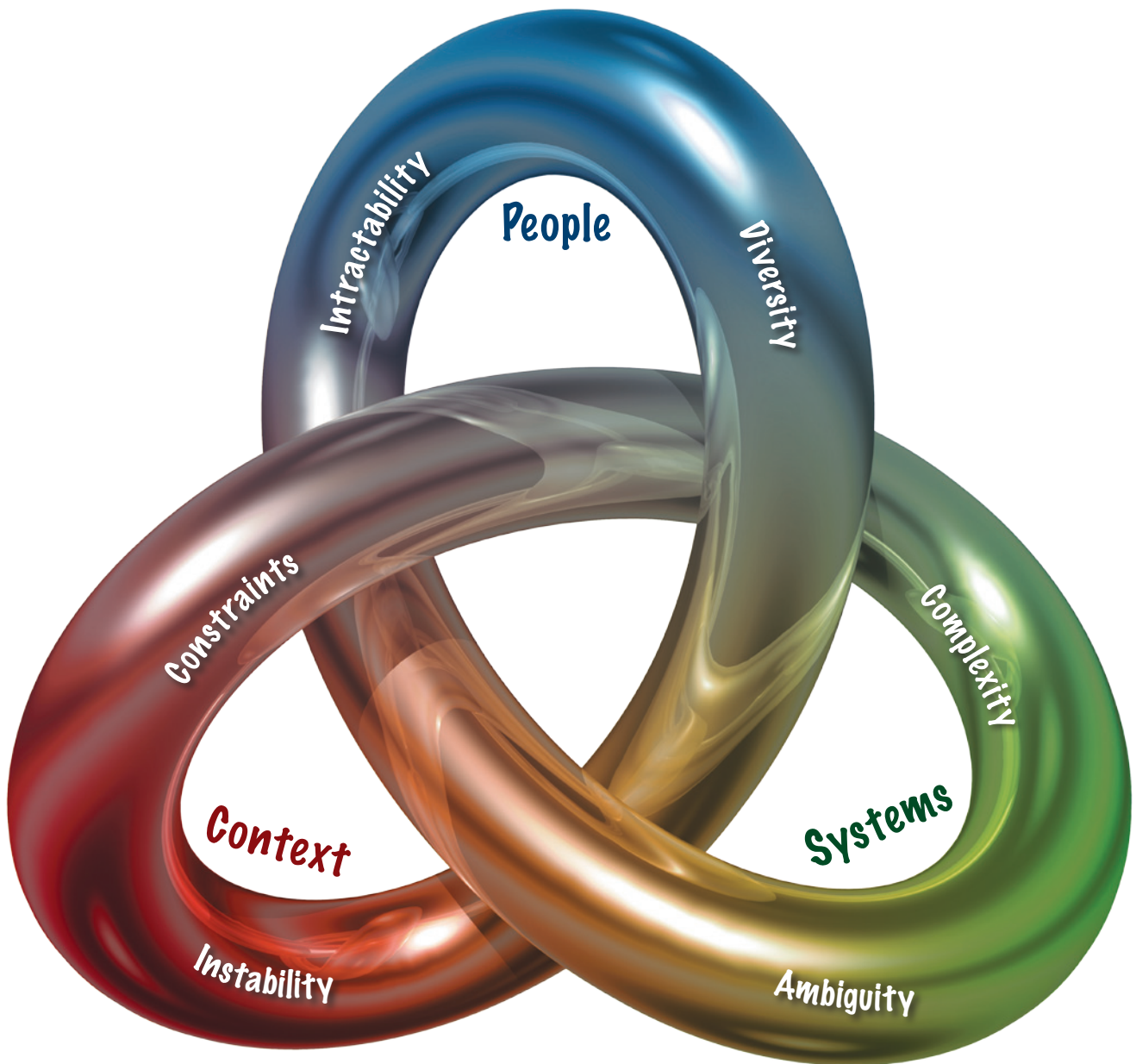


Wicked Problems



Concept Overview

Wicked Problems: Introduced

This document has the somewhat ironic purpose of trying to define something which includes indefinability as one of its major characteristics. I am attempting to do this however because in my work I find many clients need some sort of framework to try to make sense of the problems they are faced with. The academic literature has included all sorts of descriptions and analysis but what most managers want is some functional tool or model that will enable them to move ahead in solving or mitigating the issues they are working on. Consequently I have developed a visual model and related graph based around the concept of the 'Gordian knot'. My aim is for this model to:

1. provide a simple but functional way of diagnosing and tackling wicked problems
2. be both comprehensive and coherent in capturing the range of thinking on wicked problems
3. be informative through its visual elements as well as memorable and attractive

Before describing my model in detail I will present a brief historical outline of the main influences on my thinking. For anyone familiar with the topic it will be obvious that I have also borrowed some ideas and suggestions from a wide variety of thinkers but, as this is not currently intended to be a full academic paper so much as a general description of my current thinking, not every source has been listed.

