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The Role of Complexity in Preparing for Municipal Decision-Making

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Abstract - The purpose of this paper is to analyze how the theories of complexity may give insight and a new perspective into the preparation of decision-making at the municipal level. Based on concepts like emergence, self-organization, far-from-chaos, connectivity and feedback processes, the paper suggests that more attention should be paid to the invisible dynamics of the preparation process. Municipalities are regarded as open and complex social systems that must ensure democracy and make effective decisions at the same time. Furthermore, municipalities should be able to analyze information and to construe the meaning of their operational environment. Among other things, officeholders and politicians should also be creative and innovative. This paper is based on a conceptual analysis done by the author. The literature of that analysis included several dissertations concerning decision-making at the local government level in Scandinavian countries, particularly in Finland¹. This paper is based also on other sources. This paper is descriptive and interdisciplinary in nature, and the goal is to outline a framework for future research.

Keywords - Preparation of the decision-making; municipal management; complexity.

¹ Municipality is the smallest administrative unit in Finland. Finnish local authorities have a high level of autonomy which is guaranteed by the Constitution. Every four years residents elect a local council in free and democratic elections. The council is the decision-making authority in municipal finances and operations. The municipal executive board, which is appointed by the council, does the preparatory work on matters coming before the council (=mandatory preparation). The board is responsible for the municipality's day-to-day administration and financial management. In Finland, the municipal manager is an official appointed by the local council, who serves under the municipal executive board.

(The Association of Finnish Local and Regional Authorities)

I. INTRODUCTION

Traditional political research has been concentrated on power and the notion of power is described typically as a social relation connecting capacities, actions and consequences [47]. The *dualism* between politics and administration has been seen to prevent effective and organized action [3]. From the effectiveness point of view, the decision-making should be a *rationalistic* process.

Rationality means herein that a decision-maker has the ability to predict the future environment as well as identify the basic aim of the organization and its related measures of success. In addition, s/he should be able to map the capabilities of the organization, evaluate the performance of each option and select the best alternative. Despite a lot of effort by researchers, there has been a strict criticism of the rationalistic decision-making model (see e.g. Simon [39], Lindblom [24], Huczynski and Buchanan [17], McKenzie & van Winkelen [30]).

The rationalistic view has been condemned as problematic for at least two reasons. One is that it implies that the main concerns of organizations and managers are making choices or solving problems [3]. Brunsson [3] has argued that successful management has more to do with the ability to motivate people and create a communicative organizational culture than making rational decisions. According to Brunsson, "organization's main problem is not choosing, but it is taking *organized action*." Furthermore Thierauf has pointed out, that in reality the most creative and capable organizations should engage in more *problem-finding* than problem-solving [45]. The focus should be away from "what is" to "what can be" [45]. In the same way, McKenzie and van Winkelen has emphasized that successful organizations must pay equal attention to creating new knowledge and exploiting existing knowledge [30].

The other problem is that rationalistic decision-making is based on the concept of complete information [39]. In reality the idea of complete information is by necessary a fad. In the decision-making context, information is important, but just one element of the muddling process. In practice, and within the context of municipalities, decision-making is confused by the opposition of interests among stakeholders, bargaining and negotiation between powerful groups and individuals, the limitations of personal capabilities and the actual lack of information (see e.g. Choo [5]). In addition, Brunsson argues that in political organizations these same counteracting forces are part of the organization's basis for legitimating itself [3].

This paper does not reflect an interest in the notions of power or dualism itself. Instead, it is claimed that the operational and decision-making environment of local authorities is increasingly complex, turbulent and dynamically changing. In order to make good decisions succeed in the real world, politicians should draw attention to how the preparation phase of decision-making is organized. For example, resolutions related to the aging of the population, securing welfare services, increasing productivity and sustaining competitiveness in the global economy are challenging ones for the local government authorities in Western Europe. Making decisions in these fields requires considerable amount of preparatory work.

Based on the earlier research (see e.g. Sotarauta [40]) and the experience of the author, it appears that the traditional models of municipal decision-making require revision. The core question will be: how to reconcile the values of democracy, effectiveness and creativeness in the preparation of the decision-making? Instead of increasing information in the preparation of decision-making, it is suggested that the focus should be on improving interaction between politicians and officeholders.

II. MUNICIPALITY AS A SYSTEM

A system is traditionally described as a collection of *parts* that are interconnected or *related* to one another and which also relate to the *environment* surrounding the system (see e.g. Checkland [4]). Systems can be open or closed. Social systems (e.g. organization or tribe) are in principle open, which means that they exchange information with their environment [43].

