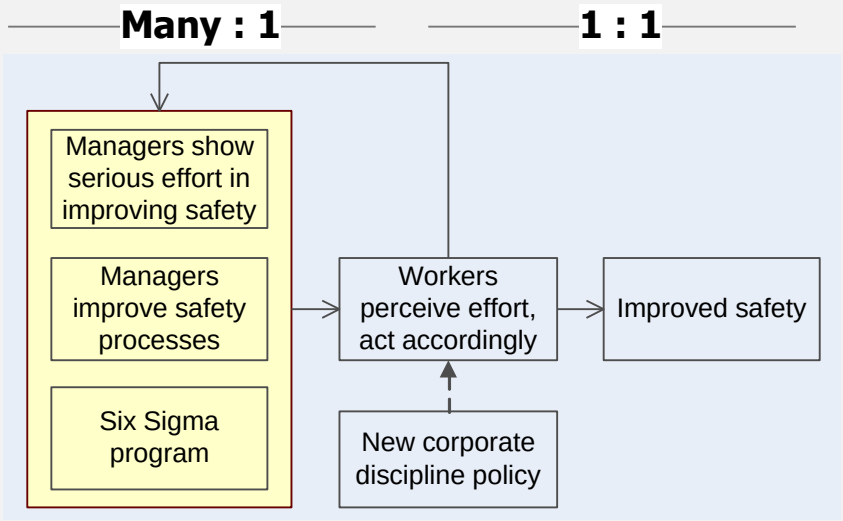
- Each version increases complexity and detail. Can we do evaluation at those increased levels?
- Even if we can collect and analyze the data, can the system be explained by the sum of its parts?
- Each element is a hypothesis. Error can pile up.



Reconfigure the logic models and reconsider the possibilities

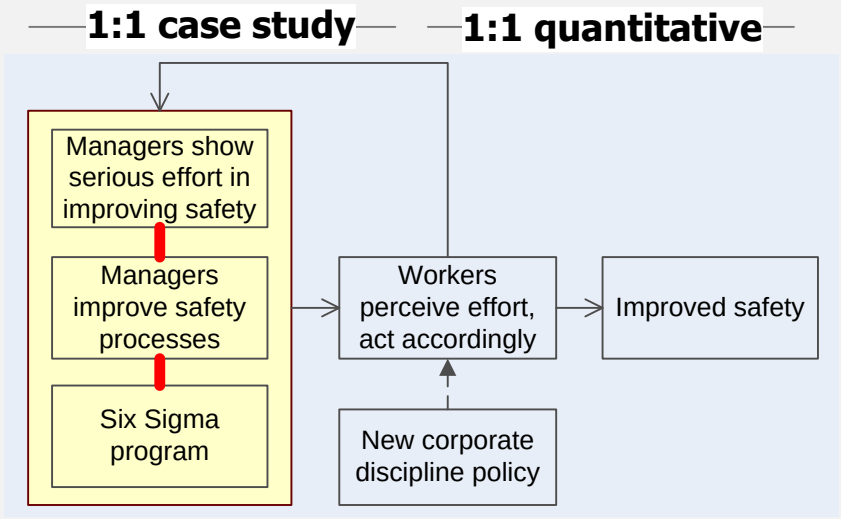
Considering:
- Our ignorance of relationships
- Interactions among elements
- Likely error if we over-specify

Maybe we should change the evaluation question to a many:1 evaluation question for the first part



Or maybe we should stick with 1:1 but use a qualitative methodology for the first part of the model.

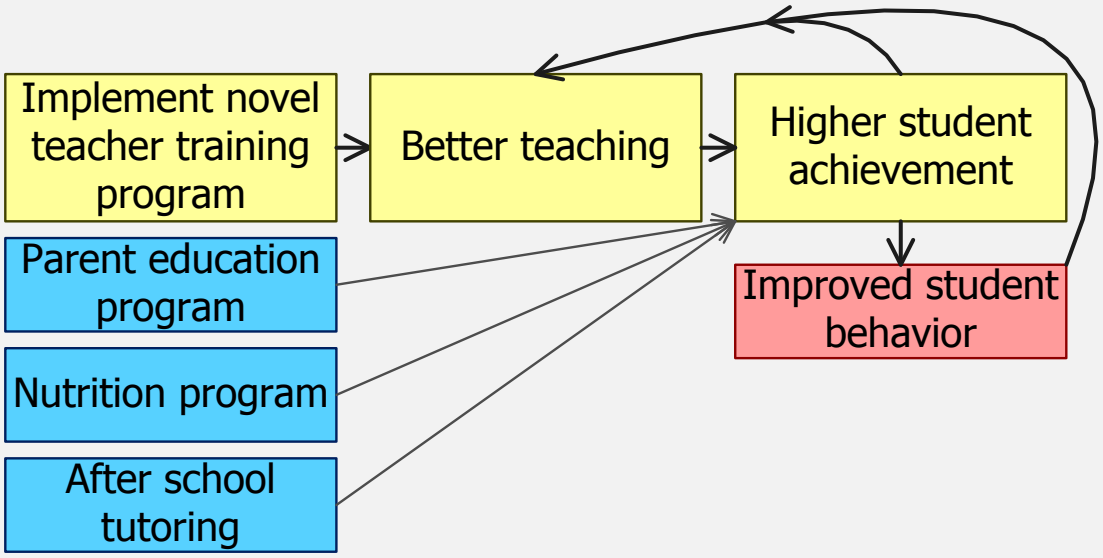
We can't make the decision without considering relationships among
- Metrics
- Methodology
- Models



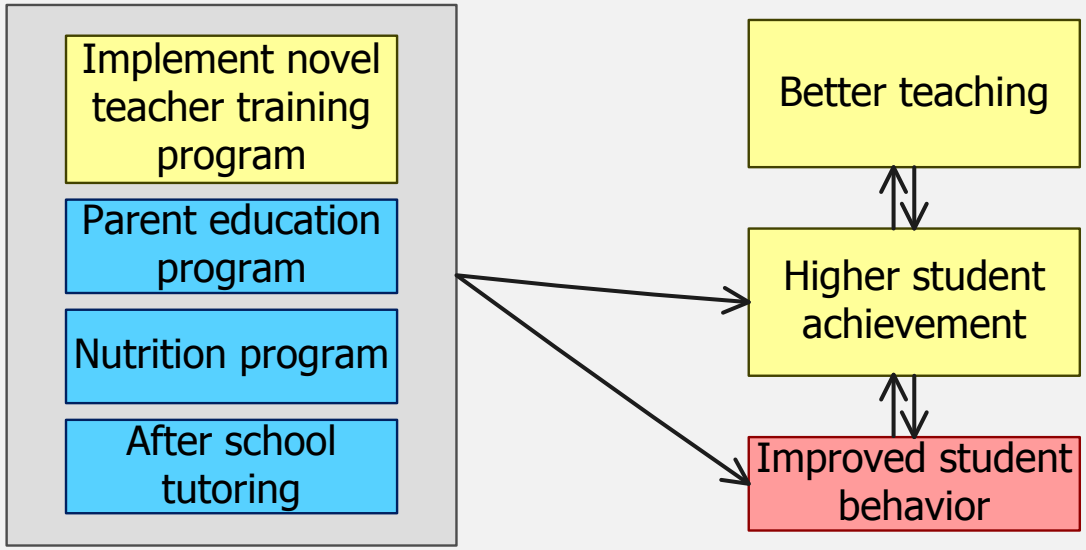
Models and methodology: Example of relationship

Do we have what we need to evaluate a novel teacher training program?

- Historical data
- Comparison group data
- Knowledge if implementation schedules
- Ability to time data collection
- Information on quality of each individual program?



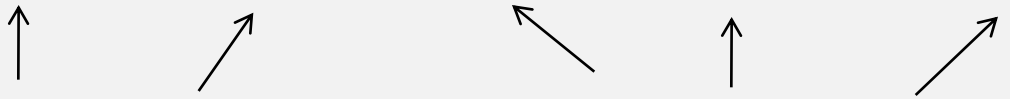
Maybe the best we can do is to test this model instead.



Visual form of logic model should reflect the state of knowledge of program theory

One reason this form is so common is implicit acknowledgement that the best we can do is to say that

Operations	Activities	Outputs	Outcomes	Impact
Legislation	Rulemaking	Rules	Reduced defects	Reduced fatalities
Funding	Inspection	Reports	Reduced failures	Reduced industries
Industry	Enforcement	Penalties	Limited propagation	Less environmental harm
Industry standards	Investigation	Information		Less property loss
State programs	State grants			Reliable delivery



If a bunch of stuff happens here

A bunch of stuff will happen there

This is just fine. A model can only depict what we know.

How do logic models relate to other elements of evaluation?

Metrics – what gets measured?	Identify constructs, but usually not at the level of detail needed for measurement
Methodology – what is the logic that allows us to interpret data?	Partially. Patterns in logic model may be a pattern that can be tested
Knowledge transfer – how do we get people to listen to us?	Partially. The model *is* knowledge. Also, stakeholder involvement sets expectations and provides structure.

Sometimes logic models can be the design

If a complicated pattern is validated, it's reasonable to assume causation even without comparison groups.

1. Model validated, reasonable to assume program brought about desired results
2. Program theory is wrong
3. Program theory wrong, but something went right
4. Nothing went right

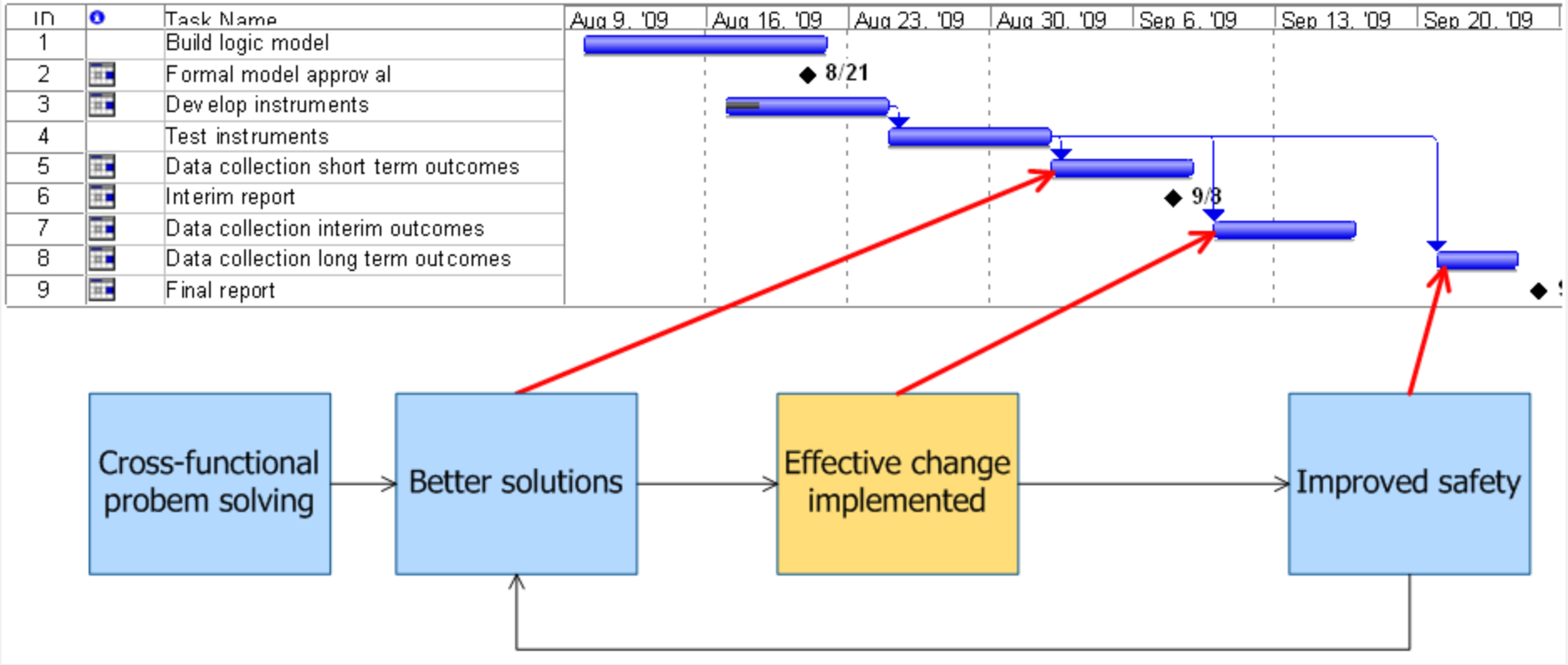
	Program outcomes achieved?	
Logic model validated?	**Yes**	**No**
Yes	1	2
No	3	4

But logic models do not tell us

- What mix of cases to pick
- What comparison groups to use
- When or how to triangulate from multiple sources of data
- Over how long a period to map pre-implementation trends
- When/how to make cross group and within group comparisons
- Number and length of post-treatment follow-up data collections

Different Ways to Model an Evaluation can be Complementary

- Project plan and logic model
  - Do not match 1:1
  - Should *not* match 1:1 because they serve different purposes
- But mapping the overlap increases ability to
  - Work with stakeholders
  - Manage the evaluation



Programs for which logic models are not appropriate

- Very stable programs with simple program theory
- Program is deliberately poorly specified, i.e.
  - Rapid prototyping – continual testing and revision approach to program design and implementation
  - Continuous improvement rapid cycling of evaluation
- Models imply program stability. Programs may be unstable
  - Rapid change in program's environment
  - Formally complex systems -- self organization, phase shifts, etc.
  - Multiple causes, highly networked and cross-linked
    - Different combinations of changes among multiple causes can bring about the same change
    - Best plan is to focus on issues that are richly linked, on the assumption that the system will loosen and somehow change

Do you need a logic model?

- Would the evaluation get better or worse if we did NOT have a logic model?
- Consequences (positive or negative) for other aspects of the evaluation:
  - Metrics
  - Methodology
  - Knowledge transfer to stakeholders
  - Ability to successfully implement and carry out the evaluation
- Costs and benefits
  - Do we have resources to build a model that would truly improve the evaluation?
  - Time to develop the model given the schedule needed to begin data collection?
  - If we develop the model late, will having it help anyway?
  - What else could be done with the time, money, and labor?

Complex Systems

- Garden variety logic models
  - Deterministic, or at least stochastic
  - 1:1, 1:many, many:many relationships can be specified and make intuitive sense
- Complex system behavior is different, a long way from common sense, and hard to depict visually
  - Stability
  - Chaos (not the same as random)
  - Edge of chaos
  - Position with respect to states is difficult to know
  - Emergence, which is not the same as
  - Self organizatipon
- Autonomous agents
  - Systems comprised of large number of autonomous agents
  - Agents sense environment and act according to a few simple rules
  - Result is emergent well organized behavior at a higher system level

Complex Systems Present Problems for Logic Models

- How do we know that program theory really behaves in a complex fashion?
- If it does, what does this do to how we work with stakeholders and for how they understand their program theories?
  - Can we use program theory to define the agents and their interaction rules?
- How can we depict the logic model in a visual fashion?
  - In a sense it is easy because agents have simple interactions
  - Not so easy at the system level
- How can we test program theory without computer simulations?
- My solution is to ignore whether a system is formally complex, and proceed by asking myself a few simple questions
  - How certain am I that the program theory is reliable?
  - Can I identify sources of uncertainty?
  - Are there alternate program theories to consider?
  - Is the program stable or unstable?
  - If unstable, can I convince the client to agree to frequent logic model revision exercises?

How to handle unanticipated program change?

- Continuum from change
  - That is somewhat foreseeable but not foreseen →
  - Change that cannot be anticipated
- Research literature, experience with similar programs and diverse expertise can reveal likely (possible) program behavior
- Program monitoring can increase lead time for detecting impending change
- Evaluation designs can be made more agile
- The way in which logic model revision is built into the evaluation change process can help to detect unanticipated events and to adjust evaluation designs
- *Evaluation in the Face of Uncertainty: Anticipating Surprise and Responding to the Inevitable* Guildford Press, 2010

Breakout exercise

- Workshop attendee presents a logic model in development
- Small group discussion of possibly useful changes
- Report back from groups, discussion with presenter

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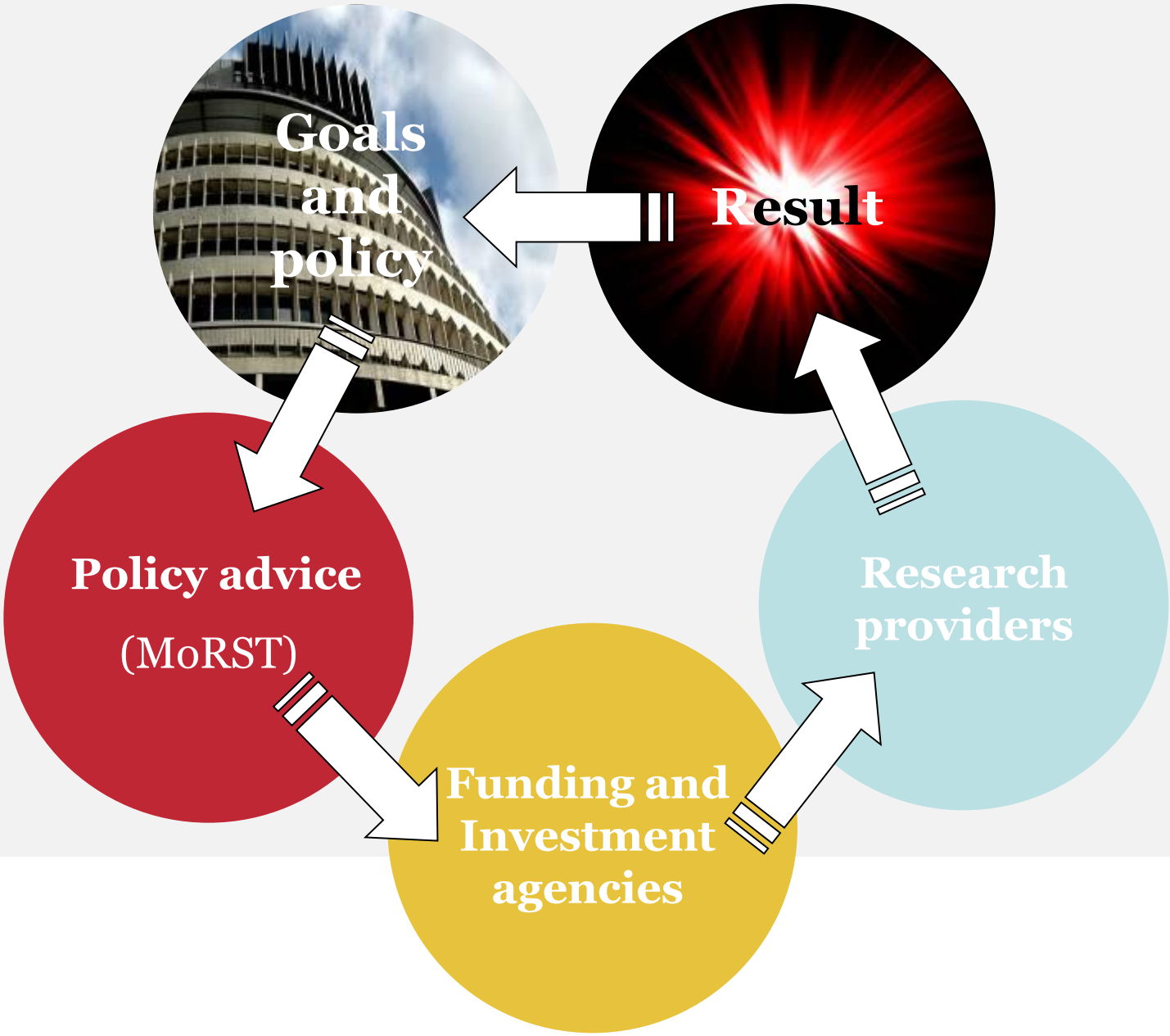
New Zealand's RS&T System



- Example 1: Logic Model for Vision Mātauranga (indigenous knowledge) and the Māori Knowledge and Development output class (MKDOC)

Mātauranga Māori

- 'Mātauranga Māori in a traditional context means the knowledge, comprehension or understanding of everything visible or invisible that exists across the universe.'

