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Smart Cities Challenge

Katinnganiq: Community, Connectivity and Digital Access for Life Promotion in Nunavut

Canada

Government of Canada's Smart Cities Challenge

A partnership between the Nunavut Association of Municipalities, Embrace Life Council, Qaujigiartiit Health Research Centre and the Pinnguaq Association

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Challenge Statement

> ***Our communities will implement protective and preventative measures to reduce the risk of suicide in Nunavut, which is ten times the national average, and increase the amount and accessibility of peer support networks, educational resources and creative outlets that promote positive Mental Health to all Nunavummiut.***

The *Katinnganiq: Community, Connectivity, and Digital Access for Life Promotion in Nunavut* proposal is submitted by the Nunavut Association of Municipalities, The Embrace Life Council, The Qaujigiartiit Health Research Centre, and the Pinnguaq Association on behalf of the 25 municipalities of Nunavut. As articulated in our challenge statement, our proposal seeks to increase protective factors to the risk of suicide by increasing the amount and accessibility of life promoting activities, resources and support systems like peer networks, educational initiatives and creative outlets to all Nunavummiut in the expanded field of data and technology.

This initiative will see the creation of a network of both physical and digital spaces that offer opportunities for Nunavummiut to connect and share knowledge with each other, learn skills through culturally responsive educational resources and extra-curricular activities, and to express themselves through creative outlets and safe environments as pathways to mental wellness. We will focus on building on community and individual strengths and capacities by integrating permanent Makerspaces as central hubs for digital and STEAM-based activities that amplify Inuit Qaujimajatuqangit principles such as collaboration, creative problem-solving, and knowledge-sharing; with the goals of increasing protective factors and contributing to social equity with respect to the digital divide in Nunavut.

The purpose of the setting up a network of Makerspaces across Nunavut is to enable and empower youth to embrace the future with confidence, armed with new coping skills and tools, and supported by positive relationships, where youth can build a personal sense of belonging, meaning, purpose and hope through their participation in activities. This initiative will provide safe, nurturing, welcoming social hubs for Nunavummiut that:

- **Provide imaginative and engaging programs:** including recreational, extra-curricular learning and skills acquisition (leadership, technology, interpersonal), the arts (performance, visual, music), traditional cultural/ language activities, peer mentoring, Elder mentoring, and coaching.

- **Leverage digital connectivity** where youth have opportunities to connect within communities and across Nunavut's 25 hamlets, share knowledge with each other and

express themselves through access to digital tools and technological know-how utilizing new telecommunications technology.

- **Integrate community support**, including wellness services, where youth can access social/community services delivered on a 'whole person' basis in Makerspaces.

This model for Makerspaces across Nunavut is focused on providing connected and accessible digital technologies and educational resources that create opportunities for intergenerational knowledge transfer and language revitalization as pathways to mental wellness for youth firmly grounded in Inuit values. In **Chapter 1** of this proposal we outline the evidence and model for our vision; as well as provide justification for the changes that were made during the finalist phase. In **Chapter 2** we outline the governance framework that will provide the platform for achieving the outcomes of this initiative. **Chapter 3** articulates the goals as ultimate outcomes, identifies the inputs and activities in a logic model, shows the KPIs which will be used to measure progress, and illustrates the specific outputs and outcomes for each activity. In **Chapter 4** we outline how the initiative would be implemented and managed, alongside a description of the several work streams, tasks and subtasks. In **Chapter 5** we provide an outline and description of the different technologies that will form part of this proposal. **Chapter 6** provides a description of our approach to data and privacy for the implementation of this initiative, while **Chapter 7 d**escribes the outreach methodology and engagement activities that were undertaken during the finalist phase. In **Chapter 8** we discuss our plans for meeting legislative and policy requirements regarding the duty to consult with Indigenous groups, modern treaty obligations, and the Community Employment Benefits Plan. Finally, **Chapter 9** reports on the finalist grant utilized and provides class B estimates for our projected costs throughout the next five years.

Chapter 1: Vision

Our final proposal continues to be based on the challenge statement above, yet has departed from our initial proposal by redirecting our proposed activities using a ***life promotion*** approach to suicide prevention, which is "based on the belief that all young people are capable of finding their own path to a holistic and meaningful life"[1]. As defined by the *Together to Live* online toolkit developed by the Ontario Centre of Excellence for Child and Youth Mental Health:

> "life promotion efforts are holistic, strengths-based and empowerment-focused. They align seamlessly with recovery-oriented models of mental health care as they aim to honour young people's individuality and build their resilience through their personal strengths, available resources and relationships with those around them. Life promotion doesn't focus on reducing suicidality as much as it focuses on cultivating the strongest possible safeguards against it – namely young people's **sense of belonging, meaning, purpose and hope**. Life promotion

[1] "What is Life Promotion?" *Together to Live*. N.p., n.d. Web. 18 Dec. 2018. <http://www.togethertolive.ca/what-life-promotion>

> also considers the influence of factors such as cultural heritage and values, community resources and support networks in shaping one's mental health"

As a result, **the *Katinnganiq: Community, Connectivity, and Digital Access for Life Promotion in Nunavut* proposal**, submitted on behalf of the 25 municipalities of Nunavut, is a multifaceted and collaborative effort to create both physical and digital spaces that address the digital divide in Nunavut, both in terms of access to improved broadband connectivity as well as in spaces to access digital tools and literacy curriculum as important protective factors to risk of suicide. Our initiative offers opportunities for Nunavummiut to connect and share knowledge with each other through peer networks, learn skills through culturally responsive educational resources and extra-curricular activities, and to express themselves through creative outlets and safe environments as pathways to mental wellness.

What our preliminary proposal began to articulate as a suicide prevention strategy composed of six distinct categories of activities (Makerspaces, the te(a)ch computer programming curriculum, mesh networks, digital art therapies, mental health and wellness applications, and the 211 Nunavut Application), we now see materializing as a more holistic undertaking, built within a life promotion framework that understands community makerspaces as safe and nurturing social hubs that provide programs, tools, and resources that integrate art, culture, language, and technology; while maintaining mental health as its priority by enabling individuals to find and engage with their own sense of belonging, meaning, purpose and hope.

Our proposal understands the concept of **mental wellness**, defined by the Alianait Inuit Specific Mental Wellness Framework, as "self-esteem and personal dignity flowing from the presence of a harmonious physical, emotional, mental and spiritual wellness and cultural identity"[2]. Additionally, the First Nations Mental Wellness Continuum Framework, developed jointly by the First Nations and Inuit Health Branch (FNIHB) of Health Canada, the Assembly of First Nations (AFN), and Indigenous mental health leaders from various First Nations non-governmental organizations, defines mental wellness as:

> "a balance of the mental, physical, spiritual, and emotional. This balance is enriched as individuals have: **purpose** in their daily lives whether it is through education, employment, caregiving activities, or cultural ways of being and doing; **hope** for their future and those of their families that is grounded in a sense of identity, unique indigenous values, and having a belief in spirit; a sense of **belonging** and connectedness within their families, to community, and to culture; and finally a sense of **meaning** and an understanding of how their lives and those of their families and communities are part of creation and a rich history."[3]

In other words, throughout this proposal we utilize an understanding of mental wellness conceptualized in terms of a whole that balances spirit, emotion, mind, body and culture. As

[2] *Alianait Inuit Mental Wellness Action Plan*. Alianait Inuit-specific Mental Wellness Task Group, 2007. Page 9. Web. 7 Jan. 2019. <https://www.itk.ca/wp-content/uploads/2009/12/Alianait-Inuit-Mental-Wellness-Action-Plan-2009.pdf>

[3] *First Nations Mental Wellness Continuum Framework*. Health Canada, Assembly of First Nations, 2015. Page 4. Web. 5 Feb. 2019.

proposed by Jennifer White and Christopher Mushquash, "Standard suicide prevention practices which make assumptions about sources of distress and are predicated on models of expert interventions and individualized treatments can sometimes be out of step with non-western, non-European cultural conceptualizations of mental health and well-being. Being culturally responsive means being attuned to local, historical, and sociopolitical influences on mental health and well being, and developing solutions that build on local strengths and address historical and contextual realities"[4].

For White and Mushquash, a transformative, life promotion approach based on Indigenous values, "is less about implementing discrete suicide prevention programs, and more about **creating the conditions for Indigenous children, youth, families and communities to flourish,** preserve their languages, reclaim their land, recover their cultural and spiritual practices, and exercise their sovereign rights to be self determining, [...] so that they can resiliently pursue lives of dignity, with purpose, hope, belonging, and meaning; and be enabled to realize their full potential"[5]. Similarly, the Wise Practices initiative states that "Comprehensive, culturally-based, community-based approaches to life promotion and suicide prevention are known to hold the most promise"[6].

In the same vein, our approach maintains an alignment with Inuit Tapiriit Kanatami's National Inuit Suicide Prevention Strategy (NISPS), *Inuusivut Anninaqtuq*, Nunavut's Suicide Prevention Action Plan for 2017-2022 as well as with the First Nations Mental Wellness Continuum Framework, all of which are evidence-based holistic approaches which consider the entire lifespan of the individual with a special focus on nurturing healthy children[7] and creating a framework of support at the individual, family and community levels[8] while addressing the socio-economic conditions that affect the daily health and wellbeing of Nunavummiut[9], as the most impactful way to ensure that people are less likely to reach the point where they consider self-harm[10].

These plans iterate on the importance of confronting social and economic inequities, childhood adversity, and mental distress, as well as historical and intergenerational trauma stemming from Canada's colonization of Inuit Nunangat[11] that create environments where risk for suicide multiplies[12]. For Inuit, creating equity "means eliminating unfair and avoidable differences in areas such as housing, education, and access to healthcare in ways that validate our language, culture and identity"[13]. As a result, these strategies outline a vision in which individuals, families, communities, organizations and governments work together to provide

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[4] White, Jennifer and Christopher Mushquash. *We Belong: Life Promotion to Address Indigenous Suicide Discussion Paper.* Page 6. Web. 5 Feb. 2019. <https://wisepractices.ca/wp-content/uploads/2017/12/White-Mushquash-2016-FINAL.pdf>

[5] *Ibid*, Page 5-8. Web. 5 Feb. 2019.

[6] "System-Level Change for Life Promotion." *Wise Practices*. N.p., 2018. Web. 18 Feb. 2019. <https://wisepractices.ca/system-level-change/>

[7] *Inuusivut Anninaqtuq Action Plan 2017-2022*. 2017. Page 9. Web. 5 Apr. 2018 <http://inuusiq.com/wp-content/uploads/2017/06/Inuusivut_Anninaqtuq_English.pdf>

[8] *First Nations Mental Wellness Continuum Framework*. Health Canada, Assembly of First Nations, 2015. Page 4. Web. 5 Feb. 2019.

[9] *Inuusivut Anninaqtuq Action Plan 2017-2022*. 2017. Page 11. Web. 5 Apr. 2018 <http://inuusiq.com/wp-content/uploads/2017/06/Inuusivut_Anninaqtuq_English.pdf>

[10] *National Inuit Suicide Prevention Strategy*. Inuit Taipiriit Kanatami: 2016. Page 9. Web. 29 Jan. 2019. <https://itk.ca/wp-content/uploads/2016/07/ITK-National-Inuit-Suicide-Prevention-Strategy-2016-English.pdf>

[11] *Ibid,* Page 5

[12] *Ibid,* Page 5

[13] *Ibid,* Page 5

wide-reaching and meaningful services that are built on the values of *Inuit Qaujimajatuqangit*, the Inuit knowledge system and worldview, to prevent suicide and build healthy communities where children and youth can grow up in safe and nurturing environments[14]. Consequently, ITK places considerable emphasis on increasing protective factors and the development of resiliencies in youth through an "upstream" approach, which are those delivered early in life and continue to be protective into adulthood[15].

In responding to the above and maintaining a Smart Cities approach that leverages data and connected technology, our goal to promote life and positive mental health for young Nunavummiut is sought by increasing protective factors and contributing to social equity through community makerspaces that nurture wellbeing while addressing the digital divide in the North. As articulated in our challenge statement, we seek to increase the availability and accessibility of life promoting activities, resources and support systems like peer networks, educational initiatives and creative outlets to all Nunavummiut in the expanded field of data and technology - with a focus on building up community and individual strengths.

Makerspaces offer a gathering space for people to come together to be creative. In the past few decades, makerspaces have become a movement and a culture of individuals "using a mix of digital fabrication, open hardware, software hacking and traditional crafts to innovate for themselves, underpinned by an ethos of openness and skill sharing rather than commercial benefit"[16]. Makerspaces are also grounded in a "DIY" culture which embraces creation and sustainability and promotes skill-building and self-directed learning. They grew popular in the United States and Canada in the 1960's and 1970's and were aligned with civic and social movements of the time. Makerspaces also encompass an ethos of "hacking", understood as a practice of taking an object with a specific use and repurposing it; or "hacktivism", which involves the subversive use of computer programs and networks.

In a deeper way, the concept of hacking as it refers to practices of innovation and adaptation have been deeply embedded in Inuit history and culture for millenia; responding to change and social upheavals with teamwork, creativity, and consensus building. What is commonly referred today as 21st century skills like critical thinking and problem solving, innovation, creativity, collaboration and communication[17] have been and continue to be the very principles built into the guiding Inuit values called *Inuit Qaujimajatuqangit* or "The Inuit Way of Knowing". These are:

(a) *Inuuqatigiitsiarniq* (respecting others, relationships and caring for people);
(b) *Tunnganarniq* (fostering good spirit by being open, welcoming and inclusive);
(c) *Pijitsirniq* (serving and providing for family or community, or both);
(d) *Aajiiqatigiinniq* (decision making through discussion and consensus);
(e) *Pilimmaksarniq/Pijariuqsarniq* (development of skills through practice, effort,action);
(f) *Piliriqatigiinniq or Ikajuqtigiinniq* (working together for a common cause);
(g) *Qanuqtuurniq* (being innovative and resourceful); and

[14] *Inuusivut Anninaqtuq Action Plan 2017-2022*. 2017. Page 5. Web. 5 Apr. 2018 <http://inuusiq.com/wp-content/uploads/2017/06/Inuusivut_Anninaqtuq_English.pdf>
[15] *National Inuit Suicide Prevention Strategy*. Inuit Taipiriit Kanatami: 2016. Page 25. Web. 29 Jan. 2019.
[16] Taylor, Nick, Ursula Hurley and Philip Connolly. *Making Community: The Wider Role of Makerspaces in Public Life*. ACM, 2016. Page 3. Web. 15 Feb. 2019.
[17] *Ontario 21st Century Competencies*. Queen's Printer for Ontario, 2015. Page 56. Web. 17 Sept. 2018. <http://www.edugains.ca/resources21CL/About21stCentury/21CL_21stCenturyCompetencies.pdf>

(h) *Avatittinnik Kamatsiarniq* (respect/care for the land, animals and the environment).[18]

We consider Makerspaces as an organic extension of this history and philosophy. Our proposal intends to create spaces for education that support Inuit values and skills like collaboration, creativity, critical thinking and problem-solving, while emphasizing relationships to the land and the environment.

Technology, in particular has always been a part of Inuit life. From developing novel solutions for housing and warmth in the cold Arctic climate, through the use of snow, or animal skins and driftwood for shelter structures, or the design and creation of clothing to protect people from the harsh winter climate; technological advancement has been essential to the survival and success of Inuit culture. This notion has carried into more recent times as well, with the understanding and mastery of small engine repair and carpentry being a component of contemporary survival competencies and the ability to travel on the land[19]. Wanda Nanibush, Curator of Indigenous Art at the Art Gallery of Ontario re-asserts that "Indigenous peoples have always been early adapters to technology, but with cultural survivance and the value of life at the forefront. It is not the technology itself that is important but what kind of life it facilitates"[20] . Similarly, this proposal will enable the adaptation of technology to Inuit life, and not the other way around.

In the article "Making Community: The Wider Role of Makerspaces in Public Life", the authors identify four broad themes that outline the different roles Makerspaces play in the wider community: acting as social spaces, supporting wellbeing, serving the needs of the communities they are located in, and reaching out to excluded groups[21]. They understand the potential of makerspaces as third spaces, or multi-dimensional social spaces separate from the home and the workplace that play a critical role in public life[22]. As a result, these spaces can have an explicit agenda beyond digital or physical fabrication, intent on creating positive change in a community[23].

Our model for Makerspaces in Nunavut is focused on building pathways to life promotion and mental wellness for youth firmly grounded in Indigenous values by nurturing creativity, fostering agency, and building positive relationships while engaging in the expanded field of technology at the intersection of art, culture, science and education. The idea that connected and accessible digital technologies and resources for Indigenous communities create opportunities for intergenerational knowledge transfer, language learning, renewal, and revitalization through multimodal forms as pathways to mental wellness has gained considerable traction in recent years.

A 2013 report titled "Promoting Positive Youth Development and Highlighting Resources for Living in Northwest Alaska Through Digital Storytelling" describes a three year project that

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[18] Education Framework: Inuit Qaujimajatuqangit For Nunavut Curriculum. Nunavut Department of Education, Curriculum and School Services Division, 2007. Web. 8 Jul. 2018.

[19] Alexander Castleton, Inuit Identity and Technology: An exploration of the use of Facebook by Inuit Youth. Carleton University, Ottawa 2014. Accessed Feb 14th, 2018

[20] Wanda Nanibush, "The Earliest Adapters, Survivance in Indigenous Media Arts" Accessed on February 24th, 2019.

[21] Taylor, Nick, Ursula Hurley and Philip Connolly. *Making Community: The Wider Role of Makerspaces in Public Life*. ACM, 2016. Page 35. Web. 15 Feb. 2019.

[22] *Ibid* page 10 Taylor, Nick, Ursula Hurley and Philip Connolly. *Making Community: The Wider Role of Makerspaces in Public Life*. ACM, 2016. Page 10. Web. 15 Feb. 2019.

[23] *Ibid* page 10 Taylor, Nick, Ursula Hurley and Philip Connolly. *Making Community: The Wider Role of Makerspaces in Public Life*. ACM, 2016. Page 10. Web. 15 Feb. 2019.

used digital storytelling as a health promotion strategy within a Positive Youth Development (PYD) framework. In this project, Digital Storytelling comprised the creation of 3-5 minute videos by youth that reflected aspects of their own life experiences. They selected and generated photos, wrote and recorded first-person voice-over narration, and learned through hands-on computer tutorials how to assemble the materials into a finished digital story[24]. The report concludes that "the digital storytelling project offered young people a way to gain a sense of personal mastery and achievement, highlight positive aspects of themselves, their lives and their reasons for living, as well as offering them a venue for strengthening connections with people [...] Digital storytelling presents a promising approach to health promotion and primary prevention that can be used to bolster cultural and identity-based protective factors needed for ushering marginalized young people into healthy adulthood"[25]. Although in this case digital storytelling is mostly focused on audiovisual techniques and materials, a variety of programs and technologies can be used to tell stories in dynamic and interactive ways, including with coding and game developing software like Twine and Scratch.

In the article "Supporting Self-Determined Indigenous Innovations: Rethinking the Digital Divide", authors Jasmin Winter and Justine Boudreau make a case for the potential of makerspaces as important initiatives that open up both physical and digital environments to project Indigenous worldviews and ways of knowing into the future of technology[26]. Specifically, the authors outline a case study that describes the efforts of the community of Pimicikamak First Nation (Cross Lake, Manitoba), who, during a state of emergency declared in March 2016 due to increased numbers of death by suicide, reached out to the uOttawa Richard L'Abbe Makerspace and partnered with its sister organization Maker Mobile to develop a strategy to empower Cross Lake youth through community-driven making[27]. This strategy involved the development of one week summer camps for youth that included curriculum on 3D modelling, 3D printing, coding, building structures on a budget, and making 3D printed jewelry, alongside the purchase of a 3D printer for the community - thus providing a source of engagement and a creative outlet for the community[28].

Another example of a community based initiative providing a STEAM (Science, Technology, Engineering, Art and Math) based model for exploration is *Wapikoni*, a Quebec-based mobile studio that travels to Aboriginal communities to provide workshops for youth that allow them to master digital tools by directing short films and musical works, through a methodology that develops self-esteem, skills and resilience[29]. Founded in 2003, their mission is to "combat isolation and suicide among First Nations youth while developing artistic, technical, social, and professional skills; broadcast films and various public awareness issues facing First Nations while enhancing a rich culture, too often overlooked; and contribute to the preservation of First Nations cultural heritage"[30]

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[24] Wexler, Lisa, Aline Gubrium, Mehan Griffin, and Gloria DiFulvio. *Promoting Positive Youth Development and Highlighting Reasons for Living in Northwest Alaska Through Digital Storytelling.* Health Promotion Practice, 2012. Page 620. Web. 12 Jan. 2019.

[25] Wexler, Lisa, Aline Gubrium, Mehan Griffin, and Gloria DiFulvio. *Promoting Positive Youth Development and Highlighting Reasons for Living in Northwest Alaska Through Digital Storytelling.* Health Promotion Practice, 2012. Page 622. Web. 12 Jan. 2019.

[26] Winter, Jasmin and Justine Boudreau. *Supporting Self-Determined Indigenous Innovations: Rethinking the Digital Divide in Canada*. Technology Innovation Management Review, 2018. Page 44-45. Web. 10 Jan. 2019

[27] *Ibid*, Page 45. Web. 10 Jan. 2019

[28] *Ibid*, Page 45. Web. 10 Jan. 2019

[29] "History." *Wapikoni*. N.p., n.d. Web. 26 Nov. 2018. <http://www.wapikoni.ca/about/who-are-we/history>

[30] "Mission, Values and Objectives." *Wapikoni*. N.p., n.d. Web. 26 Nov. 2018. <http://www.wapikoni.ca/about/who-are-we/mission-values-and-objectives>

Despite the temporary nature of these programs and the need for further study, the authors channel Dr. Julie Nagam's research in stating that "thinking about makerspaces in Indigenous communities should mean connecting contemporary Indigenous innovations to makerspace theories, and back to traditional Indigenous knowledge in a circular way that finds the common thread of community wellbeing"[31], while further adding that "as community spaces for innovation, makerspaces may serve as a point of discussion for how to encourage, for example, alternative pedagogies and educational practices to connect youth and elders to promote intergenerational knowledge transmission, [...] this could include building equipment for land-based education, hunting, and trapping, all the while encouraging language revitalization"[32]. Both of these examples are initiatives that draw on the strengths of Indigenous technology and innovation, grounded in their worldviews and methodologies, as pathways to mental wellness.

Our proposal builds on this evidence to focus on implementing permanent Makerspaces within each community in Nunavut as central community hubs for digital and STEAM-based activities that amplify Inuit Qaujimajatuqangit principles such as collaboration, creative problem-solving, and knowledge-sharing. At the same time, there is an opportunity to connect community makerspaces to each other and establish an important territorial network for innovation tied to life promotion.

We propose to centralize this network and provide the governance and project management framework for this initiative through the incorporation of a new organization, titled the Katinnganiq Makerspace Network, or KMN (which will be discussed in the Governance chapter).

Our goals are to improve wellness by teaching new skills, increasing self-confidence, improving sense of agency, fostering positive peer and adult relationships, connecting with culture and identity, and providing new creative outlets and nurturing spaces for all Nunavummiut. Curriculum, programs, and materials will prioritize and encourage the use of Inuktut to support language revitalization.

Defining Community Makerspaces and Programs

The purpose of the Makerspaces initiative is to enable and empower youth resilience to embrace the future with confidence, armed with new coping skills and tools, and supported by positive relationships. The central focus of Makerspaces is on 'protective factors', where youth will build a personal sense of belonging, meaning, purpose and hope through their participation in activities. This initiative will provide safe, nurturing, welcoming social hubs for Nunavummiut that:

- **Provide imaginative and engaging programs:** including recreational, extra-curricular learning and skills acquisition (leadership, technology, interpersonal), the arts (performance, visual, music), traditional cultural/ language activities, peer mentoring, Elder mentoring, and coaching.

[31] Winter, Jasmin and Justine Boudreau. *Supporting Self-Determined Indigenous Innovations: Rethinking the Digital Divide in Canada*. Technology Innovation Management Review, 2018. Page 46. Web. 10 Jan. 2019

[32] Winter, Jasmin and Justine Boudreau. *Supporting Self-Determined Indigenous Innovations: Rethinking the Digital Divide in Canada*. Technology Innovation Management Review, 2018. Page 45-46. Web. 10 Jan. 2019

- **Leverage digital connectivity** where youth have opportunities to connect within communities and across Nunavut's 25 hamlets, share knowledge with each other and express themselves through access to digital tools and technological know-how utilizing new telecommunications technology.

- **Integrate community support**, including wellness services, where youth can access social/community services delivered on a 'whole person' basis in Makerspaces.

The above categories include the following series of activities that have been adapted from what was preliminary proposed.

- **te(a)ch Curriculum, Digital Literacy and Capacity Building**

As it concerns digital literacy and capacity building, our preliminary proposal included the te(a)ch curriculum as a deliverable through workshops programmes within community makerspaces in addition to online and digital access. That is still very much the case. As mentioned in our preliminary application, the te(a)ch curriculum is a free K-12 computer science program designed for Northern and Arctic communities in Canada with digital content and materials that are culturally responsive to Inuit, First Nation, and Métis ways of knowing.

The te(a)ch curriculum meshes a core learning focus of computer science fundamentals with game design, animation, and physical activity grounded in cultural exploration. It is a program with benefits that extend well beyond simply teaching "how a computer thinks". The goal is to implement equitable practices in digital literacy initiatives and harness the strength of Indigenous knowledge and ways of being to build agency and ownership in the use of technology as a creative tool in informed, safe, and positive ways. As will be discussed more in the technology chapter, the online launch of this program will take place early in March 2019 - and can be found here by clicking here.

- **Digital Art and Arts and Crafts Programming**

Central to each makerspace is a foundation of arts and crafts programming that stimulate creativity and support each person's talents through skill-building and play. Each makerspace will have the curriculum and capacity for art and crafts based workshops that based in cultural practices and materials. As mentioned in our preliminary proposal, we wish to work on expanding digital art materials and curriculum to support self-expression and skill-building.

The infrastructure and environment of each makerspace will nurture play and experimentation where youth have the tools and knowledge to build and create their own experiences, in their own languages; with the Makerspace, its community network, and governing foundation having the staff and capacity to assist in the production and realization of youth-led projects.

- **Connectivity**

In our preliminary application we outlined the need to open up local communication portals for both youth and communities to connect to each other. Since becoming finalists of the Smart Cities Challenge, we have modified our original proposal from installing and maintaining mesh networks in every community to supporting initiatives like the Arctic Internet Exchange (expanded upon in the technology chapter), which have emerged as tangible avenues to improve connectivity in the North.

In the recent months, the connectivity landscape in Nunavut has shifted, and this change in our proposal has come out of research and consultation with our local networking partners Nunageek Solutions Inc and Nuvujaq into the implementation process of a mesh network within a community. The challenges identified for a hardware mesh (a mesh network with hardware nodes that creates a local area network) include the need for potentially thousands of nodes to create a successful mesh – in addition to making sure that every node has a power source and is installed, monitored and maintained properly – alongside a danger of falloff of nodes leading to area blackouts. As a project with massive logistics and a reduced capacity for IT and networking solutions in each community - the requirements for successful installation, monitoring and maintenance of mesh networks risks inflating and growing costs to the point of unsustainability.