Rittel and Webber (1973) identified ten primary characteristics of wicked problems:

1. There is no definitive formulation of a wicked problem, i.e. even the definition and scope of the term is contested;
2. Wicked problems have no 'stopping rule', i.e. no definitive solution.
3. Solutions to wicked problems are not true-or-false, but good-or-bad in the eyes of stakeholders.
4. There is no immediate and no ultimate test of a solution to a wicked problem.
5. Every (attempted) solution to a wicked problem is a 'one-shot operation'; the results cannot be readily undone, and there is no opportunity to learn by trial-and-error.
6. Wicked problems do not have a clear set of potential solutions, nor is there a well described set of permissible operations to be incorporated into the plan.
7. Every wicked problem is essentially unique.
8. Every wicked problem can be considered to be a symptom of another problem.
9. The existence of a discrepancy representing a wicked problem can be explained in numerous ways.
10. The planner has no 'right to be wrong'; i.e. There is no public tolerance of initiatives or experiments that fail.

This list has been used as the basis for all later descriptions and models. However, having ten unconnected descriptors makes it difficult to utilise in a tightly functional way for tackling wicked problems.

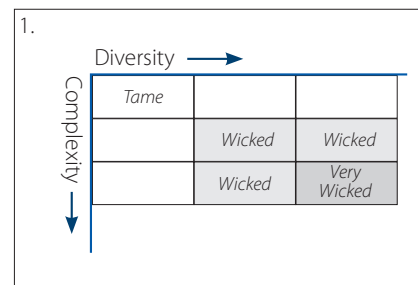
The APSC produced a significant document in **2007** titled **Tackling Wicked Problems: A Public Policy Perspective**, one in a series on "contemporary government challenges". They presented eight characteristics that were particularly targeted toward public policy problems.

1. Difficult to clearly define
2. Many interdependencies and multi-causal aspects
3. Proposed measures may have unforeseen effects
4. Problems may be unstable and continue evolving
5. No clear and correct solution
6. Problems are socially complex with many stakeholders
7. Responsibility stretches across many organisations
8. Solutions may require behavioural changes by citizens and stakeholder groups.

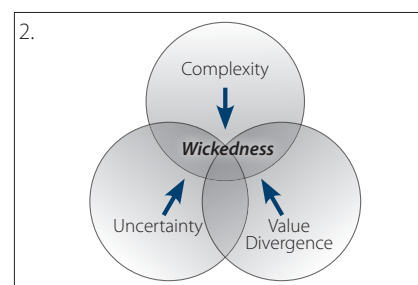
Brian Head (2008, 1 & 2) presented his initial thinking at a conference in January 2008. In response to comments on this paper he published an article later in the year in the journal 'Public Policy'. Both these works are an attempt to present a more elegant synthesis of what makes problems wicked.

In particular, he developed the idea of different dimensions whose interplay in problems move from tame through to increasingly wicked. (See Fig. 1). The more dimensions that are involved in a problem, the quicker it also becomes wicked.

His first attempt used two dimensions: diversity and complexity.



The simplicity of this was inviting but did not incorporate a number of the characteristics mentioned above. His updated model (See Fig. 2) introduced uncertainty as a third dimension and shifted terminology from 'diversity' to 'value divergence'. This brought in a lot of the missing elements but was still dissatisfying for me.



Therefore I attempted to develop my own model based on these ideas and my own experiences of working with clients over the last twenty years.

Wicked Problems: Niche Model

Ashhurst (2009) I have identified three linked areas of potential wickedness, with two dimensions in each area. This combination is easier to remember than long lists of characteristics and also provides a bit more detail than Head's model. This page provides a general description of this 'Niche' model, named after my company and each dimension is then described in detail on the pages that follow.