A summary of information we had:

- *Vision Mātauranga* is a strategic policy document. Its objective is "to unlock the innovation potential of Māori knowledge, resources and people to assist New Zealanders to create a better future".
- Intention: "*Vision Mātauranga* to be infused across the government's broader RS&T investment programme"
- MkDOC was used as a tool to implement *Vision Mātauranga*
- MKDOC's objective: "develop research capacity and capability across the themes of the *Vision Mātauranga* framework"

What is special about this strategy?

- No other country has a comprehensive research strategy that sees indigenous people, knowledge and resources, as a source of opportunity and potential national benefit in research, science and technology

Evaluation

- The primary evidence sources used in this evaluation were interviews with people involved in strategic and operational decisions related to *Vision Mātauranga* and MKDOC
- We had to evaluate the process rather than outcomes
- Fully described activities that are happening, possible outcomes that they may achieve and projects that are funded
- Recommended further policy work and clarified targets and monitoring requirements

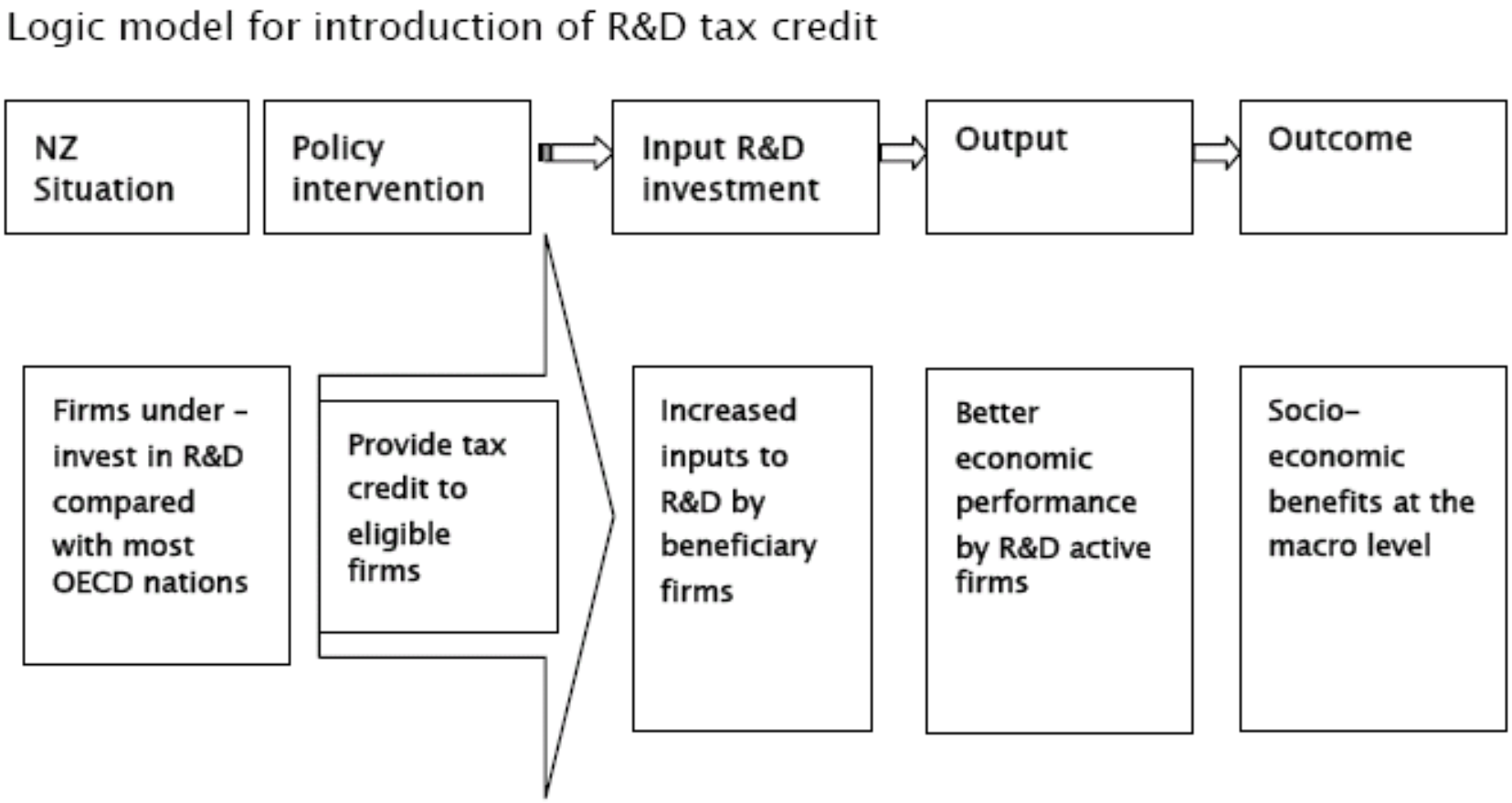
Example 2: R&D tax credit evaluation

Background

- R&D tax credit policy was introduced on 1 April 2008
- The aim of the research and development tax incentive is to:

  "improve the productivity and international competitiveness of New Zealand businesses by encouraging businesses to invest more in R&D."
- The policy basis of an R&D tax credit is: "Firms undertake R&D to improve their products and processes, which directly contributes to productivity and competitiveness. At the moment, businesses are likely to under invest in R&D because they do not capture all of the benefits from that investment – the investment results in wider benefits that boost productivity and competitiveness for other firms as well. R&D tax credits should help to address this underinvestment, resulting in businesses developing more new products and processes."
- The R&D tax credit is being administered by Inland Revenue Department (IRD).[2]
- Evaluation framework was designed in September 2007

Logic Model


Logic model for introduction of R&D tax credit
NZ Situation
Policy intervention
Input R&D investment
Output
Outcome
Firms under – invest in R&D compared with most OECD nations
Provide tax credit to eligible firms
Increased inputs to R&D by beneficiary firms
Better economic performance by R&D active firms
Socio–economic benefits at the macro level

Evaluation overview

- The purpose of the evaluation of the effectiveness of the R&D tax credit is to:

  Determine the effectiveness of the tax credit in meeting the government aim.

- The proposed evaluation will assess:

  The effectiveness of its design and delivery; and its impact on the level of R&D undertaken in New Zealand, focusing on the benefits to firms.[1]

Evaluation Framework based on the logic model

- A set of evaluative questions for each stage for the R&D tax credit evaluation.
- Each question will be answered though a set of investigative questions, with the methodology being appropriate to the question, size of sample and quality of data required- page 7 of the attached report

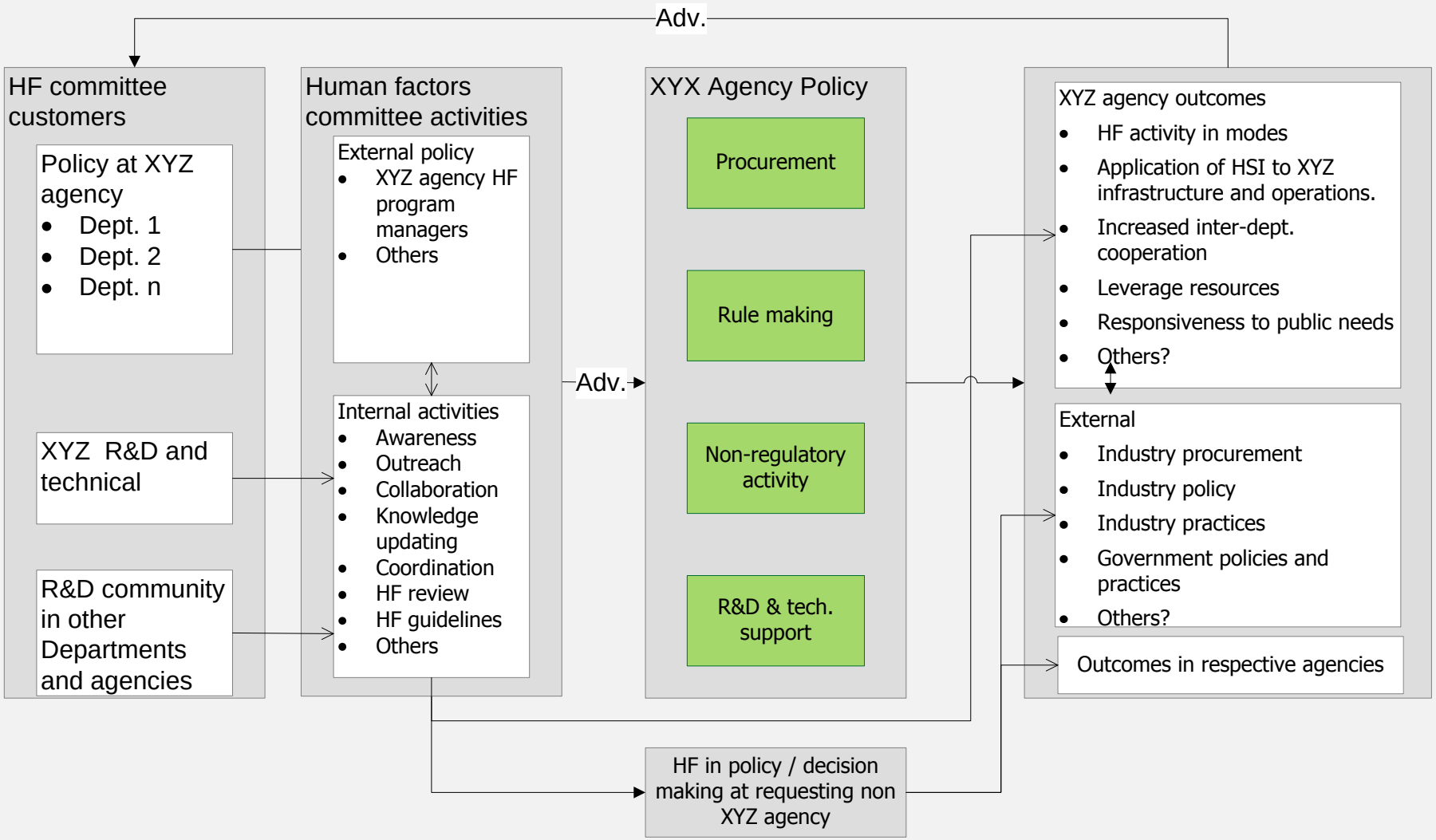
What happen next:

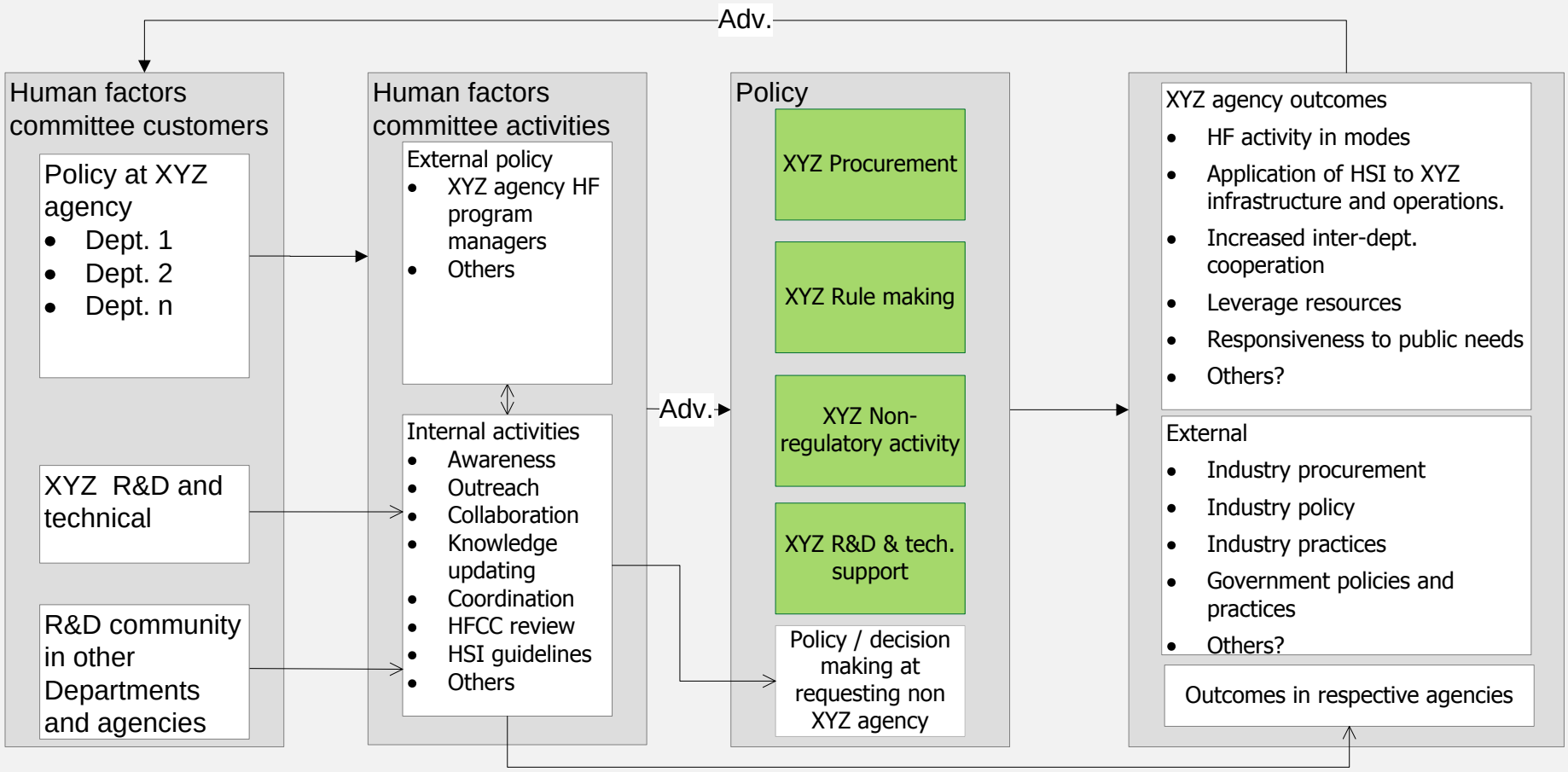
- R&D tax credit policy was removed on 1 April 2009
- We now have rich baseline data that we can use for future R&D policies

Part 2
Visual Clarity and Information Density

- **Principles**
- **Examples**

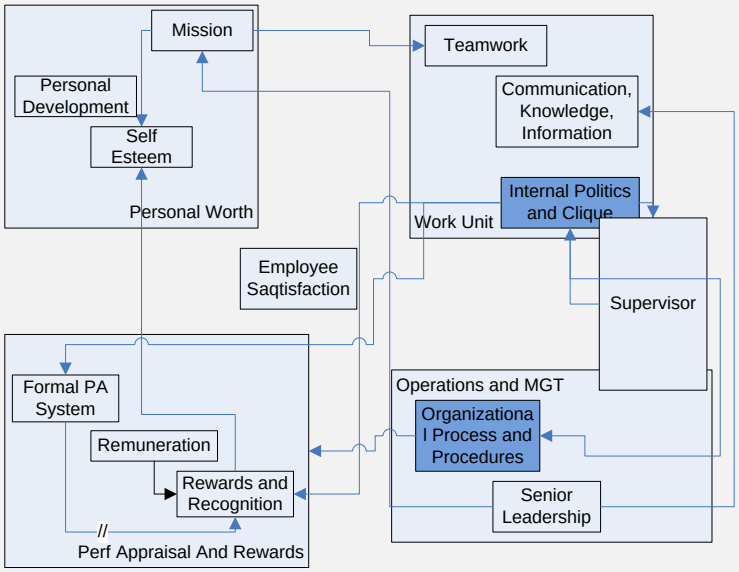
Subtle changes in content can preserve logic and greatly improve visual presentation



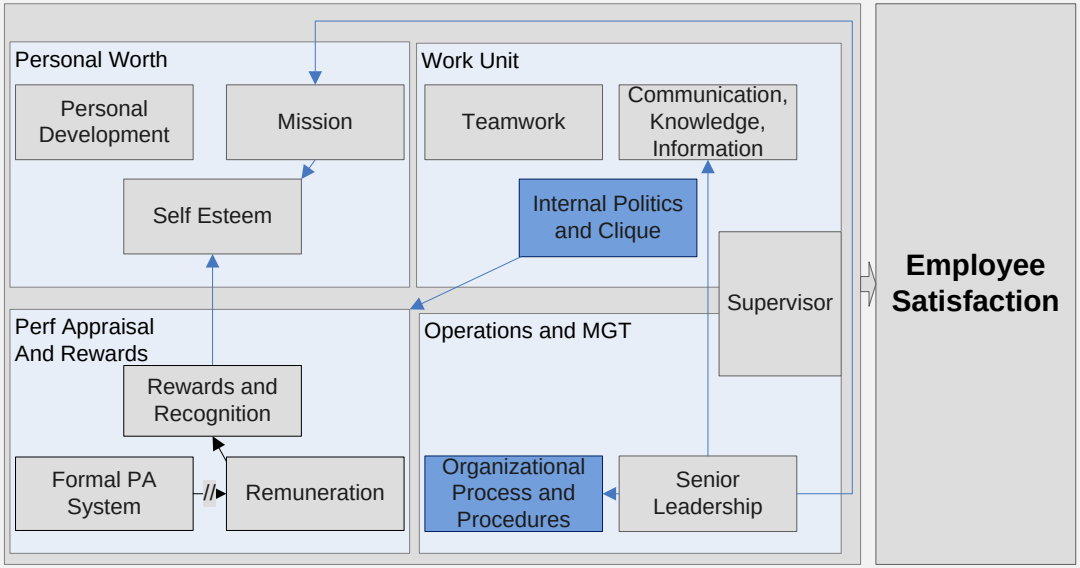

Adv.
Human factors committee customers
Policy at XYZ agency
Dept. 1
Dept. 2
Dept. n
XYZ R&D and technical
R&D community in other Departments and agencies
Human factors committee activities
External policy
XYZ agency HF program managers
Others
Internal activities
Awareness
Outreach
Collaboration
Knowledge updating
Coordination
HFCC review
HSI guidelines
Others
Adv.
Policy
XYZ Procurement
XYZ Rule making
XYZ Non-regulatory activity
XYZ R&D & tech. support
Policy / decision making at requesting non XYZ agency
XYZ agency outcomes
HF activity in modes
Application of HSI to XYZ infrastructure and operations.
Increased inter-dept. cooperation
Leverage resources
Responsiveness to public needs
Others?
External
Industry procurement
Industry policy
Industry practices
Government policies and practices
Others?
Outcomes in respective agencies

