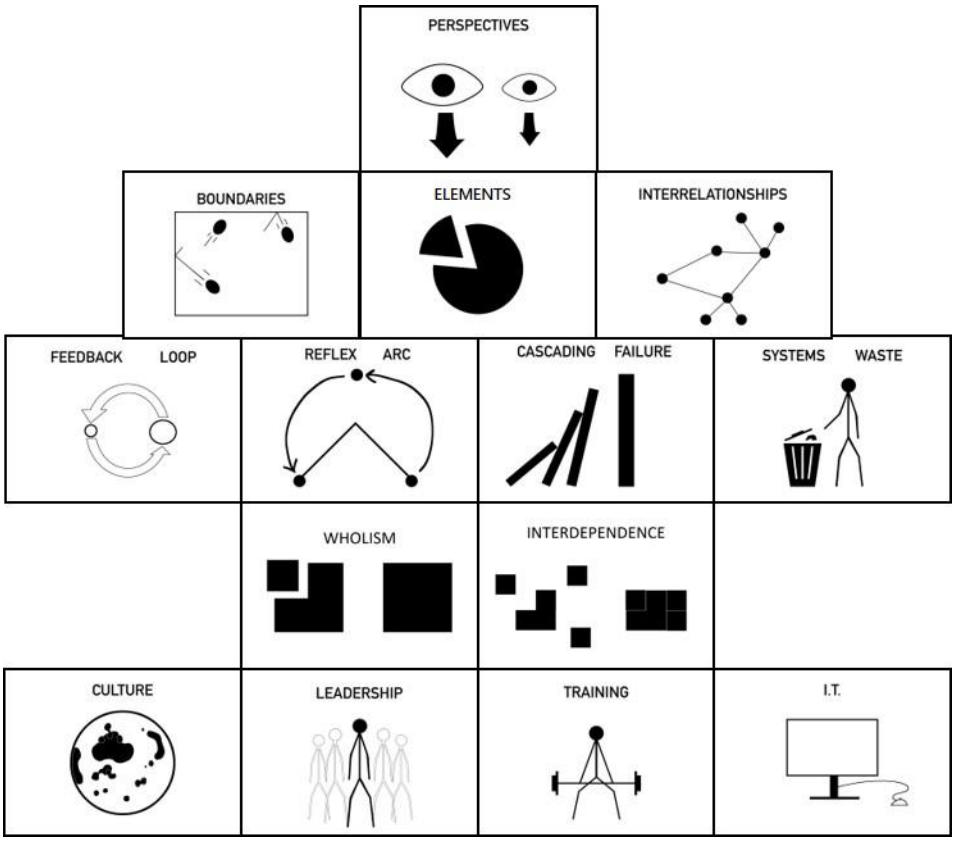
Systems Thinking 3



Contents

Welcome

This is our third communication! Now we are all locked up, and social distancing, we have less distractions.

In 'Classic Theory Discussion' we have a look at:

a. **A systems approach to preventing and responding to COVID19**: This was put together by four public health doctors working for Queens University in Belfast, and the World Health Organisation.
b. **Some ideas from Dr Russell Ackoff:** one of the great systems thinkers.

In the ideas section we chose some follow ups to the COVID19 paper with

a. **Causal loop diagrams** – what the different symbols mean, and what they are trying to show
b. **Leverage in system interventions** – **Donella Meadows** seminal work and developments since

In the controversy section we are still following the COVID19 article, and we ask, **'are causal loop diagrams any use?'**

And to leave COVID19 alone, and keep you all current, in the Systems Theory and Evaluation section, we have these March 2020 additions to evaluating systems thinking:

a. **An evaluation of a translational research body -** and some 'anti-rules' on this process each based on characteristics of open living systems
b. **The latest official guide to complex evaluations from Her Majesty's Treasury** – hot off the press

And…in an addition to our Biographies and gossip section we are featuring one of our LinkedIn members who works with systems thinking all the time…**Dr Melanie Pescud**. We hope to feature a new person every newsletter.

As per the second newsletter, we will gradually post elements of this newsletter over the coming period onto the "Systems Thinking and Evaluation" LinkedIn group. If you have not joined already, you can go to the following link and request to join. https://www.linkedin.com/groups/10508364/.

As always, a big thanks to **Julie Elliott**. She continually has interesting ideas and contributions.