The Niche Model

Figure #3 shows the visual model based on the 'Gordian knot' motif. The three areas each have their own colour but flow into the next, and the knot as a whole has no start or finish. The three areas and dimensions are:

People (Blue)

- Diversity
- Intractability

Systems (Green)

- Complexity
- Ambiguity

Context (Red)

- Instability
- Constraints

Fig. 3



People

This area is about social difference of stakeholders, and is here discussed in terms of **diversity** and **intractability**. Robert Horn 2007 talks about social 'messes' as a core element in wicked problems.

Different social groups can have very different perspectives on a problem. In many cases these worldviews are competing or incompatible in values and ideology. Stakeholders can differ in age, social status, gender, ethnicity, education etc. All these differences impact on how they define the problem, the outcomes they want, what interventions are possible and what consequences will be acceptable. People also differ in knowledge of the problem, different people knowing different parts of the problem and potential solutions.

The worldview or paradigm of different groups may also differ in strength. For some their ideology is unquestionable and quite fixed or intractable, while for others change and compromise are a normal part of life.

Systems

Problems include the systems with which people work, characterised by **complexity** and **ambiguity**. The complexity of a problem is affected by: the number of systems involved; how the systems interact with each other and how intricate the whole 'mess' is; the number of links between different parts of each system and to other problems; and the many possible points for intervention and the consequences of intervening.

Social systems also differ in how ambiguous or fuzzy they are. Multiple meanings and evaluations often exist for the same system and for interpreting terms, labels and consequences of action. Uncertainty is also an aspect and consequence of ambiguity.

Context

The context is the environment within which the problem and any solutions exist. Each wicked problem is unique and affected by different **constraints** and the level of **instability** in the situation.

Constraints can be political, environmental, chronological and ideological. They can also include limitations in resources, knowledge and willingness to change.

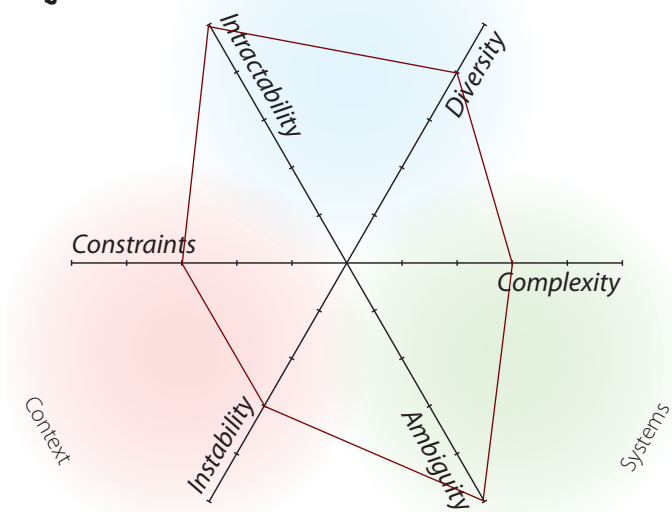
Instability is the amount of change that is occurring even without any intervention. Some politically charged situations can be very volatile and change hourly or daily. 'What is changing?' and 'Why?' are crucial questions for tackling wicked problems.

The Wicked Problems Graph

Figure #4 shows how the dimensions in the model can be used to create a graph for profiling wickedness. A rating between 1 and 5 can be assessed for each dimension. When the ratings are joined a standard radar graph is produced. The shape of the graph provides a profile for that problem from the point of view of that person.

People

Fig. 4



Graphs can be compared to contrast the different views of different stakeholders.

People: Diversity



Diversity is one of two dimensions in the people area. Intractability is the other and both are inextricably linked. The key concept here is 'difference' between people or groups. This page provides different approaches to defining diversity in the context of wicked problems. There is overlap between this dimension and others in the model so some characteristics and examples may appear in more than one definition.

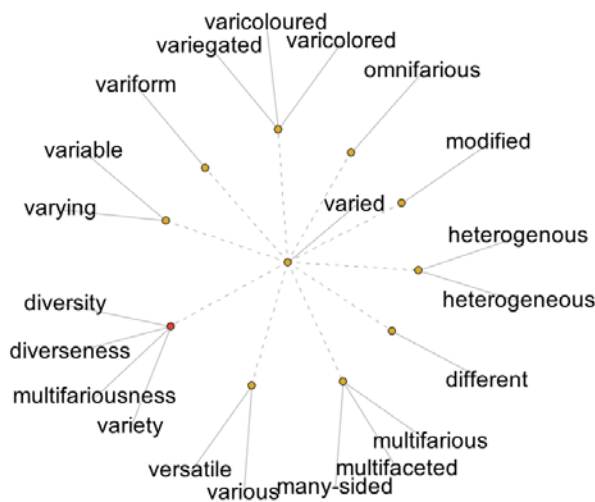
Dictionary:

diversity

1. the state or fact of being diverse; difference; unlikeness.
2. variety; multiformity.
3. a point of difference. [Middle English diversite]

diversity, difference, distinctness, unlikeness; contrast, divergence, contradistinction, spectrum, diverseness, heterogeneity, otherness, unlikeness, variation, alien, pluralist, varied, variegated

