Community in the Making

Exploring opportunities to enhance the Canadian makerspace ecosystem

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Pictured are the hands of an Industrial Designer.
Photographed by Katya Koroscil.

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Abstract

Although makerspaces present opportunities to enhance community wellbeing and social innovation, the potential of the Canadian makerspace ecosystem has yet to be realized. In combining tools and methods from the fields of design thinking, systems thinking, and business strategy, this research reveals insights and identifies opportunities towards strengthening Canada's makerspace ecosystem.

Community in the Making follows a three step methodology: Part 1 – Framing, Part 2 – Situating, and Part 3 – Learning. Part 1 begins by exploring the concept of makerspaces, their history, and their context within Canada's social economy, through background research and a literature review. Part 2 then provides an overview of the makerspace climate in Canada, based on a research questionnaire, with a focus on existing makerspace attributes, structures, and business models. Lastly, Part 3 presents nine themes, and corresponding opportunities, developed from interviews and site visits, which suggest ways to enhance makerspace viability and elevate makerspace impact across Canada. These themes include:

- Measuring Magic: Converting Meaning(fulness) in Makerspaces;
- The Pursuit of Creativity;
- Placed-based Spaces;
- Third (maker)Space;
- Locked Out: Rentals and Real Estate;
- "Vibes" Are Everything;
- The Power of Partnerships;
- The Internal Economy; and
- Removing Barriers to Access.

The project concludes with a suggestion that makerspaces are far more than places to make; they are hubs for social innovation and creativity, and most importantly, vibrant communities integral to Canada's creative ecosystem.

The hope is that this work will spark conversations and promote collaboration across Canada's makerspace community, in an effort towards building a thriving makerspace ecosystem in Canada.

Keywords: Making, Makerspace, Creativity, Social Economy, Social Sector, Community, Social Innovation, Maker, Making in Canada, Canadian Makerspace, Maker Movement

Acknowledgements

“To love a place is not enough.
We must find ways to heal it.”

Robin Wall Kimmerer

Braiding Sweetgrass: Indigenous Wisdom,
Scientific Knowledge and the Teachings of Plants

In recognition of the lands that raised me, those that continue to nurture me, and upon which I have developed this work, I acknowledge the traditional Indigenous territories of the Tla-o-qui-aht First Nation, the Esquimalt and Songhees Nations, the Mississaugas of the Credit, the Anishinabek, the Chippewa, the Haudenosaunee, and the Wendat Peoples, in addition to the many territories upon which I have had the privilege of spending time. While my relationship with the land is deeply personal and ever evolving, I am eternally grateful for all that the land encompasses, living and nonliving, and I honour those who have, and continue to, care for, protect, steward, and heal the land for generations to come.

In a project that considers the advancement of community wellbeing, education, knowledge creation, and knowledge preservation, a recognition of the land cannot be shared without acknowledging the history and ongoing legacy of colonialism, systemic injustices, and harm that is ever present in Canada. I offer this acknowledgement in solidarity with Indigenous Peoples from across these lands with deliberate intention towards reconciliation and decolonization.

It is my intention that my commitments and actions will deliver what my words cannot. Moving forward, I will continue to honour the past, empower the present, and safeguard the future with those who come after me in mind. In addition, I will continue the practice of reflexivity throughout all aspects of my life, and I dedicate myself to ongoing growth.

Through love and collective care, I envision healing, hopeful, and transformative futures in honour of the universality that connects us all.

This work and experience would not have been possible without the love, generosity, wisdom, care, and support from so many.

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To KT – Is it true?! Has the day really arrived where we've managed to string together a series of thoughts into a single paper? A gift of this experience has been getting to learn from and alongside you. Thank you for elevating this learning (and life) journey in ways that can't be put into words. May our explorations, and voice note diaries, never end…

To Jim – Thank you for teaching me how to set a stone all those years ago, and for so generously sharing your shop with me. Those days reignited my love for making and informed the foundations of this work.

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To my chosen sisters - Your encouragement, advice, love, and care throughout this process mean everything. You inspire me every day. Now let's go climb more mountains!

To my SFI instructors and peers – What a learning journey this has been! Thank you for the many opportunities to learn, reflect, and grow. This has been a wildly enriching experience.

Finally, to the many things in life that bring me purpose and meaning; to the rocks, bugs, lakes and oceans, winds, cats, flowers, trees, sun and stars, soil, and birds. These are a few of the things that make up the magic that is life, and I am so grateful to be here.

To Mum and Dad,
For everything you've done and everything you do.

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Terms

Business Model – The underlying framework that outlines how organizations operate, generate revenue, manage resources, and fulfill their purposes or missions.
Customer Segment – A specific group of stakeholders who benefit from or interact with an organization's products, services, or mission and share similar needs, preferences, and behaviors.
Design Thinking – A problem-solving methodology that prioritizes human needs and experiences, employing empathy, creativity, and iterative prototyping to develop innovative solutions.
Legal Business Structure – The organizational framework and liabilities of a business entity.
Makerspaces – Community hubs and entrepreneurial incubators that provide access to tools, resources, equipment, lessons, and a shared workspace, and which offer opportunities for learning, skill development, and building connections.
Reflexivity – The act of examining one's own assumption, belief, and judgement systems, and thinking carefully and critically about their influence.
Social Economy – An umbrella term for the many types of organizations created to meet a social need, including economic characteristics such as employee wages and benefits and the exchange of services in the market.
Social Infrastructure – he extensive spectrum of entities, organizations, agencies, clubs, congregations, groups, unions, and associations, that collectively shape society.
Social Innovation – Creating and implementing new ideas, products, or approaches that address social problems and improve the well-being of individuals and communities.
Social Purpose Organization – Organizations and businesses which operate in the social sector and tackle socio-economic and environmental challenges.
Social Sector – An economic sector characterized by organizations working to address social issues and enhancing the welfare of individuals and communities.
Systems Thinking – A holistic approach to problem-solving that considers the interrelationships and interactions among components of a system to understand its behavior and address complexity.
Viability – The capability of something to survive, prosper, or function effectively within its specific environment or context.

Preface

Throughout my undergraduate engineering degree, my peers and I studied a variety of topics, from calculus, to the history of technology, to urban water systems design. Some of our courses had a lab component with an objective of providing students with hands-on, practical experience to reinforce our theoretical learning. Under the fluorescent lights, my peers and I would sit in the labs precisely following detailed instructions as we poured small vials of various liquids together, in chemistry, and energized small circuit boards, in electric circuit labs. In our material science labs, we would watch as lab technicians placed small pieces of various metals into large testing machines to measure their properties, such as strength and ductility. In soil mechanics, our labs required us to sit behind computer screens and model soil behaviour at the particle level, under a series of digitally simulated conditions. Our success in these labs was generally assessed through lab reports, which were 40-50 page written documents that we developed and submitted to our professors a week after conducting the experiments. In the reports, we were tasked with documenting our processes, sharing our results, and discussing our findings. Generally, as all students were assigned the same experiments and required to follow the same procedures, most lab outcomes were very similar. This was expected by our professors, as our learning outcomes, and ultimately our success across our courses, were determined by a grading scheme, corresponding to a rubric, developed to satisfy the learning objectives defined by the university based on engineering accreditation requirements set by the Canadian Engineering Accreditation Board. As such, from my experience, there was little room, if any, for individuality, exploration, and creativity. After working tirelessly to prepare and submit our lab reports, my peers and I typically shared the sentiment of disinterest in returning to those lab learnings ever again. Instead, we moved forward, filling our brains with other course content that we too soon forgot. While there was thoughtful intent in the design and opportunity for hands-on learning experiences through my engineering degree, it was evident that, due to constraints and rubric-oriented learning outcomes, many of our opportunities were kept from becoming meaningful.

The year I graduated, I moved back to a small community on Canada's west coast where I had worked for a number of summers. There, I became connected with several local artists and began creating through various practices, including pottery and silversmithing. Through these processes, my love for making was ignited; I found so much joy in working with my hands. The process of throwing clay on a pottery wheel was meditative, and I enjoyed exploring the various behaviours of different clays through

different practices, such as hand building. I was also enjoying learning to fire ceramics in a kiln, and test the response of various clay types, across different firing temperatures. In silversmithing, the process of working with metals and stones from around the world left me feeling connected and grounded, and I became inspired to relearn geological and land formation processes. As my inspiration grew, so too did my creative confidence. I even began applying my skills at home, where I would change electric receptacles, and fix broken household appliances. At one point, determined, I spent multiple days troubleshooting a broken clothes dryer which resulted in a very satisfying two-dollar fuse replacement.

As time went on, I continued to reflect on the experiences that had led me to become a maker and a creator. Once day, while I was sitting at the jewellery bench making a ring, it suddenly dawned on me that the exact thing I was doing had been taught to me in my material science lectures all those years before; I was annealing, work hardening, and quenching this little piece of silver in order to turn it into a ring that would last a lifetime. It was such an exciting moment! In realizing this, I began to consider all the various ways in which my engineering learnings connected to my creative practices, from material science to silversmithing, from chemistry to firing pottery, from soil mechanics to throwing clay pots, and from electric circuits to dryer fuse replacements. That moment, and all my moments that led to it, helped me to recognize just how much meaning is made in the process, rather than the outcome. I am so grateful for the opportunities that led me to this learning, and for how much meaning making provides me. It is from these experiences that I approach this work.

A pottery workspace at Hamilton Craft Studios in Hamilton, Ontario.
Photographed by Madelaine Prince.

Introduction

"The place to improve the world
is first in one's own heart and head and hands,
and then work outward from there."

Robert M. Pirsig
Zen and the Art of Motorcycle Maintenance

The Promise of Makerspaces

This project is the culmination of thoughts, experiences, and explorations over many years, rooted in the promise of makerspaces as hubs for social innovation and community building. Though definitions of makerspaces vary due to their evolving nature, this project defines makerspaces as community workspaces, hubs, or entrepreneurial incubators, which provide public access to tools, resources, equipment, lessons, and a shared workspace, and which offer opportunities for learning, skill development, and building connections (Bowden, 2016).

Makerspaces across Canada vary in size, location, and offerings, as well as business, organization, and funding models. However, makerspaces generally share a purpose of providing opportunities for making and creating across communities. Makerspaces have been shown to generate benefits including: removing barriers in skill development, making, and manufacturing; increasing socialization and connection; serving particular needs of local communities; and, most notably, improved health, wellbeing, and quality of life outcomes (Taylor, Hurley, & Connolly, 2016; van Holm, 2017).

Makerspaces began emerging across North America around 2010, gaining significant hype for their social, educational, and economic value generation (Collins, 2017). Despite this, many makerspaces have struggled to remain viable. As a result, in the years since 2010, a number of spaces have closed, citing challenges related to rapid growth, unsustainable business models, and lack of capital, among other reasons (Organ, 2022; Sali, 2020; Su, 2017). While there are various suggestions as to why this trend is occurring, there remains a gap in research that considers and analyzes makerspace operations (Bowden, 2016). As makerspaces are thought to be important and valuable community amenities, the trend of makerspace closures suggests potential challenges related to business model viability and suggests the need for a further exploration of makerspaces from a business and economic lens. In addition, there is a gap in research which pertains specifically to the Canadian makerspace landscape.

Given the promise of makerspaces, the trend of makerspace closures, and the existing research gaps, this investigation has been undertaken. This project explores the Canadian makerspace context and identifies opportunities to strengthen Canada's makerspace ecosystem.

Project Purpose

The purpose of this project is to:

- Explore and map attributes of the Canadian makerspace landscape, with a focus on business models, using data gathered from the research questionnaire;
- Hear from makerspace leaders across Canada to understand their experiences and perspectives on the maker movement and makerspace viability;
- Develop insights and identify opportunities to strengthen Canada's makerspaces ecosystem;
- Spark conversations about building Canada's makerspace network; and
- Conduct a Major Research Project in fulfillment of the requirements for my Master of Design degree.

Report outcomes include:

- A glimpse into Canada's makerspace landscape;
- An aggregated makerspace business model analysis; and
- Insights and opportunities to support the strengthening of Canada's makerspaces ecosystem.

Research Question

What can we learn from makerspace models to strengthen Canada's creative ecosystem?

Study Significance

The following points outline the relevance of this research study:

- Makerspaces are shown to offer many individual and community benefits, though many spaces face closures. This research suggests opportunities to enhance the viability of makerspaces across Canada, thus enriching the country's social infrastructure and further enlivening communities.
- There is a lack of data that considers makerspaces within Canada. This preliminary analysis offers a starting point to further explore the nature and implications of makerspaces in Canada.

Project Scope

Various boundaries were defined in this project to establish a research scope, as outlined in the following paragraphs.

First, this investigation is limited to within Canada's geographic and governing boundaries. This scope was defined in order to analyze economic sectors and business models across comparative jurisdictional regions and relatively comparable cultural and socioeconomic conditions. In addition, the estimated number of makerspaces across Canada formed the total research population size which validated this boundary.

Second, as there is no single unanimous definition for makerspaces, a broad makerspace definition was developed for this project. In order to recruit the target participants, a strategic recruitment plan was designed to engage participant organizations consistent with the research objectives. However, as the project definition remains broad, there is the potential that organizations that are not makerspaces fit the project definition. As such, this project only considers organizations that are referenced as makerspaces or makerspace adjacent.

Third, while there are various value orientations that could have been applied in the exploration of the research question, this investigation was conducted from an economic and business lens, given the findings from the literature review. As such, the outcomes of this research are limited to those that emerged from this particular lens. There are, however, alternative lenses which could be used as an alternative approach to explore this research question, and which may share underlying values with this project, though they are beyond

the scope of this work. In addition, reflexive thematic analysis (RTA) was selected as the leading method to develop the research outcomes, as the method's philosophy and values were thought to enable the opportunity for emergence of the outcomes, while still remaining focused from an economic and business lens.

Fourth, this work focuses solely on makerspaces that are currently operational. This approach allows for an exploration of opportunities within the established makerspace network and the utilization of existing experiences and knowledge to support the current ecosystem.

Fifth, this project analysis does not explicitly contrast makerspace business models, though the resulting themes developed from across the dataset are used to provide insights from across the makerspace landscape. The result of this led to some research themes being more relevant to support certain makerspace structures than others.

Finally, this project situates makerspaces within Canada's social economy, which is an economic sector subject to varying boundaries across business structures (Manwaring, Valentine, & Thomson, 2011). In Canada, the legal frameworks available for businesses and organizations operating within the social sector continue to predominantly distinguish between traditional nonprofit and for-profit models only (Manwaring, Valentine, & Thomson, 2011). While certain regions, including areas in the U.S. and in the U.K., have taken action to accommodate and formalize various "for-benefit" venture models as a response to increased interest in these areas, there is no formal differentiation in Canada, at this time, to distinguish between for-benefit businesses in the private sector, and profit-driven businesses in the private sector. As such, given their value and impact,, all for-profit makerspaces included in this investigation are assumed to be for-benefit businesses, and are therefore situated within the social sector.

Researcher Positionality

As a researcher, my intersecting experiences, beliefs, identities, and privileges have informed the construction and interpretation of knowledge in this Major Research Project (MRP). My identity is many things, some of which include being an able-bodied, white, Canadian woman, having grown up in Toronto and who now calls both Toronto and Vancouver Island home. I consider these aspects of my identity to have influenced the way I perceived and engaged with the research subject and participants, consciously or otherwise. I recognize that my identities as a young woman, graduate student, and affiliate

of OCAD University may have resulted in a power dynamic between myself and the research participants, causing a potential influence on the outcomes of the research. I also believe that the relationship between myself, as researcher, and the research participants was fluid and reciprocally influential throughout our interactions.

As a researcher, I am continuously evolving my understanding of myself, of the world, and of the relational space in between, where I exist. The positionality shared in this report is not fixed or static, and is situated here, at this moment in time, relative to this work and the existing circumstances.

I am grateful for the opportunity to develop and share my work, and I recognize the privilege I have in using my voice, sharing my perspectives, and exploring new (to me) ways of doing, thinking, and knowing. This research journey has been a true gift.

Intended Audience

This research is intended for multiple audiences, including those who:

- Hold formal and informal leadership roles within makerspaces in Canada;
- Are interested in the connections between making and social innovation;
- Are interested in exploring social sector business models; and
- Are interested in the evolution of Canada's creative ecosystem.

Report Structure

This report is presented in seven main sections, as described below.

Introduction establishes the project topic, defines the project purpose and outcomes, defines the research question, study significance, project scope, and establishes the researcher's positionality, as well as identifies the intended audience, and defines the report structure.

Method/ology provides an overview of the research process, outlining the primary and secondary research methods, as well as the analysis tools that are applied in succession to form the project methodology. This section establishes the theoretical research orientation and identifies limitations to the study.

Part 1 – Framing presents the information gathered through the literature review and builds the foundational theory for this inquiry. This section contextualizes makerspaces within the greater economic landscape and builds upon the history and evolution of makerspaces and the maker movement. Various frameworks and concepts are explored, and the section ends with a summary of the theory and its resulting relevance.

Part 2 – Situating presents the aggregated outcomes from the questionnaire responses, providing a glimpse into the Canadian makerspace climate. This section also includes stakeholder, value proposition, and business model analyses, and ends with a summary and related implications.

