

Studying the Impact of Innovation on Organizations, Organizational Populations and Organizational Communities: A Framework for Research

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ABSTRACT

This paper examines whether and how the impact of innovation on organizations can be determined. Following a discussion of four possible conceptual paradigms, it develops a framework for studying the impact of innovations on their organizations. The paper argues that there are four main aspects to the impact of innovation that require four different approaches:

(1) Successful and unsuccessful cases of implementation of individual innovations that achieve/do not achieve their chosen objectives and the effects of innovations on (2) employees, (3) organizational functioning, and (4) Organizational structures. Accordingly, it frames the research within four possible research approaches (case studies, people, functions, structures), loosely based on Burrell and Morgan's (1979) and Gioia and Pitre's (1990) organizational paradigms. The first approach focuses research on the impact of individual innovations on individual issues and individual organizations, organizational populations, and organizational communities. The second approach studies impacts on people; the third emphasizes inputs and organizational adaptation; and the fourth the impact on structures and survival of organizations, populations and communities. The framework identifies definitions of innovation suitable for each approach, what each approach is most suited to studying, their levels of analysis, suitable methodologies and measures, and the types of impacts each is capable of revealing.

Keywords: Impact of innovation, innovative organization, innovative organizational population, organizational community, organizational demography; research framework.

Introduction

While private sector, non-profit sector and public sector innovation has been vigorously promoted for two generations, the impacts of innovation have not been determined. When the impacts of innovation have been addressed, the focus has tended to be the effect on economic performance at the firm (Evangelista and Vezzani, 2010) and country levels (Sapprasert and Clausen, 2012). During this period, the primary focus of public sector innovation has been strategies and methods to reduce use of public resources, create agencies and privatize government functions (the New Public Management), not the impact of the innovations. Several authors have noted the lack of attention to the impacts of the set of innovations known as the New Public Management (Christensen and Laegreid, 2006: 2; Pollitt, 2001: 480). Damanpour (1991: 584) recommended expanding the scope of innovation studies to include evaluation of the consequences of innovation.

The innovation literature has tended to focus on the successful implementation of innovations and making appropriate tactical choices about when to innovate and when to delay/selectively adopt innovations (de Lancer Julnes and Holzer, 2001). There is much to be learned, however, from innovations that fail, but they are difficult to research. A clear distinction must be made between innovations that are not fully implemented or that fail and ones that are fully implemented and accomplish their objectives in determining the effect on organizational survival. As well, organizations have many other objectives that include supporting employees, achieving organizational objectives and assuring the organization survives. This paper's objectives are to identify ways to determine the impact of innovations on their organizations and to develop a research framework for doing so. The term "impact" is defined to include *both* the results of the innovation's intervention (outcomes) and the broader effects of the innovation. The paper builds a framework for research on the impact of innovation on organizations that addresses both the impact of individual innovations and innovations' impacts on organizational people, functioning and structures. Each approach is seated within a different conceptual paradigm. The paradigms are described, then the paper develops an approach and explores innovation within each paradigm, by discussing the different definitions of innovation used by each approach, what each is most suited to studying and the issues that can best be studied within them, levels of analysis implied, methodologies and measures that could be used, and the impacts that can best be studied within each approach.

Organizational Concepts

The framework is loosely based on Burrell and Morgan's (1979) four organizational paradigms: interpretive, radical humanist, functionalist, and radical structuralist. The interpretive paradigm describes, explains, diagnoses and understands. The radical humanist paradigm describes, critiques, and seeks to change—critical analysis grew out of it. The functionalist paradigm searches for regularities, tests in order to predict, and controls and maintains the status quo. Theoretical interests are relationships, causation and generalization; theory-building occurs through causal analysis. The radical structuralist paradigm identifies sources of domination and persuades in order to guide revolutionary practices. It focuses on domination, alienation, macro forces and emancipation. While the objectives of innovation are not typically radical, Burrell and Morgan's paradigms help to create a conceptual framework for determining the impact of innovation on its people, organizations, innovative populations and communities.

