Toward Development of a Substantive Theory of

Public Sector Organizational Innovation

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Abstract

Using a grounded theory method, this paper outlines the process followed and progress to date in developing concepts, their properties and theories of public sector organization innovation. I have developed the concepts of PSO innovation, innovation patterns, capacity for fitness, fitness, and survival. While the use of evolutionary concepts like fitness and survival seems intuitively helpful to understanding change in PSOs, the relationships being described are complex: complex adaptive systems like patterns are also needed. I created and adopted concepts, properties and definitions; their current state of development is reviewed here, in order to capture the insights created. The learning processes employed to arrive at the concepts are also identified. I hope that the reader will develop a better understanding of the concepts and their relationships by understanding the processes and experiences that led to them.

Keywords: adaptive, evolution, fitness, grounded theory (substantive and formal theories), innovation, organizational change, public sector

Toward Development of Theory of Public Service Organizational Innovation & **Change**

For many years now, I have been intimately involved in public sector innovation (PSO) in Candara: for eight years I participated in the most innovative government in Canada until that time working in for seven pubic and private employers and later for a fifth government, and a national non-profit; I also read everything I could find on other public sector organization.   This paper summarizes my experience, research, and ideas about PSO innovation (see Glaser and Strauss, 1967 on the role of experience as the source of significant theorizing).

My interest in change originates in my childhood experience of alternatedly living in on a farm and a city although initially my interest in change expressed itself as an interest in politics, then as the academic study of changes of regime, once I joined the public service, my interest in substantive change shifted to an interest in PSO innovation. In total I worked for five governments, at the municipal (2), provincial (2), and federal government level, nine departments and a non-profit organization (NPO). I was also attended national and international public administration conferences, including several innovation award conferences which allowed me to compare the content, approaches, commitment, success and cultures of different ministries and governments in implementing change.

During this period, I began research and publishing focusing on PSO innovation processes, and the character of innovative governments over time (see, e.g., Glor, 1997, 1998a, 2000, 2007). Most recently I've been investigating PSO innovation patterns in terms of complex adaptive systems (CAS) asking in particularly whether what is true for innovations is true for organizational change in general, indeed, even for normal organizational functioning.

Grounded Theory Method

Grounded theory method (GTM) (Glaser and Strauss, 1967; Denzin and Lincoln, 2000; Lindlof and Taylor, 1995; Strauss and Corbin, 1998) is inductively developed theory, based on the observation of concrete examples of the phenomena being studied, their comparison and contrast with other examples, and the identification of concepts and their properties from generalizing out of the examples. Moreover, different phenomena from other environments are compared/contrasted. One of the strengths of grounded theory derives from it being based on real phenomena. In contrast, deductive theory builds assumptions tested against representative samples of real phenomena.   Grounded theory produces relevant theoretical abstractions for the areas studied; what must be demonstrated is the application of these abstractions to any further classes of data. The uncovered theoretical categories continue to have cogency on until proven theoretically defunct for its class of data. Also, the evidence which suggested any particular category may be accurate for much shorter periods than the concepts themselves (Glaser and Strauss, 1967: 23-24, 36). It is only once the theory and hypotheses have been developed, that deductive methods can be used to test them. As much is verified as possible, but not to the point where verification curbs generation. By keeping theory building the priority focus, the two critiques inaccurate evidence and unverified hypotheses can be avoided (Glaser and Strauss, 1967: 28). That is, theory can be continually modified by further evidence and more testing.

Grounded theory can be used to build both substantive and formal theory. S*ubstantive the*ory builds generalizations on observation of a substantive (or empirical) area such as patient care, race relations, professional education, research organizations, or, in this case, PSO innovation. *Formal theory*, on the other hand, is built for a formal or conceptual area in the field (e.g. public administration) on the comparative analysis of different kinds of substantive cases and is developed for a formal or conceptual area such as the study of socialization, authority and power, reward systems or, in this case organizational

change. Substantive theory can be used to develop formal theory. The phenomena of dying, for example, is a substantive area and a substantive theory of this phenomenon is built from analysis within or among groups within the same substantive area. For example, the study of hospital wards where patients died at different rates could reveal substantive theory about dying. Substantive theory about dying was also generated by comparing dying as a rite of passage with other rites of passage such as becoming a student or engagement for marriage. The study of status passage in general then would produce formal theory, not substantive theory. My work on PSO innovation is thus about developing substantive theory whereas my work on organizational change in general is about developing formal theory. Both substantive and formal theory are middle-range theories, as compared to either "minor working hypotheses" of everyday life or "all-inclusive grand theories." (Glaser and Strauss, 1967: 32-33).

Developing grounded theory requires theoretical sampling, not random sampling. An adequate theoretical sample requires widely and diversely chosen groups. Theoretical sampling is based on saturation of categories, that is, when no further data is being found whereby the properties of the category would change. Theoretical sampling requires many different vantage points or kinds of data in order to reveal the needed social-structural information (Glaser and Strauss, 1967: 61-67). To develop substantive theory, a researcher can select groups as s/he finds them while to develop formal theory requires the selection of dissimilar groups from a larger class. Here a distinction is made between the substantive level and the conceptual level. Groups can seem dissimilar on a substantive level yet be comparable on a conceptual level, e.g. fire departments and emergency services. The researcher chooses dissimilar substantive groups from the larger class in order to generalize a theory.

By producing theory based on real experiences, the grounded theory method overcomes two of the weaknesses of a strictly logico-deductive theory which typically attempts to apply existing theories developed from one substantive areas to new areas. While the fit between assumptions or hypotheses and the reality being studied is often not perfect in logico-deductive analyses, the fit between substantive theory and reality is perfect, since the theory is built from experience in the substantive area being studied. Because of this, even if parts of a substantive theory are later disproven, the theory as a whole may not necessarily be disproven. This is not true of a logico-deductive theory where if any part of the theory is disproven, the whole theory is disproven. It is thus harder to disprove a substantive theory than a deductive theory. Others' theories and experience are of interest but should not be allowed to stifle insights generated by qualitative data. Categories can be borrowed from existing theory, so long as the data is studied to be sure the categories fit.

Nonetheless, the generation of theory puts a premium on emergent conceptualizations. The major effort should not be devoted to data selection but to theory generation. A focus on the emergence of categories solves problems of fit, relevance, forcing and richness. Other theories are more useful at the formal theory level. The inverse is true as well—emergent substantive theory is not necessarily applicable to other areas (Glaser and Strauss, 1967: 33, 37, 41, 253).

Substantive theories should be developed first from the data, and then formal theories should be considered. Considering formal theory first can lead to the forcing of data and neglect of relevant concepts and hypotheses. This means the researcher cannot apply preset categories immediately, but must develop substantive theory first, then see if others' categories are linked to the emergent substantive theory. Developing substantive theory is a design for cumulative knowledge and theory. This leads to multiple theories, while logico-dedeuctive theory leads to premature parsimony (Glaser and Strauss, 1967: 34-5).

