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Wicked Problems

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ABSTRACT

Wicked problems are known as complex, interconnected, multifaceted issues that are difficult to define, solve, and evaluate, such as poverty, climate change, healthcare access, income inequality, terrorism, or education inequality due to their inherent complexity, uncertainty, and conflicting stakeholder perspective. They are characterized by lack of clear-cut solutions and require ongoing, adaptive approaches. We are faced with problems in our daily life, and we think of ways to solve them. A wicked problem is said to be a societal or cultural issue that is difficult or impossible to solve due to the following reasons: incomplete or inconsistent knowledge, the large number of people and views involved, the significant economic burden, and the interconnected nature of these issues with other issues. This paper delves into what wicked problems are, and how we can go or move around them.

KEYWORDS: *Wicked problems, societal or cultural issues, complex problems, problem solving, collaboration, risk and uncertainty, binary thinking*

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INTRODUCTION

In planning and policy, a wicked problem is a problem which is difficult or impossible to solve due to incomplete, contradictory, and changing requirements that are often difficult to recognize [1], as shown in Figure 1. A wicked problem 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 [2]. It is also defined as "a problem whose social complexity means that it has no determinable stopping point" [3, 4]. Wicked problems have many different characteristics such as: they have no stopping point, they lack definition, have no "right" or "wrong" solution, you can't test solutions to wicked problems, the problem is unique, they have unknown consequences, and they prove symptomatic of other problems. We can find some of the examples of wicked problems in many environments that may include educational, economic, healthcare, environmental, and urban planning challenges [5], as shown in Figures 2, 3 and 4.

HISTORY OF WICKED PROBLEMS

It was not until late 1960s that we got to know about the term "wicked problems" as it has ever existed. It was Horst Rittel that first identified so-called wicked problems in 1967 seminar at the University of California at Berkeley. West Churchman documented the phrase in a follow-up editorial in Management Science, suggesting that Rittel used the adjective "wicked" "to describe the quality of the problems, implying they have a mischievous and evil quality, where proposed "solutions" often turn out to be worse than the symptoms" [6]. This concept of "wicked problems" was introduced by Horst Rittel and Melvin Webber in their 1973 paper titled "Dilemmas in a General Theory of Planning." Researchers till date give credit to the 1973 co-publication by Rittel and Melvin Webber for the seminal work on the concept. They argued that social policy problems differ fundamentally from the "tame" problems of mathematics or engineering. Wicked problems have no definitive formulation, no stopping rule, and no immediate or ultimate test of a solution. Each solution changes the problem.

CHARACTERISTICS OF WICKED PROBLEMS

Some of the key characteristics of wicked problems by Rittel and Webber are that wicked problems [7]:

1. Have no definitive formulation.
2. Have no stopping rule.
3. Solutions are not true or false, but good or bad.
4. There is no immediate test of a solution.
5. Every solution is a one-shot operation.
6. Have no enumerable set of solutions.
7. Are essentially unique.
8. Can be considered symptoms of other problems.
9. Can be explained in numerous ways.
10. The planner has no right to be wrong.

THE EXPANSION AND APPLICATION

Since Rittel and Webber, the concept has been widely applied in fields such as environmental policy, urban planning, business strategy, public health, and climate change; with the introduction of super wicked problems [8, 9]. Wicked problems are complex and intractable issues with no clear solutions, have applications across various fields like in public policy, design, and project management. Helps in the understanding of the limitations of traditional problem-solving approaches and encourage the development of more collaborative and flexible strategies. Moreover, because of complex interdependences, 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 [4, 8].

STRATEGIES TO TACKLE WICKED PROBLEMS

Traditional approach cannot be used to tackle wicked problems in which problems are defined, analyzed and solved in sequential steps, as there are no clear definition of wicked problems. The solution to wicked problems will ultimately need additional research to understand the gaps in information pertaining to these problems. Hence, government must invest in more evidence-informed science to address the full scope of these problems [10], as shown in Figures 5 and 6. There is also the need for broader thinking into the appropriate options that will allow for more innovation within this process. Nancy Roberts highlighted the following strategies in coping with wicked problems [11, 12]:

