

Making the makers: an exploration of a makerspace in a city library

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Abstract

Connecting and thriving in a challenging public library environment means being agile and responsive to community interests. *Te Kauroa - future directions 2013-2023* is the strategic plan detailing how Auckland Libraries contributes to the vision and outcomes of Auckland City. Using the focus areas of *Te Kauroa* as guidance, a makerspace launched at the Central City library in October 2013.

In launching the space, Auckland Libraries builds on the long library traditions of providing equity of access to information and technology and being a place for learning outside formal education. Drawing on aspects of the Maker movement, the initiative positions the library to deliver new opportunities for whanaunatanga – connecting and collaborating with others, growing communities and partnerships - in a dedicated physical space.

Working with partners from the community, this development is an exploration of what a makerspace might look like in the central city, in a library and within a large library system. It is an example of a place where curiosity and discovery are revisited in the context of technology developments that make creativity more accessible and more collaborative.

This presentation tells the story of the maker space development at the Central City library. It describes the learning that staff and customers have gained from the experience, the failures and successes and will propose some initial ways of measuring the effectiveness of the space.

Introduction

The Central City library is the largest library in the Auckland Libraries system, located in Auckland's central business district (CBD). It is seen as a destination library, has a high number of transient visitors such as tourists, students and people who work in the CBD. It acts as the local library for the growing number of apartment dwellers in the inner city (Statistics New Zealand, 2014).

In 2013, Auckland Libraries published *Te Kauroa – future directions 2013-2023*¹ detailing how the library contributes to the vision and outcomes of Auckland City. The central city makerspace at Auckland Libraries was launched under the following *Te Kauroa* Focus Areas and Objectives.

Te Kauroa Focus Area	Objective	Central City Library Business Plan Actions 2013/14	Makerspace actions

¹ <http://www.aucklandlibraries.govt.nz/EN/About/plansandpolicies/futuredirections/Pages/futuredirections.aspx>

Digital Library	Work more courageously	Pilot maker activities and a makerspace	To pilot a makerspace area at Auckland Libraries
Children and young people	Develop and resource programmes for 14+	Offer maker activities for 14+	Provide maker activities for young people facilitating meaningful play. Demonstrate our commitment to <i>Te Kauroa - Future directions</i> in providing services that inspire learning and participation.
Customer and community connection	Create opportunities to connect with and learn from customers	Contribute to events in the city to increase understanding of customers	Provide opportunity for the central city community and library staff to create, connect, collaborate, and innovate with each other and experienced mentors
Library spaces	Engaging spaces at the heart of the community	3.2 Contribute to a stunning city centre 3.3 Position future libraries at the heart of multipurpose community spaces	Pilot new types of spaces in libraries which offer learning and creative opportunities for all

What is a makerspace?

Makerspaces are rooted in maker culture, DIY movements and other subcultures that reject the dependence on consumerism (Fisher, 2012). Makerspaces have been described as a way to build users' literacies across multiple domains such as science, engineering, art and design and as a gateway to deeper engagement with library customers (Colgrove, 2013). Wong (2013) described them as,

"places that help cultivate creative interests, imagination, and passion by allowing participants to draw upon multiple intelligences. They are an effective means of applying knowledge, and they tap new resources for learning. Makerspaces embrace tinkering, or playing, in various forms of exploration, experimentation and engagement, and foster peer interactions as well as the interests of a collective team.".

Makerspaces are as varied as the people who develop them. Other terms such as Fablabs or hackerspaces are used but at the core of these is a space that people gather to create and make. Equipment and tools in makerspaces are similarly varied.

Makerspaces are increasing in New Zealand and there is a growing awareness of their value². Makerspaces in libraries is a fast growing trend worldwide (Peppler & Bender, 2013; Ginsberg, n.d.; Wong, 2013). This paper does not attempt to justify their presence in libraries but rather explores the implementation experience for a city library.

² At a national government level, Green Party has released a strategy for digital manufacturing in New Zealand (Green Party of Aotearoa New Zealand, 2014) indicating the consciousness of the value of making is becoming main stream.