A system-theoretical view on municipality is depicted in Figure 1. Simplistically expressed, the changing demands and support from the environment are seen as inputs that 'drive' the municipality. To the same extent, various decisions and actions represent outputs of the municipality. Feedback processes are information flows that ensure the dynamics of the system. [43]

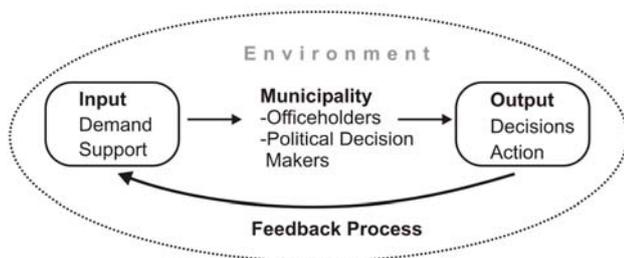


Figure 1. The municipality as a system (based on Easton [8]).

According to the presumptions of system theories, the local communities can be divided into political and administrative sections [34]. The aim of the policy is to strengthen local democracy. In this view, politicians are representatives of their constituents, who trust those they elect to use their best judgment to defend the public's interests. The officeholders' main duty is to ensure the effectiveness of the implementation of the decisions.

However, it could be said that there has been a management paradigm shift in the public sector. So-called New Public Management (NMP) emphasizes the managerial approach, efficiency and responsibility (see e.g. Clarke et. al. [6]). The New Public Management has remoulded the internal settings and workings of local administration [36]. This paradigm shift has also strengthened the position of officeholders, and the role of municipal managers as strategic leaders has increased [35]. (See more in detail about strategy process in Finnish municipalities e.g. in Sotarauta [40] and Rannisto [35]).

A. Changing environment

It has been argued that, due to the rapidly changing environment, an overly strict division into politics and administration should have disappeared. Among others, Sotarauta [40] has stressed that the basic assumptions of classical planning have simplified multidimensional social decision-making. For example, municipal institutions are faced at the turn of the millenium with many *wicked problems* which are problematic because they cannot be solved either by traditional planning or without planning [40]. Such wicked problems have several characteristics. According to Rittel and Webber [38], they are problems that have no definitive formulation, clear stopping rule or immediate test of a solution. Every wicked problem is essentially unique and is often symptomatic of the other problems. Also, the causes of a wicked problem can be explained in multiple ways. [38] Wicked problems are also noted by the fact that they refuse to be bound by administrative limits [41].

Many observers argue that previously quite clear boundaries in organizations and decision-making have begun to fade. This has multiple consequences. For example, Sotarauta [40] has pointed out that decentralized decision-making and a self-organising network of actors appears to be applicable for a complex, rapidly changing and unpredictable environment. At the same time, however, there may paradoxically be counter-effects in terms of increasing complexity, unpredictability and the rate of changes [40].

Furthermore, it could also be argued that in the preparation phase of decision-making the focus should be more on *sense-making* [48] than increasing the information flow. The aim should be that the participants of the preparation get an overview what is important and relevant concerning the

decision under discussion. The “frame of reference” directs interpretations and reduces uncertainty and ambiguity [48]. It enables people to comprehend, understand, explain and predict.

For the above-mentioned reasons, it could be said that more attention should be paid to communication and interaction between the political decision-makers and the officeholders at the local government level.

III. MUNICIPALITY AND COMPLEXITY

In a simplified manner *complexity* is always a property of a system. Mittleton-Kelly [33] emphasizes that complexity enriches traditional systems theory by amplifying additional characteristics of complex systems and by stressing their *inter-relationship* and *interdependence*. It has also been pointed out that complexity may be a main feature of the humanity [29]. In organizational research, complexity has increased its popularity during the past decade. However, there has not been an agreement on how this concept should be applied in organizational context (see e.g. Luhmann [25] & [26], Kauffman [19], Mingers [31], Holland [15] & [16], Mittleton-Kelly [32] & [33], Stähle [42], Anderson [1], Maula [28] & [29]).

Mittleton-Kelly [33] has aggregated ten *generic characteristics* or principles concerning complexity. They are self-organisation, emergence, connectivity, interdependence, feedback, far from equilibrium, space of possibilities, co-evolution and historicity as well as time and path-dependence. It should be noted that the complexity does not comprise a single, unified theory but rather a family of theories, arising from the fields of biology, physics, chemistry, computer simulation, evolution and mathematics [33]. The recognition that organizations are complex adaptive systems allows us to learn more about organizational dynamics [23].

