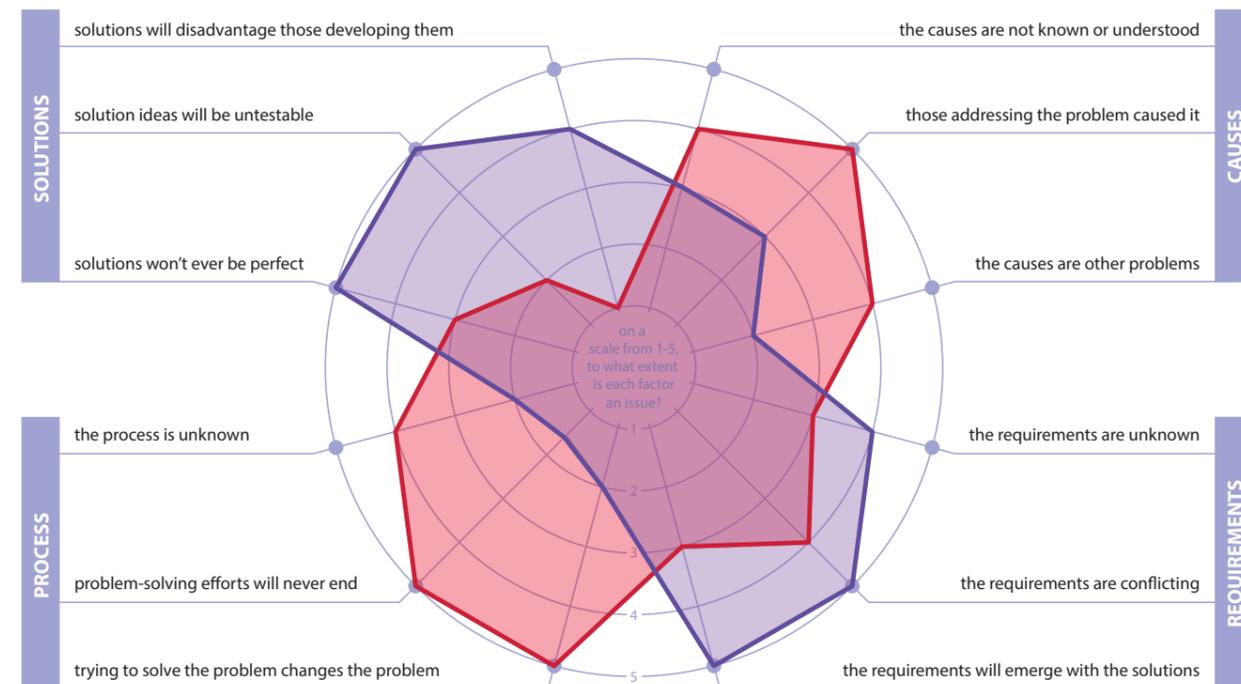


Characterising problems:

in what ways are they 'ill-defined', 'messy', 'complex' or 'wicked'?

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This document provides a visualisation for problem characterisation. The visualisation helps us represent the ways in which we find problems difficult to understand or difficult to address. It was developed for work with individuals, groups and organisations who might describe such problems as 'ill-defined', 'messy', 'complex' or 'wicked' (in contrast to those that are 'well-defined', 'clean', 'simple' or 'tame'). Such problems include problems of organisational management and strategy, social and political change, and environmental protection and restoration.

Rather than describing a problem as, say, 'wicked', the visualisation asks for our perspectives on the different ways in which it is wicked and the extent to which it is wicked in each of those ways. The visualisation can be used individually or in group work, and for considering one problem or more than one. It is useful for comparing the different perspectives that people have on a problem, for recording how those perspectives change over time and for contrasting one problem with another.

The 'default' visualisation takes the form of a radar plot that characterises problems according to twelve factors, grouped into four quadrants:

The *causes* of the problem

- the causes are not known or understood
- those addressing the problem caused it
- the causes are other problems

The *requirements* of the problem

- the requirements are unknown
- the requirements are conflicting
- the requirements will emerge with the solutions.

The *process* of addressing the problem

- trying to solve the problem changes the problem
- problem-solving efforts will never end
- the process is unknown.