Lewe
Ralph
Brian

PS: This time we are going to add an ONLINE DISCUSSION for one hour, if you wish to join us:
Monday 27, April 10 am AEST
Sunday 26, April 5 pm MST

We will post this link - https://global.gotomeeting.com/join/601760829 **to the mailing list, and add it to the LinkedIn** The discussion will be on using systems thinking to evaluate a local health department's real time response to the COVID19 pandemic. Ralph is presently undertaking this project, so he will give an update on what he is thinking at this stage of the evaluation.

Classic Theory Discussion

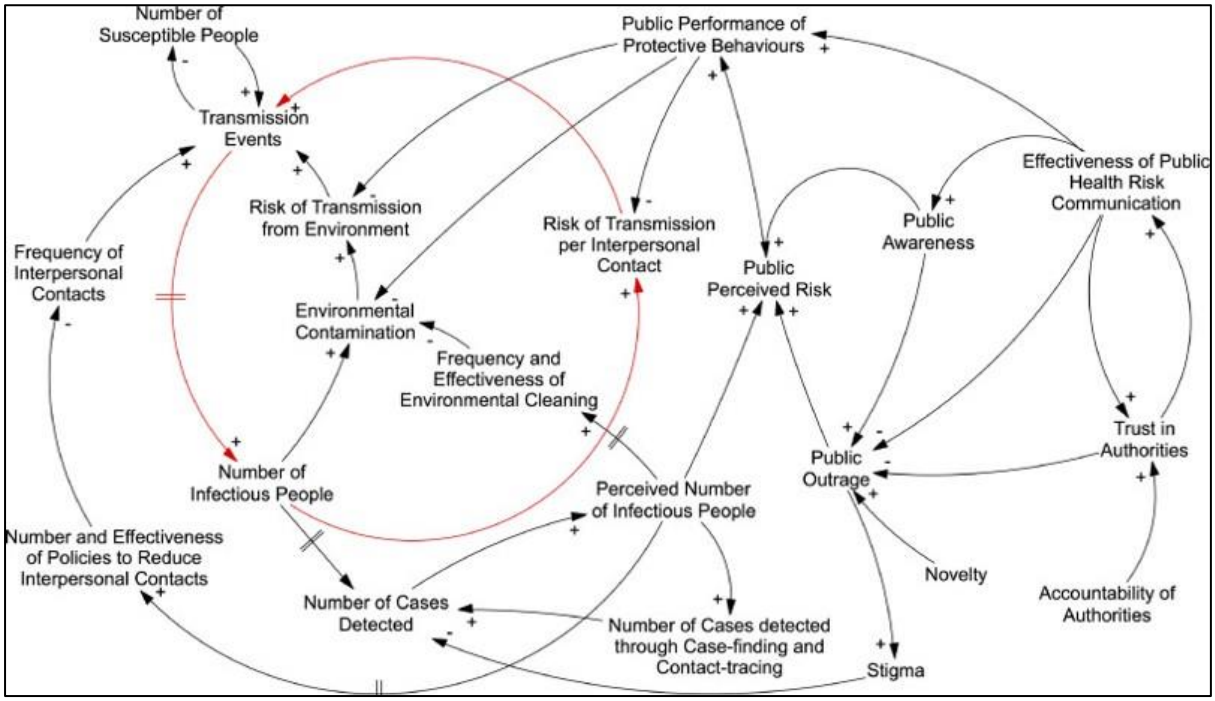
These are the foundation ideas. We have two classic approaches, one new and one old, to cover the system temporal spectrum.

A. Systems Approach to Preventing and Responding to COVID-19

Dr. Ralph Renger sent through the article "A systems approach to preventing and responding to COVID-19" (Bradley et.al., 2020)[1]. Dr Renger is currently evaluating a local health department's real time response to the COVID19 pandemic in Arizona, USA (see upcoming ONLINE DISCUSSION)

Bradley et.al. argue that systems thinking can help policy makers 'understand and influence the spread of infection'. The primary approach to a systems understanding is through a 'causal loop diagram'.

The central conclusion to this COVID-19 systems approach was that *"policy- makers should aim to bring about protective structural system changes so that the readiness of society to prevent emerging infectious disease outbreaks is independent of the current perceived number of cases. In doing so, they can create a system that is intrinsically more resilient to new, and established, infectious agents"*.



