Understanding the Potential of Public Engagement: Hackathons and Jams

by Jacqueline Pui Ying To

Submitted to OCAD University in partial fulfillment of the requirements
for the degree of Master of Design in Strategic Foresight & Innovation
Toronto, Ontario, Canada, April, 2016

Copyright Notice

Author's Declaration

I hereby declare that I am the sole author of this MRP. This is a true copy of the MRP, including any required final revisions, as accepted by my examiners.

I authorize OCAD University to lend this MRP to other institutions or individuals for the purpose of scholarly research.

I understand that my MRP may be made electronically available to the public.

I further authorize OCAD University to reproduce this MRP by photocopying or by other means, in total or in part, at the request of other institutions or individuals for the purpose of scholarly research.

Abstract

Hackathons and jams are two methods of engagement that aim to collaboratively solve a broad range of social and environmental issues through ideation, coding, and prototyping. The challenge with these events is that they require a significant commitment from participants, but set a false expectation of what their contribution is capable of accomplishing. Hackathons and jams also encounter issues with theme and participant diversity, their ability to implement long-term initiatives and questions about the ethical authenticity when the objectives of social impact and the organiser's personal gain are muddled. This research seeks to gain a better understanding of how co-creative problem solving methods: hackathons and jams, are best used in public engagement. The research methods included a literature review and expert interviews on the topic of public engagement, hackathons and jams. The synthesis of research insights uncovered technology solutionism, shifting governance and innovation as three drivers of the phenomenon, and prompted the design of a typology table. This research proposes a new model to public engagement that combines hackathons, jams and other public engagement methods as a continuous sequence of workshops for a comprehensive method that supports broader public engagement objectives for all levels of government and other organisations interested in fostering social impact.

Keywords: Collaboration, Co-creation, Public Engagement, Hackathons, Civic Tech, Open Data, Jams, Service Design, Design Thinking

Acknowledgements

I would like to thank my primary advisor, Professor Suzanne Stein. This project would not have been possible without her wisdom, guidance and optimistic spirit. Suzanne is truly a wonderful advisor and a role model that has influenced not only my research, but also me as a person. I have learned so much, thank you.

I would like to thank my secondary advisor, Dr. Pamela Robinson, for her insight and guidance. Her wealth of knowledge in Urban Planning, and expertise in Public Engagement and Hackathons has introduced me to new ideas and possibilities of which I am eager to continue exploring throughout my career.

I would also like to thank Professor Greg Van Alstyne for the opportunity to work on DesignJam, the project that instigated this research on hackathons and jams.

Thank you to all of the experts who took the time to participate and shape my research:

Adam Lawrence, WorkPlayExperience, and Global Service Jam
Bianca Wylie, Open Data Institute and Swerhun Facilitation
Jesse Darling, Evergreen CityWorks
John Schaffter, City of Toronto
Maya Goodwill, HiVE Vancouver
Lori Endes, Institute without Boundaries, George Brown University
Pamela Robinson, Ryerson University
Patti Mikula, Hackworks
Ursula Gobel, Social Sciences and Humanities Research Council

The Strategic Foresight and Innovation Program was a remarkable experience that has shaped and inspired me to reach new heights. I would like to thank the SFI faculty, as well as my co-hort. Spending the past two years together, working, goofing off and simply talking about our ideas, hopes and dreams was invaluable. I will treasure these lifelong friendships and memories.

This research could not have been achieved without the loving support of my family – my mother, sisters, Nikkie and Natalie, and William D. Coleman. A tremendous thank you to my partner, Robert Walter Joseph, whose endless encouragement, patience and understanding has kept me grounded. And finally, my friends, Abby, Danielle, Julia, Tammy, Sarah and everyone else who has carried me through this far.

Table of Contents

List of Tables

List of Figures and Illustrations

Definitions

Public engagement: Also known as Public Participation. This is a general term for a broad range of methods through which members of the public become more informed about and/or influence public decisions (Institute for Local Government, 2015).

Hackathon: An event, typically lasting several days, in which a large number of people meet to engage in collaborative computer programming (Oxford Dictionaries, 2015).

Jam: Participants come together for several days to tackle a design challenge within a specified theme (Global Service Jam, 2011).

Technology Solutionism: The belief that every problem requires a technology related solution (Morozov, E., 2013).

1. Introduction

“In 24 hours, we are going to make a difference and change the world!” The lights lit up again and a crowd of inspired and gleaming young faces smiled and applauded the founder of this year’s biggest tech startup. These youth, armed with their ideas, laptops and gadgets, scramble into teams and start pitching their ideas to one another. Designers, developers, entrepreneurs and people with a general curiosity about tech have converged for their passion to create social change. They work into the night eating junk food, playing with gadgets, and napping on the conference stage. All their effort and hard work was done voluntarily in hopes to have their skills and ideas recognised by the judges.

The next morning, the entire room is a mess with post-its, food wrappers and product prototypes. The scent of freshly brewed coffee fills the air, jolting the participants with a last burst of energy to finalise their projects before the time runs out. “BEEP. BEEP. TIME’S UP!” for the judges to come and select the top ideas. Only 5 teams will go onto the final round of pitches, leaving the other 40 teams to wonder, “what was all of my effort for?”

This scenario is the common outcome and sentiment that occurs at a “hackathon”. A hackathon is part of a new public engagement phenomenon that asks participants to converge on one weekend of co-creation and rapid product

innovation. There are two types of co-creative events that have grown in popularity since the 1990s: a “hackathon” and the other is called a “jam” or “design jam”. A hackathon is an event where small groups of people develop an innovative software prototype within a given time limit (Komssi et al., 2015, p.60). A jam is a collaborative brainstorming and service prototyping event that does not have to be technology related but occurs in a condensed timeframe (Römer et al., 2011, p.2). Hackathons, familiarly shortened to hack, and jams both harness playful and exploratory qualities that may attract the interest of corporations and governments. Their interests have emerged because traditional public engagement methods are struggling to meet the varied needs of today’s society.

Figure 1. (left) Disrupt Hackathon in NYC and (right) Service Design Jam in Berlin (Jacqueline To, 2016)

Among those planning for the future, there is a cultural shift for greater collaboration and social responsibility. Globalisation, technology and social media have amplified the ramifications of economic actions. The implications may include environmental issues, corporate transparency, and a commitment to equality. People are coming together to share online images, stories and tweets of social problems in their own backyards. By discussing these issues through social media, many in today's society feel more connected to the world and have better systems literacy.

Another aspect of technology that has influenced this movement is entrepreneurial solutionism. The tech culture uses the success of young superstar entrepreneurs to tell millennials that they can change the world with their ideas. This idealism is spoon-fed through incubators, media and coding curriculum in elementary school. If you visit code.org, one of America's largest youth coding and hackathon education programs, you will find a video of famous faces including Mark Zuckerberg, Will.i.am, and so on talking about how "the programmers of tomorrow are the wizards of the future." This initiative is a great educational program to prepare youth for the inevitable digital literacy demanded in future jobs. Masking the reality with the superhero branding, however, is changing the way young people see themselves in the workplace.

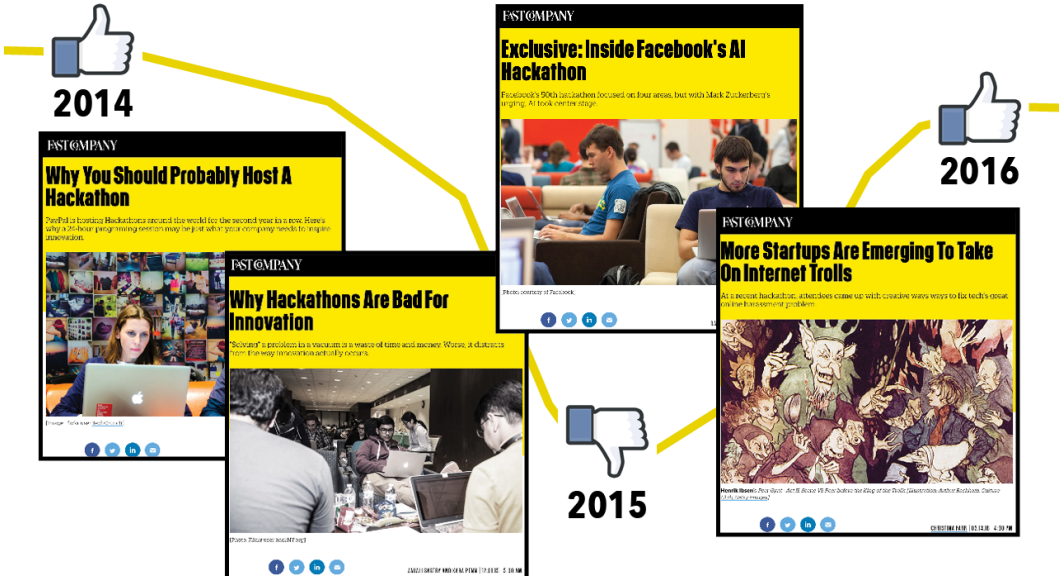

Figure 2. Fast Company Articles about Hackathons (Jacqueline To, 2016)

Traditional methods of public engagement cannot address all of the complex needs of modern society. Today's society wants deeper levels of engagement, and citizens expect to play a larger role in government decision-making (Rask et al. 2012, p.710). Their ideal participation involves playing a role in an ongoing governance process that asks questions about problem framing, forecasting emergent issues, goal setting, creating strategies that are sustainable and adaptable, and implementing co-created ideas (Rittel and Webber, 1973, p.159). This type of engagement is bottom-up and driven by the co-created insights of many individuals at many points of the policy or strategy development cycle.

Public engagement must find a way to adapt to the demographics' shifting needs. Hackathons and jams are engagement methods that originated in the private sector, but are increasingly adopted for public sector initiatives. Hackathons and

jams present an opportunity for governments and other organisations to engage with the public in a meaningful and accessible way. They are an alternative to traditional forms of public engagement. Hackathons and jams have evolved over time, causing an unclear interpretation of the methods. The lack of clear definition allows organisations to modify the event for their own needs. This inconsistency in events drives a common misunderstanding in media.

In 2014, *Fast Company* wrote an article in entitled "Why you should probably host a Hackathon"; then in 2015 they wrote "Why Hackathons Are Bad For Innovation"; and finally in 2016 the article "Inside Facebook's Al Hackathon" takes a further step in promoting great ideas coming from the hack event. The media continuous conflicted criticism is draw from the same sentiment of entrepreneurial solutionism. These events are fun, a great way to make friends with different experiences and they can provide an abundance of big ideas for the future. They also ask a lot of participants and may create a false expectation that an innovative idea or prototype created at a hackathon or jam will change the world.

My experience and perspective as a researcher, as well as a participant and organiser of hackathons and jams gave me a biased perspective that jams, hackathons and public engagement were isolated and unconnected events.

By exploring hackathons and jams, this research will provide facilitators and participants with a better understanding of what these co-creative events are and how they might best be used as efficacious forms of engagement.

How might co-creative problem solving events, hackathons and jams, best be used in public engagement?

The goal of this research is to gain a better understanding of how hackathons and jams might play a role in the future of public engagement. Who might be using these engagement methods and what are they hacking or jamming for? To fully understand both methods, this research will recount the history of public engagement and how it has evolved towards co-creative engagement. Literature and expert insights will inform the meaning of hackathons and jams and situate them within other methods of public engagement. By understanding the typology of these events through their challenges and benefits, this research presents a way to bridge the topic of hackathons, jams and public engagement. Furthermore, the analysis will elucidate possible interventions and opportunities to improve the participant experience while creating impactful social outcomes.

2. Context

This section will explore the entrenched history of public engagement, the emergence of private sector engagement, collaborative problem solving, the methods of hackathons and jams, and other methods of public engagement through a literature review.

2.1 A History of Participation

To begin the literature review on hackathons and jams, we must first explore public participation. Public participation is the practice that houses all public engagement methods. The review will explore how public participation has evolved and changed our understanding of participation and engagement. When speaking about public participation, the terminology can be complex because people also refer to the idea as public engagement, community engagement and public involvement (Rowe & Frewer, 2005, p.252, 253).

Public participation is understood as a government practice. Public participation is any activity that involves those who are affected by a governmental decision in a decision-making process and seek to respond to it (IAP2, 2016). The concept of public participation is not new. It was first used in Ancient Greece but only became a formalised term in the late 1960s (Delli Carpini et al., 2004, p.315).

In the 1960s, decision making in North America and the United Kingdom was predominantly top down. Experts devised and dictated policy and city planning for citizens. This modernist concept, where the expert professionals, such as architects and policy makers, make decisions for the public was the dominant influence in design. Some design projects, such as public housing, that approached problems through the experts' direction were failures in urban planning and policy because their design was not human-centered, and did not incorporate the needs of the people who lived in those communities. It contributed to inequality and unsafe neighbourhoods (Shapiro, G.F., 2012). The public wanted a stronger voice in decisions, leading to the formalisation of public participation.

Public participation went through significant changes over the years. Various processes were tried and tested. Social worker and researcher Sherry Arnstein was highly important to the movement towards more equal representation. She wrote about the trouble of the "empty ritual of citizen participation" in 1969. Citizens were experiencing false hope because they did not have the "real power needed to affect the outcome of the process" (Arnstein S. 1969, p. 1). Initial uses of public participation were to obtain buy-in rather than insights to the problem. She illustrated the issue by developing a ladder of citizen participation that clarified the tension in power between citizens and the governing elite.

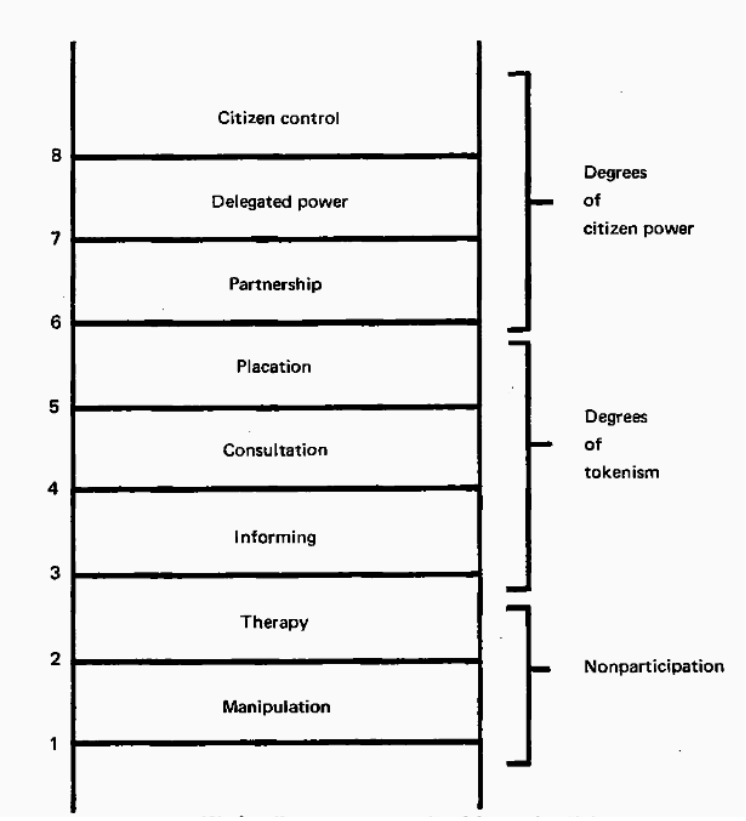

Figure 3. Arnstein's Ladder of Citizen Participation (Arnstein, S., 1969)

After Arnstein's critique, an outpouring of literature from academics and experts began to reflect and define what the field of public participation might include. Jules Pretty wrote about the range of participation typologies that are characterised in the Arnstein's ladder.

Table 1 Pretty's typology of participation

Type	Characteristics of each type
Manipulative participation	Participation is simply a pretence, with 'people's' representatives on official boards, but who are un-elected and have no power.
Passive participation	People participate by being told what has been decided or has already happened. It involves unilateral announcements by an administration or project management without any listening to people's responses. The information being shared belongs only to external professionals.
Participation by consultation	People participate by being consulted or by answering questions. External agents define problems and information-gathering processes, and so control analysis. Such a consultative process does not concede any share in decision-making, and professionals are under no obligation to take on board people's views.
Participation for material incentives	People participate by contributing resources, for example, labour, in return for food, cash or other material incentives. Farmers may provide the fields and labour, but are involved in neither experimentation nor the process of learning. It is very common to see this 'called' participation, yet people have no stake in prolonging technologies or practices when the incentives end.
Functional participation	Participation seen by external agencies as a means to achieve project goals, especially reduced costs. People may participate by forming groups to meet predetermined objectives related to the project. Such involvement may be interactive and involve shared decision-making, but tends to arise only after major decisions have already been made by external agents. At worst, local people may still only be co-opted to serve external goals.
Interactive participation	People participate in joint analysis, development of action plans and formation or strengthening of local institutions. Participation is seen as a right, not just the means to achieve project goals. The process involves interdisciplinary methodologies that seek multiple perspectives and make use of systemic and structured learning processes. As groups take control over local decisions and determine how available resources are used, so they have a stake in maintaining structures or practices.
Self-mobilization	People participate by taking initiatives independently of external institutions to change systems. They develop contacts with external institutions for resources and technical advice they need, but retain control over how resources are used. Self-mobilization can spread if government and NGOs provide an enabling framework of support. Such self-initiated mobilization may or may not challenge existing distributions of wealth and power.