The approaches used in this paper study case studies, people, organizational functioning and structure. Case studies examine the ethnography of the innovation and its organization by studying individual examples of innovations and develop hypotheses based on their findings. People-focused (humanist) research considers the effects of innovation on the people developing and implementing innovations (personnel, elected officials, managers), the people in the organization (how they do their work and how it affects their lives), and the effects on careers. It also examines the effects on clients and the public. Functionalist research scrutinizes organizational functions and the determinants of organizational mortality but assumes minimal change. Structuralist (which will be called "structural" in this paper) research analyzes innovations' organizations, structural components, mortality rates, institutions, populations and communities. These four approaches and the issues they most effectively address are discussed in the sections that follow.

The approaches focus on: (1) case studies—individual innovations and innovative organizations; (2) people working in the organization, their empowerment to innovate, rewards and punishment for innovation, the effect of innovation on people e.g. loss or creation of jobs, impact on families and people outside the organization—clients, and geographic, ethnic and other communities in which the innovation occurs; (3) functions—innovation as a function of selection factors such as resources, politics, location, organizational age and size, and environmental and ecological processes that correlate with organizational mortality (Baum, 1996; Singh, House and Tucker, 1986a; Singh, Tucker and House, 1986; Camison-Zornoza et al, 2004); and (4) structural—innovation as a tool for adaptation that affects organizational survival (March, 1991; Nohria and Gulati, 1996; Damanpour and Gopalakrishnan, 1999) and organizational population demographics.

Case Study Approach

The case study approach can investigate individual innovations, innovative organizations, innovative populations and innovation communities. *Individual innovation* case studies increase their value by being matched with others in the same innovation categories (e.g. income security innovations, informatics innovations) and/or with normal² organizations. This approach is most suited to studying the innovation process in detail and from this information, developing hypotheses. It can be used for both short- and long-term studies. Typically it has been used to describe unique high profile innovations, but this is not a necessary use. Case studies can identify the innovation adoption process, organizational and authority structures, policies, resources, environments, types (functions) of innovations adopted, impacts of specific innovations and organizational survival or mortality of individual cases. *Innovative organizational populations* are studied through the types and numbers of innovations created/implemented, types of jobs created/lost, niches (types of populations adopting types of innovations), and through their demographics. The *organizational communities* supporting innovations (Astley, 1985; Astley and Fombrun, 1987; Hunt & Aldrich, 1998) are important to the successful implementation and maintenance of innovations. They, the role they play and their fate should be described.

Employing the same definitions of innovation, researchers should identify *innovation(s)*, preferably all of the innovations of an organization, department (ministry) or population/ government, whether or not fully implemented; internal impacts, including whether they attracted public, political, and client group praise/criticism; effect on the target issue; whether and how the innovation(s) was of sufficient impact to affect the organization (e.g. consumption of resources, access to and allocation of personnel, independence, organizational level, change in power balance); impact on the role, status, independence and prestige of the organization within the population/ government, and the organization's survival or mortality, at its own level and the levels above it (see next paragraph). Mortality should be measured by whether the organization remained or disappeared from a full record (Glor, 2011). Researchers should record the size of the innovation because, if it involves size, the size at which an innovation begins to affect the fate of an organization is not known. If the innovation was part of a group of related innovations, they should also be examined (e.g. Government of Saskatchewan's Native initiatives [Glor, 1997, 2000]).

² In defining normal organizations, Glor excluded outliers, organizations known to have extreme levels of factors being studied. Normal organizations introduce some innovations but not many innovations.

Researchers need to describe the *organization, subunit, organizational pattern, population and community* that implemented the innovation, the organization and level affected, and how, and, if the innovation was at the program level, reporting what happened to the program, its organization, and the organizations one level below and two levels above it. The structural possibilities for innovation implementation range from an existing unit asked to implement a small innovation to a new organizational unit/division/directorate/department/agency created to implement a large innovation. An innovation will presumably affect most the organization implementing it, but there are exceptions. If there is a one-to-one ratio between an innovation and a structure, the innovation will be easier to track.