It is not a long article (two pages) and has some interesting ideas. Although explained somewhat in the article, I must admit I did not understand causal loop diagrams. To help myself out:

a. We included an explanation of them in the '**Ideas'** section (see section below).
b. We ask: **'do causal loop diagrams help?'** in the **Controversy Corner** section (see section below)

What are your thoughts about this diagram's utility?

[1] Bradley, D. T., Mansouri, M. A., Kee, F. & Garcia, L. M. T "A systems approach to preventing and responding to COVID-19, March 27, 2020 DOI:https://doi.org/10.1016/j.eclinm.2020.100325

B. Dr Russell L Ackoff

Why do systems thinkers construct causal loop diagrams in the first place? The problem these diagrams are trying to solve is outlined by our second entrant into the 'classic theory' section.

Dr Ackoff was Professor Emeritus of Management Science at the Wharton School, University of Pennsylvania. He lived from 1919 to 2009.

It is difficult to include all his ideas, so we concentrated on just one for this newsletter. This idea goes some way to explaining all the different variables and the 'dynamic feedback loops'

This comes from the following, which is Ackoff's greatest hits…

Ackoff, R. L., (1999) "Ackoff's Best: His Classic Writings on Management", John Wiley & Sons, ISBN: 0471316342

He advocated looking at the world using a 'producer- product' approach, as opposed to cause and effect.

…"the view of the universe revealed by viewing it in terms of producer-product is quite different from that yielded by viewing it in terms of cause-effect"

Cause and Effect
Traditionally, research is "essentially concerned with two-variable problems, linear causal trains, one cause and one effect, or with few variables at the most" (von Bertalanffy, 1968, p. 12).

Producer and Product
"Acorns do not cause oaks because they are not sufficient, even though they are necessary, for oaks. An acorn thrown into the ocean or planted in the desert or an Arctic ice cap does not yield an oak.

Because a producer is only necessary and not sufficient for its product, it cannot provide a complete explanation of it. There are always other necessary conditions, coproducers of its product. For example, moisture is a coproducer of an oak along with an acorn. These other necessary conditions taken collectively constitute the acorn's environment. Therefore, the use of the producer-product relationship requires the environment to explain everything whereas use of cause-effect requires the environment to explain nothing.

Science based on the producer-product relationship is environment-full, not environment-free."

So, this brings us back to causal loop diagrams trying to illustrate our shared understanding of the dynamics of the *full* environment. Potentially this gives us possible event points for policy intervention.

Ideas

A. Causal Loop Diagrams

I had not come across these diagrams in detail before. It just looked like a bit of a mess to me. But I was reminded that all modes are wrong, but some are useful. I thought it would be good to understand them better. This is what I found out….

Causal loop diagrams are designed to help understand a situation by creating a shared model. Julie (Elliot) tells me it's a sense-making tool to develop and aid understanding in the midst of change. Its purpose is sense-making cum action taking.

The model is made up of the following:

- Variables – things, actions, or feelings (these are the words that create the nodes)
- Causal links – variable nodes connected by arrows. This denotes one variable creating a change in the other
- Delays – double lines perpendicular across the arrows. A delay just means the effect takes time. Time is a critical element in lots of feedback

The causal arrows (feedback loops) have a positive or negative sign. This indicates the effect on the other variable is to increase or decrease. Therefore, feedback loop can have:

a. A positive polarity (more to more, or less to less): this is a reinforcing loop
b. A negative polarity (more to less, or less to more): this is a balancing loop

Dr Donna Gurule, from Loma Linda University - Public Health, gives a fuller explanation in this clip that runs for 16min 40sec.
Systems Thinking: Causal Loop Diagrams

B. Leverage in System Interventions

At this stage, I understood that causal loop diagrams give a sense of the issues using a 'producer product approach' and the dynamics are clearer. The next question was how do we intervene 'to make the world better'?

This is a large area, and we may come back to it a few times in the future.

It is based on the simple idea that there are points in a system where force for change can be applied to most advantage. A place where 'a small shift in one thing can produce big changes in everything'.

Donella Meadows, an American environmental scientist, is a seminal thinker in this area. She was stimulated by being really ticked off in a meeting about global trading regimes where she thought people had no idea what they were doing.