1. *Authoritative strategies:* These seek to tame wicked problems by vesting the responsibility for solving the problems in the hands of a few people. However, 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 the authorities and experts charged with solving the problem may not have an appreciation of all the perspectives needed to tackle the problem. Secondly, the authorities and experts can be wrong – wrong about the problem and wrong about the solution.
2. *Competitive strategies:* Competitive strategies have a long history. Whether played out on the battlefield, in politics, or in the market, stakeholders follow the strategy that assumes a "zero-sum" game. If my opponents win the right to define the problem and choose the solution, then I lose. If I win the right, my opponents, lose. A win-lose mind-set thus permeates interactions, with warfare as an extreme example of zero-sum competition when countries claim the right to define their wicked problems and their solutions (over religion, land, trade policy, etc) in such a way that it threatens other countries. Central to the pursuit of competitive strategies to deal with wicked problems is the search for power, such that the competitor can build a power base larger than his opponents, using whatever tactics his ethics and morality permit, he can increase his chances to win and define the problem and its solution in a way he sees fit, since power, after all is the ability to get what one wants against resistance [13]. Competitive strategies in solving wicked problems have numerous advantages. For example, in the market economy, industry competition prompts the search for new ideas. It also challenges the institutionalization of power, by keeping power to circulate among the competitors, so as not to centralize and institutionalize power. Power is not corrupting: it is the concentration and institutionalization of power that is dangerous [13].

   The disadvantages of competitive strategies are that, when pushed to the extreme, they can provoke violence and warfare, e. g the scars from competition in Northern Ireland, the Middle East, and Rwanda. It also consumes resources that could be spent on problem solving.
3. *Collaborative strategies:* Collaborative strategies is premised on the principle that by joining forces, parties can accomplish more as a collective than they can achieve by acting as independent agents. At the core of collaboration is a "win-win" view of problem solving and not a "zero-sum game". Alliances, partnerships, and joint ventures are all the variations of the theme as they find expression in government, business, and international relations.

Collaboration has a lot of advantages such as:

- Sharing costs and benefits of developing very expensive technology by the members of research consortia rather than carrying the full risks on their own [14].

- Military alliances to add strength in numbers and share the burden of mutual defense.
- Competitors of same product line can find virtue in working together to deliver better products and services to their customers.
- Through collaboration, redundancies could be eliminated and organizational efficiencies achieved [15].

The disadvantages of collaboration are that:

- Adding stakeholders to any problem solving effort will lead to increase in "transaction costs" due to holding of more meetings, more people with whom to communicate with, and reaching agreement takes longer time, with more effort.
- Skills of collaboration can be limited especially among people who work in a traditional bureaucracy.
- There are no guarantees that the outcomes of collaboration will be satisfactory to everyone.

COPING STRATEGIES

The coping strategies in dealing with wicked problems require a combination of strategies that acknowledge their complexity, uncertainty, and value-based conflicts. Some of the effective approaches include [1, 16-18]:

1. Avoidance and denial: Acknowledging the problem but taking symbolic actions that address the symptoms rather than the underlying causes. This approach is often used when government leaders lack the capacity or will to tackle complex issues.
2. Authoritative coercive controls: Imposing decisive solutions to manage crises that require forceful and rapid responses. This type of approach is common in disasters, emergencies, or security threats.
3. Micro-management: This has to do with breaking down complex problems into smaller, manageable parts. It focuses on just one aspect of the problem at a time.
4. Technocratic problem-solving: This is the use of science and logic to develop rational solutions. Wicked problems, however require more than technical expertise.
5. Incremental adjustment: This makes use of gradual changes through iterative processes, thereby allowing for adjustments and corrections along the way.
6. Stakeholder collaboration: This makes use of the engagement of diverse stakeholders in a consultative approach to tackle problems collectively.
7. Coping strategies: Focusing on managing uncertainties, building resilience, and strengthening community capabilities.

Other approaches are:

8. Collective action: It involves multiple actors and groups who share common values or goals to bring about change.
9. Adaptive change: This is by embracing new ways of thinking and learning, and as well as being prepared to consider different solutions to a problem.
10. Deliberative engagement: This is by bringing together citizens or those affected in a community with decision-makers or officials.
11. Breaking down the problem: Creating categories, sub-categories, and incremental approach to make the problem more manageable.
12. Moving away from binary thinking: Avoiding strict divisions of good and bad, right and wrong, to facilitate problem-solving. Binary thinking (also called dichotomous thinking, black-and-white thinking, or all-or-nothing thinking) can lead to oversimplification, polarization, and neglect of nuances and complexities. However, the alternatives to binary thinking are: nuanced thinking, contextual understanding, and gradations and shades [19].