However, in line with the values set out in this proposal, our approach will be to support capacity building and learning for individuals through makerspace programming and curriculum that addresses networking more generally (and mesh networks specifically if desired), alongside the appropriate tools for practice and prototyping – based on the expertise of networking partners Nunageek Solutions Inc and Nuvujaq.

Additionally, a digital platform for the Katinnganiq Makerspace Network (KMN) will be developed with a purpose to connect the community makerspaces and their members to each other to share knowledge, as well as to enable access to tools, resources and ongoing support for aid in building capacity among teachers and youth. This network and platform will support the exchange of ideas and knowledges between communities and individuals.

- **e-Mental Health Initiatives**

We recognize that in our preliminary application we proposed to develop several e-mental health initiatives. Currently, some of those are no longer part of this proposal. First is the wellness chat, or community chat application system with the aim of enhancing peer support groups and contribute to maintaining communications between individuals. The Kids Help Phone, which operates a 24-7 phone line for crisis and support, recently launched a free crisis text line for Nunavut, making its services more available. This is in addition to the online chat service they also provide. These developments make our proposed chat application seem redundant. Our intention is to collaborate with others and support different initiatives rather than duplicate work[33]. To complement local health resources like those offered by the Kids Help Phone, we expect each Makerspace to be a connection to local mental health resources through staff trained in ASIST (Applied Suicide Intervention Skills Training) and Trauma informed practice - as well as a direct connection to other resources offered by the Embrace Life Council and local counselling services.

[33] *We will however, continue working with youth we began relationships with to mentor and support their practice.*

With regards to gamified interventions, the previously proposed localization of the SPARX game is being pursued by York University in collaboration with Pinnguaq Association, yet the source code has recently become proprietary of a private business - licensed to York University for research purposes only. This means we have no ownership over the source code and disqualifying this feature as a viable option to develop within the context of the Smart Cities Challenge. However the potential to build a piece of (gamified) software with the aim to instill Inuit-specific health values for youth through a digital delivery mechanism is still an unprecedented and transformative initiative. Though it won't be integrated as a firm deliverable in the context of this proposal, we expect that by working with youth at community makerspaces, we will workshop the vision for this piece of software, and work collaboratively to develop it as a resource.

As a whole, this initiative employs an evidence-based approach that is built on the feedback we have received from Mayors and community members, as well as from discussion and consensus reached within the collaborating organizations leading this proposal. These processes and conversations are further discussed in Chapter 6: Engagement. Throughout the past few months, the Pinnguaq Association has, as part of this proposal, opened and operated a Makerspace in Iqaluit. The portfolio of the Iqaluit Makerspace programs and events can be found in Appendix A.

Our is an ambitious project, essentially requiring 25 different tailored approaches to makerspaces that respond to each community's strengths and resources, phased out through a 5-year period - attainable through our proposed governance and project management framework, and measured through a culturally safe evaluation framework. We will work with each community to identify the space available and the appropriate agency to implement and manage their makerspace, highlighting a collaborative and community-led approach.

We recognize this is a competition and that only 2 of 10 proposals will be selected as winners in our category. We wish to acknowledge the important work of our fellow finalists - whose initiatives represent important solutions and responses to the challenges faced in their communities. We do not pretend to state that any proposal is more important than another - as each one stands strong and is validated in its own context. What we present throughout this document is a strategy that, based on extensive evidence and consultation, will be best suited to support the communities of Nunavut to implement the system-level changes required to promote and sustain individual, family, and community wellbeing.

Chapter 2: Governance

To achieve its ambitions, the Katinnganiq Makerspace Network (KMN) initiative needs a governance framework based on key guiding principles. The following principles have been identified through community and stakeholder consultation:

Rooted in Inuit Culture

- The governance model must support the unique Inuit worldview derived from language and culture, spiritual practices and relationship with the land within each local cultural context.

- Governance institutions should be built on existing organizational structures and expertise – including government, not-for-profit (NFP), and even private - wherever possible to enable rapid community level project start-ups.
- Youth and Elder voices should be placed at the centre of relationships with stakeholders.

Community-centric approach

- The governance framework must reinforce a community-driven, community-owned approach in creating Makerspaces, with decision-making and delivery authority vested in local communities.
- Local communities must define their specific needs and develop their own customized approaches to programming based on a principles-based, values-driven operational framework that supports flexibility.
- Local governance arrangements need to evolve within the overall governance framework as local capacities are built.
- Communities must have control over any data or research that profiles their community – in terms of control how it will be used and who has access to it.

Platforms for sharing among communities

- Platforms and practices should enable learning and knowledge-sharing across all participating communities, including research and lessons learned in delivering effective programming.
- Capacity and practices should enable communities to derive the maximum potential from existing and new/forthcoming communications capacity and applications.
- Finally, technology introduction must adapt hardware and software to the unique needs and culture of Nunavut communities.

A **values statement** provides a common set of fundamental beliefs for all Makerspaces managers, partners, stakeholders and participants. The preliminary values statement under consideration is the following: *Our work will be guided by openness in adapting new technologies to our Inuit cultural traditions in ways that create safe spaces to build resilience, strengthen cultural and spiritual beliefs and nurture the innovation skills youth need for strong futures.*

This values statement and the proposed governance model and framework are built on the unique foundations of governance in Nunavut - where Inuit societal values and principles (IQ) drive development at all levels. Building the self-reliance of people and communities is a government priority and this governance proposal reinforces this priority.

Improved broadband communications will be important to the success of the project and is integrated into the governance model. There is important recent additions in satellite capacity serving the North, and within 3 years the contemplated new satellite infrastructure that is being deployed. This initiative plans to be in the forefront of taking advantage of new telecoms network capacity to deliver its programs.

This technology includes the latest geostationary satellite and the forthcoming low earth orbiting (LEO) infrastructure. Concurrent with the deployment of Makerspaces in communities

will be the development of community data centres and Internet Exchange Points. Their operational governance is an important part of this Governance Chapter.

The Katinnganiq Makerspace Network

A holistic, multi-level governance model is proposed to ensure that internal structures, functions, processes, rules and relationship behaviours are values and principles-driven and are aligned with the direction, strategy and policies supporting Makerspaces. The governance model is community context-driven and multi-disciplinary. Providing options to youth that steer them away from negative behaviours towards positive options for building their own futures and that of their communities require highly integrated efforts. The silos of traditional support approaches simply do not address the 'whole person' in the context of the community and its worldview.

Governance Structure – Territorial and Hamlet Levels

A new organization called **Katinnganiq Makerspace Network** (KMN) will be created as the umbrella organization to serve the 25 hamlets involved with this initiative. It will be formally established as a not-for-profit organization, incorporated under federal and territorial law, and charitable status registration will be sought. Its charter will be to implement the Smart Cities Challenge award and provide the platform for the co-management of Makerspaces in each community. It will act as a capacity-building and coordination support network for the hamlet-based Makerspaces. Its mission will be to provide each local Makerspace in the KMN with the tools, resources and training to support a culture of innovation firmly rooted in Indigenous values.

A unique feature of the governance model is the distributed nature of power across the 25 local level municipalities. It is envisaged that the hamlet or a self-determining delivery organization will be identified in each community, possibly an existing organization to enable rapid start-up. A new local not-for-profit will be created if a suitable organization does not exist. For the purposes of clarity, these local delivery organizations are referred to **KMN-L (for KMN-local).**

These organizations will be anchored by some formal indication of approval in principle by the local hamlet municipal authority, e.g. a resolution passed by the hamlet municipality. Then, the local Makerspaces delivery organization and the territory-wide KMN will enter into a formal agreement stipulating services to be provided and conditions to be met.

Thus, the structure will effectively be a 'bottom-up' governance model where the local delivery organization – each KMN-L - will be responsible and accountable for local activity. The delivery organization's governing body would be appropriately mandated; if a new organization is created, a new board of directors (and executive director) would be selected from local leaders in the hamle. The hamlet level NFP entity – KMN-L - will thereby become the "owners" and leaders of the initiative at the local level. Leadership will need to be carefully selected to lead the initiative and emerging leaders supported. Leadership in small communities is stretched, and individuals wear many hats.

The symbiotic relationship between the KMN and the KMN-L is to be a careful balance between them, each playing their respective roles under separate boards. The KMN will seek to

harmonize efforts overall and share experiences through common management frameworks and support tools. The KMN will provide model KMN-L governance and business practices, financial and accounting systems, as well as training offerings and HR systems and the like. With improved connectivity and familiarity with communications platforms, sharing opportunities will be enhanced within local Makerspaces (KMN-Ls) as well as across hamlets.

KMN's Governing Board

The KMN's *governing board* membership will be between 9-15 members and directors will be appointed for four years[34]. The KMN board will include local community representatives and some Makerspace executive directors of local delivery organizations, i.e. the KMN-Ls. The development of Makerspaces and KMN-Ls in each community will come on stream over time as communities develop capacity. Once there are several Makerspaces, rotating delegates from the executive directors of hamlets will serve for fixed terms and will be drawn from the growing pool of KMN-L executive directors.

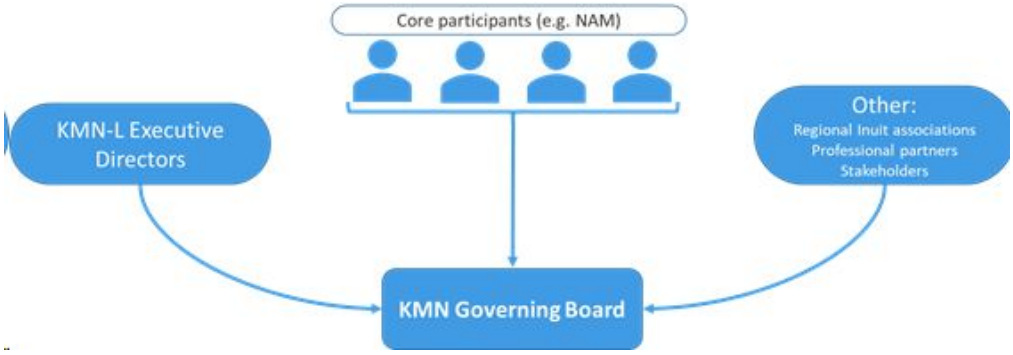

Figure 1: Constituents of the KMN Governing Board

Other members would be drawn from Territorial organizations and key stakeholder groups, e.g., professional, supplier and training organizations[35].[1] Regional Inuit associations and the Nunavut Association of Municipalities (NAM) can play representational roles. It is important that board members will be leaders and activists for Makerspaces within their communities and in doing so, will ensure strong connections between communities and KMN.

The board would likely meet face-to-face at least once per year, co-scheduled with the annual gatherings of all the municipal members of the Nunavut Association of Municipalities (NAM). While the board would govern the KMN, it could present annual progress reports to the NAM as to ensure good communication with hamlet governments as an important part of community engagement. The board will operate through communications platforms for other meetings. As shown below, the development of connectivity in response to third party investment in facilities is an important complementary part of the KMN initiatives.

[34] *It is also proposed that the following Katinnganiq Board Committees shall be constituted - the Executive Committee, a Strategic Planning and Policy Committee, a Technology Adaptation Committee and a Development and Finance Committee. A board auditor will be appointed, supported by internal audit under the Development and Finance Committee. The board governance function will be carried out by the Executive Committee.*

[35] *As a matter of good governance, Government of Nunavut representatives would not be candidates for board positions to represent the GN. However, nothing would prohibit them to be asked to serve on the board as private citizens.*

The *board Chair* will be the point for accountability to and liaison with government(s) at all levels on all aspects of the Territory-wide relationship.

It is proposed that a transitional founding board of the 4 core organizations plus an independent interim chair be put in place for six months to one year while incorporation is secured. This start-up measure will ensure rapid building of the KMN governance structure and organization and provide for orderly recruitment of new board members as their key task, in accordance with the articles of incorporation.

Founding members personally will step aside as permanent members, at least in the board's first term or unless invited back by the permanent board. In future, the board chair will be selected by the permanent board members and officers from among its members. Similarly, an interim executive director should be appointed by the transitional board, leaving open the permanent board's prerogative to select its own executive director.

It should be noted that the Nunavut talent pool is small, and individuals serve in numerous ways in their communities. Issues of conflict of interest will require ongoing vigilance. Early policies need to be put in place to ensure integrity of the board and clarity on its duties to the corporation.

The *board's role* is to set the vision, mission and mandate for Katinnganiq. It will set the macro strategic direction, policies and priorities. It will provide planning and resource allocation frameworks and allocate resources to communities. The board will develop guidance for engagement and relationships between Katinnganiq Makerspace Network (KMN) and the hamlet-based KMN-L NFPs.

The board will act as *trustee and administrator* for Smart Cities Challenge source of funds. It will commit to dispersing the funds to local municipalities via the incorporated not-for profit KMN-Ls – or to whatever community organization is to take responsibility for the KMN-L according to local circumstances. Transfer of funds would be as per an agreed formula (beginning with community governance readiness, and taking social indicators into account, e.g., number of youths, social conditions like delinquency rates, etc.). It sets out a system of quality assurance, monitoring and evaluation and reporting by hamlet-based KMN-Ls on their projects/programs.

As discussed in the *Performance Indicators* section, the board will monitor the performance of the KMN organization and hold the Executive Director (ED) accountable for overall performance and compliance on meeting the milestones and accountabilities established for reporting to Infrastructure Canada.

The KMN's binding agreements with the KMN-Ls (i.e., the local level Makerspaces) will include, inter alia, rents, salaries, purchasing and sourcing materials/supplies for the spaces. These agreements will include the operation of the telecommunications platforms, applications software, and computer hardware.

The board will be a visible and vocal advocate in Canada and elsewhere for identifying other sources of funds and partnerships, public and private, to secure sustainability for Makerspaces.

Essential to this relationship is the above initial statement of principles and values that will guide all relationship management relating to Makerspaces. They will empower communities with the flexibility needed to operate within these principles and are derived from and connect to *Inuit Qaujimajatuqangit*.

Advisory Board

The Katinnganiq board will appoint an Advisory Board (AB) to provide counsel on issues, assist in positioning the organization in their networks, and expanding the board of directors' circle of advice to non-Territorial residents. It will be composed of experts/researchers in the fields of behaviour and mental health, social measurement, youth programming, etc.

The advisory board is also a formal way to expand the community engagement network by engaging local community representatives, communications infrastructure specialists, youth, parents, and Elders. Government of Nunavut representative(s) will be invited to participate to facilitate harmonization between Katinnganiq and government policies and programs.

The AB chair and members will be nominated by the KMN board of directors for terms of 3 years. Issues may be referred to the AB, independent reports requested, and strategic insight solicited from it. It will set its own agendas and meeting times. It will be invited periodically to brief the KMN board on issues. It could be invited to provide environmental scanning as part of strategic planning. As an advisory board is discretionary, the number of members and meetings financed will be decided later by the KMN board of directors.

Executive Director of KMN

The Katinnganiq ED will be selected by and reports to the board on implementing its strategy and supporting the board on all matters. The ED should be independent of core organizations and any interested party. However, for the initial founding period, one of the core organizers could be contracted to supply an ED, provided he/she reports to the board.

After the start-up period, a permanent ED will be appointed by the board with the caution that the ED's independence must withstand public scrutiny. However, the core organizations could still be contracted to supply needed expertise, if these contracts are on an arms-length basis. It is important for good governance that any form of self-dealing conflicts of interest are not allowed to grow, even if only through perception. See graphic below that illustrates the basic KMN structure.

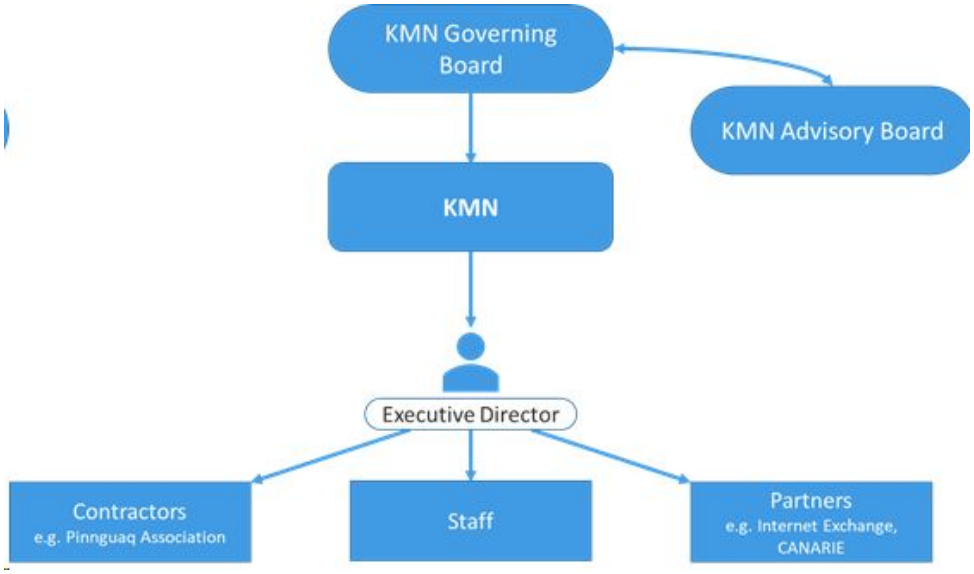

Figure 2: KMN Governance Structure

The board chair will enter into a formal MOU with the ED that lays out all duties and functions, roles and responsibilities, financial reporting and accountability requirements, annual business plan requirements, communications and issues management protocol, shared services, as well as privacy, conflict of interest, records management, audit and evaluation, and risk management. It will also contain terms of employment, compensation, liability and insurance provisions, etc.

It is the responsibility of the ED to lead the overall initiative and prepare reports for funders on the results of all work undertaken. In addition to supporting the board on the above, the ED is responsible for a research program, in conjunction with communities, to ensure that decisions can be taken based on evidence.

The ED advocates for **high bandwidth connectivity** and applications, and the training required for the communities to be equipped by resource people who can operate and maintain the expected data centres that will parallel the creation of community Makerspaces. The ED will work closely with other NFP service organizations and together will help develop capacity at the community level to operate local data centres and other technical infrastructure to fully enable the Makerspaces (the KMN-Ls).

The ED **develops and delivers education and learning resources** to support communities in such areas as technology use and development, financial management (bookkeeping), general management and administration, teacher training and curriculum delivery, and leadership development. Training workshops and learning curriculum will be essential to help build capacity for making good use of the KMN support in learning materials, resources, start-up structures, equipment.

Promotion and public communications will be important to broad public awareness of Makerspaces. Such initiatives could include annual or biannual fairs or showcases that showcase youth makerspace group projects.

KMN-Ls as the Local Delivery Organizations

Effective delivery arrangements will be required to realize the ambition of KMN, and they are an essential part of the governance framework. The respective roles and responsibilities of local governments, partners and stakeholders in building this bold new multi-disciplinary, cross-functional model will be clearly set out for the 25 geographically dispersed hamlet communities and Katinnganiq Makerspace Network.

The KMN will develop the frameworks, tools, processes and mechanisms, resources to support a culture of innovation that is firmly rooted in Inuit values. This governance framework includes a similar management framework structured for the needs of the hamlet-based KMN-L level results. Accountability and reporting requirements are central even though each KMN-L partner has its own mandate and accountabilities, culture and internal imperatives and capacities. This means that flexibility is required for individual site innovations, while operating under a common vision, mission, values and ethics and operating principles (see Project Management section).

At the local hamlet level, there will very likely be a variety of not-for-profit organizations who will enter into formal delivery partnerships with KMN and the KMN-L. By community consensus, the KMN-L delivery organization will be organized in the best way to deliver

effective local Makerspaces. The expected governance structure is pictured in the graphic below

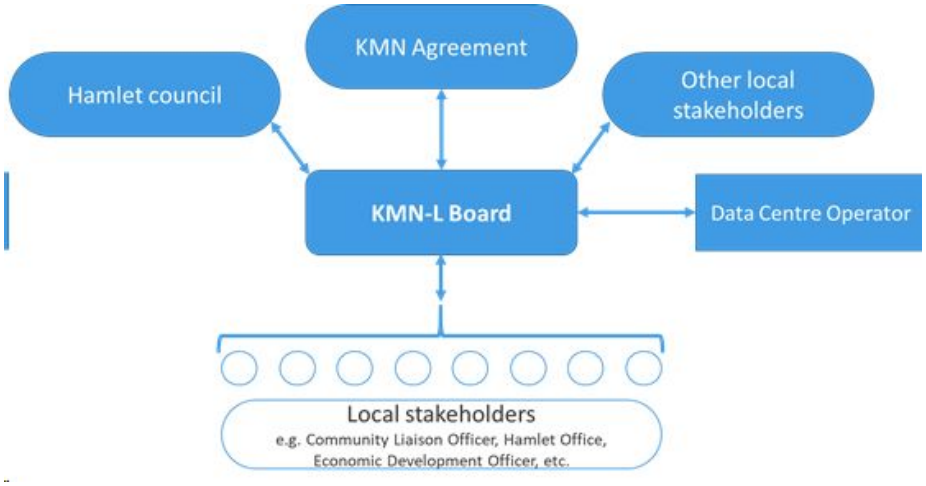

Figure 3:KMN-L Governance Structure

The Program Tools and Processes – KMN will develop tools to assist sites in developing and implementing Makerspace programs and projects. The purpose is to provide generic tools that can be adapted to local conditions and cultures:

- Broad Makerspaces guiding principles, a statement of common values and set of operating principles (to empower local sites with as much program flexibility as possible)
- Program policies and design frameworks
- Fundraising strategies and techniques (modules on achieving sustainability and value for money)
- Operations manual – including baseline operating procedures and sample Makerspace management and administrative structures/ functional responsibilities and arrangements charts, relationship management maps, personnel management including recruitment and development strategies/ generic job descriptions
- Planning, reporting and performance management systems including measurement metrics.
- A menu of generic programs and modules for communities to select from
- Training, development and delivery of programs
- Research and best practices
- Network equipment maintenance, procurement, and replacement contracting templates and procedures
- Agreements and contracting procedures for outside suppliers and NFP donations and services

Local leadership will need to be carefully selected to command the respect and moral authority needed for the initiative to succeed. Emerging leaders themselves will need to be supported by other local stakeholders as well as KMN. Small communities are stretched, and

individuals wear many hats. As much as possible, therefore, KMN will work with local institutions and encourage collaboration to ensure the limited capacity in each community will become part of the Makerspaces – and their companion communications and computer troubleshooting, infrastructure maintenance.

The Katinnganiq Makerspace Network Partners and Stakeholders

Partners and stakeholders play essential roles in the governance model. The governance model recognizes that dynamic participation of local communities, as both partners (contributors of resources) and stakeholders (benefitting individuals, groups, organizations) is essential to the legitimacy and well-functioning of the governance model and outcomes of this initiative. Partners will play formal institutional relationship roles within Makerspaces as they will bring their home organizational insights to the board and Makerspace projects. Stakeholders provide the community opinion and insight as participants in consultations, as volunteers and as participants to steer Makerspaces to address local needs and concerns.

Roles and responsibilities of Core Katinnganiq Partner Organizations

Nunavut Association of Municipalities (NAM) – The group provides a single voice for mayors and municipal administrators of the territory's 25 communities. NAM will facilitate coordination with each community's involvement and help manage KMN's activities through its board position. NAM's day to day relationships with local communities will be indispensable in the communications to and from the local hamlet councils.

The Pinnguaq Association – Pinnguaq is a not-for-profit organization whose mission is to embrace and use technology as a means of unifying and enabling Nunavummiut and Indigenous people in Canada. It has established the Iqaluit Makerspace and developed key program components expected to be adopted by the local Makerspaces, e.g. the Te(a)ch curriculum. Pinnguaq will provide on an arms-length contractual basis support for the activities under the direction of the ED - who will be hired by the board. Pinnguaq's contracted services will embrace technology, training, and organization of the activities to be adopted by the Nunavut communities.

The **Isaksimagit Inuusirmi Katujjiqatigiit Embrace Life Council** – is a non-profit suicide prevention organization based in Iqaluit. The Embrace Life Council will provide the strategic direction for the development of the proposal in relation to the identified objectives and the need to grow the protective factors that reduce the inclination for youth to harm themselves. It will establish protocols for providing services to the communities, which will be offset by payments to compensate the Embrace Life Council for its services at rates established by the board.

Qaujigiartiit Health Research Centre (QHRC) - The goal of QHRC is to enable health research to be conducted locally, by Nunavummiut, and with communities in a supportive, safe, culturally-sensitive and ethical environment. It also promotes the inclusion of both Inuit Qaujimajatuqangit and western ways of knowing and understanding wellness to address health concerns, create healthy environments, and improve the health of Nunavummiut. The QHRC will continue its research and development of mental wellness resources from a

trauma-informed perspective and will offer its services to help structure programs and an evaluation framework of KMN activities.

Relationships with Key Stakeholders and Partners

A mapping of partners and stakeholders with direct and indirect stakes in Makerspaces demonstrates the complexity of arrangements required. As an 'eco-system', all the parties are interconnected with each other in a network of adaptive, interacting organizational partnerships, depending on each other to leverage the transformational change that is essential for survival.

Regional Inuit Associations - These association fall under the Nunavut Land Claims Agreement as non-profit organizations with roles that span all aspects of Inuit society. They manage land, provide social services, monitor environmental policy, and operate for-profit development corporations that invest in wealth-generating capital.

Hamlets and Service Organizations – Collaborating local organizations and governments will contribute to the cross-functional nature of this initiative. Services are often delivered by separate government and non-profit agencies alike – and their lack of coordination is often to the detriment of youth. This KMN initiative provides an opportunity to integrate efforts and resources locally to benefit youth. The 'whole person' approach to serving youth means that health, social service providers (governmental and non-governmental), recreational organizations, etc. can work together on local programming through Makerspaces.

NGOs and Non-Profits - Churches and other NGOs like education institutions, health organizations, social-serving organizations, arts and cultural organizations, could become supporters and partners with the KMN and with local Makerspaces themselves.

Private sector funders – Funding partners could be afforded the opportunity for representation on boards of local Makerspaces or KMN. Pinnguaq often plays the role of a facilitator, recently with Google's visit to Nunavut wherein Pinnguaq helped the delegation from Google understand how their CS First curriculum fits Nunavut's internet context. Pinnguaq also maintains a partnership with Canada Learning Code which hosts monthly workshops at the Iqaluit makerspace.

Federal Government - The federal government is a key partner and the accountability relationship with it will respond to all terms and conditions of funding. As elected governments are responsible and accountable to citizens for policies and expenditures, this proposal is highly sensitive to this requirement.

Government of Nunavut - GN will continue to play a key role to play in supporting self-governing, sustainable communities that serve the social and cultural needs of residents as it supports Nunavut's economic growth and social, cultural and environmental well-being. Makerspaces will be carefully aligned with policies and programs of the GN.