To read more about these leverage points try this link:

http://donellameadows.org/archives/leverage-points-places-to-intervene-in-a-system/

Julia Canty-Waldron uses a case study around social policy related to Indigenous disadvantage in Australia to takes this idea further. She groups the twelve leverage points into:

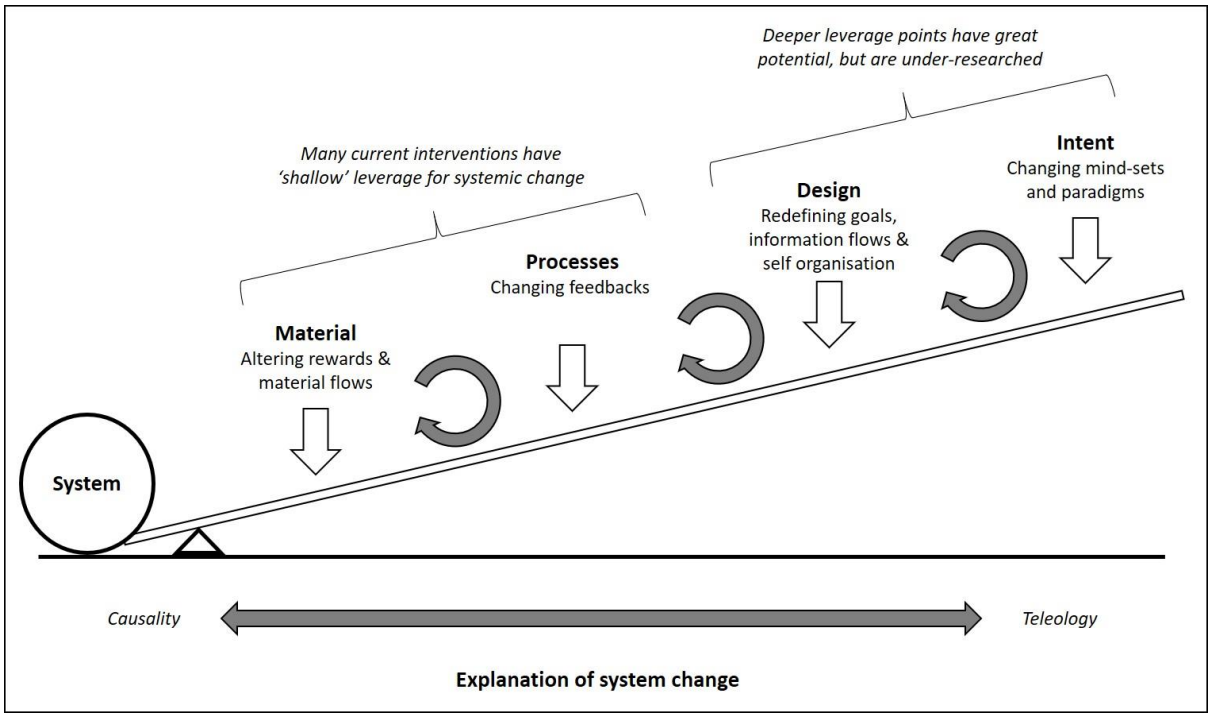
1. Physical leverage
2. Information and controls
3. Ideas as leverage

https://jfsdigital.org/wp-content/uploads/2015/01/19-2-Article4-Canty-waldron.pdf

However, the original idea is based on Aristotle's theory of Causality (the things you find out!). Here is a quick summary in six and half minutes:

Systems Thinking - video5 - Systemic interventions and their leverage

This has recently been incorporated into sustainability science. The diagram below picks up on this idea, and the article uses these ideas as a possibility to turn around humans self-destructive tendencies that have led to the 'proclamation of the Anthropocene' (just to take your mind off COVID19)[2].



[2] Fisher, J & Riechers, M. "A leverage points perspective on sustainability" People and Nature , Volume: 1, Issue: 1, Pages: 115-120, First published: 31 January 2019, DOI: (10.1002/pan3.13) https://besjournals.onlinelibrary.wiley.com/doi/full/10.1002/pan3.13

Controversy Corner

We have taken the COVID19 article and worked at understanding the underlying motivation for use of causal loop diagrams, what they mean in detail, and what is a systems idea around interventions that may be assisted by these diagrams. It is time to ask:

