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An Interpretive-emergent-holistic Approach for Collaborative Governance

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Abstract

In this paper, we intend to propose a novel pathway for achieving systems thinking—a prerequisite for strategic management—in the context of collaborative governance. This novel pathway, namely an interpretive-emergent-holistic approach, is grounded in complex adaptive systems framework and aimed at leveraging the computational power of today's information technology in providing rigorous, systematic understanding of the complex nature of collaborative governance. The defining feature of collaborative governance is the direct engagement of non-state stakeholders in a collective decision-making process for challenging social problems. While its potential has been well discussed, three major analytical challenges need to be addressed to gain in-depth understanding of success factors and pitfalls of collaborative governance and subsequently to advise practitioners in harvesting benefits from this promising governance structure. We finished this paper with discussing practical questions in implementing this approach.

Introduction

The governing structure that public management scholarship is required to pay attention is no longer limited to hierarchies. Relatively new types of governance such as networks and heterarchies of/in physical and virtual organizations have been observed and discussed in the literature. Collaborative governance represents one of such new governance structures. The defining feature of collaborative governance is the direct engagement of non-state stakeholders in a collective decision-making process for challenging social problems (Ansell and Gash, 2008). When successful, this collaborative approach can bring benefits such as increased governmental accountability, greater civic engagement, consistent downstream implementation, and potentially, better policy solutions. However, three major analytical challenges need to be addressed to gain in-depth understanding of success factors and pitfalls of collaborative governance and subsequently to advise practitioners in harvesting benefits from this promising governance structure.

The first challenge is concerned with heterogeneous autonomous stakeholders who are not dictated by a central control mechanism. Especially for controversial policy problems, stakeholders inevitably have competing interests, different values, and asymmetric information. Second, the collective decision-making process is not determined by *a priori* plans or intentions, but shaped by recurrent interactions among stakeholders and public agencies. Over time, the collaborative process can exhibit cyclical and iterative rather than linear and one-directional behavioral patterns. Third, collaborative governance involves two levels of analysis: one operating at the level of an individual's cognition and behaviors regarding policy decision-making; and the other operating at the level of the organizational context within which these individual cognition is situated. Together, the three analytical challenges define what we call the "complex" nature of collaborative governance as a phenomenon. They require analyses that can take into account the emergence of collaboration from the interactions among heterogeneous autonomous actors situated in organizational contexts.

Extant research in the field of public management has mainly taken a positivist-reductionist approach. Main assumptions of this approach include the existence of universal laws assuming that the unit of analysis in social systems is highly similar over time and space, and the possibility of understanding a system as the sum of its parts which leads to total predictability. Although these assumptions have enabled researchers to gain analytical tractability in examining traditional government-centered policy-making approach, they clash with the complex nature of collaborative governance. As illustrated by an analogy from Miller and Page (2007, p. 10), "[t]he ability to collect and pin to a board all of the insects that live in the garden does little to lend insight into the ecosystem contained therein." What Miller and Page highlight is the limitation of positivist-reductionist analyses in illuminating research on complex phenomena, because it is impossible to reduce a complex process, such as collaborative governance to fixed relationships of subsets of elements without assuming away its hallmark of interconnections and variability.

In this article, we employ the tenets of complex adaptive systems (CAS) to propose a theoretical lens and an analytical instrument for capturing the complex nature of

collaborative governance. CAS has been used to conceptualize self-organizing natural, human, and social systems of which public organizations are part (Axelrod, 1997; Epstein and Axtell, 1996; Epstein, 2006; Miller and Page, 2007). Instead of reducing a phenomenon to a set of causal variables and an error term, CAS models typically show how aggregate structures arise from simple schemata and interactions of microstate events. Therefore, CAS framework lends itself naturally to the object-oriented programming paradigm that uses objects (i.e., structures that hold data and procedures) and their interactions to construct computer programs. We intend to introduce the object-oriented computer programs called agent-based modeling as an effective tool for researchers and practitioners to simulate and explore success factors and pitfalls of collaborative governance confronting the analytical challenges. Our proposed approach breaks with the positivist-reductionist tradition by explicitly incorporating contextual factors, emergent processes and multiple stakeholders into research models. Hence, we refer to it as an interpretive-emergent-holistic approach.

