AN INITIAL EXPLORATION OF THE LITERATURE ON INNOVATION

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Introduction

- This document contains an initial exploration of the literature on innovation. The intention is to look at the organizational learning implications of this concept, as well as at the factors that motivate innovation.

- The exploration is challenging for several reasons. First, the literature on innovation is enormous, necessitating a very selective treatment of the subject. Second, there is a great deal of conceptual ambiguity associated with the term "innovation." Therefore, an overview of the concept has been included in this paper. Third, not all of the relevant literature and case study material is identified with the term innovation. This paper is limited to those materials identified explicitly as relating to the notion of innovation.

- The paper is divided into two main sections. The first section addresses the conceptual aspects of innovation and discusses the research complications associated with the notion. The second section outlines a list of factors said to contribute to innovation within organizations.

What Is Innovation?

- *Range of Definitions* — One of the key challenges of analyzing innovation is the lack of consensus about what the term means. Glor (1997, 3) provides an overview of the various meanings attributed to the term:

  > The academic literature contains a number of definitions of innovation, each revealing important aspects of it. Several authors emphasize newness, including anything perceived to be new by the people doing it (Rogers and Kim 1985) or innovation as something different for each organization into which it is introduced (Downs and Mohr 1976), or as the generation, acceptance, and implementation of new ideas, processes, products or services (Thompson 1965–66) in an applied setting (Mohr 1969). Some see it as early adoption of a new idea (Rogers and Kim 1985), others as synonymous with creativity (Jacques and Ryan 1978), still others as the same thing as improvements (Ellwein 1985), and a final group as substantive but not revolutionary changes (Merritt 1985; Deutsch 1985).

- *Relationship to Invention and Creativity* — Debra Amidon, who compiled about 40 definitions on the subject, suggests that there is a cleavage within the literature between two meanings of the term. On the one hand, there are those who think that invention (or creativity) and innovation are distinct, since the former is the inspiration and the second is the application. On the other, there are those who think the two notions are inseparable, since innovation is an artful process that requires considerable creativity.

- *Innovation and Innovativeness* — Brodtrick (1999) makes a further distinction between innovation as process or characteristic of a process ("innovativeness") and innovation as product (i.e., the result of a process). Much of the writing on the subject tends to conflate the two notions.

- *Components of Innovation* — Given the differing views on innovation and the variety of definitions available, it is necessary to stipulate a working definition. This definition is an attempt at a synthesis of the literature and contains a series of components that must necessarily exist for innovation to exist. These components are as follows:

    - *Subject of Innovation* — Innovation relates to something that is changed, which may include a product, service, activity, initiative, structure, program, or policy. Many private sector definitions limit innovation to commercial products or services. That notion is overly narrow and sector-specific.

    - *New Ideas* — Innovation involves the generation of new ideas. This suggests two things. First, that innovation involves using creativity to develop ideas. Second, that the ideas must be "new" insofar as they are either an improvement on something that exists, the invention of something that is fundamentally new, or the application of existing ideas to a new context.

    - *Application* — Creative ideas do not, in themselves, constitute an innovation. The new idea or invention must be applied (exploited, deployed, leveraged, put to work, diffused) to some organizational activity. Thus, innovation involves the practical implementation of new ideas (otherwise, one is simply left with an unused invention). This implementation may also involve artfulness, creativity, and skill to secure acceptance.

    - *Significant Change* — The change that is brought about must be "significant" and positive; that is, it must go beyond minor incremental tinkering, yet does not necessarily have to be a revolutionary departure. Significance, in this sense, means that it must relate to some improvement that is deemed to be important. For example, it must advance society, provide technological or economic progress, or provide an organization with some capability or advantage.

    A shorthand definition would thus read something like this: *Innovation is the creative generation and application of new ideas that achieve a significant improvement in a product, service, activity, initiative, structure, program, or policy*.

- *Broader Contextual Factors* — The literature also makes extensive reference to the context that is most conducive to innovation. The contextual factors differ, depending on the academic discipline. Some important terms associated with these factors include:

    - *Teams and Projects* — Much of the private management literature discusses the virtues of teams, special R&D laboratories ("skunkworks"), and short-term projects in promoting innovation.

- *Knowledge Ecologies* — Those who analyze innovation within industries often speak of special industrial districts (such as Silicon Valley) as promoting innovation within a firm. Such a concentration of firms provides cross-thatching networks that promote alliances and information sharing, as well as heated competition between market adversaries. These districts are often called "knowledge ecologies."

- *Innovation Systems* — There is an extensive literature that looks at the role of underlying techno-economic infrastructure, overarching government policy regimes, and the state of local markets in promoting innovation within an economy. This environment is typically referred to as a national or regional "innovation system" (Anderson et al. 1998).

