COMPARATIVE STUDY OF INNOVATION MODELS

EXPLORING INNOVATION IN QUEBEC'S OFFICIAL LANGUAGE MINORITY SME ECOSYSTEM

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As a not-for-profit organization, YES' mission is to enrich the community by providing English-language support services to help Quebecers find employment and start and grow businesses.

YES' passion is to help people in its community reach their potential. At its core, it is focused on helping its clients develop a personal career or business strategy and giving them the skills and confidence to execute.

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FORWARD

by Jonathan Powers, Ph.D

As two recent commentators have observed, "[i]t was possible to write reviews of the field 25 years ago. Today [in 2017], it is nearly impossible for even the most knowledgeable researcher. The literature is too voluminous." [1] In response to this constraint, this foreword adopts the more feasible, if more modest, procedure of situating the report that follows vis-à-vis several well-known and important conceptual *landmarks* in innovation studies. Specifically, this foreword will refer to the works of Clayton Christen and Benoît Godin. Despite its obvious limitations, such a procedure nevertheless offers the reader both useful points of reference within the field of innovation studies and suggestive starting points for further inquiry.

The report that follows communicates the results of research into the value and applicability of several preselected models of innovation—namely, Lean, Agile, and Design Thinking—and one innovation tool—namely, the Growth Wheel—for small and medium-sized enterprises ("SMEs") in Quebec. The report focuses more specifically on English speaking enterprises in the province of Quebec. There are three issues implicit in the overall research project that would benefit from the kind of framing a foreword can provide: (1) the tendencies and assumptions implicit in the definition of *innovation* deployed herein, (2) the significance of the *size* of the enterprises targeted in the study, and (3) the broader meaning and practical value of *models* of innovation. This foreword begins with a brief genealogy of the concept of *innovation* in order to provide a broad historical context, then proceeds to address in order each of the three issues enumerated above.

The Genealogy of Innovation

The overarching tendency in the genealogy of the concept of *innovation*, according to Godin's extensive research, has been a shift in overall valence from mostly negative to absolutely positive. "Before the twentieth century, innovation was a vice, something explicitly forbidden by law, the term used as a linguistic weapon by opponents of change"[2] Innovation began and came its maturity as a sociopolitical concept, typically playing a role in debates regarding the relative dangers and benefits of proposed alterations or adjustments—most often by social reformers and progressive political leaders—to a given social order.[3] Pointless or reckless proposals for social change would be criticized as being mere "innovations." Since the 19th century, however, our society has developed a firm commitment to the narrative of social progress along utilitarian lines, driven forcefully by technological advancement. We progress, in this narrative, precisely and predominantly by innovating. Thus, "today innovation is a word of honour"[4] and an unequivocal good. The shift in the overall valence of the word *innovation*—from critical to laudatory—has not

1 Benoît Godin & Dominique Vinck, "Innovation – From the Forbidden to a Cliché," introduction to *Critical Studies of Innovation: Alternative Approaches to the Pro-Innovation Bias*, eds. Benoît Godin & Dominique Vinck, (Northampton, MA, USA: Edward Elgar Publishing, 2017), 1.

2 Godin & Vinck, "Innovation – From the Forbidden to a Cliché," 4.

3 See ch. 4 in Benoît Godin, *Innovation Contested: The Idea of Innovation over the Centuries* (London: Routledge, 2015).

4 Godin & Vinck, "Innovation – From the Forbidden to a Cliché," 4.

changed its basic character as a term linked to social and political change. The fact that innovation began as and remains fundamentally a term of social critique strongly suggests that social and political categories—and not just commercial and economic ones—should prove useful guides for thinking about both sources of and resources for innovation.

Defining Innovation

The report that follows, adopting the definition of the Conference Board of Canada ("CBC"), understands innovation as "'a process through which economic or social value is extracted from knowledge – through the creating, diffusing, and transforming of ideas – to produce new or improved products, services, processes, strategies, or capabilities.' Innovation means change and is a disruptive process. It is about creating and sharing new ideas and identifying and developing new opportunities based on those ideas… Innovation is something new that has *value*."[5] Within this definition, the distinctive word *disruptive* signals a close kinship with Christensen's concept of "disruptive innovation."[6] For Christensen, innovations are by definition changes in or to technology. But the word *technology*, in Christensen's thinking, enjoys an immense scope, referring to "the processes by which an organization transforms labor, capital, materials, and information into products and services of greater value. All firms have technologies. A retailer like Sears employs a particular technology to procure, present, sell, and deliver products to its customers, while a discount warehouse retailer like PriceCostco employs a different technology. This concept of technology therefore extends beyond engineering and manufacturing to encompass a range of marketing, investment, and managerial processes."[7] To summarize, we might say that Christensen sees innovation as referring to changes in techniques as well as in technologies.

Both the CBC and Christensen thus view innovation as referring to a process of change or transformation in any aspect of an institution's products or operations. Whereas Christensen views innovation as a change in technique or technology, however, the CBC views innovation as a change in *ideas*. Even with the enormous scope that Christensen affords to the concept of technology, the CBC's definition, with its focus on "ideas," affords innovation even larger fields of import and impact. For the CBC and for the report that follows, innovation may originate and propagate well beyond the purview of commercial enterprises, and its impacts may likewise reverberate across domains and sectors.

Another difference between Christensen's definition of innovation and the CBC's lies in the relative scope of the qualifier *disruptive*. For Christensen, some innovations are *sustaining* while others are *disruptive*. Sustaining innovations "improve the performance of established products, along the dimensions of performance that mainstream customers in major markets have historically valued,"[8] while disruptive innovations results

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5 The Conference Board of Canada. "Innovation" How Canada Performs: A Report Card on Canada, https://www.conferenceboard.ca/hcp/details/innovation.aspx (accessed 29 Feberuary 2020), quoted in Sarah Dimick, T*he Path for SMEs: Adopting Digital Technologies* (Ottawa: The Conference Board of Canada, 2014), 3, https://www.conferenceboard.ca/temp/2545e26d-93f1-4b19-bf6b-aad792504a40/6029_AdoptingDigitalTechnologies_BR.pdf.

6 See esp. Clayton Christensen, *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail* (Harvard Business School Press: Boston, 1997), xiv ff. and ch. 10.

7 Christensen, *The Innovator's Dilemma*, xiii.

8 Christensen, *The Innovator's Dilemma*, xv.

in products that typically "underperform established products in mainstream markets[, but] have other features that a few fringe (and generally) new customers value." Some innovations, in other words, *sustain* the existing relationships between firms and the markets they currently serve, while others *disrupt* those relationships. According to the CBC's definition, however, innovation in general and without qualification "is a disruptive process." These two differences in definition have important consequences for any approach to researching or fostering innovation.

The Importance of Size

The intended audience for most of Christensen's writings is executives in larger firms. But if we survey Christensen's reflections from a distance that sets aside this intended audience, his thinking reduces to the seminal perception that enterprises and the markets they serve must be proportionally sized and can only grow in tandem. Because disruptive innovations by definition serve fringe customers or smaller and less profitable market segments, the enterprises that serve them must be small. Properly managed large enterprises are not motivated to chase fringe customers for thin margins. Only small firms have the proper sensitivities and motivations to serve small markets, which means that disruptive innovation is a small enterprise's game.[9] This research project's focus on SMEs thus aligns perfectly with Christensen's insistence on smaller enterprises and markets as the natural parents of disruptive innovations.

Two broad takeaways emerge from this line of reflection. First, within the framework implied by the CBC's definition of innovation as a disruptive process, concrete support for real innovation—in the form of subsidies, tax or fee exemptions, training, etc.—should focus on smaller enterprises. This rule will hold irrespective of the individuals who constitute any given firm. It may be possible for individual entrepreneurs or executives to become better at innovating, but if so, such individuals can exercise their skills in fostering disruptive innovations only in the context of smaller enterprises. The question of whether individual professionals or particular teams can develop their capacity for disruptive innovation merits further research.

Second, the indicators measured to gauge the success of any intervention meant to support innovation should be conceived with smaller enterprises in mind. This is not merely a question of scaling down the methods and metrics that work for large enterprises, but of recognizing that smaller enterprises build their products and their markets by relying on and generating forms of information and knowledge that differ qualitatively (not just quantitatively) from those that drive large enterprises. The substantial qualitative differences between small and medium-sized enterprise information and knowledge on the one hand, and large enterprise information and knowledge on the other, also merit further research.

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9 Christensen, Clayton M. et al. "What Is Disruptive Innovation?" *Harvard Business Review*, December 2015, https://hbr.org/2015/12/what-is-disruptive-innovation.

Models of Innovation

One crucial requirement for the smooth operation of innovation within a society is a set of conceptualisations that provide shared platforms for discussion and negotiation between the various players in an innovation ecosystem. In Godin's view, a *model* of innovation is precisely "a conceptualization, including narratives, a set of conceptualizations, or a paradigmatic perspective, often put in a pictorial form—but reduced discursively to a simplification of reality."[10] Put otherwise, a good model is a conceptualisation that usefully oversimplifies the immense complexities of innovation in a way that has explanatory power and admits of visual representation in graphical form (most often as a diagram). These characteristics serve several specific purposes. An effective model of innovation "gives social existence to a theoretical construct and contributes to making of it a viable theoretical construct in a field,"[11] which in turn highlight "societal and policy uses and also serves rhetorical purposes."[12] Models, in other words, render the intellectually technical insights of scholars broadly legible, which not only lends currency to such insights, but also suggests how they might be practically effective in shaping policy. As to rhetorical purposes, calling a conceptualisation a *model* is first "a symbol of [its] 'scientificity.' [And s]econd, a model travels easily between scholars and between scholars and policymakers. Calling a conceptualization or narrative or perspective a model facilitates its propagation."[13] Our society generally recognizes models as acceptable representations of genuinely scientific knowledge, which gives them universal legitimacy. They also travel readily between sectors and domains because they are so self-contained, compact, and legible. Models, in short, make it possible for academics, policymakers, non-profits, and entrepreneurs both to converse and to cooperate.

Conclusion

The study that grounds the report that follows focused on a population defined using two important constraints: relative smallness (qualifying as an SME) and membership in a minority language community (participation in Quebec's English Minority community). Both of these constraints clearly cohere with the basic tenets of disruptive innovation as a conceptual frame. Focusing on SMEs aligns perfectly with Christensen's insistence on the importance of smaller enterprises and markets as the nurseries of disruptive innovations. And focusing on Quebecois English speakers aligns with Godin's observations as to the potential significance of social concepts as guides for thinking about innovation. In sum, the pages that follow detail the results of a research program that has made clever and creative use of basic concepts in Canadian social policy, woven gracefully into the broadly current model of disruptive innovation, to develop results that are interesting in their own right while simultaneously shedding light on highly promising paths forward for future research.

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10 Benoît Godin, *Models of Innovation: The History of an Idea* (Cambridge, MA, USA: The MIT Press, 2017), 12.
11 Godin, *Models of Innovation*, 2.
12 Godin, *Models of Innovation*, 2.
13 Godin, *Models of Innovation*, 12.

EXECUTIVE SUMMARY

As it stands in Quebec, there are minimal opportunities for the Official Language Minority Community's (OLMC) small and medium enterprises (SME) to be supported in their learning and practice with innovation tools and processes. Majority of innovation training and workshops are offered in French or within post-secondary institutions, or are in urban areas, thereby reducing access to training for entrepreneurs in select or remote regions.

That being said, SMEs are eager to learn more about innovation and adopt innovative practices within their businesses. They gravitate towards incremental innovation, which will have more traction within SMEs in the face of the common fear of failure.

Based on the research for this report, we can recommend that innovation models are best treated as collections of tools and processes rather than strict models to follow. Businesses and the people within them are all different and will need different tools to best support and incorporate innovation within their SMEs.

This project culminates with a selection of best practices for SMEs who want to incorporate innovation into their business, and for those who want to support SMEs with innovation training. These best practices respond to the barriers to innovation that entrepreneurs and SMEs are facing, including the lack of teams, the fear of failure, the uncertainty of where to begin, as well as familiarity with innovation.

In conclusion, despite there being minimal opportunities for English-Language SMEs in Quebec to learn about innovation and to receive training in order to implement innovation processes and tools into their businesses, English-Language SMEs in Quebec are eager to implement innovation into their businesses and are seeking out opportunities to learn and be able to see gains in commercialization through this innovation. In fact, SMEs already use innovation processes and tools without knowing it and will benefit from growing their knowledge of and practice with innovation. Supporting entrepreneurs and SMEs in developing a greater understanding of innovation tools and processes - through on-going one-on-one coaching and group workshop settings, for example - will amplify the impact of innovation within their businesses and continue to support Quebec's and Canada's economies.

INTRODUCTION

Since 1995, YES has been dedicated to serving entrepreneurs of all ages in English-speaking communities in Quebec as they launch or grow their businesses. This group of entrepreneurs, part of an OLMC, are significant participants in the innovation in both Quebec and Canada. However, due in large part to their language-minority status, many of these entrepreneurs have faced increased barriers when it comes to accessing network support and services that would strengthen their long-term sustainability, growth, commercialization and competitiveness.

As part of YES's ongoing commitment to English-language entrepreneurs, our organization has sought to better understand the innovation economy through consultation as well as the identification of tools, services, and resources that could enhance English-speaking SMEs' abilities to identify and apply appropriate innovation models. To this end, this report investigates the suitability of three leading innovation models, Design Thinking, Lean, and Agile Models, for use by English-speaking small and medium-sized enterprises through a structural analysis and comparison. This report also includes an assessment of GrowthWheel, a tool created to foster innovation in business development through decision making and 360 degree analysis.

PROJECT METHODOLOGY

The goal of this research study was to enhance English-speaking SMEs abilities to identify and apply appropriate innovation models. A comprehensive research approach was used during this study, consisting of three inter-linked components.

First, we conducted a thorough and detailed review of the relevant literature, with a focus on Design Thinking, Lean, and Agile Models of Innovation. This review consisted of a comparison of each model's specific framework, including their target audience, outcomes, barriers, best practices, implementation, and assessment. Review these comparisons in "Figure 5: Innovation models comparison chart" on page 25.

Once the literature review was complete, the information compiled was distilled and presented to three focus groups, consisting of a random selection of Quebec-based entrepreneurs who operate small and medium-sized enterprises. Each focus group was dedicated to a specific innovation model. The Agile and Lean focus groups had four participants each, while the Design Thinking focus group had eight participants. On average, the participants had been in operation for two years or less, and on average had 1-5 employees. There was at least one business in each focus group that was more mature, in order to encourage a dynamic conversation, including brainstorming and an exchange of advice. These businesses were a part of the following industries: human resources, management consulting, jewelry, retail (health and wellness), food and beverages, recruitment, consulting, technology and psychology, automotive, social wellness, health and beauty, landscaping, agriculture.

Prior to the focus group sessions, each participant completed a survey to establish their baseline understanding of innovation and the needs of their businesses. In the focus group sessions, participants were asked a series of questions regarding innovation concepts and models in reference to their own experiences and businesses. Finally, following this discussion, participants completed an exit survey so that their comprehension of the concept of innovation could be assessed and if a deeper understanding of innovation was attained, as well as if these concepts could be applied to their businesses.

The final component of the project consisted of interviews conducted with leading innovation experts and facilitators, community partners, business coaches, innovation tool developers and entrepreneurs.