The elements of a theory are conceptual categories, their conceptual properties, hypotheses or generalizable relations among the categories, and their properties. A property is a conceptual element of an

aspect of a category. Grounded theory is presented either as a set of propositions or as a running theoretical discussion that uses conceptual categories and their properties. The form of the theory is not what makes it theory; rather, a theory predicts something. The discussion form is in fact richer, denser, and more complex. Propositions tend to reduce these characteristics, but they are useful in directing theoretical sampling (Glaser and Strauss, 1967: 31-32). The current study identifies a substantive theory of innovation as well as the beginnings of the development of a formal theory of change in PSOs.

Steps in Developing Grounded Theory of PSO Innovation and Change

My initial steps in the development of a grounded theory of PSO innovation involved the development of grounded knowledge of the phenomenon being studied. The term *public sector* should be read to include "Crown" corporations (corporations owned by governments). My learning experiences are outlined in the intention that it indicates sufficient knowledge and experience of innovation in Canadian PSOs to make appropriate comparisons and to identify accurately PSO innovation and change concepts, properties, theories and hypotheses.

Grounded Knowledge. This knowledge based was acquired by several experiential periods of my life. First, as a student I worked in two factories where the employees were not particularly intrinsically motivated but worked hard. An efficiency study was conducted while I worked there. I also worked as a consultant in the private sector. I studied political science, European and Asian history, political theory, social and political change, and research methods. Next, I worked for a national but internationally-oriented non-profit organization. Following that I worked for the City of Edmonton, the Ontario government for a national ministerial committee and for a Royal Commission on post-secondary education planning, the Regional Municipality of York, the Saskatchewan government, and the federal government. A regional municipality is a government providing services to several (six or eight) municipalities. In Canada, a decentralized federation, responsibility for providing most public services is lodged constitutionally with the provincial governments.

Regional and municipal governments are legal creations of the provincial governments and restricted in their capacity to tax. Municipal governments are therefore accountable both to a higher level of government and to the local people who elect them. The Region of York was one of only two regions in the province of Ontario that included health and social components in their provincially-required official plans, new planning tools in the 1970s. Top officials of both the Ontario government and York Region thought they were innovative at that time. For example, I worked on two innovative initiatives related to post-secondary education: a proposal for a major expansion of the Canada Student Loan Program and a Commission responsible for reviewing post-secondary education availability and programs in the province.

Comparison Groups. I therefore have studied innovation in the private, non-profit, and public sector, indeed eight years for one of the most innovative Canadian provincial governments at that time, the Government of Saskatchewan (Sask.). I had the opportunity to observe both the normal functioning of its management and the government and the development of people, innovations and change across the government. Changes and new initiatives required separate policy and budgetary approval in Sask. Innovation and change were looked on positively. My background permitted me to compare the programs, operations and changes with those of my previous employers and later with other organizations including the federal government. As I said to a colleague in 1980, "Someone should write a book about this government, it is so innovative." At the same time, I was influenced by Seymour Martin Lipset's *Agrarian Socialism*, about the earlier Tommy Douglas government of Saskatchewan. Sask. had been the first jurisdiction in North America to introduce publicly insured hospital care, and later, medical care insurance, which then became the model adopted by the federal government for the national programs. My role was to

implement four innovative preventive health demonstration projects that addressed the needs of four high risk groups—Aboriginal women, women at risk of having small babies, poor seniors, and children and youth at risk of accidents. I then moved to the federal government in its capacity as the primary oil producer in Canada, specifically in the departments of Energy, Mines and Resources, Health Canada, Industry Canada and the Public Health agency of Canada as well as three central agencies, Treasury Board, the Public Service Commission and the Canadian Centre for Management Development.

At the public servant level, the Government of Canada (GoC) approached innovation differently than the other four regional governments, focussing at a policy level on dissemination of innovation among the provincial and territorial governments, and at the federal government level on managerial innovation. The federal government felt more authoritarian and rule-driven in the way it made decisions compared to the other governments, although there were exceptions within some units in some departments. The federal, Ontario and York Region governments was more directly political than the Sask. government which, however, seemed more deliberately rational in its decision making. It was also more successful at carrying innovations through to implementation. Sask. was quite bottom-up in its functioning as it sought public, political party and public servant input to its decisions. The Premier regularly sought other opinions including an annual one-week tour in the province. The Premier eventually became preoccupied with constitutional negotiations, and the government lost its close connection with the population. Indeed, it was defeated at the next election.

I compared innovations, innovation management, policies, programs and management practices across departments and across the five governments for which I worked. I also looked at the differences in the patterns of award recognition over time, and saw that large governments were recognized more than small ones, some governments more than others. I also noticed how ideology played an important role in choice of innovations and recognition, and that the ideological shift of the 1980s was reflected in the innovations that were introduced and honoured. Award programs were also subject to change and seemed to consider innovation as a rather primitive concept.[1]

I concluded, despite the various interventions, that some governments were more innovative than others, on both quantitative and qualitative levels. The eleven-year Blakeney Government of Sask. introduced 126 policy and program innovations (Glor, 1997: 10-19), and 34 operational innovations (Author, 2000: 143-144). Innovation was defined as first, second or third time an innovation was introduced in North America. These 160 innovations were compared to the results and issues raised in the literature on innovation and in innovation awards, especially the IPAC innovation award, which covered all Canadian governments and the Ford Foundation—Harvard University innovations in American government award (Glor, 1998b). The conceptual levels addressed and scope of study are identified in Appendix 1, and further work that is needed is outlined in Appendix 2.

I think it is important to point out that I worked on employee empowerment and top-down versus bottom-up management (Glor, 2001c), ethics and generations in the workplace (2001d), organizational innovation patterns (2001a, b), continuous quality improvement programs, and analyzed the results of employee surveys in Canada and the USA (Glor, 2001a).[2]

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[1] Bacharach and Lawler (1980: 13-14) distinguished two types of concepts: primitive and derived. Primitive concepts are less specific and more abstract, while derived concepts have a lower level of abstraction. The value of primitive terms is largely heuristic; they sensitize people to an issue (Bacharach and Lawler, 1980: 12-14).

[2] The comparisons I made have been prepared in a table that is too lengthy for a journal article. If the reader is interested, please contact me for a copy, referring to it as Table 3.

Conceptual Categories and Their Properties

Based on my experiences, reading, thinking, discussions (I held 65 Innovation Salons) and studies of PSO innovation, in this section I lay out conceptual categories, their properties, theories and hypothesis discovered and processes followed using a grounded theory method to develop grounded, substantive theory of PSO innovation. Elsewhere I have extended this to discuss a formal theory of organizational change (Author, 2008a). I identify concepts and properties for PSO innovation and its patterns, and interrelate innovation patterns with their organizational adaptability, communications, capacity for fitness, fitness, implementation challenges, and survival. I conclude this section by identifying work that still needs to be done on these theories.

