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Wicked problem

In planning and policy, a **wicked problem** is a problem that is difficult or impossible to solve because of incomplete, contradictory, and changing requirements that are often difficult to recognize. It refers to an idea or problem that cannot be fixed, where there is no single solution to the problem; and "wicked" denotes resistance to resolution, rather than evil.^[1] Another definition is "a problem whose social complexity means that it has no determinable stopping point".^[2] Moreover, because of complex interdependencies, the effort to solve one aspect of a wicked problem may reveal or create other problems. Due to their complexity, wicked problems are often characterized by organized irresponsibility.

The phrase was originally used in social planning. Its modern sense was introduced in 1967 by C. West Churchman in a guest editorial he wrote in the journal *Management Science*.^[3] He explains that "The adjective "wicked" is supposed to describe the mischievous and even evil quality of these problems, where proposed "solutions" often turn out to be worse than the symptoms." In the editorial, he credits Horst Rittel with first describing wicked problems, though it may have been Churchman himself who coined the term.^[4] Churchman discussed the moral responsibility of operations research "to inform the manager in what respect our 'solutions' have failed to tame his wicked problems." Rittel and Melvin M. Webber formally described the concept of wicked problems in a 1973 treatise, contrasting "wicked" problems with relatively "tame", solvable problems in mathematics, chess, or puzzle solving.^[5]

Characteristics

Rittel and Webber's 1973 formulation of wicked problems in social policy planning specified ten characteristics:^{[5][6]}

1. There is no definitive formulation of a wicked problem.
2. Wicked problems have no stopping rule.
3. Solutions to wicked problems are not true-or-false, but better or worse.
4. There is no immediate and no ultimate test of a solution to a wicked problem.
5. Every solution to a wicked problem is a "one-shot operation"; because there is no opportunity to learn by trial and error, every attempt counts significantly.
6. Wicked problems 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 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. The choice of explanation determines the nature of the problem's resolution.

10. The social planner has no right to be wrong (i.e., planners are liable for the consequences of the actions they generate).

Conklin later generalized the concept of problem wickedness to areas other than planning and policy; Conklin's defining characteristics are:^[7]

1. The problem is not understood until after the formulation of a solution.
2. Wicked problems have no stopping rule.
3. Solutions to wicked problems are not right or wrong.
4. Every wicked problem is essentially novel and unique.
5. Every solution to a wicked problem is a "one shot operation".
6. Wicked problems have no given alternative solutions.

Examples

Classic examples of wicked problems include economic, environmental, and political issues. A problem whose solution requires a great number of people to change their mindsets and behavior is likely to be a wicked problem. Therefore, many standard examples of wicked problems come from the areas of public planning and policy. These include global climate change,^[8] natural hazards, healthcare, the AIDS epidemic, pandemic influenza, international drug trafficking, nuclear weapons, homelessness, and social injustice.

In recent years, problems in many areas have been identified as exhibiting elements of wickedness; examples range from aspects of design decision making and knowledge management^[9] to business strategy^[10] to space debris.^[11]

Background

Rittel and Webber coined the term in the context of problems of social policy, an arena in which a purely scientific-engineering approach cannot be applied because of the lack of a clear problem definition and differing perspectives of stakeholders. In their words,

The search for scientific bases for confronting problems of social policy is bound to fail because of the nature of these problems... Policy problems cannot be definitively described. Moreover, in a pluralistic society there is nothing like the indisputable public good; there is no objective definition of equity; policies that respond to social problems cannot be meaningfully correct or false; and it makes no sense to talk about "optimal solutions" to these problems... Even worse, there are no solutions in the sense of definitive answers.^[5]

Thus wicked problems are also characterised by the following:

1. The solution depends on how the problem is framed and vice versa (i.e., the problem definition depends on the solution)
2. Stakeholders have radically different world views and different frames for understanding the

problem.

3. The constraints that the problem is subject to and the resources needed to solve it change over time.
4. The problem is never solved definitively.

Although Rittel and Webber framed the concept in terms of social policy and planning, wicked problems occur in any domain involving stakeholders with differing perspectives.^[12] Recognising this, Rittel and Kunz developed a technique called Issue-Based Information System (IBIS), which facilitates documentation of the rationale behind a group decision in an objective manner.^[13]

A recurring theme in research and industry literature is the connection between wicked problems and design.^{[14][15]} Design problems are typically wicked because they are often ill-defined (no prescribed way forward), involve stakeholders with different perspectives, and have no "right" or "optimal" solution.^[16] Thus wicked problems cannot be solved by the application of standard (or known) methods; they demand creative solutions.^{[17][18]}

Strategies to tackle wicked problems

Wicked problems cannot be tackled by the traditional approach in which problems are defined, analysed and solved in sequential steps. The main reason for this is that there is no clear problem definition of wicked problems. Ultimately, the solution to 'Wicked' problems requires additional research to understand the gaps in information pertaining these issues. Governments must invest in more evidence-informed science to address the full scope of these problems.^[19] Broader thinking into the appropriate options will allow for more innovation within this process.

In a paper published in 2000, Nancy Roberts identified the following strategies to cope with wicked problems:^[20]

Authoritative

These strategies seek to tame wicked problems by vesting the responsibility for solving the problems in the hands of a few people. The reduction in the number of stakeholders reduces problem complexity, as many competing points of view are eliminated at the start. The disadvantage is that authorities and experts charged with solving the problem may not have an appreciation of all the perspectives needed to tackle the problem.

Competitive

These strategies attempt to solve wicked problems by pitting opposing points of view against each other, requiring parties that hold these views to come up with their preferred solutions. The advantage of this approach is that different solutions can be weighed up against each other and the best one chosen. The disadvantage is that this adversarial approach creates a confrontational environment in which knowledge sharing is discouraged. Consequently, the parties involved may not have an incentive to come up with their best possible solution.

Collaborative

These strategies aim to engage all stakeholders in order to find the best possible solution for all stakeholders. Typically these approaches involve meetings in which issues and ideas are discussed and a common, agreed approach is formulated. A significant advantage of this approach is the creation of a strong information sharing environment. The main problem is the risk that certain ideas, while integral to finding a possible solution, may be too controversial to accept by other involved parties. By enhancing the collaborative processes between researchers, this allows for wider coordination of roles within this research. With the inclusion of diverse perspectives into this process, it enhances the potential options and figures considered. The commitment to collaboration in addressing a Wicked problem will