Adapted from Jules Pretty (1995).

Figure 4. Pretty's Typology of participation (Cornwall, A., 2008, p.273)

Today's participation ranges between participation for "material incentives" to "interactive participation", and is slowly moving towards self-mobilisation. This

means that the objectives range from obtaining external resources and expertise, to participants having a stake in the decision-making process (Cornwall, A., 2008, p.273). Governments will often provide funding to external organisations to host their own preferred method of engagement. Engagement as a platform for self-mobilisation is part of the public sector mandate but is also being adopted by industry and private sector corporations.

In the 1990s, public pressure for more accountability and social responsibility in corporations was the result of major ethical issues in a globalised workforce. Corporations began to engage with their stakeholders and created a department for corporate social responsibility (CSR). This type of participation was passive. It was a way to show stakeholders that they cared, but generally did not incorporate their views on the problem into what they were doing (Sillanpää, M., 2010). As businesses undertook a greater role in social services and society, they began to engage with stakeholders. They recognised the knowledge of the public and the potential to create better product and service innovations by listening to their customers. Also, interacting with citizens on social issues contributes to their corporate social responsibility. Today's participation in the private sector ranges from consultation to functional participation, because the company is the final decision maker at the end of the participation process. Consultation only engages people through a predefined questionnaire and participants do not play any role in the decision-making process.

Hackathons and Jams are examples of contemporary methods of engagement that began from the private sector's motivations and evolved towards the ideals from public sector engagement. When the public engagement method fits the problem context, it can educate citizens about civic issues, increase tolerance and understanding for others' perspectives, improve systems literacy, and demonstrate the validity of the democratic process while informing the decision-making process (Carpini, M. X. D. 2004, p. 320). Peter M. Senge, researcher and academic, introduced the concept of systems thinking. He described systems literacy as the ability to understand that an action creates positive and negative reactions in a larger social and environmental system. Hackathons and Jams should incorporate education on systems literacy because it provides conceptual problem solving skills that evaluate interventions in context of social responsibility and sustainability for the future (Senge, P. M., 2012, p.47).

The use of contemporary methods in public engagement is gaining momentum, and with this phenomenon, new challenges surrounding public engagement have emerged. Participation fatigue and the reduction of "the public" to a relatively small citizen group are some of the key challenges facilitators face (Felt & Fochler, 2011, p.310).

Participant fatigue arises from failed project outcomes or a lacking of connection to "real" change. The community can become tired and cynical to all participatory

events (Cornwall A. 2008, p.274). Participant fatigue can impact whether or not citizens continue to engage with participatory initiatives. One way to address this issue is to create a "realistic model" of democratic engagement that is championed over "idealistic participatory methods" (Berger B. 2011, p.145). Idealising public engagement as a means to solve all problems is a narrow perspective that continues to be applied to the branding of many public engagement events.

> *Being realistic about democracy does not mean abandoning our hopes of achieving more participation, fairer representation, greater citizen vigilance, or improvements in the lot of the worst-off. Rather it means abandoning the idea that those goals should be achieved by Rousseauian ambitions of changing human nature or coercing adult citizens for their own good. It also means realising that many citizens hold reasonable, competing commitments – commitments to personal autonomy and the freedom to do without politics, for example–that might limit out ability to promote the first set of goals*. (Berger B. 2011, p.145)

By Rousseauian ambitions, Ben Berger's book on public engagement argues that engagement's value is dependent upon "the larger social, political and institutional context." He also states that engagement relies on participants whom exercise their own motivates, needs and best practices.

Finally, all of the varied understandings and definitions of public engagement is produced by the fact that there is no single optimal design for public participation (Connor M. D. 1988, p.256). Numerous public engagement methods exist because every engagement initative is unique and requires a unique problem solving process that is structured for the context and objective.

2.2 Solving Problems Together

Collaboration is perceived as the interaction that occurs among individuals. It is also a relational system that is characterised by one's motives, concerns for the community they're collaborating with, and the level of commitment (Appley, D. G. & Winder, A. E., 1977, p. 281). Crowd funding, crowd sourcing, and the ability for individuals to engage collaboratively online have broken the traditional system of top down collaboration. Increasingly, people are collaborating to solve problems together.

Collaborative problem solving is a form of participatory culture where formal and informal teams work together with an objective to complete (Jenkins, H. 2006). The highly collaborative and co-creative process adopted by hackathons and jams can be considered collaborative problem solving.

Collaborative problem solving in hackathons and jams concern the co-creation of value. Value Co-creation can be understood as "the joint creation of value by the company and the customer" (Prahalad, C. K. and Ramaswamy, V., 2004, p.8). There are five key pillars that affect co-creation: process environment, resources, co-production, perceived benefits and management structure (Bharti, K. et al., 2015, p.579). Process environment describes the domain. Resource is the available capital and supplies. Co-production is depicted in the method of co-creation. Perceived benefits can be understood as the expectations from all

stakeholders involved, and management structure involves allocating responsibilities and power to different stakeholders. The five pillars are interlinked and the adjustment of one will affect the other, and therefore affect the overall success of the co-creative initiative. In hacks and jams, each host sets the conditions that form these five pillars differently. A healthcare hackathon that is hosted by Microsoft in the United States will be vastly different from a healthcare hackathon hosted in Australia by volunteers in a co-working space. The insights and ideas co-created for the same problem will be different because of the organizer's objective, culture, participants, resources, and factors of the co-creation process, such as time and mentorship available to participants.

Public engagement is accustomed to collaborations in order to problem solve. The main difference between traditional public engagement and hacks and jams is that the former is problem solving for policy, while the latter is problem solving by producing a new product or service to "save the world". This ambition brings much drive, passion and innovation but there is also a constrained bias that technology and design should be the solution to everything, particularly social, environmental and ethical issues. That everything *needs* fixing. How did social and environmental problem solving become a dominant objective in hackathons and jams?

2.3 Hackathons and Jams as Agents of Change

Figure 5. Comparison of Hackathon and Jam Posters (Jacqueline To, 2016)

Hackathons and Jams are being marketed as agents of change. They are used to solve problems in healthcare, environment, education, transit, and numerous other domains. The demand for co-creation, a growing technology sector and the immediate need to improve issues of environment and social equality are the three main components of these events that define this public engagement trend in today's society. This trend is due to what Evgeny Morozov calls "technological solutionism".

Technological solutionism is defined as a belief that some aspect of technology can solve all types of problems. It causes people who work in industries related to technology and design to seek problems in their surroundings, from large social

issues like policing to mundane things such as cooking. However, many problems are not actually problems at all; problem finding may instigate the development of problems that were not present beforehand.

> *Not everything that could be fixed should be fixed… the more fixes we have, the more problems we see*. (Morozov, E., 2013)

Organisers of a hackathon and a jam should consider and weigh whether or not the "problem" is worth the effort, time, resources, planning, and participant energy of a public engagement event.

2.3.1 Hackathon

Hackathons are "problem-focused computer programming events" that lead to new idea prototypes in a short period of time (Briscoe & Mulligan, 2014, p.1). This kind of event often involves multidisciplinary teams of technologists, designers and subject matter experts that work together towards one objective (Irani, 2015, p.800). Participants can develop an idea, code a prototype and pitch their idea to potentially win entrepreneurial support and financial aid for product development. Hackathons vary in objectives and themes but are often similar structurally and in their characteristics (Komssi et al., 2015, p.60, 64). The event begins with an introduction of the event objective and the evaluation criteria. Participants must then self organise into teams by finding others interested a similar idea, then spend the majority of their time coding and designing in preparation for the final pitch. This anticipation is a mix of excitement and anxiety in more competitive hackathons.

Hackathons were adapted from Local Area Network parties, otherwise known as LAN parties, involved a gathering of people with personal computers to share their computer modifications (Briscoe & Mulligan, 2014, p.2). LAN parties allow people to connect in person and digitally. Participants bring their computers, laptops, and hardware to one location and connect to a single network to share information, play video games on a connected network, and co-create digitally for a few hours to several days. Hackathons adopted this model of digital and physical connectedness, and the quality of the "party" to form a new process of co-creation. The first ever hackathons appeared in 1999, held internally by OpenBSD and Sun Microsystems to challenge their employees to create new and innovative software for company products (Briscoe & Mulligan, 2014, p.2). Continued cultivation may be attributed to open source software production, promoting sharing of data and expertise, and crowd sourcing coding projects on an international scale (Irani, 2015, p.803).

Since the early 2000s, the demands for hackathons by private and public sector companies have grown and hackathons are evolving to encompass arts and culture. Termed Culture Hacks, these events bring together artists and technologists to create digital prototypes (Briscoe & Mulligan, 2014, p.1). Also, the topic is slowly engaging in civic and community-building initiatives that attempt to about bridging technology and the real world (Irani, 2015, p.800). One Hackathon example, such as Pasadena's Open Data Hack, showed that

participants and volunteers wanted to give their time and effort to shape the future of their communities by using government open data to co-create digital services (Leclair P., 2015, p.14). Participants see the design and social entrepreneurship of hackathons as an alternative method to achieve innovation by cutting out centralised bureaucratic processes in the public and private sector (Irani, 2015, p.806, 807). Whereas, the public and private sector see hackathons as an opportunity for finding new talent and new ideas. Technology-oriented corporations such as Microsoft, Facebook and Google host internal hackathons as a method of ideation, employee engagement and recruitment. Facebook's "like" button, videos and chat were all product innovations created at internal hackathon (Chang A., 2012).

Hackathons face several challenges: (1) issues with participant expectations related to intellectual property and impact of prototypes, (2) barrier to entry created by the lack of diversity in the technology sector, and (3) a bias to focus on money making ideas to save the world.

Failure to create long-term outcomes from hackathon ideas may be disappointing for participants (Irani, 2015, p.814). Lilly Irani proposes that "Hero" or "world changing" vocabulary associated with entrepreneurship influences participants to feel optimism during the hack (Irani, 2015, p.815). This optimism is productive because it fuels participants' passion to contribute productively during the event.

In turn, this optimism can misalign how participants measure the success of their project and the event. Similar findings on participant motivation are found in other research data, where social change was rated the third most important hackathon motivator behind "learning new skills" and "networking" (Briscoe & Mulligan, 2014, p.8). Participants feel that they've failed when the immediate social change advertised by some hackathons, is not realised. Better terminology can be developed to differentiate hackathons as "stunts" or as impactful engagement within a formalised strategic process (Johnson & Robinson, 2014, p.356). If the objectives are not formalised in a broader objective, participants may feel unmoved to partake in future engagement events (Johnson & Robinson, 2014, p.355).

Hackathons are often criticized for the lack of diversity associated with the gender and age representation of the technology industry. The majority of hackathon participants are males and 61% of hackathon participants are between the ages of 25 to 34 (Briscoe & Mulligan, 2014, p.7). One hackathon researcher conducted an analysis of Hackathon Hackers, the largest Facebook community for hackathon attendees between 2014 and 2015. By aggregating the total content that contained "female words" such as *she* and *her*, the resulted findings were 6.89% of total content was gender inclusive and only 19.54% of that content was female content (Ruthven, M., 2015).

Despite the dwindling numbers of female participants, companies in the technology industry are encouraging more girls to code and are targeting female workers by creating friendlier work environments. There is an imminent need to promote gender inclusivity to change the gender ratio of hackathon participants. Women in STEM are leading this change by hosting hackathons for women around the world. The Meera Kaul Foundation is an organisation hosting global hackathons that aims to create a safe and inclusive platform for ideation and coding. Women can meet other like-minded female technologist, entrepreneurs, mentors and investors which creates a long lasting support network for women in STEM (Kaul, M., 2015).

The shift to theme hackathons themed around inclusion is occurring for age as well. For example, the hackathon Aging2.0 is working with seniors, senior care providers, entrepreneurs, technologists, designers, and investors to find insights and create solutions that enhance accessibility and remove barriers for seniors. Including representation from seniors allows them to have a voice, work with youth to co-create ideas, participate in an initiative that can benefit others in their community, and removes technology/ productivity stigma towards seniors (Aging 2.0, 2016).

Another diversity challenge is the inclusion of non-English speakers in North American hackathons. If open data hackathons are to enhance citizen engagement,

transparency, and accountability and to stimulate economic activity, there should be an inclusivity strategy that provides equal opportunity for people of all languages (Scassa & Singh, 2015, p.129). Diversity in the audience is important because it gives a voice to people who might not normally be able to have a say in decisions that affect their life.

Lastly, hackathons were forged in the technology sector. The first iterations of hackathons were primarily app contests where participants win a chance to be trained in Silicon Valley by tech entrepreneur experts and funded by venture capitalist. The pressure in creating the next "unicorn" is still apparent at many hackathons. A business that is a unicorn is defined as a startup valued at over one billion dollars (MIT Technology review, 2016). This start-up tech culture has created a bias for technology-focused solutions that can scale and return a profit. Technology solutions can be an accessibility issue because only a certain population has Internet access or access to new technology. As a result, technology-focused ideation may be limited to impacted only a certain population in society (Irani, 2015, p.810).

Although there is stillroom for refinement, hackathons will remain an important form of public engagement and innovation because hackathons are a mechanism that can bridges technology with other industries. In addition, they provide access to new technologies and technology expertise. If facilitators provide participants with the information they need to fully understand the systemic problem and how

their contribution fits into the greater context of long-term outcomes, hackathons have reciprocal benefit for citizens and institutions (Johnson & Robinson, 2014, p.354).

Hackathon Example: Go Open Data Hackathon

Go Open Data Hackathon is part of the Go Open Data Conference. The hackathon took place for one day. It sought to engage citizens in problem solving with government data. One day before the hackathon, participants were equipped with knowledge. Experts spoke about opportunities for Open Data and how it might impact healthcare, transportation, environment and other fields. To create an inclusive activity, participants can choose to participate in the hackathon or "openfest" activity. People who were interested in playing with a dataset and coding participated in the hack; others looking to create ideas without a technology background tended to participate in the openfest. Participants included technologists, bloggers, community and economic developers, city planners, and civil servants. The activity was not for competition, but rather for the sake of sharing ideas and learning from one another. At the end of the fest/hack, all teams shared their ideas and prototypes with the audience. Go Open Data is a great example of citizens exercising democracy and influence by engaging with government and policy workers to co-create open data possibilities.

2.3.2 Jam

Less competitive than their hackathon sibling, jams are an adaptation of the hackathon model for designers and don't necessarily involve coding (Komssi et al., 2015, p.62). Jams are "short collaborative events for designers and creative professionals" that collaborate in the area of design, service and user-experience challenges (Briscoe & Mulligan, 2014, p.3). Jams began from the idea of jamming in music, where musicians collaboratively improvise and create music without a clear direction or goal. Evolving out of "game jams" and "culture hacks", jams take on a similar structure of fast paced ideation and prototyping in a collaborative group (Komssi et al., 2015, p.62). The first ever design jam, the IBM Innovation Jam, occurred in 2006, seven years after the first hackathon. It was hosted as an online forum where participants within and outside of IBM could contribute ideas towards four areas of concern. With IBM as the official organiser, most ideas were a technology-related invention fitted to IBM objectives and were lacking in diversity because a majority of participants were internal IBM employees (Helander, M. et al. 2007). Five years later, the Global Service Jam in 2011 changed the focus of jams towards open creativity and less technologically focused innovation (Service Design Network, 2015). The lack of restrictions in the jam fostered creativity, encouraged knowledge transfer and created community relationships. The Global Researchers of the initial Global Service Jam argue that jams present an opportunity for open innovation if the problem frame emerges from individuals and are not controlled by the market objectives of

one stakeholder (Romer, M. et al., 2011, p. 1, 3). This can be seen in the Global Service Design jam example on the next page.

French research specialist on Jams Sophie Renault identifies three factors that contribute to the success of a jam. First is the mobilisation of conversation and involvement from participants. Second the organiser is required to have a clear objective and plan deliberately for that objective. Third, there must be a commitment of the organiser to process the information and create value out of the outputs of the jam (Renault S., and Boutigny E., 2013, p.43).

Compared to hackathons, jams are more inclusive and balanced in gender participation but are predominantly youth whom have the freedom and time to participate. Jams can also be made more inclusive and accessible to seniors, people with disabilities and people of low-income households who may not be able to participate for various reasons (Press, M., 2013).

The jam initiative is fairly new, which attributes to a shortage of academic writing about the phenomenon. Further research and understanding of jams will be developed in the primary research and findings section of this thesis.

Jam Example: The Global Service Design Jam

This Jam is an example of how openness of the jam can foster global participation. The Global Service Jam's goal was to redesign the experience of services. This example is particularly notable because it is an example of how the openness of a Jam can reach a global audience. Started in 2011, the jam has been cultivated globally with minimal budget and staffing. Their significant growth can be attributed to volunteers and participants passionate about making a positive change globally.

The majority of the jams occurred in Europe, Australia and on the coasts of North America. In South America, majority of the interest was from Brazil. In South Asia, there were participants from India and Dubai. In the Middle East, there were participants from Egypt and Israel. In Asia, it has been hosted in Korea, Shanghai, Bangkok. Big cities are hotspots for jams. Although the Service Design Jam began from one specific organisation and location, the initiators of these global jams include a variety of individuals and interest groups that adapt the jam process to solve their own local issues. There have been people who have used an architectural processes, scientific processes, debate and even yoga. The free flowing and playful nature of the jam is versatile and can be translated to any regional context. Overall, an estimated 2300 ideas came out of the Global Service Jams since conception. All the ideas that come out of a jam are available to the public and digitised online on their website. The visual prototypes, drawings and

photos from the exercise help people understand the process and logic each team went through to develop their final pitch.