Research on the implications of being innovative organizations should describe the impact of the innovation(s) on the issue the innovation was introduced to address and on the fate of individual innovations, innovators and organizations. It should consider whether there was an impact on the population and the geographic and organizational communities. Research should seek out innovation case studies where there is a plausible link between an organization being innovative and surviving/disappearing. These should be matched with case studies of normal organizations. Organizations should thus be studied in sets of four cases—innovations whose organizations survived/disappeared and normal organizations which survived/disappeared. There is much information and many dynamics to understand in such case studies such as tombstone data (description of the innovation, number of innovations, niche, etc.), ratio of innovations to normal activities (budget, number of employees), founding and mortality dates, current status, size, population density, why the organization/ population innovated/did not innovate, time in each stage and what occurred (introduction of innovation, full implementation, impacts), membership of the community. The link between innovation and its impacts and organizational /population/ community survival/mortality should be explored in detail and other factors that influenced impacts and survival/mortality should be identified as well. Cases need to be paired and compared for key issues such as age, size, budget, number of employees, function(s), period addressed, and dominant political and management ideologies. The fate of employees should also be identified and compared.

Innovation case studies should be used to develop hypotheses about innovations and about the impacts of innovation on organizations. Glor (2008a) has developed some concepts, their properties and theories of public sector organization innovation. Strauss and Corbin (1998) are experts on how to do this. Others have also developed theories, such as Damanpour and Schneider (2006, 2009). Innovation case studies should also be used to classify innovations if possible.

In terms of measurements, Glor (2001a, b; 2008b, 2007a, b, 2008a, 2015) developed measures for organizational patterns that could be used and *The Innovation Journal* (www.innovation.cc) suggests what issues should be covered by case studies. Authority structure can be identified from the organizational chart. Influence may be measureable through environments. Because it is very difficult to secure case study-type information for large numbers of innovations, it is important that case studies record data such as funds and staff allocated to the innovation and what proportion they represented of their organizations' resources.

While case studies will not provide representative information for all types of possibilities, numerous case studies will allow researchers to determine the range of possible results. If very few were found, for example, where innovation was a factor in the survival/mortality of the population or community, this would suggest innovation is not a factor.

Effects on People Approach

What are the kinds of effects innovations could have on people within the organization and how can they be measured? While a considerable amount of attention is given to impacts of innovation on organization functioning (considered in the next section), the focus is rarely shone on the impacts of innovation on people. Yet, people are the most important factor in organizations. Innovations and organizations are the creation of the people who work there, pay for it, and receive its benefits. Innovation effects on employees can be studied through numbers of employees, personnel budgets, personnel policies, work technologies, empowerment strategies, employee testing and surveys, career paths, interviews, cultural assessments, and equivalent information for the innovation, organization population, geographic and organizational community. Innovation effects on people outside case studies can be explored through budget and personnel reallocation, service statistics, and measures of organizational impact on its objectives. The innovations studied need not only be limited to individual innovations but could be major initiatives as well. Work-related legislation and enforcement must also be understood. If it is true as suggested for the private sector, that 75 to 80 per cent of innovations fail, this also has a major effect on people.

Staff perspectives should be measured through organizational reports, employee and management interviews and surveys. Both management and working level personnel and current and recently retired employees should be interviewed. Numbers and types of personnel, their perspectives on the innovativeness of their organization and the organizational pattern, and the steps required to create an innovation should be recorded. Internal documents and surveys should be employed to determine staff perspectives.

A focus on people should reveal people's perspectives on innovation, their motivation toward it, how it affects their careers and those of others, and the effect of innovators on others in the organization. It should also outline the profile of employees, the employment situation in the environment, the working conditions and the dynamics within the workplace and with clients. Employees', clients', organizational and geographic community's quality of life should also be examined.

Functional Approach

The impact of innovation on organizational functions has been studied extensively, through correlates of innovation with organizational characteristics and functioning. These can be and sometimes have been treated as selection factors for survival (Baum, 1996). Organizational evolutionists (e.g. McKelvey and Aldrich, 1983; McKelvey, 1994) consider factors such as resources, environments and niches select for survival. For example, Boin, Kuipers and Steenbergen (2010) examined the role of institutional design in the survival of American New Deal public organizations, finding that design's role sometimes positive and sometimes not, as it changed over time.

