

Intro and Wicked Problems (Wk 1-2)

Reoccurring Concepts

- ⇒ *Causality – the unattainable pursuit in solving complexity?*
- ⇒ *Relationships between adaptive interactions in complex systems.*
- ⇒ *Humanity is empowered by imagination and social capital, but we must be mindful of our context in a broader system (Black Swans)*

Theme reflection ...

Understanding the study of complexity is both a refreshing new view of old problems, but it is also somewhat familiar. Reading the preliminary texts, many of the comments about modernity echoed very themes of the past for me. Fundamental authors of sociological theory, such as Giddens, Weber and Marx are referred to widely and my previous study of sociology has meant that I am very familiar with many of these concepts. Yet, complexity scholars like Harris have been able to introduce a new level of relevance for me drawing them into the context of the contemporary issues, particularly in relation to the finite nature of resources in the biosphere.

Looking at the “Wicked problems in Implications to public management” was an incredibly useful and beneficial document for me. As a member of the public service, involved in policy cycles that deal with highly sensitive issues of balancing development and environmental protection we deal with complexity and “wicked problems” daily. What this article and the broader complexity discipline has provided me with is a discourse and a language with which I can discuss these issues and demonstrate the need for a more holistic, systems based approach.

Guidelines for defining “wickedness” provide a clear visualisation of the process but like all frameworks, if used rigidly without the users being aware of the broader context it will limit the ability of practitioners to address the wicked issues that they are defining (Head 2008:10). The classic public management trap is providing guidelines and rules to simplify complexity to the extent that it no longer addresses the broader issues.

Key Concept: The most wicked problems are issues where the both the problem and the solution cannot be defined: *Are we asking the right question?*



Black swans...

Conversely Taleb's analogy of black swans is an example of a simplification that succinctly and visually presents an idea that we need to be constantly aware of. Human society places a high value on social capital, and the limitless ability of the human imagination... almost. In the value base that humans are dominant to nature, the black swans is an incredible reminder that we are but a part of a bigger system that too has it's own agency, triggers and feedbacks, creating situations that we cannot possibly conceive.

Tutorial Ticket...

Pre-Course Reading: Harris

- **Drivers and responses:** Current approaches to technology development have created quasi-cyclical changes in economic activity => reaching a reconciliation and consilience between these temporal shifts is essential for a far achieving a more sustainable world view. .
- **Relationships:** Collaboration, trust and social capital is essential for addressing the increasing complexity we face.
- **Complex adaptive systems.** – networks of interactions and connectivity.
 - *Ethics* as a variability that introduces doubt, systems thinking and balancing difficult choices.

Wicked Problems: Implications for Public Management;

- Causality – there is no “root cause” for complexity
- The role of knowledge.
 - Addressing knowledge gaps to reach consensus
 - Addressing the known unknowns and the level of uncertainty.
- Diversity of Actors and the ability to continue to “muddle through”
- Guidelines for “wickedness” – most wicked are issues where neither the problem or solution are known.

Taleb; Black swan thesis

- Prediction of the future is virtually impossible, there are unknowns that we cannot currently conceive of.
- Black swans are the failure in our imagination.

Engineering

Reoccurring Concepts

- ⇒ *The traps of deconstruction and modularity – is a system the sum of it's parts?*
- ⇒ *The creativity of precision; the reliance on, imagination and innovation for fill knowledge gaps to create a new system that responds to the new needs.*
- ⇒ *Specialisation within systems, the need for multidisciplinary.*
- ⇒ *Understanding the relationship between problems and causality.*

Theme reflection...

When considering taking a cross-disciplined approach to study, for some reason I have never particularly considered Engineering as part of these alternative disciplines. This week both pushed me beyond my social-science based comfort zone and into a world which I found surprisingly applicable to many of the problems considered within my own disciplines. There is a lot of relevance between the system analysis and understanding of engineering and the soft-systems approaches of human ecology.

Visually representing Complexity

Both in the panel and tutorials the analysis of the complex systems inevitably involved some form of visual representation of the system. From a background in policy it is easy to become immersed and reliant on words and it is important to remember the role of representing concepts visually for better and a different understanding. In human ecology the role of rich picturing environments and systems is somewhat a joke amongst students but in the context of engineering and their visual representation it reminded me of how simply and clearly information can be understood when appropriately visually depicted.