The freedom to localise these initiatives aligns with the theory that value co-creation is dependent upon the culture and the resources of the group (Bharti, K. et al., 2015).

2.4 The Timeline of Hackathons and Jams

To further distil and compare these two methods. This is a timeline that shows the progression of hackathons and jams.

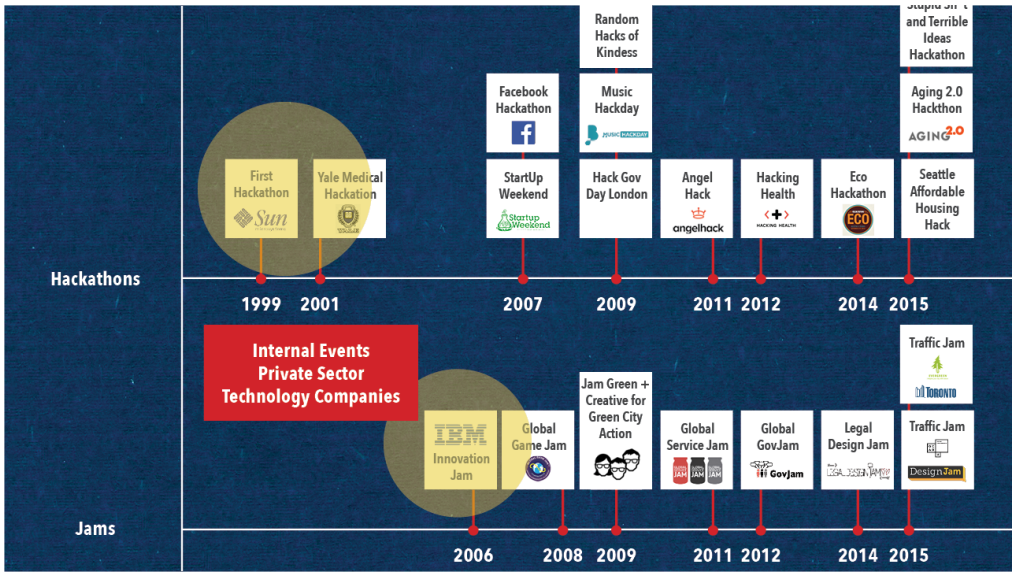

Figure 6. Timeline of Hackathons and Jams: Internal Events (Jacqueline To, 2016)

They are contemporary methods of engagement that only started in the early 2000s but has transformed significantly since their first appearance. These were mostly internal events, hosted by private sector software companies.

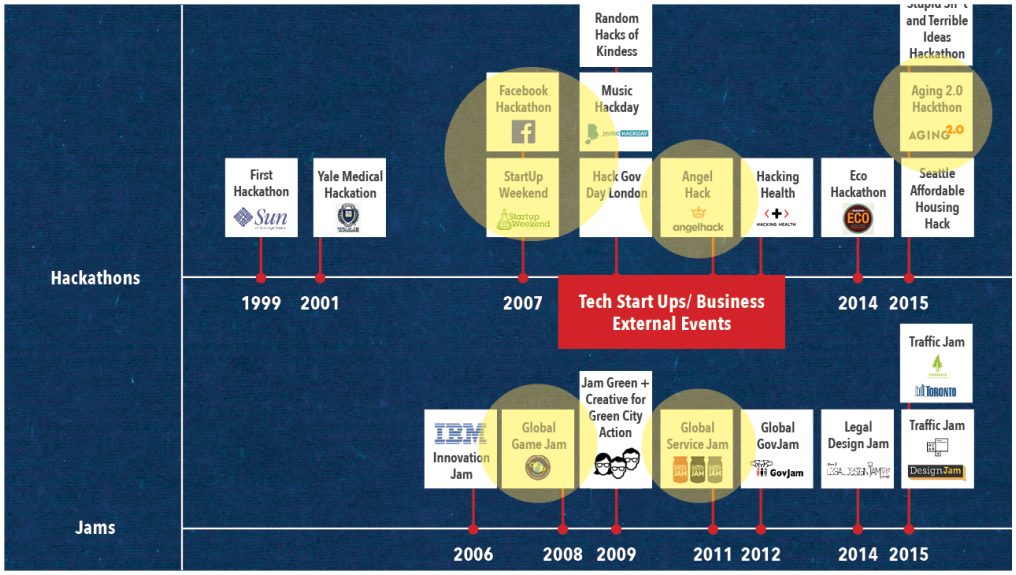

Figure 7. Timeline of Hackathons and Jams: Business Phase (Jacqueline To, 2016)

The second wave of hackathons and jams appeared in 2007 and 2008, and concentrated on creating tech start ups and business ideas, as seen in StartUp Weekend and Angel Hack and Global Game Jam. Hackathons became very competitive because some of these events were app contests for participants to potentially win venture capital, investment and a spot in a tech accelerator program.

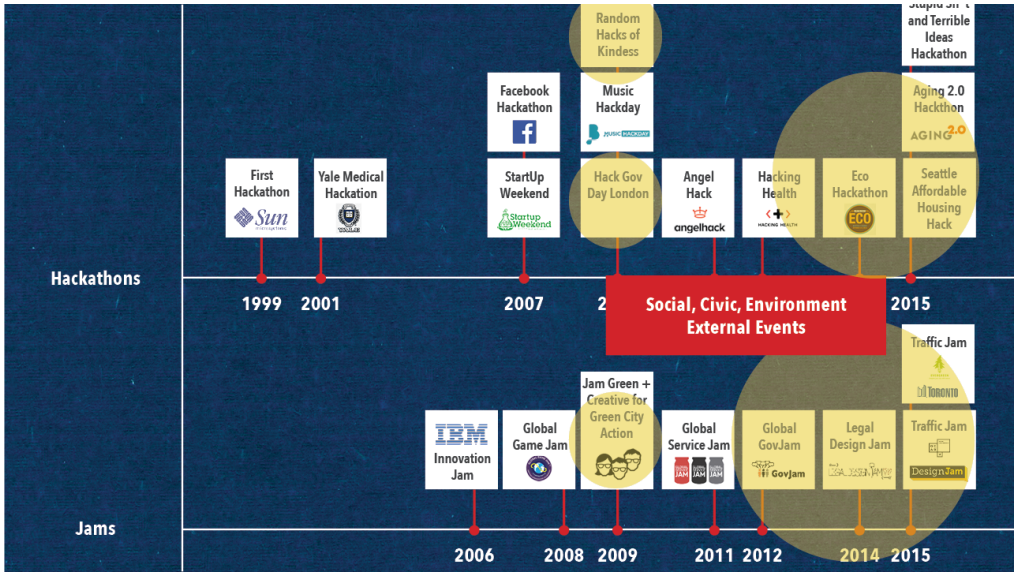

Figure 8. Timeline of Hackathons and Jams: Social Good Phase (Jacqueline To, 2016)

The third wave of hacks and jams are about societal good, and problem solving for social, civic and environmental issues. It was during this time that the competition aspect of a jam started to shift towards activism and entrepreneurial volunteering. Events were using "change the world" type slogans to build interest in hackathons and jams.

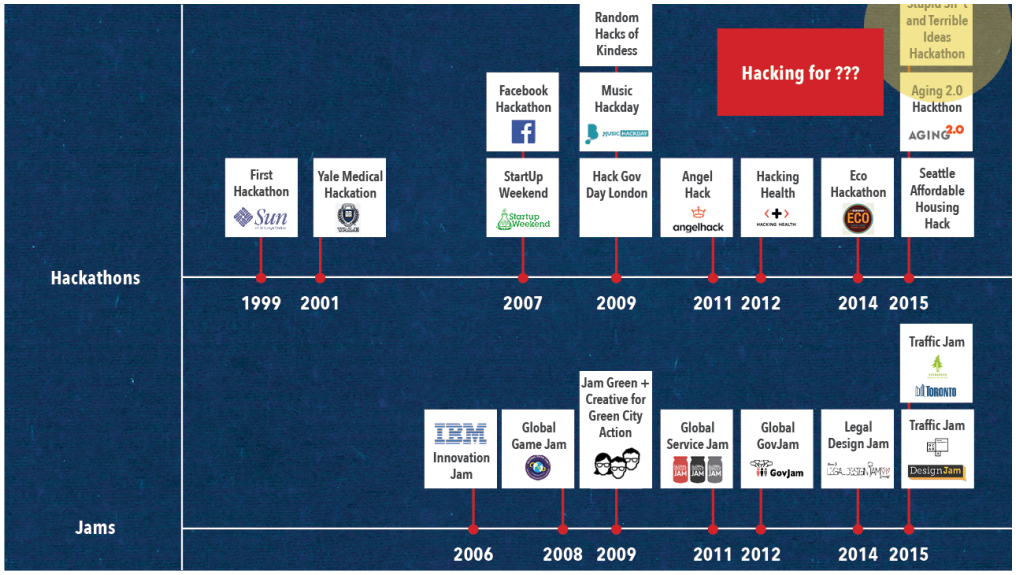

Figure 9. Timeline of Hackathons and Jams: Current Phase (Jacqueline To, 2016)

The fourth movement of hackathons and jams that appeared in 2015. Aa community came together and organized a hack for no reason. The hack was called *Stupid Things and Terrible Ideas*, and really reverted back to the community origins of a hackathon, which again were LAN parties. This signals participants rejecting the market driven models of ideation and co-creation and want to hack for hacking's sake. Hackathons had a greater connection with competitive development and economic productivity, which causes the "purposeless exploration" movement to apply more directly to hackathons rather than jams.

2.5 Mapping Methods

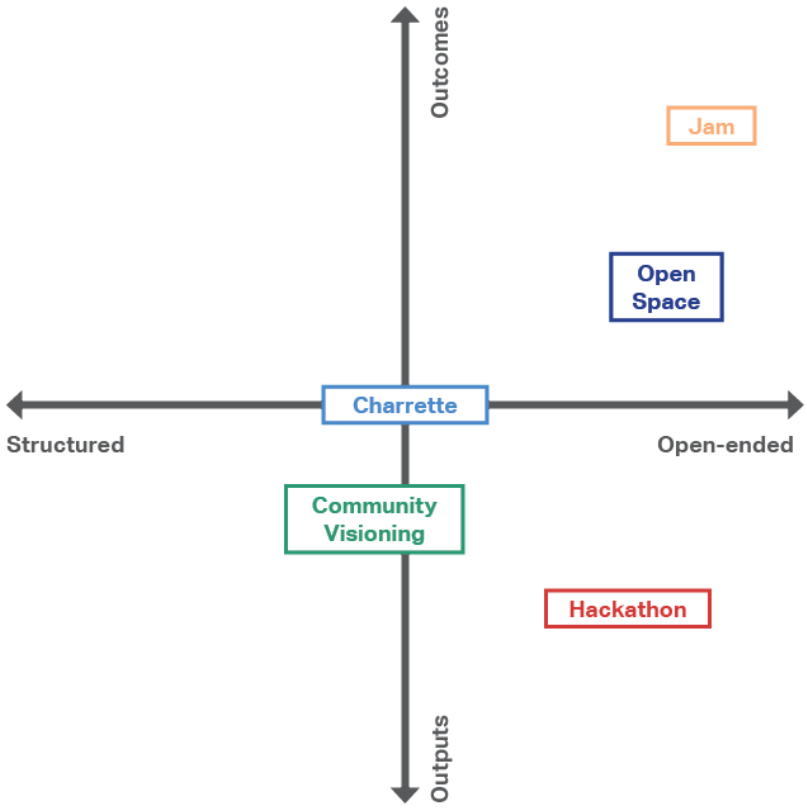

Figure 10. Map of Other Co-creative Public Engagement methods on a spectrum

In the figure above, structured represents high aspect of organizer control, and open-ended represents high aspect of participant control. Outputs are the focus on tangible results, where as outcomes are the focus on intangible results.

There are a variety of methods in public engagement. The National Coalition for Dialogue and Deliberation separates public engagement into four streams: Exploration, Conflict Transformation, Decision Making and Collaborative Action. Public engagement events that fall under the objective of collaborative action are

the focus of this research. Collaborative Action means to "empower people and groups to solve complicated problems and take responsibility for the solution" (NCDD, 2010, p.8). This section will map the methods that focus on co-creation and situate hackathons and jams in that spectrum. Other public engagement methods may include design charrettes, community visioning, future search, and open space. The four methods listed below are common and well recognised.

1) Charrette: There are two types of charrettes but this research focuses on visioning charrettes rather than implementation charrettes. Visioning Charrettes are short-term collaborative events that involve the public in participating in designing better communities or policies. Implementation charrettes involve internal stakeholders and experts when deliberate steps are needed when implementing a project or policy (Condon, P. M., 2007). Some organisers sequence both types of charrettes in one engagement process.

The charrette method is comparable to a jam. They both take on almost the same type of ideation structure and focus on human centred design and ethnographic insights to collectively derive an idea.

2) Community Visioning: A collaborative and inclusionary public engagement process that allows citizens to assist in planning their

communities by creating a consensus on a desired future and defining a set of goals or a plan to achieve the future for the community (Cochrane R., 2015).

3) Future Search: Follows the three horizons method by having three parts in the event where participants identify current issues, potential futures and how to achieve these futures (Rowe & Frewer, 2005).

4) Open Space: This approach is a free-form discussion format that allows participants to suggest topics of interest and to discuss and develop them throughout the day with others. Open space is a method that is often used in large groups of up to several hundred people (Rowe & Frewer, 2005).

2.6 Response to Themes Identified

Several key themes emerged from the literature review: stakeholder motivations, public perception of events, diversity and inclusivity, power dynamics between stakeholders and the organisation, and technology's role in engagement. These themes will be explored further in the methods chapter.

3. Methods

This chapter describes the methods I used to gather information and insights about hackathons and jams. A literature review uncovered common themes, criticisms and gaps. The themes gathered from the literature review informed the drivers in the Findings section, the expert interview questions, and the coding framework for synthesising the data. I used the findings to develop a new method/process as an intervention to the concerns revealed from the expert interview.

Research Question: How might co-creative problem-solving events, hackathons and jams, be best used for public engagement?

Sub Questions:

- How are these events defined?
- What sets the premise for using hackathons and jams as public engagement?
- What challenges are arising for experts who facilitate these events?
- Where might opportunities lie in advancing hackathons and jams as a method of public engagement?

3.1 Literature Review

The literature review uncovered a need to reinterpret traditional models of public engagement for newer engagement processes, such as hackathons and jams. Only in the past ten years, have hackathons and jams become a topic of interest in academic study. The literature available on the subject is limited but growing.

Hackathon literature is widespread, but jam literature is predominantly published in Europe or the UK. This is likely correlated to the locations where service design is a well-recognised practice. The literature review included peer-reviewed articles, books and magazine articles about public engagement, hackathons, and jams. Books were used to understand public engagement and drivers behind the phenomenon of hackathons and jams. Peer-reviewed articles were predominantly used to learn about the contexts of hackathons and jams within public engagement, because the number of books written about these engagement types is still very limited. Magazine articles were used to learn about the shifts, trends, public perception, and opportunities for hackathons and jams.

3.2 Expert Interviews

Semi-structured expert interviews were conducted with nine experts of hackathons, jams and event-based public engagement. The sampling frame included experts, facilitators and researchers of jams, hackathons and other methods of public engagement. This diversity allowed me to understand how these methods compare. For example, charrettes are often seen as jams because of their structure and application of design (Meehan, K., 2015). It was also important to have an equal representation from the public sector, private sector, academia and not-for-profit organisations, because each stakeholder type uses hackathons and jams in different contexts. Experts were identified by researching leaders of recognised hackathons and jams, and sought through word of mouth recommendation by other experts invited to participate in the interview process.

The sample size aimed to have three experts in each event types. My sampling and selection method also included years of experience in the subject matter.

Category	Hack	Jam	Other Public Engagement
Experts	3	3	3

Table 1. Sampling of Subject Matter Experts

Category	Hack + Other PE	Jam + Other PE	Hack + Jam
Experts	5	2	3

Table 2. Number of experts with knowledge in multiple domains

Category	Private Sector	Non-profit	Academic	Public Sector
Experts	3	3	3	3

Table 3. Number of experts with experience in private, non-profit, academia and public sector experience

The majority of experts have facilitated these methods in more than one domain. This is due to event partnerships and requests for co-creative events from multiple industries. Most of the hackathon experts were also experts in other methods of public engagement (open space, town hall, etc.), and vice versa. Two experts of jams had an overlap in expertise with public engagement (workshops, charrettes, etc.).

Based on the themes and gaps drawn from the literature review, I asked ten open and neutral questions, and offered each expert the option to provide additional comments at the end of the interview.

3.3 Synthesis

Data collected from the interviews were coded and cross-examined to identify important insights.