IMPLICATIONS OF WICKED PROBLEMS

Some of the implications of wicked problems are [20]:

1. Difficulty in definition and understanding: this is due to fact that they are often ill-defined, with no single, agreed-upon formulation; the scope of the problem and nature may be unclear or may even evolve as more information is gathered; and hence makes it more challenging to precisely identify the root cause and the desired outcome.
2. Lack of definitive solution: this is because wicked problems do not have single "right" answer; the solutions are often evaluated based on their "goodness" or "badness" rather than a clear true/false criterion; and what may be considered a solution in one context, could be ineffective or even possibly detrimental in another.
3. Unintended consequences and systems dynamics: The solutions to wicked problems can have unforeseen and potentially negative consequences. Interventions can disrupt the

existing system, creating new problems or exacerbating existing ones.

4. Individual and organizational impact: wicked problems can affect individuals and organizations directly, impacting their livelihoods and well-being. They require a commitment to lifelong learning and adapting to changing circumstances. Additionally, organizations must be able to respond to uncertainty and make decisions under conditions of incomplete information.
5. Need for collaboration and long-term solutions
6. Challenges for policymakers
7. Social and political implications: Wicked problems often involve conflicting values and interests, making it difficult to reach consensus. They require political will and institutional support to address complex issues; and while solutions could require changes in behavior, norms, and societal values

To deal with wicked problems demands for a shift in mindset from seeking definitive solutions to embracing iterative processes, collaborative efforts, and the willingness to adapt to changing circumstances.

CONCLUSION

Money and technology are highly valuable and crucial resources; they are certainly necessary but they are not sufficient. Simply throwing more money and/or more advanced technology at a problem will not make it go away. We therefore need to fundamentally change our thinking paradigm and approach things in context-appropriate ways, otherwise we will never move the needle on these so-called wicked problems. Wicked problems require nuanced understanding, collaborative approaches, and adaptive strategies to address. Acknowledging and embracing the complexity of wicked problems, as well as stakeholder engagement and interdisciplinary research can lead to more effective and sustainable solutions. More information about wicked problems can be found in [21, 22].

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Figure 1. Wicked problem
Source:https://en.wikiquote.org/wiki/Wicked_problem

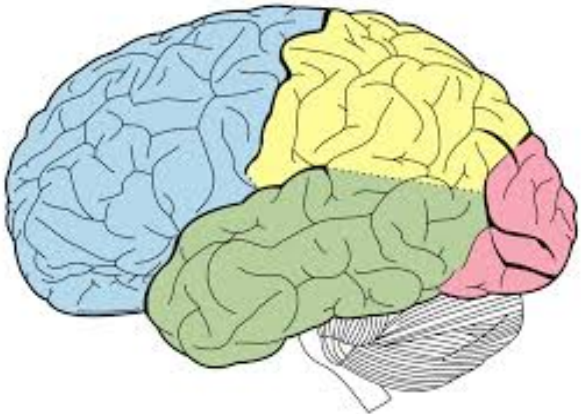

Figure 2. Problem solving
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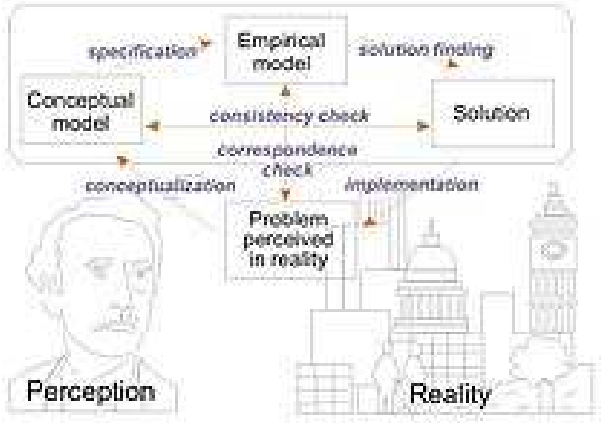

Figure 3. Problem solving
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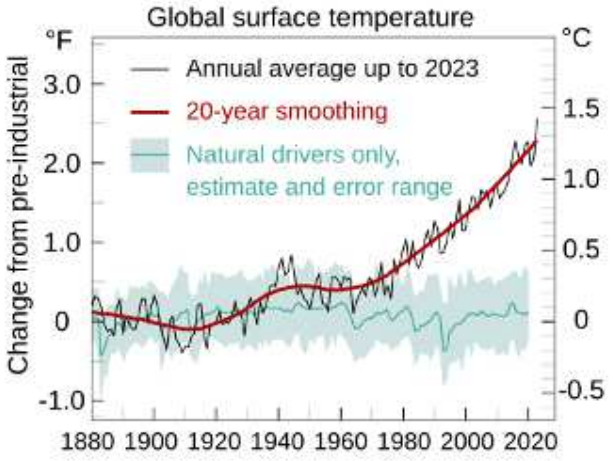