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Related meanings from the "Visual Thesaurus"

Symptoms

Symptoms of diversity in wicked problems may include:

- Focus on a single element of the problem
- Feelings of alienation
- Increasing sense of them and us
- Frustration with the 'stupidity' of 'others'
- Spiralling disagreement and anger
- Entrenching of positions

Characteristics

In the context of wicked problems the number of stakeholders is not as significant as the differences between them. A few groups with strongly opposed values, competing over limited resources, have a higher level of diversity than hundreds of people from a similar culture with similar values.

Diversity includes the following characteristics:

- Difference
- Problems are socially complex with many stakeholders
- Multiple value conflicts
- Often a-logical or illogical or multi-valued thinking
- Solutions to wicked problems are not true-or-false, but good-or-bad in the eyes of stakeholders.
- The planner has no 'right to be wrong', i.e. there is no public tolerance of initiatives or experiments that fail.
- Responsibility stretches across many organisations
- Solutions may require behavioural changes by citizens and stakeholder groups.
- Stakeholders may differ in
 - Sociological factors: age, social status, gender, ethnicity, education etc.
 - Paradigm and worldview, which impact on how they how they define the problem, the outcomes they want, what interventions are possible and what consequences will be acceptable.
 - People also differ in knowledge of the problem, different people knowing different parts of the problem and potential solutions.

Functional Examples

For most people this is an easy dimension to imagine. Any time groups with different interests compete over resources diversity is apparent.

Where this is not as immediately obvious is between different disciplines such as IT and communications experts. In one case each group assumed that everyone was very similar in their thinking and could not understand why the problem continued. After a number of discussions it became obvious that there were some deep differences on key underlying values and priorities.

People: Intractability

Intractability is an aspect of diversity but so critical it is presented in the model as a dimension in its own right. The key concept here is the 'strength of a stakeholder's paradigm' or worldview. There is overlap between this dimension and others in the model so some characteristics and examples may appear in more than one definition.

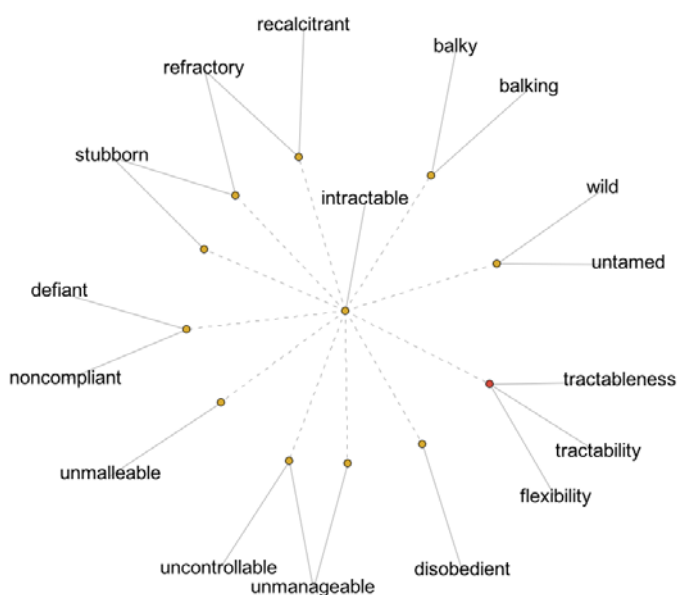


Dictionary

intractable

Not docile, stubborn. Not tractable or to be drawn or guided by persuasion; not easily governed, managed, or directed; uncontrollable; incurable; violent; stubborn; obstinate.