What are organizations? This is not an easy question to answer—I identified organizations at many organizational levels. McKelvey (1982a, b) has suggested this is correct but did not identify the levels. I therefore used an amalgam of three existing definitions, and operationalized it. According to Van de Ven and Poole (2005), organizations are social entities or structures that retain their identity while changing from one state to another. Aldrich and Ruef (2006: 4) define organizations as socially constructed systems of human activities that are boundary-maintaining and goal-directed. The Resilience Alliance identifies retention of function, structure, and identity as key to resilience, three functions that closely parallel the criteria for organizations set out by Aldrich and Ruef. Neither Van de Ven and Poole nor Aldrich and Ruef nor the Resilience Alliance agree on the meaning of their terms, however. Nevertheless, I identified criteria and indicators for the concepts of PSO function, structure and identity.

What is PSO innovation? The definition of innovation in innovation award databases, including innovation award nominees, winners, and those receiving honourable mentions, was ambiguous. It may have meant at best, for example, the first time something was introduced in the organization being studied (at any level). I sometimes thought it also might have meant being in the forefront of introducing a new ideology (New Public Management) in a PSO or being a promoter of innovation (there is an innovation bias in innovation awards). This ambiguity led to the same/related/types of innovations and processes being acknowledged repeatedly, in different departments (ministries), governments, and ward programs (Canadian, American, CAPPAM, UN, international Ford Foundation awards). In my studies of Sask., innovation was defined as the first, second or third time a new policy, program, or process was introduced in a government in North America.

Organizational Evolution. In the Darwinian concept of evolution individual living organisms do not evolve, as evolution is structural and occurs with genetic change. Only populations (species) evolve, in patterns, which form the basis for the biological classification system. Living organisms are only involved at two levels of the biological classification system, that of the individual organism and of the species. Above that level, the classification system is based on patterns and concepts only (McKelvey, 1982a, b). Given the Darwinian model of evolution and the relationships in the biological evolutionary classification system, how can the concept of evolution be applied to innovation in organizations? In the private sector organizational populations are sometimes defined as clusters or industries (Niosi, 2000), in the public sector this does not apply. Although I considered calling a department (ministry) the species, and federal, provincial and municipal governments the family, I decided to address innovation populations as *patterns*.

Innovation Patterns. Fundamental to the notion of PSOs being able to change or evolve is the core

concept that they change their patterns. Certain dynamics and types of dynamics kept being mentioned and coming up in relation to innovation: three primary areas—individuals, social dynamics and implementation—and three core conceptual categories (called factors) for PSO innovation—employee motivation, organizational culture and the challenge of implementing an innovation. Like organisms, individual humans do not change genetically over time, but they are capable of some change of what I called their intrinsic and extrinsic motivation. Like values, however, an individual's motivations do not change a great deal over time, once they are socialized. Organizational culture can change; for example, in relation to the organizational and external environment or because of changes in leadership style. Because social dynamics have both unconscious and conscious (deliberate, will-based) aspects, they can be difficult to study and to change, but they do not seem to have some equivalence to genetics. I labelled the social dynamics as top-down and bottom-up organizational cultures. The challenges an organization faces and its willingness to risk in order to implement an innovation also change sometimes, and are affected, for example, by political leadership and ideology. PSOs may also function in an organizational pattern the rest of the time, not just when innovating or changing, but this issue I have not addressed in depth; the concept of organizational pattern has only been generalized from the level of innovation to the level of change. There were differences in the patterns of functioning among the organizations I observed: Some individuals and groups of individuals were highly motivated to introduce innovation, others were not. Some organizations were clearly top-down in their functioning, others were more bottom-up. Some innovations were hard to implement while others were not or management, ministers or citizens eased the way.

I concluded that there are innovation patterns formed by these factors developing a grid that systematically represented all the possibilities. I then readily found examples of these eight patterns, with a couple of exceptions. I named these eight innovation patterns imposed, reactive, active, buy-in, pro-active, necessary, transformational and continuous change (Glor, 2001c). Although I came to these patterns through PSO innovation, it is obvious that these patterns can be found in organizations that are changing more generally (not just in organizations that are innovating), and probably can also be found the rest of the time as well in organizations as they perform their day-to-day functions. Organizations have, in other words, ways or patterns of doing things, some of which are identified in Figure 1.

This settled in my mind into three core kinds of issues, involving the impact of individuals, groups, and challenges of implementation at work in organizations. The role of individuals was important, as was that of decision-makers. The group—or social—dynamic existed at several levels throughout the organization, and a number of groups and individuals had to agree with the innovation for it to be created, implemented, and succeed. Management style was an important part of the social factor. Finally, the innovation had to be implemented and stay implemented. Even when successful, innovations were vulnerable to abolition (Pollitt, Bouckaert and Löffler, 2006: 4).

From the observation that governments functioned in patterns in relation to innovation, and the interaction of these three factors in organizations, I developed a theory that organizational innovation patterns are a function of the interaction of three complex factors: motivation; organizational culture; and the challenge of implementation of an innovation (Glor, 2001b, c). I identified properties and criteria for these factors contributing to the innovation patterns (Glor, 2001b). The individual contributes one of two possible properties, extrinsic or intrinsic motivation. The social is often an unconscious contributor within organizations, condensed into top-down and bottom-up properties. The challenge of implementation has been reduced to major and minor challenges (Glor, 2001b). Certain behaviours tend to go with these patterns.