What Are Cited As the Major Causes of Innovation?

- The following factors have been cited as major causes or motivators of innovation. They are often grouped in a variety of ways:

  - *Stages of Innovation* — Several researchers portray innovation as taking place in a stepwise manner; that is, taking place in a (more or less) linear set of steps.

  - *Loops of Innovation* — It is also fairly common to depict innovativeness as an iterative process, whereby innovators often have to go through many loops of trial and error to achieve their goal.

  - *Dynamic Models of Innovation* — Other researchers portray the innovation process in a less linear fashion, as a more dynamic model composed of various loops, tangents, and stages.

  - *Innovation Inventories* — Many researchers downplay the temporal dimensions of innovation and, instead, simply list the necessary and sufficient factors that must be in place before innovation can take place.

  - *Contextual Factors* — While some researchers provide lists of factors that must be present within the innovation process, others focus on the external (or contextual or environmental) factors that must be present before innovation happens.

  This paper will not provide an account of innovation-promoting factors that incorporate the complexity of many innovation models and dynamics. The paper will simply list many of the most commonly cited factors.

- The following list is organized into two broad categories: (1.) factors intrinsic to the innovation process that spur creativity and enable the implementation of new ideas; and (2.) contextual factors such as the support structures that facilitate progress.

Intrinsic Factors

- *Risk Management Strategies* — It is said that applying new ideas effectively requires the ability to engage in prudent risk-taking behaviours while avoiding knee-jerk risk aversion and reckless gambling. Implementing significantly new ideas involves the ability to manage risk, including the ability to minimize harmful consequences while maximizing opportunities.

- *Employee Empowerment* — Unless employees have autonomy and authority over their immediate work, it is often not possible to effect change, even if new ideas are present. Empowerment, therefore, is commonly considered a prerequisite for innovation. It also encourages the self-reliance and active problem solving that spur individual innovation. This includes the elimination (or minimization) of overly restrictive rules and red tape.

- *Leadership Skills and Change Management Strategies* — Often, the factors that determine successful innovation lie outside an individual's immediate control. For this reason, leadership skills and change management strategies are important in mobilizing needed resources and securing the cooperation of others.

- *Personal Characteristics* — According to empirical research conducted by Amabile (1998), several personal traits encourage innovation, including willingness to engage in risk, self (or intrinsic) motivation, creativity (lateral or out-of-the-box thinking), social skills, responsiveness, flexibility, certain cognitive abilities, a diverse experience, and open-mindedness (a willingness to suspend assumptions). Individuals who rely on habitual behaviour and routines, show few signs of flexibility, and only respond to external motivation apparently are considerably less likely to engage in innovation.

- *Capacity* — Without required resources, either to generate new ideas or implement those ideas, innovation can not take place. For the generation of ideas, this includes the expertise and knowledge required to develop new approaches. For the implementation of ideas, this includes access to material resources (e.g. finances), personnel, and knowledge to bring ideas to fruition.

Contextual Factors

- *Cultural Characteristics* — An organization's culture can promote or discourage innovation. The literature mentions a variety of cultural dispositions that are more conducive to innovation, including "results-oriented" culture, cultures that encourage "continuous improvement," cultures that promote "excellence" or high standards, and cultures with high levels of trust.

- *Political Incentives* — An organization's incentive system can either encourage or discourage innovation. Factors that can influence the potential include the nature of the accountability arrangements that govern organizational conduct. Arrangements that are blame-oriented, confusing, highly restrictive and myopic often breed political behaviours that are counterproductive to innovation. Conversely, well-designed accountability systems that reward personal initiative tend to promote innovation.

- *Organizational Structure* — Innovation is said to be more likely to take place in certain organizational settings, notably teams, projects, and special laboratories and think-tanks. These organizational forms tend to lack the inertia that often undermines innovation, they provide an environment more conducive to the generation of new ideas (e.g., brainstorming). Cross-functional teams composed of individuals with different skill sets often complement each other and, in so doing, are able to bring diverse bodies of knowledge and expertise to bear on a particular problem.

- *Infrastructure* — The support structure that is in place — whether within an organization or a broader economy — is said to be crucial in promoting innovation. This includes access to institutional partnerships (e.g., with educational institutions), a technological infrastructure (e.g., information and communications technologies), and a large knowledge and research base (both general and applied research).

- *Policy Regime* — The extent to which governing officials (either within an organization or a society) value innovation is said to be a factor, particularly in its effect on concrete policy decisions. Such decisions include the amount of investments in human resource development, and research and development (R & D) activities.

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