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Related meanings from the "Visual Thesaurus"

Symptoms

Symptoms of intractability in wicked problems largely overlap with diversity, and may include:

- Focus on a single element of the problem
- Increasing sense of them and us
- Spiralling disagreement and anger
- Entrenching of positions
- Dismissing alternative viewpoints as irrelevant, stupid or impractical
- Surprise at others' reactions

Characteristics

In the context of wicked problems the key issue is not in holding a point of view, but in the reaction to other points of view. Intractability includes the following characteristics :

- Exclusivity in the underlying ideology
- Singular epistemology
- Level of openness to alternative points of view
- Evangelical in orientation
- Resistance to change
- Level of passion over the issues in the problem
- Strength of group identity
- Dismissive of other viewpoints

Functional Examples

This is the sensitive dimension. No-one likes to be seen as intractable and most people consider their position reasonable and fundamentally sound. Consequently, this dimension often only becomes visible by the silence of gaps that appear when trying to make sense of the situation.

In one case I had to say to a group of twenty people that the information they had given did not add up and I needed their honesty to get a complete picture. In response multiple stories emerged on a particular person in a crucial stage of a process who was immovable and a primary cause of creating wickedness in the problem. Policy and structural changes reduced this part of the problem.

Systems: Complexity



Complexity is the result of how all the parts in a system are connected and link to other systems. The key concept here is the level of intricacy of the whole 'mess'. There is overlap between this dimension and others in the model so some characteristics and examples may appear in more than one definition

Dictionary

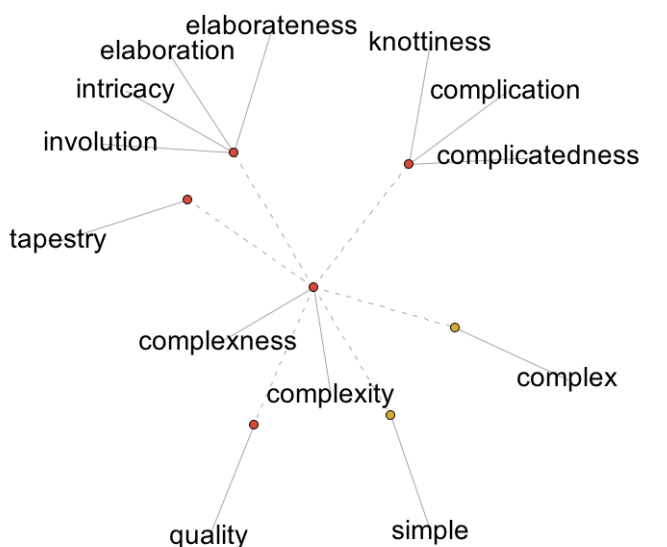
complex

1. composed of interconnected parts; compound; composite.
2. characterised by an involved combination of parts.
3. complicated; intricate.
5. a complex whole or system; a complicated assembly of particulars: a complex of ideas.

-complexly, adverb, -complexness, noun

complexity, complicacy, complicatedness, complicity, intricacy, knottiness, inextricableness, multifariousness, entanglement, mishmash, wheels within wheels, Gordian, labyrinthine, entangle, enmesh.

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Related meanings from the "Visual Thesaurus"

Characteristics

Unlike diversity, the sheer number of elements and the multiplicity of intricate detail is the primary factor in complexity in the context of wicked problems. In many wicked problems everything seems to be causally linked to everything else. Any attempt to intervene will cascade in unpredictable ways throughout the systems involved.

Complexity includes the following characteristics:

- Intricacy
- Multiple
 - systems
 - system elements
 - linkages and connections
 - causes and outputs
 - levels of detail
- Every wicked problem can be considered to be a symptom of another problem.
- Many interdependencies and multi-causal aspects
- Problems are socially complex with many stakeholders
- Fragmentation of effort and approaches to solutions.

Functional Examples

Most experts or people deeply involved in a specific issue are unaware of how much detail they hold in their long term memory. In almost every case of mapping a significant problem participants have been shocked at how much was involved and was, as it were, hiding in their heads.

In one case I used three glass walls in a meeting office to map a problem that had been unsolved for six months.

Symptoms

Symptoms of complexity in wicked problems may include:

- Feeling overwhelmed
- Inaction, frozen by over-choice
- Not knowing how to proceed
- Focus on one aspect of the problem
- Leaping from one part of the problem to another
- Fragmentation

Systems: Ambiguity



Ambiguity is the quiet dimension in wicked problems and is most often uncovered by the symptoms expressed by those trying to tackle the problem. The biggest problem here is the idea of 'common sense'. Most stakeholders do not make sense of the problem in a common way and will often be unaware of the multiple meanings being applied to the same things. There is overlap between this dimension and others in the model so some characteristics and examples may appear in more than one definition.