Part 3 – Learning forms the culmination of the research. Based on interviews and site visits, a reflexive thematic analysis revealed a series of themes, and opportunities towards enhancing Canada's makerspaces ecosystem. The section ends with a summary and related implications.

Moving Forward offers an overview of each report section, outlines the various methods and disciplines explored, summarizes the findings, and suggests opportunities for further research, as well as proposes potential initiatives that could emerge from this work.

A sewing machine at Create Makerspace in Squamish, British Columbia. Photographed by Madelaine Prince.

Method/ology

A meaningful process *is* an outcome.

Research Design

This project applies tools, methods, and principles across various disciplines including design thinking, systems thinking, and business strategy. Following a non-linear process through phases of convergence and divergence, this research follows a mixed-methods approach, consisting of quantitative and qualitative analyses, as well as employing various tools for mapping and modelling.

Primary and Secondary Research

Both primary and secondary research were conducted in this project. Secondary research was employed to gain an understanding of the makerspace landscape and the larger economic systems, as well as in the development of a Canadian makerspace database from which the initial research participants were recruited. Three primary research methods were conducted including a questionnaire, interviews, and site visits. Table 1 outlines the supporting questions, rooted from the leading research question, that guided the research methodology.

Table 1: Research approaches and support questions

Methodology	Supporting Questions	Primary Research	Secondary Research
Phase 1: Framing	What do we know about makerspaces? How do makerspaces fit within Canada's creative ecosystem?		Keyword Search Literature Review
Phase 2: Situating	What are the attributes of makerspaces across Canada? What are the value propositions and business models for these makerspaces?	Questionnaire	Literature Review
Phase 3: Learning	What are the leading strengths and challenges facing makerspaces? What insights shared across makerspace organizations suggest opportunities to enhance Canada's creative ecosystem?	Interviews Site Visits	Literature Review

IPO Framework

The project methodology was adapted from the Input-Process-Output (IPO) framework, comprising three phases, including: Phase 1 – Framing, Phase 2 – Situating, and Phase 3 – Learning, as outlined in Figure 1. Each proceeding phase of the methodology was built from the preceding phase(s), beginning with a keyword search as the initial input, and resulting in themes, and resulting insights, as the final output.

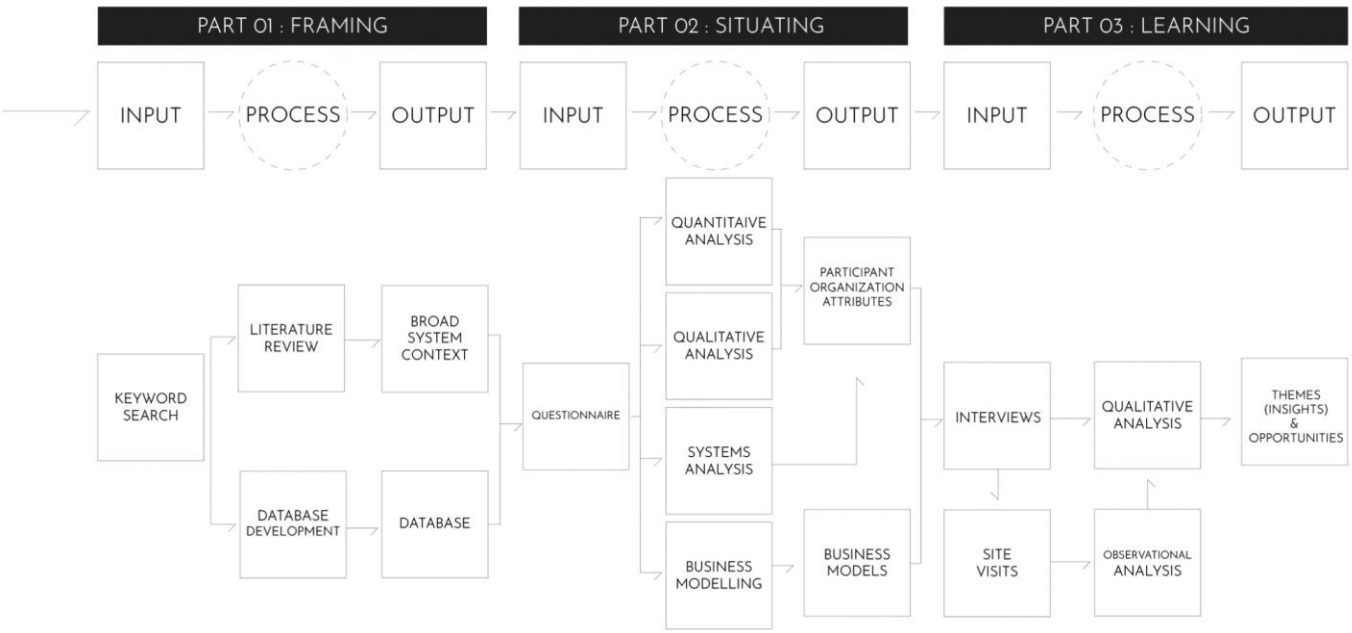

Figure 1: Project methodology – IPO process.

Primary and secondary research methods, as well as various analysis methods and tools, were designed and applied in an intentional sequence to form the project methodology, as described below.

IPO Phase 1

Input

Keyword Search

A keyword search, through various online search engines, was used to identify initial resources for the literature review as well as to initiate the development of a Canadian makerspace database. The database was used to identify potential participant organizations for recruitment in the questionnaire, interviews, and site visits.

Process

Literature Review

An extensive literature review was conducted to understand the context for makerspaces within the Canadian economic landscape. The literature review process was nonlinear, iterative, and continued throughout the duration of the project. Consulted sources included academic papers, journals, industry reports, government publications, novels, textbooks, podcasts, and websites. The leading domains of inquiry included: the history, context, and models for makerspaces, a framework to measure human need, Canada's economic system and social sector, as well as legal structures for Social Purpose Organizations in Canada.

Database Development

The database development involved conducting queries using various search engines to identify a list of prospective research participants based on the research eligibility criteria and makerspace project definition. This process required reviews of websites and social media platforms, where information was gathered, organized, and added to a repository. As the recruitment strategy utilized snowball recruitment, organizations were continually added based on input from participants and from responses in the questionnaire.

Output

Broad System Context

A general overview of the makerspace climate and the Canadian economic system was developed.

Database

The database development resulted in a repository consisting of Canadian makerspace names, websites and social media links, contacts, as well as contact roles, emails, and phone numbers. The database also served as a tracking system throughout the recruitment and primary research processes to ensure consistent communications across all participants. In total, 54 Canadian makerspaces were identified as prospective participants for this research.

The outcomes from this phase of the methodology are presented in Part 1 of this report.

IPO Phase 2

Input

Questionnaire

The online questionnaire was distributed to all prospective makerspace organizations identified in the database from Phase 1, along with an invitation to participate, consent forms, and screening forms. The questionnaire consisted of approximately 40 general questions on topics such as makerspace product and service offerings, organizational design and governance structure, customer segments, and financial structure. The questionnaire was designed in alignment with Strategyzer's Business Model Canvas (BMC) and Value Proposition Canvas (VPC) which were leading analysis tools throughout this research (Strategyzer, 2024).

Process

Quantitative Analysis

Correlational Analysis

Correlational analysis involves examining the relationship between two or more variables to determine if and how they are related to each other. The quantitative data that was collected from the questionnaire was used to identify various makerspace attributes, as well as compare some attributes, to develop a contextual overview of the various participant organizations.

Qualitative Analysis

Thematic Analysis

Thematic analysis involves systematically identifying, organizing, and interpreting patterns within a qualitative dataset to gain insights relative to an area of inquiry or research question. Thematic analysis was used to analyze the qualitative data collected from the questionnaire to identify patterns across the responses from the participations. As with the correlational analysis, these insights were used to develop a contextual overview of the participant organizations.

Systems Analysis

Stakeholder Matrix

To identify and understand the significance of various stakeholders across the Canadian makerspace landscape, Mendelow's Stakeholder Matrix was employed (Oxford College of Marketing, 2024). This tool considered the power and interest dynamics across common makerspace stakeholders to understand their level of influence related to Canadian makerspaces.

Business Modelling

Business Model Canvas

The BMC is a strategic management tool designed to help organizations visualize, analyze, and communicate their business model (Strategyzer, 2024). The tool consists of nine "building blocks" that shape how businesses operate. The research questionnaire was designed in alignment with the BMC to allow for the development of a business model for each participant organization and was then used to select interview participants.

Value Proposition Canvas

The VPC is a tool integrated with the BMC that helps businesses understand their customers' needs and the value their products or services provide to address those needs. The VPC was employed alongside the BMC, using questionnaire responses, to identify the common customer segments used across makerspaces in Canada, in addition to their unique value propositions.

Output

Participant Organization Attributes

The quantitative analysis revealed the following correlations: dates of makerspace inception, organization types, economic sectors, operating budgets, service offerings, and business structures. The various patterns from the thematic analysis revealed geographic locations, organization vision, mission, and goals, and facility characteristics across makerspaces. The stakeholder matrix identified a potential prioritization framework for managing and engaging with makerspace stakeholders.

Business Models and Value Propositions

This phase resulted in the development of business models, customer segments, and unique value propositions for each participant organization. The business models were analyzed and then organized into groupings of similar models, from which prospective interview participants were identified. Interview participants were selected across the groupings to ensure a range of business models were represented across the interviews.

The outcomes from this phase of the methodology are presented in Part 2 of this report.

IPO Part 3

Input

Interviews

Virtual, semi-structured interviews were designed and conducted to explore depth and nuance as a follow up to the questionnaire responses for select participants. Interview topics included makerspace background information, organization history and local context, successes and challenges, community and environmental value and impact, and future prospects. Of the 19 questionnaire respondents, 13 people participated in the interviews, representing 11 organizations in total; two organizations had two participants join for the interview. Based on the interview outcomes, prospective participants were identified for site visits to ensure a range of makerspace models were represented across site visits.

Site Visits

In-person site visits were conducted to gather observational research in support of the questionnaire responses and interview analysis. Site visits took place in person across two provinces, and ranged from 30 minutes to one hour. Of the 11 questionnaire participants, seven site visits were conducted across two provinces.

Process

Observational Analysis

AEIOU

The AEIOU Framework is an observational research framework consisting of five key aspects of a setting, including Activities, Environment, Interactions, Objects, and Users, which are

observed and documented by the researcher. For the site visits, the AEIOU Framework was employed, in addition to photography, and the observations were used to corroborate the interview responses through experiential research and interpretation.

Reflexive Thematic Analysis

This qualitative analysis followed Braun and Clark's approach to Reflexive Thematic Analysis (RTA) (Braun & Clarke, 2006). This flexible and iterative process involved the systematic coding and categorizing of interview transcripts to uncover patterns and themes. Reflexivity was a critical practice in the analysis process where reflections on interpretations and biases were actively conducted throughout the process in order to uphold the rigour and validity of the analysis.

Output

Themes, Insights, and Opportunities

The RTA revealed emergent themes representing patterns found across the dataset. The final output consisted of nine themes, for which resulting opportunities and implications were identified, relevant to the research question. The observations documented during the site visits were reviewed and reflected upon to validate the RTA outcomes by corroborating the experiential evidence, where available, with the derived themes and insights.

The outcomes from this phase of the methodology are presented in Part 3 of this report. These findings form the culmination of this MRP.

Ethical Considerations

In advance of conducting any primary research, a rigorous research ethics plan was developed, for review by OCAD University's Research Ethics Board and in alignment with the Government of Canada's Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans. This mandatory step was conducted to ensure that the research involving human participants would adhere to high ethical standards, protect participants, and uphold research integrity.

Research Orientation

To conduct reflexive and situated research, it is critical to establish the worldview that informs this project as this lays the foundation for the research approach, process, and findings. As such, Table 2 outlines the research orientation and worldview that guided this work.

Table 2: Research orientation

Orientation to Data	Primarily inductive; mix of inductive and deductive
Focus of Meaning	Semantic
Qualitative Framework	Experiential
Theoretical Framework	Realist; essentialist
Epistemology	Constructivist; social constructivist; interpretivist
Ontology	Critical realism

It is worth noting that subjectivity in this research was viewed as a resource, rather than an inhibitor, given that subjectivity is a key aspect of qualitative sensibility (Braun & Clarke, 2006). To maintain qualitative sensibility throughout the research process, a dedicated process of reflexivity was followed, as previously noted. When interpreting this work, it is important to consider the frame through which this research was conducted, in addition to recognizing the established research orientation.

Study Limitations

Throughout this process, every effort was made to conduct comprehensive and coherent research. Yet, there were always inherent limitations, as is true in all research. This section aims to acknowledge those limitations most relevant to this work.

Time and Resources

Additional time could have presented an opportunity to develop a more comprehensive database, potentially leading to an increased participant sample size and more generalizable quantitative research results. It is worth noting that more participants were interested in both interviewing and conducting site visits than the project timeframe and funding allowed. More participants in each phase of the research could have led to more extensive outcomes, and greater generalizability of the project outcomes.

Participant Pool and Sample Size

Some organizations may not have participated in this research due to their limited organizational capacity, namely those that are volunteer run and led. However, organizations facing capacity limitations would likely hold valuable knowledge in this investigation. In addition, participants in this research consisted of those who hold leadership positions within makerspaces, as makerspace users, and other makerspace stakeholders, were beyond the scope of this analysis. As such, the outcomes of this work are limited only to those perspectives from organizations with a capacity to participate, as well as to those who hold leadership roles within makerspaces.

Based on the research sample size and participant pool, the quantitative results cannot be generalized to broadly represent the Canadian makerspace landscape. These findings can only be used to contextualize and understand the various attributes of those makerspaces included in this investigation in order to frame the thematic insights.

Independent Sensemaking

Though this research applies participatory research methods, the research was designed for independent analysis by the researcher, resulting in individual sensemaking throughout the process. Some form of collaborative sensemaking and analysis activities may have offered additional perspectives in the development of the outcomes of this project.

Methods

Due to the nature of the standardized questions and their resulting constraints, the questionnaire did not consistently capture the same information, or the complete information intended resulting in some nuanced responses from participants. Some of the questions may not have been clearly enough defined or were misinterpreted. Where possible, ambiguous responses were clarified during the interviews.

The semi structured interviews were tailored slightly across participants in order to address organization-specific questions resulting from the responses in the questionnaire. Given interview variances across participants, there was a potential for some inconsistencies across the interviews.

Site visits were limited to what could be observed during the visit. As makerspaces are dynamic, site visits at differing times and dates may have resulted in significantly different outcomes.

Access to Information and Data

Preliminary research indicated that there is limited information available on makerspaces in Canada, in addition to makerspaces being difficult to find through keyword searches. Though snowball sampling was a relatively successful recruitment technique used for identifying Canadian makerspaces, the lack of current, accurate, and accessible information available on existing makerspaces limited the breadth of the database.

The Wood Lab at MakerLabs in Vancouver, British Columbia.
Photographed by Madelaine Prince.

Part 1: Framing

"You can't use up creativity.
The more you use, the more you have."

Maya Angelou

An Investigation on Makerspaces

Overview of Makerspaces

Makerspaces, and the maker movement, emerged as a response to the increasing accessibility of technology, and the desire to empower individuals to create, innovate, and collaborate. Originating in the early 2000s, the movement gained momentum with the rise of digital fabrication tools like 3D printers and laser cutters, as well as open-source hardware and software. Makerspaces began opening in communities, schools, and libraries across North America and Europe, providing environments for people to tinker, prototype, and learn collaboratively. The maker movement generally emphasizes a do-it-yourself (DIY) ethos, promoting skills such as problem-solving, creativity, and hands-on learning. It is thought that makerspaces foster innovation across various fields, from engineering and design to art and education, primarily through democratizing access to technology and fostering a culture of innovation.

Research on makerspaces shows that these spaces create value for both individuals and communities. First, makerspaces have been shown to advance learning and collaboration. Specifically, makerspaces have been cited to "encourage innovative thinking and creativity through an open-ended learning environment" and supports "making in disciplines that are traditionally separate" (Collins, 2017). Makerspaces have also been known to provide learning outcomes with "an emphasis on process over product", to provide opportunities for those "who have previously been underrepresented", and have been credited for amplifying a "social and collaborative synergy that happens when creative people come together" (Collins, 2017; Niaros, Kostakis, & Drechsler, 2017). Second, makerspaces have been known to support personal development. For example, research asserts that through makerspace learning, young people develop a "sense of self and a sense of community that empower them to engage with and shape the designed dimension of their world" (Collins, 2017). Following this, research suggests that participants learn about community, collaboration, and complexity, with an ultimate outcome of learning "about themselves" (Collins, 2017) emphasizing both the individual and community benefits emergent in makerspaces.

On a broader level, makerspace learning outcomes have been said to lead to determination, independent and creative problem solving, and an "authentic preparation for the real world by simulating real-world challenges" (Kurti, Kurti, & Fleming, 2014), as well

as offering the potential for “real world problem solving” through “activity and reflection” (Kurti, Kurti, & Fleming, 2014; Collins, 2017). Makerspace use has been suggested to stem from an intrinsic motivation to “‘mak[e] the world a better place’ through working on commons-oriented projects” (Bowden, 2016).