Sometimes the changes are not so subtle

Draft 1: deliberately done quickly to capture the logic



Draft 2: cleaned up for presentation



File formats matter if you want to print large scale

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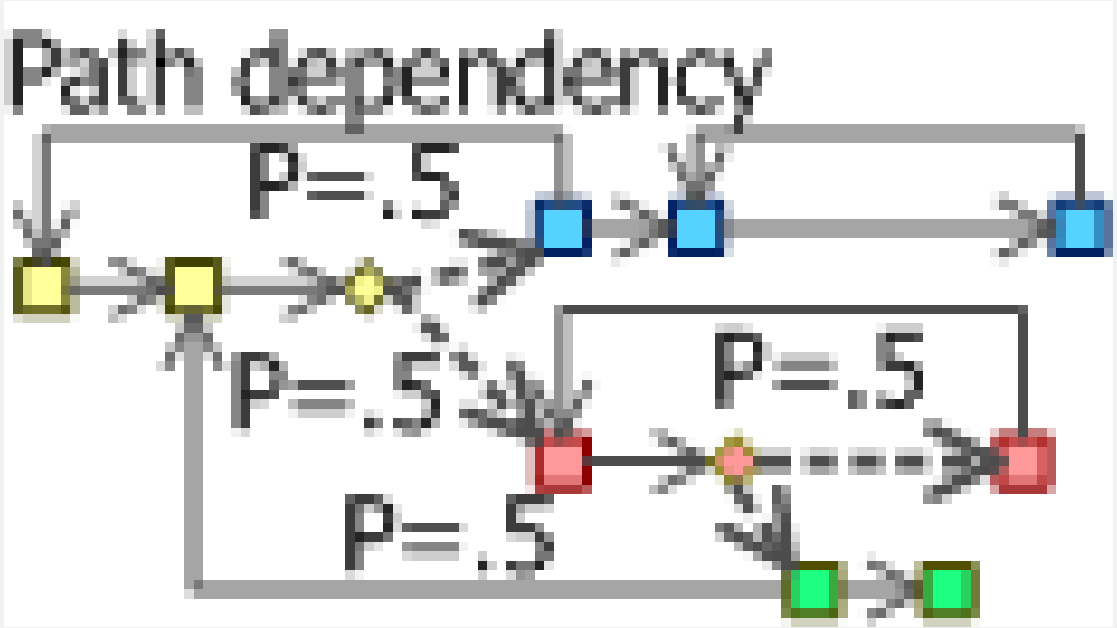
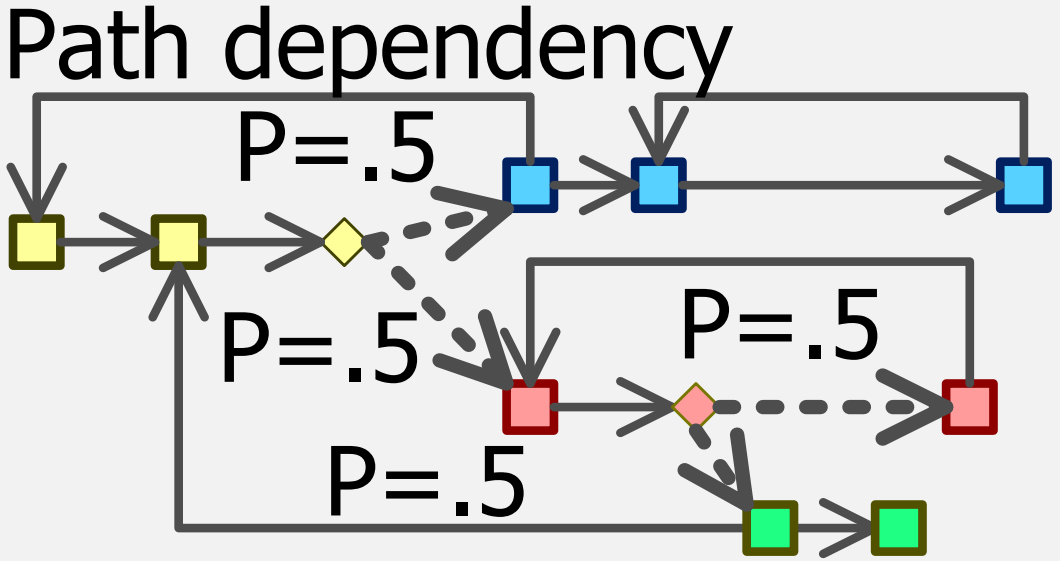


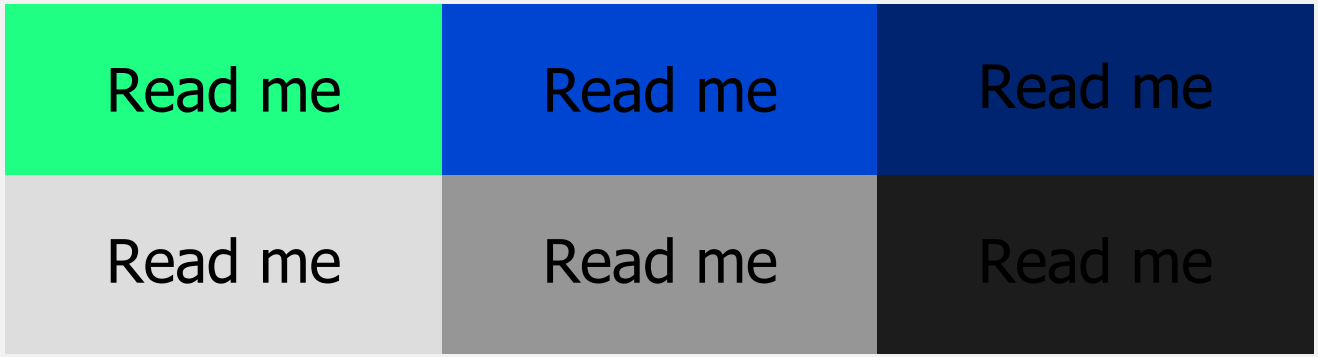
1 x 2 original as a vector graphic



Color characteristics make a difference

Modality makes a big difference in color

Computer screen	Projection monitor
Screen set to • Red 30 • Green 255 • Blue 131	Same color in print reads as • Red 0 • Green 128 • Blue 131



Color saturation can assure that differences show in B&W

If screen color gets too dark, text is unreadable

Type characteristics make a difference

- 11 point
- Serif
- 0 line spacing
- Black lines

Operations	Activities	Outputs	Outcomes	Impact
Legislation Funding Industry Industry standards State programs	Rulemaking Inspection Enforcement Investigation State grants Evaluation Education	Rules Reports Penalties Information	Reduced defects Reduced failures Limited propagation	Reduced fatalities Reduced industries Less environmental harm Less property loss Reliable delivery

- 11 point
- Sans serif
- 2 point line spacing
- Gray lines

Operations	Activities	Outputs	Outcomes	Impact
Legislation Funding Industry Industry standards State programs	Rulemaking Inspection Enforcement Investigation State grants	Rules Reports Penalties Information	Reduced defects Reduced failures Limited propagation	Reduced fatalities Reduced industries Less environmental harm Less property loss Reliable delivery

Guideline for choosing appropriate logic models

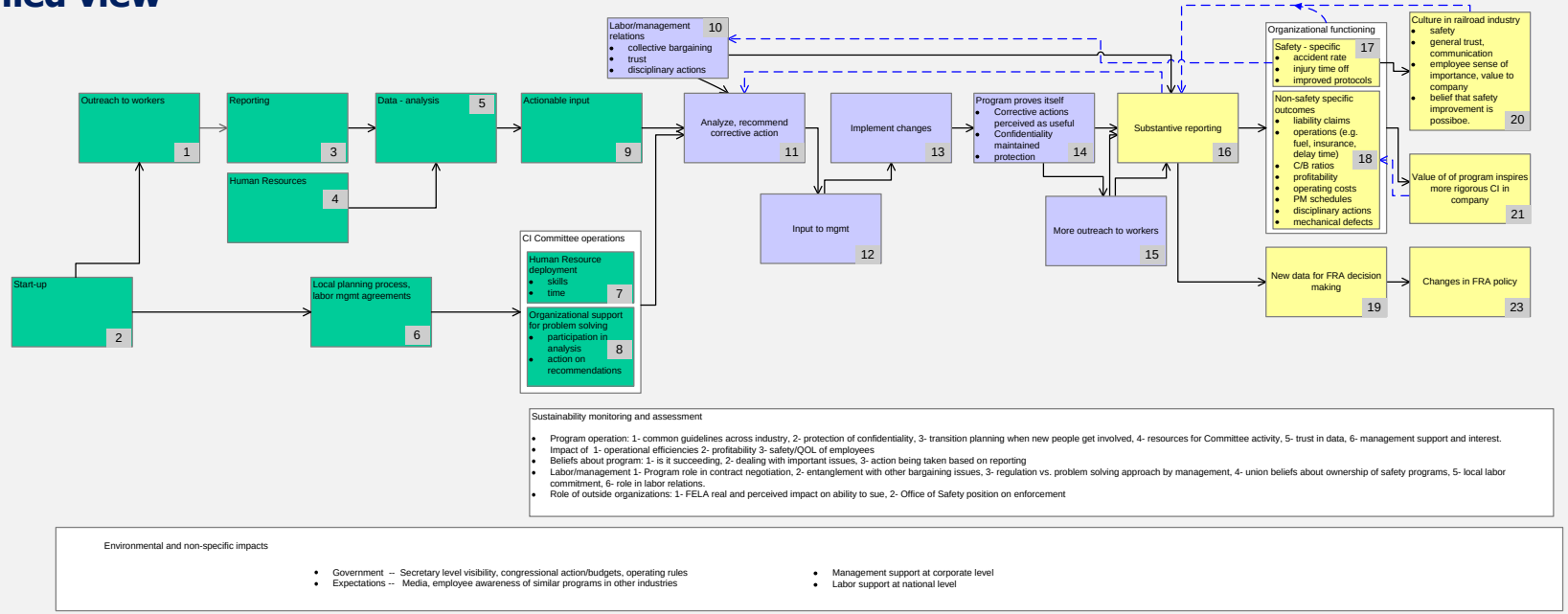
- Logic models are
  - Technology (not science)
  - Must be "good enough" to guide practical action
- "Good enough" usually means simple
- Art to choosing the right level of complexity
  - Overly complex = distracting, wasteful, prone to error
  - Overly simple blinds to possibilities

Let's critique some models, ranging from the garden variety to some exotic species

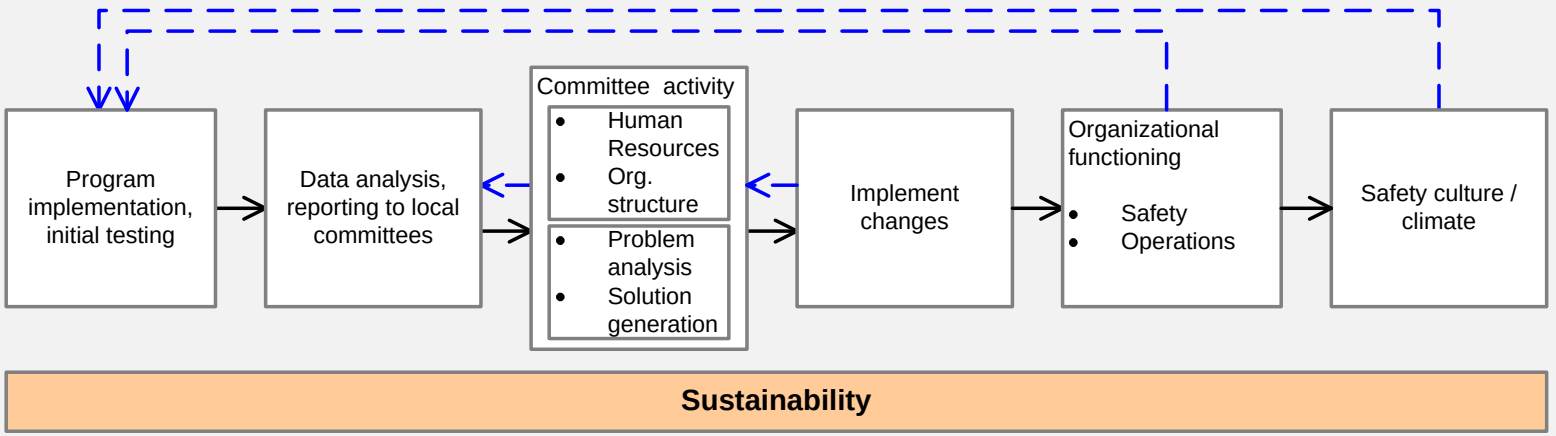
Common problems	Good	Bad	Indifferent
Ink to information? E.g. decoration that does not convey information			
Does the model hold the readers' attention?			
Does the form of the model tell the story that needs to be told?			
Does the model contain the necessary information for its audiences?			
How much explanation is needed for someone to understand the model?			
Are there false distinctions? E.g. different colors or shapes for the same categories			
Spatial relationships of elements – do they reveal or confuse the logic?			
Visual clutter, e.g., intersecting lines that do not have to intersect			
Lack of visual cues for distinctions that matter, e.g., same shape, color, column for short and long term outcomes			
Overall, how does the model "read"?			

