Augmented Reality in your library - dARing to create new user experiences

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Abstract

Augmented Reality (AR) technology embeds virtual information into the real world environment, providing libraries with the opportunity to create new user experiences. A collaboration between Kāpiti Coast District Libraries (KCDL), Wellington City Libraries (WCL), and a local tech start-up ScimitAR led to the development of an AR "ScavengAR Hunt", launched in both libraries during the October school holidays 2017. With this initiative, we aimed to provide existing customers with new ways of discovering and interacting with library spaces and collections, and attract new customers to visit our libraries.

Thanks to dynamic leaps through the development and test phases, the app went live at the end of week one of the holidays. We directed customers to use Android devices (BYOD or library-provided) to complete five AR challenges located throughout any of our 16 branch libraries. We wanted to deliver a "whole of community" experience, so ensured the challenges were self-correcting (users could identify the correct answer through a process of elimination) and visual (users did not need to read text to solve each challenge). Once all five challenges were successfully completed, the app directed customers to collect an AR-enabled bookmark that brought a "Mahi the Moa" character to life.

The app included a short survey which 18 participants filled out. Results indicated that participants found the app "fun" and thought it was a "fantastic idea for school holidays". Only one of the 18 survey respondents had never before visited the library in which they used the app, so it seems we largely reached an existing audience, rather than attracting new customers. But we saw wonderful examples of children with their whanau getting involved altogether, so felt we had succeeded in positioning the app as something fun for the whole community. Many respondents also noted they learned something new about the library as a result of doing the ScavengAR Hunt, ranging from finding new books to seeing how big some spaces were that they had not visited previously. While the app did not have inbuilt analytics, we do know that there were more than 80 installs. Some of these were onto the library devices at both Wellington City and Kāpiti Libraries, which were made available for customer use, and which were popular in both libraries.

Our AR initiative was a momentous and daring leap forward for our library, connecting us in innovative collaboration with another library and with developers outside the profession. We see enormous potential for all libraries to use AR to enhance the user experience, and to position themselves as the place for users to go, to access and experiment with new technology in a supported way. In the future, we want to explore using AR to layer relevant information into clean and simple library signage. We also want to see how we can guide

users through a wayfinding journey using AR to show them how to search the catalogue then navigate to relevant library items.

1 What is Augmented Reality (AR) and how did you use it?

AR technology embeds virtual information into the real world environment. Dynamic graphics, sound files and animations can be layered or superimposed onto fixed or static points in the tangible world around us. Such fixed points become "triggers" and reveal these rich layers when viewed through an app-enabled device or headset. Because AR can be tailored carefully to trigger at point-of-information-need, such technology enables libraries to provide their communities with an enriched and very relevant sensory experience. As the technology is scalable, it can be used to help library customers navigate and wayfind more effectively through a physical library environment, or it can be used to reveal metadata about a library space, service, collection or individual library item.

In mid-2017, KCDL, WCL and a tech start-up ScimitAR recognised a desire to collaborate together to pilot AR technology in our public libraries. This collaboration led to the development of an AR "ScavengAR Hunt" app, launched in both libraries during the October 2017 school holidays.

2 What were you trying to achieve?

Our project aims were to:

- Position our respective libraries as a "laboratory" or sandbox, where new technology services, products and ideas can be trialled and experimented with, in a supported way. This feeds into a broader, long-term strategy of shifting the focus from developing an information literate society to a digitally literate (diglit) one, leveraging the curriculum focus on diglit in New Zealand's education system.
- Work in a collaborative way with library partners and representatives from outside our sector, to see if we could challenge ourselves to work differently and to see how much collective impact we could achieve together.
- Provide existing library customers with new ways of discovering and interacting with our physical spaces and collections.
- Attract new customers to visit our libraries.
- Deliver a self-directed activity that would appeal to the whole of the community, rather than a specific demographic within it.

3 What was the result?

The ScavengAR Hunt app was Android-enabled, and launched at the end of week one of the two-week school holidays. Users could download the app for free onto their own device, or borrow a library-provided Android smartphone which already had the app available. Once launched, the app directed the user to locate five different trigger images. We were aiming to bring visitors into specific areas or collections of our libraries, so

the trigger images were placed by staff in deliberately selected locations throughout the library space – from the sometimes under-utilised children's non-fiction collection area, through to our technology and learning spaces, tucked away up the stairs.

The five trigger images each activated a different challenge or activity. As we were aiming to deliver a "whole of community" experience, we ensured the activities were self-correcting (users could identify the correct answer through a process of elimination) and visual (users did not need to read text to solve each challenge). Once all five challenges were successfully completed, the app directed customers to collect an AR-enabled bookmark that advertised our upcoming Summer Reading Programme, and brought a "Mahi the Moa" character to life.