Damanpour and Wischnevsky suggested "innovation adoption contributes to organizational success but is not necessarily the primary success factor" (2006: 275). An innovative outcome *is* the primary success factor for innovation-generating organizations (Damanpour and Wischnevsky, 2006: 275, Table 2; Tornatzky and Klein, 1982). In the cases where innovation is not the primary success factor for organizations, innovation would be one of several factors contributing to organizational

survival, and they would all need to be studied in order to determine the relative importance of innovation. Researchers need to determine the link between organizations that adopt more innovations and organizational survival and need to demonstrate whether innovation is necessary to survival of functions. A functional perspective therefore fits better with a focus on organizational management than a focus on organizational survival.

Organizational evolutionists such as Hannan, Freeman, Carroll, Baum, Oliver, Singh, Boin and others take a very different view—they see innovation and change as the manner in which organizations evolve. These authors have found selection factors that correlated with increased/decreased organizational mortality (e.g. organizational age, size, resources, embeddedness, competition, location in capital city or close to the executive, politics, niche width, population density, change etc.) (e.g. Freeman & Hannan, 1983). In a very few studies, survival analysis (e.g. time series, survivor function, hazard rate) was used to identify differences in the fate of organizations that changed compared to organizations that did not change within study populations and across populations (e.g. Singh, House and Tucker, 1986; Hannan and Carroll, 1992; Peters and Hogwood, 1988). In most studies, organizations that changed had higher mortality rates in the short and adolescent term, but settled into similar rates to older organizations as the survival time got longer (Amburgey, Kelly and Barnett, 1993; Baum, 1996; Damanpour, 1991; Singh, House and Tucker, 1986; Singh, Tucker and House, 1986).

Quantitative measures of determinants assessed by correlation have identified factors associated with earlier organizational mortality—they are among the most common measures of organizational effectiveness—and many determinants of innovation have been established.³ The fate of the organizations and organizational communities has rarely if ever been considered.

Structural Approach

Organizations are like the net that holds a ham together. They provide a context within which current activities occur, and a structure within which planning can be done, funds can be allocated, people hired, products made and programs delivered. They are essential to the implementation of innovations and their having an impact. Both a functional and a structural perspective treat

³ Damanpour (1991) analyzed 23 mostly private sector quantitative studies of determinants and moderators related to organizational innovation and recommended studying type of innovation and stage of adoption, but as secondary contingencies (intermediate variables) between primary contingencies and organizational characteristics. Damanpour and Wischnevsky recommended comparing “the units that succeed in *generating* innovations with those that do not, and the units that succeed in *adopting* innovations with those that do not” (2006: 286). Type of organization and scope of innovation were important determinants of innovation. Positive and negative statistically significant associations at the 0.05 level were found between the mean correlations of the three-paired types for specialization, functional differentiation, professionalism, managerial attitude toward change, and technical knowledge. Camison-Zornoza et al (2004: 350) found types of organization and organizational size correlated significantly with innovation. The associations between organizational variables and innovativeness were not distinguished significantly among the private, non-profit and public sectors, but were by the type of organization (manufacturing, service, non-profit sector) and the scope of innovation (low, high).³ Damanpour (1991: 583) suggested it was no longer necessary to replicate the results for variables with strong significant results, such as specialization, functional differentiation and external communication in a unidimensional study of innovation.³ To develop theories, Damanpour recommended studying type of organization (industry, sector, structure, strategy), variance in environmental threats and opportunities for different types of organizations, and multidimensional innovation studies to better understand the combined effects of different factors (contingencies) on organizational innovativeness (Damanpour, 1991: 582-3).

innovations as a source of adaptation—most organizations must adapt to survive and if organizations do not adapt, they do not survive. Considered this way, innovation is essential to organizational survival. The key survival factor is not likely to be whether the organization invented the innovation (unless the organization is in the business of inventing innovations), but rather whether an organization fully implemented the innovation(s) and achieved the results intended. Implementation is probably more difficult for innovators and early adopters than for later adopters of innovations but full implementation and achieving results can most plausibly link the innovation's and the organization's structural survival. Being in the business of inventing innovations is probably more common in the private sector than the non-profit and public sectors except in government research councils and innovative governments. An innovative government requires an innovation development function, however.⁴