Figure 1: Innovation Patterns, Based on Source of Motivation, Organizational Culture and Magnitude of Challenge
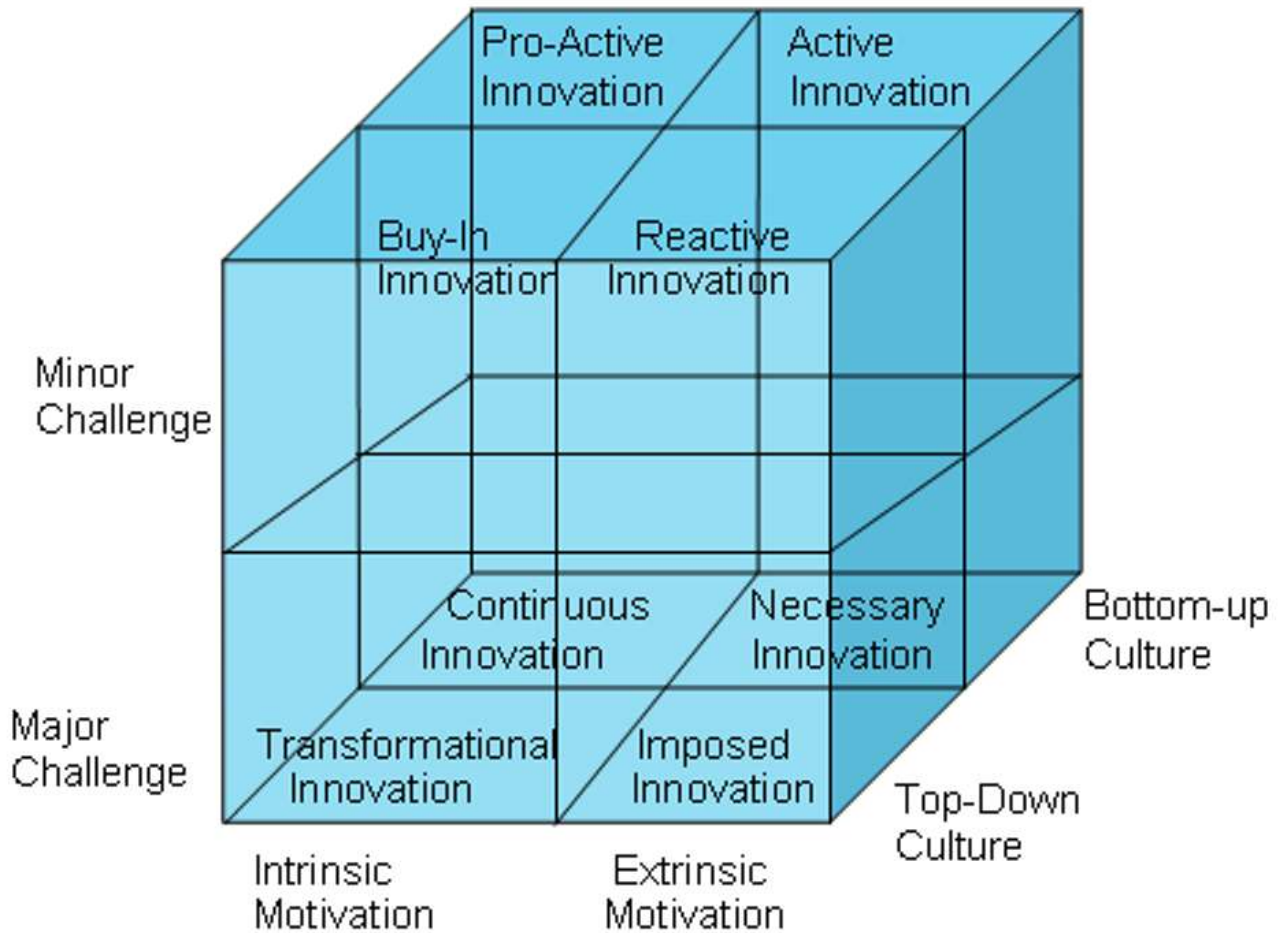
Impacts of Innovations. Next, I considered the impact of innovations on their PSOs and their patterns. The conceptual categories of organizational innovation patterns emphasize the consistencies in the way organizations behave, and could potentially be applied to compatabilities in broader organizational behaviour because these patterns of behaviour would then at least partially determine how organizations change or evolve. That possibility is not addressed here. The interaction of the three factors to form eight innovation patterns is visualized as a cube in which all patterns have some commonalities/share some factors/sides with others (Figure 1). While patterns have commonalities, they also have differences.

Differences in innovative behaviour among governments can also be seen in part as differences in entrenched patterns or, as Richardson (2008: 15) put it, we can regard organizations as a collection of interacting departments rather than a collection of individual people. I actively searched for examples of the missing patterns and more differences in the way PSO innovated. This search was successful, but it was more difficult to find PSOs with bottom-up management styles than with top-down ones. Although I feared this work fleshing out the examples might have introduced a logico-deductive element to the study, Glaser and Strauss (1967: 93) confirmed that it is acceptable to do final searches for specific confirmation. Likewise, I was aware of these case studies long before I developed the classification system for

organizational patterns. Moreover, the patterns were confirmed in use during workshops with public servants, who were excited by the patterns, and found them intuitively and sometimes actually useful since they could identify these patterns in their PSOs and private sector organizations. Their ability to apply the patterns to private sector organizations indicated this avenue is worth pursuing.

Following this examination of public sector innovations and the development of these concepts and properties of public sector innovation patterns, I realized that the factors that had been identified as determining PSO *innovation patterns* were in no fundamental way different from those determining public sector *change patterns.* Organizations could and did *change* in patterns. The concept of innovation patterns therefore broadened to the idea of (1) *PSO change patterns*. An open question is whether these patterns could be applied even more generally to (2) *organizational change* patterns, and perhaps even (3) *organizational functioning* generally.

I became convinced that the three core influences at work in organizations—the individual motivation, organizational culture and challenge—interact and form *organizational innovation patterns* that endure over time. The bottom line is, the patterns affect how organizations evolve: "…these supposed abstractions can interact with the parts from which they emerged—a process known as *downward causation*" (Richardson, 2008: 15).

Impacts of Innovation and Innovation Patterns on Organizational Adaptation, Fitness and Survival . Another major factor in how organizations evolve relates to their external environment. How successfully organizations deal with their environment is expressed by the concept of *fitness,* an evolutionary term that is frequently used but rarely examined. It is used in both relative and absolute senses, thereby linking change to a positive notion of adaptability, changeability or resilience, and suggesting as well that there could be unfit organizations that do not adapt or change sufficiently and that are not resilient. The impact of fitness is organizational survival. Innovation (and change) leads to an objective (adaptation), which helps achieve a potential (capacity for fitness), a comparative state (fitness) and an outcome (survival).

"Fit" is thus used in three different ways as: (1) organizations exhibiting certain characteristics that create the potential or *capacity for fitness*; (2) *fit* within a fitness landscape, that is, as fit in comparison with challenges or in competition with other organizations; and (3) demonstrably or absolutely fit if the organizations *survive* and not fit if they die. The concepts of capacity for fitness and fitness are relative and comparative but the concept of survival is absolute. Relative fitness can continue for some time, but the concept of survival is tied to a specific point in time when the organization has either survived or not. The concepts of capacity for fitness and fitness are prospective and can be ongoing; the concept of survival is necessarily retrospective—a change must already have occurred for a judgment to be made about whether it survived.

Fitness I conceive as the capacity for fitness (adaptation and communication) combined with the capacity to overcome challenges. These three important factors—adaptability, communication and the capacity to overcome challenges—are related as follows. Organizational *adaptability* is an emergent phenomenon. It requires sufficient variety, reactivity and self-organized emergence to allow a pattern or organization to adapt. Using complex adaptive systems concepts and methods developed by Stuart Kauffman (1995) and Rogers *et. al.* (2005), I identified criteria for variety, reactivity and self-organized emergence and ideas for measuring them and their result, adaptability (Glor, 2001b, 2007a, b). Using these criteria, the organizational innovation/change patterns (Glor, 2007a) and eight organizations functioning in those patterns (Glor, 2008b) were assessed for adaptability. Some of the innovation/organizational patterns

were found to be more adaptable than others (Glor, 2007a). Because they were scored they could also be ranked.