In this paper, complexity is used as a framework to help understand the behaviour of a complex social system, particularly municipality and the preparation phase of decision-making. From the point of view of the municipal decision-making relevant complexity concepts are discussed more detail in chapter 3.2.

A. The preparation of the decision-making

Based on the conceptual analysis, it can be said that there is no single way to define the preparation of decision-making in the local government level [18]. On the one hand, it has been described as formation of the intent of the municipality [14]. On the other hand, it can be understood as the manifestation of the decision-making efficiency [13]. Publicly expressed, the objective is to ensure that decision-makers have adequate

basic information about the matters under consideration. Some forms of interactions are more *organized* than others. For example, the municipal executive board is responsible for preparatory work on matters coming before the municipal council. In addition, local authorities provide members of the municipality with information on current issues in process, or plans affecting them, their progress, decisions reached and their effects. Inhabitants of municipality are also encouraged to express their views to those in charge of planning and decisions. Moreover, inhabitants of the municipality have right to propose initiatives in municipal issues. On the other hand, there are number of interactions which are *unorganized* in nature. In town planning, for example, there may be strong interests outside the official decision-making process which may exert significant influence on decisions, without any responsibilities [34]. Furthermore, there is evidence that many de facto decisions are already made by informal institutions, in which case the formal decision-making procedures are needed for legitimacy [35]. This is consistent with Brunsson’s observation, that the decision process can be legitimized by the illusion that it is concerned with a choice [3].

The conceptual analysis [18] strongly validates the presuppositions that the preparation of the decision-making consists of multiple interrelationships both within the local government and between administration and inhabitants of a municipality (see Figure 2).

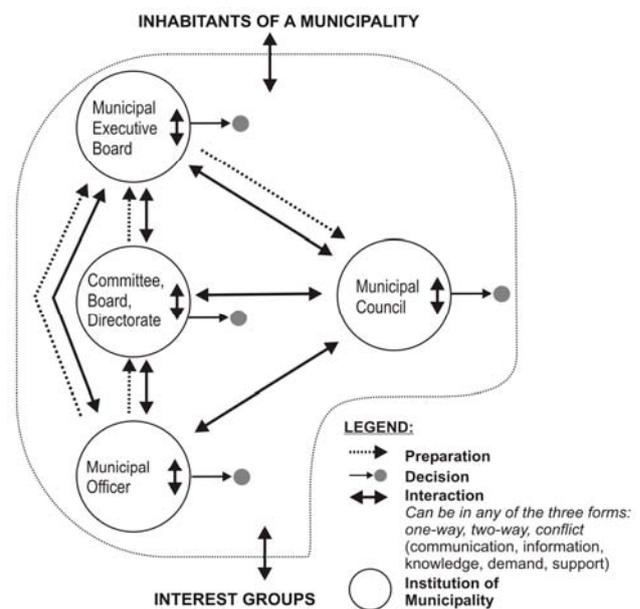


Figure 2. Finnish municipal preparation and decision-making process (Jalonen [18]).

These interrelationships can be based either on trust and cooperation or on competition and conflict. As noted before, there are increasingly number of societal problems that requires co-operation within local government and between local government and other stakeholders. A local industrial policy in the pressure of globalization, and health and social questions including the problems of ageing, among other things, are such areas where the need for cooperation is perhaps greater than ever before. However, policy-making has been a frequent source of conflict for local governments. For example, common issues such as town planning and public services to citizens, engenders conflicts between politicians who represents different interests.

Furthermore, the findings of the analysis are in line with public opinion, whereby de facto decisions are made already in the preparation phase and the formal decision-making procedures are needed for legitimacy. It could be said that the preparation and decision-making are blended each other.

Due to the numerous feedback processes and connections, the municipal preparation of decision-making has no *definable boundaries*. Indeed, it is almost impossible to evaluate the participants' influence. For example, in town planning there might be strong interests outside official preparation process, which may have a significant influence on decisions, without any responsibilities [34].