The structural approach to studying impacts focuses on organizational, organizational population and organizational community structures, and their demographics. The study of organizations within populations is demographic. Carroll and Hannan (2000) identified the conceptual organizing principles of demography as: “(1) a population perspective; (2) focused on the vital events of birth and death; (3) concentrated on the flows of events in time and the implications of events for population structure—age is the master clock ... beginning with calculation of age-specific hazards (or rates), followed by comparisons of the rates across time and among various groups; (4) individuals are related back to the population through counting of events and distributional measures of the population such as the mean and variance in age; and (5) models of demographic systems possess a coherent and consistent internal logic that permits demographers to move freely among the parts and levels of the system ... vital rates and population characteristics are used ... to derive implications for population change and stability” (Glor, 2013: 4-5; summary of Carroll and Hannan, 2000: 25-26).

Besides permitting exploration of the link between innovation and survival, tracking demographic data for innovative organizations and organizational populations would allow comparison with normal/static organizations and their populations. When *mortality* is defined as disappearance from the record, as it usually is (demonstrated by Glor, 2013), innovation is recognized as leading to the appearance and disappearance of many organizations. Disappearance should thus be treated as organizational mortality, because organizations that disappear are usually undergoing a major change in mandate—changed mandates, more/less responsibility, elimination of mandate—and structure, personnel, conditions of employment and accountabilities. Structural changes can often be traced, even after the fact, but internal changes can rarely be tracked after the fact (as demonstrated by Glor and Ewart, 2014). Internal changes that are not reflected in official documents have the disadvantage of only being traceable by word of mouth and early tracking but many researchers are suspicious of first-hand accounts. Because organizational survival is a long-term issue, researchers typically have variable, limited and inconsistent access to information about internal changes. A demographic approach, on the other hand, can explore the consequences of innovation for all types of organizations.

⁴ The innovative Saskatchewan government, for example, planned innovations in its Executive Council, departmental research and planning groups, and programs. In Saskatchewan Health, employees were asked for written proposals for innovations. In the public health area, five were approved but two were not successfully implemented.

Organizational communities need study. An organizational community is the community of organizations supporting implementation and providing the legitimacy that develops around an innovation or a package of innovations Astley, 1985; Drazin and Schoonhoven, 1996). Without one, the innovation may not survive. Such communities include for example, those lobbying for the innovations, businesses/ non-profits/ governments (departments) with similar interests or providing supplies and credibility to the innovation. They may have previously implemented the innovation(s) or may support future implementation and expansion (e.g. implementation of NPM was supported by the Organization for Economic Cooperation and Development, International Monetary Fund and World Bank.

The study of organizations and their structures is a structural approach. Glor (2013) identified the demography of normal organizational populations by sector and found organizations generally have low mortality rates and sectors have fairly similar mortality rates, with the public sector having the highest (Glor, 2013). It is not known, however, how long organizational populations, especially innovative ones, tend to exist nor whether they exist for similar or different periods of time in different historical eras. We do not know whether organizations survive shorter periods now than in the past, whether organizations exist longer in some countries than others, nor whether organizations that innovate thereby decrease or increase their mortality rates.

Demography is measured by founding and mortality rates. Glor's (2013) review of the organizational demography literature for normal organizations and summary of the results by sector (private sector, non-profit sector, public sector) offers a comparable measure of performance (also Walker, 2004) for innovative organizations and populations in the three sectors, especially the public sector. According to Glor, normal populations are "ones that include a full population (preferably) or close to it or are representative of a full population and are therefore suitable for establishing a standard. Ideally, a normal mortality rate is determined by calculating the mean mortality rate of the population over its full lifespan" (Glor, 2013: 5). The demographics of innovative organizations, populations and communities have not been studied, with the exception of a small pilot of five innovations and their organizations from the Government of Saskatchewan conducted by Glor and Ewart (2014). The measures of organizational innovativeness should be number of innovations and the adoption ranking of the innovations by the organizations, populations and communities. The number of inventions generated, what they were, and their details should also be recorded. Data bases should be developed (see Conclusion).