The *solutions* to the problem

- solutions won't ever be perfect
- solution ideas will be untestable
- solutions will disadvantage those developing them

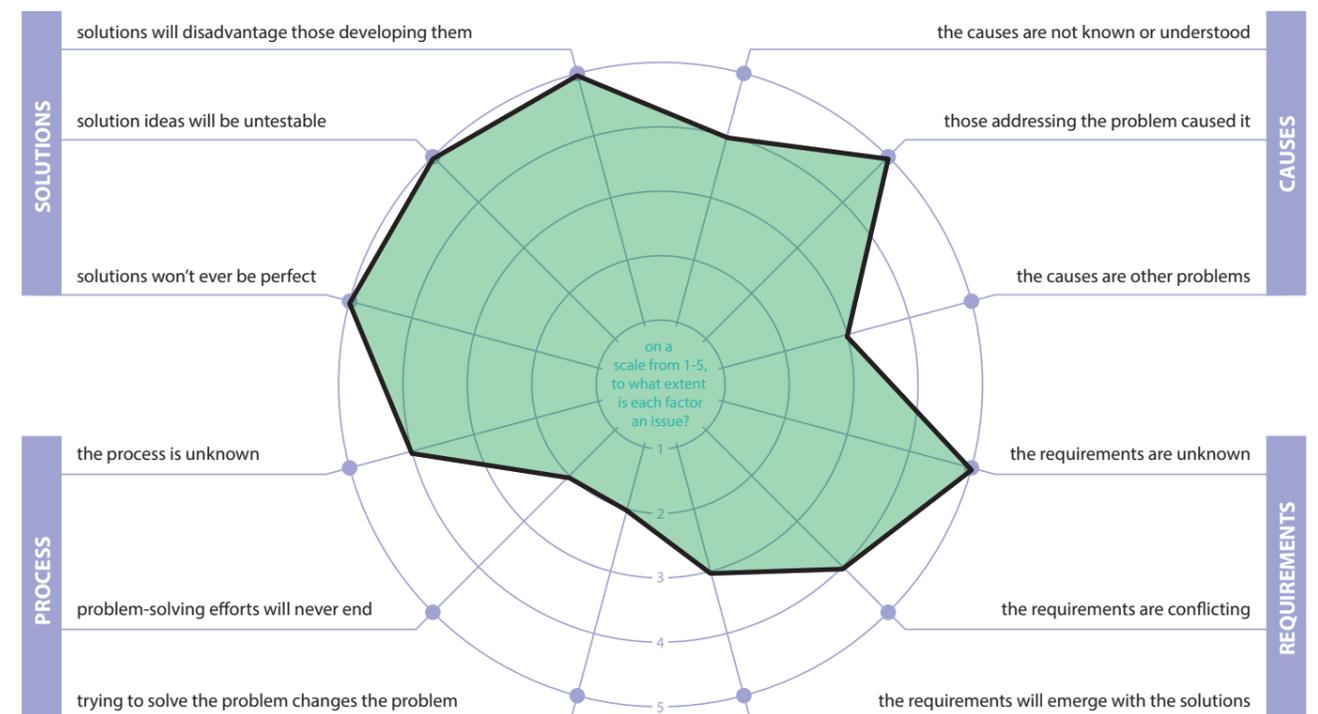