Event Type	Stakeholder	Phase	Theme	STEEPV	Finding	Rating
Hackathon	Community	Beginning	Inclusivity	Social	Challenge	High
Jam	Public	Middle	Time	Technological	Perception	Med
Public Engagement	Private	End	Accessibility	Economic	Opportunity	Low
Other	Academic	Other	Power Dynamics	Environmental	Foresight	
	Other		Other	Political	Demand	
				Value-based	Purpose	
				Other	Mechanism	
					Other	

Table 4. Coding framework

The coding framework was organised by event type, stakeholder, event phase (when applicable), themes informed by the literature review, trend domains, the type of finding (informed by the questions set). Comments were also rated in relevance, from low to high. Near the end of the interviews, the types of experts and number of experts sampled felt adequate to represent the population because a level of "saturation" was reached with the same information repeating often (Ladner, S., 2014, p.105). Saturation is understood to be when the interviewer notices a pattern where answers are repeated or similar from expert to expert.

4. Findings

For this thesis, I questioned experts about the societal context, typology, gaps and benefits to hackathons and jams. On a macro level, technology, collaboration and innovation recurred as clear trends in the interviews. The literature review likewise informed my research, setting forth these three themes as the primary drivers of hackathons and jams.

The literature review uncovered various challenges and gaps about the typology of hackathons and jams as methods of public engagement. I used these mechanisms, such as participant diversity and power dynamics, to frame and code the questions for experts. I homed in on the typology findings herein by analyzing similarities and contradictory insights gleaned from the experts.

Finally, by answering the question of how they may be best used in the future, this research project contributes a proposed intervention model to ensure that hackathons and jams accomplish their objectives.

4.1 Societal Context (Drivers)

The Strategic Foresight and Innovation program's analytical approach incorporates foresight methodologies to address uncertainty by seeking and developing potential future outcomes. Environmental scanning is a method in foresight that is used to find signals, events, and emerging trends to inform what

might be a driving force of a phenomenon. (Lang, T.,1995) This section recounts insights from experts and analyzes the insights in the larger context through signals and trends informed by the literature review to derive key drivers of hackathons and jams.

4.1.1 Silicon Valley Culture and the Rise of Technology Solutionism

Advancement in technology has both benefited from and created obstacles for hackathons and jams. Technology has enabled online engagement, access to information, the ability to crowd source and co-create technology on a global scale (Wilson, C., 2014). As mentioned in the literature review, hackathons and jams were originally private sector tech initiatives. Hackathons were adapted from LAN parties (Briscoe & Mulligan, 2014, p.2), and set up as coding competitions for companies to find new ideas for their software. The first jam was an online ideation forum hosted by IBM (Helander, M. et al. 2007). Today, these events leverage technology as a way to "change the world" and improve the society the hackers live in. One expert organiser of hackathons noted the change in motivation to do co-creative engagement:

> *A challenge with people, companies, organisations that want to do a hackathon is they do them for the wrong reasons (i.e. free labour to create a website or app). Our very first meeting with potential clients is figuring out what they want out of a hackathon, and if they're telling us that it's to bring awareness to an issue, they want to get people thinking in new ways and spark idea, or they want to drive a culture shift within a community, those are all great reasons to host a hackathon.* – Patti Mikula, Co-Founder and CEO, Hackworks

There has been a significant shift in the way organisers and facilitators use and understand the objective of hackathons. This is also the case for jams, as shown in the jam example in the literature review. The global service design jam was about open ideation on social problems. How did the private sector motivations of hacks and jams become a way for citizens to engage in active citizenship by "saving the world?".

The technology industry is deeply entrenched within the Silicon Valley technology and design culture. Silicon Valley models for social change have created a singular authority that guides the language, scope, objectives, and audience in contemporary models of public engagement such as hackathons and jams. This model of social change can be described as technology solutionism. Researcher Evgeny Morozov first identified and described this term as the ideology in the technology sector to find problems and technology based solutions for everything, even small mundane issues like the design of a garbage can. The solutions are narrow-minded because it does not consider the human condition, nor account for the complexities of culture and traditions (Morozov, E., 2013).

In addition, technology solutionism in hackathons and jams may have contributed to the methods' growing use and popularity with Millennials because youth are seeking an alternative way to volunteer, a volunteer model that allows the participants to define their role in social change. This model is called "entrepreneurial volunteering".

> *Entrepreneurial volunteers find what's not working and move toward empowerment solutions… The entrepreneurial volunteer works outside the existing system but can cooperate with an organisation to benefit its mission or to radically change or challenge the conventional way of doing things*. (Macduff, N., 2006, p.6)

Entrepreneurial volunteering can be seen in hackathons and jams because these events exist outside of traditional public engagement. The majority of entrepreneurial volunteers are Millennials. They seek to control how they engage by using their ideas, knowledge and skills to create value as they see fit (Ellis, S. J., 2012). The Silicon Valley model for social change is aligned with the mindset of an entrepreneurial volunteer.

The Silicon Valley tech culture is an imperative driver of the typology of hackathons and jams. The following trends influence these events:

1. Solutionism Bias

The majority of the themes and objectives of a hackathon focus on technology in one form or another. For instance, all of the experts interviewed mentioned open data as a common central theme in recent hackathons. Jams have a lesser focus on technology but are dominated by design solutionism. Both technology and design cultures are correlated to market and economic value. Deriving the value of co-creation simply by the market driven model in the technology sector overshadows the alternate applications that might benefit from co-creation. This creates the innovation paradox where focus on efficiency in operations and rapid incremental innovation hinders the opportunity for breakthrough innovations (Manzoni, J. et

al., ,p.2). Diverting the collective knowledge and entrepreneurial passion of citizens' co-creative public engagement towards other models of success measurement such as social gains in cultural and arts related benefits can promote greater focus on breakthrough innovations. By exploring co-creation from different contexts, we can change the definition and measures of success to a holistic model that considers all societal and environmental benefits. Maya Goodwill, the organiser of Vancouver's Nerd Jam notes:

> *It might be interesting to do a jam in housing affordability, energy, transportation, arts, and the environment*. – Maya Goodwill,

Statistics Canada lists twenty industry categories. Each industry has their own measures for success that are influenced by market, internal culture and society. What might occur when adopting co-creative public engagement in different contexts defined by greatly by societal and social success measures?

Secondly, experts continually mentioned managing public expectation as a challenge. Creating clarity for participants will help them understand the purpose of these events.

> *Why are you engaging with this public? Be clear in what your expectations are make sure that the public expectations of you are clear*. – Urusla Gobel

The link between solutionism and the need to manage expectations is the language and branding in hackathons and jams: "48 hours to change the world", "What can you build in 54 hours?", and "Re-envisioning parks in one day" are all common slogans on the websites of hackathons and jams. The emphasis on

"fixing the world" creates the expectation for impact and follow through on ideas manifested at hacks and jams. However, the world changing impact is an unlikely end to hackathons and jams.

2. Rapid Innovation

Technology has evolved rapidly since the birth of personal computers. The pressure to reduces the time available for ideation, group work and creativity. Competition to be the first to market new products and services reduces the time available for ideation, group work and creativity. Some organisations place pressure on workers to ideate and prototype in shorter time spans. To accommodate rapid innovation, more companies are beginning to adopt innovation sprints. "Sprints" are collaborative and short ideation sessions solely for the purpose of solving one specific problem by creating a tangible product or service output. One expert interviewed perceived hackathons and jams to be more open and collaborative than sprints but still falling under the same constraints in time and objective. If ideating in condensed timeframes is becoming the new normal, it can diminish the time available for creative thinking and discredit long-term implementation and hard work required when making impactful social change. The founder of the Service Design Jam movement discussed internal jamming in organisations and the lack of understanding that it rapid ideation does not guarantee innovation:

> *The results are untested, un-prototyped… they're just ideas. In organisations we have to push people to accept that this is not a guaranteed heat generator. And it does need some time. Even though 2 days is really short event, and maybe you can shorten it to 1 day, half day, it is really just a taster… 2 hours, 3 hours… You can do something in there but it's not really an innovation event.* – Adam Lawrence, Co-Founder of WorkPlayExperience and Global Service Jam

Innovation is correlated to one's ability to exercise creative thinking. When creativity is placed under time constraints, it may hinder or improve the quality of work depending on how one feels while they are working under pressure. According to the findings of a research study from Harvard Business School, creativity is enhanced when there is no time constraint. However, recognising that the professional environment places increased pressure to create outputs, people are at their most creative under time constraints when they feel as if they are part of a larger mission and the company allows the employee to obtain uninterrupted time to focus on that sole mission (Amabile, T. M. et al., 2002, p.61).

4.1.2 Shifting Responsibilities towards greater Collaboration

One of the expert interview questions asked who should facilitate hackathons and jams and whether stakeholders need to work collaboratively to host these events. The majority of experts had their own perception about the public and private sector motivations behind hackathons and jams. Most of the experts agreed that the public sector should be the organisers of co-creative public engagement events because the private sector is expected have its own agenda to its stakeholders – profit, CSR and marketing. The government has the ability to bring diverse

groups together and has a mandate for consultation, whereas, the private sector has more resources but does not have the mandate to inform citizens. There were various comments that noted the difference in competencies for both stakeholders:

> *All this hackathon stuff is in permanent beta. There's this impetus of releasing stuff faster then you keep fixing it and fixing it. Government does not have the luxury. When government gets something wrong, they're much more harshly judged. They have this private sector model of thinking around innovation but you've got a whole institution that doesn't have the same freedom the private sector has. They're being held to private sector standards but they don't have private sector freedom and liberty of experimentation.* – Pamela Robinson, Associate Dean - Graduate Studies and Special Projects (Faculty of Community Services) and Associate Professor, MCIP, RPP

> *The private sector is much better at innovating and turning on a dime. That's great. That's their competitive advantage. That's what they need to do. But you look at the Fortune 500 companies, from 1975 they're all gone, they're dead; A city remains. The public sector is designed for stability, we are building a City, a society. We think long term and it means what we take longer to innovate.*
> – John Schaffter, Director of Organisation Development, Learning and Workforce Planning, Human Resources Division, City of Toronto

The private sector is more capable of taking on risks, whereas the public sector does not have the same freedom. Running a city, a region, and a country is a long term and continuous process. The government must prove that spending will be applied towards services that are beneficial to citizens. The lack of resources and capacity for risk in various levels of government make it difficult to justify and fund contemporary models of public engagement like hackathons and jams. However, the interest in hackathons and jams from government is growing because of open data and service design. For example, the federal government of

Canada hosted the “Canadian Open Data Experience”, a 48-hour appathon for anyone interested in creating an idea using Government of Canada open data website. The Australian Government's Department of Industry, Innovation, Science, Research and Tertiary Education was one of three organisations that initiated the Global Gov Jam.

The public sector’s increased interest in hackathons and jams, and the need to shift private sector objectives towards greater social benefits, frames the case for more collaboration between both these stakeholders. By drawing this deduction, the literature helped to inform Public-Private Collaboration as a second driver that influences hackathons and jams.

Looking back in history, every economic, environmental or global crisis has gradually shifted governance due to the effects of Neoliberalism. Neoliberalism refers to “a broad range of economic policies adopted since the 1970s that promote and measure economic development” (Turner, B., 2006). In a globalising and changing society, the approach to problem solving has transformed in the following ways:

> *Government has come to rely heavily on for-profit and nonprofit organisations for delivering goods and services ranging from anti-missile systems to welfare reform...* (Kettl, D.F., 2000, pg.488)

Reduction of spending for social services and increased privatisation of public services over the past four decades has increased government reliance on external partners for public service delivery. Municipalities are strained in their resources

due to an influx in population, shifting responsibilities from higher government levels, and lack of funds. Local organisations have an obligation to perform more service delivery responsibilities as directed by municipalities, but these local organisations often suffer from similar capacity issues as well.

> *Second, the new challenges have strained the capacity of governments-and their nongovernmental partners to deliver high-quality public services… Consequently, government at all levels has found itself with new responsibilities but without the capacity to manage them effectively. The same is true of its nongovernmental partners.* (Kettl, D.F., 2000, pg.488)

Shifting responsibilities of governance is proof that society is moving towards greater collaboration. To address the complex issues of today, this systemic and biologic view of self (the organisation) is a new way of recognising the need to innovate and adapt to change. Researcher Eric Lowett proposes that we are transitioning from a Waste Economy to a Collaboration Economy. Rather than gain economic output based on consumption, organisations are collaborating to deliver sustainable solutions. Delivering high-quality public service requires funding and collaboratively forming these services with partners to understand where their difficulties in service delivery lie. Collaboration between different organisations is called interorganisational participation. There are still various issues facing collaboration of different organisations because of power dynamics, resource capacity and opposing goals. However, there is value in "successful" collaboration:

> *All these companies don't have the same objectives. But by bringing all these people together, citizens were able to leverage all of them to come*

> *up with solutions that met maybe entirely objectives all together than those companies' objectives*. – Patti Mikula, Co-Founder and CEO, Hackworks

Experts define effective collaboration as existing when two parties are able to understand the other's motivations and find a common goal. The transformative aspect is when an entirely new and shared objective is formed. The potential net benefit for society and public engagement is the rationale behind public and private collaboration. One significant net benefit is more opportunities to educate people about complex social challenges.

In consultations, the public sector needs a base of informed citizens to engage in a meaningful way. The greater the pool of informed citizens, the more likely the event will result in diverse perspectives. Private sector hackathons and jams also makes an effort to educate citizens but stops short by limiting their focus to their personal mandate. This limitation may overshadow focus on social systems education, inclusion, sustainability and user-centred approach to public engagement. For example, Budweiser hosted a hackathon with other private tech start-ups, such as Uber and BrainStation, to ideate drunk driving prevention products. The irony of an event that promotes drunk driving prevention by a prevalent beer manufacturer very clearly demonstrates their CSR motive. The Budweiser website notes "We've given Toronto's boldest thinkers the chance to empower designated drivers and potentially save lives." – an extreme proposition, though the initiative may still teach people about the impacts of drinking and driving if the educational foundation is built and they invite participants that can

make use of this information, such as youth and new drivers. Public sector experts can help to improve the problem frame by providing policy expertise, data and answers to where participants can make the most influence.

4.1.3 Finding Innovation in Co-Creative Spaces

All hackathons and jams proclaim that co-creative public engagement can generate innovation in some form. Experts agree that when the conditions are set appropriately, innovation can occur.

> (Question: Can hackathons and jams drive innovation?) *Yes, I definitely think so. They bring diverse people to the table, they test a new idea, they develop a rapid prototype in a short period of time. I do think they are an effective tool in cultivating new ways of thinking and uncovering different options and paths forward.* – Jesse Darling, Urban Project Designer, Evergreen CityWorks

Both the private and public sector want to find innovative solutions that is sustainable and can adapt to emergent issues. They want to find the gaps and understand human factors prior to creating and implementing a costly solution.

> *Hackathons drive innovation as a change agent within companies and organisations. They are driving this radical new way of thinking about their own industries.* – Patti Mikula, Co-Founder and CEO, Hackworks

There is little time for creative collaboration in a full workday, thus leading to failure for companies in retaining younger employees. Hackathons and jams present an opportunity for organisations to create a space for innovation. Organisations are interested in incorporating a safe space for teamwork, ideation, creativity and failure can injected jams or hackathons as methods within various points of product development or by allowing employees to count these events as

both education and volunteerism. With a workforce seeking greater flexibility in work and an interest to contribute in a positive way towards society, co-creative public engagement is a safe space for participants to exercise their passion and social integration.

Secondly, co-creative public engagement methods present opportunities for grassroots innovation. Grassroots innovation is understood as "community level activity with the aim of creating greater levels of sustainability" (Davie, A. 2012). There is growing interest from the public to volunteer their time and energy to participate in these engagement activities or create their own source of civic action. This grassroots movement of consumers as creators is motivated by several factors:

- Community groups are seeking to engage in activities that create a social or sustainable impact (Davie, A. 2012).
- Technological advancement of accessible online platforms, open source software and crowdsourcing allow for global collaboration and knowledge transfer (Ross, T. et al, 2012).
- The profit-driven innovation model of the private sector does not account for sustainability; rather, it creates consumerism without social values. This is slowly beginning to change, but unethical behaviour cemented in the past has resulted in a lack of public trust for corporations to be transparent about their decisions (Mokyr, J., 2014).

Grassroots innovation is important because of its ability to innovate within local constraints and to create diverse ideas for unmet social needs. It works within a "niche space" where market forces are less applicable than the social economy of community activities and social enterprise (Seyfang, G., & Smith, A., 2007, p. 591). Individuals have to develop sustainable ideas with very little capacity and resources.

> Grassroots action for sustainable development takes different forms, from furniture-recycling social enterprises to organic gardening cooperatives, low- impact housing developments, farmers' markets and community composting schemes. (Seyfang, G., & Smith, A., 2007, p. 585)

Sustainable development created by community groups can create important interventions that can be adopted and applied to other cities. When you are approaching a problem from a community level, the need to innovate within their resource and capital limitation as well as volunteers personal experience with the issue creates a situation where new approaches form.

Maya Goodwill, the organiser of the not-for-profit jam organisation called the Vancouver Design Nerds says that simply finding space to host a jam can be a difficult task. Grassroots innovation is lacking in support from public and private organisations. This weakness is because most grassroots innovations fall under social innovation. Social innovation is often viewed separately from ecological and technological innovation on the political level. Traditional views of innovation and government culture create barriers to localised social innovation.

A greater understanding of the role community-level initiatives play in sustainable innovation is needed (Seyfang, G., & Smith, A., 2007, p. 585).