Research and Consultation

We started out with little knowledge of makerspaces and no roadmap for how we might develop a makerspace at our library. We researched maker culture online, models for makerspaces in libraries and attended the online ALA conference which included a keynote on makerspaces in libraries. Collaboration has been identified by others as a key ingredient for success of library makerspaces (Good, 2013) so we made contacts with established maker libraries in America.³ We also consulted with maker experts in the community⁴.

This activity allowed us to learn about relevant processes, technologies, makerspace ethos and values. It helped us to develop a network of maker contacts that we later called on.

Makesplosion!

Using the network of maker experts we created a mini-maker faire which we called *Makesplosion!* as a launch event. The launch event resulted in a hundred people turning up each day to stay, ask many questions, try robotics, 3D printing, simple programming and other unique forms of making. We were surprised by the depth of interaction; people often stayed in one spot for twenty minutes, asking all sorts of questions of the experts or having a go. We were able to sign up eager participants to fill up our workshops for the first month. An unexpected outcome was being approached by other community makers who were keen to run workshops.⁵

Implementation

Implementation resembled starting a small enterprise inside the central library. Challenges included

- Managing and learning how to use the equipment
- creating and fine tuning the booking system
- human resourcing, including an attempt to establish a community of practice approach
- liaising with partners
- developing workshops
- developing success measures

Open platform tools were chosen for their adaptability.

³ Justin Hoenke from Chattanooga Public Library, with its large makerspace, was a useful contact to learn from.

⁴

- Mind Lab
- Tangleball - who strongly pushed the community driven makerspace ideal
- Mindhive, Mindkits and Diamondage - local entrepreneurs who sell the Diamondmind, a New Zealand made 3D printer and other maker tools
- Vivenda - a small 3D printing business

⁵ For example, a community member who had been involved with a makerspace in Shanghai approached us and has subsequently run scratch programming workshops for children.

3D printers can be used to fabricate almost any small object in plastic, making it an incredibly versatile tool and a bridge between the digital and the physical. We chose the Diamondmind 3D Printer⁶ for the following reasons:

- it was the only locally produced option
- there is a growing local support community developing
- there are experts we can telephone to help us troubleshoot

The free and open source operating system Ubuntu was installed on the computers. This facilitates access for library members who could go home and install it on their own machine easily and is a portal to a wide range of open source software.

The robotics kits are an open platform, leaving it open to customers to explore ways to build and program robots any way they see fit.

As in many libraries, space is at a premium. We had to choose between an open space on the first floor or a dedicated space behind a locked door.

While having the equipment on the open floor afforded better discoverability by customers, it presented with these challenges:

- how would we stop the computers getting swallowed by general computer users?
- how would we manage the hardware?

These concerns led us to put it behind the locked door and open the makerspace only for certain hours⁷. This limited the extent of engagement but provided us with a soft launch period, enabling the organisation and ourselves to take the first steps to cognitively adapt and explore what a makerspace means for us.

Staffing the space is challenging without dedicated human resources, but working around the regular staff roster and assistance from some regional staff means we can provide a staff presence during opening times. Communication between staff has been through a shared email group. Eventbrite, (<http://www.eventbrite.co.nz>), was chosen as an online booking system.

Evolution

We created two types of makerspace sessions - free use sessions and regular workshops. During free use sessions, customers can book any of the equipment and use it how they want. A staff member is there to assist, curate and interact. Expert mentor-led workshops were planned for the first month.⁸

We expected beginners showing up to learn new skills but were surprised that participants were sometimes experts themselves; the knowledge flow was not simply tutor to students, but between participants in a variety of ways, with the convenor as a knowledgeable facilitator. Intergenerational knowledge sharing occurred from time to time between younger and older people investigating the space. We found the two hour workshop model was too short and does not allow for participants to develop social learning interactions in depth.

In response to these observations we tried regular hangouts on 3D printing and computer game making, hoping to develop communities of practice around these types of making.

⁶ <http://www.diamondage.co.nz>

⁷ Two weeknights 5-8 pm and weekends 1-4 pm

⁸ App making, 3D printing and computer game making using gamefroot.com.

Again, results confounded our expectation. Visitors were often different each time rather than repeat customers. This is partly due to the transient nature of Central Library's customer base, being a destination library.

Moving the makerspace out onto the main floor may influence the customer participation in ways we have yet to imagine. Stories collected from makerspace sessions indicate the potential for a maker community even though this has yet to be realised.

