

SOCIO-COGNITIVE INFLUENCES ON INNOVATION

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FINAL REPORT

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KEY MESSAGE

The process of innovation required to create, develop, adopt and use emerging technologies is both fostered and constrained by social and cognitive factors that influence the nature and extent of innovative activities. Our review of research focusing on the relationship between national and organizational dimensions of culture, organizational practices, and innovation suggests that:

- While there are significant relationships between national cultural dimensions and national measures of innovation, these relationships are not absolute, and not predictive of outcomes. Rather, they are influential in the social dynamics and logics of action employed by multiple actors, which in turn influence the innovation process, technology trajectory, and performance.
- National culture is important for organizational innovative outcomes to the extent to which it shapes organizational practices. However, organizations are able, and often do, deviate from national cultural tendencies especially in countries characterized by low levels of cultural tightness, which is the case of Canada.
- Research on cultural diversity and innovation suggest that innovation is positively influenced by cultural diversity when diversity is properly managed. More importantly, innovation is itself a cultural process, and may emerge through different processes, mechanisms, and structures, challenging the notion of one best innovation culture.
- Innovative organizations are characterized as possessing a “culture of innovation” that allows them to advance and thrive in competitive markets. However, a clear specification of what characterizes a culture of innovation remains elusive.
- Based on the literature reviewed we conceptualize a culture of innovation as a congruent and generative set of values, norms, schemas, artifacts and practices within an organization that are consistent and supportive of each other and *uniquely* positioned to address external and internal demands, resources and constraints facing the organization.
- A culture of innovation develops in an organic, causally ambiguous, and idiosyncratic way and needs to be cultivated and nourished. Accumulating the right ingredients characteristic of such a culture is necessary but not sufficient to guarantee its development. No two cultures are the same even though they might share important elements.

EXECUTIVE SUMMARY

Emerging technologies have the potential to change the way individuals interact with each other, learn, and conduct business and have the potential to bring many benefits and challenges to Canadian citizens, governments and organizations. The creation, development, adoption, and use of emerging technologies are the result of *a process of innovation*, which is both fostered and constrained by social and cognitive factors that influence the nature and extent of innovative activities. In this paper, we report on a critical interpretive synthesis of research focusing on the relationship between national and organizational dimensions of culture, organizational practices, and innovation. Our review suggests the following relationships between culture and innovation:

National culture and innovation: There are significant relationships between national cultural dimensions and national measures of innovation. However, these relationships are not absolute, and not predictive of outcomes. Rather, they are influential in the social dynamics and logics of action of multiple actors, which influence the innovation process, technology trajectory, and performance. National culture is important for organizational innovative outcomes to the extent to which it shapes organizational practices. However, organizations are able, and often do, deviate from national cultural tendencies especially in countries characterized by low levels of cultural tightness, which is the case of Canada.

Organizational culture and innovation: Research on culture and innovation is still at early stages of development and, as a result, is highly fragmented and adopt multiple perspectives drawn from multiple paradigms. Several cultural characteristics have been identified, including factors that support risk taking and knowledge sharing and facilitate interaction, coordination, and collaboration among multiple players within and across organizations. Also, a set of *orientations* has been suggested to be related to innovation, including market orientation, customer orientation, learning orientation, and entrepreneurial orientation. Innovative organizations are characterized as possessing a “culture of innovation” that allows them to advance and thrive in competitive markets.

Diversity and innovation: Research on cultural diversity and innovation suggest that innovation is positively influenced by cultural diversity when diversity is properly managed and there are practices in place to promote divergent thinking, decrease conflict and facilitate communication and understanding between different actors within the organization. In addition, innovation is itself a cultural process, may emerge through different processes, mechanisms, and structures challenging the notion of one best innovation culture.

A culture of innovation

Innovative organizations are characterized as possessing a “culture of innovation” that allows them to advance and thrive in competitive markets. However, a clear specification of what characterizes a culture of innovation remains elusive. We draw on culture, cognition and innovation literatures to elaborate on the concept of “culture of innovation”, which we conceptualize as a congruent and generative set of values, norms,

schemas, artifacts and practices within an organization that are consistent and supportive of each other, and *uniquely* positioned to address external and internal demands, resources and constraints facing the organization.