Learning about how to support grassroots ideas in co-creative public engagement may increase the value of engagement for facilitators and participants. Bringing corporate participants together with grassroots groups to exercise co-creation can be a channel for grassroots ideas to get recognition and investment from corporations. The exchange of ideas from between bureaucratic and grassroots groups can create an entirely new problem frame altogether.

4.2 Typology

This section will first discuss the topic of public engagement and define the type of public engagement for this research to situate hackathons and jams as methods of this practice. It will then build a typology table to understand the characteristics that are distinct to both methods.

4.2.1 Public Engagement

Hackathons and jams are forms of public engagement. Majority of experts of hackathons and jams had previous experience with other forms of public engagement such as open space engagement and charrettes. It is important to make the distinction and comparison with other public engagement methods because it profiles the appropriate setting for a hackathon or jam.

Each public engagement method is suited to one or more of the four objectives, as defined by the National Coalition for Dialogue and Deliberation: exploration, conflict transformation, decision-making, and collaborative action. Hackathons and jams demonstrate collaborative exploration and collaborative action. They promote discovery, empower participants in designing solutions, and sometimes are used towards decision-making for a policy or strategy. The challenge with building a comparison between hacks, jams and other public engagement methods is that each method uses different mechanisms towards multiple objectives. Each method creates different results.

One instance of a public engagement method that is highly similar to a hackathon and a jam is a charrette. Charrettes use design thinking and co-creation to engage participants in building consensus over a number of design workshops. Traditionally, charrettes assisted with decision making for development and building projects. Today, the method is used to explore new domains such as technology, sustainability and business. For example, the Dublin City Council hosted a StartUp City charrette in 2013 to discuss ideas for improving municipal support for small to medium-sized businesses.

Alternatively, other public engagement methods are far from hackathons and jams. For instance, the 21ST Century town meetings uses dialogue to educate participants. Hundreds of people from different locations participate in discussions in person and online. It is an evolved form of traditional town halls

which falls under consultation rather than public engagement because it did not fully engage participants in a meaning way. Participant voices in traditional town halls were not entered into policy decisions. Other public engagement methods may fill the gaps where hackathons and jams may not fit the imminent objective.

The public engagement chosen is often based on the problem frame, timeline, objective and the organiser.

4.2.2 Typology Table

The typology table was created to study the characteristics between hackathons and jams. Based on the discussion from expert interviews, the following features will be critiqued: Setting, Time, Power Dynamics, Event Organiser, Participant Motivation, Government Motivation, Private Sector Motivation, Challenges, Outcomes/ Outputs, and Product Output.

4.2.2.1 Setting

Hackathons and jams are hosted locally and globally. Some events invest in understanding issues at a local level, whereas others use online platforms to crowdsource ideas. For initiatives that are global or national, the workshops are organised at a local level with collective results assembled after local events have occurred.

Approaching a global event by working locally seems to have the greatest investment from all parties and the greatest impact value to the local community.

This is exemplified in the Global Service Jam example in the literature review. The event gave participants the freedom to localise the jam initiative, which encourages greater volunteerism because participants may feel a strong connection to the local host or the local challenge. This practice aligns with the theory that co-creation and innovation are dependent upon the culture and the resources of the group.

> The innovation of a region depends on the following factors, all of which have a positive impact on regional innovativeness: (1) wealth, (2) the development of gross domestic product (GDP), (3) cultural diversity, (4) the talent of the population and (5) the density of the population (Gössling, T., & Rutten, R., 2007).

The culture may include the level of acceptance of innovation ideas and resources may include whether the region supports the implementation of these ideas.

	Jam	**Hackathon**
Setting	Global and Local	Global and Local

Table 5. Typology Table: Setting

4.2.2.2 Time

As with any event planning process, time is considered throughout all stages of the event. In public engagement, organisers must decide the time allocated to the entire event, time allocated to different exercises during the event and the timing of when the event takes place in the larger scope of the strategy or policy initiative. By analyzing different events and listening to event cases from experts, the research deduced the time allotted for hackathons are often longer than jams.

Time allotted to an event is influenced by the capacity for facilitators to sustain the event overtime. Not every hack or jam has a community capable of sustaining the event over time. Most jams and hackathons stop after one engagement event.

> *Events are often one off because the community runs them, the open data community, is not a sustained community, it's a volunteer-run community*. – Bianca Wylie, Founder, Open Data Institute Toronto, and Associate, Swerhun Facilitation

To have continuation and impact, hackathons and jams require a community or stakeholder to take responsibility of the task. If the hack or jam is part of a broader objective, the likelihood for continuation or implementation of results may increase.

Some organisers are trying to change the timeframe to make the engagement event a continuous process. The Social Sciences and Humanities Research Council adapted a hackathon for their needs. They hosted an open data challenge and invited the different stakeholders to ideate over 3 months instead of one weekend.

> *Participants have three months because it's an open data challenge – not a hackathon. A hackathon has different connotations. We want the community to take it seriously, within a research environment, where the solutions have been carefully developed, hopefully in collaboration with those who can benefit… We want it (the event) to have credibility.* – Ursula Gobel, Associate Vice-President, Future Challenges, SSHRC

Some researchers argue that giving a specified amount of time for participants to experience uninterrupted exercises allows for the rapid development of an idea

(Irani, 2015, p.811). Also, relationship building and trust are important factors in the success of group work. It takes time to build relationships and trust.

	Jam	Hackathon
Setting	Global and Local	Global and Local
Time	Less than 48 hours, often occurs in one weekend	24 to 72 hours, often occurs in one weekend

Table 6. Typology Table: Time

4.2.2.3 Power Dynamic

Power dynamics always exist in a collaborative setting. Power dynamics here can be understood as the capacity for participants to contribute in the event environment. The event organisers determine the scope, types of participants and co-creative methods. In a controlled environment, participants can only contribute in specified ways and is constrained within a very precise objective. In an uncontrolled environment, there may be a theme involved but no specific objective or goal in the theme. Participants have the freedom to determine how they want to co-create. This is the case for a jam. A jam leans toward "uncontrolled" because jams provide a theme to explore, whereas hackathons allow for exploration within specified end goals.

When events are open-ended and have minimal controls, this approach does not mean that the participants lack discipline in understanding where to co-create (Komssi et al., 2015, p.64).Groups tend to self organise, with some functioning dynamically and other not so well.

> *Because these groups are self-organising, there is a hierarchical challenge. How do you spontaneously structure a group? When you allow the groups to self organise, leadership naturally emerges and sometimes that can go very well, but sometimes you get a whole team of people who want to lead. Or, sometimes nobody wants to be a leader.* – Lori Endes, Special Projects and Lab Coordinator, Institute Without Boundaries

In a participant group, there are leaders and followers. Managing these personalities requires facilitation. Facilitation in public engagement is necessary to provide a helping hand for struggling teams to move forward with their ideas. One expert notes that mentioning the power dynamic and guidelines to participants prior to group work is important.

> *On a team no one's level should matter, seniority should not matter. It's a level playing field. You've got an idea, explore it.* – Patti Mikula, Co-Founder and CEO, Hackworks

Stating the rules in advance may enhance group dynamics. In addition, organisers should provide clarity about what is open for influence and what is not. Creating transparency around the power dynamics and controls will help participants build trust and understand their roles in the engagement process (Swerhun, N., 2012).

	Jam	**Hackathon**
Setting	Global and Local	Global and Local
Time	Less than 48 hours, often occurs in one weekend	24 to 72 hours, often occurs in one weekend
Power Dynamics	Uncontrolled	In-between

Table 7. Typology Table: Power Dynamics

4.2.2.4 Event Organiser

Co-creative public engagement methods suit different needs. Currently, jams and hackathons are still predominantly private sector initiatives, but governments are becoming more open to investing in hackathons as a means to explore the opportunities for government data.

Two experts started their own companies because of the growth in interest from the private and public sector who want to host hackathons and jams to engage with the public or internal staff. The founder of Global Service Design jam formed a non-profit organisation to appoint more volunteers to host global jams.

> *The size has been quite hard to keep up with. Which is why there is very slowly a non-profit organisation formed which will take over the jams from us. And that basically has to be efficient with standards and then that will open the jams and volunteers can do it. We're already experimenting now with having local groups running global jams.* – Adam Lawrence, Co-Founder of WorkPlayExperience and Global Service Jam

Another expert was employed in a game development company that hosted hackathons internally. Demand from other organisations for hacakthon expertise prompted the game development company to form a sister company called "Hackworks". Hackworks is a business with the sole purpose of hosting hackathons and technology related public engagement.

> *Eventually it became very clear that we couldn't take advantage of all the opportunities coming our way and still try and market video games, in our "day jobs". The next step was to separate the team into another company* – Patti Mikula, Co-Founder and CEO, Hackworks

Expert insights indicate that demand for both methods of engagement is growing, and has the potential to sustain hack or jam dedicated public engagement organisations.

	Jam	Hackathon
Setting	Global and Local	Global and Local
Time	Less than 48 hours, often occurs in one weekend	24 to 72 hours, often occurs in one weekend
Power Dynamics	Uncontrolled	In-between
Event Organiser	Predominately private sector and grassroots groups interested in social entrepreneurship and design. Gaining interest from government organisations but only in countries where service design is well recognised (e.g. UK, Australia, Germany)	Predominantly private sector, and some public sector.

Table 8. Typology Table: Event Organiser

4.2.2.5 Participant Motivation

Participants can encompass a variety of people. In hacks and jams, the target audience depends on the objective of the event. For example, hackathons require a mix of people with varying knowledge of coding, technology and data science. If the public engagement event is open to the public, citizens engaged or curious about the subject matter will likely participate. The term "public" or "community" is too broad to address the motivations of participant groups. It's important to identify which groups are most vital to the co-creative mission.

> *Who do you consider as public? For every organisation has its key audiences and as a federal agency (SSHRC) the public is an audience but*

> *our primary key audience are identified as researchers and graduate students… our key-stakeholders*. – Ursula Gobel, Associate Vice-President, Future Challenges, SSHRC

Identifying the types of participants needed and who might have an interest in the event will help organisers select communication channels that reach their target audience. One expert spoke about a hackathon that sought people with a specific skillset based on what the organisation needed:

> *One of the factors that contributed to TrafficJam providing meaningful outputs is that it engaged a group of citizens with incredible expertise and skill sets, including graphic design, data analysis, coding, urban planning and more. By combining their deep passion and commitment to reducing Toronto's congestion problems with their practical skills, participants were able to create insightful and innovative solutions*. – Jesse Darling, Urban Project Designer, Evergreen CityWorks

The objective of the engagement will help to determine who to invite to the event. Most hackathons and jams attract people who are employed in the technology and design industry because of their premise of engagement.

On the individual level, each participant has a different personal goal for attending a hack or jam. They may range from learning about the subject matter, meeting new people or a simple curiosity about the event theme.

	Jam	**Hackathon**
Setting	Global and Local	Global and Local
Time	Less than 48 hours, often occurs in one weekend	24 to 72 hours, often occurs in one weekend
Power Dynamics	Uncontrolled	In-between
Event Organiser	Predominately private sector and grassroots groups interested in social entrepreneurship and	Predominantly private sector, and some public sector.

	design. Gaining interest from government organisations but only in countries where service design is well recognised (e.g. UK, Australia, Germany)	
Participant Motivation	Interest in the theme, networking, learning new skills, making social impact, designing services, etc. (Varies)	Interest in the theme, networking, learning new skills, making social impact, designing a new product/ service, etc. (Varies)

Table 9. Typology Table: Participant Motivation

4.2.2.6 Government Motivation

Government mandates vary between municipal, provincial and federal operations. They are motivated by their mandate to service the public and create policies that address the needs of citizens. Government officials organise public engagement under the following circumstances:

> *1) When the public expectation has changed.*
> *2) A whole new idea arrives on the scene*
> *3) Scarcity of resources means we can't deliver what we are required to do with the resources we have so we have to make choices. That forces us to invite the public to comment.* – John Schaffter, Director of Organisation Development, Learning and Workforce Planning, Human Resources Division, City of Toronto

In order to address various forms of change and the community's reaction to change, public engagement is used to invite the community to participate in problem framing and problem solving. However, contemporary models of public engagement like hackathons and jams has only recently become a response to these issues.

> *Governments don't have a history of co-creation*. – Pamela Robinson, Associate Dean - Graduate Studies and Special Projects (Faculty of Community Services) and Associate Professor, MCIP, RPP

Co-creation in hackathons and jams require greater understanding for people to understand the impact it may have on society and the possible benefits it can provide for the public sector. One public engagement and hackathon expert explains:

> *There is a growing desire for all levels of government to conduct public engagement and policy making differently. We know that the status quo isn't working, so what are different models that government could test? A hackathon is one approach that can be taken depending on what the goals and desired outcomes of a government partner. In the case of the TrafficJam, one of the key objectives of the City of Toronto's Transportation Services Division was to forge new relationships with the tech industry. TrafficJam provided an incredible opportunity for the City of Toronto to discover new talent and act as a bit of a recruitment tool for their new Big Data Innovation Team*. – Jesse Darling, Urban Project Designer, Evergreen CityWorks

The relationships government workers can builds with other collaborators is a fundamental motivator. This can encompass any stakeholder who takes part in the event including partners, sponsors, experts, facilitators, mentors and participants. Building relationships with people or organisations that have the necessary knowledge and competencies that the government may internally, and allowing these groups to co-create with government officials may create a comprehensive and more meaningful public engagement event.

Another motivator is the government's interest in engaging with youth and millennials. Traditional forms of public engagement are often more serious and

professional. Hackathons and jams fashion a playful and party-like atmosphere to attract youth.

> *I'd like to see more public engagement that is fun*. – Lori Endes, Special Projects and Lab Coordinator, Institute Without Boundaries

Hackathons and jams are alternative methods of engagement. Having more alternatives provide flexibility for the government, and ensures greater accessibility as each method is tailored to different types of participants.

	Jam	**Hackathon**
Setting	Global and Local	Global and Local
Time	Less than 48 hours, often occurs in one weekend	24 to 72 hours, often occurs in one weekend
Power Dynamics	Uncontrolled	In-between
Event Organiser	Predominately private sector and grassroots groups interested in social entrepreneurship and design. Gaining interest from government organisations but only in countries where service design is well recognised (e.g. UK, Australia, Germany)	Predominantly private sector, and some public sector.
Participant Motivation	Interest in the theme, networking, learning new skills, making social impact, designing services, etc. (Varies)	Interest in the theme, networking, learning new skills, making social impact, designing a new product/ service, etc. (Varies)
Government Motivation	Forge relationships with a new sector, obtain service design expertise, engage with Millennials	Forge relationships with a new sector, obtain technology expertise, engage with Millennials

Table 10. Typology Table: Government Motivation

4.2.2.7 Private Sector Motivation

The private sector can range from large organisations to small startups. Outside of the Urban Planning industry, the interest of large organisations to involve the public in the internal decision making process is very low. Early applications of private sector engagement events were for marketing or to show corporate social responsibility. Private sector companies used a sponsorship model to sponsor early forms of hackathons, also known as "App Contest" (Johnson & Robinson, 2014). Participants competed to win prizes or money, provided by the company.

> *I think early on, some companies got involved in hackathons, almost as a branding exercise. 15 to 20 years ago they would sponsor snowboarding, etc. I think that's why early on some companies attached themselves to hackathons because it's cool and it's hip. The gimmicky attachment to hackathons is waning, and we're seeing companies host hackathons for deeper levels of engagement. Whether it's they want to be involved, or recruit someone, perhaps it's attached to their charitable giving arm. Rather than putting money to a not for profit organisation, they might give money to drive development in that area. I think there is a more sustainable model for funding when they find value in the outputs rather than a sponsorship model.* – Patti Mikula, Co-Founder and CEO, Hackworks

The private sector had a different comprehension of the purpose of hackathons and jams in the past. Facilitators had to use other modes to communicate the mechanics of contemporary forms of engagement with private sector organisations.

> *We've used jamming a lot in our work, with organisations in closed formats. We had the same techniques before Service Design Jam, but we called it a "workshop" instead of a "jam".* – Adam Lawrence, Co-Founder of WorkPlayExperience and Global Service Jam

Criticism about private sector motivations is drawn from this history of misunderstanding. Most experts agree that the private sector has their own agenda that can overshadow the social benefit of hacks and jams.

> *Microsoft is an amazing support within the hack community but at the end of the day, of course they want Microsoft products to be used.* – Bianca Wylie, Founder, Open Data Institute Toronto, and Associate, Swerhun Facilitation

Private sector companies do use hacks and jams to innovate upon their own products and services. However, more organisations are beginning to see other benefits to public engagement including bringing new knowledge and software to their employees, and hire new talent people into their firm. One expert spoke about an example where a traditional organisation hosted an internal hackathon to provide access to beacon technology, wearables and other gadgets that employees are restricted from during work. These new resources allowed participants to be creative with their ideas and learn about new technology innovations.