B. The preparation of decision-making as a manifestation of complexity

Based on the conceptual analysis, it seems that the preparation of decisions contains at least some elements of a complex system. For example, it could be said that the preparation is more or less boundless. It consists of feedback processes, the actors are connected each other, and there are emergent phenomena which make the preparation process to a certain extent unpredictable. Stacey [44] points out that complex systems consists of unforeseen contingencies, non-linear causalities and inconsistency behaviour. Complex systems can be described as something that cannot be foreseen from what is known of the component parts. Instead, the interaction of the individual components emerges some kind of aggregate property [23]. A relation between the parts and the whole is depicted in Figure 3.

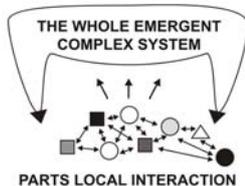


Figure 3. Emergence in complex systems (adapted Sotarauta 1997; originally Lewin 1993).

Emergence is the process that creates new order together with *self-organisation* [33]. In the context of municipal decision-making, self-organisation and emergence requires that the preparation system is capable to produce and to reduce entropy. Stähle [43] has described the self-organisation as a chain: the production of entropy; disequilibrium or chaos; the reduction of entropy and finally new organisation.

In social systems, the entropy generally refers to information. Information has been appreciated as a significant factor in systems change processes (see Figure 4.)

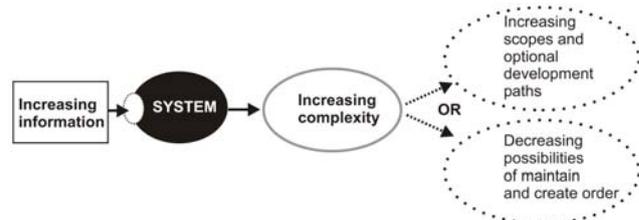


Figure 4. Information and change of system (adapted Keskinen [20]).

The researchers in the field point out the problem is that individuals often evaluate new information on the basis of their existing knowledge and mental models [43]. In the political context, the new information might be considered as a threat by politicians and officeholders. For example, Harju [12] has find out that in the context of municipal decision-making the new information is not appreciated as a valuable part of the process, but rather as an obstacle to effective decision-making. The risk is that decision-making is based only on information which reasserts the old power structures, and that the preparation process fails to guarantee the necessary diversity. Lacking diversity of the preparation might inhibit identifying changes in the environment. For example, it can be claimed that looking for *weak signals* requires rich interaction and communication between the actors in the decision-making process (see more on weak signals e.g. Mannermaa [27]).

In a human system, *connectivity* and *interdependence* mean that a decision or action by any individual may affect related individuals and systems [33]. Moreover, in order to be effective, there should be effective *feedback* processes [43]. Mitleton-Kelly [33] puts that positive feedback drives change, while negative feedback maintains stability in a system. When applied to human interactions, feedback means impact that changes potential action and behaviour [33].

The connectivity, the interdependencies and the feedback processes of the preparation process are documented in Figure 2. Based on conceptual analysis, it seems clear that, there are two kinds of feedback processes. On the one hand, the aim of preparation is to facilitate a *convergence* of (conflicting) interests (negative feedback). On the other hand,

the purpose might be to *diversify* the preparation process (positive feedback). The divergence and the convergence are depicted in Figure 5.

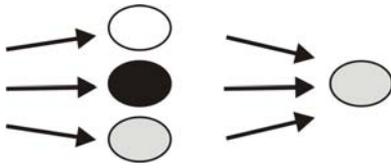


Figure 5. Divergence and convergence (adapted Maula [28] originally Arthur Andersen 1999).

In the preparation of decision-making, divergence can be seen as an imperative condition in order to be innovative and to create new knowledge. Respectively, convergence is closely related to the effectiveness of the process.

The feedback processes can be also considered from the view point of the chaos theory. A system, which exchanges information with the environment, is constantly at the *edge of chaos* or *far from equilibrium* [33]. In social systems “far-from-equilibrium” means that there are conflicting interests which create tensions in the system [43].

There is also the so-called *bifurcation point*, some kind of ‘moment of truth’ where the system has various options. Ståhle [43] describes these bifurcation points as zones between determinism and free choice. When a social entity is faced with a bifurcation point, it endows the entity with *space of possibilities* [33].

At the bifurcation point, the system discards a measure of information in order to build new order [43]. Therefore, the bifurcation can be seen as a source of innovation. According to Mitleton-Kelly [33], the alternatives at the bifurcation point “are sources of innovation and diversification, since the opening up of possibilities endows the individual and the system with new solutions.” This is what is depicted in Figure 4 and in Figure 6.