Other organizations - see Appendix 1 for sample list of local organizations in one sample, mid-sized community.

Community control over data and information

The KMN's purpose will be to connect the community makerspaces to each other to share knowledge, as well as to enable access to tools, resources and ongoing support for

building capacity among project leaders and youth. The KMN will include a digital platform to provide ongoing support for local makerspace, a platform which will evolve as the Nunavut communications infrastructure improves with added satellite capacity.

As noted above, KMN will work with the Arctic Internet Exchange to support the improvement of broadband capacity concurrently with agreements with local communities to establish a Makerspace. While it will vary from community to community, the objective will be to co-locate data centres and Makerspaces, and to arrange for their maintenance. Efforts will be made to ensure the integration of these two activities and organize single teams to manage and maintain the Makerspace and data centre facilities. Doing so will help economize on the draw on human capacity in hamlets and provide more stable and meaningful employment opportunities.

A further network objective will be to arrange for connectivity between each Makerspace and the Nunavut Research Network (NURN)– which will provide the connection to the CANARIE network. To do so will require approvals of the GN and its Arctic College, which would be a recognizable entity for CANARIE. The KMN's Digital Platform will offer be discussed in Chapter 5: Technologies.

Risks

While the core members of the proposed KMN have extensive experience in Nunavut, and in undertaking similar projects, there are always risks which should be identified and mitigation strategies developed. Some of the major risks and appropriate mitigation strategies are identified:

Underperformance on program achievements leads to lower confidence or trust by local stakeholders:

- Provide support to ensure that local decisions are realistic and well-planned for.
- Provide regular stakeholder briefings/updates to ensure knowledge gaps do not develop.
- Ensure that key stakeholders are involved in delivery and advisory functions, particularly youth, Elders and parents.

Local conflicts and consensus hamper progress

- Build formal approval procedures that place consensus at the centre of key decisions.
- Ensure the right stakeholders are at the table.
- Provide training in alternative dispute resolution and if appropriate, establish a veto right of the local organization in event of stalemate on major decisions (when it will get used, how and who will use it).

Concerns over procedural fairness by Katinnganiq Makerspace Network in allocating resources to local communities

- Be transparent as to the criteria to evaluate among different projects and to the process for arriving at the allocation decisions.

- Ensure that key decisions are taken by the board, on the advice of administrative staff – and that if affecting specific communities that the local board is properly consulted.
- Ensure that the board is comprised of the right key individuals capable of taking collective or difficult decisions.
- Establish an Executive Committee of the board that thoroughly examines any issues of procedural fairness and recommends a course of action to the Board of Directors.
- Ensure conflict of interest procedures are established for recusal as necessary.
- Create a board by-law in event of stalemate that provides for a deciding vote.

Delivery bottlenecks caused by local capacity limitations

- Well-planned, practical program/project implementation that takes account of capacity limits and plans accordingly;
- Timely training and development;
- Succession planning so that key skills/competencies can be drawn upon in event of staff turnover;

Crises, and/or other community tragedies draw leadership or delivery attention away from this initiative

- Contingency plans in place early on for rapid communication responses, local spokespersons, etc.;
- Ensure “twinning” of key individuals so that there is always a back-up individual to step into any Makerspaces governance roles in event of crisis or emergencies.

Shortage of financial resources stalls implementation

- Provide a nominal annual budget to communities to support core activities.
- Require clear planning frameworks from communities that manage cashflows.
- Proactive efforts to identify additional funding;

Chapter 3: Performance Measurement

This Chapter sets out the performance measurement model that will demonstrate how Katinnganiq Makerspaces Network (KMN) will be held to account for results achieved in implementing its vision and mission. Measuring results is a key accountability of a board and is the central part of a performance management system. The metrics established to assess whether planned results occurred, and desired outcomes are being achieved are essential to a board’s credibility and accountability to its funders, stakeholders, clients and partners.

Performance measurement is part of a broader performance management system with interdependent elements. The responsible and accountable entities are the KMN and the other three core participants – NAM, etc. The local Makerspaces (KMN-Ls) are integral components to the success of the initiative but are not directly accountable to the Smart Cities Challenge program.

Local Makerspaces will be supported by the Katinnganiq Makerspace Network, that provides centralized support, coordination, development and project management tools,

communications technology platforms and networks, research and training to Makerspaces. As such, KMN can be viewed both as a key **activity**, as well as a critical **input** to the success of local Makerspaces.

In considering a methodology for performance measurement, the following characteristics were deemed important pre-conditions for this initiative:

- Practical and easily understood performance measurement by the community-level delivery partners, i.e. the local Makerspaces
- Results achievable by communities
- Research and fact-based framework
- Low cost, simple data collection requirements for indicators and measurement tools
- A design that works backwards from the "outcomes ('ends') we wish to achieve to the goals we set and activities ('means') we do"
- Consistent with the values set out for this initiative
- Priorities-focused (simple, cautious about overreaching and risk of failure)

Our goal is to promote life and provide positive interventions for improved mental health that (i) build capacities for young Nunavummiut,(ii) promote community ownership over Makerspaces, including providing the appropriate physical spaces, and (iii) improve youth access to digital and communications technologies. The major challenge is to link activities to affecting these ultimate outcomes, given that there are so many dimensions and causes for youth capacity, community wellness, and digital acumen[36].

Significant research has been undertaken and this proposal builds on known factors that encourage well-being in youth. The National Inuit Suicide Prevention Strategy developed by Inuit Tapiriit Kanatami, lists **six objectives to reduce major risk factors**, while improving major safety and protective factors: (i*) Create social equity, (ii) Create cultural continuity; (iii) Nurture healthy Inuit children; (iv) Ensure access to a continuum of mental wellness services for Inuit; (v) Heal unresolved trauma and grief; and, (vi) Mobilize Inuit knowledge for resilience and suicide prevention[37].* Makerspaces' interventions will address all of these either directly or indirectly.

In recognizing that suicide is a complex issue, this initiative invests in protective factors through a 'life promotion framework' to reduce the risk of youth suicide in Nunavut. Our focus is on creating both physical and digital spaces that offer opportunities for Nunavummiut to connect with each other, learn skills, share knowledge, be creative, and express themselves in safe environments - as pathways to mental wellness. This focus springs from what can be called the **theory of change** – that life promotion in the manner outlined will positively affect the wellness of youth in Nunavut in years to come.

Our approach to **building protective factors**, understood as abilities, skills, and social supports that offer people the ability to cope with stress and spring back from crises and

[36] *Inuit Taipiriit Kanatamit states that achieving social equity with other parts of Canada is necessary to prevent suicide, as is strengthening 'protective factors'. Of the 11 Inuit 'social determinants' of health (Quality of Early childhood development, Culture and language, Safety and security, Education, Availability of health services, Mental wellness, Environment, Livelihoods, Income distribution, Housing and Food Insecurity), a number are beyond the scope of this project Livelihoods, Income distribution, Housing, Food Insecurity); as for the others, it is important to note that Makerspaces are but one of many possible inputs,*

[37] *National Inuit Suicide Prevention Strategy*. Inuit Taipiriit Kanatami: 2016. Web. 29 Jan. 2019.

trauma[38]- lies in understanding the risk factors for suicide in Inuit communities and how they add up to cause distress[39]. Research states that the risk factors and high numbers of suicide in Inuit communities correlate with the historical trauma from colonial violence, including dispossession, culture loss, and social disconnection[40]. The Inuusivut Anninaqtuq Action Plan states that "Inuit are **not** predisposed by virtue of their ethnicity to be at a higher risk of suicide than non-Inuit"[41]; indicating that legacies of colonial violence are the root cause of social inequities that affect Inuit[42].

Our proposal for implementing digital literacy initiatives as well as improving networking infrastructure and enabling new creative outlets based on technology are **important protective factors** that relate to and are aligned with the above objectives. As defined by authors Jennifer White and Christopher Mushquash, protective factors refer to experiences that "appear to reduce the likelihood of suicide despite exposure to risk"[43]. Some of the protective factors identified by White and Mushquash as key cultural and institutional practices, can strengthen social relations and promote resilient outcomes for Indigenous communities. They include:

- coping and problem-solving skills;
- experience with success;
- sense of belonging and connection;
- social support;
- interpersonal competence;
- support and acceptance;
- revitalizing language and traditional healing;
- enhancing cultural identity and spirituality;
- enhancing local control and community self-determination;

While there is a challenge to attribute Makerspace activities to the development of protective factors, Makerspaces and their programming in Inuit communities can have some effect on most if not all the factors above; and they can be used as measures to determine impact. Other research on building resilience adds other promising factors, such as optimism, altruism (helping others), faith and spirituality, humor, having a role model, social supports, facing fear, meaning or purpose in life (one believes one has a purpose), and training[44]. All together they represent a sound basis for developing performance measurement indicators.

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[38] Alianait Inuit Mental Wellness Action Plan. Alianait Inuit-specific Mental Wellness Task Group. Web. 7 Jan. 2019. <https://www.itk.ca/wp-content/uploads/2009/12/Alianait-Inuit-Mental-Wellness-Action-Plan-2009.pdf>

[39] *National Inuit Suicide Prevention Strategy.* Inuit Taipiriit Kanatami: 2016. Page 11. Web. 29 Jan. 2019.

[40] Kral, Michael J. "Suicide and Suicide Prevention among Inuit in Canada." *Canadian Journal of Psychiatry*, 2016. 688 - 695. 3 Apr. 2018.

[41] *Inuusivut Anninaqtuq Action Plan 2017-2022*. 2017. Page 5. Web. 5 Apr. 2018

[42] *According to Inuit Taipiriit Kanatami's Inuit Statistical Profile of 2018, 52% if Inuit in Inuit Nunangat live in crowded homes (as opposed to 9% of all Canadians), 34% of Inuit aged 24-64 in Inuit Nunangat have earned a high school diploma (as opposed to 86% of all Canadians of the same age range), 70% of Inuit households in Nunavut are food insecure (as opposed to 8% of all households in Canada), and $23,485 is the median before tax individual income for Inuit in Inuit Nunangat (as opposed to $92,011 for non-indigenous people in Inuit Nunangat).*

[43] White, Jennifer and Christopher Mushquash. *We Belong: Life Promotion to Address Indigenous Suicide Discussion Paper.* Page 6. Web. 5 Feb. 2019. <https://wisepractices.ca/wp-content/uploads/2017/12/White-Mushquash-2016-FINAL.pdf>

[44] "How To Measure Resilience: 8 Resilience Scales For Youth & Adults." *Positive Psychology Program*. N.p., 13 Aug. 2018. Web. 14 Sept. 2018.

The **conclusions** we draw from research guide our results definition and performance goals in our performance framework. We conclude that most measures of youth well-being require a broader set of indicators than this initiative can practically measure. Many are factors are well beyond the scope of Makerspaces activities and endeavours (poverty, food insecurity, school bullying, overcrowded housing, abuse, etc.). Therefore, we need to blend factors from different research sources that are more directly related to the type of programming local Makerspaces can reasonably provide. It must be recognized that Makerspaces and their activities will be but one input into these complex factors influenced by so many other aspects in the life of a youth. However, the factors selected for Makerspaces will be further vetted by mental health professionals as contributing to youth well-being and focused specifically on building the resilience youth need to adapt to life's challenges.

Finally, it is recognized that building youth resilience needs to be tackled earlier in life. While the main Makerspaces focus is on programming to support the youth experience, we will be exploring complementary programming for young children, for whom "Self-esteem is, at root, a measure of children's judgment of their own worth"[45]. Early childhood learning and child-parent digital literacy are entirely appropriate additions to this initiative, such as the e-learning for K-12. Further culturally relevant extra-curricular digital learning tools will be explored for including children through existing, proven off-the-shelf programs like Aboriginal HIPPY[46] - which could be brought into Makerspaces as a complementary activity.

Performance Measurement Methodology

This proposal adopts a Results-Based Accountability (RBA) model to assess how the vision and mission are reflected in outcomes. The performance measurement framework below will guide this work:

Fig 1: This image illustrates the RBA model

[45] "Nurturing Children's Self-Esteem Introduction." *MentalHelp.net*. N.p., n.d. Web. 20 Jan. 2019. <https://www.mentalhelp.net/articles/nurturing-children-s-self-esteem-introduction/>

[46] "Aboriginal HIPPY in Canada." *Mothers Matter Centre*. N.p., n.d. Web. 16 Oct. 2018. <https://www.mothersmattercentre.ca/aboriginal-hippy/>

From the vision articulated earlier in the Introduction Chapter, RBA begins with articulating desired 5-year outcomes and works backwards to set goals and supporting activities and define key performance indicators (KPIs) where progress can be tracked and measured for success. **KPI metrics** are proposed that focus on three areas:

- the youth experience (improved outlook, participation, and skills acquired);
- how well communities are supporting their local Makerspaces – and vice versa - as a secondary outcome (community support and participation, search for on-going funding, volunteering); and
- progress in learning and utilizing digital skills (adoption by youth, diffusion throughout the community, understanding the value of leveraging data and connected technology in such applications as Indigenous story-telling, culturally relevant games).

The approach of increasing protective factors and encouraging positive social participation through community Makerspaces will both nurture wellbeing while addressing the digital divide in the North. As articulated in our challenge statement, this proposal will use data and connected technology to increase the availability and accessibility of life promoting activities, resources and support systems like peer networks, extra-curricular educational resources, and creative outlets to all Nunavummiut.

Outcomes measurement will focus first and foremost on youth and their personal perceptions of their experiences with Makerspaces. Makerspaces will provide multidisciplinary interventions that focus on the 'whole person', to the extent possible. The observations of Makerspaces leaders and mentors who work with youth are central to measuring progress. And as collective identity is a unique part of Inuit culture, community input will also be important in recognizing success of Makerspaces. Secondly, the performance of communities in supporting Makerspaces will be assessed. Commitment to integrating Makerspaces into communities, engagement through participation, and the ability to secure on-going funding will be included. Finally, the adoption, diffusion, and impact of greater bandwidth access and new digital platforms will be addressed as a third outcome.

It is important to note that performance measurement will not track rates of death by suicide per se as a performance measure due to the multiplicity of determinants. Rather, the '*embrace life'* approach isolates certain variables that do ultimately contribute to social equity. Building youth capacities is the central purpose of Makerspaces. Therefore, outcomes measurement needs to adopt a personal approach where the life of every individual youth is honoured in the calculus of impact.

Assessment measures of change recognize that **social change will occur only incrementally over time**. Measures adopted will not specifically address the standard short, medium- and longer-term perspectives, but rather identify Stage One, Stage Two and Stage Three outcomes. This approach is proposed because length of time may not be the best measure of the *effect* of the outcome. As well, long-term outcomes are likely beyond the scope of measurement in terms of Makerspaces ultimate impacts on social equity. That would take the development of a longitudinal data base extending over generations of youth – which may well receive support and be implemented but is beyond the scope of the Challenge's program.

This initiative is ultimately about **strategic change and a change management** approach needs to be built into the strategic plan. Employees, contract personnel, leaders, partners and

stakeholders as well as organizations in general need to be equipped to understand and manage the changes that are occurring. Tools, processes, understanding respective roles and interrelationships, and excellent communications about the change process are essential to good management of change. Different ways of doing things or seeing can be threatening to some people and sensitive leadership is needed to allay concerns and recruit champions of change. A formal change management team can be identified and change champions such as vocal parents, articulate youth, other community leaders can help 'walk the talk' within communities to actively keep supporters on side.

Identifying change and drivers in the external environment is a starting point for strategic planning. An environmental assessment can provide a baseline starting point to describe the current situation assessment from which planning will evolve and the factors likely to influence future efforts. It should be noted that due to the staged implementation of Makerspaces in the 25 communities, each will proceed on its own pace due to local circumstances.

The Goals and ultimate outcomes

Makerspaces goals proposed follow the 'SMART' rules of being specific, measurable, attainable, relevant and time-specific. Below is a table of our three overall goals and ultimate outcomes. The outcome is a five-year and beyond state of being that Makerspaces aspire to:

Overall Goals		Ultimate Outcomes
Youth are active in Makerspace 'life	→	**Capable Youth**
Communities support well-run Makerspaces	→	**Permanent, connected, safe Makerspaces**
New digital technologies are effectively used	→	**Reduced digital divide for youth**

Project activities and Links to outputs and outcomes

Activities and their inputs and outputs are linked in an integrated manner as illustrated in the graphic below. The goals will be achieved through effective implementation of the workplan for the initiative as well as a constant attention to whether the outputs are driving the targeted outcomes.

Fig 2: This image represents the input, activity, output, outcome cycle

The Makerspace programming menu adapted from the activities proposed in our preliminary application is described in the Vision Chapter, some of which are further elaborated on in the Technology Chapter. These activities will leverage the benefits of data and connected technology whose operations consist of further activities to be measured. They have been reviewed and revised in response to the feedback received at the Nunavut Association of Municipalities (NAM) AGM.

The Key Performance Indicators

Key performance indicators (KPIs) are presented below and follow the three goals and activity categories identified above. Both qualitative and quantitative KPIs can be constructed from the ones below, as long as data records are kept, and other indicator data are collected and made readily accessible for analysis. As noted above, while data is available regularly – even monthly in many cases – some long-term outcomes can only be shown long after the early participants have been through the program.

Outcome - Capable Youth

Youth capabilities will be measured and assessed through observation, assessment tools, questionnaires and one-on-one interviews, descriptive reports, participant observation, survey evaluation, sharing circles, journaling and voice/video recordings. As well as these more formalized processes to gather input, each KMN-L will be encouraged to establish a "youth council" or some other way for youth to channel feedback as to the effectiveness of the local Makerspaces.

A Personal Growth Chart will be prepared for each participant, the contents of which are a joint project between the Makerspace leader or designated mentor and individual youth. Although data and information will be stored in local data centres, it will be strictly subject to privacy rules. The Growth Chart will use the following indicators and measurement approaches as follows:

Indicators	Measurement
Has acquired new skills and activities	Engages in program activities; Expands number of activities engaged in; Shows proficiency in new skills – coping, technology, language, technology skills; Excels in one or more activities; Has career goals
Has a role model or mentor(s)	Seeks out help and support
	Listens to Elders/other role models
Established new social connections	New friends and peer groups
	Participates in communities of interest
	Participates in peer circles

	Intergenerational connections to work with Elders
Has a strong sense of belonging to the community	Participates in traditional cultural and language activities, including storytelling and games
	Participates in community affairs
	Exhibits leadership
Has a positive self-identity	Optimism for the future
	Good self-esteem
	Pride of self
	Feels empowered
	Expresses opinions and speaks out
	Demonstrates self-confidence
	Good eye contact
	Care in personal appearance
	Can define personal values
Perceived progress overall by community	Multiple perspectives: Elders, youth, community leaders, parents, academic institutions, hamlet, teachers

Outcome - Well-run Makerspaces actively supported by communities

Local Makerspaces will be developed through extensive consultation with each community, and community buy-in is a necessary condition to succeed. For the program to succeed, the Makerspaces need to be supported by their communities. At the same time, the way to do this for the Makerspaces is to support the communities – it is a two-way street. KPIs will be developed from the following indicators and measurement approaches:

Indicators	Measurement
Financially self-supporting	New business partners come on board with firm, planned commitments in cash and in kind
	Alternate sources of funding identified and funding streams in place
	Sound funding projections in place to sustain Makerspaces when federal funding ends
	Growing numbers of active community volunteers, partners and stakeholders and participating youth

	Makerspaces established in all 25 communities
	Meets or exceeds evaluation criteria
	Positive public reports' feedback (exit survey from public presentations)
Increase in community volunteers, partners and stakeholders and numbers of participating youth	Number of youth attending programs at each space, broken down by activity
	Number of volunteers
	New funding/program content partners
	Active community stakeholders on advisory committees, in community consultation sessions
Makerspaces established in 25 communities	Orderly start-ups based on a readiness assessment framework
IMAGINE Canada accreditation of KMN	Plan for certification of good management

Outcome - Effective Use of New Technologies:

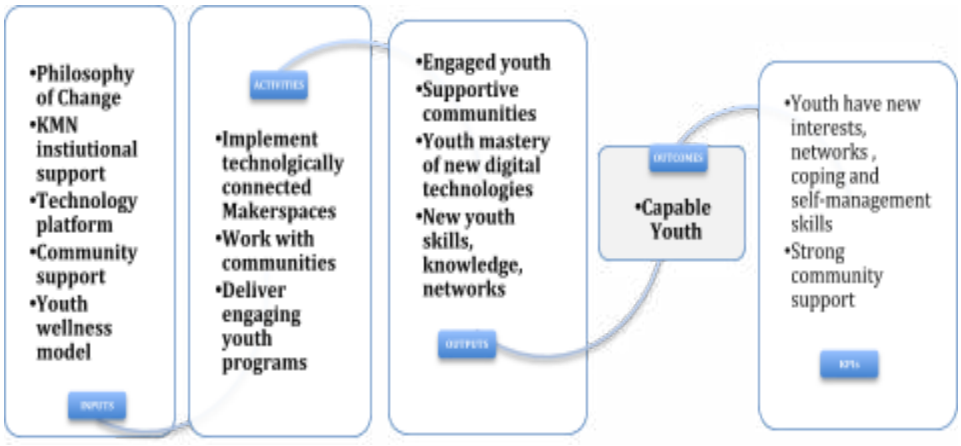
The focus is on youth utilization of information technologies, but as they are also members of communities and as their communities are committed to their well-being, of support, measures will include community adoption as well. For example, Elders will learn alongside youth, community data centres can have other uses, and technological learning can be infused as part of a local community's culture. Indicators and measurement approaches proposed are shown in the following table:

Indicators	Measurements
Digital literacy and Learning Practical Skills	Availability of extra-curricular learning tools and resources
	Accessibility of material in Inuktitut
	Offline and Online Accessibility
	Relevance of learning curricula to users
	Relevance of learning tools to users
	Digital art and creative software/applications
	Connection to culture and traditional knowledge
Reduced digital divide	Improved strength of network infrastructure: ● Reduced latency ● Increased local traffic

	Internships and job opportunities in technology
	Digital literacy and Learning Practical Skills
	Digital art and creative software/applications
	Active and positive participation in social media
	Greater creativity in using digital art, games, and story-telling
Increased opportunities to learn and share knowledge, ideas, and know-how	Skills in team working and adopting different roles
	Reverse teaching of digital skills to the elders
	Improving skills in trouble shooting and self-initiative
	Supporting the community through other applications
	Sharing skills, knowledge with other Makerspaces

Logic Model

The following images and tables represent the logic model for this initiative, drawing on the KPIs discussed above and the main work streams for the initiative (see Project Management Chapter). As such, they identify the **inputs, activities, outputs** and their **KPIs,** and the **outcomes** and their **KPIs.** As noted in the instructions to bidders, while these tables present the approach that best fits this initiative – with outputs and outcomes matching each activity - we have respected the requirements for the Performance Measurement Chapter. They are high level and individual KPIs at a more detailed level would be developed from the indicators listed above. The macro evaluation logic model is presented below.



This image represents a Makerspace MACRO input-output model

For a list of milestone, deliverables, timelines and payment schedule, **please see the section on Work Streams and Work Breakdown structure and Schedule, Deliverables and Payments in Chapter 4: Project Management.**

Inputs	Activities	Outputs	KPIs	Expected Outcomes	KPIs
Activity Focus: KMN Start-up and Operations					
Application participants and pro tem core board members of KMN	Set up Physical Office	Lease signed, network hooked up; publicized move in	Documents for lease, operations Media coverage	High awareness generated for program launch	Positive broad reaction in Nunavut
	Assess capacity and create roll-out plan for communities	Capacity assessment template and system; relevant data acquired; realistic roll-out plan prepared	Accuracy of the data and hamlet assessment	Sets a model for rest of program life, although updated regularly	Accuracy in judgment of communities selected
Local community institutions and leaders	Engage with hamlets and gain commitment – agreements struck	Outreach to all hamlets Listen and revise approach Negotiations with reps from hamlets	Introductory communications to all 25 hamlets MOUs with some hamlets	Positive rapport struck with at least half the hamlets	At least 2/3 of communities show strong interest
Challenge program officials	Negotiate Charter with Challenge Program	Signed contract with performance measurement system and payment schedule by deliverables	Satisfies KMN's cash flow requirements Realistic deliverables	Good communication and rapport established Data capture, reporting practices & established	Initiative operating smoothly with trust relationship
Professional and technical suppliers and stakeholders	Constitute, staff, and incorporate KMN	Interim board, ED, and key staff and register non-profit incorporation	Individuals appointed and incorporation documents submitted	Board and staff model broadly lauded, and operate effectively	KMN starts on the right track ascertained by stakeholders
	Establish KMN operational systems	Put in place office systems, staffing, technical plans, Makerspace packages - complete with support guides for Makerspace space, training, and local organization documents	Installed systems run smoothly Training completed for implementing KMN-Ls	Meet early milestones in creating KMN-Ls with sustained positive hamlet relationships	Positive reactions to the nature of the KMN-KMN-L relationships

Inputs	Activities	Outputs	KPIs	Expected Outcomes	KPIs
Activity Focus: KMN Content Development and Distribution Platform					
Apply te(a)ch to Platform	Establish initial programming and connectivity plans (e.g. te(a)ch)	Plans with targets and budgets for staging agreements with communities	Plans accepted and implemented	Well-functioning of programming with broad acceptance at youth and community	Number of communities within acceptable success parameters
Leverage te(a)ch Curriculum Train programming directors and technical support	Deploy programming to each participating hamlet	Instructors trained and learning, participation programs launched with full retention of youth participants	#s of youth users retained, good satisfaction score Activities deemed relevant by youth, Elders and community Usage growth and interest results	Programming is well received and effects being effect throughout the community and its youth	Highly satisfactory evaluation of program delivery and personnel competence
	Deploy technical facilities to each participating hamlet	Networks and data centres established, maintained	Schedule and level of detail reporting meets requirements	KMN-L leadership in well-functioning connectivity spurs wider community improvements	# of Makerspaces considered indispensable hubs for community
	Assess/evaluate program and build for sustainability	Program start-up, annual plans for revisions, add-ons Data collection and evaluations undertaken	ED, instructor reviews, youth feedback, community feedback, and KMN-led reviews with main stakeholders	Sustainability plans developed and implementation occurs throughout the program	Impact data indicates success as well as ongoing budget viability
	Develop Elder-Led Curriculum Develop Adult learning curriculum Deploy new programming and updates	New curriculum modules for adult and elder-led Produce updates for all modules according to feedback and regular reviews Distribute to affiliated KMN-Ls	Agreement on operating model, staffing, payment terms and successful roll-out with few outages	Overall combination of programs meeting goals of initiative, at least in the learning materials and their delivery	Community, youth, instructor evaluations of content and delivery effectiveness
	Develop Arctic Internet Exchange program Roll-out IXP and data centre program	Acquisition of equipment, contract with technical services and support local installation with maintenance services		Bandwidth infrastructure considered a great asset for the KMN-L and whole community	User and operational metrics and community satisfaction measures

	Train, recruit for follow-up years	Training through on-site and online training in the community and centrally	Cost-benefits in terms of quality and retention of trained staff	Upgraded work force throughout Nunavut for this kind of curriculum and technical elements, and Makerspace management	Operational performance of Makerspaces, community satisfaction and youth achievements

Inputs	Activities	Outputs	KPIs	Expected Outcomes	KPIs
Activity Focus: Manage Local Site Operational Start-up					
KMN advice and support	Build management & accountability structures	Functional offices & management structure	Documented policies and organizational responsibilities	Effective leadership and working relationships	Government & community confidence in KMN-L
KMN systems support	Operationalize reporting and financial management systems	Quarterly performance & financial management reports	Timely quality data that is accessible to the designated users	Accountability for results achieved	Project Charter requirements met on a year by year basis
KMN broadband connectivity requirements Staff training	Install, maintain broadband infrastructure	Advanced broadband activated in Makerspace	Timely installation, training and little downtime	Skilled support staff advance community digital literacy	Transferable skills open up new opportunities
Pilot-test new youth programs	Administer pilot tests to new programs	First cohort pilot tested and lessons learned	Reviews conducted and curricula revised as necessary	Responsive programming New elements added systematically	Satisfactory youth exit survey & parent-Elder feedback
Consultations, information material / meetings & public reporting	Manage Community Relationships	Committed and engaged community	# orgs and individuals actively involved	Long term community support	Active board & advocates; ownership for future by community
KMN support for local Privacy systems	Privacy regime established for local data	Effectively protected personal and community information	Adequate data collection, and guarded distribution practices	Trust and support of data collection and its use	Community and individual confidence in privacy protections

Inputs	Activities	Outputs	KPIs	Expected Outcomes	KPIs
Activity Focus: Deliver Youth Programs and Activities					
Promotion activities, word of mouth	Recruit / enrol target youth	Broad youth participation	Yearly enrolment increase	All target youth are reached & involved	Youth join as a normal part of development so no one left behind
Trained, enthusiastic, committed instructors Mentoring guides and guidelines	Operate programs and activities: • te(a)ch extra curricular learning • Peer circles • Elder mentoring and traditional language / culture revitalization programs and projects • Recreation • Creative arts • Leadership training	Engaging programs and activities Stronger links to traditional culture and language; new 'interest-based' youth mentors Programming reaching at risk youth	Enrolment increases and expanded # of activities and interests Satisfied youth and parents Active program participation	Development of more capable youth	• Assumes leadership • Active, vocal participation *(attendance)* • Acquires new skills and interests • Has a role model or mentor(s) • Establishes new social connections • Takes pride in personal appearance • Exhibits altruistic behaviour • Exhibits new self confidence ∆
Personal Growth Charts as prepared by program leaders, mentors, health professionals	Document progress jointly with each youth	Record of new skills, know-how, coping mechanisms, knowledge, relationships, participation, networks	Measurable new skills, interests, knowledge, know-how, coping mechanisms, relationships	Improved youth awareness, acceptance of self, focus on community, & care for future	See above attributes of successful outcome

∆ *Assessed through (questionnaires, interviews, observation; assessment of Personal Growth Charts)*

Monitoring, Reporting, and Evaluation

Project Monitoring: This activity will be on-going throughout the 5-year initiative. Monitoring will include data reviews to ensure quality and consistency. It will include client surveys to gather information on the youth experience to make necessary improvements. If early interventions such as additional training are necessary, the monitoring system will pick up such clues through the data collection system. Public meetings are another format that will be utilized on a regular basis that can serve, among other purposes (open communications, stakeholder engagement and consultations), as input to program refinements.