In Darwinian evolution, only species evolve, not individual plants and animals, which only change genetically, from one generation to the next. Both individual organizations and the patterns were assessed because of the level at which evolution occurs, to determine the levels of conceptual generality (Glaser and Strauss, 1967). Organizational patterns evolve, but organizations also have some capacity to change. To develop an understanding of evolution of organizational patterns and organizations required, however, some additional conceptual elements.

A second necessary element in organization and pattern change is the capacity to *communicate* or at least receive feedback from both the external and the internal environment of the organization or pattern. I identified two types of feedback loops (Glor, 2007b). Self-balancing (negative) feedback loops tell the organization to remain the same and to do more of the same. This is a common message for an organization, given that its purpose is conservative according to Van de Ven and Poole (2005) and Aldrich and Ruef (2006: 4). Self-reinforcing (positive) feedback loops tell the organization to move in the opposite direction (Capra, 1996). The concept of self-balancing and self-reinforcing feedback loops is used for electrical circuits in machines, and presumably should be nuanced in organizations. Organizational communication must occur with the external environment and also internally with members of the organization (Glor, 2001b, 2007a, b).

Capacity for fitness is a combined organizational capacity both to adapt and to communicate internally within the organization and externally with the environment. Kauffman's (1995) definition of adaptability is used which defines adaptability as emerging in nature from a high level of complexity.

The third necessary element is the ability to overcome *challenges* in order to implement changes. Even if an organization has a capacity for fitness, the *magnitude of challenge* it faces may support or undermine its fitness. *Degrees of change* define the types of action and the difficulty of the action the organization must accomplish (Poole et.al., 2000:5). Challenge is linked to the magnitude of the change required of the organization, based on Aldrich and Ruef's (2006:4) definition of the three fundamental aspects of organizations as maintenance of socially constructed activities, boundaries and goals. Organizational change is change in these three fundamental aspects. The capacity for fitness combined with the capacity to overcome challenges (obstacles) involved in implementation of changes produces *fitness.* In keeping with Dooley (2004), the capacity to introduce high orders of change is considered a positive indication of fitness. This is not a judgment that major challenge is a good thing but a recognition that an organization that meets challenges is more fit, but only up to a point.

These three types of maintenance in organizations are not all equally challenging. The concept of orders of change was developed by others (Watzlawick, Weakland, Fisch, 1974; Meyer, Goes and Brooks, 1993) and initially by me at two levels. First order change was change within a given system which itself remains unchanged, while second order change modified the system itself; second order change was thus more fundamental or strategic (Wilson, 1992) than first order change. First order change could involve changes in activities, structure or goals. I have come to see the three types of change as a hierarchy. To keep the distinction clear, I began to call them degrees rather than orders of change. The least challenging type of change for an organization is a change in activities or processes (what is done and how it is done). The next most challenging type of change relates to organizational infrastructure. This could be, for example, abolition of a unit, a departmental reorganization or a shift from the public to the private or non-government organization (NGO) sector, or vice versa, as long as the goals did not change. Changes in goals and thus possibly identity are the most challenging type of change for a PSO. Goals are about the

objectives of the work, who should do it, what should be done and what should be accomplished. Goals involve both the beliefs and the identity of the people who work in the organization and who makes decisions about it. Global governance accountabilities are important to goals. While a change from the public to the NGO sector may be second degree change, a shift from the public to the private sector probably implies a third degree change.

Changes in the three levels of challenge have another kind of impact on organizations: first degree change relates to activities, which serve to differentiate within the organization; second degree change relates to structure and infrastructure, which serve to differentiate; but third degree change, related to functions and identity, can interfere with the integration function in the organization. While Michaels (2000) identified structure as the most important factor, I think the most important factor in PSOs has to do with goals/identity. These three degrees of change I operationalized as activities, changing ontogeny (structure), and changing identity (goals). It became clear to me that there was a ranking among the challenge factors and that they were reinforcing. I identified an organization as being more fit if it could overcome the higher level difficulties (second and third order change) or all three types of change. I made some assumptions about their relationship, but I am not sure they are the same in all organizations all the time. They should be looked at organization by organization. Challenges are assessed by exploring what must be done to bring about the change. Patterns, the result of the interaction of the three factors, have so far been assessed by considering organizations functioning in these patterns rather than thinking about the patterns facing challenges.

There is a contradiction inherent to the concepts of fitness and survival. The ability to adapt is crucial to fitness, and it would seem that the larger the challenge the organization can overcome, the more fit it is. I developed a method for assessing challenge in this way (Glor, 2007b, Table 3). In an organization considered more fit, the more challenges it addressed successfully, it was more fit if it changed structure or goals (e.g. privatization) than if it just changed activities. When I began to consider the issue of survival, however, this became a less tenable position. It became clear to me that, while an organization retaining its identity as it changes can be a sign of fitness, it may cause the organization to move into a different organizational pattern. The consequences of that are unknown. Moreover, the failure to maintain core activities, boundaries and goals, which are at risk in innovation and change, is a sign of organizational death. Innovation and change may only contribute to fitness up to a certain point, past which it may become detrimental. Consequently, there may be a dynamic contradiction between the concepts of fitness and survival which does not always work to the advantage of the organization. This may be reflected in the 60-80 per cent death rates of organizations that change (Glor, 2008c).

The concept of fitness led naturally to consideration and assessment of the impact of change on the pattern's (but using challenge measured by a case study) and the organization's survival. The definition of *organizational survival* returns to Aldrich and Ruef's (2006: 4) basic definition of an organization, as being socially constructed systems of activity, boundary-maintenance and goal-direction. An organization that survives maintains these three properties. As a concept, survival is thus primarily about relative conservation (maintenance), while the concept of fitness is primarily about change. Nonetheless, although fitness and survival are not identical, as I constructed them, fitness predicts survival. An organization must be able to both change and conserve its essence if it is to survive.

The survival of organizations has several aspects, which may survive independently or not. Survival is the maintenance of activities, boundaries and goals. Some change is necessary, in order to adapt, but because too much change can negatively affect an organization's activities, boundaries and goals, and ultimately its identity, the (degrees of) change reverse their impact when it comes to survival. They become a negative adjustment to the positive complexity and positive or negative feedback scores.

I next realized that the three types or degrees of change were not just summative as types of change (1 + 1 +1 maximum in my assessment) but that their difficulty varied and thus should be ranked and their impact adjusted. The types of change were therefore re-ranked from having equal value to having a ratio of 1-2-3 (activities = 1, structure = 2, goals (identity) = 3). This coding recognized a hierarchy of importance but it was based on judgment, not an assessment of the relative importance of the degrees of change. It requires further investigation. The eight PSOs were scored for survival using this ranking (Author, 2008c). The survival of eight organizations functioning in eight different organizational patterns was thus assessed. The process followed to develop a substantive theory of organizational innovation and a formal theory of organizational change is laid out in Appendix 3.