Overall, makerspaces have been shown to offer many individual and community benefits which can enrich wellbeing and thus improve quality of life. To support this, makerspaces can be seen to address needs across multiple levels of Maslow’s Hierarchy of Needs (Maslow, 1943), as seen in Figure 2. Specifically, these include:

- Physiological: Contributing to overall wellbeing and improved mental health outcomes, essential for physiological functioning.
- Safety: Creating a sense of safety and security by providing a structured environment for expression and exploration.
- Love and Belonging: Serving as mediums for social connection and community building, where individuals can develop a sense of belonging and connectedness to others through shared experience and cultural expression.
- Esteem: Boosting self-esteem by providing opportunities for self-expression, creativity, and skill development, as well as recognition and appreciation from peers and society contributing to feelings of accomplishment and respect.
- Self-Actualization: Enabling individuals to explore and develop unique skills, creativity, and potential. Participation in makerspaces can facilitate personal growth, self-discovery, and the pursuit of one's passions and interests.

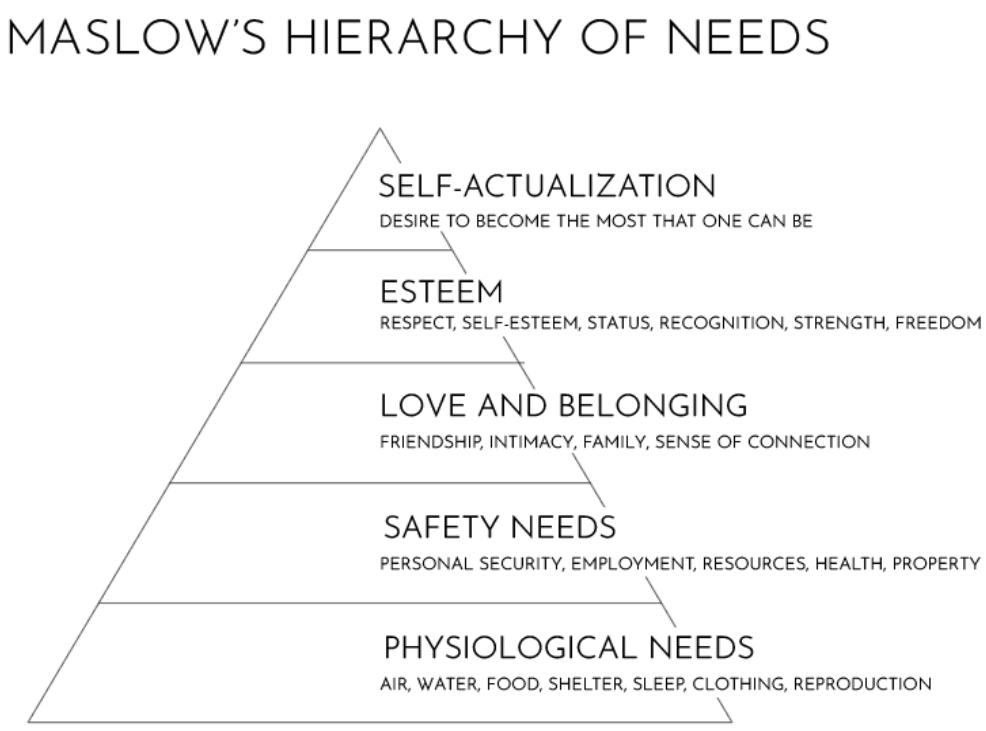

Figure 2: Maslow's Hierarchy of Needs.

Makerspace Closures

Despite the cited values and benefits and the rising popularity of makerspaces, there has been a concerning trend of makerspace closures across North America. In 2022, the founder The Shop, a multidisciplinary makerspace in Toronto, announced their closure, referencing challenges related to rent, expenses, and barriers in operating a female-run business (Organ, 2022). In December 2020, Makerspace North, a community hub and startup incubator in Ottawa, was shut down and evicted from their building citing "significant rental arrears" (Sali, 2020). In 2017, TechShop, a prominent U.S. chain of makerspaces which once called itself "the largest and most influential Makerspace in the world", closed all ten of its locations across the country with no warning, pointing to their unsustainable business model and finance issues as the leading causes (Hatch, 2014; Su, 2017). While there have been presumptions as to why this trend is occurring, there remains a gap in research that considers and analyzes makerspace operations, models, and legal structures, particularly in Canada (Bowden, 2016). As makerspaces are generally known to

be well used and important community amenities, this trend of makerspace closures suggests challenges related to the viability of the makerspace business model.

Makerspaces within the Canadian Economy

The Social Economy

Canada's existing economy can be broadly organized into three major sectors: public (government), private (profit driven), and social (for-benefit), as seen in Figure 3 (Quarter, Mook, & Armstrong, 2017). The social sector in Canada comprises Social Purpose Organizations (SPOs) who conduct their business as "a response to a social or environmental problem, which, once adopted, results in better solutions than existing approaches" and which "have a transformative impact and improve organizations, communities, regions, or systems" (Government of Canada, 2024). The Canadian Social Economy Hub defined SPOs as organizations which provide social, cultural, economic, and health services to local communities (Canadian Social Economy Research Partnerships, 2009). With the second largest charitable and nonprofit sector in the world, Canada's social sector makes a substantial impact on Canada's economy, with nonprofits and charities contributing 8.3% of Canada's GDP and employing 1 in 10 Canadian workers (Imagine Canada, 2021; Social Sector, 2020). The Government of Canada also identified the growth of the Canadian social economy as vital to the country's advancement of the United Nations' 2030 Agenda and its Sustainable Development Goals (Government of Canada, 2024).

In Canada, SPOs operate through various legal structures including charities, nonprofits, social enterprises, co-operatives, and businesses with a social mission (Government of Canada, 2024). As outlined in the Project Scope, for the purposes of this research, makerspaces are considered to be situated within the public and social sectors, with those operating as for-profit legal structures being situated within the social sector. While this investigation primarily focuses on social sector makerspaces from an economic and business lens, some public sector organizations were included in the analysis to develop a more representative makerspace landscape in Canada.

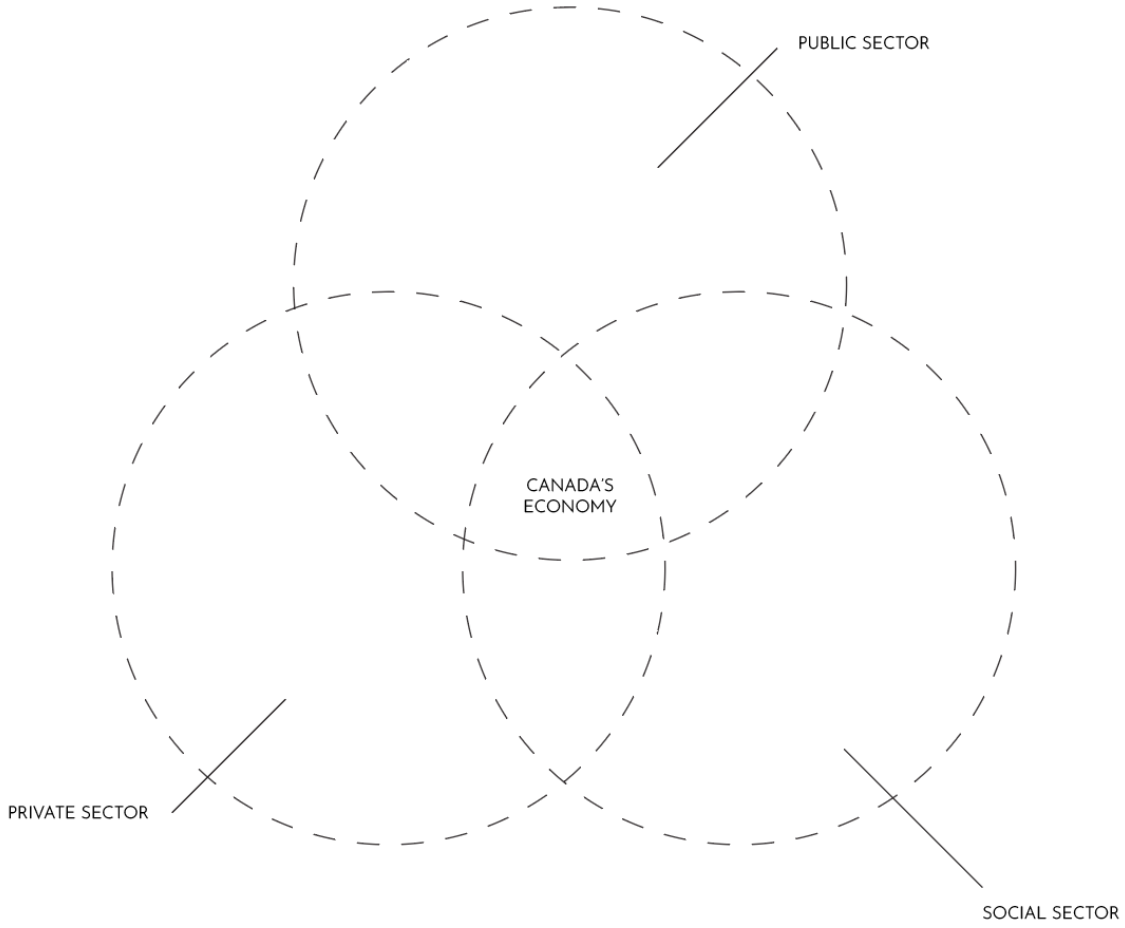

Figure 3: Venn diagram representing Canada's mixed economy.

Social Sector Legal Structures in Canada

Over the past decade, interest in the evolution models to support social sector work has surged. In particular, opportunities for social enterprise models have gained momentum and have led to an increase in new ventures (Manwaring, Valentine, & Thomson, 2011). Social enterprise suggests a flexible approach to social sector offerings, blending for-profit and non-profit goals, and presents an alternative to traditional funding methods for charitable endeavors . However, Canadian law is still evolving to accommodate diverse models within the social sector and the existing available fit within the traditional nonprofit and for-profit frameworks (Manwaring, Valentine, & Thomson, 2011). Prior to exploring makerspace

business models, it is important to understand the various legal structures available to operate a social sector organization in Canada, including makerspaces. Table 3 to Table 7 provide an overview of the various structures available in Canada for social sector organizations including for-profit, registered charity, cooperative, for-benefit corporation, and hybrid. Each of the tables outline the advantages and disadvantages associated with each structure, as adapted from MaRS Discovery District publication, Social enterprise in Canada: Structural options (Manwaring, Valentine, & Thomson, 2011).

For-Profit Model

Table 3: Overview of the for-profit model within Canada's social sector.

Definition	Advantage	Disadvantage
An independent entity generally established to conduct business activities for the purpose of generating income and maximizing shareholder returns (Government of Canada, 2023). The most commonly applied model is the corporation incorporated under the Canadian Business Corporations Act or a provincial equivalent. The Sole proprietorship, Partnership, and Business trust models are less commonly applied in the social sector.	Flexibility in: ● Activities ● Raising capital ● Dealing with assets/revenue ● Ease of conversion to nonprofit ● Ease of profit distribution to shareholders ● Familiarity of structure	● No preferential tax treatment ● Cannot receive funds from charitable sector ● Responsibility to shareholders ● No formal social purpose ● Potential for conflict between the intended social mission and the for-profit form

Registered Charity Model

Table 4: Overview of the registered charity model within Canada's social sector.

Definition	Advantage	Disadvantage
Organizations created and residing in Canada that are charitable organizations, or public or private foundations. Resources must be used for charitable activities and have charitable purposes in one or more of the following categories: ● Relief of poverty; ● Advancement of education; ● Advancement of religion; or ● Other purposes that benefit the community.	● Ability to issue donation receipts ● Ability to receive funds from other registered charities or qualified donees ● Most favourable tax treatment extended to nonprofit entities in Canada ● Legally enforced social purpose ● No investors with conflicting priorities	● Restrictions on business purposes and activities ● Limited to transition funding sources ● Assets locked in Canadian charitable sector ● Disbursement quota ● Additional reporting

Cooperative Model

Table 5: Overview of the cooperative model within Canada's social sector.

Definition	Advantage	Disadvantage
An organization owned by its members that share similar economic, cultural and/or social needs (Coop Canada, 2022). Types of cooperatives include: ● Consumer ● Worker ● Producer ● Multi-stakeholder ● Worker-shareholder ● New generation ● Community service	● Legally enforced requirement for operation on cooperative basis ● Ability to attract outside capital ● Flexibility in activities	● No preferential tax treatment ● Reduced control for founding member ● Challenges in maintaining member participation

For-Benefit Corporation Model

Table 6: Overview of the for-benefit corporation model within Canada's social sector.

Definition	Advantage	Disadvantage
For-profit organizations committed to providing social and environmental benefits while generating profits. Existing Canadian models include: ● Community Interest Companies (CICs) ● Community Contribution Companies (C3s)	● Legally enforced social purpose ● Flexibility re: activities ● Flexible capital structure	● No preferential tax treatment ● Lack of familiarity with structure ● Difficulties in exiting

Hybrid Model

Table 7: Overview of the hybrid model within Canada's social sector.

Definition	Advantage	Disadvantage
Unofficial model of two or more business structures, typically for-profit and nonprofit, working together to achieve shared desired outcomes. Not an official model.	● Leverages benefits across various business models to support shared mission	● Two or more business structures required to manage ● Misalignment between nonprofit and for-profit objectives and governing bodies ● Requires diligence in separating activities with each corresponding business entity

Summary and Implications

Overview of Makerspaces

Makerspaces have been emerging over the past two decades as places where individuals can access tools, equipment, and expertise to create and innovate, as well as build community and connections. Makerspaces have been shown to offer benefits such as improving learning outcomes, growing of social capital, fostering community building, and inspiring societal change. However, makerspace across Canada have been closing due to various business challenges. This pattern, and the perceived causes, suggests a potential challenge around makerspace model viability.

Makerspaces in the Canadian Economy

Canada's mixed economy comprises the public, private, and social sectors. This research suggests that makerspaces are situated within the social and public sectors, and that the social sector is comprised of organizations spanning nonprofit to for-profit, which all possess social missions. There are various legal structures in Canada available for social sector organizations based on their objectives, and there are advantages and disadvantages with each type, based on the desired outcomes for organizations.

The information gathered from Phase 1 was used in the design and development of the research questionnaire which informed the outcomes of Part 2.

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A woman standing at DesignWITH, in Toronto, Ontario
Photographed by Katya Koroscil.

Part 2: Situating

“Making is fundamental to what it means to be human.
We must make, create, and express ourselves to feel whole.”

Chris Anderson

Questionnaire Overview

This section situates the research participants within the context of the project findings and situates the participant organizations relative to each other in the outcomes of this work. In addition, this section shares attributes of the makerspaces that are included in this investigation and presents the findings showing makerspaces relative to each other within the Canadian social sector.

Research Participants

To situate the information shared throughout this section of the report, it is important to establish some context of who the research participants are. To participate in this study, all research participants were required to be at least 18 years of age or older. In addition, the questionnaire and interview required that participants possessed sufficient knowledge and experience to speak in detail about the organization on topics such as the organization's services and offerings, history and context, business model, governance structure, finances, and future prospects. The eligibility criteria for the site visits enabled anyone in a leadership role at a makerspace, authorized by the original research participant, to lead a site visit. Figure 4 shows the various positions held by the participants across the dataset.

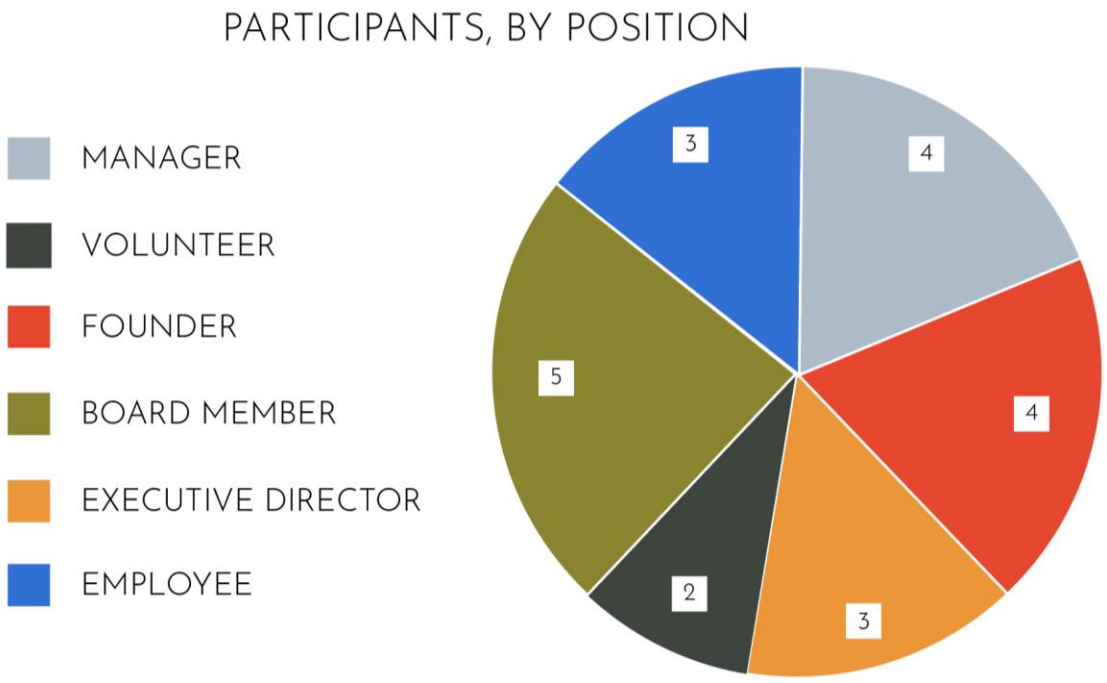


Figure 4: Distribution of participant leadership positions.