When considering cross-cultural issues of complexity, such as climate change, this again is an important technique as it can simply and eloquently represent a system or it's parts in a universally understood language. That being said like all "frameworks" reducing complexity to diagrams and images can be limiting as well. Which is evident to the fact that there is no one key methodology, a multiplicity of approaches allows for greater exploration of the issue.

Working in the development and culture sector, I think there are elements of some of the engineering systems diagrams that can be can be applied to forms of cultural mapping. Sometimes culture and the influence it has within a system can be underestimated as it is particularly hard to quantify. But by applying cultural mapping techniques it may be possible to generate a visual aid that assist decision makers in understanding how the underlying base culture influences the relationships of the components within the system.

Organisations such as UNESCO are already employing this increasingly holistic approach. (see: <http://www.unescobkk.org/culture/our-projects/cultural-diversity/cultural-mapping/>)

Key Concept: It is not the things that are important but the relationships.

Life cycles

This concept of technology having a life-cycle of development, implementation, operation, maintenance and eventual retirement, is an interesting insight concept to continue through the other themes. The concept of empires rising and falling or growing and changing links closely with this and creates an interesting reflection on our concept that development is linear. These ideas present themselves as juxtaposed but rather are inherently linked. Understanding the systems we exist in as being changing and adapting, responding to feedback loops and adjusting to further their goals is important context for understanding some of the complexities of these systems.

The systems which complexity deals with are dynamic and constantly changing, again emphasising the importance of examining the relationships between the “things” or modules within the system. Understanding the system environment and the view of the system from the broader scale is an important element. Bar Yam discusses the importance of examining the big picture whilst also understanding the components that create the system (2004:26).

Panel Question:

- Engineering is a precise discipline with a strong emphasis on ensuring the right solutions are provided, often putting human lives in danger if a system created fails. How does Engineering cope with the variability inevitably introduced into a system by human agents, particularly through moral and ethical dilemmas? – eg. September 11 Attacks, a system was engineered for the purposes of transporting people, but there was no mechanism to prevent the system becoming destructive of those it was assisting when the thinking of the hi-jacker prevailed.

Tutorial Ticket...

What do I engineer?:

- Management Plans for Cultural Heritage Protection
 - Often worked out in modular parts that are brought together in a broader plan
 - Each modules designed to be funded and operate individually but support the broader system
- Policy Frameworks
 - Legislative instruments – working within complex institutional and legal systems.
 - Designing a policy that resolves a problem/issue
- Communications strategies
 - Classic engineering lifecycle: (*development, operation maintenance and retirement*).
 - Should be slowly improved through user evaluation and target audience statistics but generally associated with the changing policy cycles.

Differences between policy making and engineering:

- Less impetus for accountability/ reliability than engineering, particularly in terms of some machines etc.
- More open to influence of political and social factors rather than technical scientific ones.

Complex Networks:

- Most things can be defined in terms of complex networks including social networks.
- Is this a useful technique for profiling social factors that impact on complex problems?
- Cultural Mapping, providing baseline information in order to develop systems to address complex, multi-faceted development problems.
- Complex Networks are not always completely random, therefore should not be treated as completely random.

Achilles Heel: fragility and resilience of complex networks if nodes are removed.

Empires and Collapse

Reoccurring Concepts:

- ⇒ *Asking the right questions – essential to finding appropriate resolutions of solutions to problems.*
- ⇒ *Understanding and acknowledging our value base and own subjectivity is important before attempting to engage or intervene in complex issues.*
- ⇒ *Known unknowns – history provides limited capacity for predicting the future, we can learn from the past but apply it cautiously to the future (there are many black swans to be found).*
- ⇒ *Multifaceted nature of humanity society, clearly demonstrated throughout history, emphasises the importance of multidisciplinary when approaching issues of complexity.*

Theme reflection...

Resilience/collapse or change?

The juxtaposition of “resilience or collapse” creates boundaries around how we conceive human societies and their development and change. The complexity of systems and the agency of individuals, groups and organization reacting to certain feedbacks demonstrates that a system is inevitably evolving and changing (Harris 2007:7). Collapses are often triggered by tipping points where the system is fundamentally changed, irreversibly so, leading to collapse of the current society and allowing a new, and perhaps better adjusted system to form.

- The overstretch of the Imperial Roman Empire led to the eventual decline, allowing other empires to rise to form.
- The ecological collapse of Rapa Nui, devastated a population reducing it to less than 150 people, yet the island remains inhabited today. Supporting a society in a relatively remote location.