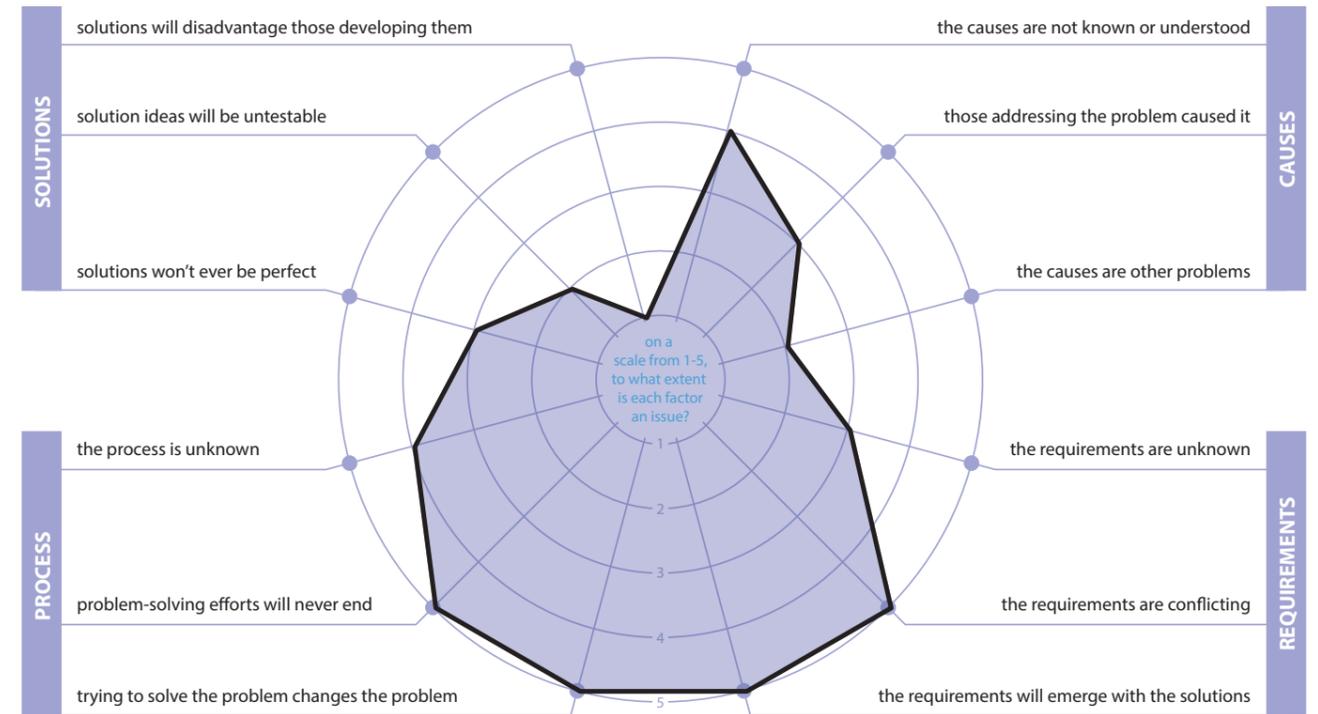
Of course, this list is not exhaustive, but many of the problems that we struggle with have characteristics similar to these.