The database developed in Phase 1 consisted of 54 makerspace organizations across Canada, with a particular interest in makerspaces in the social sector, given their cited viability challenges. The questionnaire received 19 responses from participants across six provinces and two territories, representing responses from a total of 14 towns and cities. The interviews consisted of 13 participants across 11 makerspaces. Seven site visits were conducted with seven research participants. Figure 5 shows the various provinces and territories across Canada where questionnaire participants are located.

Figure 5: Map of participant makerspace locations, by province and territory.

Makerspaces in Canada

The following quantitative and qualitative insights were derived from the questionnaire responses.

Makerspace Openings

The literature review in Part 1 indicated that makerspaces have been emerging across North America over the past two decades and this trend was validated by the participant responses, as shown in **Error! Reference source not found.**. The singular makerspace in the graph shown as opening in the 1980s corresponds to an organization within which a makerspace exists currently, however it is likely that this represents the date which the parent organization was founded, rather than the founding date of the makerspace. The recent emergence of makerspaces across Canada affirms this topic is of research significance.

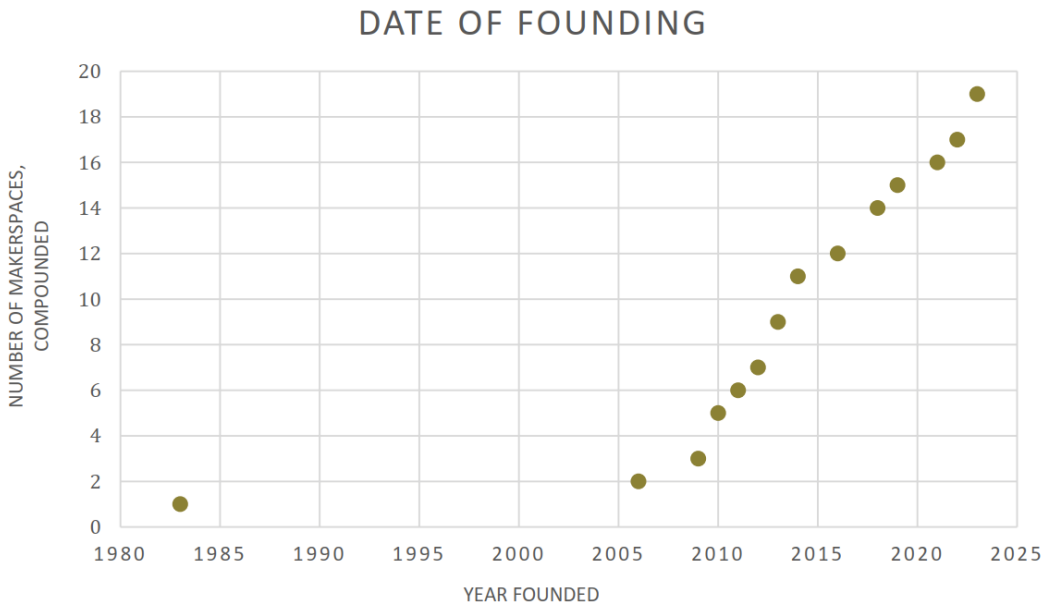


Figure 6: Graph showing Canadian makerspace founding dates, by year.

Organization Type

The eligibility criteria for participants in this study required that their affiliated organization fit the project definition of a makerspace, or similar. Given the variances across identities and perceptions of makerspaces, an exploration into the various descriptors used to define makerspaces was included in the questionnaire. The results revealed a diverse range of descriptors used to describe participant organizations, as seen in the word cloud shown in Figure 7. These descriptors reflect the multifaceted nature of makerspaces, reinforces the ambiguity of the term “makerspace”, and offers two leading organization types: the terms of "Makerspace," "Fab Lab," and "Hackerspace" suggest a focus on the making side of the

organizations, while terms such as "Community Hub," "Co-working Space," and "Event Space" suggest a focus on collaboration and community engagement. Additionally, titles such as "Business Incubator," "Innovation Hub," and "Library" hint at an environment fostering entrepreneurship, knowledge exchange, literacy, and learning.

Figure 7 Word cloud showing makerspace descriptors.

Services and Offerings

The following list provides an overview of the makerspace services and offerings that were identified across the data from the questionnaire responses:

- Events;
- Programs;
- Classes;
- Industrial workspace;
- Coworking space;
- Industrial equipment and tools;

- Craft equipment and tools;
- Education and training;
- Entrepreneurial support;
- Specialized technologies;
- Repair and maintenance services;
- Material sales;
- Community supports and initiatives; and,
- Community spaces and lounges.

In addition, the following list offers a summary of tools, equipment, machines, and materials offered by makerspaces, as reported in the questionnaire responses:

- Digital fabrication;
- Woodworking;
- Metalworking;
- Textiles;
- Electronics;
- Ceramics; and,
- Audio Video equipment.

Overall the services, offerings, and equipment available in makerspaces across Canada is extensive, and varied across spaces.

Economic Sectors

Of the questionnaire respondents, three represented makerspaces situated within the public sector, including a university, public library, and community centre, while the remaining 16 participants were situated in the social sector, as is seen in Figure 8.

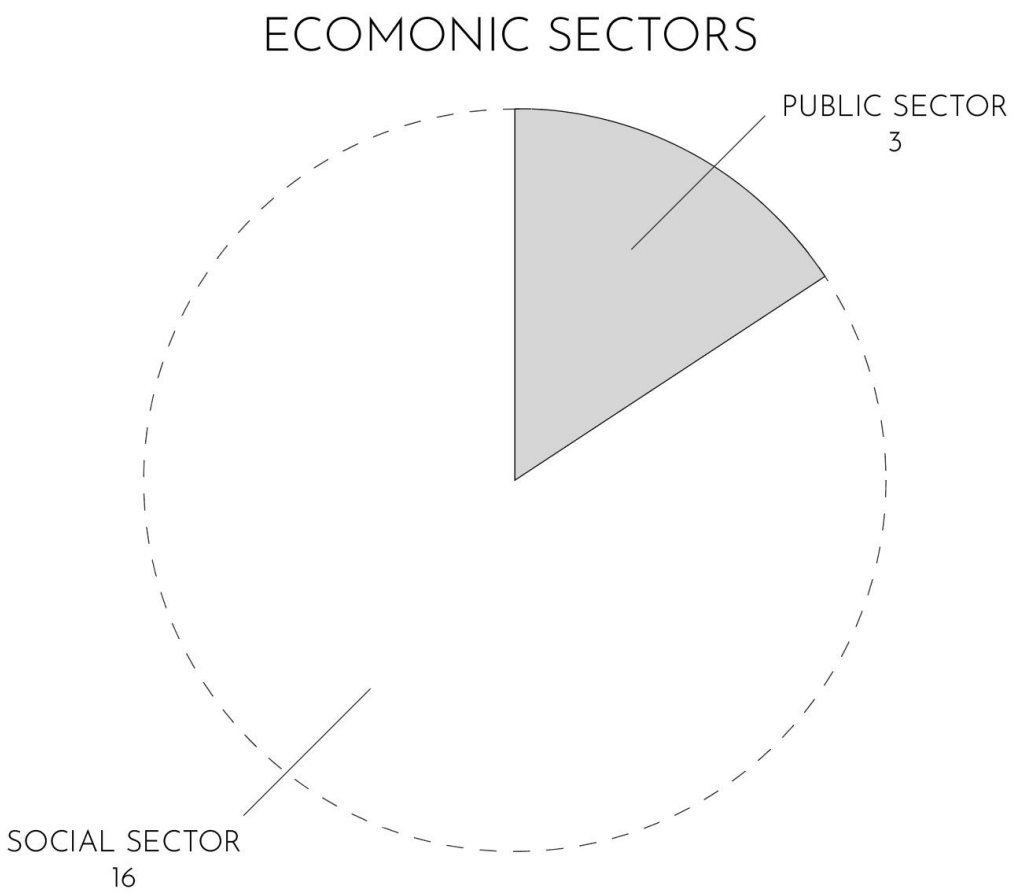


Figure 8: Distribution of participant makerspaces across Canadian economic sectors.

Legal Structures

Figure 9 shows the various legal structures used to govern makerspaces in Canada. This range of structures suggests that, while the nonprofit model is the most common model, there are a variety of models that can be leveraged, or are suitable, to operate makerspaces in Canada.

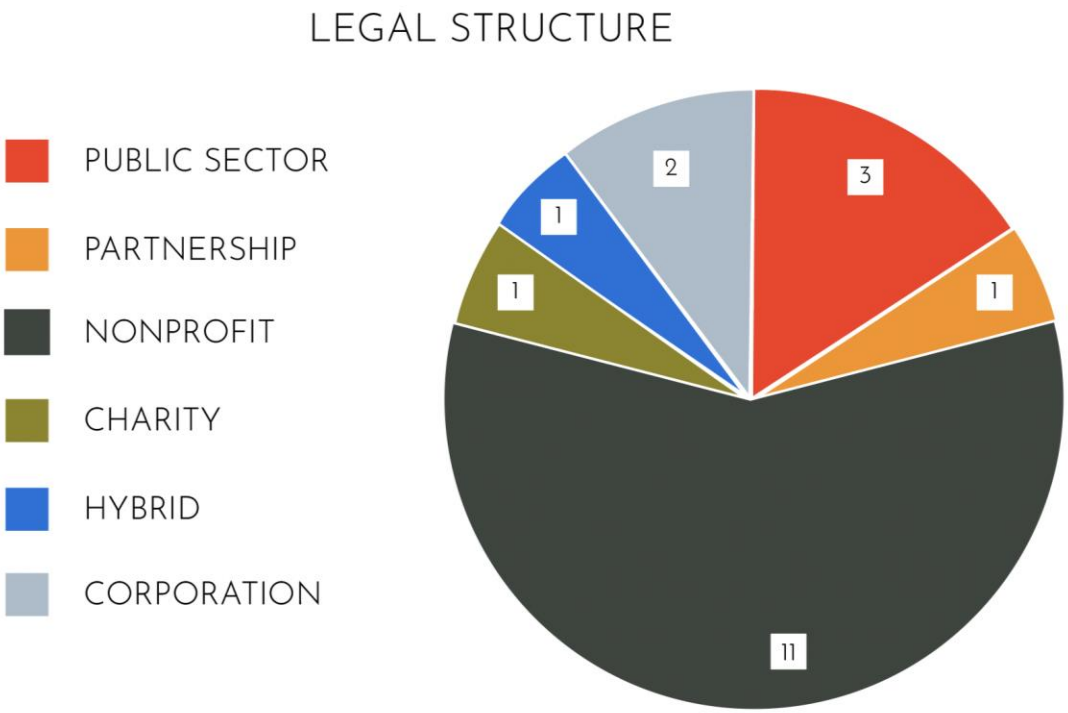


Figure 9: Legal structures across makerspaces.

Organization Sizes

Users

The questionnaire reported an annual range of 70 to 7,200 users per year across makerspaces.

Management and Staff

In the questionnaire, respondents reported a maximum number of seven full time employees at one makerspace, and a minimum of zero employees at makerspace which are volunteer led. The number of makerspace volunteers reported in the questionnaire ranged from zero to 20. This information revealed that makerspaces across Canada are all small enterprises, according to the definition provided by Statistics Canada, and that about half of makerspaces rely on volunteers for their day-to-day operate (Government of Canada, 2024).

Budget

As an additional indicator of the size of the makerspaces, annual operating budgets for participant organizations were considered, as seen in
Figure 10. These results range from $20,000 to over $500,000, with the majority of respondents reporting operating budgets between $100,000 and $500,000. One participant did not respond to this question.

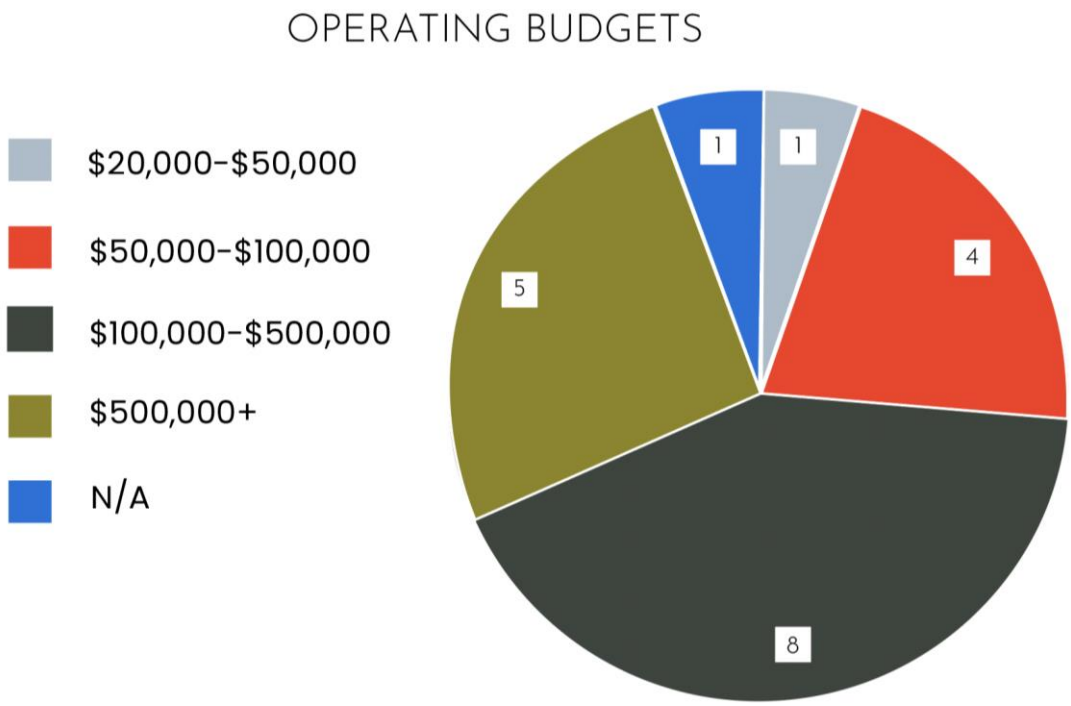


Figure 10: Range of annual operating budgets across participant makerspace organizations.

Industry Sectors

The questionnaire responses also offered a broad spectrum of industry sectors in which makerspaces operate. Education emerged as the sector with the most recurring reference, suggesting the significant role that makerspaces fill in providing learning and skill development opportunities. Additionally, Community, Recreation, and Technology sectors were recurrently referenced, underscoring the multifaceted nature of makerspaces in serving diverse community needs and fostering innovation. Figure 11presents a word cloud illustrating the makerspace industry sectors as reported in the questionnaire responses. In the word cloud, the size of each word represents the frequency it was referenced by questionnaire participants, relative to each other.

Figure 11: Word cloud identifying makerspace industry sectors.

Visions, Missions, and Goals

Defining an organization's visions, missions, and goals is foundational to ensure alignment across teams, drive strategic decision making, foster unity, and scope a clear path towards

achieving a desired future state. A vision states what an organization aspires to become in the future, a mission reflects an organization's past and present by stating why the organization exists and what role it plays in society, and goals offer more specific aims for organizations in reaching their vision and mission (BC Campus, 2014). From the questionnaire, several themes recurred across the organization's visions, missions, and goals, as listed in Figure 8.

Table 8: Patterns across makerspace visions, missions, and goals

Visions	Missions	Goals
• Community empowerment • Skill development and learning • Creativity • Innovation • Accessibility and inclusion • Collaboration and shared space • STEAM education	• Education and skill-building • Community building • Accessibility • Inclusivity • Economic development	• Community engagement • Skill development and education • Financial sustainability • Facility enhancement • Resource sharing • Community building • Organizational development • Accessibility and inclusion • Social and economic Impact • Art and cultural enhancement

Overall, the makerspace visions, missions, and goals reflected a shared commitment to building vibrant, inclusive, accessible, and innovative spaces that foster creativity, collaboration, and learning, with a strong focus on community.

Facilities

The questionnaire responses also offered insights into the types of facilities where makerspaces are located. A summary of these makerspace facility attributes is provided below.

- **Diverse Facilities**: Participant organizations described a wide range of tools and equipment to support a broad range of making activities.

- **Community Focus**: There was an emphasis on collaboration and shared resources across the data.
- **Industrial Settings**: Many makerspaces indicated they are located in old and repurposed industrial buildings, mixed-use commercial buildings, and warehouses.
- **Size Variations**: Makerspace sizes range from small urban settings, of less than 700 square feet, to larger industrial facilities of over 25,000 square feet.
- **Specialized Studios**: Many spaces feature specialized studios for specific disciplines.
- **Access**: 24-hour keycard membership is available at some spaces. Only some makerspaces indicated wheelchair accessibility.

These physical characteristics of makerspace facilities indicate the variety of spaces that exist across Canada and point to the building and zoning types available for makerspaces based on existing infrastructure.