Offsite opportunities

Some of our most exciting engagements have been outside the library at events⁹, often from children and youth, but also from people from a range of ages and backgrounds. We have also visited a number of other Auckland Libraries to offer makerspace taster sessions which show staff and customers what makerspace is about and inspire them to try it themselves. As a result of these visits and other internal communications, a number of community libraries within the larger Auckland Library system have consulted with us about maker activities and gone on to start activities¹⁰.

Libraries around New Zealand have demonstrated high level of interest in the makerspace; it has been useful in providing a tangible proof of concept for these parties.

Institutional capability

Staff development and training is an ongoing challenge. While enthusiastic, team members frequently feel out of their depth. Training was given in specific activities but this had to be an ongoing process with much support from the makerspace champions. As with any transformative change process we found learning and development:

“...can't be achieved through simply attending the odd workshop or having a guest speaker attend a staff meeting. This sort of change will require a combination of systematic, inquiry-based practitioner reflection and action, combined with the mentoring and support of the 'agents of change' who can introduce the new thinking, challenge assumptions and help clarify the moral purpose that underpins the ... activity.” (Wenmouth, 2014).

Perceptions and communication around the role of staff in the makerspace had to constantly evolve. Dealing with failure in a culture where positive customer interaction is a stated value meant adjustment for many.

“...When I failed to make the printer print, I felt as though I'd let the customer down. The customer tried to help and failed too. He was patient and came back. Others may not have returned. They may have gone away thinking that we were incompetent. I am now skilled at making the printer work and feel good.” (Cutting, 2014)

⁹ We have taken a mobile maker unit to various events such as the Festival of Education, Ngati Whatua Orakei Education Festival and the Otara Park Jam.

¹⁰ For example Glen Eden is running a weekly robotics session and Birkenhead has already done outreach activities to De Paul House using the Imagistory app and 3doodler. Several libraries chose a maker activity as part of their school holiday events.

Staff present at workshops and free use sessions have a mixed role of teaching and facilitating depending on the need. While librarians have coped well with the sessions, many still feel uncomfortable with being less than expert and need time to experiment and play.

"In spite of makerspace theory stressing that a resident expert is not required in the makerspace, staff interviewed all wanted to spend more time in the space in order to boost their personal skill and confidence levels." (Cutting, 2014)

Reflections on implementation

As Slatter and Howard (2013) discovered, the benefits of having a makerspace at Auckland Libraries have mainly been around community engagement, access to new technologies and new learning opportunities for customers and staff.

Community engagement in the makerspace activities has been constant and positive. Participants in hangouts and workshops consistently give positive feedback as to the value and enjoyment of the events.

The authors benefitted from being given the freedom to try things out as it led to willingness to try rather than find excuse. As a result, feedback from higher management for the implementation team has been positive.

Librarians increased their digital agility through involvement in the makerspace, many using it as examples in their performance reviews as an instance of where they have shown development and extension. The regional staff members contributing to makerspace have taken the maker mindset and activities back to their own libraries. Growth in the number of maker activities in the larger Auckland Libraries system seems to indicate a measure of success for this internal community.

Issues and possible solutions

The experimental nature of the space and activities has meant we have made mistakes.

One of these was managing expectations from other branches around 3D modelling events at their sites as an experiential event. Terminology used in other contexts created the expectation that the 3D printer was a service available to travel constantly. This was never the intention. Since this realisation we have started using the term "taster session".

Our initial expectation and objective was to develop a community of makers in the central city but this growth has not occurred. Instead, our experience suggests the central city makerspace fills a role of a "taster" makerspace with many one-time visitors. Customers coming to the makerspace are more often curious than driven; they do not have a particular project or outcome in mind, but just want to try new things or experience new technology.

Plans are in place to move the equipment out into the open floor as a number of issues have come from the initial choice of a small, lockable space.

- Equipment hidden away in the space and available for very few library hours limits the development of maker community and visibility for potential interested customers.
- Providing separate staffing for all makerspace sessions without extra resourcing puts pressure on service delivery teams during late nights and weekends when

staffing is already limited. Moving the space into the open floor means the equipment can be available all hours the library is open.