These concepts of organizational capacity for fitness, fitness and survival I then used to address two questions: Do innovation and change help public sector patterns and organizations be more fit? Do innovation and change help them survive? From my perspective, I have made some progress in understanding the substantive concept of PSO innovation and organizational innovation patterns. I have identified some of the properties of the concepts. Using them, I constructed some hypotheses and indicators for the concepts and properties of organizational adaptability, communication, capacity for fitness, challenge, fitness and survival. I have assessed and ranked eight organizations functioning in eight innovation patterns. An outline of the comparisons that supported this conceptual development available on request (see Table 3).[3] Further work is needed to expand the scope of my work to a substantive theory of organizational innovation and a formal theory of organizational change. To achieve this requires comparison of my work on PSOs to non-profit and private sector organizations.

Relationships among the Concepts. Using the definitions and criteria outlined above, six complex evolutionary concepts–PSO innovation, innovation patterns, organizational capacity for fitness, challenge, fitness, and survival–are core concepts for PSO innovation. Indicators have been developed for them; the relationships among the concepts are as follows. Measured by variety, reactivity and capacity for emergence, adaptability (complexity) is reduced or enhanced by communication (feedback), producing capacity for fitness. The capacity for fitness is enhanced by the challenge of implementing a change, producing a measure of organizational fitness. Assessed fitness predicts survival. These relationships among the concepts can be portrayed as follows:

Complexity (adaptability) +/- Feedback = Capacity for Fitness

Capacity for Fitness + Challenge of implementation (orders of change) = Fitness

Capacity for Fitness – Challenge predicts Survival of Organization (activities, infrastructure, goals).

The complexity, communication, capacity for fitness and fitness of the eight PSO *innovation patterns* were assessed. The criteria compared were complexity (adaptability), systems analysis (communication=feedback), and degrees of change (case studies not patterns were assessed to determine degrees of change). Three different assessments of the patterns were made and compared, and where at least two assessments agreed the pattern was assessed as fit (Author, 2007b). The *survival* of eight *case studies* was also assessed and compared. The eight case studies, the same ones used to do the degrees of change analysis for fitness, that is, one example of each organizational pattern, were assessed for survival. At the extremes of fitness measures, fitness predicted survival (Author, 2008b). When fitness was unclear, it did not.

Developing these concepts and their properties made it possible to create a grounded (substantive

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[3] Please refer to this document as Table 3.

and formal) theory of PSO innovation. The elements of the theory are laid out in Figure 2. While developed for the public sector, the theory and methodology may be applicable to PSO change generally and to other types of organizations (for-profit and non-profit), perhaps with some modifications. To determine this would require further work.

Some Hypotheses

The output from the work described above has been the development of substantive theory and hypotheses about PSO innovation, and some formal theory including:

Innovation:

- Some PSOs innovate.
- Some PSOs innovate more than others.
- Some governments innovate more than others.
- Individuals, social dynamics and challenge of implementation have important effects on PSO innovation.
- PSOs innovate in patterns.
- The character of PSO innovations changes over time.
- PSO innovation is substantially influenced by politics and ideology.
- PSO innovation patterns evolve, given sufficient variety, reactivity, capacity for emergence, and positive feedback.

Formal theory about organizations:

- PSOs evolve.
- PSOs only evolve (adapt) if they have sufficient variety, reactivity, capacity for emergence, and positive feedback.
- PSOs can be fit, unfit, and have unclear fitness.
- PSO patterns can be fit or unfit, which influences their survival.
- Organizational fitness and lack of fitness predict organizational survival.
- Organizational pattern fitness and lack of fitness predict pattern survival.

Figure 2: An Organizational Innovation Model

Ideas	*Conditions*	*Implementation Risks*	*Predicted Impact on Fitness*	*Impact on Survival*
Generation/ identification of ideas for innovations/ change	Capacity for fitness (adaptation): -Variety -Reactivity -Capacity for emergence	Primary change Secondary change Tertiary change	Unfit Unclear Fit	Die Unclear Yes
		Mediated by:		
		Ideology Org. Pattern: -Individuals		
	Communication	-Social environment -Challenges External environment		
Feedback	Feedback	Feedback	Feedback	Feedback

Strengths and Weaknesses of the Approach. Like all knowledge of complex organizations, the work

presented in this paper is approximate and provisional. We must approach CAS from many directions and take a pluralistic stand (Richardson, 2008: 17). The concept of patterns presented here has room for this: It indicates the domains that should be considered, but only suggests rather than mandates which aspects of the domains.

Conclusion

During the last fifteen years, the theory that organizations function as complex adaptive systems has emerged in the literature (Aldrich and Ruef, 2006). Complex adaptive systems concepts like emergence and patterns can be easily applied to organizations (Glor, 2001 b, c). Evolutionary concepts such as classification, fitness, competition, and survival can also be applied to them. Although intuitively interesting and potentially useful, these concepts have not always been applied in a methodical manner. The work reported used a systematic approach (that can be researched further) to the application of evolutionary and complexity concepts to PSOs. It used a grounded theory methodology, building theory inductively from case studies rather than from deductive analyses (Glaser and Strauss, 1967). It is building substantive theory and is working toward a formal theory of organizational change (Glaser and Strauss, 1967: 34).

According to Glaser and Strauss, one of the advantages of inductively generated theory is that the indicators for emergent categories are rarely a problem (Glaser and Strauss, 1967: 37). Where does my work stand in relation to their assertion that theory should be developed from experience? Much of this work has used grounded theory method, especially the development of the categories of innovation and innovative governments, which saturated the categories well. The development of the definition of organizational patterns, the introduction of evolutionary concepts into organizations, and the identification of characteristics and indicators has been done through an elaboration analysis (Glaser and Strauss, 1967). Some reliance has also been placed on the concepts and theories of others, who have identified patterns in collective human behaviour, and identified the appropriateness of evolutionary concepts in changing human environments. That work was checked and seems appropriate and useful.

My research developed substantive theory about how and what PSOs innovate, what that change means for the organization, and identified their patterns. It explored the idea that these organizational patterns evolve and postulated that the patterns play a role in whether and what PSOs innovate. It identified the fitness and survival or lack of fitness and death of PSOs, and suggested that patterns also have a capacity for fitness, fitness, and survive or die.

Development of the three grounded concepts of PSO *innovation,* innovative government and PSO innovation patterns was followed by exploration of the concepts of *organizational* capacity for fitness, fitness and survival or death. Definitions and criteria were developed for them. This opened up a number of other questions and led to further research: (1) Comparing PSO pattern fitness and lack of fitness to the survival and death of real organizations functioning in those patterns. (2) Examining PSO survival rates when changing. (3) Comparing the survival rates for fit and unfit organizations and whether fitness predicts survival. (4) Exploring the dynamic relationships between fitness and survival. The work on survival, whether fitness and lack of fitness can be distinguished, and whether fitness predicts survival has not yet been published.