Midterm Progress Assessment (year 3): A more formal external assessment is planned just past the midterm to determine how the initiative launch is shaping up, and to identify issues that need to be addressed in the latter half of the program. Any unidentified risks will be worked back into the project framework. Feedback and more qualitative insights are sought as definitive results will not be evident at this early stage. The purpose is for internal learning and course correction.

The Summative Evaluation is the final, comprehensive impact evaluation which would be carried out by government or by an independent 3rd party at the end of the initiative. As this proposal is confident of on-going sustainability, this evaluation will also be used by Makerspaces to provide guidance to the post-government phase. This evaluation would examine goals and outcomes to determine how well public dollars were spent, whether and to what extent goals and objectives were met and desired outcomes achieved. It is designed to report publicly and for government auditors to address value for money.

Such evaluations are data driven, focusing on the inputs to activities implemented and outputs from them. By definition, this is a medium-term evaluation as longer-term impacts will not likely be visible for several years after the evaluation. Summative evaluations are often used to refine future government interventions and to contribute to the public knowledge and research base for future programming and policy development. The more immediate public to which this initiative is accountable is the local community and this evaluation will be of great interest in the communities and accountability will be rendered there as well about successes and shortcomings. The logic model described in the tables above provides an initial framework for this evaluation, which will be updated according to how the initiative progresses.

Data requirements and collection: Pre-evaluation is sometimes undertaken to get a clearer baseline picture of the state of affairs. However, as there is already sufficient existing population data on the disadvantages in the North, this initiative will instead focus on pulling together **baseline data** and information profiles of communities that line up, to the extent possible, with planned activity inputs and outputs. For example, the number of youths already engaged in recreation or other community activities such as after school programs; numbers of youth with laptops, hours spent on the internet, etc. This review can form part of an 'environmental assessment' which should be undertaken as part of the start-up activities. Such an assessment will provide an opportunity for everyone to understand the environment, challenges, opportunities and risks to the initiative.

Annual audited statements (see Finance Chapter) can also look at value for money, integrity of financial systems and expenditures, risk management, internal controls and the effectiveness of governance. Business processes can be examined for consistency across communities.

Public reporting is an essential part of good governance. An annual report by KMN will be produced that summarizes progress in all the communities. Clearly these reports will be more qualitative in the earlier years. It might use youth attitude surveys and stories to convey how the initiative is unfolding. However hard data on numbers of youth involved, program activity outputs, community participation, will also be included.

One final initiative that the proponents of this initiative are committed to is the creation of a **longitudinal database** that will allow tracking of youth participants through life over a longer period of time. Such data will be important information for Inuit society where the belief is strong that decisions and activities today should result in a sustainable world for future generations. KMN will seek out separate research funding apart from Makerspaces to help design the project so that data systems can be designed at the outset to track individual progress and store additional data. Patterns and trends over a longer period of time are important to addressing fundamental societal issues associated with death by suicide. Inter-generational trauma can take generations to overcome and it is important that Makerspaces not be treated as a one-off initiative. Governments are also interested in replicability when public funds are invested. The Makerspaces model is also relevant to Indigenous communities elsewhere in Canada where rates are also high.

Evaluation Plan

This evaluation plan applies a participatory framework - a method which prioritizes collaboration between researcher and community members through joint planning, implementation, and presentation of the evaluation plan. This participatory framework is focused on collaboration for the continuous adjustment of the program to better meet its goals, and "to improve research protocols by incorporating the knowledge and expertise of community members"[47]. Throughout our plan will be a focus on process at the same time as results, creating opportunities to integrate feedback, and reflection in responses to lessons learned. This evaluation plan will be governed by the KMN board (which will include local representatives from each Hamlet as well as leaders from territorial organizations), and further developed and implemented by QHRC in collaboration with each hamlet and local delivery organization. In response to the core values of this initiative, the evaluation plan will be:

- **Community-led**: Embrace self-determination through participatory action research and the KMN governance model
- **Strengths-based approach**: work alongside and in consensus with individuals and communities to identify indicators that measure strengths to promote life and wellness through time.
- **Grounded in Inuit Knowledge**: Important that the approach is Inuit specific, holistic and positive; that it supports language and cultural capacity, where the role of Elders and young people are acknowledge and reflected in the development of indicators[48].
- **Capacity building and sustainability**; Foster autonomy and develop capacity for evaluation in the community.

[47] Qaujigiartiit Health Research Centre. *Pathways to Mental Wellness for Indigenous Boys and Men: Movember Project Report*. 2018. Web. 10 Jan. 2019.
[48] *Alianait Inuit Wellness Framework*. Web. 5 Dec. 2018.

- **Knowledge-sharing and collaboration**: work in partnerships with community, its members and organizations.

Data Collection and Use

Finalizing the indicators selected and clarifying exactly how they feed into medium term outcomes will require extensive community discussions, given the importance of community ownership of its own data and the story told from that data. Assumptions about data collection need to be recorded as a fundamental part of data partnership arrangements within the project management Charter so that there will no misunderstanding regarding expectations and so that any data/system limitations can be addressed early.

Aggregated data at the territorial level is essential to success of the initiative and for accountability back to the federal government. Privacy considerations will, of course, need to be addressed. Personal data will be subject to strict confidentiality rules [see Data and Privacy Chapter/PPIA].

The timelines established for local data collection need to be firmly part of the Charter partnership arrangements in order to meet quarterly reporting to funders. Funding holdbacks will be used to structure reporting in, if necessary.

Data will be collected on a mandatory basis, aggregated and reported into a central electronic database. Data will then be interpreted to assess if goals and milestones are being met. Collecting both qualitative and population or service data at local delivery points will require simple, easy to manage tools. Care will be taken to keep the data reporting system simple and training will be provided. Local Makerspaces leaders will need software to record and interpret behavioral cues as they occur on site to track youth progress in achieving wellness. Leading edge social measurement tools will be utilized through tablets with pre-loaded frameworks and data collection categories so that low literacy or language translation barriers are not deemed impediments.

Interpreting data will result in performance benchmarks over time to create standards of performance. Comparative data will be available by Year Three. Disaggregating data based on a small population will be a challenge and care will need to be taken not to assume trends from this data too early.

Performance management software will have to be purchased to enable data entry, storage of information in a structured way, and to provide output information. Software capabilities needed will likely include survey capability, individual case management, a central data storage hub, and data analysis. Ideally the ability to track relationships with partners and stakeholders would be included. System capacity must be able to include qualitative data (observation, attitude surveys, beliefs, values, fears) and quantitative data (services use, population comparisons with other Canadians) to demonstrate progress and measure change. An example of possible software is Efforts to Outcomes (ETO).

Risks

Risk	Description	Action
Project Management		
1. KMN and/or KMN-Ls fall behind schedule	Outcomes and funding milestones are not met	• Early warning project mgt schedule already in place. • Build flexibility into timeframes for unanticipated events. • Early alerts to funders for possible schedule changes
2. More extensive training is required than planned	Inadequate skills to do the job	• Corners cannot be cut on training. • Selection of staff must focus on ability to achieve learning proficiency required.
3. Different data systems lead to uneven and non-comparable data	Established local organizations may have their own data systems and the challenge will be to collect and collate uneven data from a variety of sources.	• Extra technical support in Year One, including provision of standard, simple templates • Good training essential to data integrity – • Up front investment in getting the KPIs is required • Pilots can help refine KPIs if necessary • Flexibility needed to amend as required
4. Data interpretation – qualitative and quantitative	Danger of interpreting meaning in small numbers; challenge to interpret qualitative data	• Good training toward data interpretation reliability • Avoid over reliance on early data interpretations for a small Nunavut population
5. Data integrity	Data will likely be managed by generalists, many with little or no knowledge of data collection and systems	• Simply designed coding inputs • On-going support and coaching • Good training and refresher courses
6. Cost of data collection systems	Quality data and information are essential to measuring progress	• Build on existing hamlet data collection and information systems to the extent possible • Less than perfect data and information are often a reality with cost trade-off
7. Hamlets are late submitting data	Flexibility is needed due to unforeseen circumstances, but persistent lateness presents a problem	• Examine overall progress, as lateness in reporting is often symptomatic of problems or inconsistencies in delivery • If persistent, resort to funding holdbacks
Mental Wellness Model		
9. Comprehensiveness of wellness model and	Mental wellness is a complex issue and there may be differing views on appropriate approaches	• Mental health professionals will be asked for input to further identify appropriate protective factors that have been preliminary identified as

complexity of mental health issues		practical and workable indicators in Makerspaces • Parents and entire communities will be encouraged to be active in supporting youth • KMN model is holistic and integrates many approaches
10. A death by suicide occurs in a community	Confidence in Makerspaces may be damaged	• A death by suicide is devastating for an entire community and the country at large; some children experience extreme adversity earlier in their lives that Makerspaces cannot address. • Staff will be trained with ASIST and trauma-informed practice to provide guidance and first aid to a person at risk in ways that meet their individual safety and privacy needs. When appropriate, mental health experts will be asked to intervene. In no way will Makerspaces staff attempt to provide professional or clinical care. • Parents, teachers, KMN-L leaders, professionals and community members at large need to collaborate on holistic support for each youth – it takes a village • Counseling for parents and youth peers
Community Support		
11. Weak community support	Project stalls due to community misunderstanding or internal resistance	• Inevitable that some individuals may be off-side – important to identify change champions as essential part of change management strategy • Strong local communications and outreach strategies need to be in place to avoid information gaps
12. Engaged parents play a critical role	Parents may be too overstretched to play a strong role; home life may be a mitigating factor	• Parenting sessions and parenting tools will be offered to the community • Professionals can be alerted as necessary • Tools can be developed for parents • Someone on call 24/7 at KMN-L and/or other hotlines
13. Multitasking	Community members are often overstretched with numerous other community responsibilities	• Sufficient resources need to be available to the extent possible to hire staff • Premium to be placed on creating good, full-time jobs
14. Understanding terminology	Language barriers may pose a challenge, as well as a focus on new terminology	• Terminology used will need to be defined clearly in both English and Inuktitut

Chapter 4: Project Management

The purpose of this chapter on Project Management is to show how the initiative would be implemented and managed. It will be organized around several **work streams**, each of which will consist of activities arranged as **tasks** and **subtasks.**

The initiative will, in fact, go well beyond the resources of the Challenge Fund. However, the initiative is triggered by the Fund and thereby accountable to the Challenge Program funders. The Project Management would fulfill the mandate accorded to the Fund's recipient, and as enshrined in a **Project Charter** (or contribution agreement). This Charter would spell out the roles and responsibilities of each party, and the arrangements for releasing the funds according to a milestone schedule. As the instrument to implement the initiative, the Project Management system is situated within the governance framework. The Project Charter is the agreement between the Challenge Fund and the to be constituted Katinnganiq Makerspace Network (KMN). Please see Governance Chapter 2 for the details about the structure and authority of the proposed KMN non-profit organization.

As indicated in the Introduction, the ambition of the initiative is transformative – In that sense the initiative is all about "**change management**". Thus, the Project Management functions are very much oriented toward learning, collaborating, and innovating. An important vehicle in this desire to improve the protective factors of Inuit youth is the utilization of **technology** – improving broadband and its applications and uses to the individual hamlet communities. Accordingly, the Project Management remit includes deploying communications and IT technology - as described later in the Technology Chapter. As a change management process, the Project Management approach must clearly include effective engagement practices to help bring along the targeted communities. This **engagement process** is described in more detail in the Engagement Chapter.

Part of the success of the project will be in the collection and handling of the socio-economic and project data, which is one work steam of Project Management. How the **data generated locally is managed** in terms of maintaining personal and community privacy is discussed in the Data and Privacy Chapter.

The Project Management is governed by the resources from the Challenge as well as other financial and in-kind services supplied elsewhere. The Financial Chapter outlines the **budget** for the initiative, at least for that part that is covered by the Challenge Fund.

This Chapter outlines the proposed project management system for the 5-year life of the initiative under the aegis of the KMN. This not-for-profit organization is to be set up as the proper authority to receive the Challenge grant and be responsible for the expenditure of the public money transferred to it - see the Governance Chapter. It will extend funds and services to locally organized **Makerspaces,** which are referred to as local KMNs, or KNM-Ls in the up to 25 Inuit communities that represent the potential beneficiaries of this project. As such, a central challenge for the project management's is to manage the process of creating the local Makerspaces in each of the hamlets in which there is a locally committed entity to work with the KMN.

The process of setting up and supporting these Makerspaces will include working with partners to establish free, public peering points (Internet Exchange Points) and **data centres** in communities with a Makerspace program. The project management team would be

responsible for working with partner suppliers through agreements, contracts and training to help the communities install and maintain these data centres and Internet exchange points – see the Governance and Technology Chapters.

The project management system consists of a project management office (PMO) for receiving and allocating funds, operating an effective financial control system, milestone-based accountability, and the performance management system (see Performance Management Chapter) to evaluate project performance. Through funding it will receive for the Smart Cities the project management will hire, contract, and grant money for services rendered through standard contracting purposes.

Project Management Approach and Principles

The project management approach is designed to fit within the philosophy of all the institutional elements and values describing the Nunavut Territory and this initiative. It is one of collaboration, consensus building, and learning and sharing. It is also about capacity building. The project management approaches and principles that have been followed right from the start of the application process are the following:

Effective Partnerships and Relationships - A culture grounded in common values and principles is essential to project success. These values need to guide behaviour, support customization of local delivery, and enable empowered local sites, consistent with modern management approaches.

Sound Leadership - Dialogue, good communications, supporting a cooperative culture are all dependent on strong, credible leadership committed to a culture of excellence. Selection of the KMN board Chair, members, ED and securing the best talent locally are key ingredients.

Talent Development - The Nunavut Inuit talent pool is small and talented individuals are often multi-focused. Timely development of local leadership, especially youth, is a key dependency of this project. KMN will undertake talent identification jointly with communities and develop and launch practical training programs focused on essential project skills acquisition. Some outside or non-Indigenous talent will be necessary in certain specialized professional areas.

Capacity Development - Shortage of organizational capacity at the local level for management of a makerspace: in this case, the KMN will leverage its resources and work closely with the specific hamlet to support and create capacity within the community. There is also a shortage of teachers/capacity for programs facilitators – which will need “train the trainer” approaches and capacity building programs in terms of curriculum delivery land administrative support.

Self-Sufficiency - While the Nunavut culture of self-sufficiency is strong, extra efforts by both the KMN and local hamlets are essential to securing the future of Makerspaces into the future. Discussions have already been held with supporting stakeholders, and proponents of Makerspaces are optimistic about future funding prospects.

Sustainability – From the beginning it is understood that a major challenge is to ensure the sustainability of the project beyond the lifecycle of the Challenge. This initiative seeks to work with each community to create capacities and implement a sustainable plan for the long-term maintenance of makerspaces, including beyond the life-cycle of this grant.

Transition from Smart Cities Challenge Application

For the past year in the application process, project management has been carried out as a joint venture among the 4 core organizations with the active participation of a range of other Nunavut stakeholders. We have operated under a governing MOU which sets out the authorities and decision-making responsibilities. Pinnguaq has acted as project manager since the shortlist award, while NAM has acted as the financial controller.

Upon notification as a recipient of one of the $10M awards, a transition process will ensue to negotiate the Project Charter and to set up the KMN, as described in the Governance Chapter. The KMN will need at least three Board members (Chair, vice-chair and Treasurer) and one staff (Executive Director) for initial deployment, in order to launch the initiative. In recognizing that individuals wear many hats and the need to support emerging leaders, the collaboration between NAM, PInnguaq, QHRC and Embrace Life Council will act as a transitional board with the workforce capacity to set up the process.

This initial board would elect a chairperson and the board would hire a start-up executive director. As explained in the Governance Chapter, the executive director could be contracted for an interim basis, preferably someone who has been fully involved with the initiative and who has project management skills and experience.

The KMN chair, board and ED will need to set the tone of the initiative at the outset. Makerspaces integrity and securing public trust will depend on sound guardianship of public funds. The Chair will establish a culture of accountability and code of ethics from the outset and ensure that the board has a full sense of the nature of public scrutiny to satisfy donors and board constituents (partners, stakeholders, volunteers).

The KMN board will need to accelerate development of governance tools will both guide and direct key activities across Nunavut, including policies (on essential things like conflict of interest, privacy, accounting requirements, rules of conduct), by-laws, strategic planning requirements/goals with clear goals and milestones to guide the ED's business plan, clear reporting structures, a funding strategy to secure Makerspaces long term future, a community consultation framework, a public communications strategy – among other start-up activities.

Project Management Staffing

Since the main purpose of the KMN is to implement the vision of the initiative, the Project Management team and the staffing of KMN are essentially one and the same. Apart from the executive director, the project management team would consist of the following positions – which could be filled through straight hires or contracts, for full or part time, and for short or long durations. Some individuals might be available for part time, or for a short time, and might be more suitable to start-up than managing the program geared to the creation of a network of effective Makerspaces in each hamlet in Nunavut. The likely early full or part-time hires would be the following:

- **Director of Finance & Development** to establish proper control systems and processes as well as manage the cash flow and accountability requirements for the award recipient, the KMN and to develop a fundraising plan;

- **Outreach and Engagement Coordinator** to work with the executive director to develop the relationships with hamlets that will encourage their starting up the Makerspaces in each community;
- **IT Manager** to work in parallel with the executive director and engagement relations director to oversee the deployment of computer and telecoms equipment and connectivity for the Makerspaces start-up and operations, along with training for staff;
- **Content and services development director** to build on the modules of t(e)ach and other curriculum (or extra-curricular) support material along with digital art and other content material to be distributed to Makerspaces;

Again, the above depiction of opening positions is pro forma only. Some responsibilities might be combined or separated; some positions might be filled by the same person; some may be assumed by a firm as opposed to an individual. The structure may change depending on priorities, and availability and skills of the individuals taking those positions. However, the functions that make up each of these positions are key to the success of Project Management.

Work streams and work breakdown structure

This Chapter translates the vision of this proposal into work streams (milestones) with multiple activities in each stream that are called tasks and sub-tasks (deliverables). The main work streams identified below place the work plan into manageable categories for performance measurement and implementation. The table below shows this work breakdown structure in brief, at the work stream and task level. This table is followed by a text that describes the tasks and subtasks in more detail.

Stream	Task
Stream 1 - KMN Start-up and Engagement	Task 1.1 – Set up physical office
	Task 1.2 – Constitute KMN
	Task 1.3 – Negotiate Charter with Challenge Program
	Task 1.4 – Set up KMN operational systems
	Task 1.5 – Assess community readiness and select
	Task 1.6 – Create Makerspace roll-out plan
	Task 1.7 – Engage and obtain hamlet commitment
Stream 2 - KMN Content and Platform Development	Task 2.1 - Establish initial programming and technical plans
	Task 2.2 – Leverage Te(a)ch Curriculum
	Task 2.3 – Develop Elder-Led Curriculum

	Task 2.4 – Develop Adult learning curriculum
	Task 2.5 – Develop Arctic Internet Exchange program
	Task 2.6 - Roll-out bandwidth and data centre program
Stream 3 - Deliver Youth Programs and Activities	Task 3.1Deploy programming and training to each participating hamlet Task 3.2 - Operate programs and activities
	Task 3.3 - Draft requirements for interconnected web-based platform
	Task 3.4 - Deploy technical facilities to each participating hamlet
	Task 3.5 - Train, recruit for follow-up years
Stream 4 - Manage the KMN-L start-ups	Task 4.1 Support local KMN-L start-ups
	Task 4.2 – Build management & accountability structures
	Task 4.3 - Deliver training
	Task 4.4 – Support program delivery Operationalize reporting and financial management systems
	Task 4.5 - Develop a Data Privacy System
Stream 5.0 – Performance Measurement, Reporting, and Sustainability	Task 5.1 – Develop Performance Evaluation Framework
	Task 5.2 – Conduct annual performance evaluation
	Task 5.3 – Report and conduct independent evaluation
	Task 5.4 - Develop a plan for continued and multi-year fundraising
	Task 5.5 – Raise new funds

Stream 1.0 – KMN Start-up

Task 1.1 – Set up Physical Office: Find office space for KMN or share space with the current pilot Makerspace location in Iqaluit.

- Negotiate lease, connectivity, services
- Deploy data center and IXP switches and routers at the QHRC office in Iqaluit
- Fit out (as necessary) and move in

Task 1.2 – Constitute KMN: The incorporation of the KMN and the recruitment of the board of directors and staff will take priority in the implementation sequence and will provide the platform for the implementation of the rest of the initiative.

- Incorporate KMN as a not-for-profit
- Establish Interim or first stage Board of Directors
- Set up sub-committees/create bylaws
- Set up Advisory Boards

Task 1.3 – Negotiate Charter with Challenge Program: such a document would in effect be the contract between the recipient of the award and the Challenge Program management.

- Establish negotiating roles and schedule for creating the Charter
- Develop key considerations/provisions of the Charter
- Determine constraints and flexibilities from the government side
- Develop milestones and payment schedules
- Gain board approval and sign

Task 1.4 – Set up KMN operational systems: Such policies as internal quality and financial controls will be put in place, e.g., board approval for expenditures over a certain amount; multiple financial sign-offs; purchasing processes and approvals and guardianship of physical assets; transparency through outside auditors; employee timesheets, etc.

- Develop statement of values and ethics and operating principles
- Develop financial controls and processes
- Create human resources policies, requirements, job descriptions and reporting relationships
- Create detailed budget or first quarter, and pro forma budget for first full year
- Establish organizational and decision-making structure

Task 1.5 – Assess Community Readiness and Select - Makerspaces will be deployed according to a readiness and community capacity assessment framework established by the KMN board.

- Assess community resources, availability of physical spaces, human resources and community social profiles
- Identify local delivery partner to take ownership of makerspace
- Secure agreement (in-principle) with hamlets to proceed with the investment in a Makerspace facility
- Identify communities that will launch Makerspaces in first year

Task 1.6 – Create Makerspace roll-out plan - Develop a detailed roadmap for the rollout of Makerspaces in each community, including steps for engaging communities and obtaining agreements.

- Define the requirements and identify best practices for dialoguing with the communities
- Develop a model agreement ("Project Charter") plan and define KMN's services and investment plan
- Test and modify in association with hamlet councils and other groups

Task 1.7 – Engage and obtain hamlet commitment - KMN will build on its contacts with the hamlets established over the life of this initiative and engage in further consultations. Critical to this engagement is to identify champions at the community level, as well as human resources

with sufficient interest, expertise, and motivation to participate in the development and operation of a Makerspace in that community.

- Determine overall Makerspace resource requirements for years one-five and submit resource requirements and final program details to the funder, as required.
- Sign community "Project Charter "agreements staggered over 5 years. The Charter will focus on local ownership for managing delivery.

Stream 2.0 – KMN Content and Platform Development

The existing 75 modules of the te(a)ch k-12 curriculum constitute an important asset for makerspace programming that Pinnguaq Association, in collaboration with its partners, has been developing over the past year. It will become publicly available on March 5th, 2019. This program was supported by ISED's CanCode granting program and will be expanded upon in the Technology Chapter.

Task 2.1 - Establish initial programming and technical plans

- Concurrent with the deployment of Makerspaces will be the development of community data centres running Internet Exchange Points, a neutral routing location where ISP's, content and network services providers, educational and government networks meet ("peer") to interconnect networks.