Stakeholders

A key element of situating makerspaces in their broader contexts is identifying who their leading stakeholders are and how they might influence the organizations. To do this, a stakeholder matrix was used, adapted from Aubrey Mendelow's Power-Interest Matrix (Oxford College of Marketing, 2024), as shown in Figure 12.

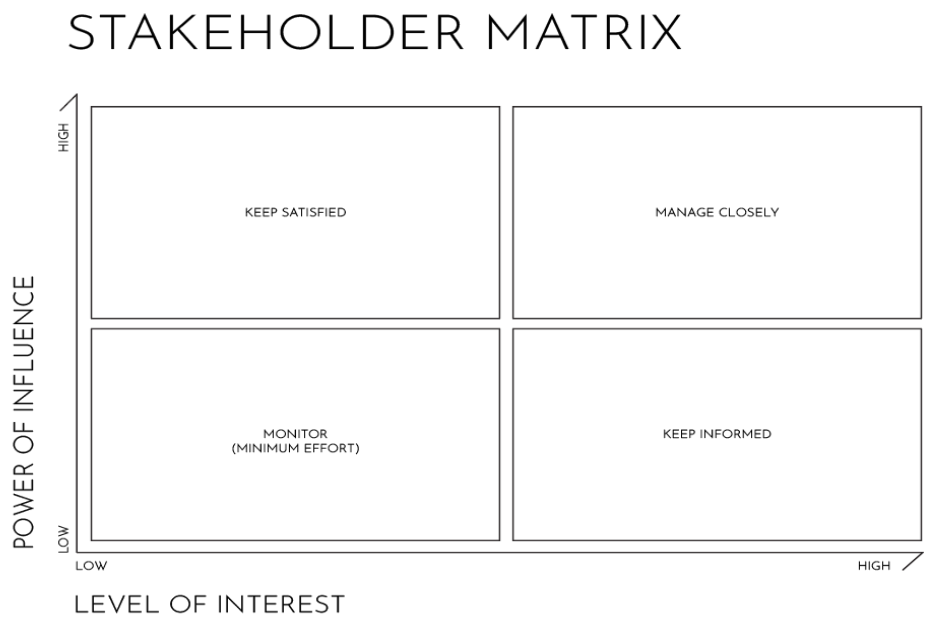


Figure 12: Stakeholder Matrix adapted from Mendelow's Matrix

The following sections detail the various makerspace stakeholders that were identified in the questionnaire, and lists them according to the various matrix quadrants they correspond to. For each quadrant, a brief explanation describes the stakeholder power and interest dynamics, relative to the organization.

High Power + High Interest

This group includes those stakeholders who have high power of influence and high level of interest over the state of affairs at a makerspace and therefore must be managed closely to ensure alignment between their goals and the makerspace goals. These include:

Business Users

Business users are entrepreneurs, general users, or members, who use the makerspace to support their small businesses, entrepreneurs and startups.

Community Organizations

Community organizations are those who rely on makerspace services and offerings to meet their organizational mandates.

Studio Renters

Studio renters are those general users, or members, who rent studio space, or another type of space, from the makerspace over longer durations.

Board of Directors

The Board of Directors represents those members who sit on the Board of a nonprofit or corporate makerspace.

Owners and Shareholders

Owners and shareholders are those who own or have a share in private or corporate makerspaces.

Management and Staff

Management and staff are those stakeholders who are full-time employees, part-time employees, volunteers, or paid contractors employed by the Makerspace.

Clients

Clients are fabrication clients at makerspaces where fabrication services are included in business offerings.

Partners

Partners are both public and private stakeholders who have some type of partnership agreement with makerspaces.

Funders

Funders are both governments and foundations who provide capital funding or sustaining funding that is relied upon by makerspaces to operate.

High Power + Low Interest

This group includes those stakeholders who have high power of influence but low level of interest related to the state of affairs at a makerspace. These stakeholders therefore must be kept satisfied in order to ensure alignment between their goals and the makerspace goals. These include:

Donors

Donors refer to those philanthropists or corporate sponsors who donate funds to support the makerspace.

Municipalities

Municipalities are the level of government which generally oversees business licensing, structural permits, and bylaw conformance.

Indigenous Governments

Indigenous governments refer to those stakeholders who play a role in land ownership rights, possess regulatory and social influence, and inform economic and sustainable development across communities.

Financial Institutions

Financial institutions refer to Canadian banks and credit unions which are the leading institutions that manage financial lending.

Low Power + High Interest

This group includes those stakeholders who have low power of influence and high level of interest related to the state of affairs at a makerspace. These stakeholders therefore must be kept informed in order to ensure alignment between their goals and the makerspace goals. These include:

General Users

General users are those who are hobbyists and recreational users, including demographics such as youth, students, adults, retirees, and seniors.

Low Power + Low Interest

This group includes those stakeholders who have low power of influence and low level of interest related to the state of affairs at a makerspace. These stakeholders therefore must be monitored to ensure alignment between their goals and the makerspace goals. These include:

Provincial + Territorial Governments

Provincial and territorial governments refer to those jurisdictions that are typically responsible for business and organizational registration and that govern the formal legal structures for various social sector organizations.

Federal Government

The federal government refers to the government jurisdiction that is typically responsible for collecting taxes. Depending on the legal structure of the makerspace, the federal government may also be responsible for business and organizational registration.

Business Model Analysis

The Value Proposition Canvas (VPC) and Business Model Canvas (BMC) are strategic management and entrepreneurial tools that work together to facilitate the visualization, analysis, and designing of business models (Strategyzer, 2024). The VPC and BMC were used to analyze the makerspace business models in this study.

As outlined in the Terms, it is important to note that, in this analysis, the term business model is used here to describe the underlying framework that outlines how makerspaces operate, generate revenue, manage resources, and fulfill their purposes or missions. While traditionally associated with for-profit enterprises, the concept of a business model in this project extends beyond profit-driven entities to include any organizations across the public, private, and social sectors. Similarly, the term customer throughout this report is used to describe those stakeholders who benefit from or interact with a makerspace's products, services, or offerings, and is used to reference models beyond for-profit enterprises. In the context of makerspaces, customers may be users, members, or participants of a makerspace, for example.

The BMC consists of nine building blocks that represent key elements of a business model. These include customer segments, value propositions, channels, customer relationships, revenue streams, key resources, key activities, key partnerships, and cost structure. Across the BMC, the building blocks interact in various ways to form a comprehensive business model. Though there is significant value in understanding the interactions across building blocks, the business modelling results from this study have been aggregated to protect the identities of the research participants and their associated organizations. Yet, the findings presented in this report do offer an insightful overview of the elements of makerspace business models.

Value Proposition Canvas

From the questionnaire responses, makerspace customer segments and their corresponding value propositions were identified. Customer segments refer to those distinct groups of customers with common needs or behaviors. Following the VPC, for each customer segment, there is a unique value proposition, which describes the unique value an organization offers to satisfy customer needs or solve customer problems. The customer segments and value propositions represent two of the nine building blocks which create the BMC. The various makerspace customer segments and their corresponding value propositions are identified in Table 9.

Table 9: Makerspace customer segments and value propositions.

Customer Segments	Value Propositions
Caregivers • Parents • Family	Provide care and recreation to the customer's loved ones, including youth and seniors
Education Learners • Youth • Students	Provide non-conventional learning opportunities to support education, skill development and education career

Recreational Users
• Hobbyists
• General population
  ○ Youth
  ○ Adults
  ○ Seniors
  ○ Retirees
	Provide:
	• A social community
	• A space to work
	• Tools
	• Equipment
	• Courses
	• Opportunities to learn skills

Businesses • Startups • Entrepreneurs • Small businesses Professionals • Builders • Fabricators, manufacturers • Craftspeople • Trades people • Artists artisans • Researchers, professors, academics	Provide: • Affordable workspace • Access to tools and equipment • Community network
Private Funders • Philanthropists • Financial institutions • Corporate sponsors	Deliver offerings that advance funder objectives
Public Funders • Government granting bodies • Foundations	Deliver offerings that align with funder values Provide funder visibility/advertising
Partners • Corporate • Public • Community organizations	Support partner in achieving objectives Expand/amplify partner objectives
Fabrication Clients	Offer unique and affordable fabrication services

Understanding makerspace customer segments and corresponding value propositions is a vital part of analyzing the makerspace business model and considering model viability. This exploration enables organizations to tailor their services to meet the specific needs of the communities they serve. By identifying leading customer segments, and their unique needs or challenges, makerspaces can allocate their limited resources more effectively, communicate more clearly, and remain more relevant and sustainable over time. In addition, this understanding facilitates collaboration with like-minded partners, enhancing makerspace's ability to achieve their missions, visions, and goals. By aligning offerings with the needs and preferences of their communities, makerspaces can maximize their impact and foster stronger connections with the communities they serve.

Business Model Canvas

In addition to the customer segments and value propositions, the remaining seven building blocks of the BMC were identified in the questionnaire and are listed below, to define the individual building blocks that form the complete makerspace business model.

Channels

Channels refer to the avenues through which makerspaces reach and deliver value to their customers. The leading channels identified across organizations include:

- Direct sales for in person services and offerings including signage and posters;
- Online platforms including social media, websites, community platforms;
- Referrals through word of mouth;
- Partnerships with like minded organizations; and,
- Community engagement including posters, signage, newsletter, radio advertisements, email lists.

Customer Relationships

Customer relationships refer to how connections with customers are established and maintained to ensure satisfaction and retention. The leading customer relationships identified across makerspaces include:

- Membership programs and incentives;
- Community events and collaborations;
- Outreach;
- Partnerships;
- Social media engagement;
- Recognition programs and events;
- Community meetings; and,
- Feedback mechanisms.

Key Resources

Key resources refer to the essential assets and elements required to operate and deliver the value proposition. The key resources identified across makerspaces include:

- Physical infrastructure;
- Equipment and tools;
- Human resources;
- Technology and software;
- Administrative systems; and,
- Materials and supplies.

Key Activities

Key activities refer to the critical tasks and processes necessary to create and deliver value. The key activities identified across makerspaces include:

- Program development and delivery;
- Space management;
- Customer support;
- Marketing and promotion;
- Community engagement and partnership development;
- Financial management; and,
- Human resources development and management.

Key Partnerships

Key partnerships refer to collaborations with other businesses or entities to leverage resources, reduce risk, or access new markets. The key partnerships identified across makerspaces include:

- Governments;
- Businesses;
- Community organizations; and
- Volunteer networks.

Revenue Streams

Revenue streams refer to the sources of income generated from delivering value to makerspace customers. The leading revenue streams identified across organizations include:

- Grants;
- Donations;
- Memberships;
- Studio/space rentals;
- Fabrication services;
- Classes; and,
- Materials.

Cost Structure

Cost structure refers to the expenses incurred to operate the business and deliver the value proposition. The cost structure identified across makerspaces include:

- Wages and salaries;
- Rent;
- Utilities;
- Supplies and materials;
- Equipment and technology;
- Facility management and repairs; and,
- Miscellaneous Costs.

Summary and Implications

Makerspace Landscape

The findings from the questionnaire tell us that Canada has a mixed makerspace landscape, consisting of organizations founded over the past two decades, and including organizations that vary in size, location, facility type, organization type, and business models. The findings also tell us that makerspaces generally share alignment across visions, missions, and goals, as well as share various stakeholders. This analysis suggests that there are a variety of legal structures and business models possible for makerspace development which may present opportunities for business development and innovation.

Stakeholder Matrix

Understanding stakeholders and their power of influence and level of interest, as outlined in the stakeholder matrix, is essential for makerspaces to determine resource allocation, manage stakeholder engagement and risk mitigation, and conduct informed decision making. Through understanding stakeholders' needs, concerns, and roles, makerspace leadership can more effectively allocate resources, mitigate risks, build relationships, and make decisions towards the benefit of both the makerspaces and their stakeholders.

Business Models

The business model analysis outlined essential elements of makerspace businesses including:

- Customer segments and associated value propositions;
- Channels for reaching customers;
- Ways that customer relationships are established and maintained;
- Key resources, activities, and partnerships in operating the business; and,
- Leading revenue streams and cost structures.

Based on the information presented in this section, prospective organizations and interview participants were identified to ensure representation of participants across diverse makerspace models. The findings from Part 2 contextualize the themes and insights developed in Part 3.

Above: An image of Sydney Makerspace in Sydney, Nova Scotia. Photographed by Charles Anderson.

Above: Participants making sneakers at a DesignWITH workshop, in Toronto, Ontario. Photographed by Katya Koroscil.

Part 3: Learning

"In listening to the research stories of others,
it is evident that research stories reveal the deep purpose of our inquiries."

Margaret Kovach

Theme Development

Based on the insights gathered in Part 2, participant organizations were selected for interviews to represent participants across a variety of legal structures and business models. Site visit participants were then selected from the interview participants. In total, eleven interviews were conducted with thirteen research participants, followed by seven site visits. The participants in the interviews and site visits represented makerspaces across corporate, nonprofit, hybrid, and partnership structures, in two provinces.

Reflexive Thematic Analysis

For the final phase of this project, Reflexive Thematic Analysis (RTA) was employed to develop themes, based on the findings from the interviews and site visits. RTA is a qualitative research method, and is used to identify, analyze, and report themes of relevance within a dataset (Braun & Clarke, 2006). This phase of the research followed Braun and Clarke's six phase RTA process, as follows:

1. Familiarization with the Data;
2. Generation of Initial Codes;
3. Exploration for Themes;
4. Reviewing Identified Themes;
5. Definition and Naming of Themes; and,
6. Writing Up.

In practice, these phases included:

1. Recording and transcribing interviews;
2. Reviewing the interviews to become deeply familiar with the content of each;
3. Qualitatively coding the interviews for interesting excerpts relevant to the research question and towards identifying potential patterns across the data set;
4. Clustering codes into sub-themes;
5. Organizing the clustered sub-themes into themes;
6. Analyzing the data associated with each theme to identify related opportunities, and implications, in response to the research question; and,
7. Writing the report.

From the themes developed in this project, resulting opportunities and implications, in response to the project research question, were identified and are presented in the following pages.

Transcription Style

Intelligent transcription was used for the interviews to provide accurate and clear data excerpts in detailing the final themes.

Theme Overview

The final themes resulting from the RTA revealed insights in response to the project research question. In total, nine themes were developed, as follows:

- Measuring Magic: Conveying Makerspace Meaning(fulness)
- The Pursuit of Creativity
- Place-based Spaces
- A Third (maker)Space
- Locked Out: Rentals and Real Estate
- "Vibes" Are Everything
- The Power of Partnerships
- The Internal Economy
- Removing Barriers to Access

Each of these themes are presented in detail in the following pages.

For each theme, the following items are identified:

- Theme name
- Brief description of the theme
- Relevant sector(s)
- Relevant Business Model Canvas building blocks (icons)
- Key sub-themes that were developed by clustering codes
- Select interview quotes, as supporting data, used to develop the sub-themes
- Additional insights, where relevant
- Opportunity space(s) that emerged
- Resulting implications
- Outcome

Measuring Magic: Conveying Makerspace Meaning(fulness)

Makerspaces are conduits for meaning making and value creation, though these aspects prove difficult to measure and convey.

Relevant sector(s): Social, Public

The following sub-themes were developed through the code clustering phase of the RTA and include select interview excerpts which supported the sub-theme and theme development.

Subtheme: Makerspaces incite meaning

> *"You just know you're making a difference, and I would say that is probably even more important than measurable KPIs."* – ELBR

> *"I can see it when [people] walk in. I feel it. To have a safe space where your creativity can grow, I think that is really important."* – BRMA

> *"I think that it really takes creativity to be able to find out what people can attach meaning to."* – BRMA

Subtheme: Value is hard to measure

> *"So much magic happens here that is very hard to measure."* – JAOB

> *"Those are the things that actually get me in the gut and I know what we're doing is making a difference, but they're really hard to measure."* – ELBR

> *"I think the evolution of seeing individuals come in, participate in our programming, seeing them leave and watching that magic happen. How do we bottle that up?"* – BRMA

Subtheme: "Quick, easy" quantitative metrics are generally used to measure and convey impact

> *"Funders need KPIs. They need numbers through the door. They need the number of people who were in each class, they need to know the number of businesses that we've helped, who have started businesses… they need to know all those things, so we measure them to the best of our ability."* – ELBR

> *"We track a couple of metrics. First, the number of members we have, the number of studios, the number of people who go through our classes, and then revenue on all of those, as well as fabrication. It's pretty easy for us to have hard numbers on all those metrics."* – SIMA

Subtheme: Efforts are made to measure success

> *"We've been relying on people to tell us, what's happening?"* – MCPL

> *"Most of our impact measurement has been around touchy feely impact statements that we have gotten back from people."* – ELBR

Subtheme: There are opportunities for unconventional impact measurement

> *"Through meaning, it's often an object, an image, a video, or something visual, that can help cue people to create their own narratives"* – BRMA

> *"The social return of investment is what I'm interested in."* – JAOB

Additional Insights

- Patterns across the dataset also indicated that certain makerspaces use grant reporting requirements to assess their impact, and that some makerspaces do not measure impact.
- Participants suggested alternative methods for measuring impact, including:
    - Surveys; asking "what would people do" and "how would they solve their challenges" without makerspace services and offerings;
    - Building a narrative to tell the "story" of the space;

- Using imagery, video, audio to capture emotions and expressions that otherwise are not captured using quantitative metrics;
- Developing a makerspace success framework;
- Measuring using circularity, and considering the system as a whole: who was employed, what materials were used, by looking at the whole;
- Measuring based on general project, craft, or process completion; and,
- Designing metrics centering the process rather than the outcomes.

