

Role of cognitive mapping in health care management decision



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Describe and discuss the role of cognitive mapping in health care management decision making.

Description of Cognitive Mapping

Cognitive mapping is an operational research technique that consists of creating a graphical representation of a person's (or group's) way of thinking about an issue, and where directionality within the map is assumed to imply perceived causality among the concepts (Eden, 2004). The proposed value of the graphical representation, as argued from the field of political science, is that it makes it easy to for anyone to see how concepts and causal relationships are related, and appreciate the overall structure of all the assertions (Eden 2004 cited Axelrod 1976, p. 676).

It is one mechanism of system dynamics simulation modelling that generally came about as a reaction to failure of traditional approaches to capture interactions within complex problems in social systems (Edkins et al. 2007 cited Checkland 1981). It avoids the common research process pitfall of reductionism by allowing multiple conflicting views to be revealed and, providing a comprehensive picture of the participants' perspectives but keeping all details to represent beliefs that are most important to stakeholders represented (Duryan, Nikolik, & Merode, 2015; Eden & Ackermann, 2004).

Cognitive mapping was initially introduced as a method for problem analysis. But recognizing its value, it has then found roles in performance measurement, decision making, and strategy formulation. Eden and Ackermann (1991) expounded on the possible uses of this technique in

becoming an instrument for developing consensus about shared goals, providing structure to multiple and conflicting aspects of an issue, informing negotiation, and suggesting actions to resolve issues.

Use of Cognitive Mapping in Health Care

Cognitive mapping is argued to be best for “ messy” situations wherein stakeholders do not understand the problem or interpret them differently, and often do not realize it (Mingers 2008 cited Ackoff 1979a). Healthcare decision making falls into this realm as it has always been complicated by information asymmetry, trade-offs between efficiency and equity, or moral ambiguity – that become legitimate sources of uncertainty and debate among stakeholders. In fact, the first uses of cognitive mapping in operational research were in healthcare, education, and defense (Eden & Ackermann, 2004).

Mingers (2008) described an example in 1997 Manchester, where the UK Health Authority commissioned the Salford Community Trust to develop an integrated approach to children’s services. Mingers argued that while the project seemed straightforward, it turned out to be a “ messy” problem as there was no agreement on the definitions of service specifications, services to be included, direction of the strategy, and how the project should be tackled. There were also many stakeholders involved in the issue (i. e. government, doctors, patient groups, industry) that had very strong opinions about the project. If the group were to make a plan based on epidemiology, practice guidelines, budget constraints and other numerical factors alone, without taking into consideration the stakeholders’ differing views, the proposed program would likely fail during implementation.

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Situations like these are common in healthcare decisions given the complexity of issues faced at doctor-patient, organizational, and national-policy level. Mathematical and statistical methods provide a narrow focus on measurable aspects of decision that fails to catch the reasoning, motivations, and interactions relevant to achieving these outcomes. Problem structuring through cognitive mapping provides an opportunity for healthcare decision makers to systematically measure these missing interactions and assess their impact to the goal under assessment (Pidd, 2004).

Sachdeva et al (2007) explored the added value of cognitive mapping from traditional approaches in understanding patient flow delays in a Pediatric Intensive Unit (PICU) of a Children's Hospital in Wisconsin, USA. "Hard operations research (OR)" results using modelling were persuasive, but became inadequate to result to change given politically sensitive issues that arose. "Soft OR" using cognitive mapping that was done identified new issues and offered a more holistic and comprehensive understanding of the issue's complexity that helped persuade decision makers to act on the recommendations.

SODA

The most common technique for cognitive mapping is the Strategic Options Development Method (SODA). SODA is an ethnographic method derived from interviews that are intended to represent the participants' subjective worlds – the theoretical basis of which is explained by personal construct theory (Eden 2004 cited Kelly 1995) wherein people make sense of their world by seeking to manage and control it.