Task 2.2 – Leverage Te(a)ch Curriculum

- Expand te(a)ch curriculum
- Make expanded curriculum publicly available

Task 2.3 – Develop Elder-Led Curriculum

- Work with Elders to identify preferred knowledge and skills to be worked on
- Work collaboratively with Elders to follow and document processes and create a set of modules around the topic

Task 2.4 – Develop adult learning curriculum

- Create 40 pieces of adult learning lessons geared towards an introduction to fundamental digital literacy skills and networking

Task 2.5 – Develop Arctic Internet Exchange program

- Contract Nuvujaq, the project's telecoms services partner
- Work with Nuvujaq to leverage its staff and resources to deploy data centres in KMN-Ls as they sign up with KMN
- Work with community to onboard willing peers to the IXP
- Identify suitable location, collaborating with community makerspaces whenever possible
- Create agreement with data centre or land owner (Arctic IX)

Task 2.6 - Roll-out bandwidth and data centre program

- Ship and install data centre (if required)

- Install IXP equipment (1 switch and 2 route servers, pre-configured before shipping)
- Enable peering networks to connect fibre, wireless or satellite to building and/or setup servers and networking equipment within data center

Stream 3.0 – Deliver Youth Programs and Activities

Task 3.1- Deploy programming and training to each participating hamlet

- Recruit/enroll target youth
- Document progress jointly with each youth

Task 3.2 - Operate programs and activities

- Te(a)ch extra-curricular learning, peer circles, elder mentoring and traditional language/culture revitalization programs and projects, recreation, creative arts, leadership training
- Administer pilot tests to new programs
- Deploy new programming and updates

Task 3.3 - Draft requirements for interconnected web-based platform

- Develop user forum
- Coordinate network storage strategy and group software bundles
- Develop local source control repository (i.e. Git)

Task 3.4 - Deploy technical facilities to each participating hamlet

- Install Internet Exchange
- Install, maintain broadband infrastructure

Task 3.5 - Train, recruit for follow-up years

Stream 4.0 - Manage the KMN-L start-ups

This stream will be undertaken in adherence to values and principles of modern management - enabling, empowering service deliverers, a shift away from rules-based management. It is also necessary when working in different contexts/locations where a one size fits all rule may not be applicable and local solutions are encouraged.

Task 4.1 Support local KMN-L start-ups

- Recruit and onboard local executive director with appropriate training
- Procure physical space for the community Makerspaces
- Recruit and train (staff should be dedicated full-time and local to the extent possible); technical, managerial and facilitation training will be provided for staff
- Recruit and train local staff for operating the Makerspace, including broadband connectivity and links to the local data centres
- Build, retrofit, furnish, and connect the physical facilities

Task 4.2 – Build management & accountability structures

- Develop bookkeeping systems, uniform financial reporting, job descriptions, results measures, purchasing, codes of care in dealing with youth (police clearances, handling situations, etc.), technology use and training/certification requirements.
- Convert to the Manual which would include templates, processes, incorporation material (including registration and bylaws), leasing agreements (space and equipment) and pro forma budgets and for the local KMNs.

Task 4.3 - Deliver training

- Develop modules for the KMN-L staff and local board
- Administer technical, managerial and facilitation training (ongoing)

Task 4.4 – Support program delivery

- Deliver Laptops through the CFS program (where the Pinnguaq Association works to make computers available to any Nunavummiut or Nunavut based organizations that require them through the Computers for Success Nunavut Program, funded by Computers for Success Canada and ISED.)
- Support local delivery organization in managing the programming of its own space, with access to the te(a)ch curriculum through an e-learning content management system at first, and later integrated into the KMN Network.

Task 4.5 - Develop a Data Privacy System

- Consult with KMN-L and hamlet community
- Design and review with the Privacy Commissioner of Nunavut
- Implement in first year

Stream 5.0 - Performance Measurement, Reporting, and Sustainability

Performance measurement is also key to maintaining public trust. Outcomes measurement through meaningful data is essential to demonstrate that organizational mission and goals are being achieved. Metrics, both quantitative and qualitative, will be established for each activity. Affordable financial systems that can deliver performance data for to guide the ED's business plan and outputs, as well as qualitative social indicators. Sustainability involves making the program attractive to an increasing number of stakeholders and obtaining sufficient revenue sources to sustain the program beyond the 5-year Challenge funding period.

Task 5.1 – Set Performance Evaluation Framework

- Modify identified metrics in collaboration with each community
- Develop evaluation materials

Task 5.2 – Undertake Annual Performance Evaluation

- Collect data for identified metrics
- Year 2 onwards, compare collected data with baseline data collected in previous years
- Incorporate feedback into service delivery and opportunities for course correction

Task 5.3 – Reporting and Independent Evaluation

- Annual public reporting is the tool for conveying this information to funders and constituents. Both written reports and community public meetings will provide the necessary transparency.
- Evaluation is a key aspect of demonstrating performance. Periodic independent evaluation will be undertaken in accordance with funder requirements.

Task 5.4 - **Develop a plan for continued and multi-year fundraising**

- Prepare different budget levels depending on the rate of roll-out to communities
- Assess impact of new funding sources on the realization of the plan
- Identify sources of funding for different aspects of local makerspaces

Task 5.5 – Raise new funds

- Identify new stakeholder targets for supporting the KMN infrastructure and programs
- Develop campaigns for additional support

Execute campaigns with supporting stakeholders – governments, private/public companies

Identifying and managing risks through risk mitigation strategies

Risk	Description	Mitigation Action
Project Management		
1. KMN and/or KMN-Ls fall behind schedule	Outcomes and funding milestones are not met	• Early warning project mgt schedule already in place. • Build flexibility into timeframes for unanticipated events. • Early alerts to funders for possible schedule changes
2. KMN and/or KMN-Ls fall behind schedule	Outcomes and funding milestones are not met	• Early warning project mgt schedule already in place. • Build flexibility into timeframes for unanticipated events. • Early alerts to funders for possible schedule changes
3. Issues arise because of programming has critics, does not fit the community	Some communities may experience problems with the content of the curriculum or its delivery to youth, or cause concern in the community	• Early course material is tried and tested • Exec directors/instructors at KMN-Ls are well trained and encouraged to report issues for resolution • Good community rapport is super-emphasized in the project to avoid communications breakdowns • Courseware will be tested before going into full use • Board members with expertise in wellness services will ensure access to proper wellness guidance

4. Complementary funding falls short, or is late – or is misused	Besides the Challenge program funding, this initiative depends on a variety of other funding sources – and shortfalls could occur; Misuse is always possible at the KMN or KMN-L levels	● Invest in strong control and fundraising skills in key KMN staff, who will take prudent measures to ensure program stability. ● Treat fund raising as a continuous activity from the launch of the project ● Control function will establish procedures for monitoring, tracking transaction in real time, such as multiple sign-offs on checks, at least 2 level review of bank statements, external audit, etc.
5. Persistent breakdowns of the technical infrastructure	Location of Makerspace, equipment failure, inadequate maintenance, or other causes of interactivity breakdowns	● Work with tried and tested service operators ● Train, train, and train the Makerspace team, rather than rely on one maintenance person in the community ● Establish an online support service to help a community to troubleshoot.
6. Staff turnover disrupts operations at KMN or KMN-L	Retention in stressful occupations is doubly difficult in the North	● Build redundancy in the overall KMN community, and bring in trainees/interns as a natural outgrowth of a sought-after employment ● Bring local communities into the KMN-L family to provide other reasons to stay, grow with Makerspace
7. Youth issues prove to be intractable in some communities, thus jeopardizing Makerspace program	Because there are many pressures on youth in Inuit communities, Makerspaces and its programming may not be able to cope	● KMN's emphasis on community involvement in Makerspaces should reduce exposure to this risk ● KMN will have enlisted support from a variety of stakeholders, e.g. social and medical services, hamlet officials, and other service organizations – so wholistic approach should help mitigate risk

Risk management requires advance preparations for unexpected events that are sure to arise. A two-part strategy will be utilized – prevention and mitigation. [Training and awareness are the best tools for prevention. And effective management practices that ward off any form of corruption, such as multiple sign-offs on checks, at least 2 level review of bank statements, external audit, etc.

Working with youth has unique security requirements as well as youth worker training to work with at-risk youth. Makerspace leaders will need to be knowledgeable of youth services available for referral in the community, including mental health, substance abuse, housing, vocational training, parenting requirements, etc.

Project schedule, deliverables and payment schedule

Because of the simultaneous, circular and collaborative character of this initiative, with several ongoing activities at any given time - we believe that an outcomes-based contribution payment schedule could be provided in four equal amounts, once per quarter, to account for the different ongoing (annual) outcomes, according to the budget submitted.

	Year 1	Year 2	Year 3	Year 4	Year 5
April		$ 532,750.00	$ 538,800.00	$ 526,850.00	$ 537,150.00
June	$ 364,450.00				
August		$ 532,750.00	$ 538,800.00	$ 526,850.00	$ 537,150.00
September	$ 364,450.00				
December	$ 364,450.00	$ 532,750.00	$ 538,800.00	$ 526,850.00	$ 537,150.00
March	$ 364,450.00	$ 532,750.00	$ 538,800.00	$ 526,850.00	$ 537,150.00
Sub -Total	$ 1,457,800.00	$ 2,131,000.00	$2,155,200.00	$2,107,400.00	$2,148,600.00
Total	$ 10,000,000.00				

Below is the Gantt Chart for the project tasks (milestones) according to a schedule for the next 5 years, with the first year being the most detailed one.

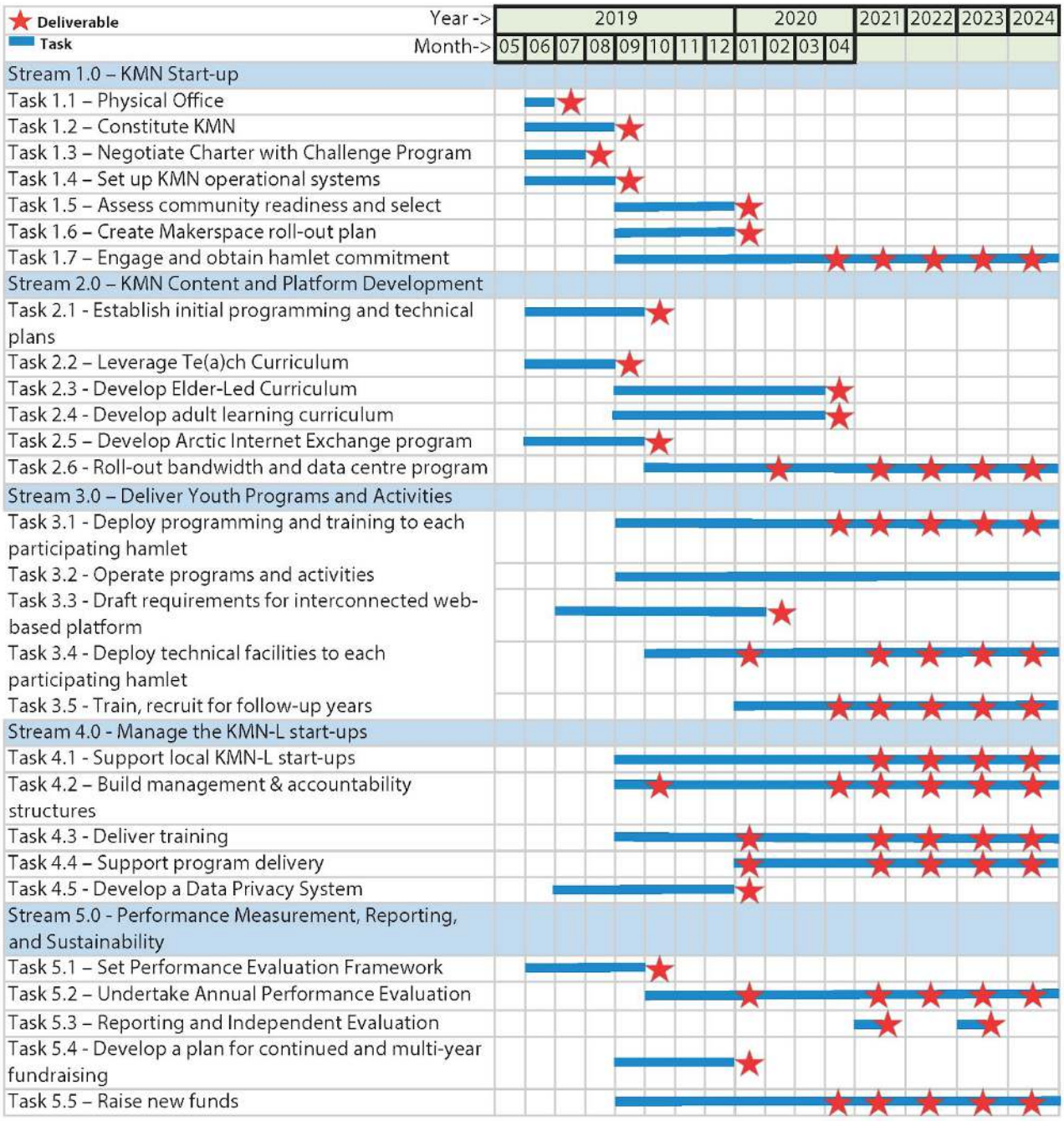


Figure 4: *This figure is Gantt chart outlining the project schedule and deliverables*

Chapter 5: Technologies

Currently, internet in Nunavut is connected by satellite, and internet connections are offered to all Nunavut communities by the internet service provider SSi Micro[49]- with connection speeds of 5Mbps delivered by Telesat's C-Band Satellite. However, the connectivity landscape is quickly changing. In July of 2018, Telesat launched Telstar 19 VANTAGE, a new generation Ka-band satellite that combines broad regional beams and powerful high throughput satellite (HTS) spot beams[50], which will service the North with connection speeds of 15Mbs. Northwestel has recently received $49.9 Million in funding from the Canadian Government's Innovation, Sciences, and Economic Development (ISED) department to build 25 new satellite earth stations to deliver this 15Mbps high-speed broadband data to every single Nunavut community by the end of 2019[51]. At the same time, Telesat will deploy a constellation of low-earth-orbit (LEO) satellites (~1,000 km from earth; ~35 times closer than traditional satellites) that will be able to provide fiber-like quality throughput anywhere on earth by 2022[52] .

Amongst these rapid changes, The KMN will be a source of ongoing support to ensure that Inuit communities gain from these rapid technological advances, benefitting the future of Inuit youth. The technologies presented here will seek to open up local communication portals for both youth and communities to connect; build capacity in children, youth, and adults to gain technical and problem-solving skills; provide opportunities for individuals to gain access to local, relevant, and Inuit-specific content and educational materials, and to provide tools and devices to support the interests and strengths of individuals through central community hubs (makerspaces). The breakdown of activities include the deployment of internet exchange points, the creation of a digital Makerspace network platform, and the deployment and further development of learning and capacity building resources and tools.

The Arctic Internet Exchange

As mentioned, internet in Nunavut is connected by satellite through each network (Northwestel, GN, Qiniq, Ice Wireless, SSi Micro), but those networks do not interconnect, meaning that connecting to a site to and from different networks requires two satellite hops, making connections expensive and slow.

An Internet exchange is an organization responsible for running Internet Exchange Points (IXPs), a neutral routing location where ISPs, content and network service providers, educational and government networks meet ("peer") to interconnect networks. An IXP establishes a trustworthy location for networks to meet. It keeps local Internet traffic from leaving the community, enables greater security and network services, and often lowers transit costs.

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[49] *Other ISP's like Ice Wireless, Northwestel offer internet services only in select communities, but that will soon change.*

[50] "Telstar 19 VANTAGE Successfully Launched by a SpaceX Falcon 9 rocket from Cape Canveral on July 22, 2018." *Telesat*. N.p., n.d. Web. 26 Feb. 2019. <https://www.telesat.com/our-fleet/Telstar-19-VANTAGE>

[51] *Canadian Radio-television and Telecommunications (CRTC) targets for urban centres as well as in rural and remote areas of Canada is of 50 Mbps download and 10 mbps upload for broadband Internet access services on fixed and mobile wireless networks.*

[52] "Why LEO?" *Telesat*. N.p., n.d. Web. 26 Feb. 2019. <https://www.telesat.com/services/leo/why-leo>

The technology is very simple, the Internet Exchange manages traffic exchanged at an IXP over a shared Layer 2 “switch” which networks connect to and communicate using the Border Gateway Protocol (BGP). Becoming a member of an IXP requires an Autonomous System Number and a network connection from a router to an IXP switchport.

By having networks peer at local IXPs, Internet traffic routes efficiently, avoiding unnecessary long trips. This is especially relevant in remote locations like Nunavut, where Internet is slow, more expensive and often suffers huge latency and congestion over satellite. If networks in Nunavut start interconnecting, a significant portion of traffic that otherwise would have travelled over satellite (and back again) will route directly from one local network to another through the IXP. This will lower the costs to ISPs by decreasing the required satellite traffic (the largest expense for providing service in Nunavut). Not only will local users on different networks have fast connectivity when communicating to each other, but it establishes a community wide platform for high bandwidth applications, content and network services (cloud computing, storage, etc).

Currently in Canada, IXP’s exist in Calgary, Edmonton, Halifax, Manitoba, Moncton, Montreal, Ottawa-Gatineau, Saint John, Saskatoon, Saint John and Vancouver. The Arctic Internet Exchange (Arctic IX) has been formed by Nuvujaq Inc and Nunageek Solutions Inc, and is sponsored by the Canadian Internet Registration Authority (CIRA) and the Internet Society. Its intention is to bring Internet service providers, government and educational institutions in the North to connect directly to each other to avoid a waste of resources, while enabling a regional and territorial wide platform for high bandwidth, low latency websites and applications within communities.

The Arctic IX has supported the Katinnganiq Smart Cities Challenge proposal in a collaboration that will see an initial installation of internet exchange points in Nuvujaq’s 2 data centres (or in space rented at existing Northwetel/SSi Micro data centres) in five community Makerspaces - thus providing a repository and access point for local content, serving as a learning tool for youth in each community, and improving broadband internet service. Further deployments will be explored and supported where possible, with a hopeful deployment of 25 IXPs’ throughout Nunavut communities.

Risks

Understanding and operating an Internet Exchange Point is fairly straightforward, but highly technical. One of the biggest challenges in operating IXPs throughout Nunavut will be overcoming the lack of technical expertise in the community. In order to effectively operate exchanges throughout Nunavut, we will have to provide a tiered support system that includes extensive documentation, technical support and training. This will be addressed through the IXP Network (http://ixp.network/), which promotes research and education of Internet Exchanges and IXP’s, and includes building a training and support network that plugs into experts in Iqaluit and the south. Along with Nuvujaq and Nunageek, volunteers from southern exchanges (Calgary, Saskatoon and Toronto) will provide high level technology support and training to local Makerspace staff that are operating a data centre/IXP.

At the same time one of the primary design goals of Nuvujaq data centres is operational simplicity, with the ultimate goal of functioning with no local technical expertise. We will use a

capacity sharing model that relies on one KMN IT position to train makerspace staff to run and maintain the data centres (if applicable) and operate the IXP's.

It is important to note that until GN and Northwestel/Bell decide to peer, an IXP will have little impact, so the primary goal for Arctic IX and the KMN is to work collaboratively with internet service providers to peer locally.

The te(a)ch curriculum

As previously described, the te(a)ch curriculum is a free K-12 computer science program designed for Northern and Arctic communities in Canada with digital content and materials that are culturally responsive to Inuit, First Nation, and Métis ways of knowing. The te(a)ch curriculum meshes a core learning focus of computer science fundamentals with game design, animation, and physical activity grounded in cultural exploration. It is a program with benefits that extend well beyond simply teaching "how a computer thinks". The goal is to implement equitable practices in digital literacy initiatives and harness the strength of Indigenous knowledge and ways of being to build agency and ownership in the use of technology as a creative tool in informed, safe, and positive ways.

The te(a)ch curriculum developed so far comprises 75 lessons or modules designed to support both teachers and students. It has been, and continues to be delivered both through one-week workshops in communities throughout Nunavut and Mushkegowuk Aski, as well as through a custom-made e-learning content management system (CMS). Pinnguaq Association has been developing this curriculum over the past 16 months for the purposes of increasing digital literacy and computer programming skills in the North, with modules soon to be available both in Inuktitut and in English. The first 40 modules will be launched online by March 6th, 2019 at https://pinnguaqlearning.space/. The curriculum lends itself well to be scalable and transferable to other Indigenous, rural, and remote communities across the region, with current adaptations being developed with Curve Lake First Nation. The curriculum is built on the 'Train the Trainer' model, which enables participants to pass on the skills learned in the programs to other community members, and to be a significant resource for teacher training and professional development. The subjects it covers so far include game design, computer fundamentals, online safety, minecraft, art design, digital storytelling, sound design, app development, VR/AR. For a full list and outline of modules, please refer to **Appendix B**.

At the same time Pinnguaq is working to develop and feature intergenerational programming based on Elder-led curriculum geared toward youth that address specific cultural practices, for example, carving, storytelling, printmaking, sewing, and tool-making, to mention of a few - through both physical and digital mediums. The need for this curriculum was re-asserted at the Annual General meeting of the Nunavut Association of Municipalities, which included the mayors of each community in Nunavut. This curriculum will provide an opportunity for Youth and Elders to learn from each others' strengths, build connections and intergenerational support for learning, while expressing cultural identity, documenting traditional practices, and building technologies and resources that support a particular craft and skill. These workshops will introduce the use of new digital skills that preserve and animate Inuit cultural heritage and create cultural continuity in a digital environment, while at the same time creating capacity for youth to gain a set of employable and transferable skills.

Additionally, the Pinnguaq Association will be working throughout the next year on adding 40 modules or lessons that will be developed under the principles of adult learning to support digital literacy for community members beyond the k-12 age range. These will address foundations of computing such as *The Absolute Basics*, *Introduction To Coding*, *The Efficient Workplace*, *Web Safety*, *Web Development*, *Online Banking* and *E-Commerce*, *Search Engines, Wikis and Research*, and *Social Media and VoIP Applications,* among others. We also anticipate that as Makerspaces gather momentum and take shape in Nunavut there will likely be a demand for specific learning resources and curriculum to be developed, such as computer networking with an emphasis on BGP/IXP and network maintenance for the KMN Digital Platform. The KMN will work with Pinnguaq Association, along with other partners like Nuvujaq, Nunageek (Arctic IX), and Canada Learning Code to create the appropriate resources and deliver training programs.

Digital tools

Each makerspace will be set up with the necessary tools and equipment to support the programming priorities defined by each community. This will likely include a mix of technologies, including a tiered system of computers (laptops, high end desktops, VR machines), printers, cutters, tablets, cameras, speakers and A/V equipment, robotics, sewing machines, art supplies, electronics, hand tools, carving tools, printing press, etc. While a standard will be developed to support the te(a)ch curriculum, each community will have the flexibility to decide what tools and equipment will be needed, and that is appropriate for their space.

The KMN Digital Platform

The Katinnganiq Makerspace Network (KMN) digital platform has as its purpose to support social connections and collaborations digitally - as well as to enable access to tools and resources for building local capacities among teachers, youth, adults in technical functions. In every makerspace that will feature a computer lab; a digital platform will be setup in conjunction with network architecture that will allow administrators the ability to create individual accounts through a network authentication protocol like Kerberos. Through a Single-Sign-On authentication, community members may gain access to the network platform on any machine, featuring: 1) user forum, 2) network attached storage (NAS), 3) a local source control repository (i.e. Git), and 4) software tools and learning resources.

A user may request a network account by visiting a makerspace and completing a brief orientation. The orientation includes an explanation of the Online Code of Conduct (expanded on in the Data and Privacy chapter) to the user which they must agree to at that time, and an on-site tutorial on how to use the network safely and responsibly. User membership provides access to the resources on the network which are mirrored across all communities, and it also supplies users with storage where they can explore and manage their content. The KMN digital platform includes:

1. User Forum:

The user forum will enable Makerspace users in different communities to connect with each other to discuss ideas, works in progress, ask questions, propose answers, and learn from each other. The form will be a custom solution based on a tailored LAMP stack application. The site will leverage caching and local storage to accommodate in areas where connectivity can be sporadic. In addition we will be tying users to their unique makerspace account ids to allow for seamless authentication to the forum.

2. Local Lab NAS (Network Attached Storage):

Each space will have a NAS (Network Attached Storage) solution. A NAS system is a storage device connected to a network that allows storage retrieval of data from a centralized location for authorized network users. NAS solutions are low-cost, scalable, and flexible This hardware will maintain a RAID[53] type configuration such as Synology Hybrid Raid (SHR) which will maintain data integrity for the local lab and also be responsible for synchronizing individual user data on individual machines with the master copy in the lab - as well as containing the latest version of a software bundle. If the internet connection is down, user data will still exist in a central location (not on an individual machine) and the NAS will later be able to synchronize data updates with a cloud solution such as google drive when the internet becomes available. This will ensure that it will be feasible to store all user related data in a way where it can synchronize with the NAS and users are free to use any machine and still maintain access to their data

3. A Local Source Control Repository:

The digital platform will host a Git server, which could host multiple repositories for the projects of the program as a whole; providing more reliable, local git access for advanced coders who take advantage of the Makerspace and encouraging collaboration between users. A source control like Git is a fundamental coding skill which is important to teach early to enable students to collaborate on projects, and work on the same code. Some of the options we have been considering are Gogs (100% open source and free of charge; all source code is available under the MIT license on GitHub), and GitLab Community Edition (an open source end-to-end software development platform with built-in version control, issue tracking, code review, CI/CD, and more).

The decentralized nature of Git will facilitate collaboration between Indigenous coders and developers across Makerspace sites, eliminating the requirement of a centralized server and adapting to the uniqueness of rural and remote regions where constant internet access is not always guaranteed. With Git, there is no single point of failure; Data redundancy is intrinsic to the Git decentralized model.

4. Software Bundles and Learning Resources:

The network will host quick and easy download bundles for all relevant open source software used in the te(a)ch curriculum (the lessons themselves are built entirely around open

[53] *RAID (Redundant Array of Independent Disks) is a storage technology that combines multiple disk drive components into a logical unit.*

source solutions). A master bundle containing all the software to be deployed on each machine will be updated and maintained on a regular basis by the IT Manager of the Katinnganiq Makerspace Network. The software bundle will be intelligent enough to do simple version checks and only update software as necessary when a new version is required, or install new software as it gets added.

Deployment to Master from Cloud: This bundle will live on the cloud. Each space will have one "Master" machine which will be responsible for being in sync with the latest version of the software bundle. We will use a "Team" cloud drive which can be mapped and synchronized with the master lab computer in each space. This would normally be done via an internet connection, however it will also be possible to connect an external harddrive to a NAS (Network Attached Storage) to perform a manual update when necessary.

Deployment to Lab machines from Master: The Master computer in each space will be responsible for deploying the updated bundle to each clone machine. Each machine will essentially be a mirror of the software that lives on the master computer. Whenever there is corruption, an administrator simply needs to re-clone the master machine software onto a new harddrive to install on one of the clone machines.

We can also leverage google drive or similar cloud solutions to synchronize individual user data. Every user will have an account which is connected to cloud storage, and therefore any individuals work, code, saved application settings and customizations will be stored in the cloud and portable to any machine in the lab or at any other space.