Figure 4. Climate change

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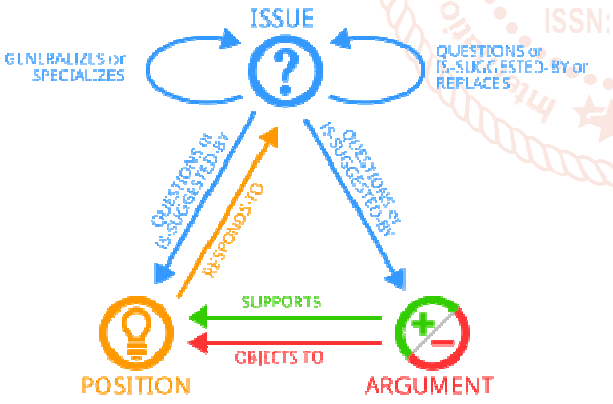

Figure 5. Issue-based information system

Source:https://www.google.com/search?q=wicked+problem+diagram+by+wikipedia&sca_esv=f03707b696694e77&udm=2&biw=1036&bih=539&sxsrf=AHTn8zouEnxYQSq745_dR7GSqIQm4jw%3A1745762477872&ei=rTgOaNKDNZqqhbIPqMCBiAI&ved=0ahUKEwiSjuyCsPiMAxUaVUEAHShgACEQ4dUDCBE&oq=wicked+problem+diagram+by+wikipedia&gs_lp=EgNpbWciI3dpY2tlZCBwcm9ibGVtIGRpYWdyYW0gYnkgd2lraXBlZGlhSLJyUMkGWJVUcAF4AJABAJgB5QKgAaUaqgEGMi0xMS4yuAEMyAEAAEBmAICoAKRA8ICBxAjGCcYyQLCAgQQABgemAMAiAYBkgcFMS4zLTGgBoEsgcDMy0xuAfzAg&sclient=img#vhid=Dk2FWmqGbLGMIM&vssid=mosaic

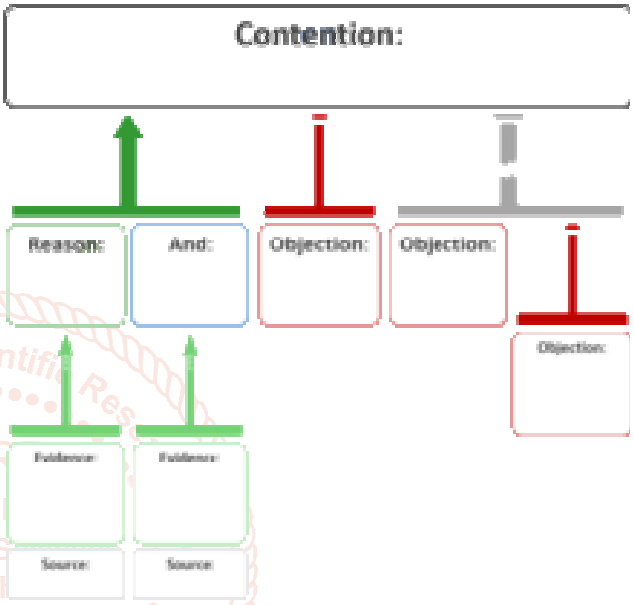

Figure 6. Argument map

Source:https://www.google.com/search?q=wicked+problem+diagram+by+wikipedia&sca_esv=f03707b696694e77&udm=2&biw=1036&bih=539&sxsrf=AHTn8zouEnxYQSq745_dR7GSqIQm4jw%3A1745762477872&ei=rTgOaNKDNZqqhbIPqMCBiAI&ved=0ahUKEwiSjuyCsPiMAxUaVUEAHShgACEQ4dUDCBE&oq=wicked+problem+diagram+by+wikipedia&gs_lp=EgNpbWciI3dpY2tlZCBwcm9ibGVtIGRpYWdyYW0gYnkgd2lraXBlZGlhSLJyUMkGWJVUcAF4AJABAJgB5QKgAaUaqgEGMi0xMS4yuAEMyAEAAEBmAICoAKRA8ICBxAjGCcYyQLCAgQQABgemAMAiAYBkgcFMS4zLTGgBoEsgcDMy0xuAfzAg&sclient=img#vhid=yNzIdhD9tWukPM&vssid=mosaic