Understanding the characteristics that problems have, or that they have for certain people at certain times, can be useful for identifying the approaches that will be used to address them. For example, after identifying the most relevant characteristics, you might ask yourself, is it a problem that requires engaging with diverse stakeholders? Or is it a problem that will require iterative attempts at solutions? How much work should be done up front to understand the context, and how often should that understanding be assessed in the face of change? Considering such questions can suggest approaches that include information gathering, idea generation, co-design and prototyping.

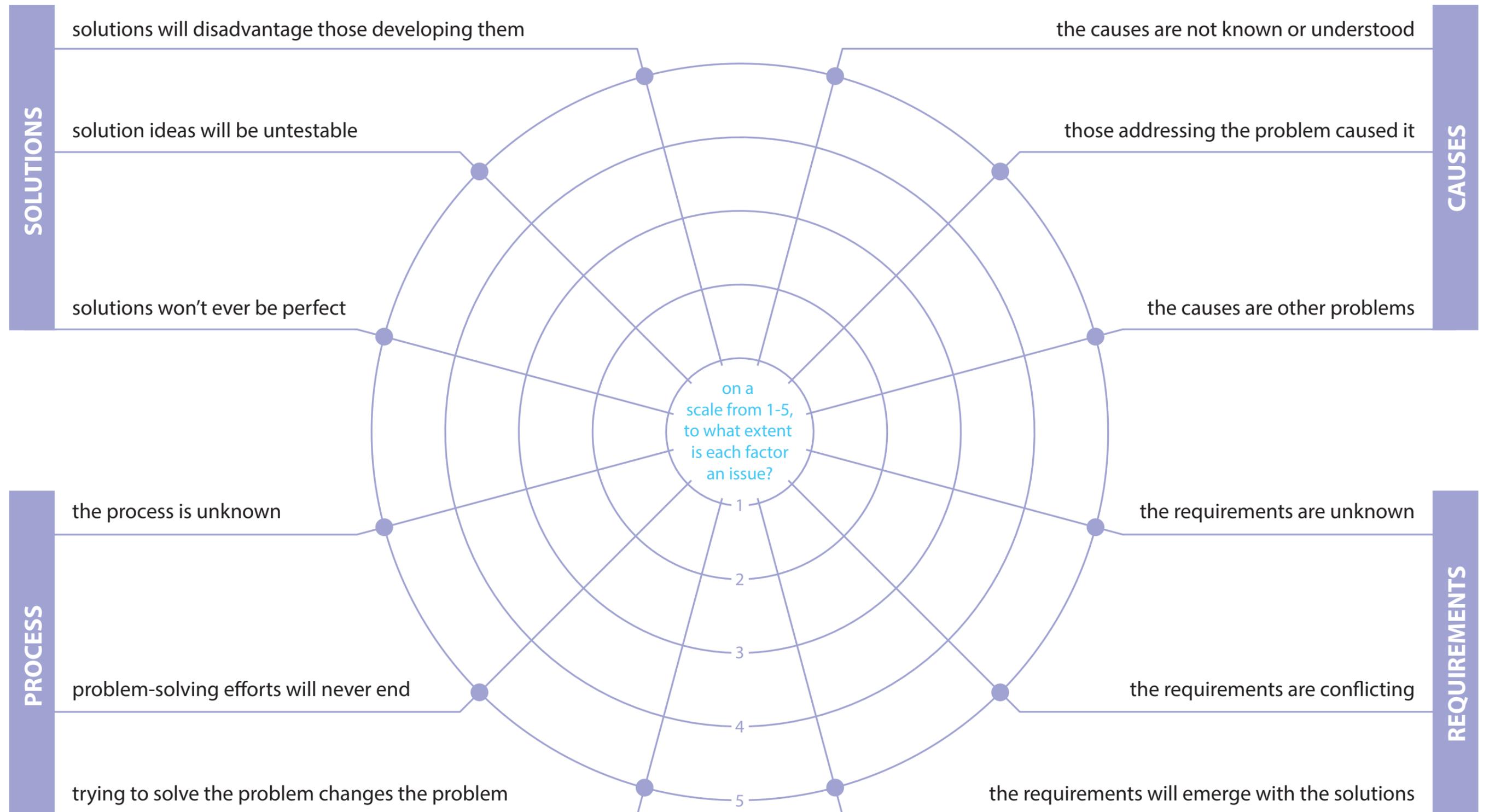
This brief document includes the following resources: (1) contrasting examples of completed visualisations, (2) a template for the default visualisation, (3) a blank template for making non-default visualisations, (4) a brief background to various characterisations of problems, especially wicked problems, and (5) a list of references and further reading.

These resources are made available for reuse by others. For example, the visualisation template can be used in its default configuration to assist people work through a process of problem characterisation. Alternatively, the blank template can be used to elicit the characteristics that are most meaningful to people, generating a visualisation tailored to their needs.