Example #1.1: Root cause problem solving innovation in a transportation industry

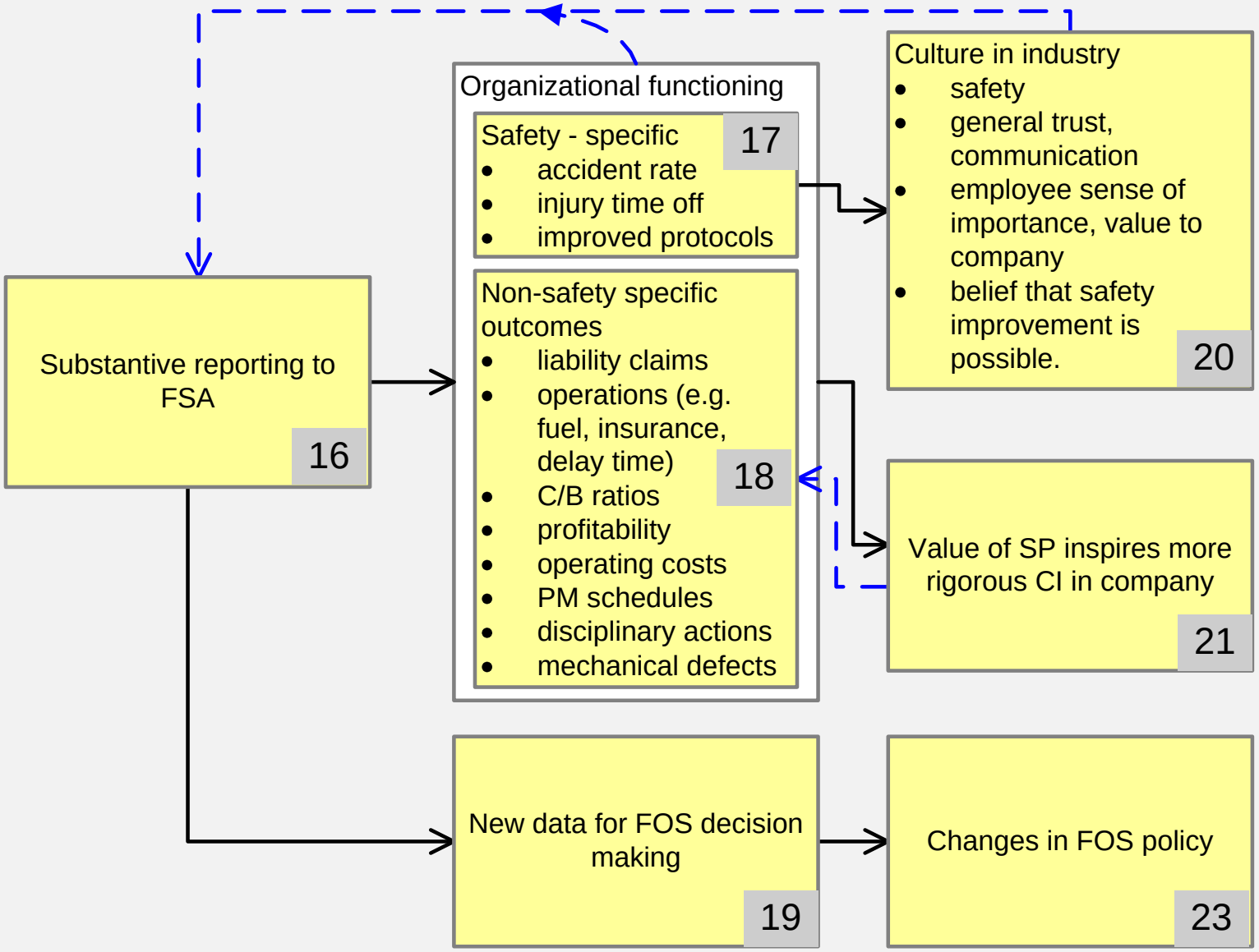
Detailed view



High level view of the same program

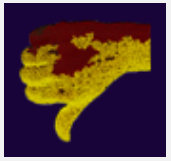


Example #1.2: Root cause problem solving innovation in a transportation industry



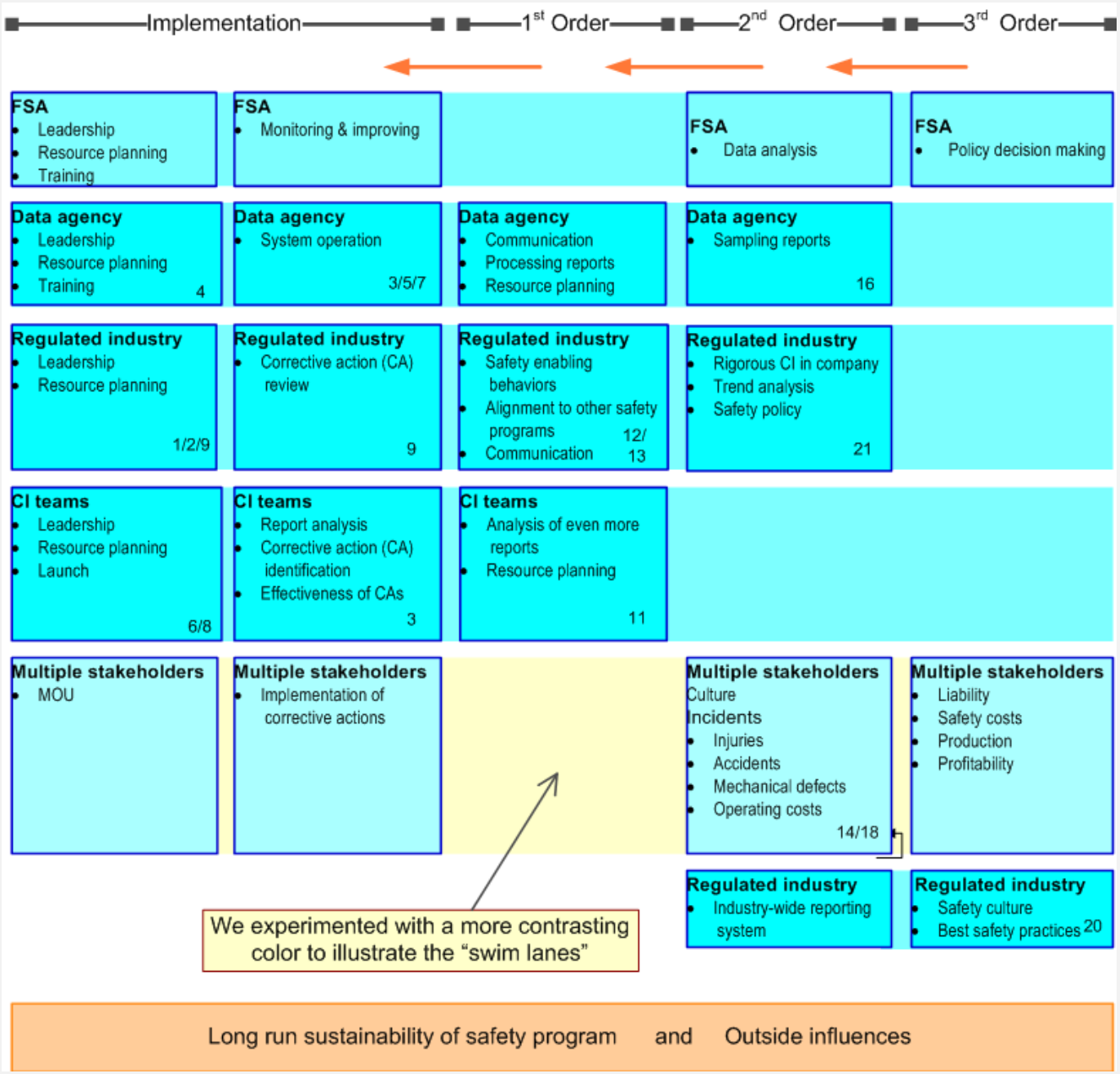
Critique of Example #1 Root cause problem solving innovation in a transportation industry

- Solid vs. dotted arrows clarify feedback loops
- Uses color to distinguish three broad program phases: "process" "employee testing" and "outcome"
- Index numbers to details of measurement procedures
- Color also differentiates gray shading. Visual cues preserved in black and white

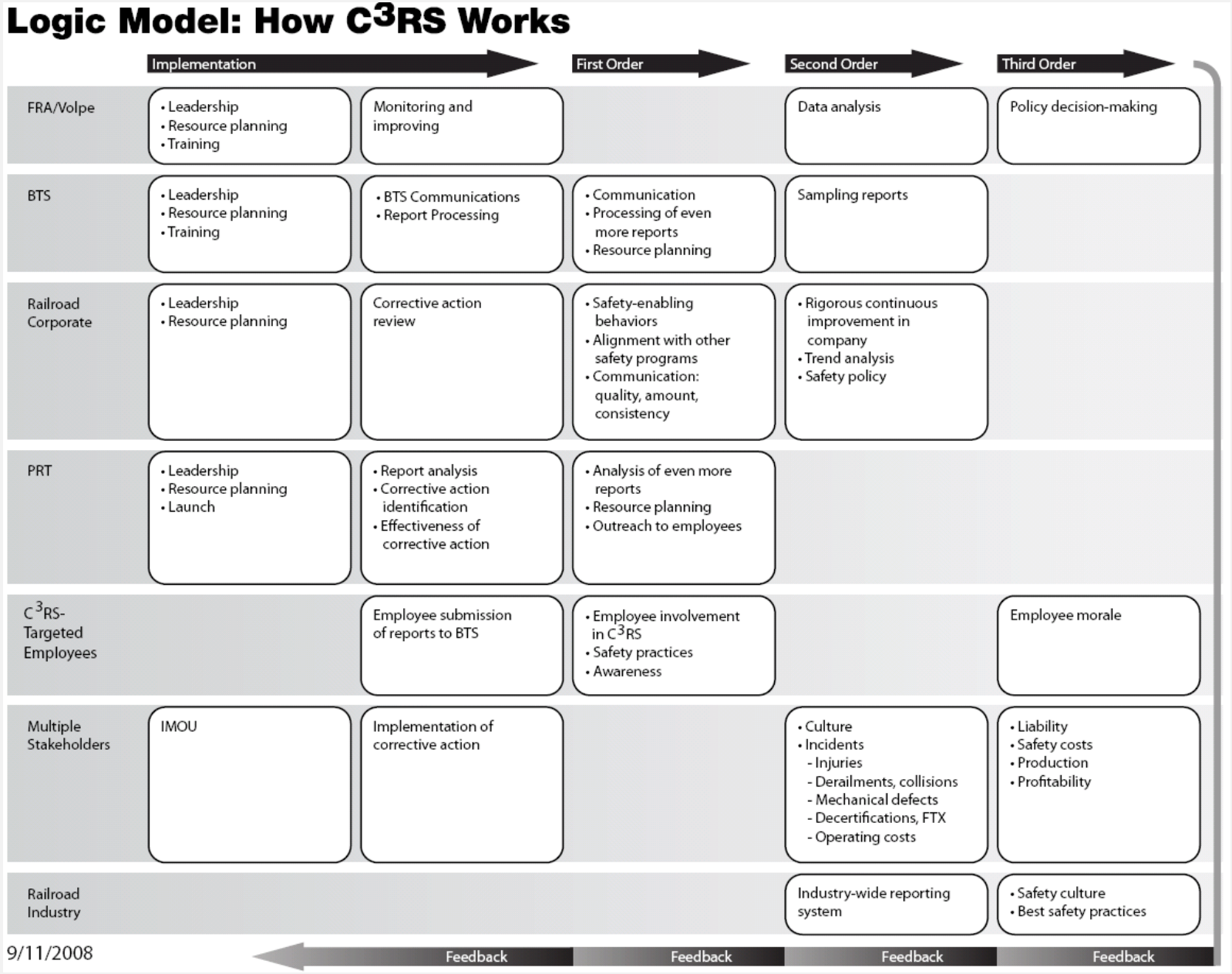


- Inconsistent level of detail
  - "Sustainability" and "environment" are black boxes
  - "Process" less detailed than outcome sections
- No explanation of reason for the color coding
- Small print, only partially offset by blowing up separate parts of model

Example #2.1 Root cause problem solving innovation in a transportation industry

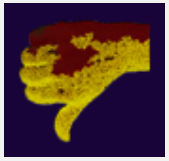


Example #2.2: Root cause problem solving innovation in a transportation industry



Critique of Example #2 Root cause problem solving innovation in a transportation industry

- Alternate version of the "flow chart" depiction. Shapes and arrows for evaluators, swim lanes for stakeholders
- Works very well in public because it speaks to people's interests

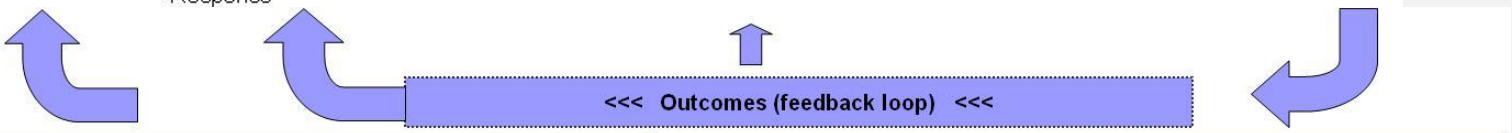


- Color reproduction in works on screen but not readable in print
- Gray tone version improves on color by keeping distinctions with less contrast differentiation. Easier on the eye. (Try light green, it's even better.)
- Neither version does very well on readability

Example 3: Input → Impact for a federal regulatory agency

A General Logic Model for Federal Safety Agency's Safety Program

External (Resources, constraints)	FSA (Actions)	FSA (Products)	People/Companies (Behavior)	Pipelines & Product (Physical effects)	Public Impacts (Ultimate value)
Inputs	**Activities**	**Outputs**	**Intermed. Outcomes**	**Outcomes**	**Impacts**
Legislation	Rulemaking	Rules	Compliance	Reduced # defects	Reduced public fatalities
Funding	Inspection	Reports	State activities	Reduced # leaks/failures	Reduced public injuries
Industry	Enforcement	Penalty assessments	Functioning one-call systems	Limited propagation	Reduced environ. harm
Industry standards	Investigation	Risk assessments	Good construction	Maximum throughput	Reduced public property loss
State programs	Data Collection/Analysis	Information	Good maintenance/ops		Reduced worker fatalities
	State grant funding	Grants	Good emergency response		Reduced worker injuries
	Program evaluation	Priorities			Reduced priv sector property loss
	Education	Orders			No major accidents
	Coordination	Waivers			Reliable delivery of energy
	Training	Qualified people			
	Research	New technology			
	Response				



Assumptions:

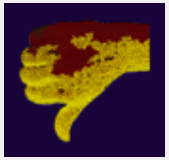
* Penalty assessments, orders, and other controls on industry behavior will be necessary and sufficient to ensure a high degree of compliance.
* Compliance is important in reducing safety risks.
* Data/analysis will provide a sound basis for decision making.

External Factors Affecting Outcomes and Impacts:

** Increasing demand for energy products*
** Constrained capacity*
** Interdependencies in the nation's critical infrastructure*
** Natural of man-made disasters*
** Population enroachment/proximity*
** Growth or decline in the U.S. economy*
** Changes in the energy/pipeline industry*
** Strong reliance on State partners*
** The need to balance safety and security*
** Public perceptions of risk*
** Large, national- or regional-level events*
** Time lag between cause and effect*
** Advances in technology*
** New sources of energy*

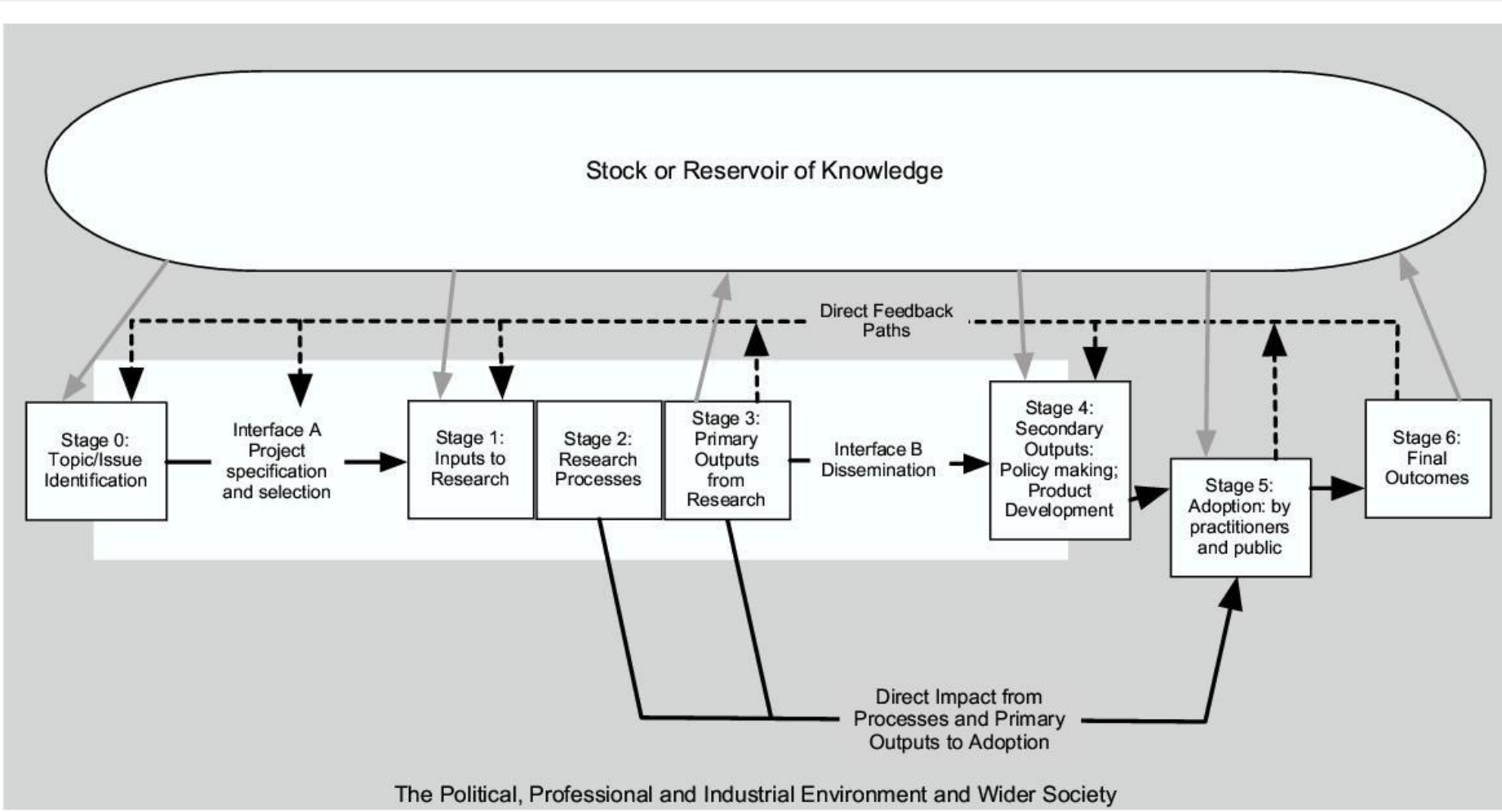
Critique of Example #3: Input → Impact for a federal regulatory agency

- Recognizes that relationships among low level items cannot be specified
- Traditional input → impact flow
- Presents assumptions needed for model to work.
- Defines each step, e.g. "output = produce (what we produce)". Useful for people not familiar with this type of model



- Hard to read. Trade-off of information density for readability made in favor information.
- Feedback arrows seem too prominent relative to other relationships depicted.

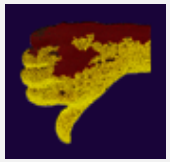
Example #4: Health outcome research



Proposed methods for reviewing the outcomes of health research: the impact of funding by the UK's 'Arthritis Research Campaign Stephen R Hanney, Jonathan Grant, Steven Woodingand Martin J Buxton *Health Research Policy and Systems* 2004, 2:4 http://www.health-policy-systems.com/content/2/1/4

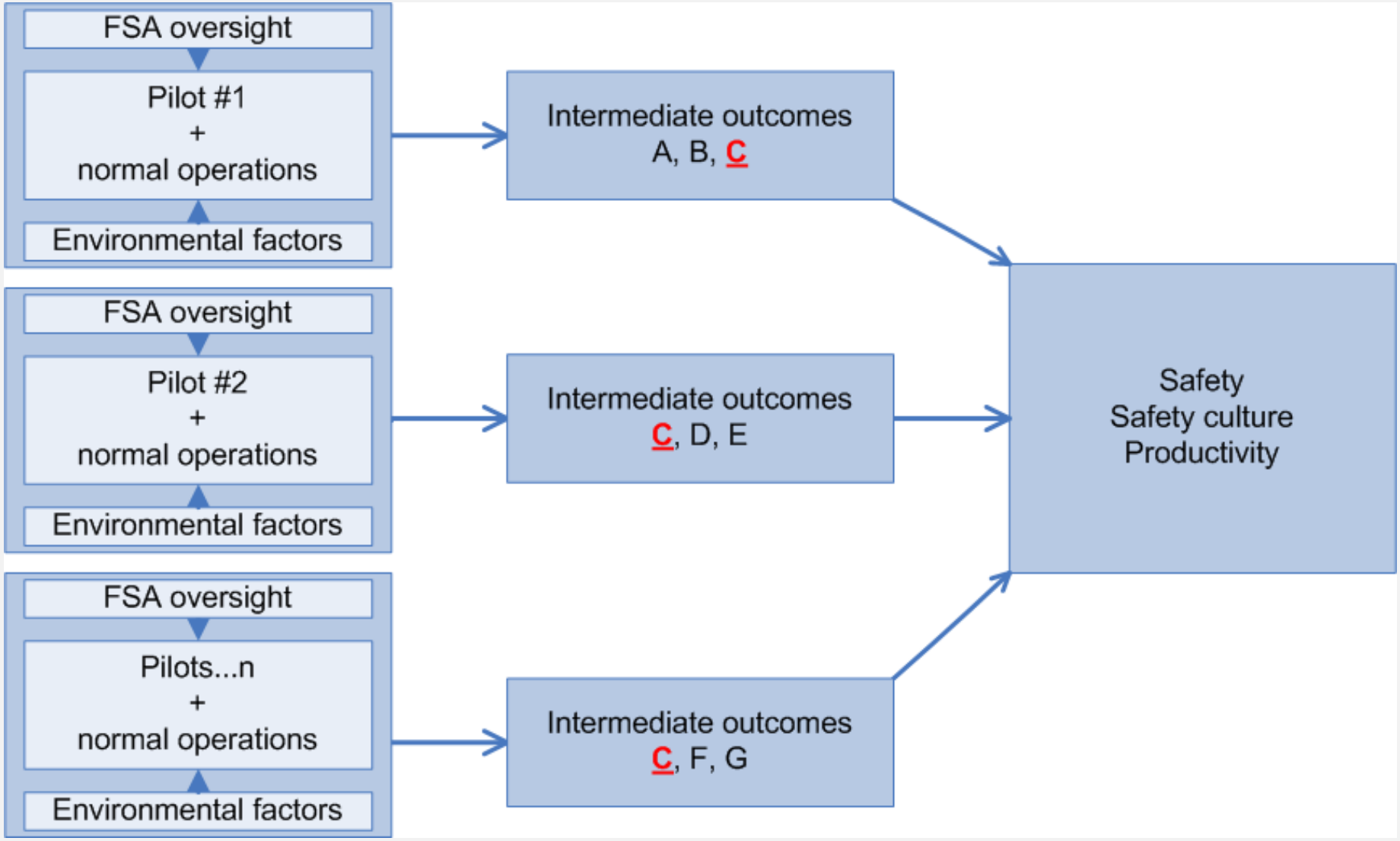
Critique of Example #4: Health outcome research