For example, open source software available on the network to complement educational resources will include but not be limited to:

- Scratch 3: The latest in the world's most popular ‘introduction to programming’ software.
- Python: Advance programming for users ready to move beyond Scratch.
- TWINE: Open Source narrative storytelling engine.
- Lua/Love: More advanced but accessible programming engine for advanced programming.
- GraphicsGale: An open source pixel art program that is the subject of at least 5+ te(a)ch lessons
- GIMP: An open source competitor to the Photoshop series.
- Voxel Busters: An open source voxel art program for the creation of voxel based 3D models.
- Blender: An open source 3D modeling program used throughout the te(a)ch curriculum.
- LibreOffice: The latest version of the open source project to compete with the Microsoft Office Suite
- Inkscape 0.92.4: An open source professional vector graphics editor for Windows, Mac OS X and Linux.

Additionally, we will approach existing major companies to provide educational and/or offline versions of their software to the KMN digital platform, which will be complement with

curriculum and workshops. These include **Google Suites, Unity**, **Unreal Engine**, **Gamemaker,** and others. The KMN digital platform will be built on a number of core principles:

- Replicability: The open source code for this network will be transferable to any new or existing community makerspace that wants to connect (depending on connectivity at each site, this can be done online or through the physical transport of content via airmail on a USB stick), at the same time that it can be used by other rural communities in Canada to create their own network
- Sustainability: With the development of curriculum on networking and network maintenance, alongside the te(a)ch curriculum – local capacities and transitioning plans will be built to monitor and maintain the network
- Offline Accessibility: Given the challenges of regular and consistent Nunavut connectivity, the network will be built to function both online and offline - with updates scheduled when internet is available.

Risks

The biggest risk to these projects are: the availability of internet access at a given time, human capacity to maintain and run these networks, and privacy issues as it relates to open source and connected community networks.

Limited internet access for users: We are addressing this mainly by making the makerspaces public places where technology tools, software, and internet connectivity can be accessed for free – with the support to learn how to use them in creative ways.

Unreliable networks: Connectivity in the Nunavut is unreliable at the best of times. As such, we are building tools that that work as well offline as they do online and that can connect and exchange information at times that don't tax the network. At the same time, we will contribute to improving broadband connectivity by working with the Internet IX to install local data centre and IXP's to improve latency and local traffic

Sustainability and Human Capacity: As addressed throughout the proposal, our focus will be on building technology/infrastructure not just as as end products but as constant learning tools.

Privacy Issues: This initiative will be develop the parameters of data sovereignty within an open source context by developing a strong privacy and data management plan.

Partnerships

The core technology partners in the development and maintenance of the Katinnganiq proposal will build the Katinnganiq Network, networking curriculum, as well set up the Internet Exchange Points and the Nunavut Research Network (with the support of Nunavut Arctic College as a requirement). The core team technology partners include partnerships with both the private and public sector to support the projects as a whole. These are:

- **The Pinnguaq Association:** As a not for profit technology startup and the lead developers of the te(a)ch curriculum,, Pinnguaq will bring its six years of experience delivering technology education in Nunavut to bear in this project.

- **Nuvujaq** is a Nunavut based not-for-profit society incorporated to advocate for improved connectivity in Indigenous, Northern, rural and remote regions and communities.

Chapter 6: Data and Privacy

This chapter addresses the need to develop processes, protocols, standards and agreements that prioritize privacy, safety, sovereignty and Inuit knowledge in data management and sharing design.

While our proposal embraces knowledge sharing, collaboration and open source technologies as processes grounded in Inuit values, our approach to data and privacy also acknowledges the detrimental impact that the prevalence of a colonial approach to research has had on Inuit, "as the most studied Indigenous peoples on earth [...] subjected to egregious abuses by researchers"[54]. This approach has placed Inuit's own role in research as marginal, while the beneficiaries of the research in terms of access to funding, data, research outcomes and career advancement lay with the researchers themselves. As a result, the notion of "open data in the context of indigenous peoples is a double-edged sword. On the one hand, open data could be used to inform development, allocate resources and set a future vision—and to influence wider public opinion and debates. On the other hand, opening up data may be accompanied by concern about protecting indigenous cultural information, rights and intellectual property"[55].

This proposal's approach to research, data and privacy embraces the notion of Inuit data sovereignty, which aims to situate Inuit self-determination at its core by focusing on priorities that are established by, and serve the needs of Inuit in terms of the governance and management of data (including intellectual property) as well as the use of data to support governance and informed decision-making. This proposal, and this chapter focuses on developing data sovereignty networks and parameters to ensure that the creation, collection, analysis and ownership of data is led and owned by the communities themselves.

As it concerns the interrelationships between technology and capacity building - our proposal recognizes that the ability to develop technology and innovation research that reflect Inuit self-determination and data sovereignty is largely contingent on the access of Inuit to digital literacy and capacity building, tools, educational resources and peer and research networks, as well as funding. With a focus on training, capacity-building and ongoing support for both Makerspace staff and users, the KMN will play a pivotal role in supporting individuals in data collection, use and analysis, as well as community ownership, control, access, of the data generated through the different stages of this initiative.

The existing laws governing privacy or personal information and data that are to be considered in this scenario are the Personal Information Protection and Electronic Documents Act (*PIPEDA*), and the *Access to Information and Protection of Privacy* (ATIPP) act. PIPEDA is the federal privacy law for private-sector organizations. Though the KMN will be incorporated as a not-for-profit, we will adhere to its principles. On the other hand, the Nunavut ATIPP governs

[54] *National Inuit Strategy on Research*. Inuit Taipiriit Kanatami: 2018. Page 5 and 23. Web. 25 Jan. 2019. <https://www.itk.ca/national-strategy-on-research/>

[55] Smith, Diane E. *Governing Data and Data for Governance: The Everyday Practice of Indigenous Sovereignty*. Australia: ANU Press, The Australian National University, 2016. Page 132. Web. 10 Dec. 2018.

public and governmental bodies and provides the framework for the right to access public records, as well as to protect the privacy of individuals whose personal information is collected, used and disclosed by public bodies. The KMN and its relationship with municipalities and hamlets, along with funding from public bodies provides sufficient context for regulation under ATIPP.

Our data management plan outlined below is aligned with the ten principles outlined by PIPEDA for the protection of personal information by adhering to and promoting the following principles: 1) Accountability, 2) Identifying purposes, 3) Consent, 4) Limiting collection, 5) Limiting use, disclosure, and retention, 6) Accuracy, 7) Safeguards, 8) Openness, 9) Individual access, and 10) Challenging compliance[56]. Our data management plan outlined below is also aligned with Nunavut's Access to Information and Protection of Privacy Act's (ATIPP), as outlined in the chart below.

Data Ecosystem

The KMN staff and board will provide the governance structure and capacity to work with each hamlet/municipality on collecting and analyzing the data and KPI's necessary to effectively manage the design, development, implementation, maintenance, improvement, and evaluation of this initiative.

In terms of the data life cycle, we will comply both with PIPEDA and ATIPP as described in the following outline. At the same time, we acknowledge that some aspects of this outline will require more detailed solutions as community-led projects are developed - and we look forward to working with the Privacy Commissioner of Nunavut to flesh them out as we move forward.

The data ecosystem in this proposal is broad, and is organized below to provide more clarity on what data elements will be collected.

Data Life Cycle	**Makerspace Data** (registration and attendance)	**Digital Platform Data** (User forum, Local storage NAS, Git, e-learning resources and participants work)	**Consultation & Evaluation Data** (KPI's)	**Authority**
Elements	Name, contact information (or that of parent/guardian), age, community/location, sex, ethnicity, food allergy information	E-mail address, username, user-generated data (messages, photos, code, art projects)	Quantitative and qualitative (opinions + thoughts) data relating to KPI's as outlined in Chapter 3: Performance Measurement. Data will be collected anonymously through simple and easy to read	

[56] *Privacy Toolkit for Businesses*. Office of the Privacy Commissioner of Canada. Web. 8 Feb. 2019. <https://www.priv.gc.ca/media/2038/guide_org_e.pdf>

			and manage tools (accounting for varying literacy levels and staff capacity)	
Collection	Seek written, valid, and informed consent from each individual for the collection of personal information and data. Outline who is collecting the data and for what purpose. At any point in time, an individual has the right to revoke their consent for the use of their personal information, along with the right to correction.			ATIPP - Part 2, Articles 40 and 41. ATIPP - Part 2: Articles 45
Use and Analysis	Data will be used to design programs catered to age group of attendees, as well as to protect individuals from possible contamination and risk to known allergens at each local makerspace.	Data will be used locally at Makerspace, according to individual desires (such as for feedback, collaborations or problem-solving) and sharing preferences. Interface design will enable users to delete their own content.	Evaluation data will be used and analyzed locally by staff working closely with central KMN partner for performance measurement. The data will be used to inform decision-making and improve programs.	ATIPP - Part 2, Article 43, 44
Storage	Physical (forms) and digital (spreadsheets) files stored at each Makerspace. File formats will conform to open standards and software whenever possible	Individual user data will be synchronized and stored both locally on an encrypted Network Attached storage device and on the cloud using a service such as Google Drive with data encryption.	Data will be stored and centralized within a central electronic database particular software (for example Efforts to Outcomes)	ATIPP - Part 2, Article 44
Trans-mission	Data will only be accessed by authorized staff at the Makerspace.	All data transfers will feature end-to-end encryption using software such as Synology Cloud Sync	Data will only be accessed by authorized staff, in password protected computers. Data will be encrypted in software like..	ATIPP - Part 2, Article 42
Sharing (disclosure) &	Makerspace registration data will not be shared with any	Each individual will own their own data in the Network and	Data will be shared privately through accountability reports to	ATIPP - Part 2, Article 47, 48, 49

distribution	third-parties, and remain for the sole use of Makerspace staff to deliver programs.	share with others at will.	funders, as well as internally with the KMN board and each Hamlet council. It will also be publically through published reports.	
Re-Use and derivative production	Derivative production will be determined by individual users or communities as the owners of their own data. If the KMN will take on any derivative production or re-use of data (for example to improve services and performance with the creation of new tools, services, or products), it will do so with valid and informed consent, and through the principles of consensus with affected communities.			ATIPP - Part 2, Article 43, 44, 47, 48, 49
Archiving and Preservation	The data and personal informational elements will be kept on file for at least 12 months, and will adhere to the right to be forgotten.	The long term archiving and preservation of data utilized throughout this project will be collected in digital and physical exhibitions, integrated into curriculum, form part of working projects and used in evaluation and published (and/or peer-reviewed) papers or reports. Data will be archived in the user forum under each person's account indefinitely or until the user deletes it or requests it to be deleted.		ATIPP - Part 2, Article 44
Disposal	We will adhere to the right to be forgotten by erasing personal data and information on file as requested by individuals.			Right to be forgotten
Security	Files kept secure in administrative files on secure computer. Makerspaces will be locked after-hours and equipped with alarm where possible.	Single-Sign-on authentication (Kerberos) and NAS synchronization with encrypted software (Synology)		ATIPP - Part 2, Article 42
Access	Each individual and community will maintain their right to access a copy of the data to see how it is being used, and as preliminary step to the exercise of further rights like rectification and erasure.			Right to Access

A big part of this project and of defining the parameters for Inuit data sovereignty will include the development of a more detailed framework that outlines clear protocols with respect to indigenous intellectual property rights, which identify the consents required to access and use high-value cultural information[57]. At minimum each community will have control and oversight of how the data collected is used, and will be supported by the KMN IT Manager through hands-on training, along with reference materials like the KMN Operating Manual.

The KMN will provide direction on how to collect, analyze and use the data to inform-decision making, improve program delivery, reporting, and evaluation that ties back to

[57] Smith, Diane E. *Governing Data and Data for Governance: The Everyday Practice of Indigenous Sovereignty*. Australia: ANU Press, The Australian National University, 2016. Page 131. Web. 10 Dec. 2018.

specific agreements between the KMN and local makerspaces regarding performance measurement, with a priority on supporting community-owned data. At this stage, data may be aggregated and de-identified so that anonymity is guaranteed, thus protecting release of data from a specific community

We recognize the importance of user safety on a community network. To keep both physical and digital spaces safe, the KMN will develop a code of conduct as part of the operations manual as a resource for every makerspace to modify and implement. The user forum's content will also need to be centrally moderated periodically by the KMN IT Manager to make sure it is free of aggression or harassment, and are users abiding by the code of conduct.

Risks

Breach of security by staff or through insecure and vulnerable devices: We will prioritize staff training on privacy issues, set up confidentiality clauses as part of employment contracts and provide training for troubleshooting procedures to increase privacy settings of computers and devices. The technicalities in data collection need to be addressed through simplicity and training in the face of limited human capacity.

Users breach others users privacy: to mitigate this risk we will also provide training on how to use the network responsibly, as well as how to use adequate safeguards and practices. Additionally we will strictly require that everyone adheres to the privacy and code of conduct for both physical and digital spaces, highlighting and enforcing an environment of respect.

Cyberbullying: to mitigate the risks of cyberbullying we again, highlight an environment of respect and enforce our code of conduct, while at the same time integrating forum moderation into a staff position, most likely the IT Manager position at KMN. The moderator would be able to flag and take-down content that is deemed to be inappropriate, offensive or trigger-sensitive. At the same time, the te(a)ch curriculum contains a few modules on online and media safety that could be delivered by staff.

Chapter 7: Engagement

Inuit Cultural practice and the principals of Inuit Qaujimajatuqangit (the Inuit way of knowing) guide the Katinnganiq project in every step of its implementation plan and governance framework. These principles serve as guidance for our engagement philosophy, providing a check for our team who are both non-Inuit and Inuit, to ensure we are wrapping ourselves in a methodology that reflects the way Inuit have shaped the direction of their own success. These principals, when embraced as a core engagement philosophy ensure a process that will be collaborative and responsive to the needs of Nunavummiut. Specifically we root our engagement in the following principles:

Inuuqatigiitsiarniq (Respecting others, relationships and caring for people): At the core of any project centered around health, wellness and suicide prevention is a need to ensure that respect and care for the people we're working with is centered at our engagement process. This means engaging in a care based model of listening, and challenging one's own assumptions of what is a 'best' or necessary approach.

Aajiiqatigiinniq (Decision making through discussion and consensus): From the beginning we have practiced acceptance in that we don't know the answers that will work for every community. The proposal that you are reading today was arrived at through lengthy discussions and involved collaborations between the four organizing partners, taking into account community feedback. Moving forward, the implementation and success of this initiative will require that discussion and consensus be placed at the heart of the decision-making process and govern the relationships between the KMN and each community. When engaging with partners and individual residents, our reliance on the principal of *Aajiiqatigiinniq* will mean we are first and foremost listening and adjusting our outcomes for each unique community and the vision they identify.

Piliriqatigiinniq/Ikajuqtigiinniq (Working together for a common cause); The challenge statement identified in this initiative is one that resonates throughout the Territory with all Nunavummiut. Throughout our engagements past and future, our focus will remain on working together for this common cause, understanding that a unified, collective and holistic approach will have the most impact.

Moving forward, the KMN will work specifically with each community through conversations with Mayors, Senior Administrative Officers and Hamlet Councils, as well as with Recreation coordinators and community residents of all ages to identify their strengths and desires. It will conduct consultations and environmental assessments with each community to develop an implementation plan that responds to their vision, resources, capacity and readiness. The success of local makerspaces and of this initiative as a whole will be built on meaningful dialogues and engagements that enable a community-led approach to systems change through Makerspace deployment.

The proposal that is presented in this document was shaped in significant ways not by one or two pivotal moments but through a series of meetings, phone calls and conversations between the four collaborating organizations that brought forth for discussion their particular mandates and areas of expertise. These discussions were informed at different points by feedback gathered from our outreach efforts. During the preliminary proposal stage, every community provided a support letter for the initiative, but one of the most important opportunities we had this year was the chance to present, in person, the vision of the Katinnganiq proposal to the Mayor's at the Nunavut Association of Municipalities Annual General Meeting in Cambridge Bay (which also coincided with Infrastructure Canada's site visit). After our presentation we heard feedback from Mayors that included the following:

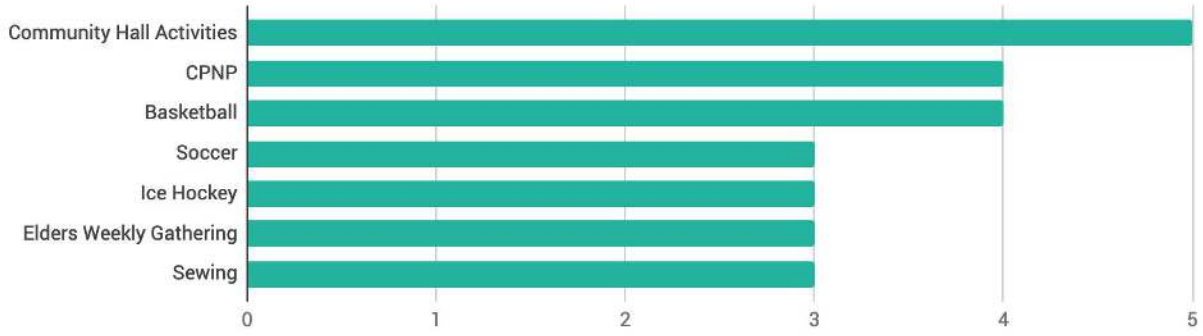
- A re-assertion of the need for space for youth and youth services in their community, since in most communities the majority of people are young
- A desire to see these spaces engage Elders as well as Youth - and facilitate teachings between them; A need for physical space where Elders and Youth to come together, learn Inuit traditions and work together to help each other go forward.
- A need for this initiative to reach the most vulnerable youth in every community - in terms of both space and curriculum - to give them a space to be and to learn. This is

especially important for the pilot Makerspace in Iqaluit and the need to diversify inclusion approaches
- Curriculum must engage Elders and allow for Elder-led learning, on topics of their choice.
- Spaces need to address tool making between Elders and Youth, especially for hunting, and assist Elders in delivering those skills
- There is a need to teach Youth how to survive on the land, so there is a need to leverage technology for use on the land
- The proposal needs to expand definition of technology to include Inuit tools and skills
- That there is need to work together between communities - and that this project can be an avenue for working together
- That technology, curriculum, tools and learning environment needs to support language revitalization, to maintain the use of one's own dialect and support traditional knowledge

This feedback at the NAM AGM resonated with the internal conversations we were having, and became a framework for which to ground the proposal in. Throughout the following months, we've attempted to articulate the above and integrate this feedback into the vision of what a 'smart city' looks like in Nunavut.

Throughout the finalist phase we communicated by phone and by email with each municipality to share more information on the proposal, to request their input through a community survey, and to ask for a letter of support for the finalist phase. One of the other important opportunities for face to face consultation was when in January 2019, two members of our team travelled to Pond Inlet, Pangnirtung, and Qikiqtarjuaq to conduct consultation sessions with community members as well as with Senior Administrative Officials and Hamlet employees. In this trip, our team led a community session in Pond Inlet, but the rest of the trip was marked by adverse weather and travel conditions which delayed and cancelled flights, forcing them to reschedule travel plans. At the community consultation in Pond Inlet, 31 community members attended and provided answers to a set of four questions, which have been compiled below:

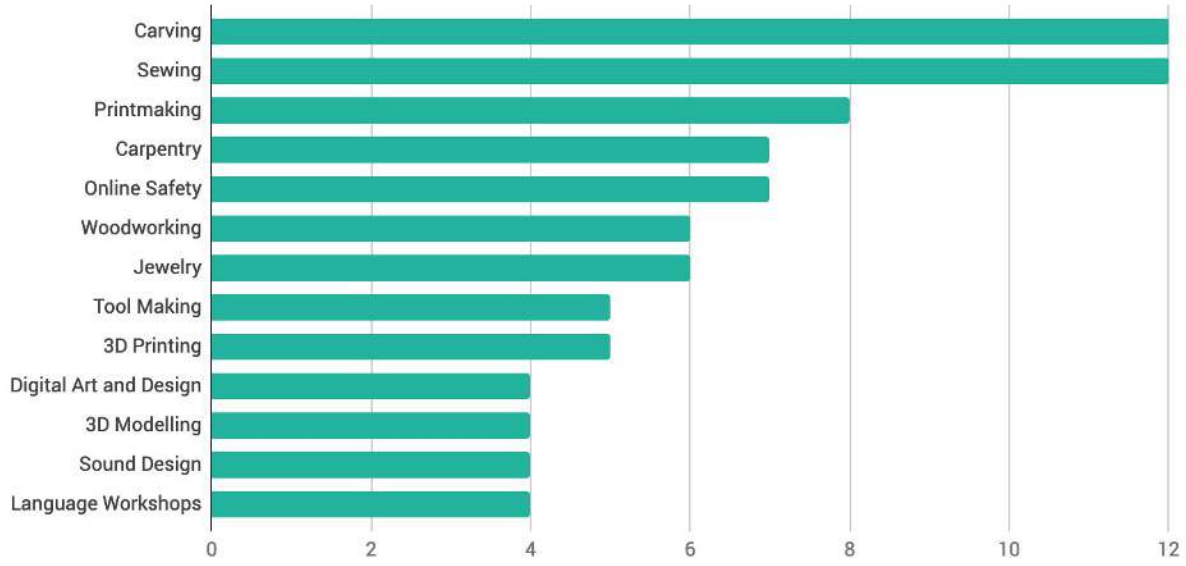
1. What general activities or wellness activities does your community already have?



Additional Answers

Volleyball (2) • Kids hockey (2) • Floor hockey (2) • Badminton (2) • Public arena (2) • Men's group (2) • AA meeting (2) • Indoor sports (2) • Pre-school (2) • Holiday square dancing (2) • Playing games (2) • Outdoor games • Game competitions • Tea party • Annual meetings for games • Prenatal • Art • Community wellness centre • School • Dances • After-school programs • Hunting and learning survival skills • All season hunting • Family grieving, healing • Fishing competitions • Science camp (summer) • Need more showing art and making Amauti

2. What are activities for wellness that you want to be doing?



Game Design (3) • Digital storytelling (3) • Computer Fundamentals (3) • Games (2) • App Development (2) • AR/VR (2) • Art (2) • Design • Beading • Crocheting • Knitting • Making Amauti • Leather making • Photography • Tools, stones and a proper facility for safe and proper learning skills in livelihood and economic benefits • Drop-in centre for children and youth • Teach young children about the dangers of drugs • Out on the land, hunting • Anything that includes training • Fishing • More activities for kids (6-10 year olds) • Homemade clothing to sell or something useful • Small engine repair training • Youth engagement with the land and parks • Language training for both Inuit and non-Inuit • Supper-making for children and youth (bringing home ingredients and left-overs)

3. What would you like to see be part of a makerspace in your community?

Theater (2) • Swimming (2) • Youth centre (2) • More public space to gather • Coffee • Office administration skills • Life skills • Cooking • Need house or workshop to do most of the above • Blacksmiths • More general activities for the youth • Marketing skills • More funding that suits local needs for betterment of the beneficiaries • Sewing • Printing art • Traditional Inuit stories made into cartoons • Getting ready for jobs for youth (how to make resumes, how to be prepared for a new career) • Making traditional clothing with youth • Youth involved with adults who are willing, and learn from them and the skills they have • Teach teenagers how to make homemade stuff • Carving • All ages learning something together • Storytelling • Courses on heritage and history • Making resumes • A shack and more staff • More public space for children and youth • Young people telling stories in their community

4. Do you have a skill that you would like to teach, support and mentor youth with?
Sewing (4) • Out on the land programs (2) • Yes, to tell and to show • Photography • Arts • Carving skills for over 18 years • Marketing art • Quarrying stones • Safety skills • Making Amauti and Parkas • Exploring patterns of clothing • How to work with leather (but no tools, etc) • Hunting, Fishing • Baking • Different kinds of design for hats, parkas, mittens and kamiks • Skinning seal and polar bear skin • Counseling and Healing • Talking with youth • I would like to learn too • We need to learn more

This information is part of the community level consultation that will be continued throughout the implementation of the initiative and inform each community's vision for their makerspace.

Another engagement opportunity we had was regarding Elder-led curriculum development. In Nunavut, Elders have said that strong relationships are the most important factors in child development. The *Inuit Qaujimajatugangit (IQ Principles)* identify a set of values and beliefs which they feel are critical to positive personal development, as well as essential guiding principles essential for all Inuit. Over the course of one week, our curriculum development team from Pinnguaq Association and QHRC travelled to Arviat, NU to meet with the Aqqiumavvik Society to discuss the process of developing Inuit-specific culturally-based curriculum based on the principles of *Inuit Qaujimajatuqangit*.

Over the course of of this week our curriculum development team met with Shirley Tagalik, Joe Karetak and Elder Louis Angalik to learn about Inuit Qaujimajatuqangit Education Framework, and did a land trip with the Arviat Young Hunters Association and the Smart Ice Programme[58]. They also met with local business owners to learn how they are using technology. This included Eskimo Point Lumber Supply (a local hardware and construction and maintenance business), the Arctic Co-operatives Limited, Hunters and Trappers Organization, Kiluk Ltd. (a local business focused on the production of fur and leather clothing), and the Hamlet of Arviat.

Lessons learned include the re-assertion that every community has their own unique needs and approaches to education and that curriculum development must be Nunavut-Inuit focused, and implementation must be responsive to the differing needs of each community. It not only helps preserve important knowledge and tradition, but also provides an Inuit perspective on personal growth and development, and how we relate to each other, to other living beings, and to the environment.

In the past few months we have also onboarded an Advisory Committee to provide feedback on the proposal as it was being developed. There were 7 members of the Advisory Committee included: Kathleen Gomes (First Nations Bank), Alisa Praamsma (Mental Halth Commission of Canada, Lynn Stevenson (Canadian Foundation for Healthcare Improvement, Mara Grunau (Centre for Suicide Prevention), Charlotte Borg (Board of the Nunavut Kamatsiaqtut Helpline), Jesse Mike (Nunavut Literacy Council), and Joshua Nash (Canadian Federation of Medical Students). The Advisory Committee met twice through teleconference. The first meeting was on November 19th, 2018 which presented the revised vision of the proposal. The second meeting took place on January 22nd, 2019 which presented progress

[58] *SmartIce is an award-winning technological innovation for the North, it's the world's first climate change adaptation tool to integrate cultural knowledge of sea ice with advanced data acquisition and remote monitoring technology to study climate change. This was a great example of an organization that works with local experts.*

done to date. In both cases the Advisory Committee was able to provide feedback and resources for continued development of the proposal.

In general, our project engagement focused on three major strategies, all three of which will continue as the project moves forward.

- Territorial Gatherings

Getting together representatives of all 25 communities in Nunavut is an expensive and rare thing, but a few key events throughout the year allow the Katinnganiq team to share and request feedback on the project. The major gathering for consultation at the municipal level was the NAM AGM. With the participation of NAM on the board of the KMN, this will continue to be an important meeting moving forward to be able to report, request feedback, and have face-to-face conversations with Mayors and Senior Administrative Officials to address any collective action to be taken. Additionally, the KMN will seek to be present at other gatherings such as the Nunavut Economic Developers Association annual meeting to engage face to face whenever possible.