Research Approaches

Table 1 creates a framework for researching the impact of innovation and addresses for each of the four approaches what an appropriate definition of innovation is, its focus, what each is most suited to studying, suitable level(s) of analysis, appropriate methodologies and measures, what is likely to be affected, and what can be studied. Gioia and Pitre (1990) recommended doing multi-paradigm theory-building: this framework suggests a way to do so. Choice of organizational paradigms and approaches is largely determined by what researchers are interested in studying but eventually all of these issues should be covered.

Table 1: Research Framework for Studying Impacts of Innovation on Organizations, Populations and Communities

Organizational Approach	Case Studies	People	Functional	Structural
Definitions of innovation & Innovative organization	-Unique to each organization that does it (OECD, 2010) -Innovative organizations are ones that introduce popular innovations (awards programs) --An innovative organization introduces many innovations (Glor)	-Unique to the employees, management, geographic community, people being served, organizational population, country -Contributes to an important national effort e.g. war effort -An innovative organization introduces innovations beneficial to employees as well as others	-Something new to an organization -An innovative organization achieves its objectives in new ways.	-Something new to the population (government) &/or organizational community -An innovative population/ community introduces many innovations
Focus of study	-Identifying, understanding, classifying & developing hypotheses about innovations, innovative organizations, populations, communities	Employees, employees' families, clients, geographic communities	-Innovations that enhance management control -Incremental innovations -Occasional radical innovations	-Innov' ve orgs, innov' ve org' al pops/ org communities
Approach most suited to	-Understanding in detail individual innovations, processes, stakeholder motivations, organizational patterns -Building hypotheses -Short & long-term -Unique, high profile innovations. ⁵	Understanding innovation's impact on people -Innovations affecting employees -Short & medium-term	-Understanding the adaptation process in relation to management's objectives -Understanding & maintaining the status quo, esp. at the level of mgmt & objectives -Short & medium-term (Damanpour, Walker & Avellaneda, 2009).	Understanding innovns' impacts on: -organizational structure -demographics Comparing across systems –governments, countries, organizational communities (Rousseau, 1985) -Longitudinal studies
Levels of analysis	One organizational level in one to four organizations at a time.	-Organizational culture -Employee & mgmt motivation -Personnel of organization -Work technologies -Work-related legislation, regulations, enforcement	-Vertical & horizontal organizations within the population -What the organization does/ produces -Organizational & management needs, products, organizational environments -Same innovations across organizations, i.e. dissemination of innovations	Organization, org' al pop & community -Organizational & population environment

⁵ thus answering the question “why this innovation?”

Organizational Approach	Case Studies	People	Functional	Structural
Metho- dology: Study...	-Ethnography of individual innovations & their organizations -Qualitative, develop grounded & substantive theory (Glaser & Strauss, 1967; Strauss & Corbin, 1998) -Comparable if matched pairs of similar innovations or organizations	-Surveys -Testing -Personnel systems -Supports to employees e.g. paternity leave; employee counselling; unemployment insurance, health, disability, sickness & accident insurance	-Normal organizations doing a few innovations -Population ecology: selection mechanisms (Hannan & Freeman, 1977) - Correlation of selection factors with organizational & population survival, impacts on structures	-Changes in organizational structure -Changes in organizational populations, communities -Comparison with normal populations
Types of data	Award winners Individual case studies	-Employee surveys -Employee testing -Geographic community statistics	Management surveys	Organizational demographic data
Measures	-Descriptions of dynamics, processes, issues in innovations, people's roles, context, results, organizations, geographic communities -Code analysis -Comparison with other innovations'/ organizations' results	-Variety among personnel's backgrounds, gender -Number of employees of each type -Geographic community employment & unemployment -Working conditions & dynamics	-Resources (number of personnel, expenditures & revenues), internal & external environment -Survival analysis	-Organizational founding, changes, length of survival, mortality -Hazard rates & ratios -Mortality rates -Individual innovation adoption ranking -Population & community innovation adoption rankings -Organizational population & community mortality rates
Impacts of Innovation on...	-Innovation process -Characteristics of innovations & innovators e.g. ideological, saved \$ Impact on: -Issue innovation created/introduced to address -Organizational structure, population, community -Fate of individual innovators, organizations, populations, communities.	Quality of life of employees, geographic community, country -Impact on fate of innovators -Impact of innovators on other staff	Organization's ability to function & adapt -Capacity to control -Survival/mortality of organizations not a focus - Innovation as contributing to a function -Population dynamics (e.g. Baum, Korn & Kotha).	Survival/mortality of organizations & organizational populations & communities