Dictionary

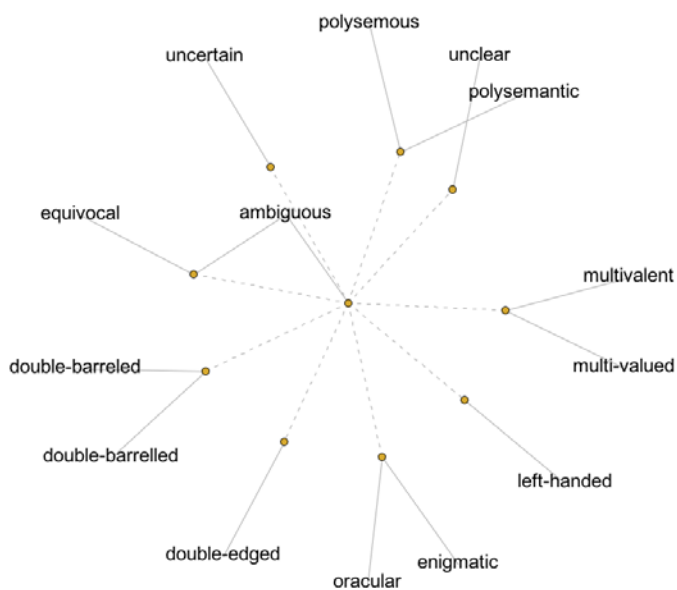
ambiguous

1. open to various interpretations; having a double meaning; equivocal: an ambiguous answer.
2. of doubtful or uncertain nature; difficult to comprehend, distinguish, or classify: a rock of ambiguous character.
3. lacking clearness or definiteness; obscure; indistinct.

-ambiguously, adverb -ambiguousness, noun

ambiguous, uncertainty ambivalence, bewilderment, confusion, doubtfulness, perplexity, undecidedness, unresolvedness, unsureness, vacillation, vagary; doubt, incertitude, incalculableness, unknowableness, unpredictability, double meaning, equivocalness, obscureness, obscurity, vagueness.

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Related meanings from the "Visual Thesaurus"

Characteristics

In the context of wicked problems ambiguity includes the following characteristics:

- Fuzziness
- There is no definitive formulation of a wicked problem, i.e. even the definition and scope of the problem is contested;
- Wicked problems have no 'stopping rule', i.e. no definitive solution.
- No clear and correct solution
- There is no immediate and no ultimate test of a solution to a wicked problem.
- Wicked problems do not have a clear set of potential solutions, nor is there a well described set of permissible operations to be incorporated into the plan.
- The existence of a discrepancy representing a wicked problem can be explained in numerous ways.
- Contradictory underlying cultural meanings
- Ambiguity may be caused by
 - lack of or uncertain data
 - different interpretations of terms and data
 - uncertainty due to instability in the problem or environment
 - multiple valid meanings
 - vagueness

Functional Examples

This is often the problem you don't know you have and requires a bit of digging to clarify and bring into focus.

In one case it was not till half way through the second of five meetings that we perceived that we were not meaning the same things even when using the same words. Over the next two hours we defined twenty terms from the point of view of each of the stakeholders. This reduced the level of ambiguity in a major way with a parallel drop in the level of the perceived wickedness of the problem.

Symptoms:

Symptoms of ambiguity in wicked problems may include:

- Confusion
- Frustration; in trying to pin down the problem
- Misunderstanding between stakeholders
 - over simple terms or labels
 - without awareness that there is a misunderstanding
 - surprise at others' reactions

Context: Instability



Instability is all about the level of change in the environment around the problem and the various dimensions of the problem itself. In many cases those caught up in the change have no control over what is happening or may even find themselves as a cause of some of the changes. There is overlap between this dimension and others in the model so some characteristics and examples may appear in more than one definition

Dictionary

instability

the state of being instable; lack of stability or firmness.

change

1. (sometimes followed by *into*) to make different; alter in condition, appearance, etc.; turn: to change one's habits.

2. to substitute another or others for; exchange for something else: to change one's job.

18. the supplanting of one thing by another.