Opportunities	Implications
• Investigate the unique value proposition for each makerspace, based on community engagement and feedback.	• Have a clearly defined value proposition. • Convey makerspace value more effectively to community and stakeholders. • Greater alignment and communication across teams.
• Explore creative and alternative ways to convey the "magic" that happens in makerspaces (see Additional Insights list).	• Capture value that would not otherwise be conveyed. • Learn new research methods.
• Work with stakeholders to adapt success metrics and impact measurement towards storytelling and narrative development.	• Improve communication with stakeholders. • Clearly defined value proposition leading to increased demand. • Improved alignment and cohesion amongst makerspace teams.

Outcome

Though the meaningfulness and value that emerge from makerspaces are difficult to measure, and therefore difficult to convey, there are creative opportunities to capture them, which could also redefine makerspaces success and impact. In turn, this shift could improve makerspace service delivery, access to financial resources, communication, community engagement, and policy development.

The Pursuit of Creativity

The public and community demand for makerspaces underscores their ability to fulfill various societal and individual needs.

Relevant sector(s): Social, Public

The following sub-themes were developed through the code clustering phase of the RTA and include select interview excerpts which supported the sub-theme and theme development.

Subtheme: There is a significant demand for makerspaces

> *"There's definitely more interest in membership than we have capacity to take on right now. There's definitely potential for it to keep growing."* – FNST

> *"There's way more people wanting to learn, needing jobs, and needing to up their skills than this whole city can bear."* – JAOB

Subtheme: People don't have access to make at home

> *"We live in apartments, RV's, and small spaces, where you can't do this kind of work. You need proper ventilation, you're not allowed to use a torch for metal work in an apartment. I do a lot of texturing and hammering, and I would be driven out of my place by my neighbours if I was doing that at home."* – CHCA

> *"Many people have something they want to pursue but they don't have the space to do it at home."* – TESI

Subtheme: People want to make and create

> *"A lot of times people just want to tinker. They just want to come in, and make, and see what they can come up with"* – ELBR

"People want to learn life skills that create meaning. They want to learn how to fix and mend their clothes. People want to be creative, and use making as the vessel to create something." - BRMA

"There's a lot of desire for people who want to make their own stuff. They want to renovate, they want to fix things up, and do projects. There's a lot of desire for that." - FNST

Subtheme: Tangible skills are being lost due to education changes and societal shifts

"No one has access to school shops nearly as often anymore. No one's parents fix the lawnmower, or change their car oil. It all gets hired out, so that connection to doing physical things in the world is becoming lost in a lot of people's lives." – MVSE

"Students who come to the engineering program have to forego every opportunity for practical training in order to get all their core high school credits to get into engineering. These students arrive at university with all of the appropriate boxes checked, and most of them have never used a drill. They don't know how to swing a hammer. The first thing we have to teach them when they come through the door is what a Phillips screwdriver is." – ELBR

Opportunities	Implications
• Growth and expansion of makerspaces, makerspace network, and makerspace locations could be a reality.	• Increased revenue streams. • Increased potential for impact.
• Offer opportunities for learning and skill developing around traditional crafts, and maintenance and repair.	• Increased revenue streams. • Increased potential for impact.

Outcome

The strong interest and use of makerspaces highlight their capacity to serve diverse needs. Given various trends in housing accessibility, education reform, and loss of tangible skills, makerspaces in Canada are presented an opportunity to expand and meet the growing and diversifying needs of people and communities.

Place-based Spaces

Makerspaces are placed-based and are therefore shaped by their local communities, neighbourhoods, and regions.

Relevant Sectors: Social, Public

The following sub-themes were developed through the code clustering phase of the RTA and include select interview excerpts which supported the sub-theme and theme development.

Subtheme: Makerspaces are unique to their locations

> *"Every makerspace is its own makerspace and kind of grows around the interests and efforts of the people that initiate it."* – BEJO

> *"I really don't think you could take any one specific Makerspace setup and plug it into another community. I think each community is so unique, that it would need to be a little bit different."* – BMSP

> *"I think there's a power to the space. I think that it changes the neighborhood."* – FNST

Subtheme: There is appetite for place-based makerspace network expansion

> *"In the broadest sense, this is absolutely something that should exist everywhere, and would absolutely be viable everywhere, though what that looks like is different in a lot of places."* – MVSE

> *"Growth could be a network of [makerspace] hubs around the world that are all innovating and all collectively coming together. Sharing that information and knowledge between hubs would be incredible."* - BRMA

Subtheme: Makerspaces rely on in-person offerings

> *"[This makerspace] is really a space that you can't make virtual. The whole point of it is that it's a place to work with your hands, in person."* – FNST

> *"We rely on bodies in buildings."* – MCPL

Additional Insights

- The idea of makerspaces as franchises was discussed and considered across the interviews, though not all participants felt that a franchise model would be viable.

Opportunities	Implications
• Build products, services, and offerings that reflect the distinct local, regional, and cultural aspects of makerspace communities.	• Local needs are catered to. • Enhances potential for local and regional impact.

Outcome

Makerspaces, shaped by local communities, present opportunities to offer unique, regionally and culturally relevant services that could foster further community building, support cultural preservation, and increase intergenerational knowledge transfer.

A Third (maker)Space

The leading makerspace value proposition is the social and community networks built from and within the spaces.

Relevant Sectors: Social, Public

The following sub-themes were developed through the code clustering phase of the RTA and include select interview excerpts which supported the sub-theme and theme development.

Subtheme: There is a spirit of support and collaboration across the makerspace community

> *"Everybody feeds off of each other, and everybody's willing to help each other out."* – BMSP

> "*By being in the space, you have to be very open, welcoming, and willing to share. I think that it's really about sharing knowledge and skill, and being open to receiving as well."* – BRMA

Subtheme: People successfully work together across experiences and differences

> *"Having hobbyists work side by side with emerging artists is really driving them to participate more, practice more, and experiment more. Creating that culture within the craft has been really nice to witness."* – MCLP

> *"We have people from every possible background coming in, working side by side, taking classes together."* – ELBR

Subtheme: Makerspaces serve as social spaces

> *"We have a pretty substantial social aspect to our space. We quickly find that members who latch onto that and who take that into consideration as part of their*

membership tend to stick around longer, get more finished, and work on more interesting things. They seem to get a lot more out of space." – MVSE
"This is a space where people can just come and meet people for the first time. We've had so many people build relationships here." – MCPL

"Just chatting with the members is an important part of the space and of the [team's] role as well." – BMSP

Subtheme: Much community building happens in makerspaces

"We've taken on quite a few members who have that interest in, not just a space to make, but also a community of makers." – FNST

"Having that community that's developed in the space is really a big piece of what continues to push it forward." – BMSP

Subtheme: Spaces are designed with no walls for an open concept

"One purposeful design in our space is that we don't provide walls. Everything is very transparent, in that you can see what your neighbours are doing." – SIMA

Opportunities	Implications
• Consider the social and community aspect of makerspaces as a leading value proposition.	• Clearly defined value proposition/ • Convey makerspace value more effectively to community and stakeholders. • Greater alignment and communication across teams.
• Invest energy and resources towards community building initiatives.	• Clarified value proposition. • Attract prospective customers. • Increases social capital.

Outcome

As the social connections and communities that are built in makerspaces are their leading value, there are opportunities for makerspace resources to be strategically allocated and invested in these aspects of the business to expand the communities and networks, and to promote further diversity and accessibility.

Locked Out: Rentals and Real Estate 

Costs and stability of commercial rentals and real estate is the leading viability challenge for makerspaces.

Relevant sector(s): Social

The following sub-themes were developed through the code clustering phase of the RTA and include select interview excerpts which supported the sub-theme and theme development.

Subtheme: Costs of commercial rent are out of reach

> *"It's very difficult. We tread a very fine razor thin line financially, about actually being able to afford the space and financially being able to continue to exist."* – BMSP

> *"If things like rent, leasing, and commercial spaces get out of hand again, that might just make things economically unviable for us."* – MVSE

> *"The biggest [challenge] is being at the mercy of our landlords, it's that physical space."* – BMSP

Subtheme: Leasing instability is a leading insecurity

> *"The challenge with this lease is that it doesn't give us the runway that we need. It would be great if we knew we could have this space for five years, but we don't have that kind of assurance. I think we could plan with way more enthusiasm if we knew we had five years."* – JAOB

> *"We have a 90 day eviction notice clause, but three months isn't all that long to go ahead and move a big space with fairly limited resources."* – DPAQ

Subtheme: Many spaces benefit from rental arrangements which reduce their rent costs

> *"The model that we've developed with our landlord partner has been absolutely central to our survivability through some pretty challenging economic times."* – DPAQ

> *"[Our local municipality] has a tax exemption plan, whereby if we're renting and we're seen to give back to the community, which we do, there's an arrangement with the city where the landlord's property taxes are reduced, which is then deducted from our rent. This is our first year having this benefit and I can see it's going to make a huge difference."* – BEJO

> *"The landlords here basically bought [this building] for this purpose. We were kind of joking before that, saying, "oh, maybe some [philanthropists] will come along and buy us a building". And then that exact thing happened, which was kind of nuts."* – TESI

Subtheme: There is a fine balance between costs to access the makerspaces and costs to run makerspaces

> *"The business model is tricky because we need the physical space, so we are at the mercy of landlords, but those costs have to be passed along to our members. That's that fine line of making it affordable while still being able to pay rent and continue to exist. It's a challenge."* – BMSP

> *"If we aren't able to find a space that is affordable, we're going to have to raise membership rates. So we're working on trying to increase the number of members so the space can remain affordable. But definitely the biggest challenge right now is looking at how do we keep it affordable for members?"* – FNST

Additional Insights

- There is a pattern of, and need for, frequent makerspace relocation due to affordability and growth.
- Some participants indicated that they are looking to purchase space in the future as leasing commercial space is unsustainable for business viability.

- Good relationships with landlords are important to maintain.
- Though rental arrangements can offer financial stability, they can also create limitations based on how dependent organizations become.
- There is a perception that makerspaces would be more successful in areas with a high cost of living due to the resulting lack of space, high costs of rent, and typically higher incomes, whereas in areas with a lower cost of living, access to workshop space may not be at a premium.

Opportunities	Implications
• Explore rental arrangements and partnerships with people and organizations who share alignment with the makerspace objectives and who recognize their value.	• Increased revenue streams. • Dependency on funding partners.
• Lobby provincial governments, and other jurisdictions, to implement rent control, tax incentives, and rental protections for for-benefit organizations.	• Reduced cost structure. • Ensures access to affordable commercial space for a diverse range of businesses and social enterprises.
• Reevaluate business model to identify alternative areas for cost recovery.	• Increased revenue streams. • Reduced cost structure.
• Rethink rental and ownership models, exploring alternative opportunities within the social economy in Canada.	• New and alternative models for rental and real estate legitimized for for-benefit organizations. • Increased potential for impact.

Outcome

Commercial rentals and market real estate are largely out of reach for makerspace organizations, posing viability challenges. Yet, there are opportunities to lobby governments, revise the makerspace business models, and explore alternative rental and ownership models in order to achieve greater stability.

“Vibes” Are Everything

People, and the culture they create, determine makerspace success.

Relevant sector(s): Social, Public

The following sub-themes were developed through the code clustering phase of the RTA and include select interview excerpts which supported the sub-theme and theme development.

Subtheme: Skills can be taught, but vibes can’t be

> *“We look for people who have the right vibe. The running joke is that one of my email signatures, instead of Executive Director, is Director of the Vibes, because that’s a really important piece.”* – BMSP

> *“Skills haven’t really been an issue because we are a makerspace. We don’t require that you come in with the exact skills that are needed, but more that you’re willing to learn. Then, we trust that the skills will be picked up by passionate people. That’s part of the culture of being in a makerspace, that you’re willing to learn new skills.”* – SIMA

Subtheme: People shape the space

> *“The space evolves quite organically, as people come through the space. Obviously, it’s driven by the staff and by the Board, but there’s a lot of impact that the members make themselves as well.”* – BMSP

> *“The intention is to bring like minded individuals together who really believe in the ideas and the potential for impact on the community.”* – BRMA

> *“The thing that everybody shares is the sense that they really want to make stuff. They want to build, they want to create.”* – FNST

Subtheme: Good people are the most important resources

"When there are really good members who are really active, it stimulates the community." – FNST

"[The makerspace] is what the members make of it, and this is what most spaces end up being. It's just a matter of finding that active group of people that push for the things that they want to have available." – MVSE

"Our biggest failure is not actually having in place the resources that we needed, and we lost the people who made all the difference for so many people. Once you lose those individuals, it's not just somebody who knows SolidWorks or how to use a lathe. It's that combination of skills, plus the time for people, the ability to teach, and the absolute love of making. It becomes the greatest loss to the community. [Makerspaces are] not just the equipment, they're the individuals that animate it." – ELBR

Subtheme: The culture teaches resilience

"I would say [innovation] includes creating an environment where we can try things out and not be afraid if things go wrong." – PLRT

"Every Makerspace has come through a different avenue to get to where they are, and each makerspace is so unique in what they do, and what they offer, and how they got there, so [success] really comes down to a lot of trial and error." – BMSP

In terms of how we've matured, we've just tried a lot of different things. – SIMA

Additional Insights

- A pattern across the data showed that makerspace leadership aims to create a culture that feels welcoming and inviting.

Opportunities	Implications
• Review the key resources in the business model and invest in those that are most important, such as people.	• Consistent and core team. • Limited staff and volunteer turnover. • Improved health outcomes. • Improved culture.
• Provide competitive employment and volunteer incentive packages to attract and retain the people needed for success.	• Consistent and core team. • Limited staff and volunteer turnover. • Improved health outcomes. • Improved culture.
• Invest in leadership development and team building.	• Improved culture. • Increased customer satisfaction.

Outcome

As people and culture can determine the success of makerspaces, there exists an opportunity for leadership to be strategic about human resource engagement, and to invest in their teams in consideration of the value they provide to the organization. The results can lead to healthy and strong team dynamics as well as increased customer satisfaction.

The Power of Partnerships

Partnerships are makerspace enablers.

Relevant sector(s): Social

The following sub-themes were developed through the code clustering phase of the RTA and include select interview excerpts which supported the sub-theme and theme development.

Subtheme: Partnerships enable makerspaces to exist

> *"Three [partners] came together to satisfy an obvious need for an ecosystem building hub in this region and that's really how we got our start."* – ELBR

> *"[This organization] was able to take off as quickly as it did because I didn't have to think about my salary [due to a financial partnership]. I didn't have to fund myself."* – JAOB

Subtheme: Partnerships build broader community networks and ecosystems

> *"There's a number of organizations who are involved in ecosystem building. We help each other and support programming that works to benefit everybody."* – ELBR

> *"We're always trying to find ways to support one another so we can keep doing the things that we're doing."* – ELBR

> *"The other thing is that we really try hard to sit in the community and be an asset to the other organizations and do a lot of referral from one place to another."* – DPAQ

> *"There's a lot of organizations in the city and we're all doing the same thing, but in a different way. I've always looked at how we can work together, even if it's something small, like cross promoting each other, and helping each other grow our businesses."* – BMSP

"If you want to build yourself a little tower, house everything inside it, and stay in there, you're going to help some people. But if your hand is held out to all the organizations who are really trying to help, and you're able to lean on each other's strengths and refer to each other's programs, that [emergence] from the whole sum of the parts is true. When you start working as a group, in a community, with multiple partners, you can lift people up quicker. It just works." – ELBR

Additional Insights

- Throughout the interviews, participants suggested that makerspace partnerships enhance offerings, through courses and collaborations, and create new opportunities for makerspaces and their corresponding partner organizations.
- A pattern emerged that authentic partnerships are important, and that they feel good.

Opportunities	Implications
• Identify key partnerships from the business model and invest time and resources in building and maintaining the most critical and promising partnerships to the organizations.	• Access to resources, expertise, and support that are necessary for their sustainability and growth.
• Engage in networking and community building opportunities to enable emergent partnerships.	• Broaden reach. • Increase visibility. • Attract potential collaborators from diverse backgrounds and sectors.

Outcome

Partnerships are makerspace enablers, enhancing organizational viability and fostering broader community networks and ecosystems. These collaborations not only provide essential resources and support for makerspaces to thrive, but also create opportunities for diverse stakeholders to connect, collaborate, and drive innovation, ultimately strengthening the fabric of the making community and broader society.

The Internal Economy

Makerspaces support economic development for makers and creatives by fostering an internal economy through various efforts and initiatives.

Relevant sector(s): Social

The following sub-themes were developed through the code clustering phase of the RTA and include select interview excerpts which supported the sub-theme and theme development.