Kennedy’s thesis questions the ongoing global hegemony of the United States. With the predicted rise of countries such as China and India the collapse of the global hegemony of the United States brings an important question of whether collapse is something to be avoided, or whether it should be accepted as part of the evolution of the human systems.

- The question of collapse and growth limits understood through examination of values which are central to society. The concept of what we aspire to, the western concept of a linear progression of society, whether it be a “golden age” or “developed” are rooted deep within our history, through societal norms, religious beliefs and institutionalised mechanisms for social governance.

- Is the worth of a society in its education? (a European perspective?)
- Or is the decline of a society measured by its vanity, and appreciation of the frivolous excesses of luxury? (western commercialism and materialism?)

Key Concept:
Attempting to provide a hypothesis for a complex and extensive system such as human society can be in danger of over simplification – does Kennedy’s theory fail to acknowledge the agency and adaptation ability of each unique module?

“You find a singer instead of a philosopher; a teacher of silly arts is summoned in place of an orator, ... organs played by waterpower are built, and lyres so big that they look like wagons” Marcellinus (Ancient Roman historian)

Considering rise and fall of empires and societies over time is incredibly complicated, looking for patterns can be futile (despite Kennedy's effort) as it leads to a simplification of that is not necessarily beneficial in understanding system. Even in my brief reflection above I have neglected to discuss many other key factors contributing to the relative resilience of a society. This includes recognising the importance of relationships, and considering scale when reviewing the collapse of empires. What strongly emerged for me, throughout the discussions and readings was that when considering Empires, the complexity of the system can become over whelming. This to me emphasises the importance of "asking the right question"

What is the right question:

As explained in week 2, the complexity of a "wicked problem" is compounded when the problem or in this case the question isn't easily identified. I think this is particularly evident when considering the importance of history in application to the resolution of contemporary issues of complexity. The discipline of history today is generally conceded to be subjective, as there is no imperative to find the right answer, rather provide an appropriately evidenced explanation. Alternatively, engineers create a solution that is has to be exactly proven and tested, otherwise faults in the system could create catastrophe, as human trust is placed on the ability of these mechanical systems to work.

In order to "use" history effectively in the application to the complex issues of today's world the right questions need to be asked. The impetus to ask the "right" questions is not present within the historiographical discipline, as experts on the panel stated, history today is often more about understanding the context and the psychological state of people within a particular society.

In soft systems thinking, situational analysis is essential to understanding the values underpinning the current system, which in turn often inform the power relationships within that system. Perhaps History becomes applicable to the issues of complexity when other disciplines define the question.

Panel Question:

- When examining history, both ancient and modern how important is it to understand the intimate and minute details in order to (re)construct the bigger picture of the past?
- What other disciplines do historians rely on to fill knowledge gaps?

Tutorial Ticket...

- Historians – in creating general theories, have issues with the evidence of the past is almost too varied to reach solid indisputable conclusions. But “general valid conclusions can be drawn”

Addresses the concepts of known and unknown information, and is based on creating hypothesis from partial information. Knowledge gaps create an additional layer of complexity, whilst understanding the parameters and context which these texts and “evidences” of the past were written in can also be complicated.

- *Kennedy*: Much historical literature is centered around war. There is also the assumption that ‘war’ and the ‘great power system go hand in hand.
- *Black*: Putting theories in the context of a rise and fall, with such economic factors neglects non-western nations – such as china.

Setting guidelines boundaries and parameters can lead to assumptions and a blindness when addressing complex issues. There is an importance to maintain a focus on the issues but with an awareness of the broader influencing factors

- *Kennedy*: History can’t come to a conclusive statement about where we are now and how we apply this to the future as the nature of the system is one that is in a constant state of change.
- *Black*: The problem with greater theories is that it can neglect or underrate the multiplicity of factors affecting policy makers.

The variability of factors affecting wicked problems.

- Langdon: *Manioc and the Easter Island Enigma*
- Issues of translation, and assumption and bias from the translators base culture. => *Black Swan*: It was inconceivable to Corney that Manioc could have been present on the island, therefore he “corrected texts”

Development.

Reoccurring Concepts:

- ⇒ “Memory” the past values and construct affects the current conceptualisation of “development”
- ⇒ Causality vs drivers; understanding the relationship between components of modules within the system.
- ⇒ Induction vs deduction – who is empowered within the system?
- ⇒ Boundaries and base culture critique.