As part of the scope of this project, we also assessed the GrowthWheel Innovation Tool, to identify best practices, what we can learn, what we can do without, and provide recommendations for other tools entrepreneurs could use to practice innovation. This assessment followed our participation in a training session for coaches and advisors on how to use this tool with their clients, critical discussion with business coaches about this tool, and an interview with the GrowthWheel Innovation Tool's creator.

LANDSCAPE OF INNOVATION

As defined by the Conference Board of Canada, innovation is

> "'a process through which economic or social value is extracted from knowledge – through the creating, diffusing, and transforming of ideas – to produce new or improved products, services, processes, strategies, or capabilities.' Innovation means change and is a disruptive process. It is about creating and sharing new ideas and identifying and developing new opportunities based on those ideas… Innovation is something new that has *value*."[1]

As compared to other developed countries, while Canada has developed a robust support system fostering innovation in the form of Universities, teaching hospitals and other institutions, our ability to commercialize and capitalize on the fruits of innovation lags behind our global peers.[2]

Innovation in SMEs owned by people from Minority and Marginalized Groups

Minority and marginalized groups represent a significant sector of the small business industry, including English-speakers and women, entrepreneurs with less than five years of experience, entrepreneurs with less than a high school diploma, and more. These groups face barriers in many areas, including, growth, sustainability, as well as others. According to the 2017 Survey on Financing and Growth of Small and Medium Enterprises, SMEs that are majority owned by Ingidenous persons and persons with disabilities still face barriers when it comes to the growth of their enterprises with only 14.6% and 6.1% saw an 11% or more growth per year, respectively. Both of which are under the average for all SMEs at 20.1% having 11% or more growth per year (figure 1).[3]

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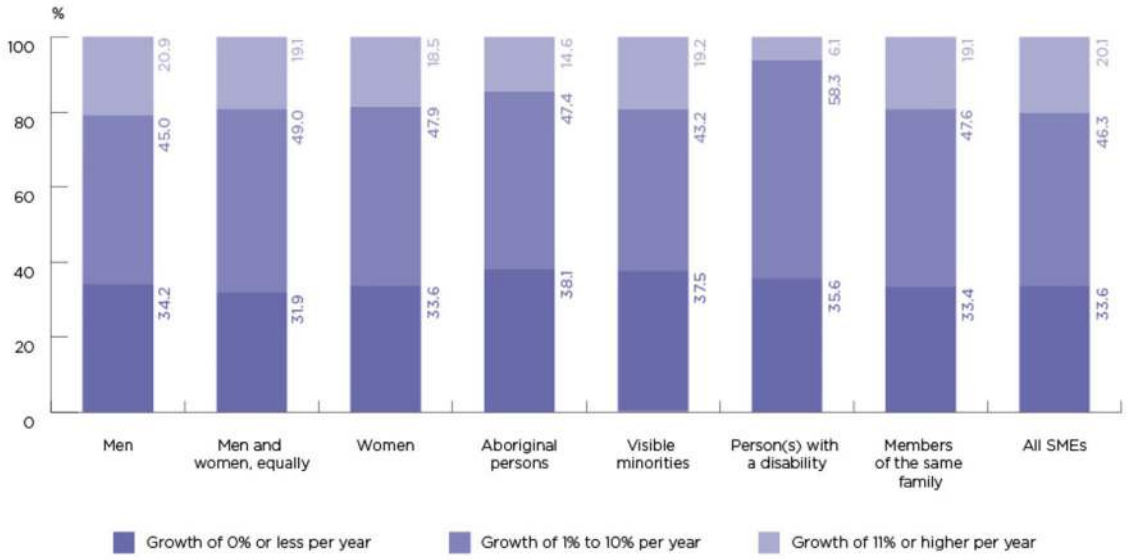
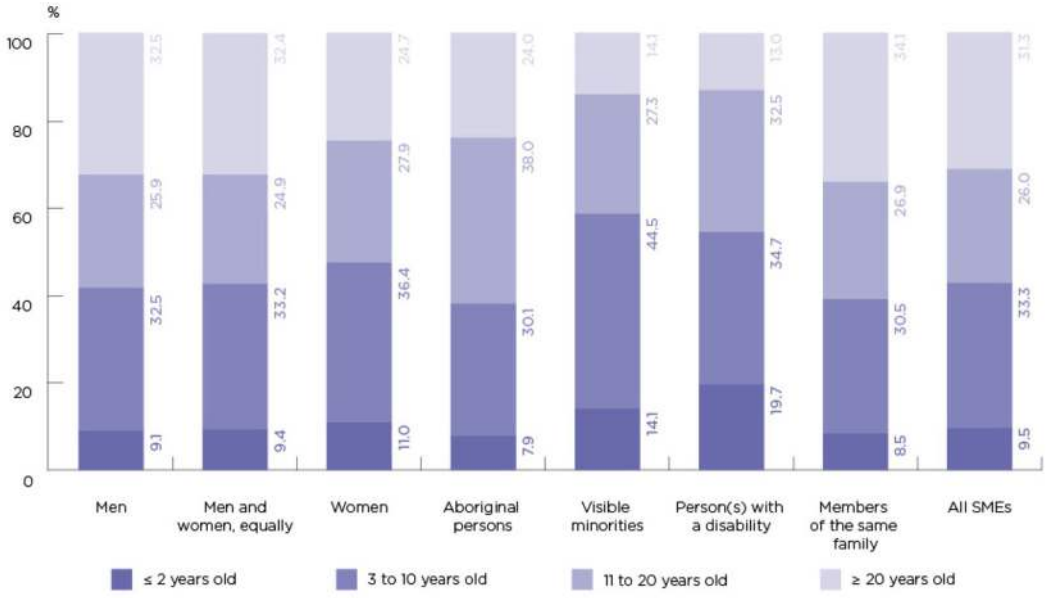
1 "The Path for SMEs: Adopting digital technologies." *The Conference Board of Canada* (February 2014), 3.
2 "Innovation," How Canada Performs: A Report Card on Canada, *The Conference Board of Canada*.
3 "Figure 9: Average growth in sales/revenues from 2015 to 2017 by majority ownership type," Statistics Canada, *Survey on Financing and Growth of Small and Medium Enterprises*, 2017, quoted in *SME Profile: Ownership demographics statistics*, Innovation, Science and Economic Development Canada, Government of Canada, 2020, https://www.ic.gc.ca/eic/site/061.nsf/eng/h_03115.html.

Figure 1: Average growth in sales/revenues from 2015 to 2017 by majority ownership type



Additionally, SMES that are majority owned by women, indigenous persons, visible minorities, and persons with disabilities still face barriers when it comes to sustainability of their businesses, all of which have lesser percentage than the 30.1 % of SMEs to make it to 20 years or more (Figure 2).[4]

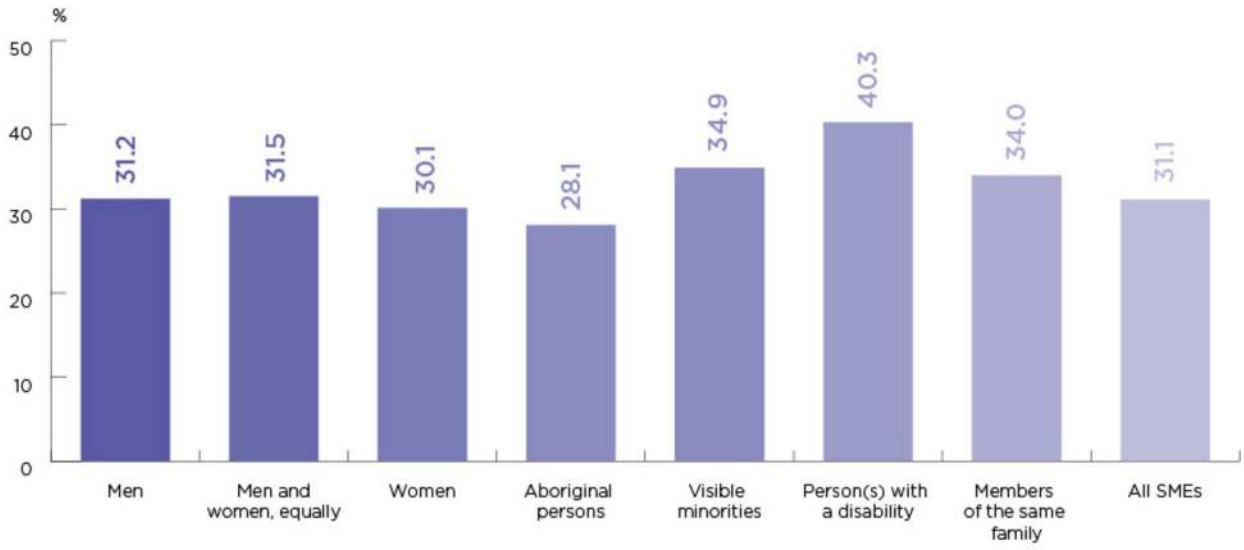
Figure 2: Age of business by majority ownership type



4 "Figure 8: Age of Business by majority ownership type," Statistics Canada, *Survey on Financing and Growth of Small and Medium Enterprises*, 2017, quoted in *SME Profile: Ownership demographics statistics*, Innovation, Science and Economic Development Canada, Government of Canada, 2020, https://www.ic.gc.ca/eic/site/061.nsf/eng/h_03115.html.

However, SMEs that are majority owned by members of a visible minority group or persons with disabilities have a higher innovation propensity than other types of majority ownership (Figure 3).[5]

Figure 3: Innovation propensity by majority ownership type



From the figure above, it seems that there is a slight inverse correlation between groups who face higher barriers to innovation and their propensity to innovate. Although this trend is promising, in order for Canada to compete on the global stage with other, more innovative countries, this correlation will need to rise.

Quebec has long considered itself a centre for research and innovation. This aligns with the reality of the entrepreneurial landscape in Quebec, which, as of December 2017, is much more focused on small and medium-sized service-based enterprises. In the province of Quebec, 97.7% of all businesses are small businesses, and 66.6% of Quebec's private sector employment is based in small business. These small businesses tend to be service-based rather than product-oriented with 78% of the small businesses in Canada being service-based.

In Canada, between 2013 and 2017, SMEs that were majority owned by men were less likely than all SMEs to operate in service-producing industries, and were more likely to operate in goods-producing sectors; in other words, the majority of small businesses in service producing industries are those majority operated by women, indigenous person, visible minorities, and persons with disabilities.[6] Service-oriented businesses include wholesale trade; retail trade; transportation and warehousing; information and cultural

5 "Figure 11: Innovation propensity by majority ownership type," Statistics Canada, *Survey on Financing and Growth of Small and Medium Enterprises*, 2017, quoted in *SME Profile: Ownership demographics statistics*, Innovation, Science and Economic Development Canada, Government of Canada, 2020, https://www.ic.gc.ca/eic/site/061.nsf/eng/h_03115.html.

6 "SME Profile: Ownership demographics statistics," *Innovation, Science and Economic Development Canada, Government of Canada*, 2020, https://www.ic.gc.ca/eic/site/061.nsf/eng/h_03115.html.

industries; finance and insurance; real estate and rental and leasing; professional, scientific and technical services; management of companies and enterprises; administrative and support, waste management and remediation services; educational services; health care and social assistance; arts, entertainment and recreation; accommodation and food services; other services (except public administration).[7]

Majority of innovation is occurring in small businesses in Quebec that are majority owned by persons in minority and marginalized group – which would include members of the OLMC - but they continue to struggle with growth and sustainability.

The connection between the innovation propensity in small businesses majority owned by minorities and marginalized groups and innovation occurring in SMEs in Quebec's Official Language Minority Community is apparent through the challenges they face. The OLMC in Quebec faces many of the same challenges that other minority and marginalized groups are facing, including lack of access to innovation training, network development, and financing.

Innovation for all?

As innovation has developed into a popular term used in startup and entrepreneurial ecosystems in Quebec, more entrepreneurs are expressing interest in further study to understand how innovation can benefit their SMEs. While this excitement is evident, entrepreneurs seem, at the same time, unable to prioritize the exploration into innovation due to the real and perceived barriers they face.

Often, businesses are interested in or implementing innovation methods to improve their community reputation, reduce costs, to aligning their business with personal values, government regulations, social and environmental considerations and economic benefits.[8] Additional incentives for incorporating innovation in their SMEs might be to create a competitive advantage,[9] or to solve complex problems or take advantage of complex opportunities,[10] or to enable them to commercialize in new ways. Ultimately, innovation in SMEs is about enhancing productivity and effectiveness, rather than innovation for innovation's sake.

Innovation can be a significant benefit to SMEs, but there are many potential barriers to consider, including a lack of resources,[11] risk averse managers and owners,[12] lack of knowledge about innovation and how it should be implemented, past success of existing

7 "Figure 10: Contribution of SMEs to the export of goods by number of exporters and value of exports," *Key Small Business Statistics*, Statistics Canada, 2019.

8 Claude Legrand and David S. Weiss, "How leaders can close the innovation gap," *Ivey Business Journal* (July/August 2011): np. https://iveybusinessjournal.com/publication/how-leaders-can-close-the-innovation-gap/

9 Legrand and Weiss, "How leaders can close the innovation gap."

10 Legrand and Weiss, "How leaders can close the innovation gap."

11 Antoine Pierre and Anne-Sophie Fernandez, "Going Deeper into SMEs' Innovation Capacity: An empirical exploration of innovation capacity factors," *Journal of Innovation Economics & Management* (2018): 139-181.. https://www.cairn.info/revue-journal-of-innovation-economics-2018-1-page-139.htm#

12 Donard Games, "Can SME benefit from innovation in an emerging market economy?," *Academy of Entrepreneurship Journal* 25, no. 1 (2019): 1-10. https://www.abacademies.org/articles/Can-sme-benefit-from-innovation-in-an-emerging-market-economy-1528-2686-25-1-210.pdf

management systems, lack of follow through, and lack of strategy or planning.[13]

SMEs must select an appropriate innovation model, modify an existing one for their type of business, or develop a tool kit of innovation methods and processes that they can call on. Their choice should be based on a broader understanding of innovation as well as their motivations and expected outcomes. To do this, SMEs should assess their innovation capacity, identify the potential barriers and potential solutions, create a strategy and a plan, identify dedicated resources, and establish a permanent communications strategy on innovation goals.[14] [15] Additionally, entrepreneurs can seek out guidance to help them through the process of innovation exploration in the form of formal training, resources or other support systems.

Applying Innovation

A common misconception of innovation is that it only happens in Research and Development, when a business is trying to develop a new product. And while this is a common place for innovation methods, there are many other areas of a business that innovation can be seen, applied, and used. However, the application of innovation and innovation models can offer a great deal to SMEs. As per the Conference Board of Canada, "Innovation means change and is a disruptive process. It is about creating and sharing new ideas and identifying and developing new opportunities based on those ideas…"[16]

There are many approaches to innovation SMEs can take, focusing on the product or service, the process that is used to develop a product or service, as well as the operations surrounding these business activities. One can incorporate innovation with a short term or long-term approach, as well as a radical or incremental approach. As many of the innovation models suggest, the process is iterative, meaning SMEs will continue in a cycle of feedback, reflection and review, and adjusting to innovate.

Innovation is often inspired out of need, a need by that individual, society, or a specific community. When we focus on a specific audience, we can more clearly see what they need and want. This is a foundational component of Design Thinking, as well as other innovation models. By pulling information from your target audience, you see the facts and can make decisions from those facts.