- Rich feedback loops
- Nested system boundaries, e.g.: whole system, stages 1-3, knowledge
- Identifies stages that span boundaries (0, 4)
- Shows interfaces and stages as distinct aspects of program logic
- Distinguishes pervasive factor (knowledge) from location-specific elements
- Solid vs. dashed highlights feedback loops form forward facing relationships
- Gray vs. black differentiates "specific : specific" vs. "specific : pervasive"

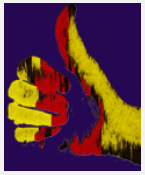


- No boundaries around "interface" is confusing
- "Stage 5" below plane of other stages. Is it really different?
- Arrow use
  - Solid black used for 2 different purposes: "direct impact" and "interface"
  - Thick black lines around shapes are distracting

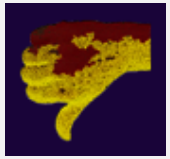
Example 5: Depiction of multiple site evaluation logic



Critique of Example #5: Depiction of multiple site evaluation logic

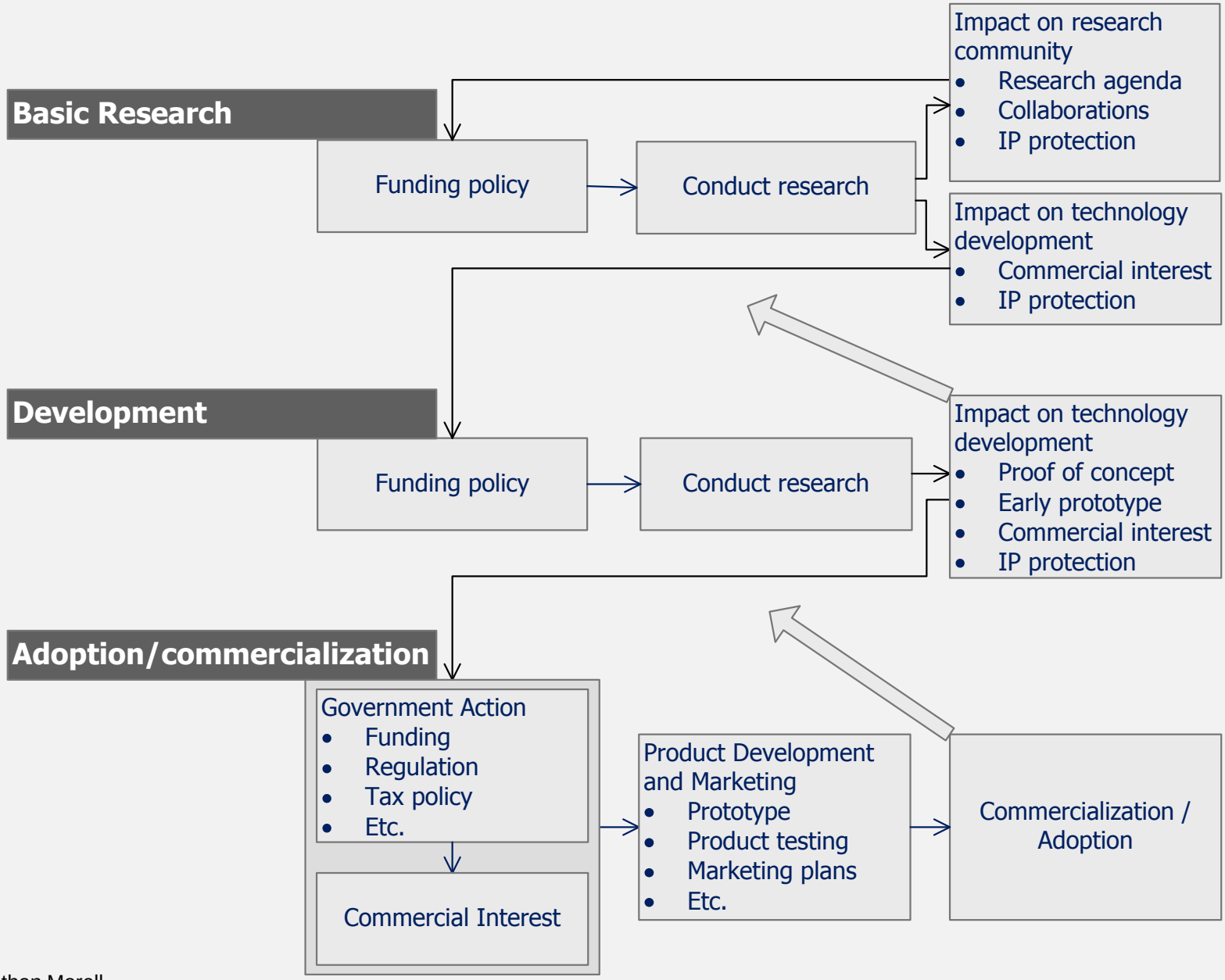


- Shows common outcomes for all pilot projects.
- Shows common and unique intermediate outcomes.
- Acknowledges that outcome for each pilot is a function of the pilot, normal operations, and environmental factors.
- Simple is good



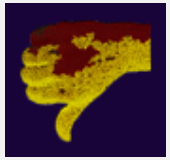
- Left hand column is hard to read
- Distinction between common and unique intermediate outcomes is hard to discern in column 2

Example 6: Evaluation along the R&D continuum



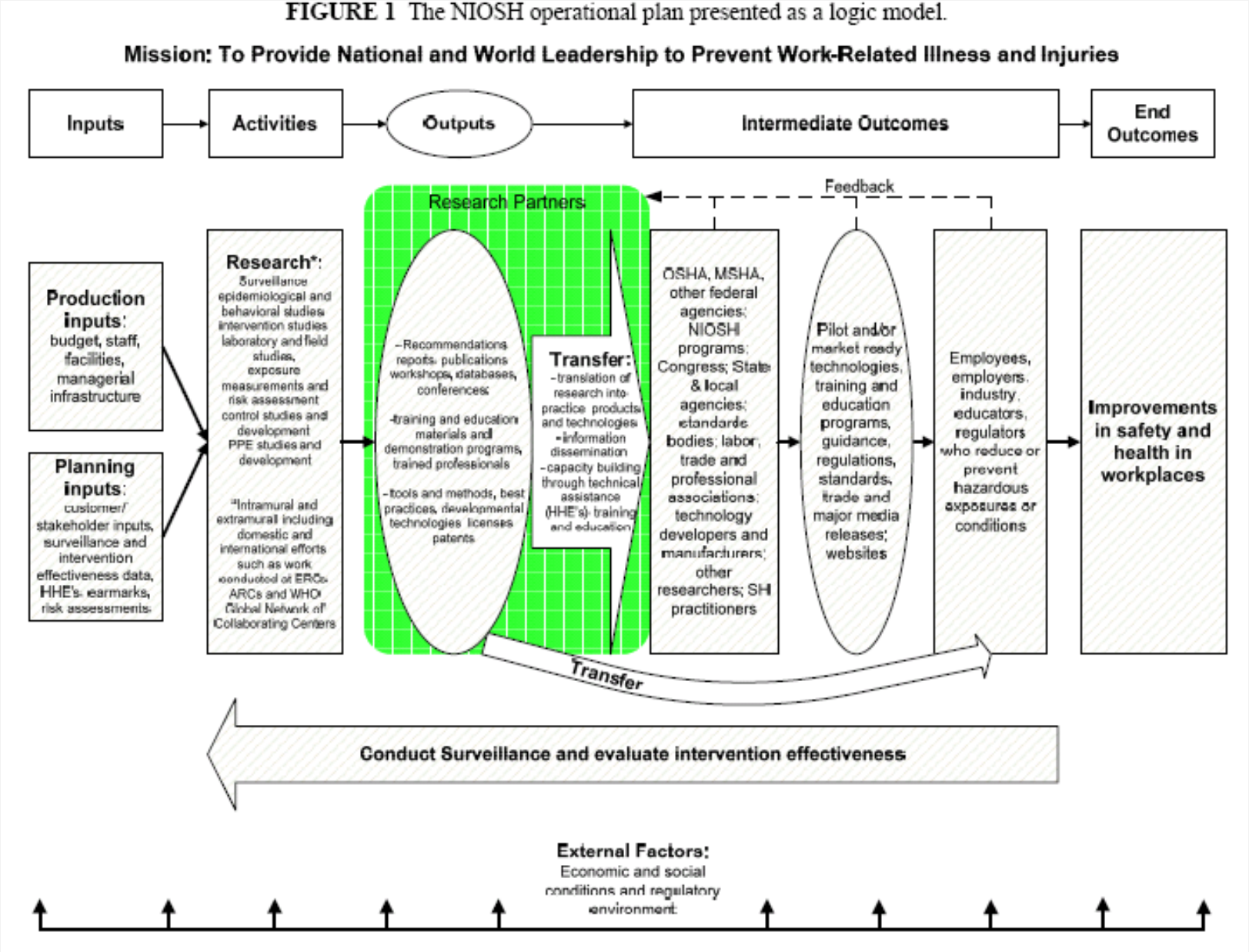
Critique of Example 6: Evaluation along the R&D continuum

- Stages along the life cycle are clearly laid out through the use of different background color and white space
- Clearly different form of arrows to differentiate 1:1 relationships and 1:many relationships



- Combining left to right with top to bottom flow of logic is confusing. (But maybe better than an outsized paper or very small boxes.)
- Not obvious that the diagonal arrows refer to the *entire* previous stage

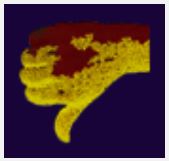
Example 7: Evaluation R&D at NIOSH



Framework for the Review of Research Programs of the National Institute for Occupational Safety and Health - 8/10/07
http://www.cdc.gov/niosh/nas/

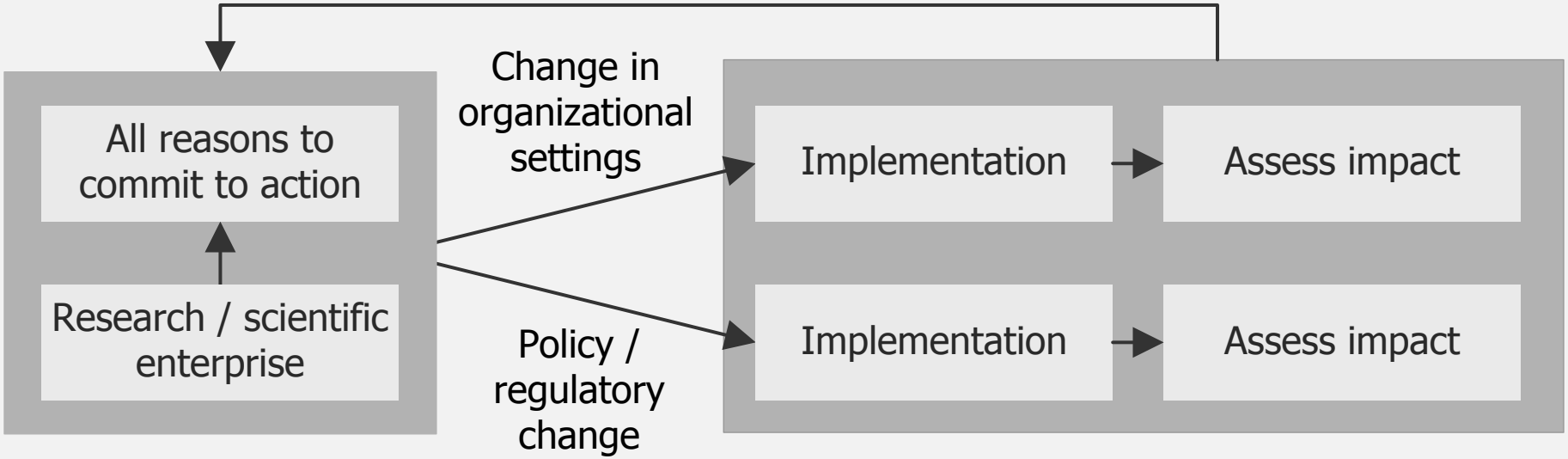
Critique of Example 7: Evaluation along the R&D continuum

- Familiar input → outcome format
- Variety of information presented, e.g. transfer, role of research partners, production and planning inputs
- Enough detail to convey a good sense of the project without a lot of explanation



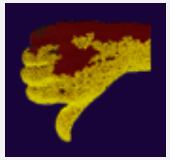
- Use of different shapes don't indicate obviously different concepts, e.g. ovals vs. rectangles
- Small print, hard to read
- Cross hatching to show region of research partners is distracting

Example 8: How can evaluation influence technology / knowledge transfer from laboratory to real world application?



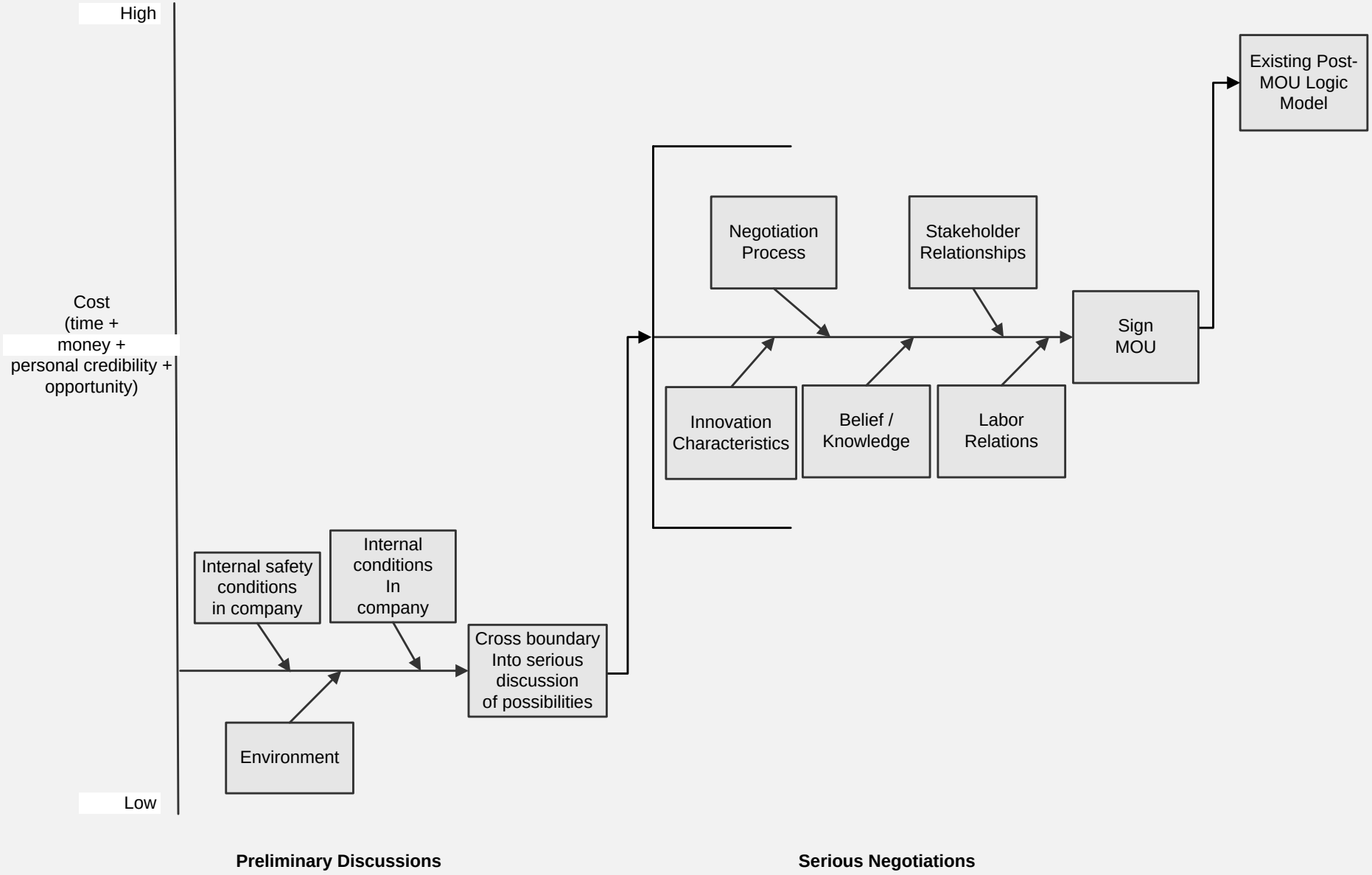
Critique of Example 8: How can evaluation influence technology / knowledge transfer from laboratory to real world application?

- Simple is good
- Lots of white space makes the model easy to read
- Gray tones successfully differentiate elements without jarring contrast effects.



