

# Current trends in Program Logic: Paradigm Wars and Black Swans?

Presentation by  
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to AES Lunchtime Seminar Series  
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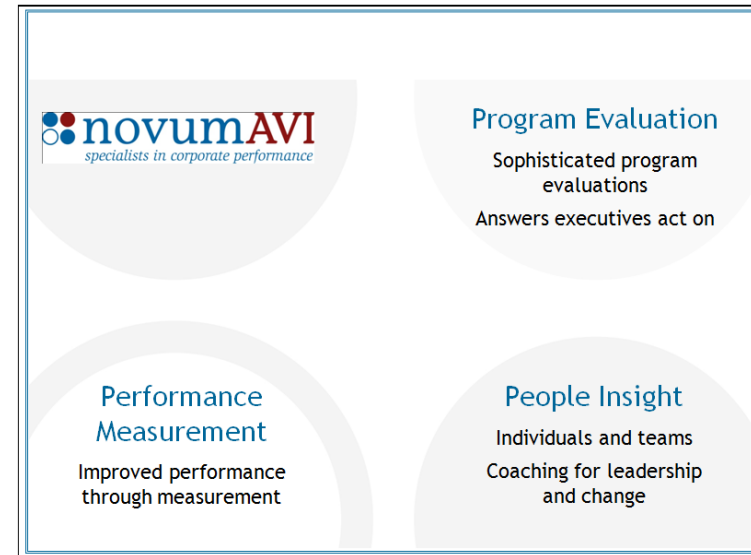


The term 'paradigm wars' references an article in 1989 by Gage about the so-called paradigm wars between quantitative and qualitative research in educational research, in which he declared the 'wars' as over. 30 years later the debate still rages.

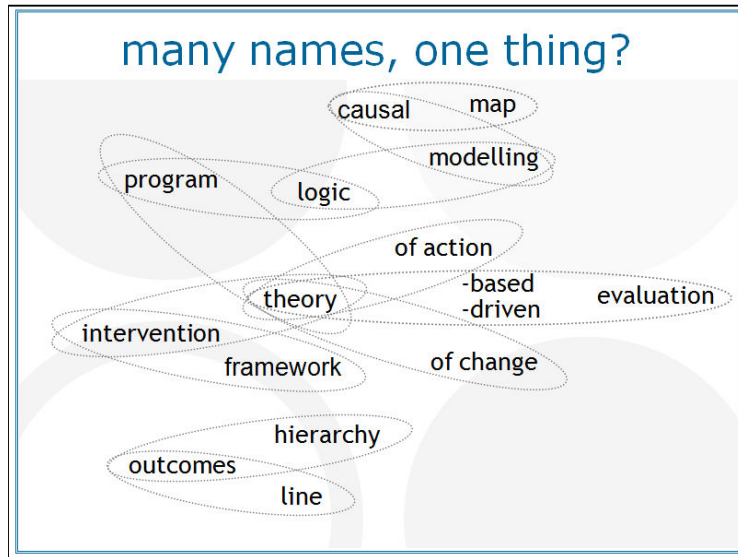
Program logic seems to be developing similar demarcations and schisms as the quantitative-qualitative divide, and this presentation canvasses some of the issues.

'Black swans' references the effect of the highly improbable, and was first used in contemporary times in relation to financial markets. Programs are not immune from these incidents.

Gage, N.L. (1989) The paradigm wars and their aftermath: A "historical" sketch of research on teaching since 1989. *Educational Researcher*, 18 (7), 4-10.



NovumAVI is a consultancy that specialises in corporate performance measurement, program evaluation, and people insight.



There are many terms used in the area that falls under the umbrella of 'program logic'. Ros Hurworth has given a history of what she terms clarification approaches, beginning with evaluability assessment (1970s), program theory (1980s) and then program theory.

As the display shows, there are many combinations of nouns and adjectives in the field. Whether the multiple terms refer to the same thing, and whether two people mean the same thing when they use the same term are points for discussion.

Beyond the terms, there are a number of accepted frameworks, as the next displays show.