Collaborative Governance Research

The Past and Developments

This use of language, governance, in the public management literature implies not only the enlargement of the scope and boundary of public management, but also a different conceptualization of the work (Rhodes, 1996; Stocker, 1998; Boyte, 2005). Governance recognizes a complex set of institutions and actors beyond government, the blurring of boundaries and responsibilities for addressing social and economic issues, power dependence, autonomous self-governing networks of actors, and sees government as able to use new tools and techniques to steer and guide (Stocker, 1998). Therefore, it is more appropriate to see that the emergence of the governance concept redefines a focus on government as a single stand alone institution to a process that addresses complex, messy, and challenging problems (Rhodes, 1997; Hajer and Wagenaar, 2003). This broadened view has been more explicit with terms for new forms of governance such as network and collaboration.

Governance through network has attracted substantial scholarly attentions (Rhodes, 1996; Bueren, Klijn, and Koppenjan, 2003; Provan and Kenis, 2007). They argue that besides hierarchy, network consisting of nodes (social organizations) and relations can be equally effective in forming policies (Rhodes, 1996; Hudson, Lowe, Oscroft, and Snell, 2007) and in achieving goals (Provan and Kenis, 2007; Lubell and Fulton, 2007). Governance through collaboration has been discussed as a response to continuous social changes and complex social and economic problems (O'Leary, Gerard, Bingham, 2006; McGuire, 2006). Collaborative governance brings multiple stakeholders together in common forums with public agencies to engage in consensus-oriented decision-making (Ansell and Gash, 2007). Since there already exist higher level analyses to outline the definition and scope of collaborative governance from the previous studies (Ansell and Gash, 200x; Thomson, Perry, and Miller, 2009; v here we briefly highlight key developments and limitations in the existing literature.

Most of all, defining collaborative governance has been a challenging task. There have

existed slightly different terms to refer to the phenomenon of collaborative governance such as collaborative process, collaborative management, or collaborative policy-making. Also, a range of terms (i.e. participatory management and interactive policy-making) has been interchangeably used. Therefore, it has not been easy to define collaborative governance, differentiating it from the existing approaches or terminologies. In recent literatures, collaborative governance is most often seen as a process and explained as a framework that integrates initial conditions, process, and outcomes (Thomson and Perry, 2006).

“A process in which autonomous or semi-autonomous actors interact through formal and informal negotiation, jointly creating rules and structures governing their relationship and ways to act or decide on the issues that brought them together; it is a process involving shared norms and mutually beneficial interactions” (Thomson, Perry and Miller, 2009, p. 25).

Most recent development in the collaborative governance research can be found from the synthesis of the previous studies in order to measure the construct of collaboration or to identify conditions for more or less effective collaboration. For example, Thomson, Perry, and Miller (2009) identified five dimensions of collaboration for measurement: governance, administration, organizational autonomy, mutuality, and norms. They claimed that the 17 indicators that represent the multidimensional scale of collaboration are theoretically and statistically valid measures of each of five dimensions for collaboration. Ansell and Gash (2007) developed a contingency model from a meta-analysis of previous case studies that have identified conditions for more or less effective collaboration. The case studies have produced a laundry list of variables and causal relationships of subsets of elements that are highly variable depending upon contexts. The contingency model integrates the findings from the case studies within a framework of collaborative process.

While this is a meaningful development in the collaborative governance research, there are some limitations that need to be more seriously thought out. In the definition, collaborative governance is seen as a process of collective decision-making by various stakeholders. Is this a different process from the traditional policy process? In spite of some differentiators such as emphasis on trust building and shared understanding, the framework very closely resembles traditional policy process models. These models have shown a descriptive merit, but have also been criticized due to lack of theoretical explanatory power and its heuristic nature (Sabatier, 2007). If collaborative governance must be viewed as a process, then the force to understand a process of actions brings two crucial implications in research: (1) focus on systemic patterns of the process and (2) awareness about the limitation of cross-sectional measurement of incommensurable constructs.