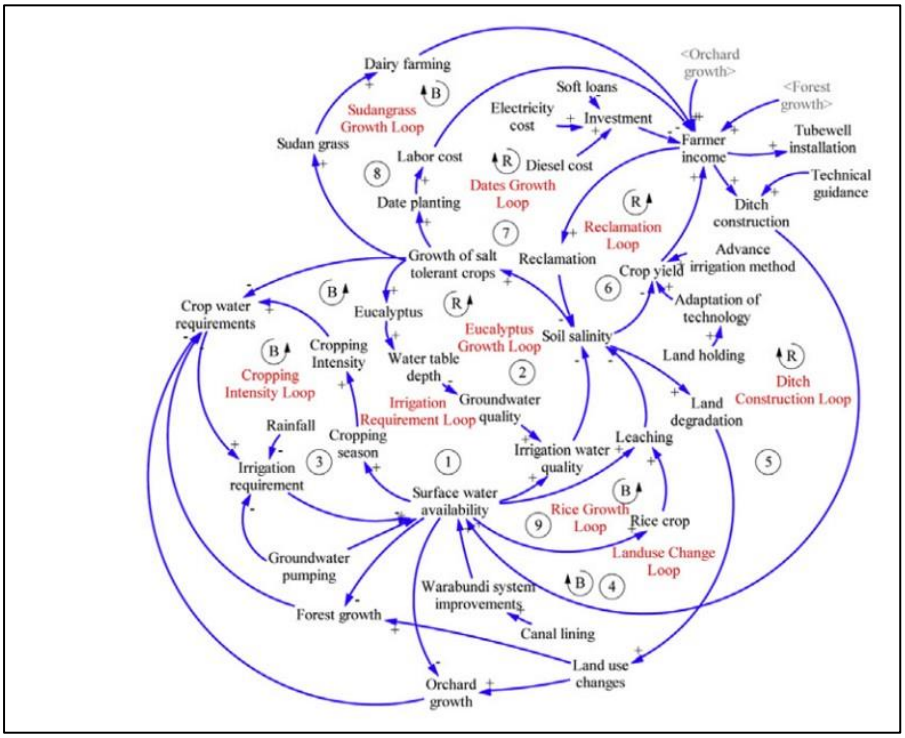
Do causal loop diagrams really help?

Ralph says "useless, because its predictive power has not been tested". His take is its fine as a hindsight 20-20 view of things, but how do you apply it and how do you use it to predict what will happen? "The power of modernist science is in prediction!"

Julie says "…isn't that the point with wicked problems (e.g. the predictive power has not been tested)? Decision making policy agents must improvise without the benefit of predictive certainty. The model illustrates a shared understanding for improvising in the midst of complex change. We really don't' want to rerun this pandemic 3000 times to get that type of data. Evaluators need to do better than only work on stuff that we have the answers to."

Dr Lewe Atkinson, our in-house systems super-powers infused expert (SSPIE), says "they are more meaningful to those who have participated in their creation. Otherwise, they can seem dense and impenetrable, so they are a poor communication tool."

Just to get you thinking, we give you another example as to how they are being used. This one comes from 'a step method' to get key stakeholders understanding soil salinity management on farming land in Pakistan[3]:



[3] Inam, A., Adamowski, J., Halbe, J. & Prasher, S. "Using causal loop diagrams for the initialization of stakeholder engagement in soil salinity management in agricultural watersheds in developing countries: A case study in the Rechna Doab watershed, Pakistan" Journal of Environmental Management 152 (2015) 251e267https://www.mcgill.ca/bioeng/files/bioeng/using_causal_loop_diagrams_for_the_initialization_of_stakeholder_engagement_in_soil_salinity_management_in_agricultural_watersheds_in_developing_countries.pdf

Systems Theory and Evaluation

A. Bench to Bedside

At the end of 2019, Dr Renger and his team evaluated the Dakota Cancer Collaborative on Translational Research (DaCCoTA). This program focuses on moving cancer projects from basic research to the real-world helping patients. DaCCoTA aims to advance cancer research in rural populations as well as American Indians and other minorities.

The approach used was System's Evaluation Theory (SET). The conclusions were SET was more work, but gained a stronger response to implementing recommendations:

"Using SET proved useful in providing near real-time actionable recommendations. One of the greatest advantages of SET was it provided a richer and more meaningful implementation evaluation (i.e., focused on interconnections) than would have been possible using a programme evaluation approach grounded in logic models (i.e., focused on siloed core process). However, a systems evaluation approach is more costly to design and implement than a traditional programme evaluation approach using logic models."

Dr Renger's latest article is published in the current Evaluation Journal of Australia.