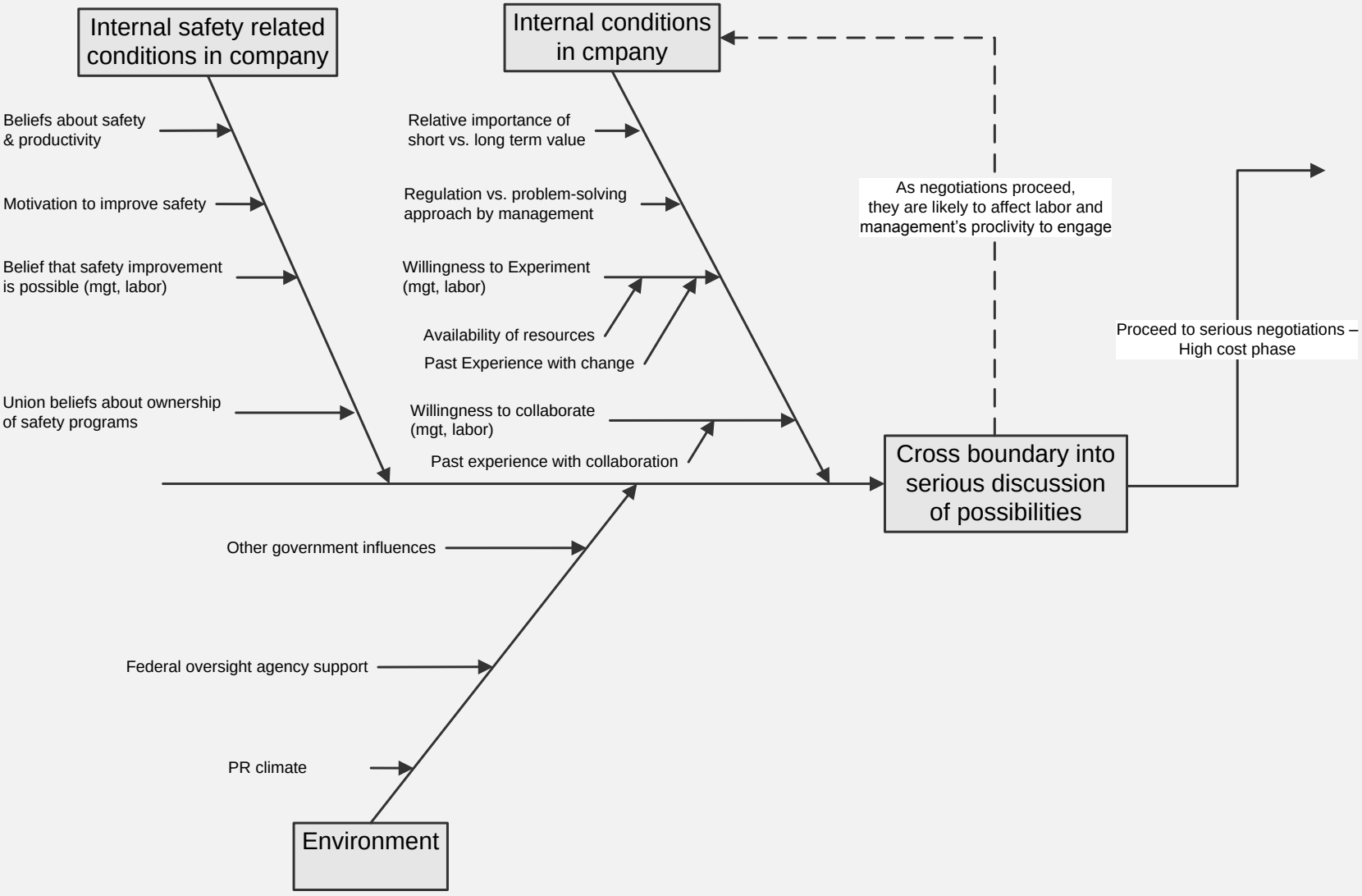
- Feedback loop is a much less specific relationship than the forward relationships but form of arrows is the same. The distinction is obscured
- Gray box on right was used to avoid clutter from multiple feedback loops. But this implies a commonality of policy and program evaluation that I did not intend.

Example #9.1: Recruitment of companies into a safety program



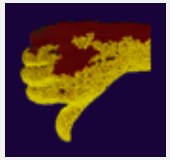
Example #9.2: Recruitment of companies into a safety program

Preliminary Discussion – Low Cost Phase



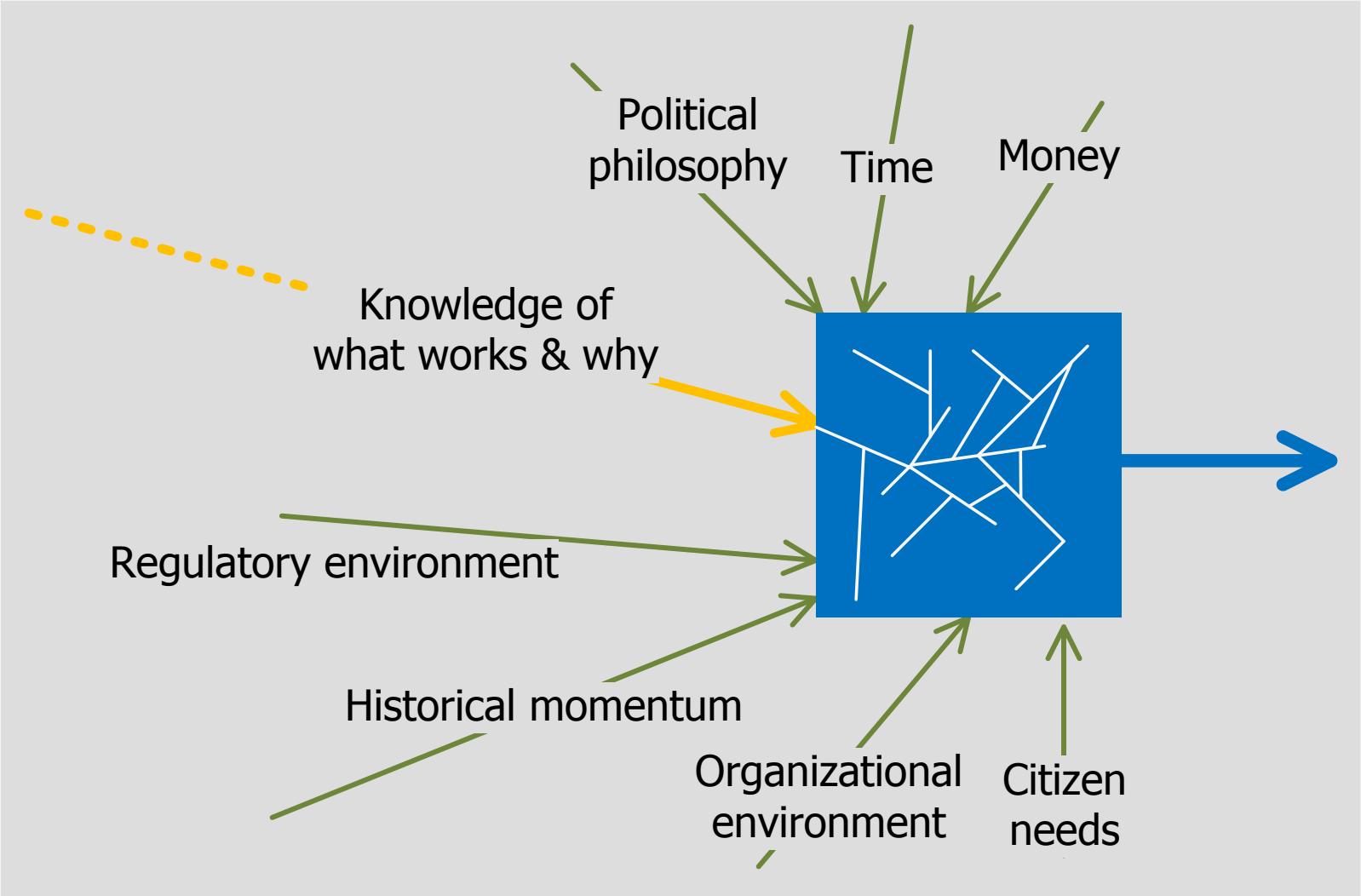
Critique of example #9: Recruitment of companies into a safety program

- Does include overall view + a more detailed view
- Includes graphic representation of "phase cost"
- Very recognizable form to many audiences

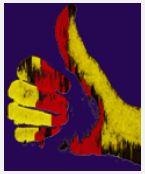


- Small type. Enough white space that type size could be larger
- Visuals imply mostly independent root causes, which is almost certainly not the case

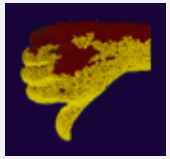
Example 10: Understanding the role of evaluation in decision making



Example 10: Understanding the role of evaluation in decision making

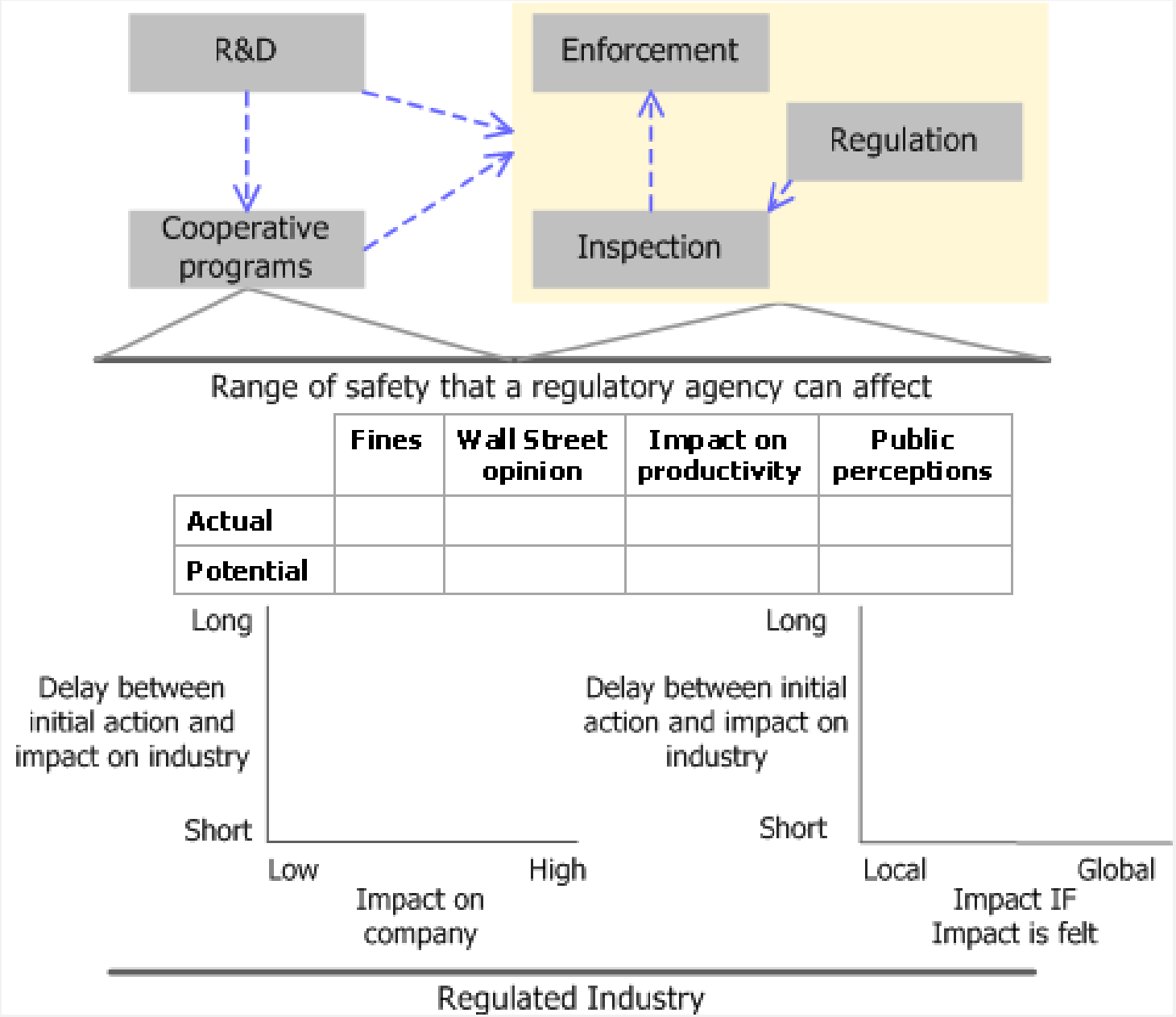


- Used to help people appreciate how analysis fits with decision making
- Message conveyed in two ways
  - Content
  - Form of the graphic
- Puts stakeholders at ease because it legitimizes their reality
- Recognizes that non-technocratic factors have a legitimate claim on decision making

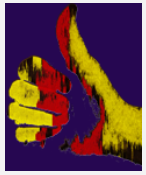


- Shows a program theory that is wrong. The factors involved do not combine in simple vector form. Also relative size of the elements are highly context-dependent.
- Useful for a general framing of the problem, but *not* as a guide for developing methodology

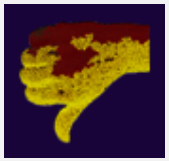
Example 11: Impact of regulatory agency on industry



Critique of Example #11: Impact of regulatory agency on industry

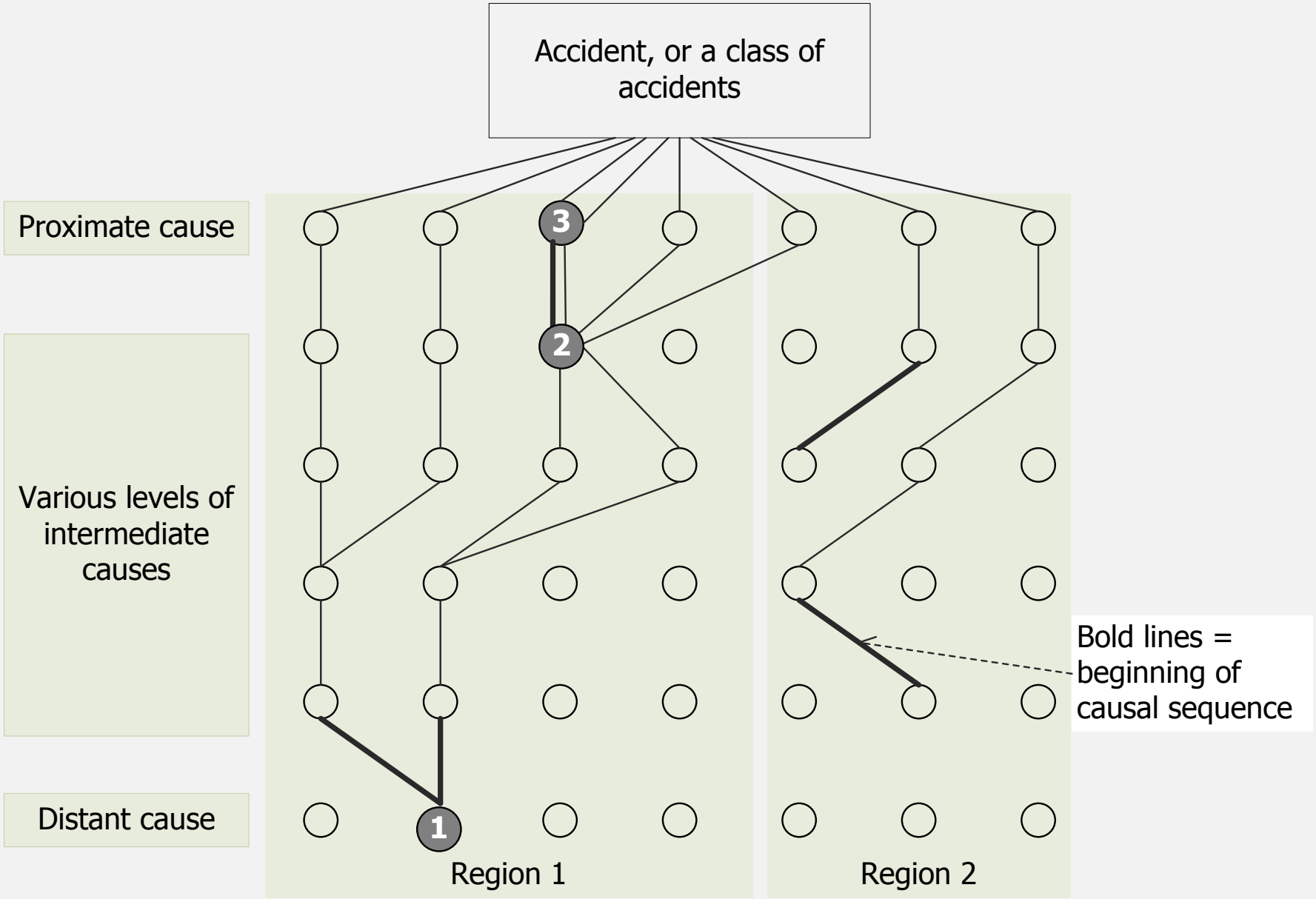


- Shows a wide variety of information
  - Agency operations
  - Choice of cooperative and coercive action
  - Types of impact x stakeholder
  - Relationship between timing of action and impact on industry
- Fairly readable given the diversity of information

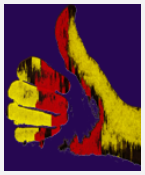


- Confusing format: flow chart → table – graph (I separated them in later versions.)
- Relationships among levels not in the slightest obvious
- No data points on graphs. A few would help show the relationships
- Nothing obvious about it

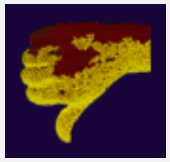
Example 12: Accident logic to evaluate process improvement to prevent accidents



Example 12: Accident logic to evaluate process improvement to prevent accidents

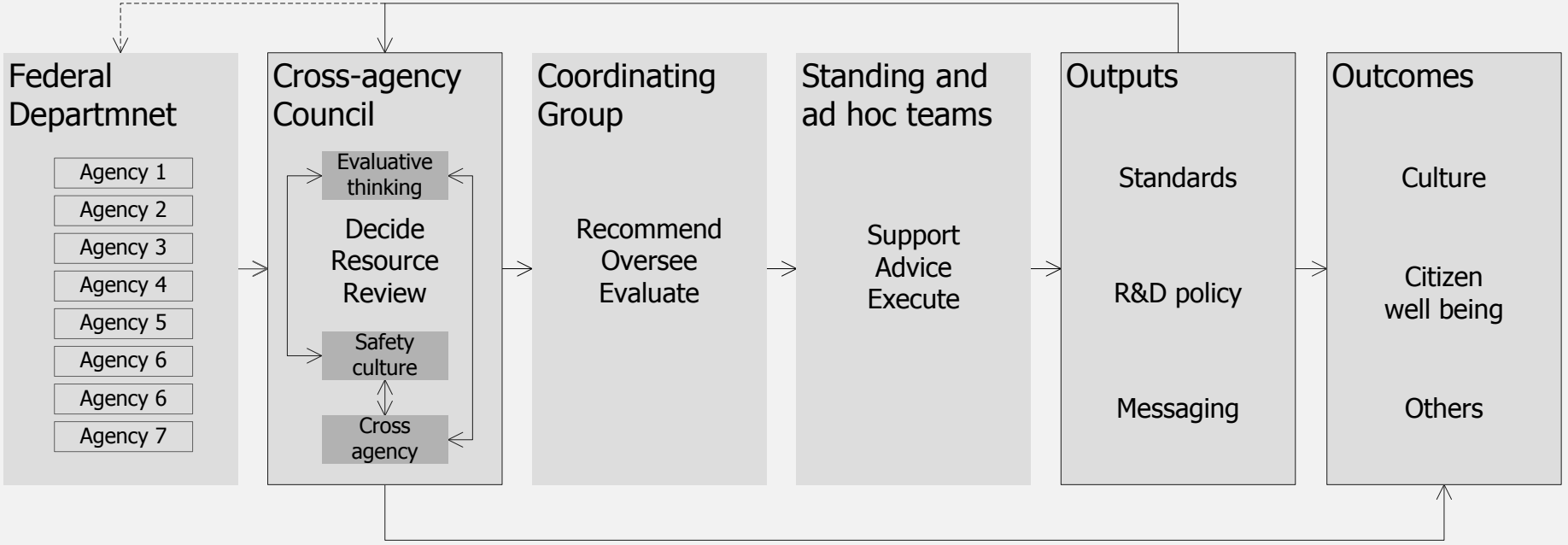


- Valiant try at using a simple picture to show a complex system. (But I'm not sure it worked.)
- All things considered, a pretty good way of looking at multiple root causes for the same event
- Explanation of heavy vs. light lines provided

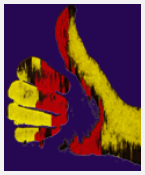


- Difference between bold and thin lines is not obvious, even with the explanation on the diagram
- Not obvious what all the elements are – level of causal factors, regions, convergence and divergence of lines
- Misleading about how such systems work
  - No provision for changes in dynamic relationships, new items appearing, old ones disappearing
  - In general, model conveys a sense of a deterministic relationships when in fact this is a complex system

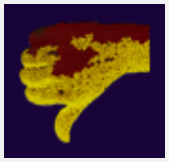
Example 13: Concept of Operations – Cross-agency Process Improvement Council in a Federal Department



Example 13: Concept of Operations – Cross-agency Process Improvement Council in a Federal Department



- Minimal visual contrast while still maintaining important distinctions
- Main elements are all the same size
- High enough level for short briefings, with enough detail to convey the operational principles



- Diagram in "cross agency council" is a bit to cute and inexplicable
- Not at all obvious how the dotted and solid feedback loops are different

Development of a Logic Model for Transport Canada's Road Safety Program

Presented by Natalya Kuziak, A/Evaluation Manager
Departmental Evaluation Services, Transport Canada

Context 1

- Treasury Board requires that all federal government departments evaluate all programs/activities, not just contribution programs

- Road Safety is one of TC's strategic outcomes that must be evaluated as a whole; essentially this will be an internal horizontal evaluation of all activities under Road Safety

- Road Safety is organized into four sub-activity areas as follows:

  Motor Vehicle Safety Regulatory Framework (PAA 3.4.1.)