	Jam	**Hackathon**
Setting	Global and Local	Global and Local
Time	Less than 48 hours, often occurs in one weekend	24 to 72 hours, often occurs in one weekend
Power Dynamics	Uncontrolled	In-between
Event Organiser	Predominately private sector and grassroots groups interested in social entrepreneurship and design. Gaining interest from government organisations but only in countries where service design is well recognised (e.g. UK, Australia, Germany)	Predominantly private sector, and some public sector.
Participant Motivation	Interest in the theme, networking, learning new skills, making social impact, designing services, etc. (Varies)	Interest in the theme, networking, learning new skills, making social

		impact, designing a new product/ service, etc. (Varies)
Government Motivation	Forge relationships with a new sector, obtain service design expertise, engage with Millennials	Forge relationships with a new sector, obtain technology expertise, engage with Millennials
Private Sector Motivation	CSR, hiring new talent, obtain space and time for creativity, innovate internal services	CSR, hiring new talent, obtain space and time for creativity, innovate internal products

Table 11. Typology Table: Private Sector Motivation

4.2.2.8 Challenges

When asked about challenges, all experts mentioned three key issues that confront hackathon and jam organisers: problem framing, public perception and stakeholder expectations.

> *The hardest part was narrowing the scope of the challenge question - figuring out exactly what we wanted participants to spend their time working on in order to enhance the likelihood that the solutions would actually be useful to Transportation Services*. – Jesse Darling, Urban Project Designer, Evergreen CityWorks

Creating a suitable problem frame was mentioned by all experts as a one of the greatest challenges to public engagement. It is also a highly important aspect to successful co-creation. If the problem frame is too broad, it will not address the specific objectives of the hack or jam.

> *95% is making sure the question is tightly focused and there is a person who really needs the problem solved in the room ready to take action*. – John Schaffter, Director of Organisation Development, Learning and Workforce Planning, Human Resources Division, City of Toronto

The scope of the event will determine the related activities and the people required both internally and externally who has the right competencies to carry out the scope. There needs to be experts to educate participants on the subject matter, facilitators who design the methods that fit with the subject matter and a way that outputs generated can be shared and mobilised in the greater context. Achieving a good balance between a problem frame that is both broad enough to allow for freedom of ideation and defined enough so that participants understand how to move forward, is a task that influences co-creation.

Public perception of culture is another challenge to hackathons and jams. The methods face a contrasting perception bias. Negative connotations with the word "hack" still remain. People are afraid of hacker culture. It creates a barrier to entry for participants because they think they must be apart of that culture and understand technology to participate.

> *There is still a negative connotation with the word hackation or hacking with the general public. One of the challenges is definitely explaining what it is and that it is not evil.* – Patti Mikula, Co-Founder and CEO, Hackworks

On the contrary, the playful culture in a jam is celebrated for fostering creativity but is perceived to lack productivity. Participants often have a perception bias that fun things are not work. This is not the case. Time and effort is required in planning a jam, ideation and co-creation.

> *Jams need a fun and silly atmosphere*. – Maya Goodwill, Director of Social Impact at HiVE, and Development Director, Vancouver Design Nerds

> *The big challenge there is simply noting the body of work. In internally jamming, when we jam in organisations, the main challenge is expectation. Because two things, either in most cases, people find it very hard to see that it is work, because it looks fun. People think play can't be productive and the opposite is true. It's enormously productive*. – Adam Lawrence, Co-Founder of WorkPlayExperience and Global Service Jam

Despite these perceptions of culture, the majority of hackathons and jams organisers are tackling these cultural perceptions by altering their language, branding and problem frame.

The third challenge is managing stakeholder expectations. Participants expect organisers to follow through on making an impact at the end by implementing insights and ideas to some degree. Hackathons and jams create many great insights, ideas, and prototypes. There is no guarantee the work at a hack or jam will be implemented on a larger scale.

> *People confuse creating ideas with actually implementing a change. It is the difference between generating sparks and creating and maintaining a fire. People get excited about generating "sparks" at a hackathon, but the more challenging and painstaking work is catching the spark and nurturing it into a roaring fire. That requires time, hard work and building a consensus for action. Hackathons are fun, but they're not always what's required*. – John Schaffter, Director of Organisation Development, Learning and Workforce Planning, Human Resources Division, City of Toronto

> *People confuse a jam with a sprint, and saying, we're going to put 50 people in a room who have work to do and we must have concrete results from this. And we have to say to them "you don't understand innovation". We cannot say you must innovate. And to do it in 6 hours, in 4 hours, in 2 hours, and get great results is a lottery. The results are untested, un-*

> *prototyped, they're just ideas*. – Adam Lawrence, Co-Founder of WorkPlayExperience and Global Service Jam

Jams and hackathons create many "sparks". Sparks are ideas but they cannot be fully tested or prototyped within the short time allotted. The common misconception is that participants or organisations assume that there will be concrete results and innovation will always occur. Experts noted that the end of a hack or jam is uncertain and the responsibility for implementation can vary between organiser and participant.

> *(In reference to transit hackathon) Feedback has been really positive about the actual hackathon experience. Overall, participants felt like they meaningfully contributed to developing new solutions to mitigating Toronto's congestion problems. This was the first time – at least that I'm aware of – that Torontonians were asked by government to help them with a major public problem. This as a huge accomplishment. Hopefully TrafficJam acts as a catalyst to more partnerships and collaboration between government and the general public. Did the solutions actually inform transportation policy? It's too soon to tell.* – Jesse Darling, Urban Project Designer, Evergreen CityWorks

> *The majority of our hackathons, certainly, the external hackathons that are with the public, all of the intellectual property and ideas are owned by the participants. If you're doing an internal hackathon with an institution, the institution owns that IP, but that's an outlier.* – Patti Mikula, Co-Founder and CEO, Hackworks

To see and understand change requires time. This relates back to the capacity issues mentioned in the section about "time". These events lack the capacity to carry out long-term change, unless it is integrated to a larger objective.

> *Continuity is one of the biggest challenges for these events…One reason the Toronto Public Library hackathon was great was that the objectives were connected to the strategic plan of the library. Can we take a hackathon and embed it in that process somewhere so that people know*

ideas go back to leadership? – Bianca Wylie, Founder, Open Data Institute Toronto, and Associate, Swerhun Facilitation

One expert spoke about the Toronto Public Library hackathon. The hackathon was used to inquire insights towards a larger strategic plan for the library. This integration provided continuity to the results of a hackathon.

	Jam	**Hackathon**
Setting	Global and Local	Global and Local
Time	Less than 48 hours, often occurs in one weekend	24 to 72 hours, often occurs in one weekend
Power Dynamics	Uncontrolled	In-between
Event Organiser	Predominately private sector and grassroots groups interested in social entrepreneurship and design. Gaining interest from government organisations but only in countries where service design is well recognised (e.g. UK, Australia, Germany)	Predominantly private sector, and some public sector.
Participant Motivation	Interest in the theme, networking, learning new skills, making social impact, designing services, etc. (Varies)	Interest in the theme, networking, learning new skills, making social impact, designing a new product/ service, etc. (Varies)
Government Motivation	Forge relationships with a new sector, obtain service design expertise, engage with Millennials	Forge relationships with a new sector, obtain technology expertise, engage with Millennials
Private Sector Motivation	CSR, hiring new talent, obtain space and time for creativity, innovate internal services	CSR, hiring new talent, obtain space and time for creativity, innovate internal products
Challenges	Problem Framing, Public Perception, Stakeholder Expectations	Problem Framing, Public Perception, Stakeholder Expectations

Table 12. Typology Table: Challenges

4.2.2.9 Event Outcomes and Outputs

The majority of experts interviewed mentioned a need to differentiate the final outcomes and outputs in co-creative public engagement. Experts described "output" as the product/ service prototype, or the tangible pieces that are produced at the end of an event. "Outcomes" are intrinsic benefits that are invisible, such as the building new relationships, learning new skills, or finding a new personal insight or revelation.

Participants in jams tend to spend most of the ideation period in an open and exploratory mindset. They need to produce an idea at the end but the culture is less competitive and the events don't place pressure on funding or startup incubation.

> *Most of the outcomes of jams are very strong but the outputs are usually very weak. They die straight away, and that's not the intention.* – Adam Lawrence, Co-Founder of WorkPlayExperience and Global Service Jam

In contrast to jams, hackathons dive into the coding and prototyping of ideas more quickly and have a greater incentive for outputs. Hackathons and jams have difficulty tracking outcomes that are intrinsic, however experts have stories of people who have met at an event and gone on to start their own partnership. Outputs are rather easy to track because the top ideas will often be presented and documented online.

	Jam	Hackathon
Setting	Global and Local	Global and Local
Time	Less than 48 hours, often occurs in one weekend	24 to 72 hours, often occurs in one weekend
Power Dynamics	Uncontrolled	In-between
Event Organiser	Predominately private sector and grassroots groups interested in social entrepreneurship and design. Gaining interest from government organisations but only in countries where service design is well recognised (e.g. UK, Australia, Germany)	Predominantly private sector, and some public sector.
Participant Motivation	Interest in the theme, networking, learning new skills, making social impact, designing services, etc. (Varies)	Interest in the theme, networking, learning new skills, making social impact, designing a new product/ service, etc. (Varies)
Government Motivation	Forge relationships with a new sector, obtain service design expertise, engage with Millennials	Forge relationships with a new sector, obtain technology expertise, engage with Millennials
Private Sector Motivation	CSR, hiring new talent, obtain space and time for creativity, innovate internal services	CSR, hiring new talent, obtain space and time for creativity, innovate internal products
Challenges	Problem Framing, Public Perception, Stakeholder Expectations	Problem Framing, Public Perception, Stakeholder Expectations
Outcomes/ Outputs	Outcomes then outputs	Outputs then outcomes

Table 13. Typology Table: Outcomes/ Outputs

4.2.2.10 Product Output

The product output is the type of tangible visuals and prototypes that are produced during a co-creation event. Hackathons originated through technology. The final product or output from a hack is usually some form of technology or data insight such as an application, a map or visualisation.

> *In a hackathon, the output will be an application, a map, a visualisation of some sort, there's some technical output. A jam is more design process, how should we improve this thing, the outcome may be a flowchart, a sketch of better ui/ux, it doesn't require very technical people. In community consultation or public meeting, the parameters are just that there's a host and there's the general public… it's a conversation of some sort. How much that conversation can be applied to decisions is a spectrum – it depends on how much room there is for public influence.* – Bianca Wylie, Founder, Open Data Institute Toronto, and Associate, Swerhun Facilitation

In contrast, jams use service design mentality and tools so their output is a prototype that can come in the form of drawings, video, flow chart, illustrations, and other artistic forms of outputs that don't require the same technicality.

	Jam	**Hackathon**
Setting	Global and Local	Global and Local
Time	Less than 48 hours, often occurs in one weekend	24 to 72 hours, often occurs in one weekend
Power Dynamics	Uncontrolled	In-between
Event Organiser	Predominately private sector and grassroots groups interested in social entrepreneurship and design. Gaining interest from government organisations but only in countries where service design is well recognised (e.g. UK, Australia, Germany)	Predominantly private sector, and some public sector.
Participant Motivation	Interest in the theme, networking, learning new skills, making social impact, designing services, etc. (Varies)	Interest in the theme, networking, learning new skills, making social impact, designing a new product/ service, etc. (Varies)
Government Motivation	Forge relationships with a new sector, obtain service design expertise, engage with Millennials	Forge relationships with a new sector, obtain technology expertise, engage with Millennials
Private Sector Motivation	CSR, hiring new talent, obtain space and time for creativity, innovate internal services	CSR, hiring new talent, obtain space and time for creativity, innovate internal products
Challenges	Problem Framing, Public	Problem Framing, Public

	Perception, Stakeholder Expectations	Perception, Stakeholder Expectations
Outcomes/ Outputs	Outcomes then outputs	Outputs then outcomes
Product Output	Outputs include product or service prototypes	Outputs include a technology related product or service

Table 14. Typology Table: Product Output

4.2.2.11 Typology Discussion

The typology table above summarises the insights gathered about the typology of these events. Some significant insights from the table include:

- Jams are shorter than hackathons.
- Jams focus on learning outcomes. Hackathons focus on product outputs.
- Jams focus on design. Hackathons focus on technology.
- Both face similar challenges in different respects.

Both methods, hackathons and jams, have evolved and adapted since their first emergence. The characteristics between the two events in have many similarities, and the blurring lines between hackathons and jams may be the cause. We see both methods trying to adapt some key qualities of the other. Hackathons seek greater openness and inclusivity, whereas jams seek to have measurable and visible impact. There is evidence from events, such as TrafficJam and Go Open Data, of hackathons incorporating the title of a jam or a jam session structured within a larger hackathon.

When considering the macro scale of public engagement, traditional public engagement is in a phase of experimentation and transition as well. The traditional approach to public engagement such as a town hall is shifting towards co-creation. The dynamics of traditional co-creative public engagement such as a charrette are becoming more playful and adapting tools from service design and the digital component of hackathons. Ultimately, the majority of experts agreed that hackathons and jams are methods within public engagement. Having additional methods for public engagement provides facilitators with new approaches to problems. The correlation to public engagement is not always recognised by society because of the branding and private sector origin that is associated with hackathons and jams. In addition, hackathons and jams are methods that are not formally recognized by professional associations and government groups as methods of public engagement; they continue to exist as external methods of engagement, adding to the confusion of public perception.

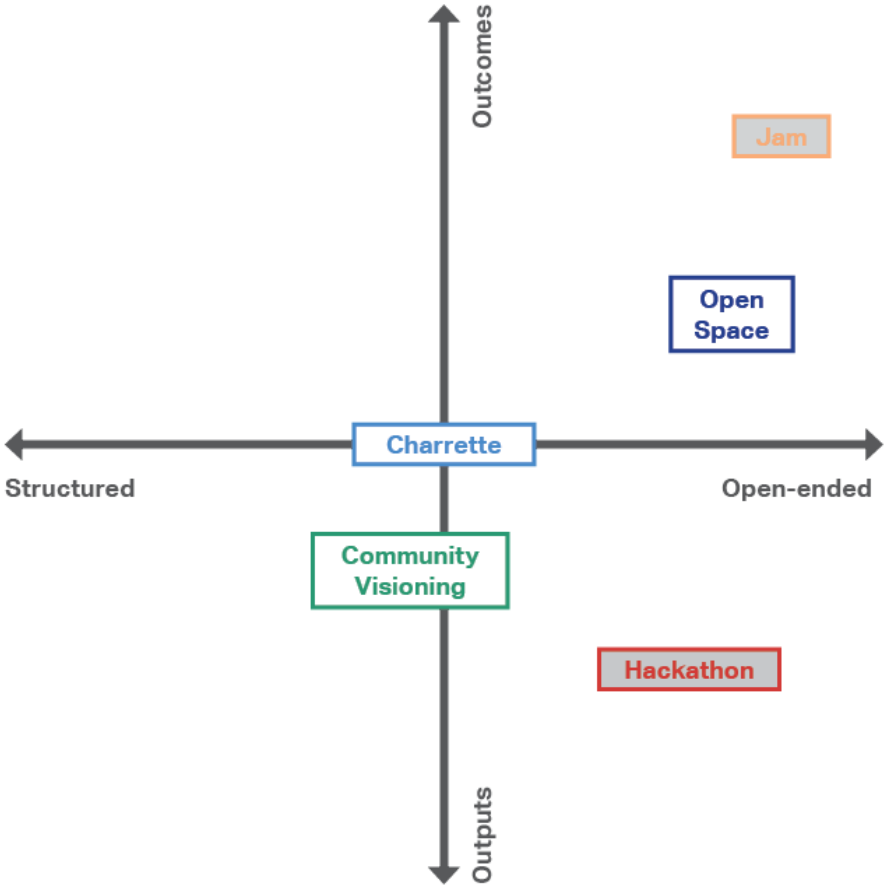

Figure 11.Map of Other Co-creative Public Engagement methods on a spectrum (Jacqueline To, 2016)

Returning to engagement methods, jams and hackathons have been greyed out because they are not formally recognized. Public engagement facilitators and associations should be more open to new kinds of methods and techniques that have been adapted of emerged in the past several years. New methods of public engagement are formed from emerging issues, trends, technology, changing aspects of business and government, and the needs of today's society. In recognizing new engagement methods, facilitators are empowered with a breadth

of tools from the past and the present that suit a variety of situations and audience needs.

Hackathons and jams are valuable methods because they educate and provide experience in collaboration and co-creation, a necessary skillset to shape a collective of citizens that can contribute to future social and environmental issues.

> *… co-creation is the most sought after skill. Your ability to co-create, to be able to work on a team, to be able to break down the hierarchy and actually get to the point of co-creation… those skills are on the soft side but they cannot be underestimated for value.* – Lori Endes

The next step is to encourage greater adoption of hackathons and jams is to leverage the expert insights to find the considerations needed to foster a better process. The main challenges are that the public perceives both hackathons and jams to be lacking visible long term results, however there is a greater dissatisfaction in market focus and unmet expectations with hackathons than jams. How might this be resolved? Firstly, ensure that hackathons and jams are tied to broader strategic initiatives. Secondly, in a hackthon, focus on educational outcomes rather than competition. Thirdly, participants are the driving force of public engagement events so focusing on community driven and allow flexibility to influence and contribute to the solution through multiple channels.

4.3 Intervention

This research proses a new way to approach hackathons and jams by identifying the core considerations and process to achieve success and ensure social impact. The intervention was delineated from issues brought forward from the literature review, drivers and the typology insights from experts. This section will explain why diversity, education and foresight are three central aspects to the success of hackathons and jams, and explore hacks and jams as methods of public engagement by integrating them into a long-term and iterative process. This is depicted by the intervention equation below.