Subtheme: Makerspaces provide important services to small businesses

> *"We've helped hundreds of small companies either get started, or helped them as a stepping stone, so that they have a place to prototype and de-risk themselves before moving on to a bigger space, or determine that their business model isn't viable."* – SIMA

> *"We have some members [who are] running their small business almost entirely out of the makerspace."* – MVSE

> *"[Our biggest success is] in making a difference for a number I'm gonna say, upwards of 50 small businesses, making a difference in their lives."* – ELBR

> *"I think certainly every one of the small businesses that have come out of makerspace, and eventually grown up and realized makerspace was no longer a fit for them, because they'd gotten too big, and they popped off and went elsewhere. Every one of those has been a success."* – DPAQ

Subtheme: Makerspaces create internal economics and economic networks across their communities

> *"Since we used to do custom fabrication, we still have people reaching out with us asking [to do jobs], so our members can actually put their name forward and put*

them on to this list, where they say [what work they specialize in] so when individuals and organizations reach out, we actually provide them the contact info for our members." – BMSP

"One of the things that I'm most proud of that we've done in the past few years is that three of our emerging artists are now self-employed. They don't have restaurant jobs anymore. Now they're completely dedicated to their craft. Since they've been able to focus, it's changed everything. It's incredible to watch." – MCPL

Subtheme: Values-driven economic development

"I think, for me, and also that what makes this space so interesting, it's not that the product and the material is sustainable, but also how we made it, who we employed, who came to the table, who are the collaborators, and we really do choose based on value and that that values connection." – BRMA

"Part of our mandate is to make sure artists get paid for their time. So, for most clubs we lose money but we build community. That's mostly what we're here for." – MCPL

Subtheme: Makerspaces are generative spaces where valuable products and services are created

"What's been really exciting about [this makerspace] and the recent maker movement is that it's not just providing access to information in all its forms, but we are also empowering users to create content. Rather than just consuming content, makerspaces are also now places where people can consume and create content. That's been a really exciting shift." – PLRT

"We have a group of volunteers who fix up [wheelchairs] and then donate them to people in the community who need them." – CHCA

Additional Insights

- Patterns indicated that some economic impacts can be difficult to measure.

Opportunities	Implications
• Explore ways to measure and capture the economic impact of makerspaces to convey to stakeholders.	• Strengthen stakeholder trust and confidence. • Increased support from stakeholders.
• Continue investing in building systems and networks to support internal economies, such as hiring networks, job boards, and networking events series.	• Strengthen internal economy. • Enhance capacity to drive broader economic development. • Create opportunities for makerspace community.

Outcome

Makerspaces drive economic development by providing essential services to small businesses and fostering internal economies within their communities. Their values-driven approach to supporting entrepreneurship creates opportunities for innovation and collaboration, resulting in the creation of valuable products and services that benefit individuals, the making community, and the broader economy.

Removing Barriers to Access

Accessibility and affordability are of utmost importance for makerspaces to meet their missions.

Relevant sector(s): Social, Public

The following sub-themes were developed through the code clustering phase of the RTA and include select interview excerpts which supported the sub-theme and theme development.

Subtheme: Makerspaces face visibility issues; ambiguous or unfamiliar services and offerings

> *"I actively looked for something like this before I found [this makerspace]. Once in a while, I would get on Google and search "shared shop for rent" or "rent a workspace" in hopes of finding [a makerspace], basically [this makespace]. It existed, I just didn't have the words to find it yet."* – MVSE

> *"When people come to the space and they've never been here before, one of the most common things I hear is, "Holy crap! This place is amazing. I never knew it existed". And we've existed for eight years. So that really is our biggest challenge. It's just getting the community to be aware of what we do and who we are."* – BMSP

Subtheme: Perception that makerspaces serve everyone; there is a low barrier to entry

> *"That this is something that anyone can come out to, and anyone can learn. It's affordable and accessible, and you don't need any background to get started. I think that's sort of the biggest thing for me."* – MVSE

> *"There's something here for everyone. That's really the biggest draw."* – BMSP

> *"Our focus was always providing the space, removing barriers for people to be able to come in, and make, and create, and be artists."* – BMSP

Subtheme: Providing access to makerspaces is a priority

> *"If there's an accessibility barrier, there's a problem."* – MCPL

> *"What we are doing as an organization is creating more space for more people to have access to the art of making."* – FNST

> *"Accessibility, that is the key word, I'm going to say it 3000 times."* – MCPL

Subtheme: Affordable access is a leading priority

> *"We're trying to take steps to make it more financially accessible, even to our own detriment. Because if people aren't using the space, we don't have a purpose to exist."* – ELBR

> *"We're thinking about all the people who can't even get through our doors. People who have much tighter financial barriers. How many potentially great artists and makers are we not supporting by them not having the means to even get a membership here?"* – BMSP

Additional Insights

- University and college makerspaces are generally not available for public use.
- While library makerspaces tend to offer the greatest access to makerspaces, they typically offer more elementary technologies and crafts as compared to larger makerspaces situated within the social sector. There is an apparent need for both.

Opportunities	Implications
• Build into the business model financial support for those who otherwise cannot access such as scholarships, grants, volunteer opportunities in exchange for membership, etc.	• Increase visibility. • Increase diversity. • Attract new customer segments.
• Explore technologies to enhance accessibility for makers of various abilities.	• Technologies may be costly. • Attract new customer segments. • Positive societal outcomes.
• Establish demographic and inclusion targets, developing diversity, equity, inclusion, and accessibility goals and regularly reviewing progress to inform decision making.	• Attract new customer segments. • Expand makerspace network. • Positive societal outcomes.
• Create programs tailored to equity-deserving, marginalized, or otherwise excluded communities, offering opportunities such as scholarships, artist residencies, classes, etc.	• Attract new customer segments. • Positive societal outcomes.
• Invest in marketing efforts, particularly in underserved areas or areas not being reached.	• Attract new customer segments. • Positive societal outcomes.

Outcome

Removing barriers to access in makerspaces involves increasing visibility, clarifying services and offerings, and ensuring affordability. Based on the insights developed from this analysis, there exist opportunities to foster inclusivity, encourage diverse participation, and democratize innovation, ultimately leading to greater makerspace impact and reach.

In Response to the Research Question

This project began with a question:

What can we learn from makerspace models to strengthen Canada's creative ecosystem?

In response, nine research themes were developed, based on participant contributions, that were revealed through reflexive thematic analysis. In review, these themes include:

- Measuring Magic: Conveying Meaning(fulness)
- The Pursuit of Creativity
- Place-based Spaces
- A Third (maker)Space
- Locked Out: Rentals and Real Estate
- "Vibes" Are Everything
- The Power of Partnerships
- The Internal Economy
- Removing Barriers to Access

For each of these themes, relevant opportunities and implications are identified, suggesting possible ways in which makerspaces across Canada can thrive into the future.

This research revealed that, although makerspaces face challenges in relation to accessing affordable and stable rentals, as well as difficulty reaching all prospective customer segments, they offer far more than just access to making. This research has shown that makerspaces are, in fact, communities and social networks, hubs for learning and skill development, spaces for place-making and building cultural connections, spaces for individual identity and self-exploration, social capital incubators, and internal economic systems. The most important finding from this research is, perhaps, that makerspaces are places for emergence, and places where people have opportunities to make meaning.

Overall, the outcomes of this work tell us that, while makerspaces face viability challenges, there exist opportunities to support makerspace success, ultimately enhancing the Canadian makerspace ecosystem into the future.

Pictured is a stool from DesignWITH, in Toronto, Ontario.
Photographed by Katya Koroscil.

Moving Forward

“In the pursuit of knowledge, there is no finish line.”

Jane Goodall

What have we done?

This project aimed to address the following question: What can we learn from makerspace models to strengthen Canada's creative ecosystem? To answer this question, this research employed a three-part methodology including phases of Framing, Situating, and Learning, across which tools and methods from design thinking, systems thinking, and business strategy disciplines were employed. In Part 1, the concept of makerspaces was explored through a literature review and database development, examining their history and context within Canada's social economy. Part 2 offered an overview of the makerspace landscape in Canada, focusing on makerspace attributes, structures, and business models, based on data gathered from participant questionnaires. Part 3 synthesized findings from participant interviews and site visits into nine themes, resulting in opportunities and implications being identified to enhance makerspace viability and impact across Canada.

What have we found?

Part 1, Framing, highlighted the role of makerspaces as catalysts for learning and community building, and suggested that the recent trend of makerspace closures across Canada may be an indication of business viability challenges. Part 1 also identified that makerspaces operate within Canada's social sector and outlined various legal frameworks available for makerspaces to operate within Canada's social economy. The findings from Part 1 informed the development of the questionnaire and identified research participant organizations.

Part 2, Situating, contextualizes the landscape of makerspaces in Canada, revealing various insights from a quantitative analysis. In this analysis, the nonprofit structures was identified as most commonly used to govern makerspaces, though various alternative models are also used. Power and interest dynamics across stakeholders were identified using a stakeholder matrix, offering insights for resource allocation, engagement strategies, risk management, and decision-making. In addition, an aggregated makerspace business model analysis was undertaken using Strategyzer's Business Model Canvas and Value Proposition Canvas, outlining how Canadian makerspaces sustain operations, attract customers and participants, secure funding, and foster innovation. The findings from Part 2 informed some aspects of the interview development and was used to identify participant organizations.

Part 3, Learning, looked at makerspace viability across various models through interviews and site visits. Reflexive Thematic Analysis was used to identify nine themes: Measuring Magic, Pursuit of Creativity, Place-based Spaces, A Third (maker)Space, Locked Out: Rentals and Real Estate, "Vibes" Are Everything, Power of Partnerships, Internal Economies, and Removing Barriers to Access. For each theme, opportunities and implications to strengthen Canada's creative ecosystem were identified. Despite challenges such as access to affordable real estate and ensuring accessibility in spaces, makerspaces are shown to be important community amenities across Canada. Overall, the research indicates significant potential for makerspaces to thrive in Canada's creative landscape.

Where do we go from here?

The following actions may support the initial implementation of these research outcomes:

Continue conversations about the importance and need for makerspaces in Canada. Starting a conversation about Canada's makerspace network requires a deep dive into ways to make it more accessible, secure funding to build financial resilience, and allocate resources effectively. Collaborative efforts across governments, educational institutions, and businesses are crucial for keeping this ecosystem thriving. By empowering people from all walks of life to nurture creativity and gain new skills, Canada can lead the global maker movement, advancing society and driving innovation.

Build a Canada-wide makerspace network to advance the makerspace ecosystem. Establishing a Canada-wide makerspace network is pivotal for advancing the makerspace ecosystem across the country. By connecting makerspaces from coast to coast, this network would facilitate collaboration, resource sharing, and knowledge exchange among makers, innovators, and entrepreneurs. Through this network, Canada can harness the collective talents and ingenuity of its citizens to address societal challenges, drive economic growth, and position itself as a global leader in the maker movement.

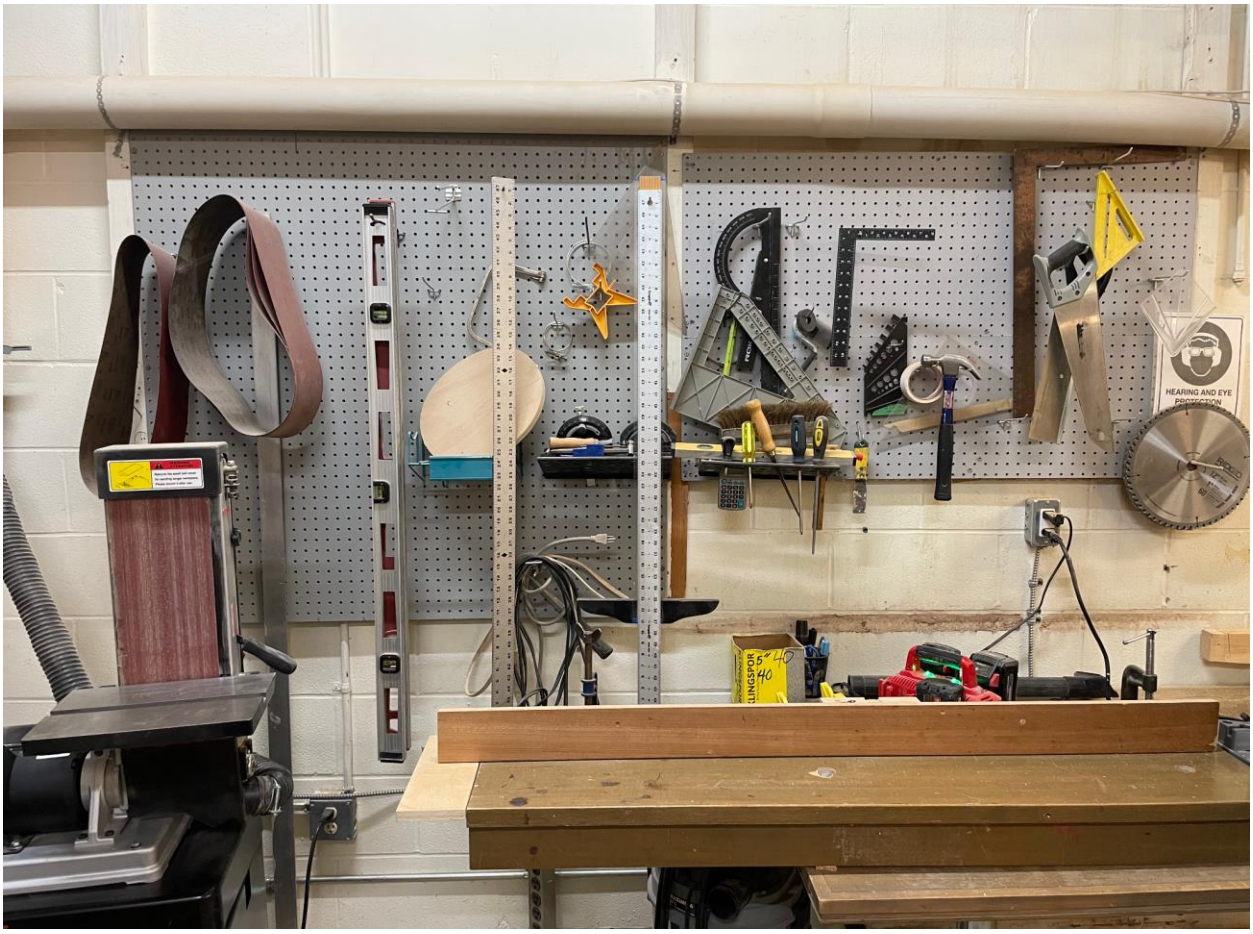
Further Inquiries and Investigations

While the primary focus of this study was to learn from existing makerspaces, it also yielded numerous emergent concepts that suggest opportunities for further research. Although much of these prospective analyses fell outside of the scope of this project, there exist opportunities for further exploration. Some of these include:

1. Conduct a systems analysis of the social sector in Canada to understand the range of models and organization types, and opportunities for innovation.
2. Examine the intersections and tensions between digital and analog realms in the future of making and creativity.
3. Explore new approaches and models to fund community development initiative in Canada and internationally.
4. Evaluate the learning outcomes and impacts generated through constructivist learning in makerspaces.
5. Develop tools and establish standard frameworks for assessing social impact.
6. Consider policy and economic frameworks of for-benefit corporations across Canada, to grow the economy through value-driven for-profit enterprises striving to achieve social and environmental impact.

A Promising Future for Makerspaces in Canada

Despite some challenges faced by makerspaces as outlined in this work, makerspaces in Canada demonstrate resilience and adaptability. They serve as more than just physical locations for creation; they are engines for community building, economic growth, cultural exchange, and inclusive learning. This research shows evidence that makerspaces offer promise for Canada's creative landscape. By leveraging the insights gained from this research, makerspace communities can explore new opportunities to support the sustainability and impact of the maker movement across the country. With a focus on innovation, community engagement, and sustainable business practices, the future for makerspaces across Canada looks bright.



A wall of tools at Makerspace Nanaimo, in Nanaimo, British Columbia.
Photographed by Madelaine Prince.

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A community lounge at MakerLabs in Vancouver, British Columbia.
Photographed by Madelaine Prince.

Appendix

Appendix A: Participant Screening Questions

Appendix A outlines the screening questions used to screen participants for the questionnaire, interviews, and site visits.

Questionnaire and Interview

1. Are you 18 years of age or older?
2. Are you employed by, a participant of, or hold a leadership role with a makerspace, or similar?
3. Makerspaces can be defined as organizations that offer opportunities for learning, skill development, and building connections through access to a variety of tools, resources, equipment, lessons, and/or a shared workspace.
4. Do you possess sufficient knowledge and experience to speak in detail about the organization on topics such as the organization's services and offerings, history and context, business model, governance structure, financial structure, and future prospects?

Site Visits

1. Are you 18 years of age or older?
2. Are you a staff or community member of the makerspace organization who has been authorized by the original participant to tour the Graduate Research through the space?

Appendix B: Research Questionnaire

Appendix B outlines the questions used in the participant questionnaire.