The interaction and interdependency among stakeholders during the collaborative process are not necessarily linear, but *nonlinear* in nature. The emergent nonlinear patterns of collaborative process can only be observed within a longer time frame, and a series of questions can be asked regarding to systemic patterns the process presents. While primitive, theoretical approaches for such emerging patterns are available. For example,

conventional predator-prey models also known as ‘nano-fox property’ have been used for analyzing population dynamics as well as managerial dynamics in organizations (Kiel, 1994). In addition, more recent advance in modeling helps to introduce extinction and reproduction of entities in dynamic systems which might be more relevant for social systems dynamics (Axelrod and Cohen, 2000). They help examine nonlinear emergent patterns of complex process that characterizes the system of collaboration.

By definition, the *nonlinear* or *emergent* process implies the inherent limitation of a positivist-reductionist approach as well as empirical measurement of dynamic constructs such as collaboration. A snapshot of collaborative process does not necessarily provide an accurate or meaningful picture of the phenomenon. Further, it is highly doubtful to argue the relationship between collaboration and its social outcomes using limited measurement. The positivist-reductionist approach carries a strong preference for empirical research that requires precise measurement for control and prediction, giving up substantial amount of contextual realism. However, the utility of this approach is inherently limited for the understanding of nonlinear dynamic systems. The argument here is not to point out superiority of one approach, but to highlight the limitation of favoring the positivist-reductionist approach in making sense of highly complex collaborative process.

Some Needs for the Future

The definition and characteristics of collaboration as a mean of governance very closely resonates the nature and properties of complex adaptive systems. However, a main approach in the collaborative governance literature has followed the trajectory of the past studies for other research subjects. Recent advances in sciences have not been well translated in the literature. General systems theory, dynamic systems theory, and complex adaptive systems have influenced management scholarship for a long time, but their potential has not yet fully explored, or they have been short in producing fruitful outcomes. In this paper, we framed collaborative governance from a CAS point of view in order to draw meaningful insights for theory and practice and to introduce a developing analytical approach within the CAS tradition.

Collaborative Governance as Complex Adaptive Systems

A movement of complexity science can be described as the study of the phenomena which emerge from a collection of interacting objects (Johnson, 2007). In complex systems, the objects (or actors) adapt their behavior to pursue their goals based on local rules. Complex adaptive systems (CAS) include several unique properties such as nonlinearity, co-evolution, and self-organization. Due to the complex interactions of autonomous purposeful actors, the self-organizing systems exhibit emergent phenomena. Emergence refers to “new system properties and relations among subsystems that has no place in the system components” (Simon, 1996, p. 170). An intense search is now underway for characteristics and rules associated with emergence across various complex systems (Bak, 1991, 1996; Casti, 1997; Guzy, et al., 2008; Holland, 1998; Resnick, 1994). Everyday examples that complexity science has studied include traffic jams,

financial markets, weather, and ant foraging. Recent applications of complex systems to social science topics include, but are not limited to understanding cooperation (Axelrod, 1984, 1997), harnessing complexity for organizations (Axelrod & Cohen, 2000), enhancing policy analysis (Dennard, Richardson, & Morcol, 2008; Kim, 2006), and improving business strategies (North & Macal, 2007; Johnston, et al., 2008).

In a simplest explanation, CAS includes following properties: (1) aggregation that allows groups to form, (2) nonlinearity that invalidates simple extrapolation, (3) flows that allows the transfer and transformation of resources and information, and (4) diversity that allows elements to behavior differently from one another and often leads to robustness (North and Marcal, 2007).

Collaboration especially for the purpose of governance consists of a coordinated and bounded set of patterned relations among members, tasks, and resources that are often imbalanced at a starting point, but shares somewhat common interests and responsibilities. The emergence of this form of governance has been attributed to a social change toward extremely diverse and decentralized structure or an increased complexity of the problem government faces today (McGuire, 2006). Regardless of a position on whether this is truly new phenomenon or not, the rise of collective decision-making and implementation of rules by different stakeholders has drawn substantial academic attention with many questions.

The system of collaboration is embedded within organizational, temporal, and social contexts. Within the system various stakeholders are interdependent and influenced by each other. They make a series of collective decisions for joint actions over time. Stakeholders have their own identity within the organization they represent, but also are embedded within the formal or informal boundary of joint efforts. Highly complex causal relationship between local dynamics and system dynamics exist through feedbacks and feedforwards, which shapes the pattern of the collaborative process.