Hurworth, R. (2008), Program clarification: An overview and resources for evaluability assessment, program theory and program logic. *Evaluation Journal of Australasia*, 8, pp. 42-48

The table is titled "Logframe matrix" and is a 6x4 grid. The columns are: Project Description, Performance indicators, Means of verification, and Assumptions. The rows are: GOAL, PURPOSE, COMPONENT OBJECTIVES, OUTPUTS, ACTIVITIES, and INPUTS. Each cell contains a brief description of the concept and its relationship to the other levels. A source note at the bottom right reads "Source: AusAid (2005) AusGuide/efm".

Project Description	Performance indicators	Means of verification	Assumptions
<b>GOAL</b> broader effect, impact	measures of effect		
<b>PURPOSE</b> outcomes from combined components	endstate descriptions	Sources of information and	about the Purpose-Goal link
<b>COMPONENT OBJECTIVES</b> outputs from each component	quantity/ quality/ timing	methods used to collect and report it	about the Component objective-Purpose link
<b>OUTPUTS</b> direct results	quantity/ quality/ timing		about the Output-Component objective link
<b>ACTIVITIES</b> tasks in project	activity indicators		about the Activity-Output link
<b>INPUTS</b> resources, information, links from other projects			about the Input-Activity link

The Logframe Matrix - often referred to as the LFM - is a framework used extensively in aid and development work. Its name is prosaically derived from 'logical framework' (presumably to be distinguished from illogical frameworks).

Its essence is a 4 x 4 matrix, with the rows showing the outcomes hierarchy, and the columns listing outcome level, indicators, sources, and assumptions.

The core LFM only looks at outputs/outcomes, and a modification as shown here is to add inputs and activities below these.

My own critique of the LFM approach is twofold. One, in practice these can become table filling exercises where the aim is simply to populate each cell in the table with words that seem to make sense (or sensible process phrases like "see Bill for what to fill in here").

Two, it doesn't show the cause and effect links in the program beyond the general assumption that everything in activities causes everything in outputs.

## Funnell program theory matrix

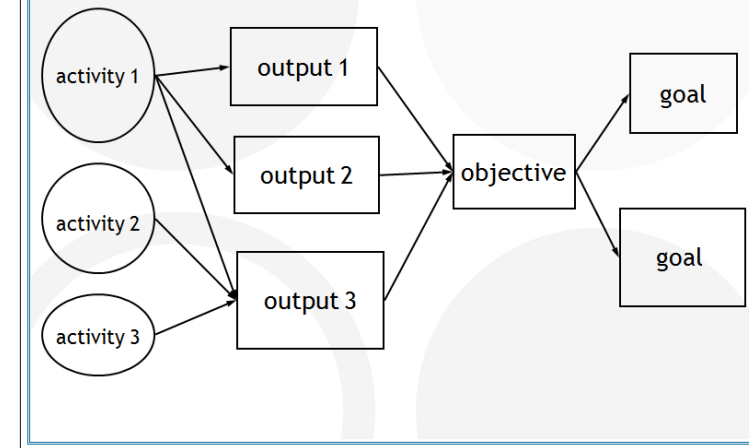
Intended Outcome	Success Criteria	Program Factors affecting Success	Non-program Factors affecting Success	Activities and resources of program	Performance Information	Sources of data
Immediate						
Intermediate						
Ultimate						

Sue Funnell uses a modified approach that still has the outcomes hierarchy as rows, but incorporates two very important other elements. One, a clear statement of success criteria; two, statement of program and non-program factors that affect success. The latter make explicit in words the cause and effect links.

Both the LFM and Funnell's approach are easy to do from a production perspective: any reasonably competent support person can create and format a table in a word processing package, and most people can write words to fill the cells in the table. This is also a weakness - the nuances of program theory and cause and effect can be quickly lost in the pressure to fill a table.