Organizational Approach	Case Studies	People	Functional	Structural
Issues which could be studied...	<ul style="list-style-type: none"> -The innovation & organization & how they function -Organization culture -How did innovation affected the organization <ul style="list-style-type: none"> -Was the innovation fully implemented? -Did it accomplish its objectives? -Did and how did it affect its organization, especially survival 	<ul style="list-style-type: none"> -Empowerment -Participatory management -Organizational networks, collaborations (Sorensen & Torfing, 2012) -Motivations -Effects of innovation on careers 	<ul style="list-style-type: none"> -Innovations' & orgs' functions, resources, etc. necessary to develop & implement innovations -Implementation challenges -Stages of innovation implementation -Innovative organizations 	<ul style="list-style-type: none"> -Innovations' effects on organizations --Innovative organizations --Innovation's/ns' effects on populations -Fate of organizations sponsoring innovations - Fate of innovative organizations

Table 2 outlines some thoughts on what each of the levels of research might reveal. Data are typically collected at the level of and the level below and above the level of the structure being studied e.g. if the object of study is an organization, data are collected about innovations, sub-organizations, the organization to which the innovation reports, and the level above that. The order outlined in Table 2 is appropriate. Research would ideally be conducted sequentially, but it is also valuable to do some of each type, which is what has been done to date.

Table 2: Research Approaches

Research Methodology	What Each Could Reveal
1. Matched case studies of innovations	<ul style="list-style-type: none"> - What the issues are in specific organizations - What innovation looks like in organizations, to verify definitions - Effects of innovation on its organizations - The answer to "Is it possible to measure..." e.g. organizational innovativeness in the way defined. - Possible theories of innovation - How normal & innovative organizations differ/are similar.
2. a. Studies of people	<ul style="list-style-type: none"> - Employees' opinions and perspectives - Statistics collected by the organization + magnitudes and trends - In-depth understanding of issues, factors, history, etc. - Numbers of employees engaged/laid off due to the innovation
b. Matched case studies of innovative & normal organizations and populations	<ul style="list-style-type: none"> - What normal & innovative populations look like, to verify definitions - Determine how normal/static & innovative populations differ & are similar - What the issues are in specific populations - Effects of innovation on some organizations, organizational populations & communities
4. Correlations	<ul style="list-style-type: none"> - Innovation, organizational & environmental characteristics & other factors that correlate with organizational innovativeness
5. Demography of innovative organizations	<ul style="list-style-type: none"> - Demographic profile of innovative organizations, organizational, populations, communities - Compared to normal organizational populations (public sector, other sectors)

Discussion

A number of the debates in innovation studies could be informed by these approaches. For example, Downs and Mohr (1976) suggested that the determinants found have been unstable across studies. Damanpour, on the other hand, concluded that “the effects of determinants on organizational innovation are not necessarily unstable across different studies” and that Downs and Mohr’s (1976) prescriptions “are better suited to studies in which the focus is on the innovation rather than the organization” (Damanpour, 1991: 582). Damanpour nonetheless emphasized the need for studies of single innovations and their adoption process, which “are essential to understanding the generation, development, and implementation of innovations in organizations. Multiple-innovation studies are also needed” (Damanpour, 1991: 582). This framework should help researchers clarify when each focus is needed.

This approach would help identify organizational characteristics and factors that facilitate innovation adoption and build theory. “Theory accumulation and theory building in the field of organizational innovation is possible...more elaborate research toward developing reliable theories should be conducted” (Damanpour, 1991: 582). Damanpour (1991: 583-84) recommended (1) using his innovation results to guide selection of independent variables in research, to consider more than one dimension and to include variables from several categories (e.g. individual, organizational, environmental); (2) a comprehensive list of innovations related to all parts of an organization should be studied;⁶ (3) a change of focus from a few unrelated innovations or sets of innovations of the same type to groups of related innovations; this would draw a link between innovativeness and organizational effectiveness. Such studies need to be longitudinal and multidimensional and would require both substantial resources and collaborative efforts.