The basic characteristics of collaboration systems can be briefly summarized as follows: (1) collaboration involves interactions across constituents in collaboration, the collaboration group as an entity, and the context collaboration occurs, (2) the structure and behavior of collaboration changes over time and tends to become complex, and (3) constituents in collaboration have two generic functions (identity) to complete their joint project and to fulfill their own needs.

This theoretical framework for collaborative governance poses serious analytical challenges that traditional approaches cannot effectively address. The first challenge is concerned with heterogeneous autonomous stakeholders who are not dictated by a central control mechanism. The boundary of collaboration has been extended to include non-state stakeholders such as private partners, civic organizations, and citizen for direct decision-making. There is a need to consider inevitably competing interests, different values, and asymmetric information among stakeholders. Second, the collective decision-making process is not determined by *a priori* plans or intentions, but shaped by recurrent interactions among stakeholders and public agencies. A reason might be related to the

nature of problems that collaborative governance aimed to address. These problems often described as ‘wicked problems’ require deliberation to define what the problem is and consensus building about how to approach such a problem. Over time, the collaborative process can exhibit cyclical and iterative rather than linear and one-directional behavioral patterns. Third, collaborative governance involves two levels of analysis: one operating at the level of an individual’s cognition and behaviors regarding policy decision-making; and the other operating at the level of the organizational context within which these individual cognition is situated. Together, they require analyses that can take into account the *emergence* of collaborative governance from the interactions among heterogeneous autonomous actors situated in organizational contexts.

An Interpretive-Emergent-Holistic Approach

The research model we proposed for collaborative governance explicitly incorporates contextual factors, emergent processes and joint decision-making of multiple stakeholders. This inherently requires multilevel analyses. An analytical approach that is suited for this research model is computational models. Computer or computational modeling has been used as a key instrument in gaining knowledge on complex adaptive systems in various areas. Some of these models aim to search for underlying mechanisms or understanding processes of dynamic open systems that present emergence. Others aim to support decision-making by representing a highly complex context through deliberation with stakeholders and providing a shared context of dialogue. In both camps, simulation models have served as a pivotal tool for an inquiry of complex systems.

Simulation is a particular type of modeling for various purposes such as prediction and understanding. Early computer simulation in social science can be found from discrete event simulation and system dynamics that model queues, processes, and the trajectories of variables over time. The development of simulations in social science is well discussed elsewhere (Gilbert and Troitzsch, 2005; Marcy and Willer, 2002). In more recent years, scholars have been interested in some issues that are specific to the social sciences and the relevance of computer simulation to understanding human societies. For example, agent-based modeling has been adopted as an increasingly common modeling technique.

Agent-based models (ABM) are somewhat different from classical simulation models in that heterogeneous agents directly interact with each other and adopt their behavior based on local information available. Each agent consists of attributes and methods to present their behaviors. Agents can be representative of any objects from humans to concepts. Action rules specify how agents interact. This flexibility of setting rules allows researchers to test various rules to identify most appropriate explanations of phenomena or to design the rule that can alter the existing system. This approach has been used for many purposes, such as modeling emergence (Holland, 1998), far-from equilibrium behaviors (Bak, 1991, 1996), constructivist learning and challenging assumptions (Resnick, 1994), virtual laboratories (Casti, 1997), technological or engineering applications (various applications based on object-oriented programming), and urban planning (Guzy et al., 2008).

Why is ABM an appropriate tool for an IEH approach?

The basic insight we aim to gain using ABM is an understanding about the emerging system patterns of collaborative process, hoping that we can identify or introduce effective social actions in/to complex adaptive systems. To discuss this point, we first presented a generic research framework for an interpretive-emergent-holistic approach in Figure 1, which was revised from Arrow, McGrath and Berdahl (2000).