30. change one's mind, to alter one's intentions or opinion.

changeable, alterable, unstable, variable, fluid, instable, labile, adaptable, adaptive, elastic, flexible, malleable, erratic, fluctuating, uncertain, unsettled, oscillation

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Characteristics

In the context of wicked problems instability includes the following characteristics:

- Change in
 - the environment
 - constraints
 - people's thinking
 - almost any other dimension or factor involved in the problem
- Every wicked problem can be considered to be a symptom of another problem.
- Proposed measures may have unforeseen effects
- Problems may be unstable and continue evolving

Functional Examples

In my experience clients are often surprised by this dimension. Often changes only become obvious as a project progresses and may be caused by factors totally unexpected or out of mind or control.

In a number of cases severe weather events have had a major impact on making a problem more wicked.

Continual change can lead to fatigue and a desire to pretend that things are constant.



Related meanings from the "Visual Thesaurus"

Symptoms:

Symptoms of instability in wicked problems may include:

- Exhaustion
- Confusion
- Frustration;
 - in trying to pin down the problem
 - with others and the situation because 'things won't stand still'.

Context: Constraints



Constraints can be political, environmental, chronological and ideological. They can also include limitations in resources, knowledge and willingness to change. There is overlap between this dimension and others in the model so some characteristics and examples may appear in more than one definition.

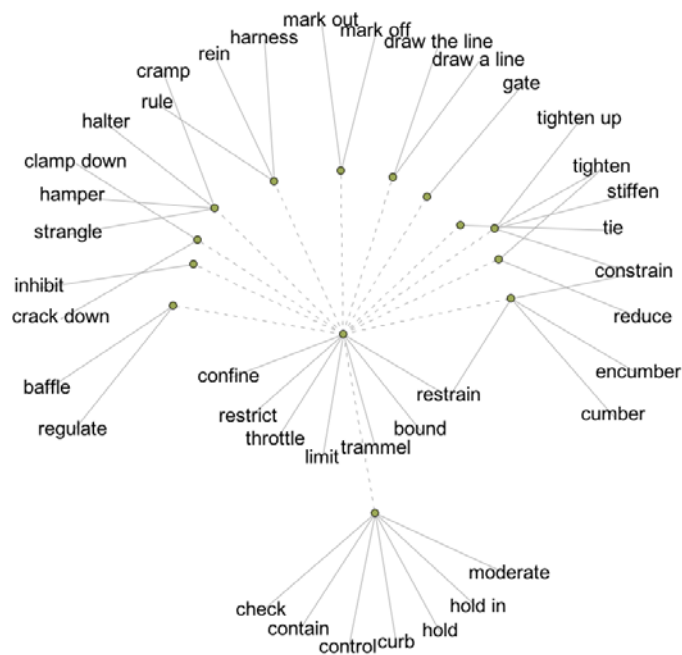
Dictionary

constrain

1. to force, compel, or oblige; bring about by compulsion: to constrain obedience.
2. to confine forcibly, as by bonds.
3. to repress or restrain.

constrain, controls, curb, guide, check, curb, damp, govern, handle, keep in check, keep under control, manage, monitor, regulate, rein, repress, restrain,

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Related meanings from the "Visual Thesaurus"

Characteristics

There are different types of constraints coming from different parts of the context. These include:

- Boundaries
- Intra- and inter-organisational politics
- Paradigm and ideological boundaries and focus
- Physical and spatial limitations
- Economic and resource based limitations
- Time based limitations, causalities and dependencies
- Stakeholder purpose or vision
- Epistemology and knowledge of stakeholders
- The capacity to confront ambiguity and complexity
- Any aspect of a wicked problem may be seen as a constraint by some stakeholders.

Functional Examples

Clients often describe aspects of this dimension very early in the process because it is often the trigger to calling in a consultant.

Often the complaint is the arbitrary setting of completion dates for a project or solution.

In many cases the person in authority is seen as a major cause of the problem but is intractable in their perception that the causes of the problem lie elsewhere.

In practice almost anything can become a major constraint. In one case a very small part on a piece of machinery was holding up a whole project but the problem was so complex that this tiny issue was neglected.

Symptoms:

The major factor here is boundaries, the sense of coming up against a wall or working within imposed limits. Symptoms of constraints may include:

- Frustration at not being able to do 'X'
- Sense of repression
- Confusion: 'why are people putting these obstacles in our way?'

Tackling Wicked Problems



To develop a process for tackling wicked problems I have relied on a variety of tools, sources and ideas but two main sets of authors, Conklin 2006 and Horne & Weber 2007, have been most influential. Both utilise some form of a visual mapping language and a facilitated, collaborative dialogue. Each of them also have a definite structure to their processes using a specific set of symbols and graphical elements.