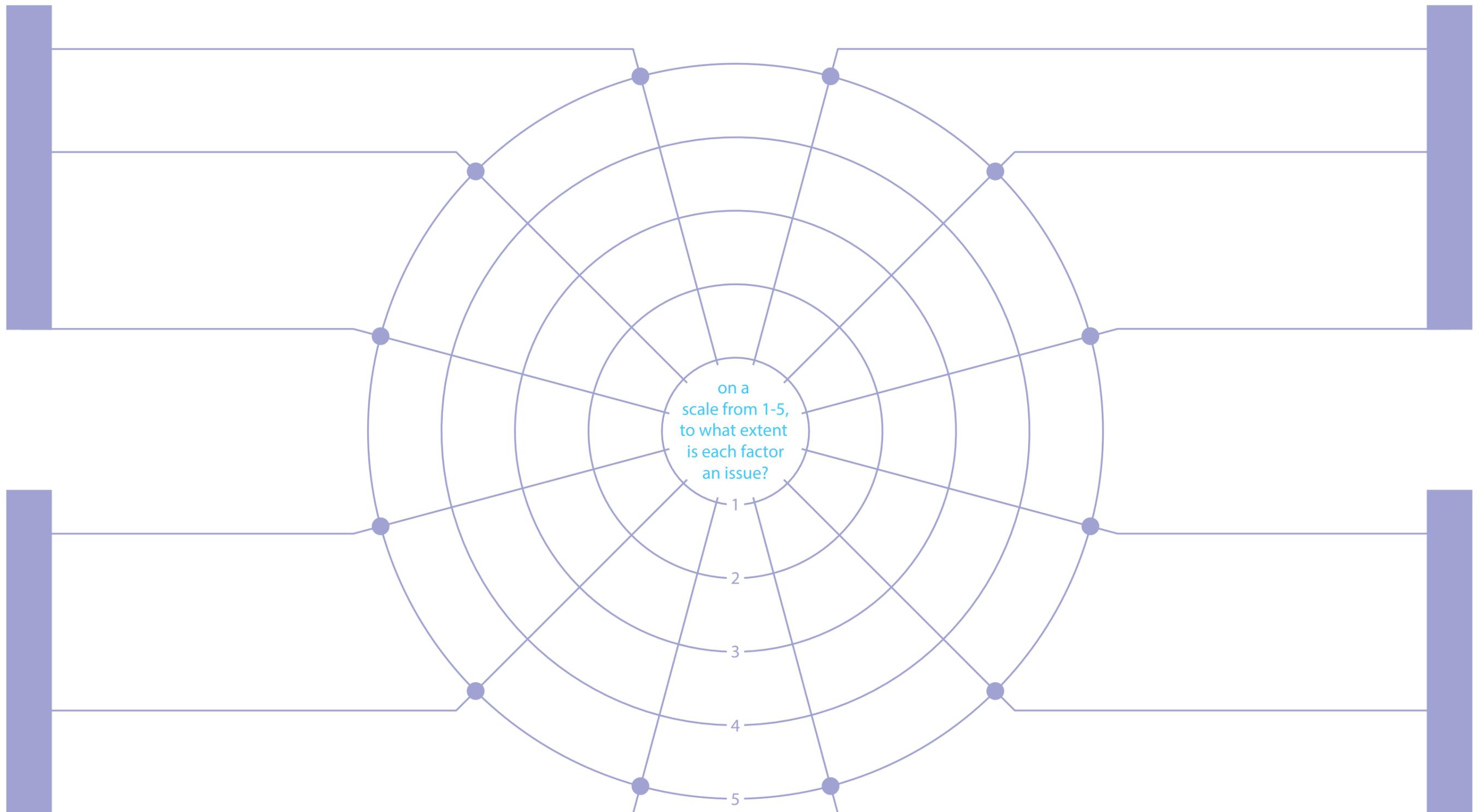
1. Problem characterisation visualisation (examples of completed radar plots)



2. Problem characterisation template (default dimensions and groupings)



3. Problem characterisation template (blank dimensions and groupings)



4. Background

What is a problem, and what characteristics does it have?

A problem can be defined as a difference between the way things are and the way you want them to be. Some people don't like the word 'problem', preferring words like 'challenge' or 'opportunity'. You can think of things that way if you want. However, here I'll use the word 'problem', simply because it conforms to standard terminology, like 'wicked problems', and associated terms such as 'problem framing'.

Not all problems are the same as each other, and different problems can often be distinguished according to the different characteristics that they exhibit. But what are those characteristics, and where do they come from?

Of the many terms that are used to characterise the kinds of problems that need characterising at all, 'wicked problem' is perhaps the most widespread. The term was popularised by a 1973 publication in *Policy Sciences* titled 'Dilemmas in a general theory of planning' by Horst Rittel and Melvin Webber.¹

In Rittel and Webber's article, ten characteristics of wicked problems were outlined, which have often been repeated:

1. There is no definitive formulation
2. There is no stopping rule
3. Solutions are neither true-or-false, but good-or-bad
4. There is no immediate and no ultimate test of a solution
5. Every solution is a "one-shot operation", with no possibility of trial-and-error (because every attempt counts significantly)
6. They do not have an enumerable (or an exhaustively describable) set of potential solutions (nor is there a well-described set of permissible operations that may be incorporated into the plan)
7. Every problem is essentially unique
8. Every problem can be considered as the symptom of another problem
9. The cause of a problem can be explained numerous ways, with each explanation determining the nature of the solution
10. Those addressing the problem have no right to be wrong.