As Design Thinking facilitator, Toni Chowdhury, has said "innovation can exist as incremental improvements on something that is already in existence. You don't have to start at the beginning and end at the end, the process is iterative. Apply the concepts that work best for you and your business."[17]

Innovation tools can be applied in different areas of a business, it can be applied to the product, service, process, organization, and the business model. Innovation, however, can

13 Legrand and Weiss, "How leaders can close the innovation gap."
14 Terry Frederick, Than Lan, and Vicki Martin, "A Lean Innovation Model To Help Organizations Leverage Innovation For Economic Value: A Proposal," *International Journal of Management & Information Systems* 18, no. 2 (2014): np. https://clutejournals.com/index.php/IJMIS/article/download/8491/8500
15 Games, "Can SME benefit from innovation in an emerging market economy?"
16 "Innovation," How Canada Performs: A Report Card on Canada, *The Conference Board of Canada.*
17 Toni Chowdhury, Interviewed by Jessica Knapp. January 19, 2020.

also be applied in two different ways, incremental and radical. The following chart from IMP[3]rove – European Innovation Management Academy describes what Incremental and radical innovation looks like in the five different areas of a business. It is valuable to have both incremental and radical innovation as it allows businesses and entrepreneurs to find their footing in the adoption of change. By starting with incremental changes businesses can assess what additional tools they need to support the growth within their business (Figure 4).[18]

Figure 4: Classification of innovation projects - Examples

Innovation type	Incremental innovation	Radical innovation
Product innovation	• Product line extension • "Face lift" • Additional features • Improved quality *Example: Offering the food product in different sizes for single households and large family households*	• Totally new product introduced into a new market • Based on an evidently different technology • Creating new customer value *Example: MP3*
Service innovation	• Service improvement • Introduction of new service option *Example: Pick-up service*	• Totally new service offering Creation of a new market • High increase in customer value *Example: Express parcel courier instead of normal mail service*
Process innovation	• Small increase in productivity *Example: Shortening a process step*	• Introduction of totally new production process *Example: Self-service bakery*
Organisational innovation	• Small changes to the organisational structure *Example: Reducing the interfaces to the customer*	• Totally new organisational model *Example: Risk-sharing partnerships*
Business model innovation	• Complementing the existing network with additional partner *Example: Integrating additional distributor for additional market or geography*	• Using of totally channels to sell product/service offerings (sell directly online) *Example: Online direct marketing for instead of brick and mortar business*

Barriers to Innovation

There are many barriers to innovation, the most significant is the mindset of the entrepreneur and the company culture. Following mindset, businesses will not innovate because of their current misunderstanding of innovation. Frankly, the definition of

18 "Classification of innovation projects," *IMP[3]rove– European Innovation Management Academy*, May 2024, https://www.improve-innovation.eu/?attachment_id=5425.

innovation has been complicated to the point that it prevents many from being able to access quality training. In the same area of misunderstanding, many entrepreneurs are already doing incremental innovation within their SMEs, but don't recognize it as innovation.

In Quebec there are limited opportunities for English-speaking entrepreneurs operating SMEs to learn how to put innovation to work in their businesses. When an English-language entrepreneur is inspired to learn about and incorporate innovation into their SME, they often have limited time and money, and the resources that SMEs do have access to discuss innovation predominantly in theory rather than in practice. As David Madié, CEO and founder of GrowthWheel, has said, "ideally, entrepreneurs will receive a combination of theoretical understanding as well as practice, but it's possible for entrepreneurs to innovate through practice, without a theoretical understanding of innovation."[19] While French and English universities in Quebec have been offering innovation training into their programs, these opportunities remain inaccessible to most English-language SMEs due to considerations of time and cost.

It is therefore likely not a surprise that one of the biggest barriers to innovation is cash flow, finances, and time. Experimentation and innovation require failure to learn and can therefore be perceived as extremely expensive and time consuming. This has been a particular pain point for SMEs, which has forced them to concentrate on making ends meet rather than growing their businesses.

The lack of accessible training opportunities for English-language SMEs is a significant barrier for businesses in Quebec. Without this support, Quebec has not seen an uptake in innovation in English-language SMEs. However, with the appropriate facilitator training and practical innovation learning opportunities for SMEs, this can change. SMEs are led by individuals who are highly motivated and have an entrepreneurial mindset; these qualities are the foundation of innovation and place SMEs in the best position to innovate.

SMEs are, by definition, "any business that has fewer than 100 employees".[20] The small team size in organizations such as these is considered, in itself, a barrier to innovation. Innovation generally depends on the input of various interdisciplinary and diverse team members to contribute ideas and skills to the process. Further, organizational culture could also pose as a barrier to innovation in SMEs. The fear of risk is often elevated in organizations where resources (financial and/or human) are scarce. Innovation fails in cultures such as this.

19 David Madié, Interview by Jessica Knapp. January 2, 2020.

20 "Hardwiring Sensitivity to Small Business Impacts of Regulation: Guide for the Small Business Lens," *Treasury Board of Canada Secretariat*, 2012, accessed March 9, 2020, https://www.canada.ca/en/treasury-board-secretariat/services/federal-regulatory-management/guidelines-tools/guide-small-business-lens.html

INNOVATION MODELS

This project focuses on three innovation models: Agile Model, Lean Model, and Design Thinking. Traditionally, innovation models are selected based on what industry a business is in, whether they offer a product or service, and what types of constraints a business is facing. When studied as individual models, each have strengths and limitations for different SMEs, however, if viewed as collections of innovation tools and process that can be applied within SMEs in ways that complement the entrepreneurs within businesses, and more importantly their customers, these models make up the foundation of a comprehensive resource. This section provides brief summaries of each model, its strengths and limitations, as well as references to the focus group participant experiences.

Agile Model

The Agile Model was popularized by software developers, but it has become increasingly popular among non-software developers and growing businesses who want to deliver maximum outcome with minimum output through short feedback cycles to support quick learning and adaptation – also referred to as "fail fast and fail often."

The main goal with the Agile Model is to get the product into the hands of the user as soon as possible with the intention of providing continuous updates. Businesses often start with a minimum viable product (MVP) and continue to build and grow from them with the support of feedback from their customers.

The Agile Model requires a skilled manager to oversee this continuous process, set clear expectations and goals for the product, ensure that the team has access to the tools and resources they need, give workers the space to use their skills, knowledge, and experience.

The best practices for the Agile Model include:

- Maintaining a constant pace indefinitely
- prioritizing the individuals and interactions over processes and tools, and the working software over comprehensive documentation
- responding to change over following a plan,
- enabling businesspeople and developers to work together daily throughout the project,
- building projects around motivated individuals, simple approaches as they are easier to change,
- organizational buy-in,
- keep teams in sync,
- working with a team.

While there are many benefits to using the Agile Model, it does not always work well in the context of a small to medium-sized enterprise. For instance, SMEs often operate with small team and do not have the additional resources to dedicate a team member

to oversight. Additionally, the implementation of this model is supported by adopting an agile mentality – this is based on workplace culture and is often not prioritised by SMEs. SMEs tend to lean more towards a conservative mindset, keeping the potential losses in mind. For this reason, some organizations foster a culture of keeping with one decision or direction, which is in direct contrast to the Agile mindset.

However, in our Agile Model focus group session, many of the participants demonstrated the use of agile methods and processes within their businesses without acknowledging that these processes were elements of the Agile Model. One participant noted:

> Some of my approach seems agile but I didn't call it that. How I'm working with new team members. I'm learning to identify how to hire (what I'm not good at – their strengths). She does the work and figures out how to do it. I let go of micromanaging. I give objectives in general. I am also learning how to not micromanage myself. When speaking clients/giving recommendations – applying this thinking to my own recommendations. How I collaborate with clients; We meet more often create and use shared documents, and we co-create. Then we build and meet, and see if works. Doing this with creating policies as well. This methodology seems to resonate with how I am working.

This is a commonality with all three focus groups and innovation models, these SMEs are already using innovation skills within their business but are not always using them with intention. This shows us that SMEs have the capacity for innovation, but this capacity can be held back from its full potential due to competing demands and resource restrictions.

The main traits of the Agile Model that were embraced by the participants were:

- Non-hierarchical idea generation,
- giving everyone a voice and the opportunity to be heard,
- team first,
- trial and error (fail fast),
- let the people who are good at the work lead and do the work,
- progress not perfection,
- constant improvement,
- that the process is iterative and human-centred.

The focus group participants also noted that having an external team, including a business coach was important to supporting the innovation of their business. However, one participant expressed that she had past experiences with agile and that the consistent and regular meetings and constant feedback did not compliment her working style.

Lean Model

The Lean Model was popularized by auto manufacturers over 30 years ago, but it has become common in a variety of sectors and operating environments including service, high volume, and high standardization segments to the local bespoke manufacturers engaged in low-volume, high-variety business environments. This model is also used by businesses that struggle with insufficient resources and the pressure for driving down costs, as well as, businesses looking for an efficient and cost-effective innovation model.

The main goal with the Lean Model is to maximize customer value while minimizing waste, to develop an innovative culture, supporting processes and infrastructure, to increased profits, decreased costs, efficiency gains, and long-term growth, to continuously increase operational performance in productivity and quality, and waste reduction.

There are multiple approaches to using the Lean Model in a business, including product creation and manufacturing. The basic elements of the Lean Model to create a product include develop an idea, build a prototype, test it among users, and repeat until you have a prototype the client is willing to buy. In contrast, the basic elements of the Lean Model for the manufacturing process include conducting an assessment, identify the gaps and actions to take to close gaps, implement recommended improvement actions, and repeat. While this model is like Design Thinking, the Lean Model prioritizes fast pace and efficiency, and is often supported by tools for relevant industries.

The best practices for the Lean Model include:

- Communication between management, employees and subcontractors,
- using predictive and preventative maintenance,
- always looking for the root of the problem,
- creating a process to look for mistakes,
- making investments that will benefit the long term,
- creating a permanent environment of pressure,
- organizational buy-in,
- extending lean practices beyond the administrative process and the extended supply chain,
- working with a team.

It is recognized that combining Lean methods to build a tailored innovation system is the ideal usage. Businesses should consider what parts of the process can be automated and what technology can support this automation. The Lean Model is a collection of elements that work together as a system, therefore a holistic undertaking in incremental steps is recommended. Having a role dedicated to observing the pace of lean implementation within the business is also recommended.

While there are many benefits to using the Lean Model, it does not always work well in the context of a small to medium-sized enterprise. For instance, SMEs are often working with subcontractors and therefore don't have the same opportunities for oversight as they would with their own employees. Additionally, SMEs are more likely to outsource production to a large company, this limits the impact that the Lean Model can have for SMEs.

In the Lean Model focus group session, participants discussed the contradictory and intimidating elements of innovation. They commented that through innovation processes they are encouraged to fail fast and fail often, however, when working towards incorporating innovation within a workplace, entrepreneurs are cautioned that if it isn't done well it will do more harm than good. They discussed the risk of investing in innovation as fears of wasting their investments of time, money, and trust. Participants also expressed that SMEs can't innovate when they are struggling to do the minimum, ironically, it is often through these experiences of struggling to produce that inspire innovation, or more likely, inspire the thoughts that lead the team to trying something new as a last resort.

One participant outlined her current operational procedures and highlighted that she uses Instagram for market testing. This is a great demonstration of meeting her clientele where they are, and an innovative use of a digital tool designed for a different purpose. One participant indicated that they are not goal oriented or a planner, so this innovative process did not resonate with her.

Many participants in this focus group session mentioned that they rely on subcontractors to complete different parts of product development. One participant said:

> The process is so standardized already. Perhaps with sub contractors – I must call everyday to be on top of them. I have to do lots of follow up. I don't know how to make this better. It is much easier with employees who are working in front of you, but it's not an option to have employees at this time.[21]

They expressed issues with being able to account for timing and delays by these subcontractors. This is an area to potentially explore, using innovative processes when subcontractors are involved.

Design Thinking

In 2003 the term Design Thinking was coined by David Kelley, the founder of the Stanford school. Design Thinking is not associated with a particular industry, instead the goals of this model is to find a solution to a particular problem through reframing the problem with an interdisciplinary team. This fact pushes this approach to model to the forefront of innovation models because it is applicable to all parts of a business in any industry, however, the openness also serves as its limitation. Often by using innovation models that are more closely related to one's industry, entrepreneurs receive tailored guidance to the common challenges they face.

21 Ruchy Khurana, "Notes for Lean Focus Group: A Discussion about the Lean Innovation Model." Montreal, Quebec. October 28, 2019.

In an interview, Toni Chowdhury, a Senior Design Thinking Coach, explains that "Design Thinking is just one of the tools. Innovation is a much much bigger thing… You can use the principles and methodology to a certain extent, but it may not be the only thing that will solve your problem."[22]

The main goal with Design Thinking is to find a solution to a problem, while making people mindful of their own personal innovation process and awakening their creativity. Design Thinking is inherently human-focused and advocates that we centre humans through innovation, specifically receiving user/client perspective and feedback regularly. Ultimately, it creates a space where one can rid their habits and look with new eyes.

There are five phases of the Design Thinking cycle, but it is non-linear and iterative. The phases include:

1. Empathizing with users/clients,
2. finding out their needs,
3. creating solutions for them,
4. prototyping and tests solutions with them,
5. collecting feedback.

The best practices for Design Thinking include:

- Open and entrepreneurial mindset,
- using an interdisciplinary team or group of people to work with,
- supporting open-mindedness and adaptiveness,
- providing training for critical thinking, socio-cultural and leading abilities, execution, and for tools that inspire Design Thinking,
- centring the human in the process,
- organizational buy-in,
- identifying a team lead to steer the team through each step of the process,
- working with a team.

Again, this model does not always work well in the context of SMEs at first glance. For instance, most SMEs have small teams, so their immediate network does not allow for diverse perspectives. However, by connecting to the larger entrepreneurial community, these SMEs can access the support they need to effectively use these tools. Additionally, Design Thinking can take a large amount of time, which is a resource that many SMEs do not have a lot of, and therefore embracing this model can be daunting for an SME.

In the Design Thinking focus group session participants learned that technology is not always a part of innovation. They learned that innovation is about simplification, not complexity.

22 Chowdhury, Interviewed by Jessica Knapp.

Toni Chowdhury, a Senior Design Thinking Coach led the focus group participants through a "Wallet Exercise," where the participants worked in pairs to redesign a wallet to meet their needs. The participants resonated with the fact that people tend to think of what they know and not outside the box. Participants identified that the entrepreneurs pain point is not the client's pain point and that this is the main reason for making incorrect assumptions about the client's experience with their product or service. One participant shared their challenges with using Design Thinking as a solo-entrepreneur, meaning that they are a team of one. The other participants rallied with recommendations that included not doing every step and embracing an external team either in person or digitally. They illustrated the value of using other entrepreneurs as a stand in for an in-house team. Participants also voiced their experiences using a business coach or mentor as stand ins for team members.

One question asked by a participant was, "how do you innovate the moving parts of your business?"[23] This is a highly relevant question for SMEs who are worried that incorporating innovative processes will take their time away from their business. Chowdhury's response was to treat innovation initiatives like a special project alongside your business. That the first phases of Design Thinking are not about implementation, but about connecting with the user, research, analysis and brainstorming.[24]

One participant stated that the Design Thinking focus group session brought clarity to their business through using a different thought process. They commented that the focus group was well organized, had separate but related information and activities, and many useful tools and action plans. The initial Design Thinking exercises helped participants get into the mindset of organizing and planning their processes for their business without the pressure to start changing things in their business.