The app included a short optional survey which 18 participants filled out. The survey asked demographic questions, so we could see how well we had reached all members of our community with the initiative, and determined if the user had learned anything as a result of engaging with the initiative. Results indicated that participants found the app "fun" and thought it was a "fantastic idea for school holidays". Only one of the 18 survey respondents had never before visited the library in which they used the app, so it seems we largely reached an existing audience, rather than attracting new customers. But we saw wonderful examples of children with their whanau getting involved altogether, so felt we had succeeded in positioning the app as something fun for the whole community. Many respondents also noted they learned something new about the library as a result of doing the ScavengAR Hunt, ranging from finding new books to seeing how big some spaces were that they had not visited previously.

While the app did not have inbuilt analytics, we do know that there were more than 80 installs. Some of these were onto the library devices at both WCL and KCDL, which were made available for customer use, and which were popular in both library networks.

2 Who did we work with?
The ScavengAR Hunt was the result of a collaboration between KCDL, WCL and ScimitAR.

KCDL comprises four physical libraries, spread across 48km just north of Wellington, serving a resident population of 52,700. WCL comprises 12 physical libraries, spread throughout Wellington City, serving a resident population of over 190,000 residents.

ScimitAR is a technology start-up team, who were participants in the Museum of New Zealand Te Papa Tongarewa's Mahuki innovation accelerator programme in 2017. The aim of the Mahuki programme to help "to develop ideas into world-leading digital businesses for the cultural sector"[1] The ScimitAR team comprises "creatives, educators and game developers who are passionate about making fun, interactive and educational

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[1] https://www.mahuki.org/ [accessed 24 April 2018]

experiences" using augmented reality and gaming technology to bridge "the gap between the digital natives of newer generations and the content of your spaces."[2]

3 Why did we partner with ScimitAR and with each other?

WCL had started exploring the development and delivery of AR and Virtual Reality (VR) technologies within the local Wellington technology market. They were aware that ScimitAR were part of the Mahuki programme, so would likely offer a more cost-effective option compared with market rates.

KDCL had expressed interest at earlier library get-togethers with WCL in exploring technology for our library communities, and working together whenever possible to achieve collective impact by sharing our experience and learning.

During some hands-on experience for the WCL and KDCL teams with a range of VR and AR technologies at Te Papa's Hinātore Learning Lab[3], Chris and Kat started to develop some ideas about how we could map AR tools onto the physical library space to provide an enriched end-user experience.

A bit of magic was born when the three groups met up later the same day, and the ScimitAR team appeared in pink flamingo T-Shirts that came to life through our smartphones. All sorts of possibilities for working together to develop something really captivating and engaging for our library customers leapt to mind. There was also an almost tangible "can do" dynamic in the atmosphere. Chris suggested we collaborate together, citing the benefits of bringing multiple perspectives and many different voices and views together to achieve the best outcome possible. Kat suggested we write up a MOU, develop some partnership guidelines, and get all parties to sign off first. Chris said "or we could just go ahead and do it". So we did.

Without a framework or guiding principles in place, there was a risk that the project could have derailed, or suffered from inertia, at various points. But although all parties did not always agree on everything (we had differing views as to how some of the AR challenges should work, for example), with an agreed set of goals, and an agreed timeline, we delivered an AR product on time and within budget which was very well received by both library customers and staff.

4 How did we do it?

In August 2017, we sat down together to do some initial brainstorming to establish our overall goals or "endpoints" as above. That then led to us collectively identifying an AR-enabled "ScavengAR Hunt" as a way to bring all and any library visitors into our physical libraries to engage with AR technology and our existing spaces, collections and services in new and exciting ways. We set ourselves an ambitious timeline, and targeted roll-out for the upcoming October school holidays (six weeks away at that point). This is because we knew AR would particularly appeal to a younger, digital-savvy audience, and both WCL and KCDL always see more people (caregivers and their kids) coming through the doors looking for activities and distractions during any school holiday. So we knew we'd have significant community reach during that period, even though we

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[2] https://www.mahuki.org/about/participants-2017 [accessed 24 April 2018]
[3] https://www.tepapa.govt.nz/learn/for-educators/hinatore-learning-lab [accessed 26 April 2018]

were clear from the outset that we wanted to deliver a "whole of community" (not just "kids only") experience.

To achieve our goal to design something that would appeal to and by used by the entire community, we adopted a User Experience (UX) approach to the project. We embraced the concept of participatory or co-design[4], with ScimitAR testing the app during its development on various members of the community – from a 9 year old (who whizzed it) to a 40-something year old librarian (who didn't). We were trying to develop an experience that that would work for the whole of the community, rather than only for a specific demographic within it. This follows the premise of "8-80" design, also termed "8–80 cities" by Gil Peñalosa[5] in relation to community-friendly urban design. Taking this premise and applying it to the library world, the idea is that if everything we do, design and provide is great for an 8 year old and an 80 year old, then it will be great for all people. Instead of categorising these demographics as "edge cases" and designing for the middle-of-the-road majority, we should instead design for them first.