Although this list is generally taken to define the characteristics of wicked problems, these characteristics were not stable prior to the publication of the 1973 paper. Only six characteristics are listed in an earlier article by Werner Kunz and Horst Rittel (1972), some of which combine items from the above list and some of which are different.² Rittel's earlier lectures also, unsurprisingly, included different formulations of the list, including items such as "There are no well defined solutions. You either have many solutions or none. The probability that a wicked problem has one solution is null" (Skaburskis, 2008: reporting on a lecture from 1969).

Variation in the defining characteristics of wicked problems suggests that those characteristics should not be thought of as 'set in stone', but as explorable and revisable. For example, focussing on environmental problems in particular, the concept of 'super wicked problems' was elaborated by Levin, Cashore, Bernstein and Auld (2012), adding four more characteristics:

1. Time is running out
2. Those who caused the problem are now seeking a solution
3. The central authority needed to address the problem is weak or non-existent
4. Proposed solutions discount the future irrationally.

Many other such characteristics can be identified in the various literatures that consider problems which are ill-defined, ill-structured, messy, complex, difficult or intractable.³ Such characteristics can generally be grouped into different categories, such as the four quadrants of the default visualisation adopted here. For example, we might ask if it is the *process* of addressing the problem that is challenging, or the implications of the *solutions* (or actions) that are proposed. Or, is it the *causes* of the problem that are themselves causing difficulty, or the various *requirements* that must be identified and balanced?

In addition to variation in how problems are characterised and how those characteristics are grouped, there are also different views on the challenge presented by each characteristic or group. This can be because those views vary from person to person, or because they vary through time. Such information can be elicited through engaging with the stakeholders who identify, frame, communicate and address problems, and also those who experience the effects of problem-solving efforts or other interventions. The resources provided in this document are intended to help with this, either through processes of participatory diagramming (Kesby, 2000) or graphic elicitation (Crilly, Blackwell & Clarkson, 2006).

Notes

¹ Although this 1973 publication is often cited as the publication that introduced 'wicked problems', that term had already been used as the title of an editorial in *Management Science* by C. West Churchman (1967) reporting on Rittel's presentation at a recent seminar. Churchman describes wicked problems as "that class of social system problems which are ill-formulated, where the information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing" (p. B-141). A similar report is made by John Goldsmith (1969) in the *Archives of Environmental Health*, with the same definition as that offered by Churchman (p. 516).

A description of how the term 'wicked problems' arose in the interactions between Rittel, Churchman and Webber is provided by Skaburskis (2008). The term 'wicked problem' was used with a similar but less specific meaning during the 1950s and 1960s and possibly earlier. However this is probably only because the term 'wicked' then enjoyed more widespread use,

and so was commonly applied to describe classes of problems that were difficult or pernicious. For example, see page 32 of the *Minutes of the Airport Development and Operation Conference* from 1959 (State of New York, Department of Commerce), or page 13 of *A Report of the Proceedings at the Third Biennial Congress* from 1962 (Association of British Theatre Technicians).

² See section 3, titled 'Information problems are wicked'.

³ For example, at about the same time as the publication of Rittel and Weber's article, Herbert Simon (1973) was publishing on ill-structured problems (referring to earlier work on ill-defined problems). Simon argues that there is no real boundary between well-structured and ill-structured problems, but offers several characteristics to define the former, including that there is a definite criterion for testing any proposed solution, and a mechanizable process for applying the criterion (p. 183). Ill-structured problems, in contrast, are much more subjective and require design approaches to address them. Similar arguments can be found in Russell Ackoff's (1974) work on messy problems, where he claims that such messes are managed, or designed for, but are not solved.

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