Several participants commented that the approaches, processes, and tools they were using were only good for entrepreneurs just starting their businesses. Chowdhury was quick to respond that these approaches, processes and tools are good for businesses at any stage.

In each focus group, participants demonstrated a willingness to brainstorm and solve problems for businesses outside of their industry, which contributed to the overall experience for these entrepreneurs.

GrowthWheel

GrowthWheel is a visual toolkit for advisors and coaches to facilitate the business development experience for entrepreneurs. With business innovation and coaching at the core, the GrowthWheel outlines the scope of business development for entrepreneurs. It sets coaches up to facilitate the decision making and action taking that entrepreneurs will be faced with through their business development.

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23 Jessica Knapp, "Notes from Design Thinking Focus Group: A Design Thinking Workshop." Montreal, Quebec. November 28, 2019.

24 Knapp, "Notes from Design Thinking Focus Group: A Design Thinking Workshop."

This tool is designed for entrepreneurs, but to be accessed through an advisor or coach who has received training from the GrowthWheel team. While this tool supports the entrepreneurial ecosystem and ultimately provides the innovative guidance entrepreneurs need through the toolkit itself by connecting them with an advisor, it is not through a direct line – unless that entrepreneur receives the GrowthWheel training themselves, which is costly and time consuming.

In a telephone interview with David Madié, the creator and CEO of GrowthWheel, he explains that the concept of the wheel isn't new. "It's a growth wheel we didn't really invent the wheel... It's just a collection of things that are already happening that we put up in a nice-looking circle with colors on it. It's just a checklist of things that exist in all businesses."[25] He continues to explain that what is innovative about GrowthWheel is the way in which the information and support for making decisions and taking actions is made available. GrowthWheel has made the elements of business development accessible to all entrepreneurs, not just those who have gone through business school and are well versed in the theoretical jargon.

GrowthWheel is a checklist that gives the entrepreneur a 360-degree perspective of their business. It facilitates getting focused, making decisions, and taking action. These are essential skills for entrepreneurs, as most are overwhelmed by the number of decisions to be made when operating a business.

GrowthWheel doesn't give specific advice to the entrepreneur, nor do they expect the advisors using GrowthWheel with their clients, as Madié explains "... we tried to make a tool ...that facilitates a process, but does not tell you what is right or wrong, like some literature is doing. GrowthWheel doesn't try to do that, we simply give tools for the individual advisor and client to use for that process that they have, and thereby making the advisor a facilitator, rather than someone who gives specific advice." [26]

This tool is one that can support a business throughout its lifetime. By returning to any of the areas indicated in the wheel the entrepreneur can innovate an element of their business, either for the first time, or the thirtieth time. GrowthWheel provides over 20 decision sheets specifically about innovation to guide coaches and entrepreneurs through exercises for their business, predominantly following the elements of Design Thinking. This tool is designed for businesses at any stage looking to bring innovation into their business, it is also intended for both small, medium, and large businesses.

25 Madié, Interview by Jessica Knapp.
26 Madié, Interview by Jessica Knapp.

CHARACTERISTICS OF THE INNOVATION MODELS IN PRACTICE

Figure 5: Innovation models comparison chart

	Design Thinking	Lean Model	Agile Model
Potential outcomes of using this innovation model	• To find a solution to a problem. • To make people mindful of their own personal innovation process and/or awaken their creativity. • To create a human-focused future. • To create a space where one can get rid of their habits and look with new eyes, with a child's mind.	• To maximize customer value while minimizing waste. • To develop an innovative culture, supporting processes and infrastructure. • To increased profits, decreased costs, efficiency gains, and long-term growth. • To continuously increase operational performance in productivity & quality, waste reduction.	• Customer satisfaction. • To provide continuous delivery, ensure independent operations, and decreased dependencies. • To promote sustainable development. • To uncover better ways of developing software by doing it and helping others do it.
Target Businesses for this innovation model	• Applicable to all SMEs with or access to interdisciplinary teams working on internal or external problems.	• Manufacturing, Service-based, and a variety of sectors and operating environments, including high volume, high standardization segments to the local bespoke manufacturers engaged in low-volume, high-variety business environments. • SMEs that produce small bulk or custom-made products. • SMEs who frequently struggle with insufficient resources and the pressure for driving downcosts. • SMEs looking for an efficient and cost-effective innovation model. • SMEs with a competitive environment and exposure to an international market.	• Software developers of software developers. • Non-software developers and growing businesses who want to deliver maximum outcomes with minimum output and seek short feedback cycles so you can learn and adapt quickly. • SMEs who work with suppliers in different locations, or develop on a platform basis, will have to modify this model. • A hybrid solution composed of agile and classical project management gives SMEs the desired agility without the risk of being crushed by the agility bandwagon.
Barriers to this innovation model	• Lack of confidence in ideas. • Poor understanding of the customer needs. • Single perspective. • Non-collaborative team • Organizational culture that doesn't support creativity or new ideas.	• Lack of trust and safety. • Lack of leadership commitment. • The ability to change. • Price constraints and global competitors. • The greater the level of product niche orientation, the slower the recognition and adoption of lean practices.	• Lack of trust. • This model cannot guarantee agreement on dates. • Scaling of agile management is possible but challenging. • Reinforced sustainable development.

	Design Thinking	Lean Model	Agile Model
How to use this innovation model	• Non-linear process (Reframe the problem within each stage). • Empathize with users/clients. • Find out their needs. • Create a solution for them. • Test solutions with them.	**From Terry Frederick et al.** • Conduct Assessment. • Identify Gaps and Actions to Take to Close Gaps. • Implement Recommended Improvement Actions. • Iteratively Repeat Steps 1-3. **From Mark Dingley** • Standardize the process. • Use predictive and preventative maintenance. • Find the root of the problem. • Create a process to look for mistakes. • Make investments that will benefit the long term. **From the National Bank** • Develop an idea. • Build prototype. • Test it among. • Repeat until you have a prototype the client is willing to buy. **From Ian Stuart & Todd Boyle** • Realign and visually reinforce performance objectives. • Create a permanent environment of pressure. • Extend lean to administrative processes and the extended supply chain. • Read, experiment and learn from others. • Individual lean elements will work together as a system to achieve long term waste reduction and continuous flow improvement. • There are different success factors are critical for companies at different stages of development. **From Wilfred H. Knol et al.** • For companies just starting to implement lean practices, the following success factors are critical: • Communication. • A learning focus, an improvement structure (sufficient resources, improvement training and a performance management system) and • Support congruence.	• The first step is to understand what you need—the managerial skills, abilities, and traits that enable digital innovation. • Determine the outcome you're trying to achieve. • Let the people who do the work figure out how they're going to do the work based on their knowledge and experience. • Strive for short feedback cycles to reflect and adapt. • Pay attention to the people doing the work. Trust them. Give them the environment and support they need. • Measure progress.

	Design Thinking	Lean Model	Agile Model
Best Practices for this innovation model	• Support open-mindedness and adaptiveness • Provide training for critical thinking, socio- cultural and leading abilities, execution, and for tools that inspire design • Center the humans in the process	• Combine lean methods to build a tailored innovation system. • Consider what information technology infrastructure should be used to facilitate the innovation processes. • Plan the whole process, prepare in advance, be more aware of potential risks, and focus on achieving long term goals rather than get discouraged by the lack of immediate success. • Recognize individual lean elements as well as how they all work together as a system to achieve long term waste reduction and continuous flow improvement. • A holistic undertaking in incremental steps. • Manufacturing SMEs should only continue to improve upstream processes after internal processes are in good order. • The presence of a process improvement engineer is critical to the pace of lean implementation.	• Maintain a constant pace indefinitely. • Individuals and interactions over processes and tools. • Working software over comprehensive documentation. • Customer collaboration over contract negotiation. • Responding to change over following a plan. • Satisfy the customer through early and continuous delivery of valuable software. • Welcome changing requirements, even late in development and harness this change for the customer's competitive advantage. • Deliver working software/product/service frequently, from a couple of weeks to a couple of months, with a preference for the shorter timescale. • Businesspeople and developers work together daily throughout the project. • Build projects around motivated individuals, give them the environment and support they need and trust them to get the job done. • Continuous attention to technical excellence and quality of design enhances agility. • Use simple approaches, because they're easier to change. • Teams must be kept in sync. Management must be kept abreast of program progress. • Timelines and dates must integrate and remain constant. • Select agile methods for only where the bottleneck isn't under too much pressure

	Design Thinking	Lean Model	Agile Model
Assess the impact of the innovation model	• Ask: Is the client satisfied? • Reflection on the dimensions of Design Thinking: Human-centered focus, Strategy and goals, Innovation approach, Altruism, Collaboration approach and brainstorming, Technology usage, User involvement, Prototype usage, Test, Experimentation, Resources need.	• Achievement of long term goals	• Meeting customers' needs • Working software/products
Tools recommended from the literature	• Innovation and creative thinking training	• Information Technology • Lean Canvas Model • Assessment Surveys • Innovation Transformation Action Grid	• Critical Chain Management • Digital Technologies • Digital Technology Adoption Pilot Program (DTAPP)

FOCUS GROUPS RESULTS

Three focus groups were conducted, each focused on a specific innovation model (Agile, Lean, Design Thinking). The Agile and Lean focus groups had four participants each, while the Design Thinking focus group had eight participants. There were a total of sixteen focus group participants.

Participants completed surveys in advance of the focus group session to establish their baseline understanding of innovation and the needs of their businesses. Participants also completed surveys at the end of the focus group session to gauge changes in their understanding of innovation and how it relates to their business. Additionally, conversations were monitored and recorded for additional analysis.

SME Profile

With regards to the age of the businesses represented in the focus groups, there was an equal split between businesses under 1 year of operation and between 1 to 3 years in operation (approximately 44% each). There was a smaller representation of businesses over 3 years in operations (12%). The inclusion of some more mature businesses encouraged a dynamic conversation that included brainstorming and offering of advice amongst all the participants.[27]

Most businesses that participated in the focus groups had one employee (69%) or two employees (25%), while 6% had 3 or more employees. Further, the participants who participated in the focus group represented both the service (50%) and product (25%) industries, with some that overlapped in both (25%).[28]

The industries that these businesses were from include: Human resources, management consulting, jewelry, retail (health and wellness), food and beverages, recruitment, consulting, technology and psychology, automotive, social wellness, health and beauty, landscaping, agriculture.[29]

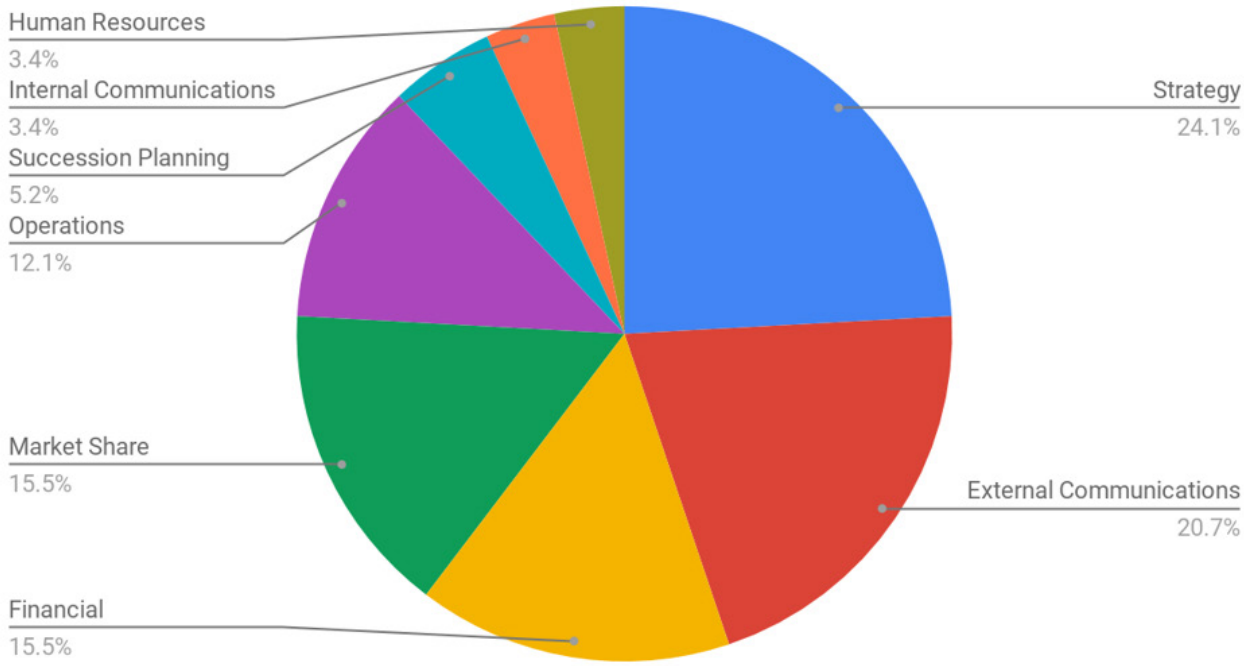
27 Anonymous Participants. "Agile Focus Group Introduction Survey Responses," Montreal, Quebec. October 24, 2019, Anonymous Participants, "Lean Focus Group Introduction Survey," October 28, 2019, and Anonymous Participants, "Design Thinking Focus Group Introduction Surveys," Montreal, Quebec, November 28, 2019.

28 Anonymous Participants. "Agile Focus Group Introduction Survey Responses," "Lean Focus Group Introduction Survey," and "Design Thinking Focus Group Introduction Surveys."

29 Anonymous Participants. "Agile Focus Group Introduction Survey Responses," "Lean Focus Group Introduction Survey," and "Design Thinking Focus Group Introduction Surveys."

Figure 6: Areas in which their businesses could improve (self-identified) [30]

When participants were asked about the areas in which their businesses could improve, participants identified:



Majority of the participants could not identify innovation training or resources offered in English in Quebec. The resources mentioned include YES, Écoles des enterprises, Saje, Pop-Up Lab, Concordia University's Human Systems Intervention Graduate Program, as well as business incubators and accelerators, including District 3, Osmo, Zu, and La Piscine.[31] Of those mentioned, the majority offer their services in French and in English on occasion.

Focus Group Framework

Two different approaches were used for the focus groups; participants in the Agile and Lean focus group sessions were presented with small units of information about innovation and the different models and were supported in discussion with non-leading questions over the course of three and a half hour session. The Design Thinking focus group was organized with a workshop component in that the participants received information about innovation and this specific model throughout and were guided through a series of activities over the course of an eight-hour session.

30 Anonymous Participants. "Agile Focus Group Introduction Survey Responses," "Lean Focus Group Introduction Survey," and "Design Thinking Focus Group Introduction Surveys."

31 Anonymous Participants, "Agile Focus Group Conclusion Survey Responses," October 24, 2019, Anonymous Participants, "Lean Focus Group Conclusion Survey Responses, " October 28, 2019, and Anonymous Participants, "Design Thinking Focus Group Conclusion Surveys,"Montreal, Quebec, November 28, 2019.

During the Agile and Lean focus group sessions, participants from Quebec's OLMC SMEs were presented with three business innovation models through the sharing of the literature review. This review was distilled into fifteen-minute presentation sections, alongside a set of non-leading questions to support discussion among the participants. Participants were then introduced to a specific model and asked to apply it to their own business. Following the exercise, participants shared their evaluation of the potential opportunities and challenges.