Renger, R., Basson, M., Hart, G., Van Eck, R., Souvannasacd, E., Renger, J. & Foltysova, J.
"Lessons learned in evaluating the infrastructure of a Centre for Translational Research"
Evaluation Journal of Australasia 2020, Vol. 20(1) 6 –22 DOI: 10.1177/1035719X20909910

If you are interested in TRANSLATIONAL RESEACH, Dr Lewe Atkinson has published his list of 'anti-rules', each based on characteristics of open living systems, or twelve ways to kill off that research translation before it can do dangerous things like improving our lives. Link here - https://i2insights.org/2018/09/25/killing-research-translation/

B. Policy Evaluation – The Magenta Book

Julie Elliot asked me if I had red the Magenta Book (that is a poor attempt at a joke). The Magenta Book apparently is the central guide for all UK government departments on evaluation. The book outlines how evaluations should be designed and managed, different options for evaluations, and generally why evaluation is great for policy.

I found out that the Magenta Books grew out of the 'Modernising Government White Paper' and supplements the treasury 'Evaluation and Appraisal Green Book'. Hmmm….

The Magenta Book 2020 (March) Supplementary Guide on Complexity outlines key concepts and points to consider in evaluation when working in complex and challenging policy areas. It is clear, and well put together. It deals with many problems evaluators face normally in evaluations and gives a systems type rationale for its' methods.

The primary approach is like 'Scrum' (agile) project management. Essentially continuous evaluation on smaller chunks of work that are designed to test concepts and lead to gradually developing a workable approach to complex problems.

From <https://www.cecan.ac.uk/events/handling-complexity-policy-evaluation-introducing-magenta-book-2020-supplementary-guide

Biographies and gossip

We have decided to feature our readers, largely because it is much more interesting to us then reading our biographies again. It also gives us all an idea of the breadth and depth of systems thinking out there. Our first reader feature is Dr Melanie Pescud.

A. Dr Melanie Pescud

Dr Melanie Pescud is a Senior Research Fellow at the School of Regulation and Global Governance (RegNet) at the Australian National University (ANU).

Originally from the small goldmining town of Boddington in South West Western Australia, she grew up on a farm with her father, a truck driver, mother, a nurse, and older sister.

As someone always interested in health, she completed her undergraduate degree and PhD studies with a focus on public health at the University of Western Australia before moving to Canberra to work at ANU.

After a short stint out of academia working in the not for profit sector and federal government, she returned to ANU to work on a systems thinking project funded by The Australian Prevention Partnership Centre.

The aims of the study are (1) to gain a clearer picture of how systems approaches are being used to describe and understand complex problems in chronic disease prevention research and (2) identify, at a deeper level of practice, whether and how systems approaches are being used to create real world change.

Melanie thinks that one of the best things about systems thinking is applying it beyond the professional setting to the personal setting, especially with respect to being open to understanding multiple perspectives, using reflective practices, and deep listening – some of the well-known systems practices that are helpful across all facets of life! They also happen to come up as key practices within yoga, something Melanie studies, practices, and teaches.

[we are tempted to start a 'Yoga for Systems Thinkers' session for the lockdown….! Eds]

B. Contribution Team

i. Julie(Elliott)

Julie is best known as Executive Producer on the zombie apocalypse movie "Me and My Mates Vs the Zombie Apocalypse" (2014).

Julie Elliott is also a PhD student at the School of Media and Communication, RMIT University. Her research project is 'Developing Complexity-congruent evaluation theory and practice.'

Contact: julie.jcelliott@gmail.com

ii. Lewe (Atkinson)

Lewe likes to wear Hawaiian shirts and play the banjo.

Lewe is also the powerhouse behind Haines Centre for Strategic Management (Brisbane). He lives and breathes systems thinking – and is always working towards the practical application of system thinking principles to business (and government) sustainability.
Contact: lewis@hainescentreasia.com

iii. Ralph (Renger)

Ralph's daughters refer to him as 'the arrow' because of his hair style.

Ralph has published over seventy articles in academic journals, and taught systems for more years than he can remember. For the last thirty years he has presented to conferences around the world.

Contact: ralph@justevaluation.com

iv. Brian (Keogh)

Brian has recently found out his name is most well-known as a dog's name because of bravery during WW11. The book '**The Amazing Adventures Of Bing The Parachuting Dog"** was published in 2012 (they changed Brian's name to Bing!!!)

He has a company 'Cobalt59' (www.cobalt59.com.au) with a lovely person called Julieanne, and he likes working with the people above.
Contact: briankeogh@icloud.com