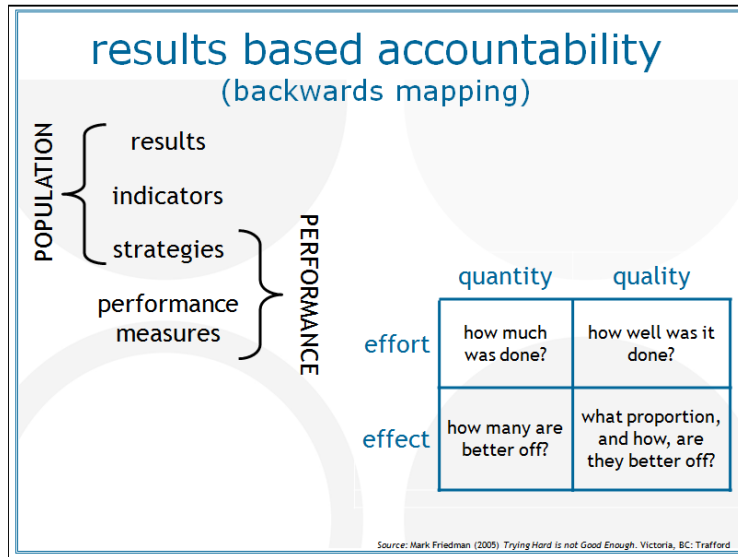
Funnell, S. (2000). Program theory matrix for evaluation and monitoring. In P. J. Rogers, T. A. Hasci, A. Petrosino & T. A. Huebner (Eds.), *Program theory in evaluation: Challenges and opportunities* (Vol. 87). San Francisco, CA: Jossey-Bass.

## path diagram



A third approach is the graphical method in which the links are clearly drawn, and allow for one-to-one, many-to-one, and one-to-many causal relations. The diagram can be annotated at both the nodes and the links to convey success criteria (nodes) and context and assumptions (links).

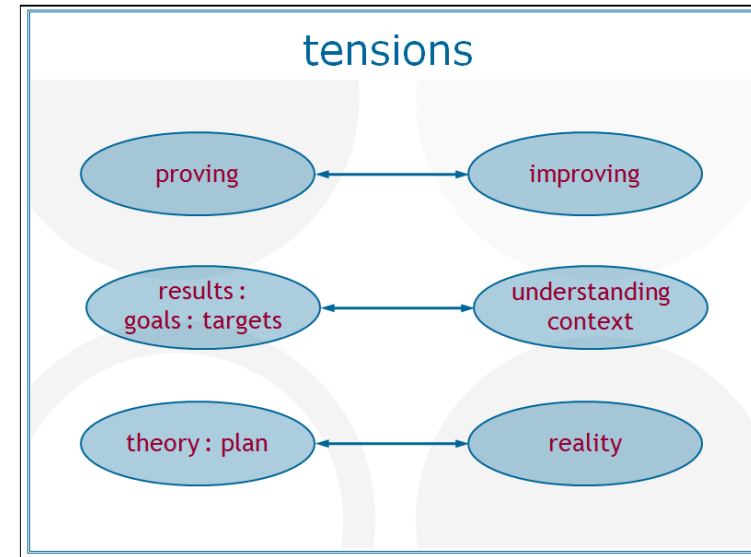
From a production perspective this approach is harder to do than the matrix approaches because it is not a table. However, from an understanding perspective there is a richness in the diagram that is never conveyed by a table.



A relatively new approach, that claims to be different, is results based accountability. Its key difference is that it works backwards from the results to be achieved, whereas program theory/logic approaches usually work forwards from the activities being done.

Beyond this - often subtle - shift in perspective a core part of RBA is the focus on effort and effect, and quantity and quality of each. Friedman is explicit that the least important to measure is quantity of effort and the most important is quality of effect. (As an aside, politicians will often recite lists of figures of what has been done - effort quantity - but are much quieter about what has been achieved.)