While I can appreciate the advantages of each approach most of my clients have requested something more unstructured and related to their own context. The changing and fuzzy nature of wicked problems means that often specific issues need to be revisited and problem definitions revised. Consequently, I have developed a flexible overarching approach with various options at each stage. This page presents a default process but in practice there is a lot of moving back and forth and changing of minds as the process progresses. Stages 2-5 may be repeated depending on logistics and the availability of stakeholders.

Stage #1 Initial Scoping (Client focus)

Working with the client we attempt to set the broad boundaries of both the problem and the required outcomes. This stage addresses these sorts of questions:

- What is the core problem?
- What are the key issues that need to be addressed?

People:

- Who are the stakeholders?
- How strong and fixed are stakeholder positions?
- What priorities are given to different values?

Systems:

- What system is linked to the core problem?
- What other systems are linked?

Context:

- What is the history of this problem?
- What are the main causes?
- What constraints are there on tackling the problem?

Process:

- What is the agreed process for tackling the problem?
- How much time do we have?
- How many iterations can we do?

Outputs:

By the end of this stage we have an agreed description of the project and a summary of the problem from the perspective of the client. We should also have some specific questions we want to ask the stakeholders.

Stage #2 Initial Exploration & Identification (Stakeholder focus)

This stage involves dialogue with the identified stakeholders and mapping of their thinking. This may be done through individual interviews, small focus groups or a combination of both. It may also include survey type questions. Key decisions for this stage include:

- How many people and groups will be involved and who are they?
- Will all the stakeholders meet together or separately?
- What will be the structure of surveys, meetings, questions, mapping and outputs?

Process:

- Initial discussion on questions such as in Stage #1
- Survey questions on the perceived level of wickedness on each dimension

Outputs:

By the end of this stage we have one or more maps of interlinked problems as seen from different vantage points of the stakeholders. The chief objective is a first cut at stakeholders describing the wicked problems and its causes. Following the meeting, the facilitators create a draft map.

Tackling Wicked Problems (Continued)



Stage #3 Analysis (Problem description focus)

This stage is focused on an analysis of the information collected from stage #2. We work with the client to make sense of the information and create a causal concept map that shows the different perspectives on what makes up the wicked problem. Different priorities and value sets can also be identified.

Survey data is collated and relevant radar graphs are produced to show the different profiles perceived by stakeholders.

Outputs:

By the end of this stage we have one or more maps of interlinked problems as seen from different vantage points of the stakeholders. The chief objective is a first cut at a mental model of the presenting Wicked Problem and other embedded and linked wicked problems.

Stage #4 Clarification & Exploration

This stage is the second dialogue with the identified stakeholders and mapping of their thinking. It also revisits any survey questions. If groups met separately they will be introduced to each others' perspective on the problem. The primary goal here is to provide feedback and capture the responses.

Process:

- Presentation of draft maps, survey results and value sets.
- Discussion on results
- Survey questions on the perceived level of wickedness on each dimension at this stage

Outputs:

By the end of this stage we have one or more revised maps of interlinked problems as seen from different vantage points of the stakeholders. The chief meeting objective is to clarify and capture the thinking of stakeholders in light of the feedback provided.

Stage #5 Core Dialogue on options for potential ways forward

From the shared understanding developed so far, this stage uses whole group dialogue to develop options on possible ways forward. This may be by

- Reducing one or more dimension of wickedness
- Generating Ideas on how to manage a dimension if it cannot be reduced
- Generating ways of reconceptualising the problem in light of the clarification maps and dialogue etc.

This stage may be conducted at the same time as stage #4 depending on logistics, timing etc.

Outputs:

By the end of this stage we have a collection of possible ways forward. They may be in the form of revised causal or concept maps and will include descriptive text. Survey questions could be re-asked to see the perspective of stakeholders on the impact of the proposed changes.

Stage #6 Recommendations

This stage is focused on an analysis of the information collected from stage #5. We work with the client to make sense of the information and create a collection of causal concept maps that show the possible interventions and their impact on the wicked problem. Survey data is collated and relevant radar graphs are produced to show the different profiles perceived by stakeholders.

Outputs:

From this synthesis we develop a collection of recommendations for tackling the wicked problem. This may include survey results and maps.

Wicked Problems Bibliography



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