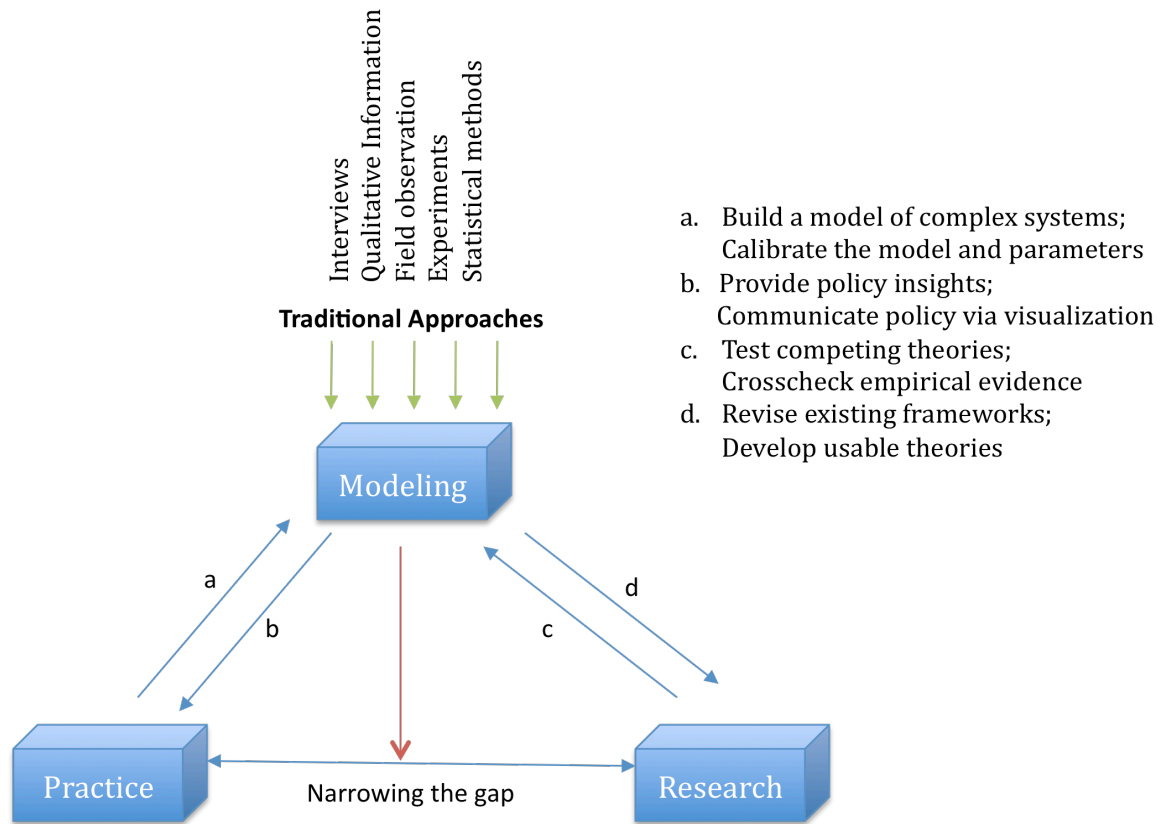


Figure 1: The Research Framework for an IEH approach

Modeling helps scientists because there are some commonalities between reality (or research context) and the simulation model even though the relationship might not be direct. Conceptual model (or abstraction) mediates the two, showing how scientists frame social process of their interest. The task of examining correspondence between real world process, an abstraction of the process, and an implementation of the abstraction using computer programming languages provides enormous challenges to scientists. They require to understand the complexity of a research context, to gather relevant knowledge and information from the literature and field works, to build a model that operationalizes such knowledge, analyze a large volume of simulation outputs using various statistical techniques, and interpret and communicate information for others.

For example, if a scientist is interested in understanding a civic collaboration for alternative health service delivery via modeling approach, there is several knowledge that

the scientist needs to be exposed. In the following section, we will illustrate a research example that was conducted based on this research framework to better understand collaborative process.