Figure 12. Intervention Equation (Jacqueline To, 2016)

4.3.1 Diversity

Diversity here applies to the participant group. As with any form of public engagement, inclusion and diversity is correlated to democracy and fair representation. Experts all mentioned the importance of inviting and facilitating mixed participant groups.

> *For the public consultations about the budget, the most important thing was that we had table groups of 8-9 people who were mixed groups. So we mixed men and women, people who didn't know each other so that you could meet different people to generate the feedback.* – John Schaffter, Director of Organisation Development, Learning and Workforce Planning, Human Resources Division, City of Toronto

Hackathons and jams can be perceived as an exclusive form of participation because the variance in engagement design may not always address diversity and inclusion. Mentioned in the literature review and the prior driver about the technology and design sector, the participants are mainly youth or working professionals in the technology and design industry. Women had to create their own hackathons because previous hackathons were not inclusive to gender. Co-creation asks participants for time commitment, educated involvement and intensive group work that are barriers for some groups. Unless the engagement requires a sampled and targeted participant group, it is unlikely that seniors or working parents of low-income households can take part. This is important because newer hackathons and jams have objectives to impact social and environmental issues. One expert mentioned the saying "build with, not for,", meaning problem solving requires the voice of minority groups that endure the issue. Inclusion of these groups should be necessary, but can present an ethics challenge. Rather than recruiting marginalised and sensitive groups, hackathons and jams can partner with service providers who work with these groups. For example, if a hackathon is trying to improve homelessness, they need to have the housing office, shelter workers and volunteers in the room with co-creators.

> *Rather than trying to resolve a problem for the homeless person, talk to the person that works in the housing office to see what tools they need. Don't try to interrupt the end person. Ask yourself, how do you help the service support person? Then you're helping them provide the support for the end person.* – Bianca Wylie, Founder, Open Data Institute Toronto, and Associate, Swerhun Facilitation

Another group that is not often included is the retiring generation of Baby Boomers. Seniors are still interested in working part-time and contributing back to the community post retirement. A CBC article noted that in North American culture, your identity is determined by your job and boomers do not have flexibility in retirement work. Seniors may struggle with mental health and isolation that can be improved through volunteerism and flexible work. A research study in the Journal of Health and Social Behaviour correlates a positive relationship between volunteer work and depression in later life. Short engagement events have the potential to improved social integration and can be an alternative to formal volunteering processes.

4.3.2 Education

Hackathons or jams can be an educational experience. The wealth of learning that occurs at hackathons and jams are already being recognised by educators as an opportunity to educate youth. Education focused co-creation has mainly been about hackathons to encourage more youth and girls to learn code and educate a generation of coders. Projects such as *Code.org* and the *Hour of Code* program promote hackathon style computer science education for elementary, middle and high school students and provide guidelines and tools for educators to facilitate their own hackathon for the classroom.

A hackathon and jam is often used for knowledge mobilization. Knowledge mobilization is defined as activities relating to the production and use of research

results, such as synthesis, dissemination, transfer, exchange, and co-creation (SSHRC, 2015).

> *One term that is used in the research community is called knowledge mobilization. It's not knowledge transfer, in many universities they talk about knowledge transfer. We use a co-creation model for knowledge mobilization. We have grants for the co-creation of knowledge.* – Ursula Gobel, Associate Vice-President, Future Challenges, SSHRC

When the proper information and education is available at a hack or jam, participants have the necessary understanding to learn from one another and create new ideas. Hackathons and jams can set the conditions for learning that is unconventional to the traditional classroom. Conversations and co-creation allows for learning to happen through natural curiosity.

> *Learning not because someone just taught them (the participants), but making space for people to learn… Some participants were grilling us on questions at the library hack. There was a lot of interrogation about our institutions. Learning more about your city, government, and library services… it's this unexpected learning that happens.* – Bianca Wylie, Founder, Open Data Institute Toronto, and Associate, Swerhun Facilitation

Hackathons and jams can set the conditions for people to test their natural curiosity. For instance, the openness of a jam allows people to think beyond the traditional approaches to testing an idea (digital, visual drawings, service maps, etc.). One team at the Gov Jam took their idea to the streets to understand how citizens might react. It is delightful see where people's curiosity can take them in a hackathon or jam session.

> *My favourite-ever jamming picture is a picture which is from the Los Angeles Gov Jam in, I think, 2012, which has a guy standing in a*

> *cardboard box in a middle of a neighbourhood in LA, with a sports coat and a tie on. There are various bits of post-its and bits of paper… Behind him there are about 4-5 hipster types with clipboards, and iPads who are this design team, and he's a middle-aged gentleman with a tie on… And there's citizens in front of them looking like, "What are you doing?" ….It was a perfect example of them really living prototyping and actually getting out and doing it. The citizens were impressed and so were the teams*. – Adam Lawrence, Co-Founder of WorkPlayExperience and Global Service Jam

Experts expressed the learning outcomes of hackathons and jams manifest in two ways. The first type of learning is about skills building. This happens when the participant learns a new ideation method or new software. The second type is context learning where participants learn about the issue's systemic complexity, their city, the social problem and the capacity at which the people working in this space can address the problems in the context. To ensuring the event allows for these two types of learning to occur, organisers should provide background information, mentors, facilitators, resources and software for experimentation.

Education only goes as far as the theme or problem frame of the event. In the findings section about drivers, technology and design-related domains still dominate. Many industries are still unexplored.

4.3.3 Foresight

Foresight is a methodology that is increasingly used in organisations. It is also a growing methodology in public engagement (e.g. community visioning, future search, and open space). Some experts say future thinking will become second nature to organisations and be inherently part of the innovation process.

> *Foresight will become second nature to organisations. I think it's going through a growth spurt right now. People are wrapping their head around the idea that hierarchy isn't necessarily the best way to get stuff done. Collective imagining and brainstorming could lead more directly to sustainable innovation. I think in time it's going to be very common.* – Lori Endes

Hackathons and jams are public engagement methods that pursue inventive insights and ideas that may improve an aspect of the future. During the problem framing and problem finding phase, participants brainstorm their idea of the future and how their product or service concept might help to attain that future. Data visualisation and the visual ideation processes in hackathons and jams allow participants to see the future from another person's perspective.

> *Visioning has to be tempered with the constraints. Visioning goes with a discussion about opportunities and challenges. Trade-offs need to be more normal for us to talk about.* – Bianca Wylie, Founder, Open Data Institute Toronto, and Associate, Swerhun Facilitation

When envisioning the future, we can see trade offs and influences. Visualising the positive and negative impacts of an idea can help organisations better evaluate whether the idea sustainable. The current approach of hacks and jams finds a problem to create an intervention for (present to future). The opportunity to ideate backwards (future to present day) may fit the playful nature of hackathons and jams. Foresight activities for participants might be to co-create alternate futures, such as scenarios or time machines, in order to understand how their idea might fit into different futures. If facilitators situated a foresight activity prior to coding/ prototyping, participants can better comprehend the positive and negative effects of their idea.

4.2.4 Full Cycle Public Engagement

Experts were questioned about where hackathons and jams might fit in the broader context. Experts spoke about issues of creating true impact and change. As noted in the typology section, time is required for long-term change and public engagement must be integrated into a strategic or policy planning initiative, particularity in the early stages where diverse insights are most valued.

> *Chicago has open gov/civic hack nights rather than having these flashy episodic events. People are realising that we need to have a different kind of conversation that need to take place over time.* – Pamela Robinson, Associate Dean - Graduate Studies and Special Projects (Faculty of Community Services) and Associate Professor, MCIP, RPP

> *Being brought in too late into the planning stage by the client. Nothing happens with great ideas because clients have no plans to follow up.* – Maya Goodwill, Director of Social Impact at HiVE, and Development Director, Vancouver Design Nerds

These challenges may arise because hackathons and jams are often misunderstood as a complete exercise of a design thinking or product development process. Rather, they are a singular method in public engagement that suits one specific objective. The Danish Design Ladder will be used to illustrate this indication.

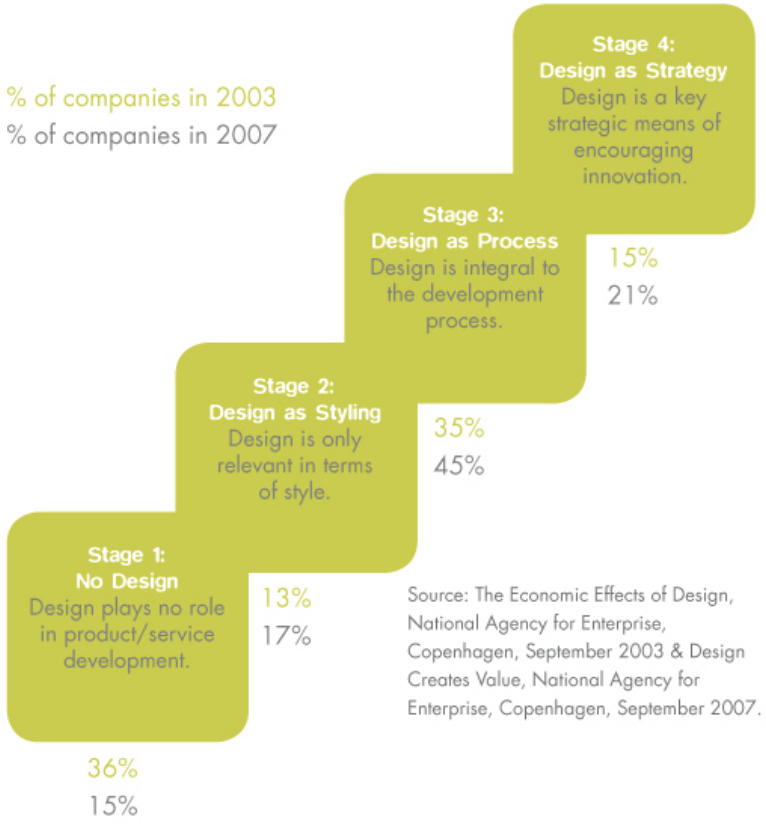

Figure 13. Danish Design Ladder (Kretzschmar, 2003).

Singularly, these events are at the stage of 'design as a process'. The objective is to gather multidisciplinary teams for generating ideas and insights towards one problem. They are not full processes for innovation because their end contribution is often unclear, nor always implemented. Also, hackathons and jams often have similar event domains but are hosted by stakeholders that don't know of one another. In Toronto 2015, there were two jams both titled Traffic Jam with the

same objective to tackling Toronto's traffic and transit issues. Unclear results, combined with the efforts that are silos create an abundance of scattered information, where as, if the events evolved together by sharing insights overtime, it can generate richer outputs.

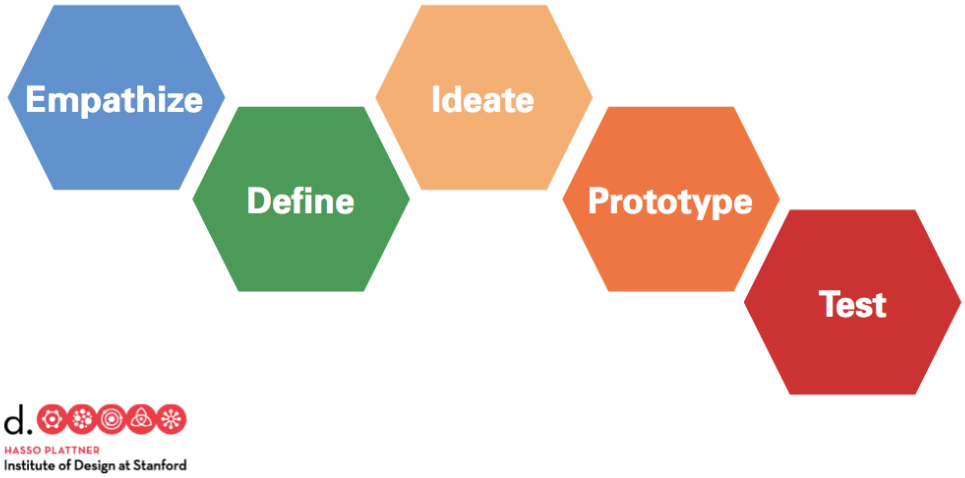

Figure 14. Design Thinking, Institute of Design at Stanford

Co-creative public engagement events like hackathons and jams adopt some aspect of the Stanford D School's Design Thinking in engagement activities. The diverse experiences of participants create conditions for empathy, the problem is defined through a set of themed challenges, participants ideate by brainstorming, and a variety of visualisation tools are used to prototype the selected idea. In a hackathon or jam, the test phase occurs after the event. There might be support from event partners by means of sending the project to an incubator, or the idea is given to the organising body and they are responsible for testing the end product.

What organisers may not realise is that hackathons and jams represent one block of the Design Thinking process, which may be situated together to become a broader design innovation practice. The initial idea for one engagement event was prompted by one expert's insight:

> *(Referring to the GovJam) It would be interesting to see them in a full cycle… you could take ideas out of the jam and put them into the hack. You're still facing the same problem that you have to decide so early what you are going to do that you can commit yourself to an idea that nobody needs.* – Adam Lawrence, Co-Founder of WorkPlayExperience and Global Service Jam

Hackathons are great for creating and prototyping products. Jams focus on the ideation process. Other public engagement methods are used to build empathy, education and create consensus. The following adaptation of the design-thinking model was created from the insight.

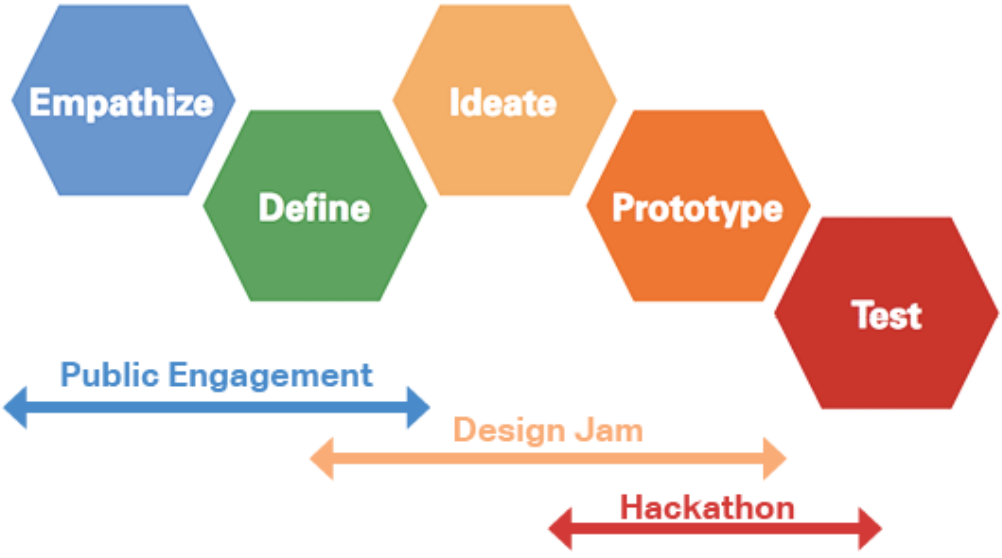

Figure 15. Adapted Design Thinking Process, Institute of Design at Stanford

Education and deliberation focused public engagement such as an open space encourages participants to share experience and learn about one another in discussion groups. Public engagement methods in the empathise and define phase should empower participants to choose their own discussion topic within the domain and build consensus about what is needed in these issues. Moving onto the ideate, prototype and test phase, design jams and hackathons are suited to formulate solutions and actualise the possible ideas.

To next expansion of this model is a response to expert comments about time and impact in a broader system, mingled with design as an iterative process. Figure 4 rethinks how these events are designed by placing them throughout a strategy or policy development project to create a full product development cycle. Public engagement methods are used to inform and co-create a conversation with the public, while jams and hackathons allow for intense ideation and prototyping in short sprints.

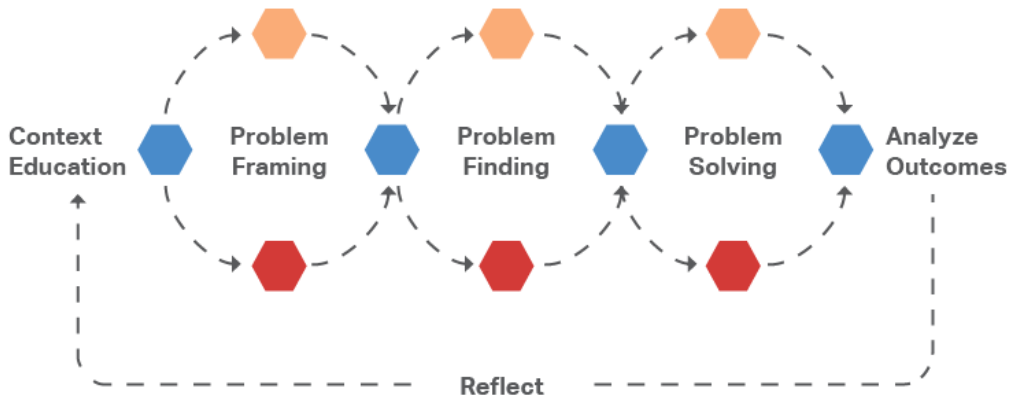

Figure 16. Public Engagement, Hackathons, Jams model for full cycle product/service innovation

Adopting the different engagement methods in a broader innovation process can be an alternative method for research and development. Hackathons and jams should be done in conjunction with traditional public engagement methods that give a voice to minority groups and break down barriers to the conversation.