- Community Engagement

In the development of this proposal, engaging with community members at large in community visits were an excellent method to talk to individuals and learn about what they would like to see as part of this initiative. These opinions will shape the vision for their local makerspace as it is being developed. At the same time, one-on-one meetings with Hamlets were productive in understanding the intricacies of each one's unique situation, and will be necessary for the planning and implementation of this initiative into the future. With a governance framework that includes the broad representation of municipalities, Inuit organizations and leaders in both the public/private sectors of each community we will continue to build on consultations and engagement as a necessary and essential part of what this project hopes to achieve.

- Technology as a Connector

Already Nunavummiut are utilizing technology to share and expand their cultural practices, and the Katinniganiq project will leverage those existing uses for engagement in the project. Facebook is a good example, with high usage in the North. Our engagement strategy includes a heavy use of Facebook and social media, along with our website as important information and outreach tools.

Though our experiences have been positive so far, consultation does not come without criticism. It is important to note that the constructive feedback we received, along with lessons learned through our team's experience, be processed and utilized to better improve our efforts. For example, though the spaces proposed in this initiative are intended to be led by and serve Inuit communities, it has been vocalized by leaders that these spaces need to include the most vulnerable sectors of each community, including individuals from low-income households, those who are un or underemployed, individuals who have not graduated from high-school and

individuals who are differently abled. To address this, it should be important to make sure that outreach and access is continuously part of the administrative process, and that accessibility and inclusivity be integrated by design into both the physical spaces and the technologies utilized so that inequalities are not exacerbated or maintained.

With regard to accessibility, and underscoring that a part of this initiative concerns language revitalization, it is important to acknowledge the role of language and unilingual speakers. Throughout the engagement processes of this initiative, we have developed outreach materials in both Inuktitut and in English, as well as relied on live interpretation when needed.

Another important point that has been made is the need to support economic development and career opportunities in the territory through the funding that is made available by this prize or other fundraising initiatives. To address this, it will be necessary for the planned incorporation of the KMN organization (that will manage the smart cities and other funds) to be based in Nunavut and hire Nunavummiut, prioritizing Nunavut Land Claim beneficiaries. At the same time - the KMN will fulfill its role to support training for local staff and integrate capacity building through its services.

Risks

This is a project of immense magnitude that is faced with particular obstacles in terms of access to technology, distance, and human resources to coordinate communications and engagement. Below is a description of some of the major risks we have identified for engagement, along with the mitigation strategies we will be incorporating:

Restricted Communication Channels: Every community and every individual experiences things differently and no one mode of communication can be taken for granted. Our teams understands the value of a multi communications approach and will focus on ensuring engagement can be done equally through community radio, social media, email newsletters, and personal engagement, with a priority on written and verbal content in Inuktitut.

Distance and Travel: Travel to each of the 25 communities is incredibly expensive for anyone in the territory. While engagement will be ongoing and regular with a budget for necessary travel from a base in Iqaluit, this project prioritizes a community-led approach supported with training and digital communications to collaborate and achieve results.

High Turnover/Skills Capacity: Staff Turnover in Nunavut is always high as people move from opportunity to opportunity. Maintaining consistent staff and building capacity in each community to see these projects through will be a constant challenge. Throughout the proposal, our approach includes training and capacity building for both participants and staff through a 'Train the Trainer' model - and budgets to prioritize well paid employment opportunities.

Feedback integration: Consultation and engagement yield important feedback for project managers and leaders to consider - yet there is always a risk that feedback provided won't be incorporated into project design and implementation. We will strengthen a community-led process, with individual Hamlets, local organizations and community members as the ultimate decision makers with the power to integrate aspects of the proposal that have not been considered.

Chapter 8: Implementation

The jurisdiction of this entry into the Smart Cities Challenge is governed by the the Nunavut Land Claims Agreement and represents an Inuit population of 84%. This section will lay out how the implementation of this initiative will be built in alignment with the articles of the Nunavut Lands Claim Agreement, alongside the values of Inuit Qaujimajatuqangit. The principals themselves are intuitively compatible with duties to consult, employment benefits and respect for the land through a process that complies with all our requirements under global, federal, territorial, municipal and Inuit law.

Duty To Consult with Indigenous Groups

As detailed in Chapter 6 on Engagement, the duty of the Katinnganiq proposal to consult with our communities is a central piece for the implementation of the project. NAM, as the lead proponent for this initiative is key. The group provides a single voice for mayors and municipal administrators of the territory's 25 communities. NAM leads this duty to consult at the highest level, working daily with municipal leaders on every decision and soliciting feedback throughout the process. The association was formed to make important contributions to decisions about Nunavut communities and capital projects, with Katinnganiq fitting naturally into that discussion. As noted in the Engagement chapter, we lean heavily on Aajiiqatigiinniq (decision making through discussion and consensus) which means that the duty to consult extends beyond just this initial phase of the development of a proposal and is a core value that spans the entire project.

Modern Treaty Obligations

Nunavut sits on the largest settled land claim in the entire world. The respect for the terms of that land claims agreement will be a core tenet of the implementation phase. Given the size and scope of this proposed project and the source of the funding, this project as a whole and the proposed KMN organization in particular will adhere to the articles of the Nunavut Land Claims Agreement[59] as they relate to the project's implementation. There are certain obligations under the NLCA that are relevant to this project. They include;

Article 23: Inuit Employment Within Government[60]: While this article directly relates to employment within the Government, Katinnganiq is committed to support and encourage a workforce that is reflective of the population it serves by prioritizing Inuit in leadership positions and building capacity for emerging and young leaders. We will develop an Inuit employment plan that specifically focuses on training and support in the ICT sector, along with training in administration, bookkeeping, management and program facilitation - with both digital materials and in-person delivery.

[59] "Nunavut Agreement." *Nunavut Tunngavik Incorporated*. N.p., n.d. Web. 12 Dec. 2018. <https://nlca.tunngavik.com/>
[60] "Nunavut Agreement: Article 23." *Nunavut Tunngavik Incorporated*. N.p., n.d. Web. 12 Dec. 2018. <https://nlca.tunngavik.com/?page_id=2301>

In addition to the types of education and employment plans that stakeholders organizations in this project already have in place, we developed employment strategies modeled on the Government of Nunavut's own hiring policies which put priority on Inuit hiring and are rooted in Part 4 and 5 of Article 23 of the Inuit Employment Plan.

Article 24: Government Contracts[61]*:* This Article will govern how the KMN project commits to administering and distributing any government funds. We will actively seek out and encourage Inuit firm involvement as primary partners in delivery, and support local businesses. While much of the NLCA is designed to discuss the interaction between Inuit and various levels of Government, the spirit of the agreement remains relevant and vital to what we are aiming to do. Respect for the NLCA in the implementation of the Katinnganiq project is paramount.

Community Employment Benefit

Implementation of this initiative will adhere to and complement the CEB as outlined by Infrastructure Canada. Our implementation of the Nunavut Land claims Agreement will address both employment and procurement opportunities for Indigenous peoples (specifically Inuit) and Inuit firms throughout the life of this project. At the same time, we will encourage and support the participation of women (and Inuit women in particular) in leadership positions influencing both the design, management and delivery of programs.

At the same time, our proposal carries with it a strong emphasis on capacity building programs for youth, which will be more concretely integrated into career opportunities through internships programs with the KMN and within each community. The Pinnguaq Association will support internships (where applicable and in-line with eligibility criteria) through the delivery of the Digital Skills for Youth internship wage-matching program it administers on behalf of ISED. Other wage-subsidy programs (like those that exist as part of Canada's Youth Employment Strategy, and the Kakivak Association), will be sought after to support internships, mentorships, apprenticeships and youth leadership.

With at least 5 staff positions at the KMN not for profit, and 2 positions at each Makerspace, along with possible interns, this initiative has the potential to create a significant amount of employment opportunities and economic development in the territory. While the Makerspace and te(a)ch program both host content targeted at adults, it is designed with K-12 youth in mind. Some of the most prevalent feedback we've received in our community consultation was around the need for consistent and positive youth programming. Coupled with our focus on health and wellness, this project is well positioned to provide that.

The very existence of the proposed program and the infrastructure it will create serves as a boon to small and medium businesses, as well as social enterprises. Already in the six months since the Iqaluit Makerspace opened we have welcomed in small businesses and shared both what we can offer to them, but more importantly, what they can offer to our attendees. This project is about supporting the already vibrant culture of innovation in the territory.

As it relates to reporting on these statistics and the stories that accompany them, Katinnganiq is committed to expanding on them as part of the performance measurement framework outlined in Chapter 3.

[61] "Nunavut Agreement: Article 24." *Nunavut Tunngavik Incorporated*. N.p., n.d. Web. 12 Dec. 2018.

Chapter 9: Financial

This chapter provides a detailed financial breakdown of a five-year implementation plan for this initiative. In serving 25 unique communities, we recognize that the prize of $10 million dollars will not cover the costs of independently opening and sustaining fully realized makerspaces in 25 communities throughout five years. The prize of $10 Million will be a substantive amount that will help launch this initiative, but as has been the focus throughout this proposal, the end goal we seek is one of financial sustainability beyond the timeline of this grant, predicated on a multi-level collaborative framework that breaks down silos and harnesses community, territorial and national efforts and capacities to support the outcomes of this project.

The KMN's role in this sense is key to attracting more funding from municipal, territorial, federal and private/corporate dimensions, and integrating this support while working with each community to create local capacities for the long-term maintenance of community makerspaces. With the mission to serve each community, we have included those projections into the design of a 5-year budget plan that allocates the $10 million dollars in start up costs for both the KMN Not For Profit, as well as for 24 individual makerspaces[62], in a phased sequence, spread out as follows:

- FY 2019-2020: KMN Not-for-profit, 4 Makerspaces
- FY 2020-2021: KMN Not-for-profit, 5 Makerspaces
- FY 2021-2022: KMN Not-for-profit, 5 Makerspaces
- FY 2022-2023: KMN Not-for-profit, 5 Makerspaces
- FY 2023-2024: KMN Not-for-profit, 5 Makerspaces

This phased approach will see implementations in each community in ways that respond to their resources, capacity and readiness, with the KMN allocating the funds accordingly. In this budget, estimates are allocated each year to a group of 4 or 5 communities (depending on the year) for start up costs, with the projection that in subsequent years, Makerspaces will be running with additional funding provided collectively by local municipalities, a local organization, as well as by KMN funds obtained through additional fundraising efforts beyond that of this prize. The estimates included in this budget are based on the following assumptions:

Salaries

Due to the high cost of living in Nunavut (high housing rents, high cost of food, and high utility costs), an average salary in Nunavut needs to adequately reflect a living wage. According to payscale.com an average salary in Nunavut is $72,715[63], while an average

[62] *The Iqaluit Makerspace has not been budgeted for because start-up funds have already been directed to it from the preliminary application grant, and though it will remain part of the Katinnganiq Makerspace Network, it will be managed and funded by the Pinnguaq Association.*

[63] "Average Salary in Iqaluit, Nunavut, Canada." *PayScale*. N.p., n.d. Web. 27 Feb. 2019.

salary at the GN is $99,000[64](not including staff housing). To remain competitive, KMN and local Makerspace salaries are budgeted to receive market rate salaries that correspond with their duties and responsibilities, and their respective FT or PT commitments. For the first year, salaries have been prorated with the assumption of a September start date

KMN Operations Manual

As a new not-for-profit organization providing ongoing support, the development of an operations manual will be an essential tool for its success, and the success of local Makerspaces. It will outline managerial, financial, and administrative processes, develop statement of values, ethics and operating principles, internal and human resources policies, and others as outlined in the project management chapter. We have budgeted $30,000 in smart cities award costs to hire an experienced consulting firm, along with $20,000 in in-kind labour from the 4 collaborating organizations to produce these deliverables in a reasonable timeframe.

Rent and Utilities

Though office space in most urban centers is high, the context in Nunavut also includes the added challenge of scarcity. Available spaces are scarce, and as much as we will work to combine resources wherever possible, we have projected an annual rent of $60,000.00 (or a monthly fee of $5,000.00) in each community (based on the rent paid for the Iqaluit Makerspace from August 2018 to February 2019). For the first year, rent and utilities costs have been prorated to 75% of the full costs to account for the timing of Makerspace deployment in the late summer, early fall.

Internet

The internet context in Nunavut has been addressed throughout this proposal and more specifically in the technology chapter. Independent of our initiatives, each makerspace will offer a wireless internet connection purchased by one of the Internet Service Providers available in each community. For example, SSi Micro/Qiniq offers Internet Plans in every community of 150Gb at 5Mbps for a monthly fee of $399.00, before tax; and over usage prices of $120 per 10Gb. Northwestel is not available in every community just yet, but are mandated to offer their services in all communities by the end of 2019 through Telesat's new Ka-band high throughput satellite. Right now, in Cambridge Bay or Iqaluit for example, their monthly plans for 100Gb are priced at $129/month before tax, with over usage fees at an extra $4/Gb. We have budgeted an average annual fee of $4,800 (or $400 monthly) for enough bandwidth to support Makerspace users in each community. Though we see these fees adapting with the changing connectivity landscape over the next few years.

<https://www.payscale.com/research/CA/Location=Iqaluit-Nunavut/Salary>

[64] "Average Government of Nunavut Salary." *PayScale*. N.p., n.d. Web. 27 Feb. 2019. <https://www.payscale.com/research/CA/Employer=Government_of_Nunavut/Salary>

Travel

Travel to and within the territories is prohibitively expensive. Nunavut's land area is 1,936,113 sq. km (or 20% of Canada's land mass), with 25 fly-in only communities. For example, one return flight from Iqaluit to Ottawa in September of 2019 costs, at the lowest price, $1,585.00[65]. Airfare from Iqaluit to Cambridge Bay costs approx $3,448.00 and a ticket from Cambridge Bay to Kugluktuk is priced at $1,704.00. An annual budget of $50,000 for the KMN Not-for-profit will be able to support consultation, implementation and performance measurement.

Evaluation

Evaluation is a key aspect of measuring the performance and outcomes of this initiative. We have budgeted for a bi-annual independent evaluation to be undertaken in accordance with funder requirements to assess the performance of this initiative as a whole. Simultaneously, in the first year we have budgeted $25,000.00 for the development of a comprehensive evaluation framework that will work with communities to further develop the key performance indicators that have been set out in this proposal, along with the development of the evaluations tools and materials appropriate to this context.

At the same time we have budgeted annually to carry out data collection, analysis and reporting

Curriculum Development, Facilitation and Training

Much of the curriculum development involved in this initiative has and is being produced by the Pinnguaq Association, with funding confirmed from other granting programs (such as ISED's CanCode and Digital Literacy Exchange Programs), as well as through support from various partners. As the curriculum and learning resources are expanded to serve this project and each community's needs, we anticipate that there will be a need to adapt and create materials that respond to a specific demand. With a focus on digital literacy for adults as well as Elder-led curriculum, Pinnguaq will leverage its resources to support this initiative - while responding to the demand of its services with smart cities funds where needed through nominal fees.

The Embrace Life Council staff will provide training in ASIST and Trauma-informed practice for Makerspace staff. Based on their registration and facilitation fees, we have budgeted $5,000 per training session, per community.

KMN Digital Network Architecture

The development and deployment of the Network Architecture has been quoted at $60,000.00 for its development and deployment, with an additional $10,000.00 quoted for

[65] *Flights priced through Expedia.ca on February 27, 2019 for travel between September 17 - 29, 2019.*

the preparation of curriculum and learning materials regarding its management and maintenance.

Startup Materials

Each Makerspace will require a set of startup materials to run its programs. With the assistance of programs like Computer for Success Nunavut, Computers for Success Canada, and Computers for Schools we can provide in-kind refurbished government laptops to each space. A selection of additional materials that will be essential for running programs include high capacity desktops, VR headsets, VR Camera, high end 3D printer, 3D scanner, inkjet printer/cutter, document cameras, speakers, DSLR cameras, video cameras, speakers, art supplies, hand and carving tools, books, robotics tools (dash and dot), and electronic learning materials (Makey Makey sets, Lego Mindstorms, Elenco Snap Circuits, MicroBits, Raspberry Pi's, and Arduino, along with other basic materials, like conductive thread, wires, LED lights, etc). With a budget of $40,000 for start up costs, each community space, with assistance from KMN can procure the tools and materials that are right for them.

Internet Exchange Points (Arctic Internet Exchange)

The cost of an IXP Nunavut is primary based on the accessibility to a data centre. If the GN or one of the ISPs (Northwestel or SSI Micro) will donate or rent Arctic Internet Exchange space in their data centre, the setup costs can be as little as $10,000 in each community. If a data centre is required, the most cost effective option will be one of Nuvujaq's 2 data centres, which will cost roughly $200K including installation. Nuvujaq will have a data centre in Iqaluit (funded through other means) this spring and has another data centre available to deploy in the community makerspace. At the same time, the equipment needed to setup an IXP at a data centre (1 switch, 2 routers) is priced at $10,000 for each setup. Additional IXP setup labour and training delivery will cost $10,000 per instalment.

Other Sources of Funding

The Finance Committee of the KMN Board, along with the Executive Director, the Finance Director, and the Development Coordinator the KMN will be an organization capable of fundraising to further support this mission at the federal, and territorial levels, while also working with the private sector. Expressions of interest from non-government funders have been positive. We have had a positive rapport with the Internet Society and CIRA, both of whom have funding programs. We have relationships with Google and Microsoft, and will also be pursuing funding from RBC Future launch and TD Ready Commitment. We will also be pursuing wage matching internship programs from Kavikak Association, or the Digital Skills for Youth program (administered by Pinnguaq association) and the Technical Work Experience Program (TWEP), which is administered by Computers for Schools (CFS) and part of Canada's Youth Employment Strategy.

In general, with funding for a Finance director and fundraiser, we will be utilizing an accrual method of account, performing annual audits, and building a fundraising campaign to further sustain this initiative beyond lifetime of this grant.

Risks

The major financial risks of this project rests in being able to secure the support from other sources of funding to be able to provide a sustainable path forward for each community makerspace. The mitigation strategy for this major risk factor is addressed throughout this proposal, and it includes a strong vision, governance framework, and project management strategy (including performance measurement) that builds in costs for fundraising and development. The strong leadership and management of the KMN will centralize fundraising to further support local Makerspaces, while also assisting in applying for and sourcing funding at the local level.

Finalist Grant

Smart Cities Challenge		Report on $250K Grant to March 2018
	Total	**Details**
Outreach Coordinator Salary		
Outreach Coordinator Salary	$38,000	*Chelsea Singooriee/Nunabox Media*
Subtotal	$38,000	
Outreach + Consultation		
Room booking fees, door prizes, snacks + refreshments for community sessions + live interpretation fees	$3,120	*Bookings and Cancellation fees at Pond Inlet, Pangnirtung and Qikiqtarjuaq*
Subtotal	$3,120	
Travel, Accomodations, Per Diems		
Travel to Iqaluit, Pond Inlet, Pangnirtung, Qikiqtarjuaq communities for outreach	$11,380	*Team of 2 people*
Travel to Jury Presentation	$4,200	*Pinnguaq, ELC, + QHRC (1 rep each)*
Travel to NAM AGM	$6,800	*Team of 2.5 (1.5 of team financed through Pinnguaq)*
Travel to Arviat for Curriculum Development consultation	$5,000	*(some additional fees also supported by Pinnguaq)*
Travel to Ottawa for CIRA/IXP meeting	$2,925	*Team of 2 (Pinnguaq + QHRC)*
Subtotal	$30,305	

Marketing		
Website	$4,000	
Branding	$1,500	Nunavut Artist hired for logo design
Communications/Advertising/Design	$2,800	
Subtotal	$8,300	

Translation		
Translation of project brief	$1,200	
Translation of press release	$1,200	
Translation of preliminary proposal	$3,475	
Translation of brochures, website and other outreach material	$2,600	
Translation of Final Proposal and Video	$7,000	Budget for Translation to be done after March 5th
Subtotal	$15,475	

Pilot of Mesh Network		
Equipment	$3,000	
Research		in-kind Fleming Student project
Coordination of Fleming students	$2,000	
Subtotal	$5,000	

Administration		
Administration overhead	$27,000	$6,750 for each of the four partner organizations
Advisory committee	$2,800	*$200 fee per meeting per Advisory Committee Member (7 members total)*
Subtotal	$29,800	

Final Proposal Development		
Research and Proposal Development labour	$30,000	
3rd Party Consultants fee	$30,000	*Hired Consultant Team*
Subtotal	$60,000	

Makerspace Pilot		
Rent, Utilities	$30,000	*$5,000 a month for 6 months*
Basic furnishings		Pinnguaq in-kind
Hardware (computers)		Pinnguaq in-kind
Staff Salaries contribution	$30,000	*Pinnguaq supported most salary costs in-kind*
Software/Tools		Pinnguaq in-kind
Subtotal	$60,000	
TOTAL	**$250,000**	

The months of preparing this proposal with support of the finalist funding was a mix of practical research and development, along with the installment of a pilot Makerspace in Iqaluit, and travel and consultation. The $250,000 provided for the finalist phase was used consistently with the budget proposed with one major change, and adjustments for actual scope of expenditures. The major adjustment was in the redirection of funds budgeted for mesh network research and implementation, to the hiring of a consultant firm to assist in the writing of the final proposal. What follows is a description of the funds that were spent.

Outreach Coordinator: $38,000

An outreach coordinator for the project was hired in early November 2018, bringing on Chelsea Singoorie of Nunabox Media to the project. Chelsea, a trilingual Inuk from Pond Inlet brought a knowledge of not only the communities we were visiting as apart of this project but also extensive community development experience through her experiences with Nunabox. Chelsea travelled across Nunavut hosting consultations and helping craft the final project based on the feedback of those we met with.

Outreach and Consultation: $3,120

Originally, a budget line of $15,000 was created specifically to provide funding for participation in our consultation. This included to pay for room bookings, the purchase of prize giveaways for our consultations and honorarium for specific consultations. Creating incentives for participation is a standard practice in Nunavut consultation and this budget was expended in that fashion, however, it was significantly reduced due to the limited time for travel, concurrent with the writing of this application for our staff.

Travel: $30,305

Nunavut is the most expensive place to travel in Canada, with some community visits running close to $10,000 for a two day session. The $40,000 in the travel that was originally

budgeted was reduced due to reduced travel and the combination of additional funding through Pinnguaq's te(a)ch program to consultation and te(a)ch workshops We ended up being able to visit;

- Pangnirtung
- Pond Inlet
- Arviat and;
- Cambridge Bay

It also included funding for Katinnganiq members to consult at major meetings in Ottawa and Toronto both with the purpose of bringing on additional partnerships to help compliment the initiative.

Marketing: $8,300

Promotion of the initiative was vital throughout the process and this included the development of a website, a new logo for the initiative and Facebook/social media outreach. Facebook is the most popular form of communications in Nunavut and the purchase of advertising through the service was a key part of spreading the word to those that could not attend.

Translation: $15,475

Our primary audience for this project is Inuktitut speaking and a $14,000 translation budget was created to ensure that all project materials are available in Inuktitut. Our news, alerts, project briefs and project proposal documents are all translated and available in English/Inuktitut, as is the website.

Pilot of the Mesh Network: $5,000

Pinnguaq partnered directly with Sir Sanford Fleming College in Peterborough, Ontario to bring on four students of the Wireless Network Technology program to explore Mesh Networks. These students, along with staff from Pinnguaq, conducted research on Mesh Networks, and some experiments to determine the value of bringing Mesh Networks to this project.

As is explored in this proposal, this research, along with input and expertise from Nunageek Solutions Inc and Nuvujaq, ultimately highlighted the flaws on any heavy reliance on Mesh Network in this proposal and this is why it has been scaled down so significantly.

Administration: $29,800

An Administration budget was created to cover the costs of the four key organizations involved. Nunavut Association of Municipalities, Qaujigiartiit Health Research Centre, Embrace Life Council and Pinnguaq all received $6,750.00 each to help cover administration of the

project. Another $2,800 was put aside for the Advisory Committee to support their involvement.

Research and Final Proposal Development: $60,000

This funding covered the actual writing of the proposal. This primarily was absorbed in wages but also in the hiring of the consultant firm Nordicity who came on to help finalize the proposal.

Pilot Makerspace: $60,000

$60,000 was provided to the Pinnguaq Iqaluit Makerspace to help cover the costs of operating the space in 2018/2019 as apart of the pilot project. This included rent, utilities and wage subsidies. The space helped shape the direction of this project more than any other individual initiative. Pinnguaq contributed an additional costs for salaries, furniture, and materials between September 2018 and March 2019 to support the staff and the space itself.