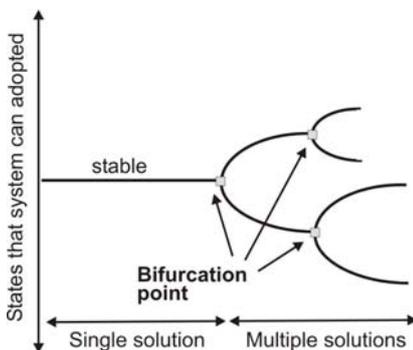


Figure 6. Bifurcation (adapted Mitleton-Kelly 2003).

In the municipal decision-making process, there are also bifurcation points, which determine a particular life path for that process. On the basis of the conceptual analysis, there is strong evidence that in order to exploit opening possibilities, there must be an atmosphere of confidence based on communication intensity (see e.g. Harisalo & Stenvall [11]). This is also consistent with the basic concepts of Luhmann [26], who argues that the self-organisation of social system is based on communication and trust between constituents.

C. Complexity and the information technology

According to Geiselhart [10] the studies of information technology in government have focused on the instrumental outcomes, i.e., the efficiency of information provision and service delivery. There is also strong evidence that, e.g. practical efforts for increasing computer-based communication have been concentrated on strengthening existing structures and one-way communication [37]. So far, it has been a myth that technology stimulates democracy. These research findings are compatible with the presumptions of representative democracy.

However, the focus should be on how computer-based information and communication technologies might be integrated into administrative processes to ensure effectiveness, participation, resilience and legitimacy [9]. Geiselhart [10] suggest that information technology has the potential to repluralise democratic policy. Klijn & Koppenjan [21] argues that in the post-modern era the most challenging demand for the local authorities is to develop more communicative and interactive decision procedures. Moreover, Kooiman [22] points out that traditional approaches in modern societies “neglect diversity, do not cope with dynamics and unsatisfactorily reduce complexity.”

Seen from the complexity view, information technology is an emergent phenomenon which opens up new channels of communications and increase the connectivity and the interdependencies of the preparation process.

Interactive systems such as computer-based communication are also feedback systems, and hence they can generate surprises even while showing identifiable patterns. Complexity theory emphasizes that “rather than suppressing the resulting disorder and instability as undesirable risks, these processes can be accepted as inherent in all forms of evolution, adaptation and renewal” [10].

Even though it has been argued that administrative decision-making is based on formal knowledge (i.e., fact), Simon (1957) has already stressed that overly strict division into policy and administration represents an oversimplification, because it would be difficult to distinguish reason from values in the decision process [39]. In other words, political and administrative decisions are based on the best information and sound reasoning as well as

values, opinions and emotions. Therefore the big question concerns how information technology facilitates not just rational deliberation but also creates and communicates moral principles in addition to expressing personal and group values [7]

Information technology amplifies complexity and the connectivity of the preparation process. The resulting 'messiness' should be regarded not only as natural, but crucial for the survival of the preparation system. The objective should be to conjoin environmental complexity with organizational complexity [2].

IV. CONCLUSIONS

In the context of local government, complexity arises at least from problems concerning the integration of complex information from a variety of sources, imperfect or incomplete information, the presence of uncertainty and complex interaction between the politicians and officeholders.

This paper has concentrated on the challenges facing the preparation phase of municipal decision-making. Its description is based on a complex social system, which implies that more attention should be paid to the *invisible dynamics of preparation*. In particular, the research should focus on the interactions and interrelationships between politicians and officeholders. According to the complexity theories, even rather small matters may generate large and irreversible impact on the preparation process. Respectively, the preparation process could be immune to specific planning. This means that the preparation process may benefit from diversity, connectivity, the exchange of information, flexibility and the utilization of emerging information as an input. On the other hand, a preparation process that, detail-wise, is carefully planned beforehand may be a vulnerable one.

One proposed solution to the dilemma of *effectiveness* and *creativity* is outlined in this paper. It is that conflicting interests in the preparation process should not be damned as the barriers of the effective activity. Instead, they should be seen as triggers or tensions which activate interactions between the actors of the process. Actually, it may be claimed that the more dynamic the environment, the more a *need for communication* exists within the preparation process and between the process and its environment. In other words, the focus should be on both *the parts* and *the whole* (see Figure 4). In finding a balance between the convergence (negative feedback) and the divergence (positive feedback), the municipality might be one step closer to reconciliation of the values of effectiveness and creativity.

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