Mark Friedman (2005) *Trying Hard is not Good Enough*. Victoria, BC: Trafford



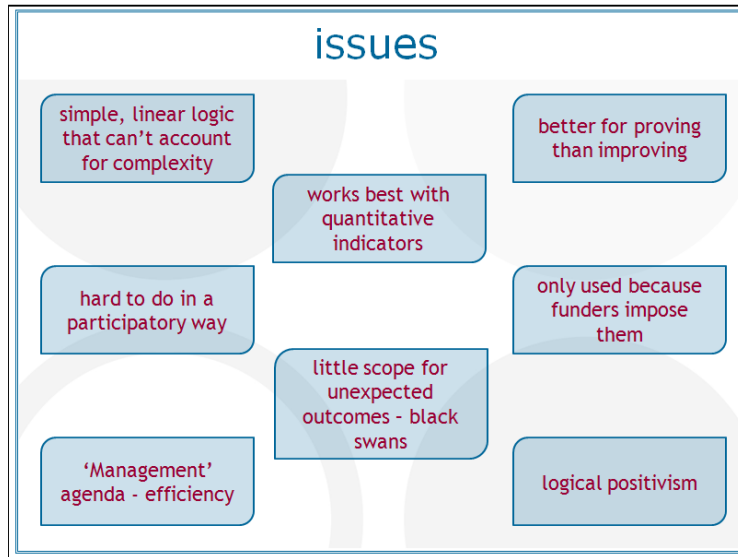
There are (at least) three tensions in the use or conceptualisation of program logic.

The tension between 'proving' - showing that a program works - and 'improving' - adjusting a program to be more effective, efficient or appropriate is really the tension between theory and practice.

Another tension is between those who see program logic as a tool for setting and defining results, goals and targets in a perhaps fairly simplistic 'return on investment' view, and those who see to understand the context.

The third tension is between the espoused program logic - the stated theory or plan - and the enacted program logic - the reality when the plan is implemented.

see e.g., Bakewell, O. & Garbutt, A. (2005) *The use and abuse of the logical framework approach*. Swedish International Development Cooperation Agency



**Linear logic:** Program logic, whether it be words, a table, or a diagram, tends to reduce the real-world complexity of systems with multiple feedback loops to a simple cause-and-effect model, and often doesn't account for external influences on the outcomes - influences that may overshadow any program effect.

**'Management' agenda:** Linked to the apparent simplification that program logic can impose is a concern that developing a program logic serves an 'efficiency' agenda of reducing inputs, or program activities.

**Hard to be participatory:** The skills required to develop a robust, meaningful (for the evaluator) program logic, and the language used in program logic, often don't encourage participation, especially by clients.

**Best with quantitative:** Some regard program logic, or the models it produces, as being suited only for things that can be measured with numbers, and so can lose valuable information and a richness in describing both the program and its outcomes.

**Proving not improving:** as discussed in the previous slide, a concern of some is that program logic is a tool for proof of theory rather than improvement of practice - this concern probably comes more from those people who worry that their program doesn't work.

**Imposed by funders:** this is a concern raised a lot in the aid and development domain - that program logic is a pre-condition of funding, but that funders are mainly interested that the exercise has been done rather than that it produces any useful results, insights or understanding. The comment is that the program logic is never viewed after the program commences.

**Logical positivism** - see next slide

**Black Swans** - see two slides hence

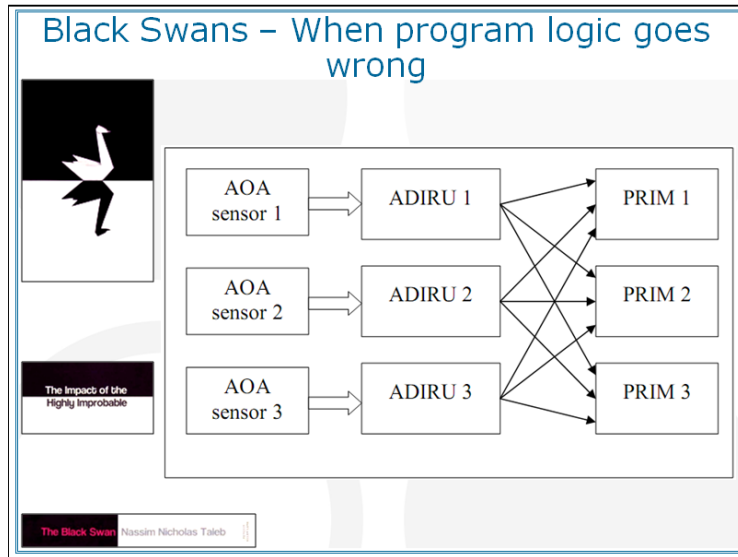
**Logical Positivism**

This is raised as a criticism of program logic, as if logical positivism were a bad thing. It's essentially the basis for the scientific method and, while there are other forms of enquiry, asserting an understanding of how the world works based on tested evidence is not a bad thing.