- The small space limits the number of people who can be comfortably accommodated. Moving the space into the open floor means more people can be accommodated but causes other issues such as noise management.
- There is a security risk for staff alone with patrons in the room. Moving the space into the open floor enables line of sight to the main enquiry desk and open views everywhere. Behaviour can be monitored easily.

Development of relationships with outside groups has moved forward slowly. As with all collaborative ventures, finding ways that each partner can benefit can be difficult when ideologies are not aligned. For example, some potential partners work with a business model with profit as the main motivator whereas libraries focus more on the engagement of the community.

Measuring effectiveness

We developed four measures for the evaluation of makerspaces. These measure the resilience of the makerspace idea, the engagement levels of the idea, and the potential for growth. Each measure has three metrics. The first is a bottom line (minimum requirement), the second a top line (aspirational goal), and the third is called a Pinky and the Brain line¹¹.

While the top line is aspirational, it is achievable. The P&B line is a plan to ‘take over the world’, and a reminder of the transformative potential of these ideas.

The principles behind these measures and metrics come from the development approach in Te Kauroa (Auckland Council, 2013):

- Customers at the centre, to involve customers in shaping services
- Experiment, innovate, and learn to take a more agile development approach
- Collaborating and partnering for success to strengthen our impact and visibility in the community
- Working smarter to foster continuous business improvement
- Empowering our people to focus on outcomes and accountability

The measures are:

Grow-like-weed-itude:

- This measures the resilience and sustainability of the idea from a staff and library system perspective
- Based on the historical experience of guerrilla warfare, that suggests there is very little hope of destroying a revolutionary movement after it has the support of 15% to 25% of the population (Tse -Tung & Guevara, 1962).

Bottomline: 13 libraries in the Auckland system with permanent makerspaces or semi-permanent maker activities

Topline: Annual subscriptions to maker events grow by 25%

¹¹ This is named after the cartoon mice, whose initial interaction in every episode is:

Pinky: So Brain, what are we going to do tonight?

Brain: What we do every night, Pinky. We're going to try to take over the world!

P&Bline: Help set up makerspaces in 16 public library systems (of 66 (Public Libraries of New Zealand, 2013)) in Aotearoa New Zealand

Social-interesting-ness:

- This measures the ability of makerspace ideas and activities to engage the community's imagination
- Based on a tweet (Bečela, 2014) that had the following formula to measure and compare the engagement scores of Facebook posts:
 - likes + shares (X2) + comments (X4)
number of fans

Bottomline: Average combined channel monthly score of 1+ (current average is .50)

Topline: One mainstream media story about the impact of Auckland Libraries' makerspaces

P&Bline: Work with local iwi to develop/find measures that are meaningful for tangata whenua

Filling-in-form-ability:

- This measures the rigour behind the thinking and the quality of the business model
- Based on V1.04 of the Social Lean Canvas (Yeoman & Moskovitz, 2014) adapted from The Lean Canvas, which in turn is adapted from The Business Model Canvas

Bottomline: Ability to adequately fill in all information required by the Social Lean Canvas

Topline: Creation of a multi-layered model for library makerspace creation, taking into account various levels of investment/partnership possibilities

P&Bline: Raising \$160,000 for the creation of library makerspaces across Aotearoa New Zealand

What-would-Andre-say:

- This measures the social and environmental impacts of the makerspace, in story-telling terms
- Based on an outreach event from Birkenhead Library, where we met 8 year old children who were almost illiterate

Bottomline: One anecdote or conversation that demonstrates how the makerspace has helped the most vulnerable in our society

Topline: One project or workshop activity that is demonstrably linked to making a positive ecological/environmental impact

P&Bline: One communication from a person who believes that the makerspace has demonstrably helped them escape a vulnerable situation

The first and second metrics are a combination of monthly tracking and annual review. The third metric, filling-in-form-ability, is a yes/no and can be completed at any stage of the process. What-would-Andre-say records stories and keeps the makerspace aware of social and environmental impacts.

Conclusion

The launch of the makerspace has been a challenging but revitalising project for Auckland Libraries. There has been a growing awareness amongst the community with respect to accessing maker activities. Amongst library staff there is a growth of knowledge and enthusiasm for interacting with the community in this way, building maker culture into our traditional service delivery to create value for customers and ultimately contributing to Auckland Council's vision of making Auckland the world's most liveable city.

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