6. Budget FY 2019-2020

a) KMN

Labour and Salaries

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total	
1	Executive Director	1 FTE	$45,000.00	KMN	$45,000.00		$45,000.00	Assuming September 2019 Start Date
1	Financial Director/Fundraiser	1 PTE	$45,000.00	KMN	$45,000.00		$45,000.00	Assuming September 2019 Start Date
1	IT Manager(Data Center/IXP/KMN Digital Platform)	1 FTE	$45,000.00	KMN	$45,000.00		$45,000.00	Assuming September 2019 Start Date
1	Content/Curriculum Development Manager	1 PTE	$45,000.00	KMN	$45,000.00		$45,000.00	Assuming September 2019 Start Date
1	Outreach and Engagement Coordinator	1 PTE	$25,000.00	KMN	$25,000.00		$25,000.00	Assuming September 2019 Start Date
Subtotal Labour and Salaries					**$205,000.00**	**$0.00**	**$205,000.00**	

Materials

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total	
1	Operations Manual	Documents on processes, agreements, charter, non-profit registrations, internal policies	$50,000.00	KMN/Consultant	$30,000.00	$20,000.00	$50,000.00	In Kind contribution from all partners + consultant fees
1	Network Manual	Development of network training manual	$10,000.00	Pinnguaq	$10,000.00		$10,000.00	
							$0.00	
							$0.00	
							$0.00	
Subtotal Materials					**$40,000.00**	**$20,000.00**	**$60,000.00**	

Subcontracts and Consultants

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total	
1	Curriculum Development	Adult learning, and Elder-led curriculum	$200,000.00	Pinnguaq	$50,000.00	$150,000.00	$200,000.00	in-kind from Pinnguaq
1	Evaluation Framework	Further development of indicators and development of materials	$25,000.00	QHRC	$25,000.00		$25,000.00	

1	KMN Digital Network Architecture	Development of Network Architecture (user accounts, user forum, network storage, local source control repository)	$60,000.00	Pinnguaq	$60,000.00		$60,000.00	
Subtotal Subcontracts and Consultants					**$135,000.00**	**$150,000.00**	**$285,000.00**	

Administration

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total	
1	Office Space Rent	Annual Rent for a space shared with the Iqaluit Makerspace	$76,800.00	KMN/Pinnguaq	$24,000.00	$52,800.00	$76,800.00	in-kind from Pinnguaq
1	Internet Connection	annual cost	$1,800.00	KMN	$1,800.00		$1,800.00	
1	Office Supplies	annual cost	$1,000.00	KMN	$1,000.00		$1,000.00	
1	Performance Evaluation	Data collection and KPI measurements	$65,000.00	KMN/QHRC	$65,000.00		$65,000.00	
Subtotal Administration					**$91,800.00**	**$52,800.00**	**$144,600.00**	

Instructor Training or Professional Development

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
Subtotal Instructor Training or Professional Development					**$0.00**	**$0.00**	**$0.00**

Other Costs

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
	Travel	Travel to communities for consultation and implementation	$50,000.00		$50,000.00		$50,000.00
Subtotal Other Costs					**$50,000.00**	**$0.00**	**$50,000.00**

KMN SUBTOTAL					**$521,800.00**	**$222,800.00**	**$744,600.00**	
b) Community Makerspace								
Labour and Salaries								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
4	Executive Director	1 FTE at each local Makerspace (5 in a year)	$45,000.00	KMN-L	$180,000.00		$180,000.00	Assuming September 2019 Start Date
4	Program Facilitator/Head Instructor	1 FTE at each local Makerspace (5 in a year)	$40,000.00	KMN-L	$160,000.00		$160,000.00	Assuming September 2019 Start Date
Subtotal Labour and Salaries					**$340,000.00**	**$0.00**	**$340,000.00**	
Materials								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
4	Startup Materials	(High capacity desktops, Basic Furnishings, Art Supplies, Robotics Tools, VR equipment, books, 3D printer, etc) list to be compiled collaboratively with each makerspace	$35,000.00	KMN-L	$140,000.00		$140,000.00	
4	Laptops (set of 25)	CFS laptops for Makerspaces	$10,000.00	CFS		$40,000.00	$40,000.00	In kind from Computer for Success Nunavut (CFS)
2	Nuvujaq Data Centers		$200,000.00	Nuvujaq		$400,000.00	$400,000.00	in-Kind from Nuvujaq
3	Space rental on Existing Data Center	Rented on Northwestel/Ssi Micro/Nuvujaq data centers	$10,000.00	Nuvujaq	$30,000.00	$0.00	$30,000.00	
5	IXP equipment (1 Switch, 2 router servers)		$10,000.00	Nuvujaq	$50,000.00		$50,000.00	
Subtotal Materials					**$220,000.00**	**$440,000.00**	**$660,000.00**	
Subcontracts and Consultants								

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total	
Subtotal Subcontracts and Consultants					**$0.00**	**$0.00**	**$0.00**	
Administration								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
4	Rent	Annual costs	$40,000.00	KMN-L	$160,000.00		$160,000.00	
4	Heating	Annual costs	$3,000.00	KMN-L	$12,000.00		$12,000.00	
4	Electricity	Annual costs	$1,500.00	KMN-L	$6,000.00		$6,000.00	
4	Internet	Annual costs	$3,500.00	KMN-L	$14,000.00		$14,000.00	
Subtotal Administration					**$192,000.00**	**$0.00**	**$192,000.00**	
Instructor Training or Professional Development								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
4	Admin/Management /Financial		$6,000.00	KMN	$24,000.00		$24,000.00	
4	Te(a)ch facilitation training		$15,000.00	Pinnguaq	$40,000.00	$20,000.00	$60,000.00	in-kind from Pinnguaq
4	ASIST Training		$5,000.00	Embrace Life Council	$20,000.00		$20,000.00	
4	Trauma-informed practice Training		$5,000.00	Embrace Life Council	$20,000.00		$20,000.00	
4	KMN Digital Network Setup & Training program		$10,000.00	Pinnguaq	$40,000.00		$40,000.00	
5	IXP Setup and Training program		$10,000.00	Nuvujaq	$40,000.00	$10,000.00	$50,000.00	
Subtotal Instructor Training or Professional Development					**$184,000.00**	**$30,000.00**	**$214,000.00**	
Other Costs								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
Subtotal Other Costs					**$0.00**	**$0.00**	**$0.00**	
Community Makerspace SUBTOTAL					**$936,000.00**	**$470,000.00**	**$1,406,000.00**	

Project Budget TOTAL (FY 2019-2020)					**$1,457,800.00**	**$692,800.00**	**$2,150,600.00**				
Project Budget Total Year to Date					**$1,457,800.00**	**$692,800.00**	**$2,150,600.00**				

6. Budget FY 2020-2021

a) KMN

Labour and Salaries

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
1	Executive Director	1 FTE	$90,000.00	KMN	$90,000.00		$90,000.00
1	Financial Director/Fundraiser	1 PTE	$90,000.00	KMN	$90,000.00		$90,000.00
1	IT Manager(Data Center/IXP/KMN Digital Platform)	1 FTE	$90,000.00	KMN	$90,000.00		$90,000.00
1	Content/Curriculum Development Manager	1 PTE	$90,000.00	KMN	$90,000.00		$90,000.00
1	Outreach and Engagement Coordinator	1 PTE	$50,000.00	KMN	$50,000.00		$50,000.00
Subtotal Labour and Salaries					**$410,000.00**	**$0.00**	**$410,000.00**

Materials

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
Subtotal Materials					**$0.00**	**$0.00**	**$0.00**

Subcontracts and Consultants

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
1	Curriculum Development	Adult learning, and Elder-led curriculum	$53,000.00	Pinnguaq	$28,000.00	$25,000.00	$53,000.00
Subtotal Subcontracts and Consultants					**$28,000.00**	**$25,000.00**	**$53,000.00**

Administration

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
1	Office Space Rent	Annual Rent for a space shared with the Iqaluit Makerspace	$80,000.00	KMN/Pinnguaq	$26,000.00	$54,000.00	$80,000.00
1	Internet Connection	annual cost	$2,000.00	KMN	$2,000.00		$2,000.00
1	Office Supplies	annual cost	$1,000.00	KMN	$1,000.00		$1,000.00

1	Performance Evaluation	Data collection and KPI measurements & external evaluation	$85,000.00	KMN/QHRC	$85,000.00		$85,000.00	
Subtotal Administration					**$114,000.00**	**$54,000.00**	**$168,000.00**	
Instructor Training or Professional Development								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
Subtotal Instructor Training or Professional Development					**$0.00**	**$0.00**	**$0.00**	
Other Costs								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
	Travel	Travel to communities for consultation and implementation	$50,000.00		$50,000.00		$50,000.00	
Subtotal Other Costs					**$50,000.00**	**$0.00**	**$50,000.00**	
KMN SUBTOTAL					**$602,000.00**	**$79,000.00**	**$681,000.00**	
b) Community Makerspace								
Labour and Salaries								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
9	Executive Director	1 FTE at each local Makerspace (5 in a year)	$90,000.00	KMN-L	$450,000.00	$360,000.00	$810,000.00	costs absorbed by KMN-L or through other sources of funding obtained by KMN
9	Program Facilitator/Head Instructor	1 FTE at each local Makerspace (5 in a year)	$80,000.00	KMN-L	$400,000.00	$320,000.00	$720,000.00	costs absorbed by KMN-L or through other sources of funding obtained by KMN
Subtotal Labour and Salaries					**$850,000.00**	**$680,000.00**	**$1,530,000.00**	
Materials								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	

5	Startup Materials	(High capacity desktops, Basic Furnishings, Art Supplies, Robotics Tools, VR equipment, books, 3D printer, etc) list to be compiled collaboratively with each makerspace	$35,000.00	KMN-L	$175,000.00		$175,000.00	
5	Laptops (set of 25)	CFS laptops for Makerspaces	$10,000.00	CFS/Pinnguaq		$50,000.00	$50,000.00	in-kind from CFS
3	Space rental on Existing Data Center	Rented on Northwestel/Ssi Micro data centers	$10,000.00		$30,000.00		$30,000.00	
Subtotal Materials					**$205,000.00**	**$50,000.00**	**$255,000.00**	

Subcontracts and Consultants

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total	
Subtotal Subcontracts and Consultants					**$0.00**	**$0.00**	**$0.00**	

Administration

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total	
9	Rent	Annual costs	$60,000.00	KMN-L	$300,000.00	$240,000.00	$540,000.00	costs absorbed by KMN-L or through other sources of funding obtained by KMN
9	Heating	Annual costs	$4,000.00	KMN-L	$20,000.00	$16,000.00	$36,000.00	costs absorbed by KMN-L or through other sources of funding obtained by KMN
9	Electricity	Annual costs	$2,000.00	KMN-L	$10,000.00	$8,000.00	$18,000.00	costs absorbed by KMN-L or through other sources of funding obtained by KMN
9	Internet	Annual costs	$4,800.00	KMN-L	$24,000.00	$19,200.00	$43,200.00	costs absorbed by KMN-L or through other sources of funding obtained by KMN
Subtotal Administration					**$354,000.00**	**$283,200.00**	**$637,200.00**	

Instructor Training or Professional Development

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total	
5	Admin/Management/Financial		$6,000.00	KMN	$30,000.00		$30,000.00	
5	Te(a)ch facilitation training		$5,000.00	Pinnguaq		$25,000.00	$25,000.00	in-kind from Pinnguaq
5	ASIST Training		$5,000.00	Embrace Life Council	$25,000.00		$25,000.00	
5	Trauma-informed practice Training		$5,000.00	Embrace Life Council	$25,000.00		$25,000.00	

5	KMN Digital Network Setup & Training program		$10,000.00	Pinnguaq	$40,000.00	$10,000.00	$50,000.00	in-kind from Pinnguaq
Subtotal Instructor Training or Professional Development					**$120,000.00**	**$35,000.00**	**$155,000.00**	
Other Costs								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
Subtotal Other Costs					**$0.00**	**$0.00**	**$0.00**	
Community Makerspace SUBTOTAL					**$1,529,000.00**	**$1,048,200.00**	**$2,577,200.00**	
Project Budget TOTAL (FY 2020-2021)					**$2,131,000.00**	**$1,127,200.00**	**$3,258,200.00**	
Project Budget Total Year to Date					**$3,588,800.00**	**$1,820,000.00**	**$5,408,800.00**	

6. Budget FY 2021-2022

a) KMN

Labour and Salaries

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
1	Executive Director	1 FTE	$90,000.00	KMN	$90,000.00		$90,000.00
1	Financial Director/Fundraiser	1 PTE	$90,000.00	KMN	$90,000.00		$90,000.00
1	IT Manager(Data Center/IXP/KMN Digital Platform)	1 FTE	$90,000.00	KMN	$90,000.00		$90,000.00
1	Content/Curriculum Development Manager	1 PTE	$90,000.00	KMN	$90,000.00		$90,000.00
1	Outreach and Engagement Coordinator	1 PTE	$50,000.00	KMN	$50,000.00		$50,000.00
Subtotal Labour and Salaries					**$410,000.00**	**$0.00**	**$410,000.00**

Materials

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
Subtotal Materials					**$0.00**	**$0.00**	**$0.00**

Subcontracts and Consultants

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
1	External Evaluation	Annual	$30,000.00	Consultants	$50,000.00		$50,000.00
Subtotal Subcontracts and Consultants					**$50,000.00**	**$0.00**	**$50,000.00**

Administration

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total	
1	Office Space Rent	Annual Rent for a space shared with the Iqaluit Makerspace	$84,000.00	KMN/Pinnguaq	$28,000.00	$56,000.00	$84,000.00	in-kind from Pinnguaq
1	Internet Connection	annual cost	$2,200.00	KMN	$2,200.00		$2,200.00	
1	Office Supplies	annual cost	$1,000.00	KMN	$1,000.00		$1,000.00	

1	Performance Evaluation	Data collection and KPI measurements & external evaluation	$85,000.00	KMN/QHRC	$85,000.00		$85,000.00	
Subtotal Administration					**$116,200.00**	**$56,000.00**	**$172,200.00**	
Instructor Training or Professional Development								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
Subtotal Instructor Training or Professional Development					**$0.00**	**$0.00**	**$0.00**	
Other Costs								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
	Travel	Travel to communities for consultation and implementation	$50,000.00		$50,000.00		$50,000.00	
Subtotal Other Costs					**$50,000.00**	**$0.00**	**$50,000.00**	
KMN SUBTOTAL					**$626,200.00**	**$56,000.00**	**$682,200.00**	
b) Community Makerspace								
Labour and Salaries								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
14	Executive Director	1 FTE at each local Makerspace (5 in a year)	$90,000.00	KMN-L	$450,000.00	$810,000.00	$1,260,000.00	costs absorbed by KMN-L or through other sources of funding obtained by KMN
14	Program Facilitator/Head Instructor	1 FTE at each local Makerspace (5 in a year)	$80,000.00	KMN-L	$400,000.00	$720,000.00	$1,120,000.00	costs absorbed by KMN-L or through other sources of funding obtained by KMN
Subtotal Labour and Salaries					**$850,000.00**	**$1,530,000.00**	**$2,380,000.00**	
Materials								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	

5	Startup Materials	(High capacity desktops, Basic Furnishings, Art Supplies, Robotics Tools, VR equipment, books, 3D printer, etc) list to be compiled collaboratively with each makerspace	$35,000.00	KMN-L	$175,000.00		$175,000.00	
5	Laptops (set of 25)	CFS laptops for Makerspaces	$10,000.00	CFS/Pinnguaq		$50,000.00	$50,000.00	in-kind from CFS
3	Space rental on Existing Data Center	Rented on Northwestel/Ssi Micro data centers	$10,000.00		$30,000.00		$30,000.00	
Subtotal Materials					**$205,000.00**	**$50,000.00**	**$255,000.00**	
Subcontracts and Consultants								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
Subtotal Subcontracts and Consultants					**$0.00**	**$0.00**	**$0.00**	
Administration								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
14	Rent	Annual costs	$60,000.00	KMN-L	$300,000.00	$540,000.00	$840,000.00	costs absorbed by KMN-L or through other sources of funding obtained by KMN
14	Heating	Annual costs	$4,000.00	KMN-L	$20,000.00	$36,000.00	$56,000.00	costs absorbed by KMN-L or through other sources of funding obtained by KMN
14	Electricity	Annual costs	$2,000.00	KMN-L	$10,000.00	$18,000.00	$28,000.00	costs absorbed by KMN-L or through other sources of funding obtained by KMN
14	Internet	Annual costs	$4,800.00	KMN-L	$24,000.00	$43,200.00	$67,200.00	costs absorbed by KMN-L or through other sources of funding obtained by KMN
Subtotal Administration					**$354,000.00**	**$637,200.00**	**$991,200.00**	
Instructor Training or Professional Development								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
5	Admin/Management /Financial		$6,000.00	KMN	$30,000.00		$30,000.00	
5	Te(a)ch facilitation training		$5,000.00	Pinnguaq		$25,000.00	$25,000.00	in-kind from Pinnguaq
5	ASIST Training		$5,000.00	Embrace Life Council	$25,000.00		$25,000.00	
5	Trauma-informed practice Training		$5,000.00	Embrace Life Council	$25,000.00		$25,000.00	

5	KMN Digital Network Setup & Training program		$10,000.00	Pinnguaq	$40,000.00	$10,000.00	$50,000.00	in-kind from Pinnguaq
Subtotal Instructor Training or Professional Development					**$120,000.00**	**$35,000.00**	**$155,000.00**	
Other Costs								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
Subtotal Other Costs					**$0.00**	**$0.00**	**$0.00**	
Community Makerspace SUBTOTAL					**$1,529,000.00**	**$2,252,200.00**	**$3,781,200.00**	
Project Budget TOTAL (FY 2021-2022)					**$2,155,200.00**	**$2,308,200.00**	**$4,463,400.00**	
Project Budget Total Year to Date					**$5,744,000.00**	**$4,128,200.00**	**$9,872,200.00**	

6. Budget FY 2022-2023

a) KMN

Labour and Salaries

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
1	Executive Director	1 FTE	$90,000.00	KMN	$90,000.00		$90,000.00
1	Financial Director/Fundraiser	1 PTE	$90,000.00	KMN	$90,000.00		$90,000.00
1	IT Manager(Data Center/IXP/KMN Digital Platform)	1 FTE	$90,000.00	KMN	$90,000.00		$90,000.00
1	Content/Curriculum Development Manager	1 PTE	$90,000.00	KMN	$90,000.00		$90,000.00
1	Outreach and Engagement Coordinator	1 PTE	$50,000.00	KMN	$50,000.00		$50,000.00
Subtotal Labour and Salaries					**$410,000.00**	**$0.00**	**$410,000.00**

Materials

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
Subtotal Materials					**$0.00**	**$0.00**	**$0.00**

Subcontracts and Consultants

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
Subtotal Subcontracts and Consultants					**$0.00**	**$0.00**	**$0.00**

Administration

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total	
1	Office Space Rent	Annual Rent for a space shared with the Iqaluit Makerspace	$88,000.00	KMN/Pinnguaq	$30,000.00	$58,000.00	$88,000.00	in-kind from Pinnguaq
1	Internet Connection	annual cost	$2,400.00	KMN	$2,400.00		$2,400.00	
1	Office Supplies	annual cost	$1,000.00	KMN	$1,000.00		$1,000.00	

1	Performance Evaluation	Data collection and KPI measurements, and external evaluation	$85,000.00	KMN/QHRC	$85,000.00		$85,000.00	
Subtotal Administration					**$118,400.00**	**$58,000.00**	**$176,400.00**	
Instructor Training or Professional Development								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
Subtotal Instructor Training or Professional Development					**$0.00**	**$0.00**	**$0.00**	
Other Costs								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
	Travel	Travel to communities for consultation and implementation	$50,000.00		$50,000.00		$50,000.00	
Subtotal Other Costs					**$50,000.00**	**$0.00**	**$50,000.00**	
KMN SUBTOTAL					**$578,400.00**	**$58,000.00**	**$636,400.00**	
b) Community Makerspace								
Labour and Salaries								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
19	Executive Director	1 FTE at each local Makerspace (5 in a year)	$90,000.00	KMN-L	$450,000.00	$1,260,000.00	$1,710,000.00	costs absorbed by KMN-L or through other sources of funding obtained by KMN
19	Program Facilitator/Head Instructor	1 FTE at each local Makerspace (5 in a year)	$80,000.00	KMN-L	$400,000.00	$1,120,000.00	$1,520,000.00	costs absorbed by KMN-L or through other sources of funding obtained by KMN
Subtotal Labour and Salaries					**$850,000.00**	**$2,380,000.00**	**$3,230,000.00**	
Materials								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	

5	Startup Materials	(High capacity desktops, Basic Furnishings, Art Supplies, Robotics Tools, VR equipment, books, 3D printer, etc) list to be compiled collaboratively with each makerspace	$35,000.00	KMN-L	$175,000.00		$175,000.00	
5	Laptops (set of 25)	CFS laptops for Makerspaces	$10,000.00	CFS/Pinnguaq		$50,000.00	$50,000.00	in-kind from CFS
3	Space rental on Existing Data Center	Rented on Northwestel/Ssi Micro data centers	$10,000.00		$30,000.00		$30,000.00	
Subtotal Materials					**$205,000.00**	**$50,000.00**	**$255,000.00**	
Subcontracts and Consultants								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
Subtotal Subcontracts and Consultants					**$0.00**	**$0.00**	**$0.00**	
Administration								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
19	Rent	Annual costs	$60,000.00	KMN-L	$300,000.00	$840,000.00	$1,140,000.00	costs absorbed by KMN-L or through other sources of funding obtained by KMN
19	Heating	Annual costs	$4,000.00	KMN-L	$20,000.00	$56,000.00	$76,000.00	costs absorbed by KMN-L or through other sources of funding obtained by KMN
19	Electricity	Annual costs	$2,000.00	KMN-L	$10,000.00	$28,000.00	$38,000.00	costs absorbed by KMN-L or through other sources of funding obtained by KMN
19	Internet	Annual costs	$4,800.00	KMN-L	$24,000.00	$67,200.00	$91,200.00	costs absorbed by KMN-L or through other sources of funding obtained by KMN
Subtotal Administration					**$354,000.00**	**$991,200.00**	**$1,345,200.00**	
Instructor Training or Professional Development								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
5	Admin/Management /Financial		$6,000.00	KMN	$30,000.00		$30,000.00	
5	Te(a)ch facilitation training		$5,000.00	Pinnguaq		$25,000.00	$25,000.00	in-kind from Pinnguaq
5	ASIST Training		$5,000.00	Embrace Life Council	$25,000.00		$25,000.00	
5	Trauma-informed practice Training		$5,000.00	Embrace Life Council	$25,000.00		$25,000.00	

5	KMN Digital Network Setup & Training program		$10,000.00	Pinnguaq	$40,000.00	$10,000.00	$50,000.00	in-kind from Pinnguaq
Subtotal Instructor Training or Professional Development					**$120,000.00**	**$35,000.00**	**$155,000.00**	
Other Costs								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
Subtotal Other Costs					**$0.00**	**$0.00**	**$0.00**	
Community Makerspace SUBTOTAL					**$1,529,000.00**	**$3,456,200.00**	**$4,985,200.00**	
Project Budget TOTAL (FY 2022-2023)					**$2,107,400.00**	**$3,514,200.00**	**$5,621,600.00**	
Project Budget Total Year to Date					**$7,851,400.00**	**$7,642,400.00**	**$15,493,800.00**	

6. Budget FY 2023-2024

a) KMN

Labour and Salaries

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total	Notes
1	Executive Director	1 FTE	$90,000.00	KMN	$90,000.00		$90,000.00	
1	Financial Director/Fundraiser	1 PTE	$90,000.00	KMN	$90,000.00		$90,000.00	
1	IT Manager(Data Center/IXP/KMN Digital Platform)	1 FTE	$90,000.00	KMN	$90,000.00		$90,000.00	
1	Content/Curriculum Development Manager	1 PTE	$90,000.00	KMN	$90,000.00		$90,000.00	
1	Outreach and Engagem	1 PTE	$50,000.00	KMN	$50,000.00		$50,000.00	
Subtotal Labour and Salaries					**$410,000.00**	**$0.00**	**$410,000.00**	

Materials

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
Subtotal Materials					**$0.00**	**$0.00**	**$0.00**

Subcontracts and Consultants

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
1	External Evaluation	Annual	$30,000.00	Consultants	$50,000.00		$50,000.00
Subtotal Subcontracts and Consultants					**$50,000.00**	**$0.00**	**$50,000.00**

Administration

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total	
1	Office Space Rent	Annual Rent for a space shared with the Iqaluit Makerspace	$90,000.00	KMN/Pinnguaq	$31,000.00	$59,000.00	$90,000.00	in-kind from Pinnguaq
1	Internet Connection	Annual cost	$2,600.00	KMN	$2,600.00		$2,600.00	
1	Office Supplies	Annual cost	$1,000.00	KMN	$1,000.00		$1,000.00	
1	Performance Evaluation	Data collection and KPI measurements and external evaluation	$85,000.00	KMN/QHRC	$85,000.00		$85,000.00	

Subtotal Administration					**$119,600.00**	**$59,000.00**	**$178,600.00**	
Instructor Training or Professional Development								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
Subtotal Instructor Training or Professional Development					**$0.00**	**$0.00**	**$0.00**	
Other Costs								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
	Travel	Travel to communities for consultation and implementation	$50,000.00		$50,000.00		$50,000.00	
Subtotal Other Costs					**$50,000.00**	**$0.00**	**$50,000.00**	
KMN SUBTOTAL					**$629,600.00**	**$59,000.00**	**$688,600.00**	
b) Community Makerspace								
Labour and Salaries								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
24	Executive Director	1 FTE at each local Makerspace (5 in a year)	$90,000.00	KMN-L	$450,000.00	$1,710,000.00	$2,160,000.00	costs absorbed by KMN-L or through other sources of funding obtained by KMN
24	Program Facilitator/Head Instructor	1 FTE at each local Makerspace (5 in a year)	$80,000.00	KMN-L	$400,000.00	$1,520,000.00	$1,920,000.00	costs absorbed by KMN-L or through other sources of funding obtained by KMN
Subtotal Labour and Salaries					**$850,000.00**	**$3,230,000.00**	**$4,080,000.00**	
Materials								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	

5	Startup Materials	(High capacity desktops, Basic Furnishings, Art Supplies, Robotics Tools, VR equipment, books, 3D printer, etc) list to be compiled collaboratively with each makerspace	$35,000.00	KMN-L	$175,000.00		$175,000.00	
5	Laptops (set of 25)	CFS laptops for Makerspaces	$10,000.00	CFS/Pinnguaq		$50,000.00	$50,000.00	in-kind from CFS
3	Space rental on Existing Data Center	Rented on Northwestel/Ssi Micro data centers	$10,000.00		$30,000.00		$30,000.00	
Subtotal Materials					**$205,000.00**	**$50,000.00**	**$255,000.00**	

Subcontracts and Consultants

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total	
Subtotal Subcontracts and Consultants					**$0.00**	**$0.00**	**$0.00**	

Administration

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total	
24	Rent	Annual costs	$60,000.00	KMN-L	$300,000.00	$1,140,000.00	$1,440,000.00	costs absorbed by KMN-L or through other sources of funding obtained by KMN
24	Heating	Annual costs	$4,000.00	KMN-L	$20,000.00	$76,000.00	$96,000.00	costs absorbed by KMN-L or through other sources of funding obtained by KMN
24	Electricity	Annual costs	$2,000.00	KMN-L	$10,000.00	$38,000.00	$48,000.00	costs absorbed by KMN-L or through other sources of funding obtained by KMN
24	Internet	Annual costs	$4,800.00	KMN-L	$24,000.00	$91,200.00	$115,200.00	costs absorbed by KMN-L or through other sources of funding obtained by KMN
Subtotal Administration					**$354,000.00**	**$1,345,200.00**	**$1,699,200.00**	

Instructor Training or Professional Development

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total	
5	Admin/Management/Financial		$6,000.00	KMN	$30,000.00		$30,000.00	
5	Te(a)ch facilitation training		$5,000.00	Pinnguaq		$25,000.00	$25,000.00	in-kind from Pinnguaq
5	ASIST Training		$5,000.00	Embrace Life Council	$25,000.00		$25,000.00	
5	Trauma-informed practice Training		$5,000.00	Embrace Life Council	$25,000.00		$25,000.00	

5	KMN Digital Network Setup & Training program		$10,000.00	Pinnguaq	$30,000.00	$20,000.00	$50,000.00	in-kind from Pinnguaq
Subtotal Instructor Training or Professional Development					**$110,000.00**	**$45,000.00**	**$155,000.00**	
Other Costs								
Quantity	**Component Description**	**Notes**	**Component Cost**	**Delivery Org**	**Infrastructure Canada funded Costs**	**Other Sources of Funding**	**Total**	
Subtotal Other Costs					**$0.00**	**$0.00**	**$0.00**	
Community Makerspace SUBTOTAL					**$1,519,000.00**	**$4,670,200.00**	**$6,189,200.00**	
Project Budget TOTAL (FY 2023-2024)					**$2,148,600.00**	**$4,729,200.00**	**$6,877,800.00**	
Project Budget Total Year to Date					**$10,000,000.00**	**$12,371,600.00**	**$22,371,600.00**	