Further research is needed to determine if concepts applied to PSO innovation can also be applied to organizational change, if the concepts of and criteria for capacity for fitness, fitness and survival/death can be applied to other types of organizations in addition to PSOs. This further work would contribute to the

creation of formal theory about how and what and why PSOs and other types of organizations (NPOs and enterprises) innovate and change and how their innovation, change and normal operating behaviour compare. Formal theory is needed based on comparing how organizations operate and change. More work is also needed on the organizational versus pattern scope (levels). Is it necessary (more productive) to move to the pattern level to consider evolution of organizations, as it is with animals and plants? While organizations do change with the generations of people who work in them (e.g. Author, 2001d), do they evolve otherwise? If so, what evolves? How much evolution can/does occur this way? The relationship between fitness and survival also needs further work.

What have I learned by documenting the relationship between my ideas and my experiences? I found that my concepts emerged in part from my personal experiences, that my experiences made me ready for the ideas, and that they helped me confirm my ideas. The ideas were right for a certain time and place, and a certain perspective on them. Are the ideas generalizable? I found they were in relation to my experiences with other governments, and my learning about other governments.

About the Author

Eleanor Glor has worked for three levels of Canadian government and a non-profit organization. She is the Editor-in-Chief of *The Innovation Journal: The Public Sector Innovation Journal* (www.innovation.cc). In recent years her interest in public sector innovation has turned to the public sector organizational environment as a complex environment. Employing this concept, she has published both a book, *A Gardener Innovator's Guide to Innovating in Organizations* (The Innovation Journal, 2006) and articles in *Journal of Public Affairs, The Innovation Journal* and *Emergence: Complexity and Organization* (*E:CO).*

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Table 1: Conceptual Levels and Scope of Analyses - Research Done

Concepts Sequentially Studied	Conceptual Level	Scope of Study
Public sector organizations (PSOs) (individual organizations)	Innovations	• Compare own direct observations and experiences with innovation in 5 governments at municipal, provincial & federal level in Canada. One was a recognized innovator before 1980, another after 1990, introducing quite different innovations, in keeping with their ideologies.
Innovations & Ideology	Innovation clusters	• Compare five governments, of different political stripes • In keeping with political ideology: liberal, social democratic, conservative, neo-conservative
Results of innovations	Innovations	• Evaluation of four demonstration projects for high risk groups. As possible, comparison with similar programs with the same target groups in other organizations/gov'ts. Four articles published.
PSOs (individual organizations)	Innovative Government	• In-depth study of one govt (Sask) with 19 other authors (published 2 books on policy/program innovations and process innovations)
Which governments innovate more/less	Innovative Government	• Compare Sask innovations to other Canadian, some American & Commonwealth govts that implemented similar innovations • Compare Sask. govt innovations to innovations of other govts identified through Innovations in American Govt Award, other research, APEX Award (federal government executives).

Concepts Sequentially Studied	Conceptual Level	Scope of Study
Which kinds of governments innovate more/less	Innovative and not innovative governments	Substantive: • Compare number of innovations of each group • Compare number of IPAC Innovation Awards received by all Canadian governments in order to identify innovative and laggardly governments • Compare innovations—which governments introduced which innovations by comparing governments all Canadian governments, USA governments • Compare innovations—which governments introduced which innovations from Poel study of American and Canadian governments, Gow study of federal govt, Borins study of American governments. • Compare Canadian and American innovations that received awards (often similar, consistency over time i.e. same types of innovations given awards over 20 years) • Compare innovative to non-innovative governments Formal: • Compare Government of Sask. (social democratic then neo-conservative) to Province of Ontario (Conservative), Region of York (conservative), Government of Canada (Liberal then neo-conservative), Government of Sask. later (neo-conservative) • Compare types of innovations introduced by types of governments on dimensions of politics, size, character of population, etc. over time.
Stages of innovation process	Innovation Process	• In Saskatchewan government (substantive) • In Sask govt compared to general process laid out by Rogers (formal)
Innovation and political process	Innovation Process	• Innovation stages and feedback • Importance of political party in power • Types of innovation by political party in power

Concepts Sequentially Studied	Conceptual Level	Scope of Study
If innovations occur in PSO in patterns, what do they look like?	PSO innovation patterns (species)	• Comparison of Canadian govts, from literature (Poel, 1976) and esp. IPAC award 1990-2006 nominees (1609 nominations in total). • Compared with Ford Foundation - Harvard U. Innovation Award • What are the dynamics that matter for patterns? • Search of literature for relevant patterns and criteria (Author, 1998)
If PSOs do innovation in patterns, what do they look and feel like?	PSO patterns	• Differences in PSO innovation patterns • Is there an innovativeness ranking among patterns?
Organizational Change Patterns	PSO change	• Awards (especially IPAC award) • Comparison with quality programs in GoC and provincial departments • Added ten developed and developing govts (USA, UK 2 x, China, Egypt, Russia, Brazil, India), European Creative Cities
What are the important factors in PSO patterns?	PSO Change Patterns	• Individuals, social dynamics, challenge of implementing a change
How do/can patterns relate to each other?	PSO organizational patterns	• Complexity: can they be ranked? • Capacity for fitness • Fitness • Survival
Where are the boundaries of organizational patterns?	PSO organizational patterns	• How to measure org. pattern complexity • Develop methodology for assessing organizational complexity that permits ranking of complexity and numerical distinctions among patterns • Compared to 22 European Creative Cities adapting to major economic changes
Adaptability (complexity)	PSO patterns	• Search of organizational evolutionary and complexity literature for relevant process patterns and criteria
Communication (feedback)	PSO patterns	Ditto, esp. Capra's description of feedback

Concepts Sequentially Studied	Conceptual Level	Scope of Study
Capacity for Fitness	PSO patterns	Invented concept Capacity to adapt
Challenge of Implementation	PSO patterns	Invented concept
Fitness	PSO patterns	• Applied concept • Implications for fitness and lack of fitness • Compared to death rates of private sector innovation • Compared to death rates of excellent organizations Compared to: • Capacity for fitness plus feedback. Three different analyses: systems, analysis of CAS, degrees of change.
Survival	PSOs (survive/die)	• Applied concept • Added Abu Dhabi & Europe-wide innovation award (EPSA) • Compared to death rate of European Quality Award programs after two years (Pollitt, Bouckaert and Löffler (2006: 4). • Compared assessed fit to actual survival of PSO • Compared survival of fit and unfit PSO

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Where are the boundaries of organizational patterns?	PSO organizational patterns	• How to measure org. pattern complexity • Develop methodology for assessing organizational complexity that permits ranking of complexity and numerical distinctions among patterns • Compared to 22 European Creative Cities adapting to major economic changes
Adaptability (complexity)	PSO patterns	• Search of organizational evolutionary and complexity literature for relevant process patterns and criteria