An Example:

The Interplay of Time, Trust, and Interdependency in Collaborative Process

Collaborative governance is increasing as a style of civic program design to address complex social problems. As another example of organizing around a specific problem instead of an institution, stakeholders from various sectors of the community decided to adopt and implement a public program through a decentralized bottom up process. As an approach, its cost-effectiveness and outcomes are yet uncertain (Bardach 1998; Coglianesi 1997; Freeman 1997; Fung and Wright 2001; Imperial 2005). In these collaborations, power and control are distributed among stakeholders, creating the challenge of designing programs or incentives that encourage group coordination and cooperation. The traditional research findings that assumed top down or hierarchical structures for addressing community-based problems only provide very limited guidance for this increasingly common approach to community problems. Another major challenges for understanding these collaborations is that the progress is neither linear nor one-directional but cyclical and iterative. The interplay of time, trust, and interdependence inherent in the cyclical and iterative process poses enormous analytical burdens in the research of collaborative progress (Ansell and Gash, 2008). Such analytical challenges are ideal suited for an interpretive-emergent-holistic approach.

In series of studies on uniquely successful civic collaborations in Colorado, early research reported that a high quality process during the first part of the collaboration correlated strongly with program outcomes years later (Hicks, et al, 2008). The specific challenge was to identify practices that contribute to high quality collaboration and to examine how the practices generate a strong and stable collaboration over time. To unpack the importance of different collaborative governance choices, Johnston et al. (2008) compared field observations from several community health programs. After identifying the features of collaborative governance most associated with favorable program outcomes, an agent-based model was created that formalized the strategic behaviors of stakeholders based on experimental economics, game theory, and complexity theory. A series of simulated experiments were conducted to gain fine-grained understanding of how small changes can be used as an active force to engender and reinforce commitment among stakeholders, minimize uncertainty, and influence the likelihood of positive program outcomes.

The findings early research in Johnston (2008) conducted using the research framework can be summarized as follows:

- The growth of trust in groups has path dependent characteristics that helps explain the variation of program outcomes seen in the field between communities that seemingly start from similar conditions
- Some interventions to encourage cooperation were only useful when

- applied to the entire group, some interventions needed to target individuals, and each had differences in both effectiveness and costs.
- Groups that were working well together had some resilience but were at risk for breaking down when conditions changed. Groups that had already broken down were not at risk for spontaneously working well together.
 - While groups that failed to coordinate looked similar in the end, there were many different causes for failures, each suggesting a unique, most useful type of intervention.

Besides these findings that have theoretical merits, the research framework has uniquely served not only in improving research, but also in communicating with and informing practitioners through visualization. The ability to visualize the life cycle of collaborations gained by the use of the agent-based model led to three types of policy insights that would not have been possible through traditional analytical approaches. First, policy makers and researchers could witness how early differences between communities can propagate over time to lead to long-term outcome differences. Second, separate threats to group cooperation could be identified and understood. Third, once identified, strategies to mitigate such threats can be tested and compared. For practitioners, the approach opens up the research process, communicating the findings by developing a shared language mediated through visualization. Consequently, interacting with the model practitioners develop a context to discuss how to address the challenges of time and trust while respecting the competing need for inclusiveness inherent in collaborative governance. For researchers, the use of the theoretical framework and agent-based methods start to open the “black box”, unpacks individual and combined collaborative processes, and isolates their influence toward successful policy implementation.