Focus Group Findings

Through these focus group sessions, it was apparent that participants were already using innovative processes within their businesses, however, only occasionally did participants in these focus group sessions explicitly recognize this. This demonstrates that some aspects of innovation tools and methods are a part of the entrepreneurial ethos. This begs the question; are innovation tools and methods being used to the best of the entrepreneur's ability if they are lacking the education and awareness around the models and innovation?

Problem solving processes are at the foundation of innovation. By understanding their current approach to solving problems, this provides a reasonable basis for knowing an entrepreneur's capacity for innovation. Before the focus group session began, participants were also asked how they currently solve problems. 60% of the participants indicated they consult with advisors or coaches and brainstorming with their internal teams to solve problems. 22% of the participants indicated that when faced with a problem they seek out creative solutions, and finally, 22% of the participants indicated that they solve problems as they arrive using trial and error. 22% of the participants indicated that it is too early to tell how their business will solve problems, and two did not respond to this question.[32] [33]

Also, in advance of the focus group session, participants were asked about the tools, software, and programs that they use to help with productivity and other goals for their business. Participants identified over twenty tools/programs/software that they use, the majority are technology-based, but a few are non-tech, like mind mapping, physical inventory storage, and an agenda. Of the technology based, Excel, Google Docs, Trello, Slack, and QuickBooks were the most mentioned, followed by Google Analytics, Asana, Dropbox, Omni, and Squarespace.[34]

In advance of the focus group sessions, the words most used by the participants to define innovation were "new", "process," and "solutions." This is a highlight in this project because it shows that the concept of innovation is present within the minds of these entrepreneurs. The participants' word choices demonstrate that they have a general understanding of innovation and its purpose. The focus group participants do miss out on key elements of innovation such as, problems, teamwork, and communication.

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32 Anonymous Participants. "Agile Focus Group Introduction Survey Responses," "Lean Focus Group Introduction Survey," and "Design Thinking Focus Group Introduction Surveys."

33 Participants were able to choose multiple answers, which will account for the fact that the percentages do not equal up to 100%.

34 Anonymous Participants. "Agile Focus Group Introduction Survey Responses," "Lean Focus Group Introduction Survey," and "Design Thinking Focus Group Introduction Surveys."

When asked what prevents a business from trying new tools or new ways of doing things, the participants echoed the common barriers to innovation,[35] including: Finances, Knowledge, Time, Fear of risk or change, entrenched in traditional ways of doing business, organizational culture, lack of resources and lack of diversity. Whereas for their own businesses, they identified their challenges as, work/life balance, time management, cash flow, isolation, internal and external communications, finding clients, financial planning, among others. [36]

From their surveys at the end of the focus group session all participants indicated that they loved having the opportunity to discuss their challenges and how innovation models, methods and tools could provide potential solutions. They also indicated that they would like to have seen more examples of innovation models in action in businesses more like theirs. 93% of the participants indicated that they felt they had a greater understanding of innovation after their focus group session and 100% indicated that innovation has a value and a place in their business. The areas in which they see the value include product and service development, external communications, marketing, finding their niche, organizational systems, customer experience and accounting. [37]

The elements of innovation methods that these participants noted they would like to incorporate into their businesses include, the Agile mindset, Design Thinking, co-creation, tailor/adjusting service offerings to client specific needs, shifting to focusing on the human centre, surveying customers, using new materials, agile feedback loops with clients, error detecting practices, letting the process be more iterative, doing more analysis, having more awareness in the creation of the service and products, group brainstorming, and network and business development, including having a business coach. [38]

When participants were asked if they had the resources to implement the elements of innovation, they would like to incorporate into their businesses 37.5% said no, 37.5% said yes, 12.5% said yes and no, and 12.5% did not respond.[39] Of those who said no to having the resources needed, 100% indicated the need for additional humans, 83% indicated they needed the financial resources, and 50% indicated they needed time.[40] However, 86% of participants expressed an interest in attending future training sessions on innovation. [41]

35 Pierre and Fernandez, "Going Deeper into SMEs' Innovation Capacity: An empirical exploration of innovation capacity factors."
36 Anonymous Participants. "Agile Focus Group Introduction Survey Responses," "Lean Focus Group Introduction Survey," and "Design Thinking Focus Group Introduction Surveys."
37 Anonymous Participants, "Agile Focus Group Conclusion Survey Responses," "Lean Focus Group Conclusion Survey Responses, " and "Design Thinking Focus Group Conclusion Surveys."
38 Anonymous Participants, "Agile Focus Group Conclusion Survey Responses," "Lean Focus Group Conclusion Survey Responses, " and "Design Thinking Focus Group Conclusion Surveys."
39 Participants were able to choose multiple answers, which will account for the fact that the percentages do not equal up to 100%.
40 Participants were able to choose multiple answers, which will account for the fact that the percentages do not equal up to 100%.
41 Anonymous Participants, "Agile Focus Group Conclusion Survey Responses," "Lean Focus Group Conclusion Survey Responses, " and "Design Thinking Focus Group Conclusion Surveys."

BEST PRACTICES, OBSERVATIONS, APPLICATIONS FOR SMES

This project culminates with a selection of best practices for SMEs who want to incorporate innovation into their business, and for those who want to support SMEs with innovation training. These best practices respond to the barriers to innovation that entrepreneurs and SMEs are facing, including the lack of teams, the fear of failure, the uncertainty of where to begin, as well as familiarity with innovation. Additionally, this section includes observations related to Innovation and SMEs that could serve as new areas for research.

Best practices for SMEs wanting to incorporate innovation include:

Barrier: Lack of team

- Connect to an interdisciplinary group of entrepreneurs to solve the challenges faced in business.
- Connect with a Business Coach to support your business growth and guide you to relevant innovation tools.
- Use current customers as a resource to act as a proxy for team.
- Use technology to connect virtually with outside stakeholders and personal network to serve as proxy for team.

Barrier: Fear of failure

- Fail fast. Learning from failure is a part of the innovation process.
- Seek feedback from clients and users on a regular basis.
- Learn how to collect information from customers. This feedback is essential to shape your business, product, or service. For example, by using focus groups, super customers, and even social media.
- Explore incremental and radical innovation.

Barrier: Unsure of where to start

- Start where you are. You don't always need to start at the beginning when using innovation model processes since most are iterative. Start at the phase that is most relevant to your business. For example, following a focus group one can use the Customer Journey Map to address one part of their business at a time.
- Alternately, start with how to commercialize an idea – ask the question, what would your customer buy?
- Don't assume innovation is only about technology. There are many non-technical innovations that can be implemented to processes.
- Start with organizational culture and mindset. The goal is buy-in to the concept of innovation from the beginning.
- Make a plan. Innovation can get overwhelming fast, which is why it is recommended to make a plan on which areas of your business you want to innovate first and why.

- Go deep. Don't be superficial with incorporating innovation into your business. You must put the necessary work into understanding your clients to get real information.
- Lean into external perspectives to support you with creating an innovation plan and executing the plan. For example, business coaches, mentors, and masterminds.

Best practices for those who want to support SMEs with innovation training:

Barrier: Entrepreneur is unfamiliar with potential value and financial benefit of innovation

- Create an open minded environment.
- Ensure that entrepreneurs have an entrepreneurial mindset.
- Do exercises that are disconnected from the entrepreneurs' industries. This will give them perspective on and practice with innovation outside of their business. Typically, this builds excitement for applying innovation to their own business.
- Help entrepreneurs identify the areas where they are already innovative. This will serve as motivation.
- Using examples and case studies of other businesses using innovation, as closely related to the SMEs industries.
- Deliver innovation training in group settings.
- Present comprehensive took kit, allowing entrepreneur to select the right tools for their particular situation.

Barrier: Entrepreneurs' fear of failure and of the unknown

- Facilitators must be entrepreneurs. This experience is necessary to understand the realities of entrepreneurs in the group, and to support them in understanding the role and value of innovation.
- Give SMEs as many opportunities to practice innovative processes as a group.
- Show SMEs how to use innovation tools, do not just reference them.
- The Customer Journey Map is a highly recommended tool for service-based SMEs.

Showing that innovation can be done in incremental steps. An SME doesn't have to innovate each element of their business at once or at the same time, but they will feel like this is the case.

Additional Observations From Research

- There is minimal historical analysis on innovation in Quebec, and innovation in Quebec's OLMC.
- There are many tools available to SMEs to guide their use of innovation, however not all tools are created equal.
- Entrepreneurs must be open-minded and have an entrepreneurial mindset that permeates throughout the entire organization.

- Entrepreneurs are more receptive to innovation while in group settings.
- Personality should be taken into consideration when it comes to selecting an innovation model for a business. A participant from the Lean Model focus group session expressed that she had past experiences with the Agile Model. She stated that the consistent and regular meetings and constant feedback did not compliment her working style.
- More research is needed on the processes and tools for innovation with respect to subcontractors. Many of our SMEs in the focus group sessions mentioned that they rely on subcontractors tocomplete different parts of product development. They expressed issues with being able to account for timing and delays by these subcontractors.
- Multiple training sessions are needed. Each innovation model has a variety of elements, which take time to learn and understand. Single training sessions will not provide the quality of learning that is necessary for SMEs to start using new processes and tools in their business.
- When the goal for the innovation application is commercialization, it is important to establish this direction at the beginning of the product/solution lifecycle – at conceptualization. As noted in the article "What's the Difference Between Launching and Commercializing a Healthcare Innovation?", teams should keep commercialization at the forefront even during ideation and all through to launch.[42]
- It may be helpful to connect innovation models to feminist approaches. One participant made the connection between the Agile Model and feminist thinking and referenced an article: "Why don't we just call agile what it is: Feminist."[43] This is a potential approach to innovation training for businesses who are interested in incorporating a more feminist approach in their business.
- Majority of innovation training in English takes place in higher education settings that are not accessible to many entrepreneurs.
- Severe lack of innovation training for English-speakers in Quebec - our focus groups were the closest to English innovation training many of these entrepreneurs have received.

42 "What's the Difference Between Launching and Commercializing a Healthcare Innovation?," *Legacy DNA: Strategy for Health Innovators*, accessed March 4, 2020, https://www.legacy-dna.com/blog/whats-the-difference-between-launching-and-commercializing-a-healthcare-innovation

43 Hanna Thomas, "Why Don't We Just Call Agile What It Is: Feminist," *Medium.com*, September 2019, https://medium.com/@Hanna.Thomas/why-dont-we-just-call-agile-what-it-is-feminist-8bdd9193edba

RECOMMENDATIONS

There are several areas of initiative that could be undertaken to support the use of innovation in English-language small and medium-sized enterprises in Quebec:

- More exposure to examples of innovation, knowledge sharing about innovation, and opportunities to practice with innovation tools are foundational elements of supporting SMEs in Quebec.
- Provide resources to English-language organizations in Quebec who support entrepreneurs to develop and offer relevant training needed to support innovation in SMEs. For example, group coaching, workshops, software, models, apps, masterminds, networks, etc.
- Organize in-person sessions to offer:
    - group coaching sessions over a series of weeks.
    - small group workshops to support knowledge sharing
    - entrepreneurial support group to discuss challenges and have access to interdisciplinary network
    - small cohort training sessions over a series of weeks that focuses on incremental innovation processes.
- Workshops on innovation mindset, innovation capacity, recognizing innovation, non-technology-based innovation, small budget - big innovation,
- Provide opportunities to see how other businesses in similar industries have incorporated innovative processes and tools. For example, receiving a tour of those companies, or talking to those entrepreneurs in a mentoring session.
- Trainings in group settings can be paired with on-going personalized trainings at accessible costs.
- Commercialization should be considered and understood at all steps of the innovation process, tying monetization to innovation thereby potentially adding more value when prioritizing necessities for the business. Education on the values of commercialization through innovation is necessary.
- Create a collection of innovation tools for coaches and advisors to reference for their clients, like GrowthWheel, Customer Journey Map, Business Canvas Model, etc.
- Provide grant opportunities to support SMEs planning to incorporate innovation processes and tools.
- Provide resources, training and support for entrepreneurs in all industries, not only industries focusing on technology.

CONCLUSIONS

SMEs in Quebec's OLMC are uniquely positioned to find success with innovation. The challenges they face as a minority community in Quebec has driven them to discover innovation in small ways. If they are supported in learning and applying innovative methods and processes they are likely to grow their innovation propensity. There are minimal opportunities for English-Language SMEs in Quebec to learn about innovation and to receive training in order to implement innovation processes and tools into their businesses. English-Language SMEs in Quebec are eager to implement innovation into their businesses and are seeking out opportunities to learn. Supporting entrepreneurs and SMEs in developing a greater understanding of innovation tools and processes through coaching and workshops will amplify the impact of innovation within their businesses and continue to support Quebec's and Canada's economies.

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APPENDIX A

Literature Review: Innovation Model Literature Review and Analysis Prepared by Jessica Knapp of Jessica Knapp Consulting for Youth Employment Services

Developing a comprehensive understanding of Innovation and innovation models is the first step in breaking down barriers for small and medium enterprises wanting to improve their productivity. This report presents a critical analysis of twenty-three articles provided by Youth Employment Services (YES) on the concept of Innovation and three innovation models (Design Thinking, Lean, Agile). This report contributes to a larger research project that focuses on developing and expanding entrepreneurship through new information in the form of recommendations related to the application and usage of various innovation models.

This report is divided into two sections: 1) Introduction to Innovation Models, and 2) Application of Innovation Models. Alongside the critical analysis that highlights similarities and differences, is a grid that conveys the same information. Following the critical analysis of the three innovation models, this report presents its framework, methodology, limitations and recommendations for future research, as well as recommendations for the design of future focus groups.

Prior to delving into the three innovation models it is essential that SMEs and business advisors understand the concept of Innovation. As defined by the Conference Board of Canada,

Innovation is "'a process through which economic or social value is extracted from knowledge – through the creating, diffusing, and transforming of ideas – to produce new or improved products, services, processes, strategies, or capabilities.' Innovation means change and is a disruptive process. It is about creating and sharing new ideas and identifying and developing new opportunities based on those ideas…Innovation is something new that has *value*."[1]

The concept of Innovation is the specific focus of five articles, however, it is mentioned and referred to by nearly all of the articles. The concept of Innovation is applicable to all SMEs and is an appropriate entry point for SMEs to learn about specific innovation models. Often, businesses are interested in or implementing Innovation methods to improve their community reputation, reduce costs, to aligning their business with personal values, government regulations, social and environmental considerations and economic benefits.[2] Additional incentives for incorporating Innovation in their SMEs might be to create a competitive advantage,[3] or to solve complex problems or take advantage

1 The Conference Board of Canada. "Innovation," How Canada Performs: A Report Card on Canada, https://www.conferenceboard.ca/hcp/details/innovation.aspx (accessed 29 February 2020), quoted in Sarah Dimick, *The Path for SMEs: Adopting Digital Technologies* (Ottawa: The Conference Board of Canada, 2014), 3, https://www.conferenceboard.ca/temp/2545e26d-93f1-4b19-bf6b-aad792504a40/6029_AdoptingDigitalTechnologies_BR.pdf.

2 Claude Legrand and David S. Weiss, "How leaders can close the innovation gap," Ivey Business Journal (July/August 2011): np. https://iveybusinessjournal.com/publication/how-leaders-can-close-the-innovation-gap/

3 Legrand and Weiss, "How leaders can close the innovation gap," Ivey Business Journal.

of complex opportunities, or to enhance productivity. Ultimately, Innovation is about enhancing productivity.