1. What is the name of the organization (makerspace or similar) you are affiliated with?
2. What is your position within the organization?
3. What type of organization is it?
4. What is the location or address of the organization?
5. Does the organization have a website? If yes, please provide the link:
6. Does the organization use social media? If yes, please provide the link(s):
7. What year was the organization founded?
8. What is the organization's vision? A vision states what the organization aspires to become in the future.
9. What is the organization's mission? A mission reflects the organization's past and present by stating why the organization exists and what role it plays in society.
10. What are the organization's leading goals? Goals are the more specific aims that organizations pursue to reach their vision and mission.
11. What type of business structure is the organization registered with?
12. What industry sector(s) do you consider the organization to exist within? Sectors could be, but are not limited to, education, technology, manufacturing, community services, recreation, etc.
13. Please provide a general description about the organization including its products, services, and/or offerings.
14. Please provide a general description of the organization's spaces, buildings and/or facilities, if any.
15. What tools, equipment, machines, and materials does the organization offer to its customer/community segment(s)? Please provide a general list.
16. Are the organization's products, services, and/or offerings available to the general public?
17. If answered "some" to Q16, please describe.
18. What are the leading customer/community segment(s) the organization currently serves?
19. Who are the customer/community segment(s) does the organization aim to serve, if different from above?
20. What is the organization's unique value proposition for each customer/community segment? A value proposition identifies the unique value that the organization provides their customers/community that differentiates them from other products, services,

and/or offerings. Think: what unique value does the organization offer that drives its customers/community to access its products, services and/or offerings?"

21. For each value proposition identified in Q20, what are the corresponding customer/community needs that the organization's products, services and/or offerings satisfy?
22. Approximately how many customers/community members does the organization serve on an annual basis?
23. What are the various methods or channels through which the organization communicates with and delivers value to its customer/community segments?
24. How does the organization maintain its customer/community relationships?
25. How do existing customers/community members access the organizations products, services, and/or offerings?
26. How do new customers/community members learn of and access the organizations products, services, and/or offerings?
27. How are the products, services, and/or offerings being used by the organization's customers/community members (e.g. hobby, professional, recreation, entrepreneurship, education, etc.)? Please describe.
28. What are the key activities undertaken to maintain the organization's day-to-day activities? Please provide a brief description of each key activity. Key activities refer to the primary actions that are imperative for the business or organization to function. For example, sales and customer service, research and development, production, marketing, etc.
29. What are the key resources needed to maintain the organization's day-to-day operations? Please provide a brief description of each key resource. Key resources refer to the primary resources that are imperative for a business or organization to function. For example, physical (buildings, vehicles, equipment, raw goods, etc.), intellectual (brand, proprietary knowledge, patents, partnerships, etc.), human (creativity, experience, etc.), financial (cash, credit, stock, funding, etc.).
30. How is the organization’s leadership structured?
31. What is the organizational structure? Please identify the various positions or departments, the corresponding number of employees, and their leading responsibilities.
32. Approximately how many people does the organization employ full time?
33. Approximately how many people does the organization employ part time?
34. Approximately how many people does the organization employ seasonally?
35. Approximately how many regular volunteers are involved with the organization, if any?
36. Are volunteers necessary to maintain day-to-day operations at the organization?
37. What is the approximate range of the organization's annual operating budget?

38. What are the organization's leading revenue streams?
39. What are the organization's leading costs?
40. Are the organization's financials reported publicly? If yes, please provide a link or describe how they may be accessed.
41. Is there anything else you would like to share?

Appendix C: Interview Questions

Appendix C outlines the interview template used in participant interviews.

Topic 1: Organization Review

1. Can you tell me a bit about your role at the makerspace and what it entails?
2. How would you describe a day-in-the-life at the makerspace?
3. What do you think makes makerspaces unique from others working in the same space?
4. How would you describe the makerspace culture?

Topic 2: History

5. Can you tell me a bit about the makerspace inception and how it was initially funded?
6. How has the organization evolved since it began?
7. Is growth of the makerspace part of the business model? If yes, in what way?

Topic 3: Context

8. I'm hoping to understand how much the makerspace depends on its context to exist (neighbourhood, user groups, community culture, local health, and economy, etc.). From that perspective, do you think that this model be taken and replicated in another city or region and be successful? Why or why not?

Topic 4: Successes and Challenges

9. How does your makerspace measure its success internally as an organization?
10. What do you consider to be the greatest successes of the makerspace to date?
11. What do you consider to be the biggest challenges the makerspace has faced?
12. What do you consider to be the makerspaces greatest failure, or failures, if you're comfortable sharing?

Topic 5: Social Impact

13. At this time, does the makerspace measure impact?

Topic 6: The Future

14. From your perspective, what is the current climate of the maker movement and what

do you think is happening on a broader scale in terms of the evolution of making and makerspaces?

15. Is there anything that could happen might challenge the viability of the organization?
16. In strategic foresight we talk about identifying weak signals and trends, things that might be Social, Technological, Economical, Environmental and Political, that could potentially change or disrupt the way things are. Are there any signals or trends that you've noticed in the makerspace sector that are or might eventually affect or influence the makerspace?
17. In ideal circumstances, what do you hope for the future of the makerspace in 10 to 20 years?

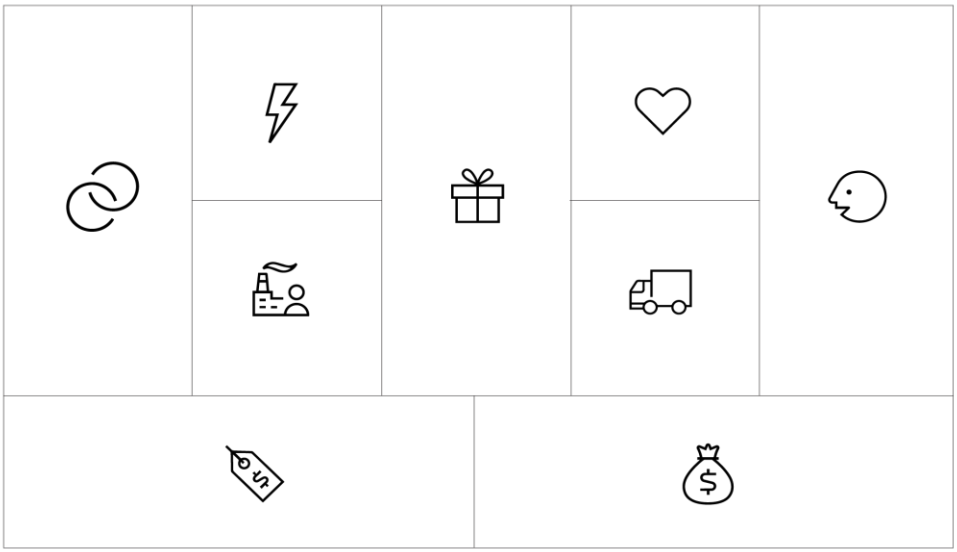
Wrap Up

23. Are you aware of or have you participated in any other similar research?
24. We are now at the end of the structured questions; do you have any additional thoughts or information that you'd like to share with me?

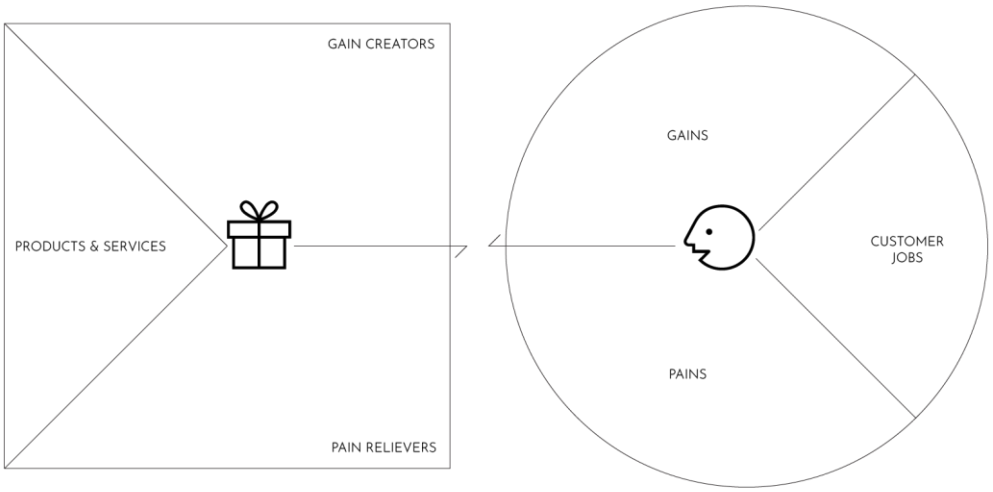
Appendix D: Business Model Canvas and Value Proposition Canvas

Appendix D shows the templates for the Business Model Canvas and Value Proposition Canvas.

Business Model Canvas

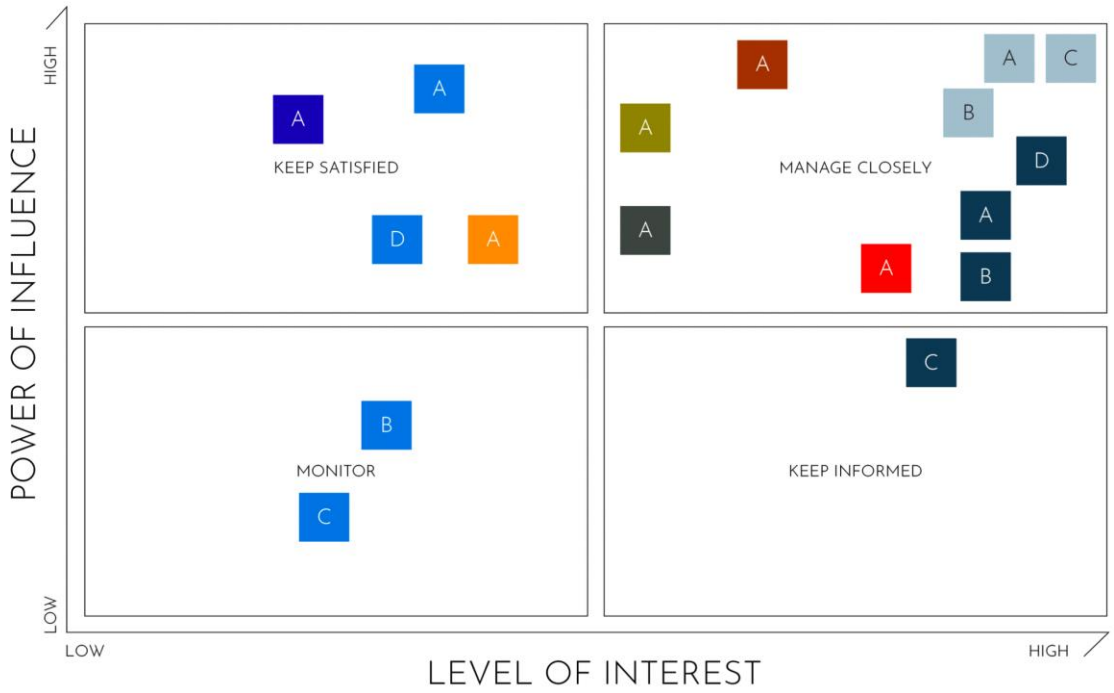


Value Proposition Canvas



Appendix E: Stakeholder Matrix

Appendix E details the makerspace stakeholders and their positions relative to each other on the stakeholder matrix.



STAKEHOLDER MATRIX LEGEND

01. USERS
- 1A: Business
  - Small buisness
  - Entrepreneurs
  - Startups
- 1B: Community Organizations
- 1C: General Users
  - Hobbyist, recreation
  - Youth/Students
  - Seniors/Retirees
- 1D: Studio Renters

02. CLIENTS
- 2A: Fabrication Clients

03. GOVERNMENTS
- 3A: Municipal
- 3B: Provincial and Territorial
- 3C: Federal
- 3D: Indigenous Governments

04. FUNDERS
- 4A: Government Foundations

05. PARTNERS
- 5A: Private
  - Corporate
- Public
  - School Boards
  - Universities
  - Community Organizations

06. LANDLORDS
- 6A: Owners
  - Property
  - Land
  - Buildings

07. FINANCIAL INSTITUTIONS
- 7A: Banks
  - Credit Unions

08. DONORS
- 7: Philanthropists
  - Corporate Sponsors

09. ORG GOVERNING BODIES
- 9A: Board of Directors
- 9B: Management Staff
- 9C: Business Owners BusinessPartners

Appendix F: AEIOU Frameworks

Appendix F outlines the AEIOU framework that was used for observational research during the site visits.

The AEIOU framework consists of five categories: Activities, Environments, Interactions, Objects, and Users. AEIOU worksheets are structured templates that guide designers through the process of observing and documenting elements in order to gain insights into an environment through observation. The AEIOU framework was designed by Mark Baskinger and Bruce Hanington as a tool for designers to understand and analyze user experiences and environments.

The following provides an overview of the questions and insights typically gathered in each phase of the AEIOU framework:

A – Activities:

- What activities are users engaged in?
- What are the main tasks or actions they perform?
- How do they navigate through these activities?
- What are the goals or motivations behind these activities?

Insights: Understanding users' goals, motivations, and behaviors in context.

E – Environments:

- Where do the activities take place?
- What physical spaces or settings are involved?
- How is the environment organized or structured?
- What are the characteristics of the environment (e.g., lighting, noise)?

Insights: Identifying environmental factors that influence user experiences and behaviors.

I – Interactions:

- How do users interact with each other?
- How do they interact with objects or tools?
- What social dynamics are at play during these interactions?
- Are there any patterns or sequences in the interactions?

Insights: Recognizing social and interpersonal aspects that shape user experiences.

O – Objects:

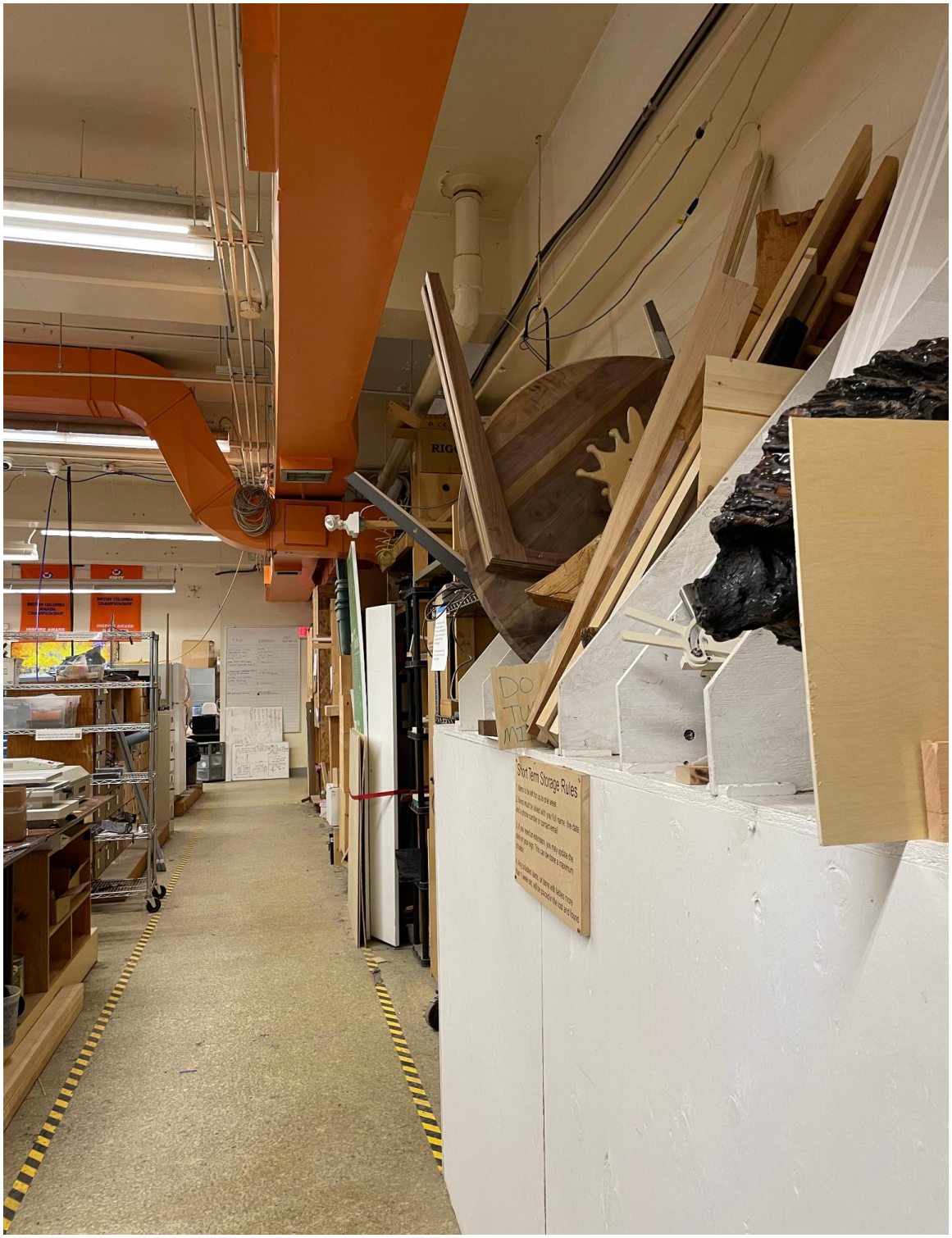
- What objects, tools, or artifacts are present?
- How are these objects used or manipulated?
- What are the characteristics and qualities of these objects?
- Are there any issues or challenges related to the objects?

Insights: Examining the role and impact of physical objects on user activities and experiences.

U – Users:

- Who are the users?
- What are their demographics (e.g., age, gender, occupation)?
- What are their needs, preferences, and limitations?
- How do users vary in terms of experience or expertise?

Insights: Profiling users and understanding their diverse needs, preferences, and contexts.



A hallway at Victoria Makerspace in Victoria, British Columbia.
Photographed by Madelaine Prince.