Theme reflection ...

Definitional Debate:

Although definitional debates are not particularly useful, debates surrounding “development” inevitably return to the question of “what is development?” Effectively throughout humanity, there has always been an aspiration to a “golden age” or a Utopia. The Ancient Roman authors (as mentioned in the empires reflection) associated this with literacy and refined luxury. Greeks and Islam all aspired to a similar peak of refinement. This concept of linear progression is born in the very roots of western society.

Traditional conceptualisation of the world from Islander cultures throughout the South Pacific is far more cyclical. Closely associated with environmental determiners they have systems and patterns that rise and fall and evolve, but are less engaged in the rigid concept of constant “progression”, and in the contemporary western case, expansion to an ultimate goal.

That being said, most people in today’s society want “development”. The analysis of the economic situation is not present in minds of individuals but there is a genuine desire to enhance their prospects for the future, particularly associated with health and education although access to the cash economy remains an important component.

The Melanesian Indigenous Land Defence Alliance rejects “development” as its current neo-liberal construct, claiming that the complexity of the system associated with just a single word allows many agendas to hide beneath the concept of development. Whilst defying development, particularly in the form of Foreign Direct Investment, they acknowledge the need to provide their children with the opportunities to enhance their future prospects (Regenvanu 2009).

Amartya Sen’s concept of development being a state of freedom of person and of expression is far closer to how I would conceptualise development (Harris 2007:3). To me, defining development is about how the individual relates to their own intimate section of the broader network. The Gross National Happiness Index, I think is a good example of this. The concept of development should be defined by the individual.

Key Concept: The entire premise of development supported by a values construct that there is a “utopia” or “golden age” to aspire – In the Empire of the western developed world, of globally hegemonic powers, when is our decline?

Applicability of the Complexity discourse to Development.

For me, Development is the ultimate issue of complexity, it incorporates multiple other complexities such as the impacts of climate change as well as moral, emotional and ethical facets adding additional layers to the challenge of dealing with these issues. The question of the practicality and the applicability of the complexity discourse to development, as raised in the tutorial, was one that really challenged me.

Looking at “Wicked Problems” in the second week and linking it to public sector management provide some really practical tools and ways of conceptualising and addressing issues which I face regularly working in a bureaucracy. Conversely trying to apply similar techniques, of viewing the big picture, consulting with all stakeholders in a situation is simply not practical when I was working on community development project in Vanuatu. On the smaller scale, within Vanuatu, examining the relationships between certain groups, or modules within a system is essential to work effectively within the system, but on the broader scale it simply is not possible. This is where I think the ability to set boundaries to the system your examining and working within is essential.

Midegley states that “*boundary critique gives rise to the possibility of embracing theoretical pluralism*” (1998:103). I believe that embracing this soft-systems methodology when addressing complexity in development enables a deconstruction of the complexity without over-simplifying the model to the extent that it becomes distorted.

Are traditional economies less valuable than monetary economies?

Bride price payment, Mangaliliu Village, Vanuatu (Fleming, 2009)



Panel Question:

- How is culture represented and quantified within the development discourse?
- Is there any capacity for cultural diversity and cultural identity be a key driver of change that should be considered when examining causality of development issues?

Tutorial Ticket..

What is the most important aspect of development?

In one speech Truman created billions of “under-developed” people creating an idea and assumption that there were then “developed” people and that it was a linear progression to economic and governance improvement. From this premise the most important aspect of development is those elements that are most closely associated with achieving improvement in the indicators stipulated by international power brokers such as the World Bank. Structural reform, good governance and strong accountable institutions create the foundation which should lead to improvement in trade, population health and access to markets.

How does Australian Govt consider “Development”

- Conformist to the neo-liberal idea of poverty alleviation through economic growth.
- Concerned with “structural reform” to stabilise institutional and governance structures to avoid uprisings that may threaten Australia’s Security.
- “Closer Partnerships” or re-enforcement of neo-colonial attitudes.

How I consider development?

I had previously considered development from a sociological perspective, and a practical perspective rather than economically, applying strategies such as the “prisoners dilemma” easily articulated many ideas I’ve had about development such as there is an incentive not to be altruistic (particularly in relation to Aid).