Innovation can benefit SMEs, but there are many potential barriers to consider, including a lack of resources,[4] risk averse managers and owners,[5] lack of knowledge about innovation and how it should be implemented, past success of existing management systems, lack of follow through, and lack of strategy or planning.[6]

However, there are ways to assess an SMEs' capacity for innovation. In their article, "Going Deeper into SMEs' Innovation Capacity: An empirical exploration of innovation capacity factors" Antoine Pierre and Anne-Sophie Fernandez provide recommendations and a framework for how to assess innovation capacity. This includes a hierarchy of fourteen innovation factors, ranked as "very important," "important," and "not important."[7] Alternatively, in the article, "How leaders can close the innovation gap," Claude Legrand and David S. Weiss present seven major characteristics of a culture of innovations that leaders need to incorporate into their SME. These seven characteristics compliment the hierarchy of the fourteen innovation factors presented by Pierre and Fernandez. Additionally, Legrand and Weiss present six guiding principles to follow when developing an innovation plan which compliments the previous recommendations and provides a more specific step-by-step process for SMEs.

SMEs must select an appropriate innovation model or modify an existing one for their type of business. Their choice should be based on a broader understanding of innovation as well as their motivations and expected outcomes. To do this, SMEs should assess their innovation capacity, identify the potential barriers and potential solutions, create a strategy and a plan, identify dedicated resources, and establish a permanent communications strategy on innovation goals.[8] [9]

Introduction to Innovation Models

While there are important differences between each, the three models all centre the human or human experience, emphasizes the importance of employee cooperation, and improving customer/client satisfaction. When an SME is considering which innovation model to use, there are many factors to consider. The following sections explore the

4 Antoine Pierre and Anne-Sophie Fernandez, "Going Deeper into SMEs' Innovation Capacity: An empirical exploration of innovation capacity factors," Journal of Innovation Economics & Management (2018): 139-181.. https://www.cairn.info/revue-journal-of-innovation-economics-2018-1-page-139.htm#

5 Donard Games, "Can SME benefit from innovation in an emerging market economy?," Academy of Entrepreneurship Journal 25, no. 1 (2019): 1-10. https://www.abacademies.org/articles/Can-sme-benefit-from-innovation-in-an-emerging-market-economy-1528-2686-25-1-210.pdf

6 Claude Legrand and David S. Weiss, "How leaders can close the innovation gap."

7 Antoine Pierre and Anne-Sophie Fernandez, "Going Deeper into SMEs' Innovation Capacity: An empirical exploration of innovation capacity factors," 139-181.

8 Terry Frederick, Than Lan, and Vicki Martin, "A Lean Innovation Model To Help Organizations Leverage Innovation For Economic Value: A Proposal," International Journal of Management & Information Systems 18, no. 2 (2014): np. https://clutejournals.com/index.php/IJMIS/article/download/8491/8500

9 Donard Games, "Can SME benefit from innovation in an emerging market economy?" Academy of Entrepreneurship Journal 25, no. 1 (2019): 1-10. https://www.abacademies.org/articles/Can-sme-benefit-from-innovation-in-an-emerging-market-economy-1528-2686-25-1-210.pdf

similarities, differences, and intersections of the outcomes, target audiences (the industries and business models), and the barriers faced for each model.

Outcomes

The three innovation models covered within this review are Design Thinking, Lean, and Agile. Each model centres the human or human experience. Each model emphasizes outcomes for employees to work better together and to improve customer/client satisfaction, however, they achieve these outcomes through different approaches.

Looking closer at the human centre of these models, Design Thinking emphasizes the personal innovation process for team members,[10] creating a space where one can get rid of habits and look with new eyes and with a child's mind,[11] and empathizing with the users/client.[12] Similarly, the Lean Model emphasizes behavioural change,[13] creating and fostering an innovative culture,[14] maximize customer value,[15] and achieving higher levels of workforce engagement.[16] And in the Agile Model, customer satisfaction,[17] and helping others develop better processes are emphasized.[18]

In addition to the human experience, each model shares the common outcomes of identifying problems, finding solutions to a problems, and refining the processes used to find these solutions. However, the problems, the processes used to find solutions, and the methods of refining these processes make up the core differences between these models (these processes and ways to refine them will be discussed in the Application of Innovation Models section of this report).

Design Thinking can be applied to any problem, and is commonly used for finding solutions to client problems,[19] but much like the Lean and Agile Models, it can also be used for finding

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10 "Design thinking for business, and how it can benefit SME's" Business Achievers (blog), December 14, 2012, accessed August 9, 2019. https://www.business- achievers.com/general/design-thinking-for-business-and-how-it-can-benefit-sme-s

11 Maria Camacho, "David Kelley: From Design to Design Thinking at Stanford and IDEO," She Ji: The Journal of Design, Economics, and Innovation 2 no. 1 (2016): 88-101. https://www.sciencedirect.com/science/article/pii/S2405872616300065

12 Melina Costa, "A Tough Crowd: Using Design Thinking to Help Traditional German Butchers," This Is Design Thinking (blog), nd, accessed August 8, 2019. https://thisisdesignthinking.net/2017/01/adalbertrapsstiftung_trueffeljagd/

13 Terry Frederick, Than Lan, and Vicki Martin, "A Lean Innovation Model To Help Organizations Leverage Innovation For Economic Value: A Proposal."

14 Terry Frederick, Than Lan, and Vicki Martin, "A Lean Innovation Model To Help Organizations Leverage Innovation For Economic Value: A Proposal."

15 Terry Frederick, Than Lan, and Vicki Martin, "A Lean Innovation Model To Help Organizations Leverage Innovation For Economic Value: A Proposal."

16 Ian Stuart and Todd Boyle, "Advancing the adoption of 'lean' in Canadian SMEs," Ivey Business Journal: Improving the Practice of Management (January/February 2007): np.https://iveybusinessjournal.com/publication/advancing-the-adoption-of-lean-in-canadian-smes/

17 Sanjay Zalavadia, "Scaling Agile for Your Small Business," Get Zephyr (blog), January 3, 2017, accessed August 8, 2019. https://www.getzephyr.com/insights/scaling-agile-your-small-business

18 Martin Fowler and Jim Highsmith, "The Agile Manifesto," SoftwareDevelopment: The Lifecycle Starts Here (August 2001): 1-7. http://users.jyu.fi/~mieijala/kandimateriaali/Agile-Manifesto.pdf

19 Maria Camacho, "David Kelley: From Design to Design Thinking at Stanford and IDEO," 88-101.

solutions to problems within the SME[20] [21] and solutions to problems their customers are having.[22] [23] Each model can to both internal and external products, services, and processes.

Additional expected outcomes of the Lean Model include increased profits, decreased costs, efficiency gains, long-term growth, waste reduction,[24] and competitive advantage.[25] And outcomes for the Agile Model include develop independent operations[26] and sustainable development.[27]

Target Audience

In addition to their goals and motivations, these three innovation models have similarities and differences related to their applicability to the various industries and business models of SMEs. While Design Thinking can be applied to any SMEs with or access to interdisciplinary teams, the Lean and Agile Models are tailored to more specific industries and business models.

The Lean Model is traditionally used in manufacturing businesses (this is stated in all but one of the relevant articles on this model),[28] but can be applied in a variety of sectors and operating environments that include high volume, high standardization segments to the local bespoke manufacturers engaged in low-volume, high-variety business environments.[29] This model is for SMEs who frequently struggle with insufficient resources and the pressure to drive down costs,[30] SMEs that produce small bulk or custom-made products,[31] and service-based business,[32] as well as SMEs looking for an efficient and cost-effective innovation model.[33]

While traditionally used by small software development teams,[34] [35] the Agile Model is

20 Wilfred H. Knol, Jannes Slomp, Roel L.J. Schouteten, and Kristina Lauche, "Implementing lean practices in manufacturing SMEs: testing 'critical success factors' using Necessary Condition Analysis," International Journal of Production Research 56 no. 11 (2018): 3955-3973. https://www.tandfonline.com/doi/full/10.1080/00207543.2017.1419583.

21 Martin Fowler and Jim Highsmith, "The Agile Manifesto," 1-7.

22 Mark Dingley, "How can SMEs benefit from lean manufacturing."

23 Sanjay Zalavadia, "Scaling Agile for Your Small Business."

24 Mark Dingley, "How can SMEs benefit from lean manufacturing."

25 Terry Frederick, Than Lan, and Vicki Martin, "A Lean Innovation Model To Help Organizations Leverage Innovation For Economic Value: A Proposal."

26 Sanjay Zalavadia, "Scaling Agile for Your Small Business."

27 Martin Fowler and Jim Highsmith, "The Agile Manifesto," 1-7

28 Not mentioned in "Lean Startup and Business Model Generation: Methods for a successful SME," National Bank (blog), November 3, 2018, accessed August 8, 2019. https://www.nbc.ca/business/advice/start-up/lean-startup-and-business-model-generation-methods-for-a-successful-sme.html

29 Ian Stuart and Todd Boyle, "Advancing the adoption of 'lean' in Canadian SMEs."

30 University of Vassa, "Too small to be lean? Implementing lean philosophy in SMEs." ScienceDaily, November 8, 2016. https://www.sciencedaily.com/releases/2016/11/161108172950.htm

31 Wilfred H. Knol, Jannes Slomp, Roel L.J. Schouteten, and Kristina Lauche, "Implementing lean practices in manufacturing SMEs: testing 'critical success factors' using Necessary Condition Analysis," 3955-3973.

32 Ian Stuart and Todd Boyle, "Advancing the adoption of 'lean' in Canadian SMEs."

33 Terry Frederick, Than Lan, and Vicki Martin, "A Lean Innovation Model To Help Organizations Leverage Innovation For Economic Value: A Proposal."

34 Wolfram Müller, "Agility: How SMEs can benefit from agile methods," TOC Focus: Theory of Constraints (December 14, 2015): np. https://www.toc- goldratt.com/tocweekly/2015/12/agility-how-smes-can-benefit-from-agile-methods/.

35 Martin Fowler and Jim Highsmith, "The Agile Manifesto," 1-7.

also for growing software development teams,[36] and small and growing SMEs in other industries who want to deliver maximum outcome with minimum output and are seeking short feedback cycles.[37] Additionally, the Agile Model should be considered for SMEs who work with suppliers in different locations, or develops on a platform basis, however, they will have to modify this model to suit their needs.[38] This model is not for everyone and any SME should be able to clearly explain why this method is right for their SME.[39] Modifications to this model are possible, for example, "a hybrid solution composed of agile and classical project management gives medium-sized enterprises the desired agility without the risk of being crushed by the ability bandwagon."[40]

While these innovation models have clear industry and business model preferences, the articles included in this review emphasize that the processes can be modified to be applied to different industries and business models. Regardless of the model, SMEs need to carefully consider which model is right for them based on their motivations, goals, and innovation capacity.

Barriers

While the barriers to innovation in general are applicable to these three models, the articles included within this review highlighted barriers related to the specific innovation models.

SMEs seeking to implement Design Thinking might struggle with team members having a lack of confidence in their ideas,[41] with developing a comprehensive understanding of their customers' needs,[42] [43] and if they only incorporate a single perspective. In each article about Design Thinking, an interdisciplinary group comes together to reframe problems and work towards a solution. SMEs, which typically have smaller teams will need to access a group to use Design Thinking.

SMEs seeking to use the Lean Model might struggle with their employees' ability to change,[44] the price constraints related to the cost of materials and global competitors,[45] and further, if they have a greater level of product niche orientation, they will see a slower recognition and adoption of Lean practices.[46]

Additionally, if there is a lack of trust and safety, or a lack of leadership commitment, SMEs seeking to implement the Lean Model will struggle.[47]

36 Sanjay Zalavadia, "Scaling Agile for Your Small Business."
37 Kent McDonald, "How to Explain Agile to Your Stakeholders," Agile Alliance (blog), nd, accessed August 8, 2019. https://www.agilealliance.org/how-to-explain- agile-to-your-stakeholders/
38 Wolfram Müller, "Agility: How SMEs can benefit from agile methods."
39 Kent McDonald, "How to Explain Agile to Your Stakeholders."
40 Wolfram Müller, "Agility: How SMEs can benefit from agile methods."
41 Maria Camacho, "David Kelley: From Design to Design Thinking at Stanford and IDEO," 88-101.
42 Melina Costa, "A Tough Crowd: Using Design Thinking to Help Traditional German Butchers."
43 "Design thinking for business, and how it can benefit SME's" Business Achievers (blog), December 14, 2012, accessed August 9, 2019. https://www.business- achievers.com/general/design-thinking-for-business-and-how-it-can-benefit-sme-s
44 Mark Dingley, "How can SMEs benefit from lean manufacturing."
45 Ian Stuart and Todd Boyle, "Advancing the adoption of 'lean' in Canadian SMEs."
46 Ian Stuart and Todd Boyle, "Advancing the adoption of 'lean' in Canadian SMEs."

47 Terry Frederick, Than Lan, and Vicki Martin, "A Lean Innovation Model To Help Organizations Leverage Innovation

Similar to the Lean Model, if SMEs are applying the Agile Model and there is a lack of trust, they will not be successful.[48] With all the moving parts that SMEs using the Agile Model will have, this model will not be able to provide guaranteed agreements on dates within the product development and delivery processes.[49] While one of the main objectives of the Agile Model is to incorporate sustainable practices, this is also a major barrier for SMEs success with this model.[50] Finally, while an optional element of the Agile Model, SMEs seeking to scale their business will face additionally challenges throughout this process. It is recommended to follow a specific guide for this process, like in Sanjay Zalavadia's article "Scaling Agile for Your Small Business."

The best way for SMEs to tackle the barriers to innovation or their selected model is to complete an initial assessment to identify the existing barriers and potential solutions, develop a strategic plan, and to frequently reassess their processes. It must not be forgotten that SMEs must engage their employees in this process. Creating an organizational culture of open-mindedness and security is crucial for innovation to thrive.

Application of Innovation Models

In addition to outcomes, target audience, and barriers, the articles within this literature review also discuss implementation processes, best practices, and assessment. The following sections explore the recommended implementation processes, best practices, and forms of assessment for each innovation model.

Implementation process

Design Thinking is centered on creating solutions for problems by working in multidisciplinary teams. It is crucial for teams to recognize that Design Thinking is a non-linear process.[51] Teams will need to reframe the problem they are seeking a solution for at each stage of the process.[52] By reframing the problem, an SME will ensure that they are seeking out a solution for the correct problem. The articles related to Design Thinking all presented a similar implementation process based on four steps. A Design Thinking team will empathize with the users/client, find out what their needs are, create solutions for this problem, and test their solutions with the client.[53] If the solutions are unsuccessful, the team should reframe the problem.

Of the six articles on the Lean Model, four provide a specific implementation process to follow. While there are similarities in the steps, they often appear in different orders and among different steps.

In Terry Frederick, Than Lan and Vicki Martin's article "A Lean Innovation Model To Help Organizations Leverage Innovation For Economic Value: A Proposal," they propose that

For Economic Value: A Proposal."