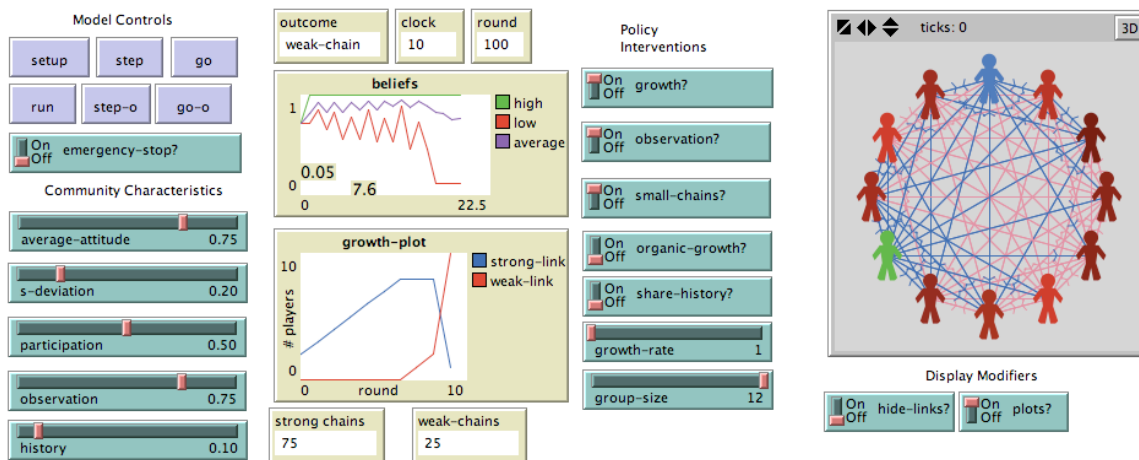


Figure 2: Growth Model ABM Interface

Implications of an IEH Approach for Constructing a Research Program

An interpretive-emergent-holistic approach will become increasingly relevant as we are

faced with an evolving category of research questions in the field of public management and policy; a shift from how much differences in policy choices influence targeted outcomes to why new forms of organizing are more or less suited for types of problems within diverse environments, to how to make sense of and evaluate process and outcome of these distinct forms of organizing, and to how to properly plan ahead as an organization that has significant social responsibility. Networked governance, emergency preparedness and management, citizen engagement, cross jurisdictional collaboration, and sustainability systems are only a few of the obvious contexts where this approach will become most common, appropriate, and useful. These questions and contexts all share characteristics that make them ideally suited for an interpretive-emergent-holistic approach. Each requires an analysis of heterogeneous units, operating in uncertain environments, with competing goals at multi-levels.

From our trials so far, we learn that at least four questions need to be simultaneously considered to judge whether this approach is applicable: Is the research aiming to understanding or addressing complex messy policy problems involving human decision-making? Is the decision made as a collaborative effort or in a collaborative environment? Can systems analysis support the collective decision-making process?, and Does visualization help to communicate and/or analyze these complex processes? To elaborate these challenging issues in detail we discuss three general research questions that are particularly relevant in this analytical approach.

How do we develop and validate meaningful or useful models of collaborative governance? A common critique is that simplifying the model of complex reality into reduced forms significantly decreases the credibility and applicability of the findings especially in the context of complex policy making. On the contrary, complex models reduce intuitive appeal and understanding for the audience, thus raise the validation questions of grounding, calibration, and verification. One way that we can balance these challenges can be to create a deliberate plan for validation at the onset of the modeling project and continual interaction between scientists and stakeholders. However, how to implement this idea is widely open to researchers, dependent on research objectives, and tempered by the scope of the claims.

How do we evaluate the usefulness of these efforts in general and specifically in relation to traditional approaches? This question opens a new area for evaluation community. For example, we need to discuss which traditional evaluation criteria are still relevant for evaluating actions in changing worlds informed by these very different tools and approaches and how traditional evaluation criteria can continue to add value in new approaches. We need to answer why and how certain tools and techniques work in collaborative settings and under what conditions such tools are more effective and informative. What barriers prevent actions of players even if reasonable advices were provided and why? How to feed the findings of practices back to the theory?

How can we bridge the gap between the new sources of knowledge generation and the decision-makers, including non-technical experts and everyday citizens? New ethical challenges with this approach, as with any other type of model, need to be continually

explored. For instance, what obligation do we have to reveal biases during the modeling process? If stakeholders think the model and thus the process is inauthentic, then they will be less likely to engage in sincere discussion or be satisfied by the conclusions reacted through deliberation (Cash, et al., 2003). Therefore, information choice, use, and effectiveness in policy decisions are deserving of greater scrutiny in efforts to inform decision-making. Models need to be built as transparent as possible to avoid the threats to modeling fidelity including: wrapping in solutions when convenient, ignoring qualitative elements in favor of the quantitative ones, and reporting findings or making claims on a scale not supported by the validation plan.

Conclusion

To summarize, our proposed study aims at advancing the complex adaptive systems framework as an appropriate theoretical lens for conceptualizing the process of collaborative governance, developing an agent-based model to serve as an effective tool for testing propositions, illustrating how the theoretical lens and analytical tool is appropriate for examples that collaboration is key of organizing, and ultimately extending this analytical approach from collaborative governance to general contexts and offering theoretical and empirical implications. We believe that the interpretive-emergent-holistic approach can complement the traditional positivist-reductionist perspective and facilitate systems thinking and strategic management in a new era of public management.

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