  Motor Vehicle Safety Oversight (P.A.A. 3.4.2)

  Motor Carrier Safety (P.A.A. 3.4.3)

  Road Safety Outreach (P.A.A 3.4.4)

Context & Approach

- The challenge is to create a logic model for a horizontal initiative composed of many sub programs and sub sub programs

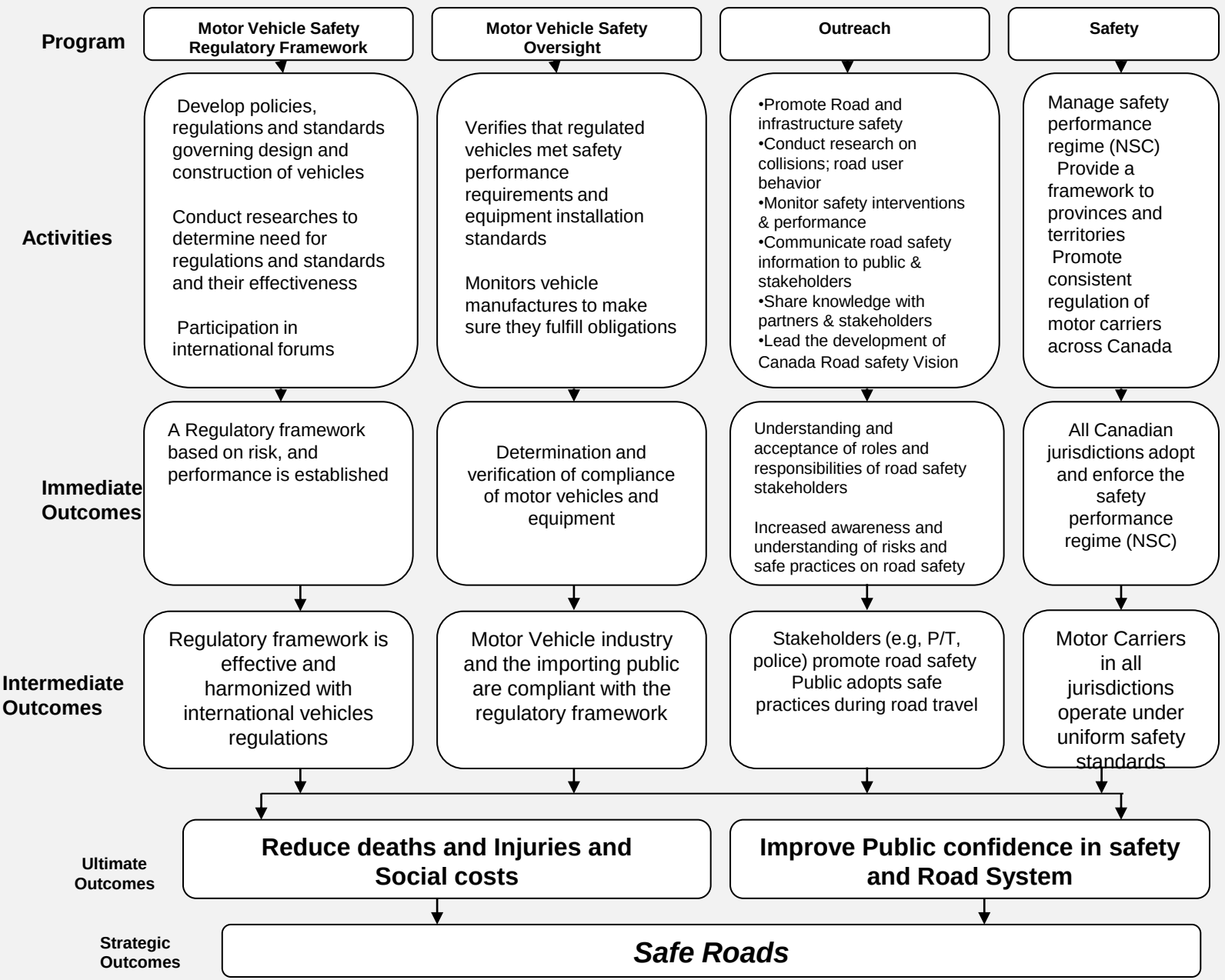
- The logic model must also be aligned with the expected results outlined in the Performance Management Framework for all strategic objectives, this defining our intermediate and ultimate outcomes

- The logic model will primarily be used to guide the evaluation; it will be too high level to assist program managers to manage at the sub activity and sub sub activity level

- The approach taken has been for the evaluation team to draft a logic model based on program documentation and a combination of existing logic models used by the Road Safety Directorate and Transport Canada's PMF

- Program management has requested consultation with the sub activity program directors only

LOGIC MODEL OF TRANSPORT CANADA'S ROAD SAFETY PROGRAM



Information We Did Not Add to Model

- Program management (as an activity)
- PAA Sub Activity numbers associated with the component programs
- Key outputs
- Target groups/program reach

Part 3
Working with Stakeholders to Build a Model

Working with stakeholders from the stakeholder's point of view.

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Tactics for working with stakeholders

Managing revision

Group process

Looking inward – supporting data collection and analysis

Appreciate people's mixed motives for having a logic model

- Evaluation
- Planning
- Explanation
- Advocacy

- Motives mix and their proportions shift
- A good way to get into trouble is not to recognize these changes

Knowledge transfer: Logic models are useful but not sufficient

- Active engagement by stakeholders prepares them mentally to receive and process the information
- Indicates
  - What information will come
  - When it will come
  - Why it is important

But

- There is more to promoting use than logic models
  - Not all users of the information will be involved in logic model development
  - Not all relevant knowledge can be contained in the model

Consider three types of knowledge that can be put in a model

1. Program logic as articulated by stakeholders
2. Related domains in which the model is embedded, e.g.
   - Mental health services program as related to other community services
   - Reading program's linkages to school system or parental involvement
3. Theories of human / social / organizational behavior, e.g.
   - How do the dynamics of innovation adoption affect implementation or outcome of the program?

- 2 and 3 are powerful, but use with caution.
- There are very good reasons to stick with the basics
  - Makes the evaluation harder: resources, scope, complexity, time to implement
  - Marginal added value may be small (but it can be large)
  - Model complexity increases error

Respect what you know and stakeholders don't, or are likely to forget

- Enthusiastic stakeholders can get carried away. The evaluation really does have a
  - Scope
  - Budget
  - Purpose
- Every element and relationship in a model is a hypothesis
  - Hypotheses can be wrong
  - Error piles up
  - Level of detail scope should reflect what we know
- Evaluation is more than just a logic model
  - Metrics
  - Methodology
  - Knowledge use plans and procedures

Tactics for working with stakeholders

- Begin with a small group who already knows what a logic model is.
  - Work out model to just below a very high level
  - Use draft to get feedback from a wider circle of stakeholders and experts
- Draw a rough model and send it off for feedback and approval.
  - Can be useful for mid-term corrections or to deal with unanticipated developments
  - Requires a good working relationship with stakeholders
- Chat about the program.
  - Begin to sketch the logic they are verbalizing or implying.
  - Put burden on yourself – "This is what I understand you are telling me about the program. Did I get it right?"
- Depending on people and their experience with logic models it may be a good idea to begin with a large group

Here is an approach I like

Complete but Overly Complicated Model

Step 1:
Build complete model

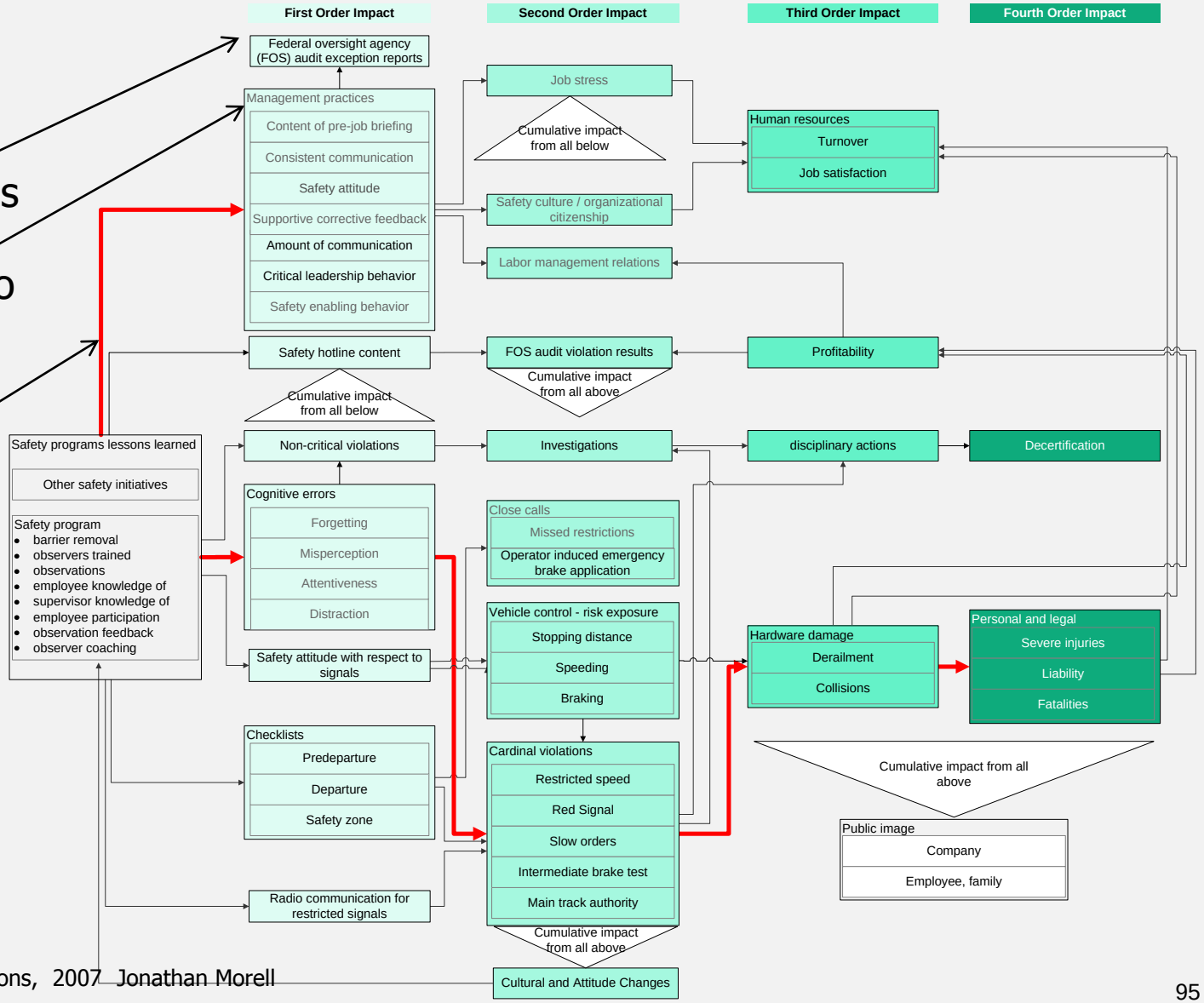
Step 2:
Can we measure all important elements?

Yes

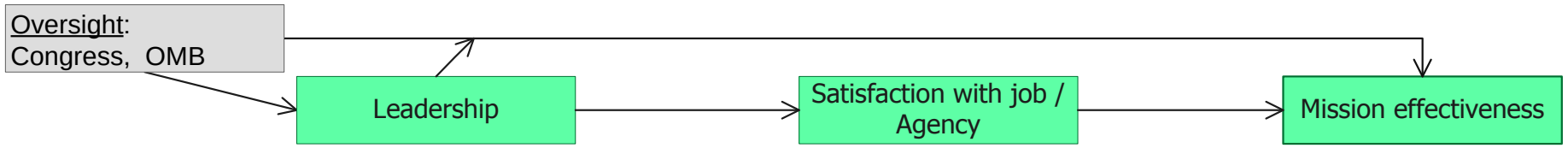
No

Step 3:
How far can we get with what we can measure?

Remember to critique the visual clutter!



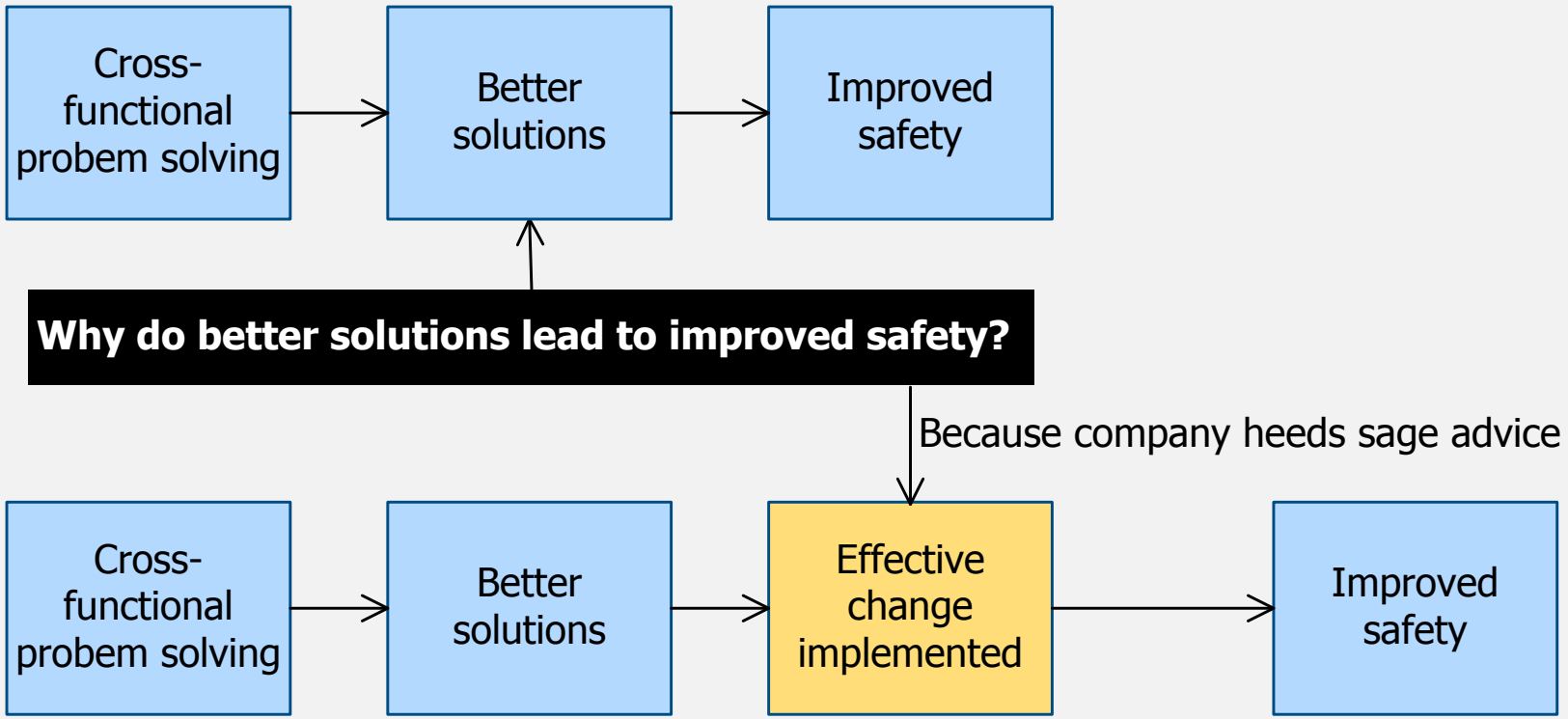
Use Logic Models to Organize Multiple Sources of Information



Summary	Senior leadership demonstrate ….	Satisfaction with agency performance varies with "organizational distance"…	Individual employee motivation affects organizational level activity…
FHCS	▪ Leadership, especially senior leadership, key driver of job satisfaction ….	▪ Employees more satisfied with formal appraisal systems than discretionary ….	▪ Employees depict information flow as relying heavily on informal channels…
Employee Engagement Merit Systems Protection Board,2008.	▪ First line supervision a critical factor in determining …	▪ Characteristics of engagement	▪ Agencies with higher engagement…
360 Leadership Survey	▪ Leaders build strong working relationships and demonstrate …		
Organizational Culture Scales	▪ Scale scores demonstrate pattern of bias toward more proximate leadership…		▪ Teamwork and rapport with direct supervision are best rated elements …
Open Ended Responses Following Culture Scales	▪ Strong suspicions of leadership being …	▪ Dissatisfaction with discretionary applications of fairness…	▪ Employees critical of agency's effectiveness amid …

Get people to question assumptions

- Improves evaluation
  - Design and measurement
  - Customer expectations
- Depending on where the evaluation comes in program life cycle, may also improve program design