Conclusion

This paper identified a conceptual structure for researching and some of the factors important to determining the impact of innovations. It suggested that four kinds of research were needed—case studies, studies of impacts on people, quantitative studies of relationships between innovations and organizational factors, and demographic studies of organizational and population survival and mortality. Impacts cannot, however, be determined through one research program in one country—they need to be assessed in numerous organizations and populations before conclusions can be drawn. The research framework would be useful for conducting comparable research and for assuring research is cumulative and would make possible comparisons of innovations to each other, innovations to normal activities, innovative organizations to normal or static ones, innovative organizational populations to normal ones,⁷ and innovation communities to normal organizational communities. To assure comparability, researchers should coordinate their efforts and adopt common definitions, concepts, theories, methodologies and measures. Researchers need to be conscious of the definitions used by others and explicit about their own. By standardizing definitions, research could

⁶ Glor (1997, 2002) and colleagues did this for the Government of Saskatchewan, a population.

⁷ While it would be easier to find results comparing innovative and static populations, comparison to normal populations is recommended because it will be easier to find information on a normal population than a static one, if there is such a thing. Identifying and isolating static populations will be even more difficult than identifying and isolating innovative populations. Normal populations will presumably be introducing some but not many innovations.

be clearer, and relationships and theories could be tested more effectively. Comparison of organizations, populations, communities and countries would be possible if common definitions and research protocols were used. Some research programs are already in place, for example international LIPSE⁸ and research on smart and liveable cities programs. There is no program on the effect of public sector innovation on its organizations, organizational populations and/or organizational communities. There is no equivalent in the public sector to the private sector European longitudinal Community Innovation Survey (CIS),⁹ but there should be.

To explore the effect of innovations on their organizations, populations and communities, researchers require: (1) An ability to identify innovations and distinguish innovative organizations from laggards (terms developed by Rogers, 1995); (2) An understanding of the factors involved in organizational survival (requiring in-depth case study, people and correlation research); (3) Accessible databases of information about innovative organizations, organizational populations and organizational communities, including dates of founding and disappearance from the record. Researchers would also need to collect the information needed to determine whether (1) an innovation had an impact on an organization's survival, and (2) organizational and population survival was related to an organization's innovativeness in whole or in part, rather than to other factors such as leadership or political selection.

The most valuable research for achieving an understanding of the impacts of innovation (some of which has already been done) would be (1) numerous comparisons of matched case studies of innovative and normal organizations, using clear, measurable definitions; (2) numerous studies of the effect of innovation on people; (3) studies of the factors correlating with organizational survival and mortality and determining whether innovation is adaptive for survival; and (4) studies of the impacts of innovation on organizational structures and innovation's effect on organizational demographics, by examining the fate of innovations, innovative organizations, their populations and their innovation communities. Since there is already a substantial literature on the fate of normal organizations and populations, once the fate of innovative populations is determined, it should be possible to compare the demographics of normal and innovative organizational populations.

Demographic analyses require large data bases of innovations, organizations, innovative organizational populations and innovation communities. There is information in government budget estimates and sometimes in other documents but there are no inclusive data bases for innovations and their organizations. A few surveys of innovations can be accessed, e.g. the biannual survey conducted by the ICMA of top management, querying adoption of specific innovations. Since this information is not now systematically collected, researchers in cooperation with interested organizations such as governmental central agencies, professional associations or international agencies should therefore develop accessible data bases of the development, approval, implementation, effects, feedback, and survival of innovative *organizations* for entire organizational *populations* and *communities* that would allow consideration of the demographics of innovative organizations and whether innovation has been adaptive for organizations, populations, communities. Similar normal populations should be identified and compared to the innovative populations and communities.

⁸ Learning from Innovation in Public Sector Environments (www.lipse.org)

⁹ e.g. Evangelista and Vezzani, 2010 (Italy); Sapprasert and Clausen (Norway), 2012.

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