48 Martin Fowler and Jim Highsmith, "The Agile Manifesto," 1-7.

49 Wolfram Müller, "Agility: How SMEs can benefit from agile methods."

50 Kent McDonald, "How to Explain Agile to Your Stakeholders."

51 "Design thinking for business, and how it can benefit SME's" Business Achievers (blog), December 14, 2012, accessed August 9, 2019. https://www.business- achievers.com/general/design-thinking-for-business-and-how-it-can-benefit-sme-s

52 Maria Camacho, "David Kelley: From Design to Design Thinking at Stanford and IDEO," 88-101.

53 Melina Costa, "A Tough Crowd: Using Design Thinking to Help Traditional German Butchers."

lean SMEs conduct an assessment, identify gaps and actions to take to close gaps, implement recommended improvement actions, and iteratively repeat these steps.[54] In Mark Dingley's article "How can SMEs benefit from lean manufacturing," he proposes that SMEs standardize their processes, use predictive and preventative maintenance, find the root of the problem, create a process to look for mistakes, and make investments that will benefit the long term.[55] In the National Bank's article "Lean Startup and Business Model Generation: Methods for a successful SME," they suggest that SMEs using the Lean Model should develop an idea, build a prototype, test it, and repeat it until they have a prototype the client is willing to buy.[56] And in Ian Stuart and Todd Boyle's article "Advancing the adoption of 'lean' in Canadian SMEs, " they recommend SMEs realign and visually reinforce performance objectives, create a permanent environment of pressure, extend the Lean Model to administrative processes and extended supply chain, and read, experiment, and learn from others.

Additionally, Wilfred H.Knol, Jannes Slomp, Roel L.J. Schouteten and Kristina Lauche's article "Implementing lean practices in manufacturing SMEs: testing 'critical success factors' using Necessary Condition Analysis" identifies critical factors of the Lean Model for SMEs that are at different stages of implementation. For companies just starting to implement lean practices, they should focus on communication, they should have a learning focus, an improvement structure and support congruence.[57] For companies that have a more advanced experience with implementing lean practices, they should focus on extensive presence of top management support, a shared improvement vision, leadership, and a supplier link, that is the relationship and processes established up and downstream from the business.[58]

Of the five articles on the Agile Model, an implementation process can be extracted for SMEs that includes the following steps, SMEs should understand what they need (managerial skills, abilities, and traits that enable digital innovation)[59] and they should determine the outcome they are trying to achieve.[60] They should let the people who do the work use their knowledge and experience to figure out how they will do this new work.[61] SMEs should strive for short feedback cycles so they can learn and adapt quickly.[62] Agile teams should be measuring their progress along the way and keep a sustainable pace.[63]

There are many similarities in the implementation processes of the Lean and Agile Models

54 Terry Frederick, Than Lan, and Vicki Martin, "A Lean Innovation Model To Help Organizations Leverage Innovation For Economic Value: A Proposal."
55 Mark Dingley, "How can SMEs benefit from lean manufacturing."
56 "Lean Startup and Business Model Generation: Methods for a successful SME," National Bank (blog), November 3, 2018, accessed August 8, 2019. https://www.nbc.ca/business/advice/start-up/lean-startup-and-business-model-generation-methods-for-a-successful-sme.html
57 Wilfred H. Knol, Jannes Slomp, Roel L.J. Schouteten, and Kristina Lauche, "Implementing lean practices in manufacturing SMEs: testing 'critical success factors' using Necessary Condition Analysis," 3955-3973.
58 Wilfred H. Knol, Jannes Slomp, Roel L.J. Schouteten, and Kristina Lauche, "Implementing lean practices in manufacturing SMEs: testing 'critical success factors' using Necessary Condition Analysis," 3955-3973.
59 Ruben Mancha and Bala Iyer, "Harnessing Innovation," Ivey Business Journal: Improving the Practice of Management (March/April 2017), accessed August 8, 2019. https://iveybusinessjournal.com/harnessing-innovation/
60 Kent McDonald, "How to Explain Agile to Your Stakeholders."
61 Kent McDonald, "How to Explain Agile to Your Stakeholders."
62 Kent McDonald, "How to Explain Agile to Your Stakeholders."
63 Kent McDonald, "How to Explain Agile to Your Stakeholders."

including performing an assessment of current processes, identifying and understanding outcomes, and the use of short feedback cycles. As well as the importance of working within a team, having diverse perspectives, and creating an open-minded and supportive organizational culture.

Best Practices

Through the suggested implementation processes for each model, the articles in this literature review also presented many best practices for implementing each innovation model.

In Design Thinking, SMEs are encouraged to support open-mindedness and adaptiveness.[64] They should also provide training for critical thinking, socio-cultural and leading abilities, execution, and for tools that inspire design.[65] It is important for SMEs to access training offered by credible facilitators who have experience in entrepreneurship. Fostering creativity, open communication lead to an organizational culture that is open to innovation and change. Finally, they should always remember to center the humans in the process.[66]

Looking at the implementation of the Lean Model, SMEs are encouraged to combine lean methods to build a tailored innovation system. They should consider what information technology infrastructure should be used to facilitate the innovation process, and plan the whole process, prepare in advance, be aware of the potential risks, and focus on achieving long term goals rather than get discouraged by the lack of immediate success.[67] It is essential that SMEs see the Lean Model as a holistic undertaking[68] that is implemented in incremental steps.[69] For example, SMEs will need to recognize the individual lean elements as well as how they all work together as a system to achieve long term waste reduction and continuous flow improvement.[70] It is recommended that manufacturing SMEs only continue to improve upstream processes after internal processes are in good order.[71] Finally, the presence of a process improvement engineer is critical to the pace of lean implementation.[72]

The best practice for the Agile Model that are presented in the articles in this literature review are extensive. From Martin Fowler and Jim Highsmith's article "The Agile Manifesto,"

64 Li, Rui, Zhenyu Cheryl Qian, Yingjie Victor Chen & Linghao Zhang. "Design Thinking Driven Interdisciplinary Entrepreneurship: A Case Study of College Students Business Plan Competition." The Design Journal: An International Journal of All Aspects of Design 22 no. 1 (2019): 99-110. Accessed August 8, 2019. https://www.tandfonline.com/doi/pdf/10.1080/14606925.2019.1602993.

65 65 Rui Li, Zhenyu Cheryl Qian, Yingjie Victor Chen & Linghao Zhang. "Design Thinking Driven Interdisciplinary Entrepreneurship: A Case Study of College Students Business Plan Competition," 99-110.

66 Maria Camacho, "David Kelley: From Design to Design Thinking at Stanford and IDEO," 88-101.

67 University of Vassa, "Too small to be lean? Implementing lean philosophy in SMEs." ScienceDaily, November 8, 2016. https://www.sciencedaily.com/releases/2016/11/161108172950.htm

68 University of Vassa, "Too small to be lean? Implementing lean philosophy in SMEs." ScienceDaily, November 8, 2016. https://www.sciencedaily.com/releases/2016/11/161108172950.htm

69 Terry Frederick, Than Lan, and Vicki Martin, "A Lean Innovation Model To Help Organizations Leverage Innovation For Economic Value: A Proposal."

70 Ian Stuart and Todd Boyle, "Advancing the adoption of 'lean' in Canadian SMEs."

71 Wilfred H. Knol, Jannes Slomp, Roel L.J. Schouteten, and Kristina Lauche, "Implementing lean practices in manufacturing SMEs: testing 'critical success factors' using Necessary Condition Analysis," 3955-3973.

72 Ian Stuart and Todd Boyle, "Advancing the adoption of 'lean' in Canadian SMEs."

they emphasis four guding principles: Individuals and interactions over processes and tools, working software over comprehensive documentation, customer collaboration over contract negotiation, and responding to change over following a plan.[73] While all eight elements are important to successful implementation of the Agile Model, they have prioritized four to simplify the process.

Additionally, Fowler and Highsmith recommend that SMEs welcome change even in late developments, that they deliver working products frequently, that business people and developers work collaboratively daily, that SMEs build projects around motivated individuals, give them the environment and support that need and trust them to get the job done, maintain a constant workflow, face-to-face communications are best, use simple approaches, and that teams should reflect on effectiveness at regular intervals.

The need for sustainable workflow and organizational culture shifts are the main similarities between the three models. Design Thinking and Agile Models continue to emphasize the human element of the products and process, whereas the Lean Model shifts to an emphasis on planning. The Lean Model's focus on planning strengthens the opportunities for meeting long term objectives, but unlike the Agile Model, does not create an environment conducive for quickly implementing change. Both the Design Thinking and Agile Models embrace creativity and change in their processes, as well as collaboration within the teams and with the clients/customers. It is clear through the best practices how each of these models lends itself to particular industries. However, each of these models are adaptable to industry and business models, therefore it is up to individual SMEs to create a tailored innovation model that will meet their current and ongoing needs.

Assessment

This final section of the literature review synthesis, reviews the ways each innovation models assess the success of implementation in SMEs. Of all the areas of synthesis, assessment discussed the least in these articles.

Within Design Thinking, SMEs are encouraged to review and compare their progress to the eleven dimensions of design thinking presented in Rui Li, Zhenyu Cheryl Qian, Yingjie Victor Chen and Linghao Zhang's article "Design Thinking Driven Interdisciplinary Entrepreneurship: A Case Study of College Students Business Plan Competition," which are Human-centered focus, Strategy and goals, Innovation approach, Altruism, Collaboration approach and brainstorming, Technology usage, User involvement, Prototype usage, Test, Experimentation, Resources needed.[74] Since the Design Thinking process is iterative, there is an ongoing need for human and financial resources.

The success of the Lean Model is more challenging to assess because results are based in long terms goals. This is why it is an essential part of the process to continuously assess, identify gaps and actions to take to close gaps, and implement recommended improvement actions.[75]

73 Martin Fowler and Jim Highsmith, "The Agile Manifesto," 1-7.

74 Rui Li, Zhenyu Cheryl Qian, Yingjie Victor Chen & Linghao Zhang, "Design Thinking Driven Interdisciplinary Entrepreneurship: A Case Study of College Students Business Plan Competition," 99-110.

75 Terry Frederick, Than Lan, and Vicki Martin, "A Lean Innovation Model To Help Organizations Leverage Innovation

For the Agile Model, working software/products are the primary measure of success.[76] And like the Lean Model, SMEs using the Agile Model should conduct regular and ongoing assessment to identify gaps, actions to take, and implement recommended improvements, this form of assessment imparts an accurate measure of the progress and a deeper understanding of the risks involved in any given project.[77] Like Design Thinking, the Agile Model is a success if the customer's needs are met.[78]

If an SME is unsure of whether the innovation model they have selected is working for them then they should review their motivations for incorporating the model and their expected outcomes. Additionally, they can reassess their innovation capacity with the recommendations made within the articles in this literature review.

Individual Article Summaries

Innovation

Pierre, Antoine and Anne-Sophie Fernandez. "Going Deeper into SMEs' Innovation Capacity: An empirical exploration of innovation capacity factors." *Journal of Innovation Economics & Management* (2018): 139-181. Accessed August 8, 2019. https://www.cairn.info/revue- journal-of-innovation-economics-2018-1-page-139.htm#

This article conducts a case study with thirty-two SMEs from multiple industries. Pierre and Fernandez facilitated interviews focused on two main approaches: 1)to establish which dimensions the SMEs already know and use, and 2) questions specific to four new dimensions they are proposing. In addition to the case study, this article includes a literature review. Based on this comprehensive literature review, they identified ten innovation dimensions. In this article, they propose four new innovation dimensions and identifies which of the fourteen dimensions are relevant to SMEs. Through this analysis, Pierre and Fernandez propose a new framework for innovation capacity specifically for SMEs.

Games, Donard. "Can SME benefit from innovation in an emerging market economy?" *Academy of Entrepreneurship Journal* 25, no. 1 (2019): 1-10. Accessed August 8, 2019. https://www.abacademies.org/articles/Can-sme-benefit-from-innovation-in-an-emerging-market- economy-1528-2686-25-1-210.pdf

In this study, Games conducts a quantitative analysis of 120 SMEs in creative industries in three Indonesian cities in West Sumatra, which specifically explores the relationship between innovation capabilities, risk taking, positive outcomes, negative outcomes, and financial performance. Games finds that risk taking is essential for business innovation in order to pursue business opportunities. In this case, risk taking and innovation capabilities can be seen as ways of enhancing SME innovation which in turn will increase SME financial performance.

For Economic Value: A Proposal."

76 Martin Fowler and Jim Highsmith, "The Agile Manifesto," 1-7.

77 Martin Fowler and Jim Highsmith, "The Agile Manifesto," 1-7.

78 Kent McDonald, "How to Explain Agile to Your Stakeholders."

Innolytics. "Five ways SMEs can innovate successfully by Innolytics." *Innolytics: Exploring Future Markets*. Accessed August 8, 2019. https://innolytics-innovation.com/innovation-in- smes/

This article suggests the SMEs are unique because innovation is handled by operational departments in addition to day-to-day business, unlike in large enterprises that would have dedicated departments for innovation. In order to work around the lack of resources, this article suggests that SMEs should focus on "lean and goal-oriented innovation management." This article promotes the use of Innolytics innovation tool and does not make any references to previous research or reviews of the tool.

Burch, Sarah. "Small Businesses and Sustainability Innovation: Confronting the Gap between Motivation and Capacity." *Centre for International Governance Innovation Policy Brief No. 127* (2018): 1-12. Accessed August 8, 2019. https://www.cigionline.org/sites/default/files/documents/PB%20no.127web.pdf.

This article is based on web-based surveys completed by SMEs in the Greater Toronto and the Metropolitan Vancouver Areas. Sarah Burch explores the business case for sustainability innovation in SMEs, since SMEs employ the most individuals in the private sector and cause most of the private sector pollution. Burch is specifically concerned with the way SMEs are motivated to make progress on sustainability. Burch identifies the main barriers as lack of time, funding, and availability of staff. Burch suggests that because government regulations are the least motivating that there is room for improvements to government policies. Additionally, she indicates that both management and policy approaches should explicitly consider the community-based motivations of businesses, rather than relying simply on economic incentives. Finally, Burch argues that SMEs should not respond to sustainability innovation in a reactive way.

Legrand, Claude and David S. Weiss. "How leaders can close the innovation gap." *Ivey Business Journal* (July/August 2011). Accessed August 8, 2019. https://iveybusinessjournal.com/publication/how-leaders-can-close-the-innovation-gap/

This article defines the innovation gap, identifies causes, and potential solutions. This article is not strictly concerned with SMEs and only focuses on older companies. Legrand and Weiss identify an innovation gap as a lack of action by leaders (Owners/Managers) to incorporate innovation within their companies, and they suggest that this is because past solutions from the industrial economy have made them successful. Moving into a knowledge economy requires that companies shift to an innovation model in order to continue being successful.

Legrand and Weiss recommend all the people involved must understand what innovation is, how to support it, and why it is necessary, the concept of innovation needs to be imbedded within the organization, not just in what they create, but how they create and how they operate, and finally, there must be a plan for innovation.

Design Thinking

Li, Rui, Zhenyu Cheryl Qian, Yingjie Victor Chen & Linghao Zhang. "Design Thinking Driven Interdisciplinary Entrepreneurship: A Case Study of College Students Business Plan Competition." *The Design Journal: An International Journal of All Aspects of Design* 22 no. 1 (2019): 99-110. Accessed August 8, 2019. https://www.tandfonline.com/doi/pdf/10.1080/14606925.2019.1602993.

This article uses a college student competition featuring design and non-design majors as a framework for a case study. Researchers find that the training of design thinking improves the innovating ability of students with an all-dimensional approach. This research suggests that, in order to cultivate design thinking, SMEs should be focused on the opportunities and challenges brought by the interdisciplinary, personalized training, and self learning activities under the scenario of open innovation. Researchers have three recommendations to cultivate design thinking: 1) open-mindedness and adaptiveness of professionals and educators,(2) focus on whole world integration, and 3) training of critical thinking and socio-cultural abilities, and execution and leading abilities, as well as tools that inspire design.