Concepts Sequentially Studied	Conceptual Level	Scope of Study
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Capacity for Fitness	PSO patterns	• Invented concept • Capacity to adapt
Challenge of Implementation	PSO patterns	• Invented concept
Fitness	PSO patterns	• Applied concept • Implications for fitness and lack of fitness • Compared to death rates of private sector innovation • Compared to death rates of excellent organizations • Compared to: • Capacity for fitness plus feedback. Three different analyses: systems, analysis of CAS, degrees of change.
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Appendix 2: Conceptual Levels and Scope of Analyses - Research To Do

Concept	Conceptual Level	To Be Considered	Scope
Organizational innovation patterns (species)	Organizational innovation patterns	• Capacity to overcome challenges	Government
Organizational Change Patterns	Organizational change patterns		Organizations
Fitness	PSOs	• Implications of fitness and lack of fitness	Patterns and organizations
Evolution of Patterns	Patterns	• Are some patterns more likely to shift to other patterns? • Are some patterns more likely to evolve to certain other patterns? • How do patterns change?	Patterns
Survival	Organizations in public, private, NPO sectors	• Survival of organizations in different sectors. • Implications of high death rates in organizational change	Public, private, NPO organizations
	Sectors (public, private, NPOs)	• Do different sectors have different survival rates?	Public, private, NPO sectors
Organizational change • Minimize differences in comparison groups • Maximize differences	Organizations	• Compare PSOs to NPOs • e.g. UNA & GoS • Way NPOs tend to mimic their equivalent govt department structurally • Look to PSOs for guidance, "leadership" • Reading how to fit to govt requirements • Compare to Russia, Abu Dhabi, India, China	

Appendix 3: The Process of Building a Substantive Theory of Organizational Innovation and Formal Theory of Organizational Change

These steps were not all sequential but ongoing and looped back to reinforce, or (often) rethink previous assumptions and conclusions.

A. Developed personal experience and knowledge of public sector innovation

Step 1: Experienced personal change, compared living experiences in two places and cultures.
• Studied social and political attitudes and behaviour of the public in the largest Canadian province, Ontario.
• Observed practices (e.g. hiring), programs and wish-lists of Government of Ontario and Region of York.
• Observed practices, programs and wish-lists of all Canadian provinces and territories in post-secondary education,
• Observed practices, programs and wish-lists of counties and regional municipalities in health and social services, engineering and planning.

Step 2: Observed an acknowledged long-term innovative government (Government of Sask.) in depth, including a cross-section of innovations and change, and its functioning and innovations in one line department (Health).

Step 3: Observed, researched and developed innovations in several environments, of several kinds (central agencies, line departments, regional offices) in several governments at all three levels of Canadian government.

Step 4: Observed, heard, read and talked about innovations and change in several other Canadian governments and in numerous governments around the world, in several types of systems, at several levels of government. Talked with people at many levels of government (including at 65 Innovation Salons I organized) and with the public (especially my family and friends), gave papers about my ideas, submitted books and papers for publication; received responses.

Step 5: Studied the nominations for several innovation awards and talked to some of them, including the five innovation award programs funded by the Ford Foundation around the world, the Commonwealth Association for Administration and Management (CAPAM) award, UN public service innovation award, Creative Cities Award of the European Union, European Public Sector Award, IPAC innovation award, Association of Professional Executives of the Government of Canada (APEX) Leadership in Service Innovation Award.

Step 6: Compared characteristics and perspectives of governments and populations for which I had worked e.g. big/small, nature of population, population's willingness to change, etc.

B. Observed Patterns

Step 7: Observed that governments seem to approach innovation, change, and normal functioning in consistent ways, and over time. Concluded governments do innovation and change in patterns. Noticed they may do normal activities in patterns too.

Step 8: Shifted thinking up a conceptual level to ask: If public sector organizations do innovation and change in patterns, what do these patterns look like? What might be the major factors that determine or establish those patterns? Are those factors external or internal to the organization, or both? What are the implications of those patterns? Can they be compared?

Step 9: Sought literature on organization innovation, and later, on change. Discovered there was seemingly relevant literature on the role of individuals in the workplace, especially the literature on leadership, strategic planning, and employee motivation. Found some but less literature on the social dynamic in the workplace and society. Found little literature on the implementation of innovation. Discovered there is little in the way of organizational change theory or innovation theory, especially in the public sector.

Step 10: Observed that the dynamic of innovation and change can be grouped into three types of factors: the impact of the individual, the social, and the challenge of implementation.

Step 11: Developed a visual way to conceptualize and present these three factors interacting in a cube, producing eight patterns.

Step 12: Worked with the patterns by:

(A) Seeing two groups of public servants and others could apply the concept of patterns to their organizations and experience. One reported later this was helpful in accomplishing change.

(B) Identifying and preparing a case study of each pattern. This proved to be a complex process, involving considerable research, analysis and reanalysis of innovations, organizations and participants. Observed that some patterns were more predominant than others. Concluded that this may be because of the character of the governments and the political times e.g. it was very hard to find bottom-up organizations in top-down governments, and most governments and units were top-down. Wondered whether governments might (still) have feudal cultures.

C. Explored the implications of the patterns.

Step 13: Explored whether the patterns were associated with particular processes and outcomes several ways, according to their (i) level of creativity, (ii) level of flexibility–such as organizational slack–in the implementation environment, (iii) whether the process created a self-balancing feedback loop that cancelled itself out (much like destructive interference in the physics of wave forms), causing innovation in an organization to sputter and fail, or self-reinforcing feedback loop that supported and augmented the capacity for ongoing innovation (like constructive interference of wave forms in physics), and (iv) the level of success in the innovation outcomes for each pattern. Concluded that the patterns pointed to areas for intervention to modify weaknesses (frequently unsuccessful outcome areas). While all of the innovations studied had been successfully implemented, many died (later discovered this is not unusual [any more?]).

Step 14: Observed that organizations are like living organisms. Saw fitess should not be studied at the individual organization's level, but at the level of organizational patterns. Introduced the notion of fitness of patterns.

Step 15: Identified three factors in pattern fitness: (i) Feedback, (ii) Adaptability (complexity), measured three ways (iii) Capacity to overcome implementation challenges.

D. *Explored the implications of the patterns for the organizations*

Step 16: Explored pattern and organizational fitness

Step 17: Explored organizational survival. Found high death rate. Found control factors.

Step 18: Explored the relationship between fitness and survival
•   Can organizational pattern fitness and lack of fitness be distinguished
•   Do fitness assessments predict different results for organizational patterns and organizations?

Step 19: Explored possible changes in patterns over time
  ● Explored their meaning for patterns and organizations
  ● Considered pattern evolution from one organizational pattern to others.
  ● Can evolution of patterns be predicted?