The point of the slide is that even elite athletes who are paid significant sums per year, and who, presumably, are coached and trained by evidence-based practice, can still fall prey to superstitious pseudo-science and nonsense.

AJ Burnett is wearing a Phiten necklace (they retail for about \$25-30) which has a series of untested, unproven and probably spurious claims made about it.

The necklace probably neither harms nor helps - they're worn by about one-third of Major League Baseball players - but it's a good example of what happens when we ignore logical positivism.



The term ‘black swan’ comes from the book of the same name by Nassim Nicholas Taleb, and refers to the effect of the highly unlikely. He wrote mainly in the context of financial markets, and risk assessments in those markets.

The black swan is the situation for Europeans where, by definition, a swan is white. What do you do when you find a black swan? It changes your world.

The diagram looks a lot like a program logic diagram - there are inputs, processes and outputs.

In this case it's part of the flight control system for an Airbus A330-303.



The main photo shows the damage to the ceiling panels in Qantas flight QF72 (an Airbus A330-303) on 7 October 2008 when the aircraft abruptly pitched nose down, causing unrestrained passengers to leave their seats. At least 14 people were seriously injured.

Modern aircraft typically have three parallel systems for flight control elements, giving a high level of redundancy for unlikely failure events.

Key to understanding what might have happened on QF72 are the three ADIRUs (air data inertial reference units) which connect to three flight control primary computers (PRIMs).

Because ‘spikes’ (aberrant readings) will occur in data from the sensors there are extensive algorithms in the PRIMs to filter and smooth these spikes. Without going into the detail of these algorithms (see the ATSB reports listed below) there was the potential that if two significant spikes occurred exactly 1.2 seconds apart then the flight control system would respond to the aberrant data. In this case that response appears to be by initiating an emergency dive.

The black swan here is an unexpected, unplanned but in hindsight quite plausible event that had severe consequences

ATSB TRANSPORT SAFETY REPORT Aviation Occurrence Investigation AO-2008-070 *In-flight upset 154 km west of Learmonth, WA 7 October 2008 VH-QPA Airbus A330-303*

November 2009 - Interim Factual No. 2

March 2009 - Interim Factual

2008 - Preliminary

**The Economist**  
**THE READERS' AWARD 2010**  
Economist editors have carefully selected a shortlist of seven ideas they believe have the potential to change society radically but have not yet done so.  
By casting your vote you will be automatically entered into a draw to win a free place at the awards ceremony on October 21st in London, where the winning idea will be announced.

**CAST YOUR VOTE: Of the following seven ideas, which one do you think will have the biggest impact on society in the next decade?**

- 4G networks
- Electric cars
- Geoengineering
- Graphene electronics
- Personal genomics
- Private space-launch services
- Randomised trials of aid and development schemes

VISIT: [www.economistinnovation.com](http://www.economistinnovation.com) for further explanation of these ideas, to cast your vote and enter the free prize draw.

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Source: The Economist (12 June 2010) Vol 395, No. 8686, Technology Quarterly supplement, p. 7

In closing, The Economist magazine recently asked its readers to vote on which of seven selected ideas they thought would have the biggest impact on society in the next decade.

Among the more apparently innovative, such as private space launches and electric cars (and graphene electronics - whatever that is\*) is randomised trials of aid and development schemes.

Sound program logic is at the heart of understanding any program, or aid and development scheme, and so it seems to have a rich future.

\* Graphene is a one-atom thick sheet of carbon - It has many interesting electronic properties and could replace silicon in future electronic device. Graphite, with which we are more familiar, is many layers of graphene stacked together. You can produce your own graphene by drawing a pencil across a piece of paper.

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# DISCUSSION

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