Cultural values represent culturally influenced principles and judgments about right and wrong, desirable and undesirable, such as individualism, egalitarianism, competitiveness and goal achievement. *Cultural norms* represent knowledge of behaviors that are typical and socially approved. Norms are learned by observing how others behave and through others' reactions to our own behaviors such as expectation to develop new products permanently, and an appreciation of unconventional ideas, expectations of innovative outcomes and behaviours. *Cultural schemas* are knowledge structures storing information that guide interpretations, expectancies, and responses. Cultural schemas encompass many of the cognitive components of culture which facilitate interpretation, including market and customer orientations, learning orientation, and entrepreneurial orientation. *Cultural artefacts* refer to circulated innovation stories, arrangements, rituals and language that have symbolic meaning and support innovation. *Cultural practices* refer to the actions and routines practiced by actors on a regular basis such as formal processes to collect and harvest ideas, share knowledge and foster coordination and collaboration among different actors.

Organizations are faced with internal and external demands and constraints and possess unique resources. Demands include legal compliance, social expectations, and technological factors. Resources and constraints include financial, human structural and social capital. These demands, resources, and constraints are subjectively perceived and may be acted upon in different ways, resulting in different outcomes. Further, different groups within the organization may focus on different cultural resources when interpreting situations and assembling actions, which explains why groups within an organization may perceive the innovative potential of an emerging technology differently.

Innovation is itself a cultural process and multiple assemblages of varying cultural components are possible. Innovation may emerge through different processes, mechanisms, and structures and the congruence or incongruence among cultural elements as well as how cultural elements are demarcated to address a particular problem are as important as the cultural elements themselves.

Innovation is an emergent, non-linear and dynamic discovery process that can yield unintended outcomes and characterized by high levels of technological, commercial, organizational, and social uncertainty and ambiguity. Therefore, the resulting degree of innovation often can't be decided *a priori* but is assessed *a posteriori*. It is possible and necessary to advance technology management strategies to shape the development and growth of innovative cultures. However, bringing all the right strategies and practices together does not guarantee innovative outcomes.

Implications

Navigating the innovation cycle and transforming ideas into successful outcomes in the marketplace is a complex task dependent on multiple components. While Canada is

relatively strong in idea generation and technology creation, it is weak in the capacity to commercialize those technologies on a global scale, suggesting that Canadian organizations need to foster a culture of innovation in order to support innovative practices not only in terms of new technologies but also innovative business and marketing strategies.

However, Canadian organizations need to develop a culture of innovation that is congruent with the Canadian innovative environment including internal and external demands and constraints, as well as unique resources that are available to Canadian organizations. A culture in support of innovation must address objective and subjective constraints facing the organization. Assembling the right strategies, personnel and practices alone, does not create cultures of innovation. Rather, a culture of innovation is forged through the active and engaged process of “doing”, delivering innovative outcomes repeatedly over time.

Fostering a culture of innovation and delivering innovative outcomes, from the creation or application of emerging technologies, involves processes of searching for, selecting, and committing to combinations of ingredients that are the seeds of innovation. It further involves practices to curate and cultivate the investments into creative assets, nurturing the application of those assets into productive innovations, and finally harvesting the fruits produced (innovative outcomes) through commercialization in the marketplace, or productive diffusion into the organization. Fostering a culture of innovation is a sustained process of prescient, proactive, and adroit action that both anticipates and reacts to the vagaries, uncertainties, and opportunities presented by the environment. There are no quick fixes or magic bullets to developing innovative cultures and producing innovative outcomes.

Future research

The best practices driven nature of the innovation discourse creates the illusion that any organization in any environment can become innovative if innovative practices, values, and orientations are adopted. However, there isn't enough evidence to support that claim. Research investigating the boundary conditions of these best practices is required in order to generate actionable outcomes to Canadian organizations.

Future research needs to provide insight into what constitutes a culture of innovation in the Canadian context and how the processes and practices adopted by organizations shape the development this culture over time. Research should also address how such cultures are cultivated and nourished and what may potentially be ways in which innovative cultures can be destroyed if proactive efforts are not enacted to preserve and promote them.