Problems in complexity addressing development:

There are so many factors involved in development that trying to apply any of the adaptive system models such as Game theory or agent based modelling is each of them can easily over simplify the matter at hand. As Bar-Yam states recognition of the role that individual agency plays is often not prioritised, and that frameworks such as the comprehensive development framework, creating plans for dealing with incredibly complex and constantly evolving systems of societies is impossible

Seminar 1...

Approvals and Wildlife Division Forum *Jurisdictional challenges of Environmental Enforcement.*

5th August 2010

Department of Environment Water Heritage and the Arts.

This Forum is a forum that is designed to present ideas, and issues some of which could easily be classified as “wicked problems” for discussion across sections and groups working with assessing the environmental impact of development throughout Australia. This particular forum focussed on the role which the commonwealth department can play in compliance and enforcement

. Of particular interest in the context of complexity is

- examining the role of “expert advice”;
- making judgement calls about future impacts despite acknowledged knowledge gaps;
- and analysing the role the commonwealth department plays in the wider system of governance. (A good example of agency within a complex system.)

This particular forum was in relation to significant native vegetation clearing on land near Munglinup in Western Australia. Jurisdictionally the native vegetation is addressed under state legislation with the Federal Government involvement in relation to the impacts on listed species under the *Environment Protection and Biodiversity Act (1999)*. The two key species of concern were the Malleefowl and Barnaby’s Cockatoo. Ultimately the decision was made that there was insufficient evidence of significant impact to pursue the case either criminally¹ or under civil proceedings¹, but the Federal department would continue to support the state prosecutions in relation to the clearance of 325 ha of native vegetation.

This decision prompted significant discussion in the role that environmental assessments, compliance and enforcement plays within the broader mantra of promoting social and economic development whilst advancing the protection of Australia’s Biodiversity.

Aerial Image-
delineating cleared area
amounting to 325ha –
*Significant impact? On
what Scale? .*



Matters of National Environmental Significance (NES).

Establishing whether or not developments or environmental infringements impact on a matter of NES is the basic premise which informs the course of particularly issues within the department. If it is considered a serious infringement then a investigation is initiated if it is considered to be a minor impact, then softer compliance measures are implemented such as caution notices. I think this foundational judgement can create a blindness within the system, definitional guidelines of “what is and what isn’t” can easily result in decision makers failing to see impending disasters.

As Bar-Yam discusses this exact point, by focussing on the large- scale it is possible to miss a deeper understanding of the interaction of the components, equally focussing on the national-scale can result in a failure to understand the global impacts (2004:26)

Experts are often relied upon to address knowledge gaps, with the only critical analysis applied to the advice given is in relation to it’s ability to be credible within a court room. Adams refers to the “creed of expertise” a specific knowledge type, that whilst highly values, particularly in a society with increasing specialisation within a system (2004:32). But what must be acknowledged in this is the fact that it comes with its own discourse and value base of the particular individual providing the advice.

The broader thesis of Adams article is around “usable knowledge”, and the need for a reflexivity within decision makers to critique and assess knowledge, rather than simply rely on accumulated knowledge without question. Understanding the role that knowledge can play in a system is an important element to grasping the complexity of the situation.

Institutional and Bureaucratic complexity.

That being said there are some strong initiatives within government to address knowledge gaps, predominately through collaborative mechanisms. Multidisciplinary approaches, and forums such as this particular one encourage the sharing of knowledge to a certain extent. Steering committees and advisory groups are often formed to bring together multiple stakeholders to look particularly at the multifaceted complex issues.

One of the largest cross-divisional discussion forums was created in response to the increasingly alarming issues associated with the Coorong, prompted specifically by the acidification of Lake Alexandrina. Although it brought together many sectors of the environmental management of the area that previously had been working independently it failed to address the bigger picture, broader spectrum need for multidisciplinary collaboration. The committee would have been far more effective to engage stakeholders of the farming community, the aboriginal communities affected. Perhaps in this case, ironically it was a lack of experts, to inform the decision making process. Although an attempt was made the policy processes and guidelines for engagement interdepartmentally meant that there was insufficient flexibility to form such a committee.

Although a small issue it elucidated many of the issues presented in the study of complexity. Creating effective environmental policy that balances the expansionist neo-liberal ideas of development whilst also attempting to maintain a level of environmental protection and sustainability is indeed a multifaceted and complex issue. Deciding that this particular clearance of vegetation does not have a significant impact could potentially mean that key corridors that will protect the species in the future, and allow them to adapt to other key threatening processes (such as Climate Change) is something that no “expert” can authoritatively advise on.

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