SODA uses a formal modelling technique with rules for its development as described by a user guide developed by Eden and Ackerman (Ackermann et al., 1991). The transcripts of the interviews are separated into short distinct phrases (nodes) that eventually get sorted as goals, strategic directions, or potential options. Fidelity in transcription is imperative to represent the participants' intentions and to promote ownership of the resulting map created. The concepts are linked (arrows) to determine accurate subordination of concepts, directionality and opposing poles to create the overall structure. While the map is an important output of its own, these can also be subject to further analysis to gain deeper insight, such as:

	Map	
Analysis	Characteristics	Goals
Head analysis	Nodes with only incoming arrows	To identify end goals or effects
Density analysis	Number of mentions of the concepts	To determine the potential key issues from the perspectives of the

participant
 s that may
 need
 further
 examinatio
 n

To
 measure

Number of the
 links to the importance

Centrality concept, or and
 analysis ratio of complexity
 arrows to of the
 concepts concept's
 implication
 chain

Hierarchi Number of To identify
 cal concepts in most
 cluster chain or potent
 analysis arguments options or
 linked to valued
 option outcomes
 to
 influence

on the
goals

To
prioritize
options
with
consequen
ces for the
biggest
number of
key issues

To
determine
the single
action that
may cause
multiple
goals to be
achieved

Potency analysis
Number of goals each option supports

Composit e tail analysis
Ranking of potency analysis

Source: Summary by Author

Healthcare Example of Using SODA

A case study by Duryan et al. (2015) on intellectual disability care in

Netherlands made use of SODA to determine factors that adversely affect

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delivery of patient-centered care as evidence for future resource allocation. Following SODA guidelines, the team conducted one-on-one, semi-structured, hour-long interviews with the managers and patient group leaders within one division of a residential care facility. Initially, they were thought to have contrasting goals – financial sustainability for the managers and quality of care from resource constraints for the patients. Using the Decision Explorer software, cognitive maps were created and merged to reflect the combined views. Key assumptions were then discussed and verified, and follow-up focus group discussions with different subgroups of the patients (young vs old) and their families were done to refine the ideas represented by the initial group. The merged map was then subject to head, domain, centrality, potency analysis, and composite tail analysis.

Results showed that “ group leader freedom to make decisions”, “ flexible shifts”, and “ time spent with patients” were the most potent options/solutions, and therefore needed quick action by the managers. According to the researchers, the exercise successfully facilitated critical analysis of the problem and fostered ownership of the proposed solutions by all stakeholders. Seeing the different/ opposing thoughts organized and their end-goals similar also helped reach consensus and manage disagreements.

Expansions of SODA

While SODA provides solutions to complex strategic processes, it lacks a mechanism to allow for agreement among the strategies to be developed. SODA was developed further into JOURNEY Making (JOintly Understanding Reflecting and NEgotiating strategY) to become a process-oriented and management-science strategy by using the composite map in a workshop <https://assignbuster.com/role-of-cognitive-mapping-in-health-care-management-decision/>

setting as a tool to help negotiation and explore policy options that will allow the issue to be intelligently resolved (Mingers, 2008). Another method, the Oval Mapping Technique (OMT), creates a cognitive map but through a highly participative strategy workshops.

White et al (2007) used JOURNEY Making to collect and define “ public values” and “ voices” among stakeholders involved in a community hospital project in South London. Intergroup workshops were done in phases to map/graph the issues and options related to the decision. The process resulted to wide acceptance of the recommendations and an official plan enacted by the Department of Health. This is one among many examples of the opportunity to use these newer OR tools in healthcare strategy management planning at both organizations and the national policy arena.

Limitations

Cognitive mapping provides an opportunity to deal with messy problems in a systematic way, but general acceptance of it as a method is still lacking.

Mingers (2008) explains that especially in the United States, it is viewed as a “ soft OR” method not regarded for publication in top journals nor teaching in courses among top schools.

The concerns on subjectivity of results remain valid that even though the process is systematic and rigorous, they are still variable and dependent on both study design and recruitment. The cognitive maps developed will depend largely on the choice of participants, their active participation, their personal motivations, and the assumption that they are adequately informed of the problem. And the probability of one person skewing the result is high

given the small sample (i. e. 4-10 people) used for these activities. The method also assumes adequate facilitation by the research team to determine the key nodes and domains, which may not always be the case.

Also, while cognitive mapping provides a snapshot of the decision making, it does not promote understanding over time periods and cannot be used to derive numerical assessments of its impact (Pidd, 2004).

Cross-validation or triangulation using many models of the same issue may be done to increase its validity (Abernethy et al, 2005). Combination of “ soft” and “ hard” methodologies is believed to increase acceptance and sustain organization change especially in healthcare settings (Sachdeva et al., 2007). And, it should always be used in conjunction with other methods for research data gathering, monitoring, performance measurement, or decision support.

Lastly, for cognitive mapping to be useful in decision support, it requires the decision makers to understand the method/process, recognize the value of the issues at the front line, take the results seriously, and act on the recommendations. It is therefore crucial for any research team using this method to help the decision makers appreciate the approach and engage with the recommendations.

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