Camacho, Maria. "David Kelley: From Design to Design Thinking at Stanford and IDEO." *She Ji: The Journal of Design, Economics, and Innovation* 2 no. 1 (2016): 88-101. Accessed August 8, 2019. https://www.sciencedirect.com/science/article/pii/S2405872616300065

This article is an edited transcript of an interview between David Kelley, the founder of the Stanford d.school—the Hasso Plattner Institute of Design at Stanford University. Kelley coined the term "design thinking," and, in this discussion, explains that to him. The fundamentals of design thinking are multidisciplinary team-based, human-oriented, and problem solving. The goal of design thinking is to find a solution to a particular problem through reframing: through the process of reframing, the team is supported in thinking creatively (unlike the analytical process used by mostly engineers).

Costa, Melina. "A Tough Crowd: Using Design Thinking to Help Traditional German Butchers." *This Is Design Thinking* (blog). nd. Accessed August 8, 2019. https://thisisdesignthinking.net/2017/01/adalbertrapsstiftung_trueffeljagd/.

This article discusses the experience of a design thinking team based in Germany with the challenge of creating a new experience of going to a traditional German butcher. The process the team from HPI School of Design Thinking in Potsdam used was: 1) Empathize with users, 2) find out their needs, 3) create solutions for them, and 4) Test with them. This article follows the team as they completed this process with unsatisfactory results, restarted by reframing the problem, and reached a successful solution for the butchers.

"Design thinking for business, and how it can benefit SME's." *Business Achievers* (blog). December 14, 2012. Accessed August 9, 2019. https://www.business- achievers.com/general/design-thinking-for-business-and-how-it-can-benefit-sme-s

This article lays out the five steps of Design Thinking Methodology in a generic way that can apply to any SME. This article positions Design Thinking as the solution to two of the most common causes of SME failure: unsatisfactory products and poor understanding of customer needs. With a step-by-step description of each phase, this article emphasizes that the SME may have to loop back to any of the other phases, as this is a cyclical process, not a linear process.

Lean Model

Frederick, Terry, Than Lan & Vicki Martin. "A Lean Innovation Model To Help Organizations Leverage Innovation For Economic Value: A Proposal." *International Journal of Management & Information Systems* 18 No. 2 (2014). Accessed August 8, 2019. https://clutejournals.com/index.php/IJMIS/article/download/8491/8500.

This article proposes a process for SMEs to assess innovation in an efficient and cost-effective manner. The foundation of the proposed process come from two previously established processes, the "Build-Measure-Learn Feedback Loop" by Eric Ries and the "Persuasive Technologies" by B.F. Fogg. This article provides a framework for a Lean Innovation Model, which can be summarized in four basic steps: 1) conduct assessment, 2) identify gaps and actions to take to close gaps indicated by the innovation transformation action grid (ITAG), 3) implement ITAG recommended improvement actions, and 4) iteratively Repeat steps 1-3.

University of Vassa. "Too small to be lean? Implementing lean philosophy in SMEs." *ScienceDaily*. November 8, 2016. Accessed August 8, 2019. https://www.sciencedaily.com/releases/2016/11/161108172950.htm

This article is a brief summary of Anna Rymaszewska's doctoral dissertation at the University of Vassa (Finland). Rymaszewska's focus is on SMEs with manufacturing operations that are characterized by low volumes and high variability, production ramp-up, as well as with the connection between lean implementation and environmental sustainability. Rymaszewska's dissertation shows that the specifics of SMEs call for a different approach than would be the case for large companies. Moreover, the implementation of the Lean Model should be addressed from the perspective of a company's strategy, and environmental sustainability. Her research provides an original contribution that is realized through proposing a revised perspective on lean implementation in SMEs, which takes into account aspects such as key practices, processes, and performance criteria.

Dingley, Mark. "How can SMEs benefit from lean manufacturing." *Matthews Australasia* (blog). September 3, 2015. Accessed August 8, 2019. https://blog.matthews.com.au/how- can-smes-benefit-from-lean-manufacturing/.

In this article, Dingley proposes five steps to make the Lean Model work with the goal of maximizing customer value and minimizing waste for SMEs with manufacturing production: He suggests that SMEs 1) standardize the process, 2) use predictive and

preventative maintenance, 3) find the root of the problem, 4) create a process to look for mistakes, and 5) make investments that will benefit the long term. He also provide guidelines for standardization.

"Lean Startup and Business Model Generation: Methods for a successful SME." *National Bank* (blog). November 3, 2018. Accessed August 8, 2019. https://www.nbc.ca/business/advice/start-up/lean-startup-and-business-model-generation-methods-for-a-successful-sme.html

This article explains why SMEs and start-ups should both use the Lean Model Canvas and the Business Model Canvas. Along with the business plan and a financial plan, entrepreneurs would be able to demonstrate their relevance and viability of their business idea as well as establish their credibility among stakeholders. A Lean Model Canvas provides exercises to help businesses reflect and ask questions to help test product or service, and is based on the principle of repetition: 1) develop an idea, 2) build prototype, 3) test, and 4) repeat until you have a minimum viable product.

Alternatively, the Business Model Canvas has nine blocks to represent an organization, product or service offering. It is used to assess the desirability and feasibility of a product, and its potential profitability by asking you to assess 1) key partners, 2) activities and resources needed to successfully deliver your product or service, and 3) costs and revenue to expect.

Stuart, Ian, Todd Boyle. "Advancing the adoption of 'lean' in Canadian SMEs." *Ivey Business Journal: Improving the Practice of Management* (January/February 2007). Accessed August 8, 2019. https://iveybusinessjournal.com/publication/advancing-the-adoption-of-lean-in- canadian-smes/

In this article, Stuart and Boyle present a study of the relationship between Lean manufacturing and Lean thinking in eighteen Canadian SMEs (and a few large businesses). Ultimately, they identify a disconnect between Lean manufacturing and Lean thinking in these SMEs. The researchers share nine main observations and make four recommendations for manufacturing management to increase the pace of Lean adoption. This article demonstrates the parallels between design thinking and Lean thinking. Both innovation models are customer oriented and both encourage exposure to alternative perspectives to inspire creative solutions.

Knol, Wilfred H., Jannes Slomp, Roel L.J. Schouteten & Kristina Lauche. "Implementing lean practices in manufacturing SMEs: testing 'critical success factors' using Necessary Condition Analysis." *International Journal of Production Research* 56 no. 11 (2018): 3955-3973. Accessed August 8, 2019. https://www.tandfonline.com/doi/full/10.1080/00207543.2017.1419583.

This study looks at thirty-three Dutch manufacturing SMEs in order to assess whether there might be a sequence of criticality in the twelve success factors. They find that different success factors are critical for companies at different stages of development.

However, they state that having these success factors does not necessarily lead to more success, they are necessary, but not a sufficient condition for success. Success factors are described as "areas of managerial planning and action that must be practised to achieve effective quality management in a business unit."

Agile Model

Fowler, Martin and Jim Highsmith. "The Agile Manifesto." *SoftwareDevelopment: The Lifecycle Starts Here* (August 2001): 1-7. Accessed August 8, 2019. http://users.jyu.fi/~mieijala/kandimateriaali/Agile-Manifesto.pdf

In this article, Fowler and Highsmith summarize a document called "The Manifesto for Agile Software Development," created by seventeen self-identified anarchists. They outline a foundation for Agile Models, recognize that each project is different, that each project team is different, and that there is no one-size-fits-all solution. In addition to their four core values, they have identified twelve principles for the Agile Model. The core values emphasize human interaction and collaboration, prototype development (proof of concept), and embracing change.

Zalavadia, Sanjay. "Scaling Agile for Your Small Business." *Get Zephyr* (blog). January 3, 2017. Accessed August 8, 2019. https://www.getzephyr.com/insights/scaling-agile-your-small- business

In this article, Zalavadia discusses how SMEs who use agile practices can scale this model with growing teams. This is important because agile practices are most associated with small teams. However, the agile method is highly flexible and therefore can scale to meet the needs of teams and team activities in response to changing circumstances. This means that instead of having one team working on a project, there are multiple teams working on the project, or multiple projects.

This article identifies seven areas that will guide SMEs in scaling agile practices.

Müller, Wolfram. "Agility: How SMEs can benefit from agile methods." *TOC Focus: Theory of Constraints* (December 14, 2015). Accessed August 8, 2019. https://www.toc-goldratt.com/tocweekly/2015/12/agility-how-smes-can-benefit-from-agile-methods/.

This article suggests that agile methods are not adaptable and instead that SMEs should use a hybrid solution composed of the Agile Model and classical project management. This article suggests the use of Critical Chain Management as a framework, selecting agile methods for only where the bottleneck isn't under too much pressure. This article is not backed up by a study or references.

McDonald, Kent. "How to Explain Agile to Your Stakeholders." *Agile Alliance* (blog). nd. Accessed August 8, 2019. https://www.agilealliance.org/how-to-explain-agile-to-your- stakeholders/.

In this article, McDoanld, states that the Agile Model is not for everyone, and since it was designed by software developers, many have a hard time applying it to their own SME. This article discusses how SMEs can introduce the agile methodology to their internal stakeholders but cautions that the agile method might not be right for every SME and encourages the reader to be able to clearly express why they think their SME should embrace the agile method. This article reframes the principles introduced in the Manifesto for "Agile Software Development" and the "12 Principles Behind the Agile Manifesto", so that they are applicable to any SME. The essence of the agile way of being is described as delivering maximum outcome with minimum output and seeking short feedback cycles so you can learn and adapt quickly.

Mancha, Ruben and Bala Iyer. "Harnessing Innovation." *Ivey Business Journal: Improving the Practice of Management* (March/April 2017). Accessed August 8, 2019. https://iveybusinessjournal.com/harnessing-innovation/

In this article, Mancha and Iyer examine the differences between "Innovative Digital Entrepreneurs" and "Digital Innovators," and the role of the digital innovator as a leader of digital change inside both SMEs and Startup organizations. Based on interviews with two venture capitalists and former executives at Microsoft and Hubspot, this article characterizes the traits and attributes of the digital innovator.

Decision Making

"The Path for SMEs: Adopting digital technologies." *The Conference Board of Canada* (February 2014): 1-12.

This article discusses the challenges, barriers, and best practices for the implementation of digital technologies in SMEs. While looking at and speaking with Canadian SMEs, this article shows that the increase of productivity in SMEs will play a substantial role in growing the Canadian economy. The Canadian economy is at a tipping point, as the baby boomer population is retiring and labour costs are increasing. The increase in productivity within SMEs is a potential solution to this national problem. This article identifies five barriers to the adoption of digital technologies and identifies six best practices for digital technology integration. This article further states that SMEs are often motivated to change by a pain point, or when they recognize a need. There is no definitive way to assess the success of implementing digital technologies. So, they recommend setting pre-implementation benchmarks, and that the growth of the business and customer and employee satisfaction would be good indicators.

This article recommends the Digital Technology Adoption Pilot Program (DTAPP), which provides funding and advisory support to SMEs. However, the authors caution that digital technology is just one way to increase productivity.

Rush, Richard. "Effective Change Management: The Five Stages of the Innovation-Decision Process." *The Evolution: A destiny solutions illumination.* May 31, 2019. Accessed August 9, 2019. https://evolllution.com/technology/tech-tools-and-resources/effective-change-management-the-five-stages-of-the-innovation-decision-process/

In this article, Rush proposes five stages for implementing change, which are: knowledge, persuasion, decision, implementation, and confirmation. The core themes within this article are to ensure that employees are included at each stage and to not skip or shortcut any stage. Each stage is vital for the process of implementing change within a business. Rush suggests that it is worthwhile to share advice about implementing change when supporting SMEs who are using innovation models.

Nordlander, Jessica. "Innovative Leadership Part One: Managing Decision Making." *Forbes*. March 12, 2019. Accessed August 8, 2019. https://www.forbes.com/sites/forbestechcouncil/2019/03/12/innovative-leadership-part-one-managing-decision-making/#7893374453eb

In this article, Nordlander discusses how management can develop a transparent process to make decisions. Nordlander emphasizes the need to empower employees to make decisions in their own areas, while also embracing employee contributions to the larger challenges the business is facing. Essentially, Nordlander emphasizes the need for transparency in the decision-making process, as well as the active engagement of the internal stakeholders.

APPENDIX B

Interview questions for David Madié, Founder and CEO, GrowthWheel International Inc.

Interview conducted on January 2, 2020 by Jessica Knapp

1. GrowthWheel has been described as an innovation tool, in what ways does it support, inspire, or foster innovation?

2. When building GrowthWheel, how was supporting, inspiring, and fostering innovation taken into consideration? What was important to you and your team when developing this?

3. On the website, GrowthWheel is directly connected to Design Thinking. Is GrowthWheel connected to other innovation models?

4. A large part of GrowthWheel is making decisions and taking actions. How does this tool support entrepreneurs in doing these two things over and over again?

5. Who was this tool designed for - small or larger businesses? Who benefits the most?

6. Explain the role of the GrowthWheel consultants - de facto team members? Mentors?

7. GrowthWheel tools include options for group learning (presentations) - why? What is the value of group seminars vs one on one with the company?

APPENDIX C

Interview questions for Toni Choudhury, Senior User Assistance Developer | Senior Design Thinking Coach, SAP

Interview conducted on January 19, 2020 by Jessica Knapp

1. When leading a Design Thinking training session, what qualities of the group are most important?
2. From your perspective, what does a person need to successfully use design thinking in their business?
3. What type of mindset or corporate culture is needed for design thinking to thrive?
4. Knowing that Design Thinking is based on group work, what advice do you have for entrepreneurs working by themselves or in very small teams?
5. What are some of the limitations you have identified with design thinking?
6. What are the most important takeaways for participants in design thinking training?
7. As a facilitator, how do you prepare for guiding the participants through this training?
8. What recommendations would you have for others who would like to offer design thinking training to entrepreneurs and SMEs?
9. What type of SME is design thinking best for?
10. How is Design Thinking related to other innovation models?

APPENDIX D

Innovation Focus Group Introduction Survey Questions

1. What is your role at this business?
2. How many years has your business been in operation?
3. How many employees does your business have?
4. What industry is your business in?
5. Is your business product or service based? Circle the best response: Product / Service / Both
6. What are some areas in which your business could improve? Check as many as needed: Financial Market Share / Operations/ Human resources / Strategy / Succession Planning / Internal communications / External Communications / Other:
7. How do you or your employees currently solve problems?
8. What tools/software/programs is your business currently using, or what practices that are already in place that help with productivity and other goals?
9. How would you describe innovation?
10. What might prevent a business from trying new tools or ways of doing things?

APPENDIX E

Innovation Focus Group Conclusion Survey Questions

1. What did you love about this workshop?
2. What do you wish you saw more of?
3. After this workshop, do you feel you are walking away with a greater understanding of Design Thinking / Agile / Lean innovation model? Yes / No
4. Does innovation have a value/place in your business? Yes / No
   a. If yes, in what areas of your business is innovation of value?
5. Can you identify areas of your business where you are already innovative?
6. What other elements of innovation would you like to incorporate into your business?
7. Do you have the resources to implement the elements identified in question #6 into your business? (internal support, finances, external support, etc) Yes / No
   a. If no, what resources do you need?
8. What innovation training or resources offered in English in Quebec are you aware of?
9. What other innovation models would you like to learn about?
   Circle all that apply: Design Thinking / Lean / Agile / Other:
10. Would you attend future training sessions on innovation? Yes / No