Get people to question assumptions

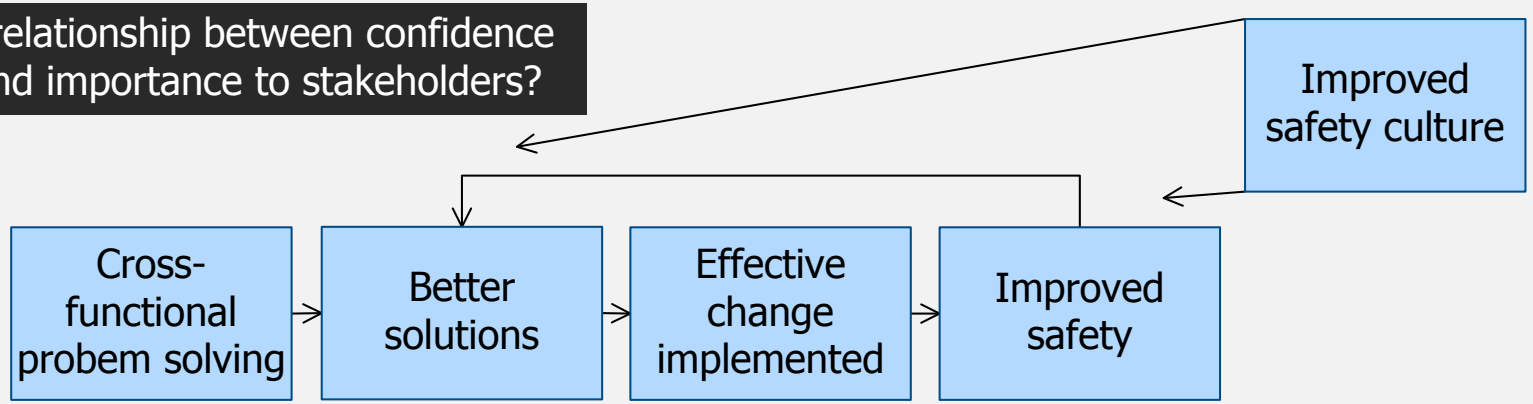
- What does the research say?
- What do non-involved experts say?
- Neighboring systems
  - What are they
  - What happens to them when the program is starts to function or starts to have an impact?
- Use the 5 whys on important parts of the model
- Unpleasant realities
  - Conflicts between a model that evaluates and a model that advocates
  - Negative consequences
    - Opportunity costs
    - Conflicts with other activities, systems, programs, etc.
    - Perverse effects, e.g. education for girls leads to social displacement

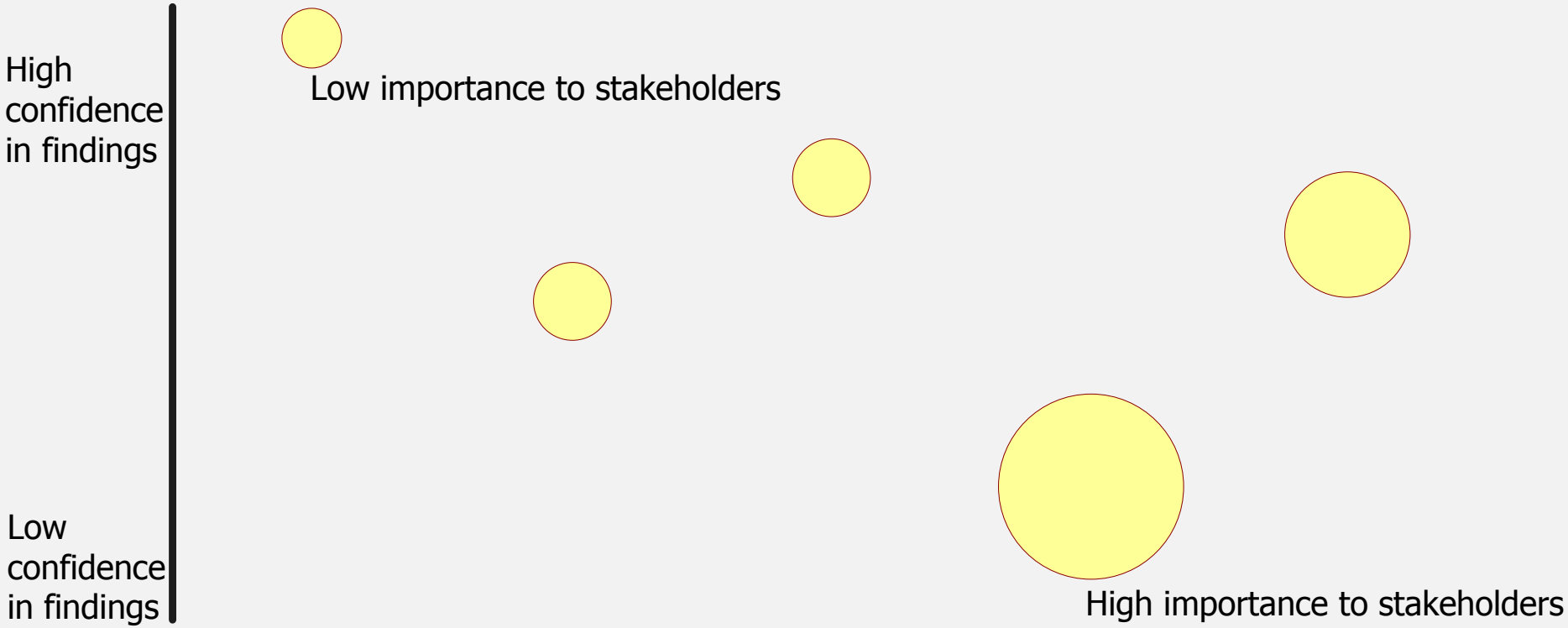
Sources of input to logic model

Source	Strength	Weakness
Stakeholders	▪ Deep appreciation of context ▪ Knowledge of program detail ▪ Vested interest in participation ▪ Sets groundwork for evaluation implementation	▪ Lack of perspective, may have strong + or – feelings ▪ Vested interest ▪ Not likely to have insight from comparable efforts ▪ Not likely to have insight from research literature
Critics	▪ More complete / balanced model ▪ Alternate program theories	▪ Hard to recruit ▪ Those who are paying you might resist
Evaluation team	▪ Experience with other programs ▪ Sensitivity to implications for methodology	▪ Lack of domain knowledge
Non-stakeholders familiar with similar programs, & research/ evaluation literature	▪ Objective ▪ Knowledge not known to stakeholders	▪ Blind to context and specifics

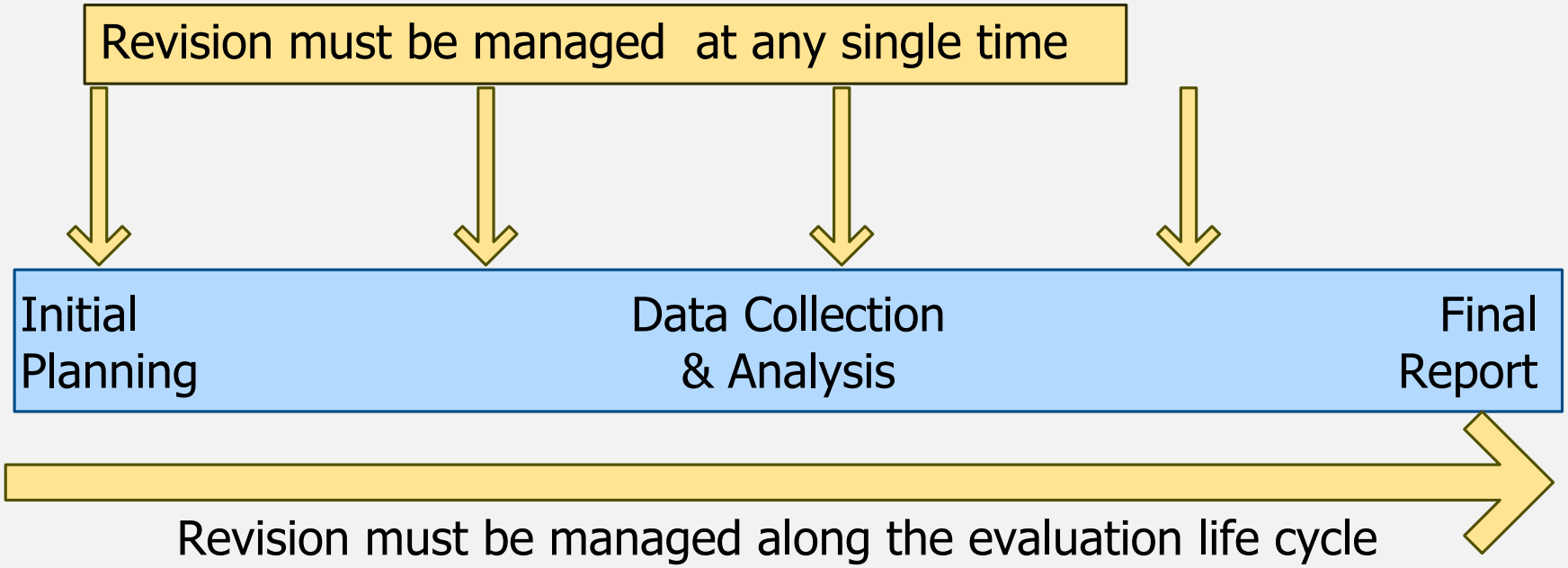
Use Visual Displays Creatively

What is the relationship between confidence in findings and importance to stakeholders?





Managing revision along two dimensions



Assure relevance through revision

- Begin with a model that is useful and relevant
- Match tempo of revision to purpose of evaluation and program stability
  - Frequent: Heavy formative evaluation to assist in developing a novel program in an unfamiliar setting
  - Infrequent: Stable program with heavy emphasis on long term outcome
- Fixed schedule for revision
  - Timeline
  - Resources
- Include non-stakeholder expertise and knowledge
  - Similar programs
  - Relevant research literature
- Vigilance about change in
  - Program
  - Environment (e.g., policy, funding, public perception)

Assure relevance through revision

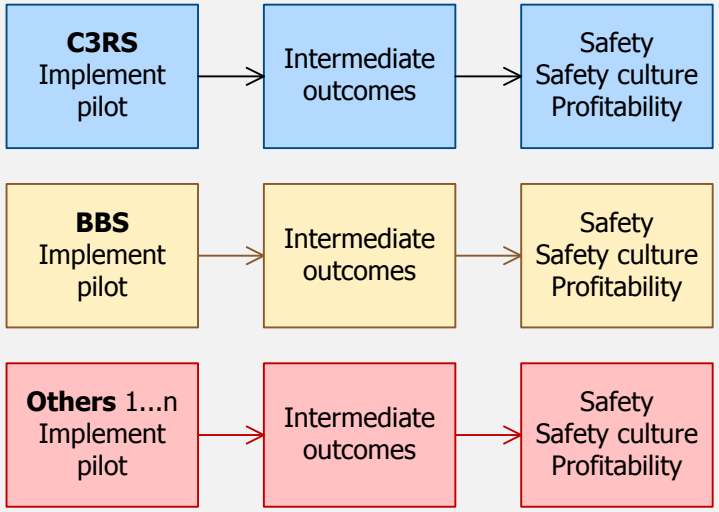
- Look for targets of opportunity to adjust in midstream
  - Maintain relationships with stakeholders so you can ask them to work at revisions
  - Sneak in resources to allow unscheduled change, e.g.
    - make it part of "data analysis" and pad the budget
  - Revelations about program behavior revealed during discussions about findings, e.g.
    - "We were wrong, it looks as if culture is changing earlier than we thought"
  - Realizations that important program activities were left out, e.g.
    - "We probably should have modeled the pre-implementation recruitment process."

Help Stakeholders Appreciate Evolving Relationships Among Programs

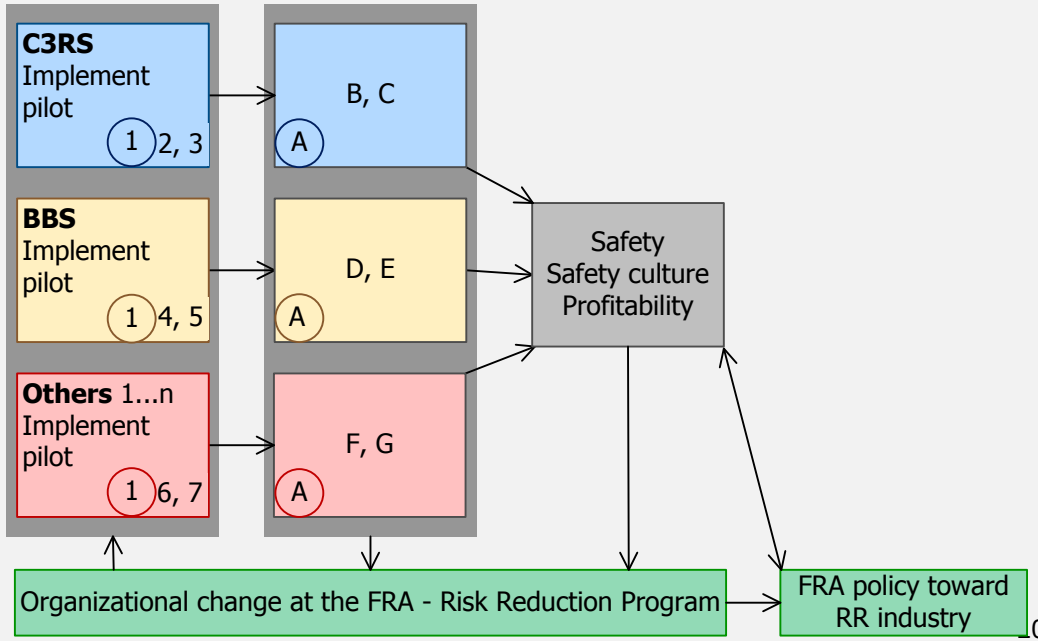
3 separate programs

Some unique intermediate and long term outcomes

Some common intermediate and long term outcomes



Combine to have consequences not likely to derive from any one alone.



Choosing group members

- Who can influence program operations?
  - Implementation
  - Outcome
  - Sustainability
- Who can influence the evaluation?
  - Access to data
  - Integrity of the design
- Who can make use of the evaluation findings?
  - Same program in same setting
  - Same program in a wider range of settings
  - Other programs with similar objectives
- Values
  - Who has a right to influence what the evaluation measures?
- Operational
  - Given constraints of time and money, who should be involved?
  - Will candidates put in the work?
- Some stakeholders can be sampled, e.g. teachers,
- Some stakeholders are unique, e.g. minister of education

Group process choices for logic model development

	1:1 – Evaluator to Respondent	1: Many – Group Meeting
Face to face		
Phone, video, Internet		

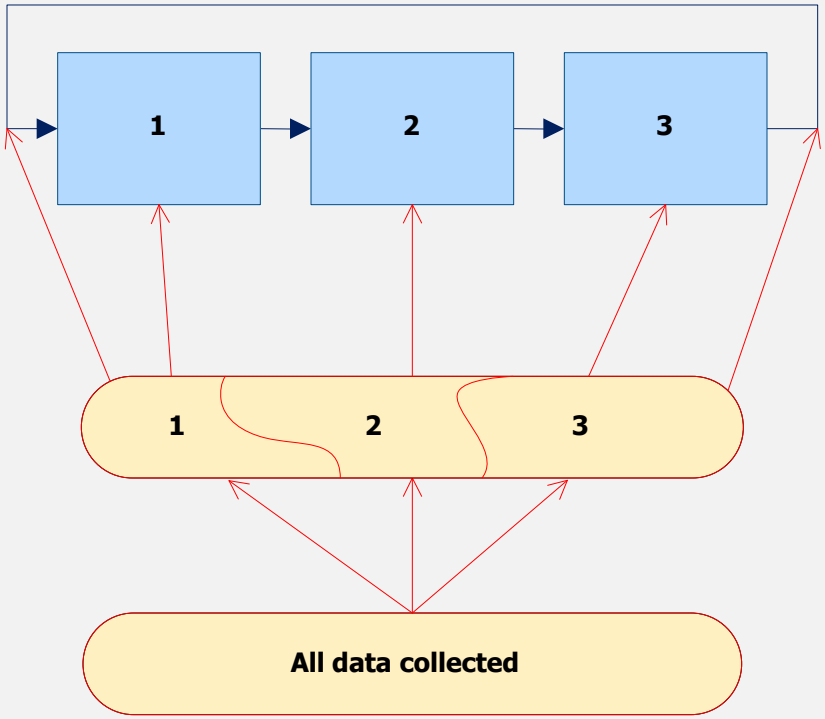
Considerations for choice of tactics

- Time pressure
- Need for consensus vs. advice
- Decide if you need consensus or advice
- Potential for conflict among stakeholders
- Working relationships among group members
- Opportunity for multiple rounds of deliberation
- Power / status differential among stakeholders
- Degree of common understanding among group members

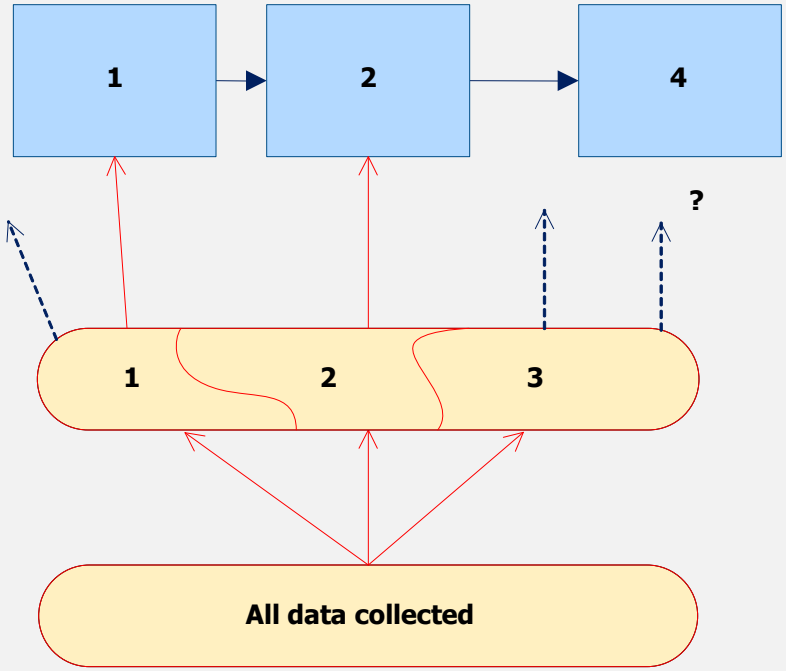
Consider the advantages and disadvantages of linking different elements of the evaluation

Index Logic Model → Data → Analysis

- Powerful
- Elegant
- Useful



But think of the rework when the model changes



Discussion

- How has your thinking changed about the relationship between logic models and other aspects of evaluation?
- How can logic models be useful for reasons other than getting consensus among stakeholders about program operations?
- When is it useful to use multiple forms of a model for the same evaluation?
- What is the value of making the information content of a logic model more dense and multidimensional?
- What are the different uses of a logic model at different points on the evaluation life cycle?
- Why/when can logic models be useless or counterproductive?