> *I see opportunities for cities and agencies using them as part of their civic engagement. Until the city is doing that proactively, the community has the opportunity to look at the city and see the initiatives and organise their own co-creative event. This model when you work in concert with the city, it gives it a place, support, a place for outputs to go, it doesn't need sponsors. I hope these worlds collide and do hacks and jams the same way we do public consultation today.* – Bianca Wylie, Founder, Open Data Institute Toronto, and Associate, Swerhun Facilitation

> *The private sector is willing to take the risk, calculate the risk and willing to lose the money. So there is a mismatch and our way to say it is what a private hackathon can't do what we do, it should be a compliment process. Hackathons can do what we can't easily do. So for sure the people who are doing hacks, charrettes need to set the conditions so that they aren't disappointed. People get disappointed very fast.* – John Schaffter, Director of Organisation Development, Learning and Workforce Planning, Human Resources Division, City of Toronto

Often in traditional public sector engagement, a fund is provided to organisations that work with minority groups to host their own public engagement event. Internal public sector employees often design the events; thereby, the organisation has limited influence on designing the process and questions that influence the outputs of the event. There may be an opportunity to leverage the accessibility and public engagement expertise from the public sector, and build inclusion in a hackathon or jam. Such a step would take us towards more accessible long-term public engagement.

4.3.5 Plan for Implementation

To summarise the findings, typology and interventions, the following are four actionable items for public engagement organisers.

i. Collaborate
   - Connect hacks/ jams/ other public engagement in the same domain/ with a similar objective.
   - (Public and Private Sector) Reduce costs and resources and increase credibility by sharing competencies.

ii. Diversify
   - Improve the quality of a hack/ jam by increasing diversity through culture change, finding new promotion channels, and identifying barriers to different minority groups.
   - Allow for the option to hack or jam so participants have the freedom to choose their own learning activity.

iii. Educate
   - Improve learning outcomes by ensuring multiple educational tools are provided, exploring different hackathon/jam domains such as arts and culture, and test foresight engagement methods.
   - Use foresight and systems activities and frameworks to question long-term effects on environmental or social change.

iv. Create a long-term plan that addresses the macro and environmental context the engagement is used for.

5. Conclusion

This research project set out to understand how collaborative problem solving events: hackathons and jams, might be best used for public engagement. It explored the context on a macro level through a literature review of public engagement, private sector engagement, collaborative approaches to problems, and the various uses of hackathons and jams. The research sought insights into the event's typology by interviewing facilitators, researchers and organisers of hackathons and jams. The course of research was sufficient in identifying important factors of typology, finding interventions and opportunities for how hackathons and jams might play a role in the future.

5.1 Conclusion

The research reveals the misconception of success in a hackathon or a jam is the cause of much confusion about the purpose of these methods of engagement. There is tension between public engagement for societal good and engagement for economic productivity. This research proposes that hackathons and jams can best contribute to societal good when incorporated within the public engagement process. Government hosted engagement events does not always take regard for the aspect of social good, but the government mandate to involve society and citizens in policy innovation creates pressure for social and sustainable outcomes.

Rather than measuring success of a singular event by it's ability to create "world changing" outputs, all of the experts point to the importance of measuring success in realistic achievements, such as the ability to foster participant learning and ideation. One single hackathon or jam is unlikely to create the next "world changing" product, but can be the start of, or, contribute to an existing idea that may improve one aspect of society or the environment. The exploration revealed that hackathons and jams are methods of public engagement that, when thoughtfully planned, may produce a robust conversation and innovative ideas that can educate participants on multiple levels. Education, sharing new ways of thinking, creating a shared understanding or goal, and fostering a community that is informed and engaged in social good – these intrinsic outcomes are the primary contributions provided by hackathons and jams.

To create a natural learning environment, hackathons and jams should increase diversity. Consideration to reduce barriers to participation, foster diversity in gender, age and culture will provide equal representation and new creative ideas. Although some gender and age specific organisations have already begun to create inclusion-focused initiatives, inclusion should be a constant objective for all hackathon and jam organisers.

If hackathons and jams place greater emphasis on education, the public and private sector is encouraged to diffuse biases and see the potential net benefit to

society and reciprocal benefits if both stakeholders can develop a common agenda to foster learning. Regardless of these factors that can be improved upon, it is evident through the research that hackathons and jams have shaped a modern way of collaboration.

The findings propose a rethink of singular methods of public engagement, towards a new sequenced model of public engagement to create a full development cycle. Experts recognised that social impact requires sustained responsibility, long-term investment, testing and implementation. A sequence of public engagement events that include hackathons and/ or jams as part of the engagement process may be more proficient in fostering impactful change and innovation. Public engagement methods are used to inform and co-create a conversation with the public, while jams and hackathons allow for intense ideation and prototyping in short sprints. Adopting the events in a greater innovation process can be an alternative method for research and development.

Hackathons and jams bring together a community, collective knowledge and collective action. There is a global collective that desires to be apart of building a better future for their community and the world, and that speaks volumes in itself. Perhaps, our society will shape the unique value presented in these engagement methods, not by what outputs are investable or marketable, but by how a society is capable of learning from one another to build its own resiliency, and therefore

creating long-term effective and transformative change through educated citizenship.

It will be interesting to see how future facilitators and organisers might use hacks and jams. Organisers and facilitators influence the overall community culture of hackathons, jams and other methods of public engagement. The best way to see where the shift might occur is to take part and collaborate.

> *Do it. Do it and mess it up. And do it again and get better at it. It's going to surprise you and it's going to be useful. It's going to be useful in ways you didn't expect it to be useful. It does create real connections between people.* – Adam Lawrence, Co-Founder of WorkPlayExperience and Global Service Jam

In conclusion, my perspective as a researcher is optimistic. My belief is that hackathons and jams add to the roster of public engagement methods and therefore, present more opportunities for decision-making bodies to interact with citizens and grassroots groups through conversation and co-creation.

5.2 Next Steps for Research about Hackathons and/ or Jams

- Further research might include a longitudinal study on one specific public engagement initiative that involves a jam or hackathon. A longitudinal study can be used to track the outputs and outcomes of the event by following the experiences of various participants.

- Further research about participant inclusion, the issues surrounding gender equality and diverse representation in age. How might hackathons and jams include fairer representation?
- A study on ownership of intellectual property to understand the perception of ownership from all stakeholders. feel about ownership of ideas at co-creative and collaborative settings and where responsibilities might lie in terms of which stakeholder…
- Do hackathons and jams have the potential to do social good in the long term? How might social good be measured? And alternatively, what does failure mean for stakeholders?
- Another insight is that the challenges and issues mentioned by the experts related to the framework of the five pillars of value co-creation. Issues with resources, developing relationships and trust with participants, the environment and perception of benefits are all important considerations of co-creative engagement events such as hackathons and jams. Much can be drawn from value co-creation theory that may help to further distil the typologies of these new methods of engagement.

5.3 Next Steps for this Project

- This research will be developed into a condensed and illustrated guidebook for public engagement facilitators and government officials.

The book will place emphasis on hackathons and jams as valuable methods for public engagement.

- Host a workshop with interested organisations that uses the “full-cycle” public engagement model for to gather insights and design for a broader policy or strategy program. How might hackathons and jams present a space for testing new innovations and prototypes?

Bibliography

Aging 2.0. (2014-2016). Retrieved http://www.aging2.com/about/

Appley, D. G., & Winder, A. E. (1977). An evolving definition of collaboration and some implications for the world of work. *The Journal of Applied Behavioral Science*, *13*(3), 279-291.

Arnstein, S. R. (1969). a ladder of citizen participation. *Journal of the American Institute of Planners, 35*(4), 216.

Berger, B. (2011). *Attention deficit democracy: The paradox of civic engagement*. Princeton: Princeton University Press.

Bharti, K., Agrawal, R., & Sharma, V. (2015). Value co-creation: Literature review and proposed conceptual framework. *International Journal of Market Research, 57*(4), 571. doi:10.2501/IJMR-2015-048

Briscoe, G., & Mulligan, C. (2014). Digital innovation: The hackathon phenomenon. *London: Creativeworks London Work Paper*, (6).

Carpini, M. X. D., Cook, F. L., & Jacobs, L. R. (2004). PUBLIC DELIBERATION, DISCURSIVE PARTICIPATION, AND CITIZEN ENGAGEMENT: A review of the empirical literature. *Annual Review of Political Science, 7*(1), 315-344. doi:10.1146/annurev.polisci.7.121003.091630

Chang, A. (2012, July 20). Deep Inside a Facebook Hackathon, Where the Future of Social Media Begins. Retrieved November 1, 2015, from http://www.wired.com/2012/07/facebook-gears-up-next-big-thing-in-three-day-camp-hackathon/

Cochrane, R. (2015). Community visioning: The role of traditional and online public participation in local government. *Asia Pacific Journal of Public Administration, 37*(1), 18-32. doi:10.1080/23276665.2015.1018370

Condon, P. M. (2007). Design charrettes for sustainable communities Island Press.

Cornwall, A. (2008). Unpacking 'participation': Models, meanings and practices. *Community Development Journal, 43*(3), 269-283. doi:10.1093/cdj/bsn010

Davies, A. (2012). *Enterprising communities : Grassroots sustainability innovations.* Bradford: Emerald Group Publishing Limited

Ellis, S. J. (2012). *New trends in volunteering - and how to tap into them.* Madison: Society for Nonprofit Organizations.

Fochler, M., & Felt, U. (2011). Slim futures and the fat pill: Civic imaginations of innovation and governance in an engagement setting. *Science as Culture, 20*(3), 307-328. doi:10.1080/09505431.2010.524200

Funding innovation: From silicon valley to shanghai, investing in innovation is exploding. investors, corporations, and governments look beyond unicorns to sustainably nurture big ideas (2016). Technology Review, Inc.

Global Service Jam. (2016). Retrieved http://planet.globalservicejam.org/

Gössling, T., & Rutten, R. (2007). *Innovation in regions.* European Planning Studies, 15(2), 253-270. doi:10.1080/09654310601078788

Helander, M., Lawrence, R., Liu, Y., Perlich, C., Reddy, C., & Rosset, S. (2007). Looking for great ideas: Analyzing the innovation jam. Paper presented at the 66-73. doi:10.1145/1348549.1348557

Institute for Local Government (2015). *What is Public Engagement and Why Should I do it?* Retrieved from National Coalition for Dialogue and Deliberation: http://www.ca-ilg.org/sites/main/files/file-attachments/1._ilg_what_is_public_engagement_and_why_should_i_do_it_mar_2015.pdf

Institute of Design at Stanford (2016). Retrieved http://dschool.stanford.edu/

International Association for Public Participation, http://www.iap2.org/

Irani, L. (2015). Hackathons and the Making of Entrepreneurial Citizenship.*Science, Technology & Human Values*, *40*(5), 799-824.

Jenkins, H. (2006). *Convergence culture: Where old and new media collide*. NYU press.

Johnson, P., & Robinson, P. (2014). Civic Hackathons: Innovation, Procurement, or Civic Engagement?. *Review of Policy Research*, *31*(4), 349-357.

Kaul, M. (2015). Women Hacakthons: A Gateway to the Evolution of a more Equal World. *Entrepreneur Media*. http://www.entrepreneur.com/article/269940

Kettl, D. F. (2000). *The transformation of governance: Globalization, devolution, and the role of government*. Public Administration Review, 60(6), 488-497.

Komssi, M., Pichlis, D., Raatikainen, M., Kindstrom, K., & Jarvinen, J. (2015). What are hackathons for? *IEEE Software,32*(5), 60-67. doi:10.1109/MS.2014.78

Kretzschmar, A. (2003). The economic effects of design. National Agency for Enterprise and Housing, Copenhagen: Denmark

Lang, T. (1995). An overview of four futures methodologies. *Manoa Journal of Fried and Half-Fried Ideas*.

Leclair, P. (2015). Hackathons: A jump start for innovation: A civic hackathon improves transparency, increases community engagement, and builds innovation in the city of pasadena. *The Public Manager,44*(1), 12.

Li, Y., & Ferraro, K. F. (2005). Volunteering and depression in later life: Social benefit or selection processes? *Journal of Health and Social Behavior*, 46(1), 68-84. doi:10.1177/002214650504600106

Neoliberalism. (2006). In B. Turner (Ed.), *Cambridge Dictionary of sociology*. Cambridge, United Kingdom: Cambridge University Press. Retrieved from http://search.credoreference.com/content/entry/cupsoc/neoliberalism/0

National Coalition for Dialogue and Discussion. (2010). Resource Guide on Public Engagement. Retrieved from National Coalition for Dialogue and Discussion: http://www.ncdd.org/files/NCDD2010_Resource_Guide.pdf

National Coalition for Dialogue and Discussion. (2014). Engagement Streams Framework. Retrieved from National Coalition for Dialogue and Discussion: http://www.ncdd.org/files/rc/2014_Engagement_Streams_Guide_Web.pdf

Noakes, S. (2016, January 25). Serial retirement - the boomer approach to leaving work - *CBC News*. Retrieved January 26, 2016, from http://www.cbc.ca/news/business/rrsp/transition-to-retirement-1.3392141

Manzoni, J., Davila, T., Epstein, M. J., & Books24x7, I. (2014). *The innovation paradox: Why good businesses kill breakthroughs and how they can change* (1;1st; ed.). US: Berrett-Koehler Publishers.

Mokyr, J. (2014). A flourishing economist: A review essay on edmund phelps's mass flourishing: How grassroots innovation created jobs, challenge, and change. Journal of Economic Literature, 52(1), 189. doi:10.1257/jel.52.1.189

Morozov, E. (2013). *To save everything, click here: Technology, solutionism, and the urge to fix problems that don't exist.* Penguin UK.

Prahalad, C. K., & Ramaswamy, V. (2004). Co-creation experiences: The next practice in value creation. *Journal of Interactive Marketing,18*(3), 5-14. doi:10.1002/dir.20015

Press, M. (2013, March 5). The Jam Experience [Web log post] Retrieved from https://mikepress.wordpress.com/2013/03/05/the-jam-experience/

Rask, M., Maciukaite-Zviniene, S., & Petrauskiene, J. (2012). Innovations in public engagement and participatory performance of the nations. *Science and Public Policy*, *39*(6), 710-721.

Renault, S., & Boutigny, E. (2013). Le partage ponctuel d'idées en ligne par la pratique du Jam: atouts et limites. *Gestion*, *38*(3), 35-44.

Rittel, H. W., & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy sciences*, *4*(2), 155-169.

Ross, T., Mitchell, V. A., & May, A. J. (2012). Bottom-up grassroots innovation in transport: Motivations, barriers and enablers. Transportation Planning and Technology, 35(4), 469. doi:10.1080/03081060.2012.680820

Rowe, G., & Frewer, L. J. (2005). A typology of public engagement mechanisms. *Science, Technology, & Human Values, 30*(2), 251-290. doi:10.1177/0162243904271724

Römer, M., Thallmaier, S., Hormeß, M. E., Lawrence, A., & Habicht, H. (2011). Jams as emerging practice of innovation communities: The case of the Global Service Jam 2011.

Ruthven, M. (2015, September 14). Gender Representation in Hackathon Hackers [Web log post] Retrieved from https://medium.com/hackathon-hackers/gender-representation-in-hackathon-hackers-2bea7e3088c6#.36qo8sdbh

Scassa, T., & Singh, N. (2015). Open data and official language regimes: An examination of the canadian experience. *EJournal of eDemocracy & Open Government, 7*(1), 117-133.

Service Design Network. (2015) Retrieved https://www.service-design-network.org/

Shapiro, G. F. (2012). The pruitt-igoe myth. *Journal of the Society of Architectural Historians*, 71(1), 111-113. doi:10.1525/jsah.2012.71.1.111

Senge, P. M. (2012). Creating schools for the future, not the past for all students. *Leader to Leader, 2012*(65), 44-49. doi:10.1002/ltl.20035

Seyfang, G., & Smith, A. (2007). *Grassroots innovations for sustainable development: Towards a new research and policy agenda.* Environmental Politics, 16(4), 584-603. doi:10.1080/09644010701419121

Sillanpää, M. (2010). Stakeholder Engagement. In W. Visser et al., *The A to Z of corporate social responsibility*. Hoboken, NJ: Wiley. Retrieved from http://ezproxy-library.ocad.ca/login?url=http://search.credoreference.com/content/entry/wileyazcsr/stakeholder_engagement/0

Social Sciences and Humanities Research Council. (2015, September 4). *Guidelines for Effective Knowledge Mobilization*. Retreived from http://www.sshrc-crsh.gc.ca/funding-financement/policies-politiques/knowledge_mobilisation-mobilisation_des_connaissances-eng.aspx

Swerhun, N., Avruskin, V. (2012) *Discuss. Decide Do.: The value of engagement as a decision support tool*. Toronto, Ontario: SWERHUN Facilitation & Decision Support

Todd, J. A., (2013). Planning and Conducting Integrated Design (ID) Charrettes. Retrieved from https://www.wbdg.org/resources/charrettes.php

Wilson, C. (2014). The internet will make governments unrecognizable. Optimum Online, 44(1), 1.