This approach was beautifully encapsulated by the following image, which we kept sharing when articulating our goal and way of working with library colleagues and Council stakeholders:

Photo: Brendan McDonald, Port Macquarie-Hastings Library Service
From the Australian Public Library Alliance and Australian Library and Information Association (ALIA) report, *How public libraries contribute to THE STEM AGENDA 2017.*

This approach could also be described as "inclusive" or "kind design, and is described by Nat Dudley states in her "Be Kind Design" presentation at Webstock 2018[6] as follows:

Inclusive-first design is design that:

- *Enables equivalent access for everyone*
- *Enables equivalent experience for everyone*
- *Is safe for everyone*

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[4] "An approach to design attempting to actively involve all stakeholders (e.g. employees, partners, customers, citizens, end users) in the design process to help ensure the result meets their needs and is usable" Wikipedia https://en.wikipedia.org/wiki/Participatory_design [accessed 26 April 2018]
[5] https://www.880cities.org/ "We are a non-profit organization. We bring citizens together to enhance mobility and public space so that together we can create more vibrant, healthy, and equitable communities." [accessed 16 April 2018]
[6] https://medium.com/@natdudley/be-kind-design-d28324b7c348 [accessed 16 April 2018]

And it does it as a priority, not an after-thought.

An equivalent experience means that nobody who uses your product is made to feel less welcome or included, and where everyone who uses it has the same opportunity for success.

We achieved our inclusive design goal, by:

- Ensuring the AR challenges were self-correcting (users could identify the correct answer through a process of trial and error and only once all five challenges were successfully completed, the app directed customers to collect an AR-enabled bookmark that brought a "Mahi the Moa" character to life)
- Ensuring the AR challenges were graphically-based (users did not need to be able to read text to solve each challenge)
- Making Android smartphones available for free loan to library customers at both WCl and KCDL (users didn't need to own their own device and BYOD to be able to participate in the experience)

Due to the tight timeframe, we quickly adapted an Agile approach, with the ScimitAR team moving into Sprint phases then bringing their progress back to representatives from the WCL and KCDL teams on a fortnightly basis, for review and advice. We also aimed for pragmatism rather than perfectionism, so at all stages, we were flexible and prepared to settle for a "good enough" outcome. As an example of this approach, we launched the app as Android only because the ScimitAR team were not able to meet the requirements for app launch in the Apple Store in the time available. In a perfect world the app would have been platform-agnostic and therefore accessible to the whole of our community, but in the real world, this was just not possible.

5 What were the benefits to your customers, the library staff and wider organisations?

The AR initiative enabled us to position both WCL and KCDL at the 'cutting edge' development end of the technology landscape. This meant our customers and colleagues could start to see their local public library and place of work as a sandbox or 'touch point' for new technologies that may not be otherwise widely available, due to cost or lack of awareness.

For KCDL, this opportunity to develop and deliver something for all library visitors – the "whole of library for whole of community" as we phrased it - came at the perfect time. We had just completed team-wide strategic planning workshops, through which we identified the desire to work together as "one team" across all four of our physical libraries and all four of our specific focus areas (Youth, Digital, Community (i.e. Adult), Māori & Heritage).

Such a "one team" approach ensures we deliver a consistently high level of customer service across all locations and at all times, and ensures an equitable customer service experience for our communities. This AR initiative gave us a perfectly timed opportunity to try out this way of working – no one physical library, or focus area team, 'owned' the initiative. It was rolled out at every library, and was up to everyone in the team to get to grips with the idea through team meetings, emails, practice runs and conversations, and support its delivery when we went live.

And from a strategic viewpoint, this AR initiative enabled WCL to position itself as taking visible steps towards the achievement of a specific Wellington City Council (WCC) goal:

- Position Wellington as a city laboratory where new services products and ideas can be trialled, and
- Evaluate the success of the tech hub and consider which model/s will best meet future demand for connection and collaboration across Wellington's technology sector.

6 What will we do different next time?

Next time (and there will be one), we will be more deliberate with the use of inbuilt analytics, so we can gather richer data to evaluate the initiative. We need to specifically measure how our users used the AR app, and whether or not it worked well, at all or well enough for the "8 and 80 year olds" who are at the heart of our design process.

We will be more dedicated to our co-design approach, and will do more rigorous testing with all representatives from our "8 to 80" community.

We will also articulate the concept more lucidly to our entire teams of library staff. At KCDL, we will also designate a project lead. Even though the "whole of library for whole of community" approach worked reasonably well, there were times when library staff on the floor wanted someone to go to, to test or question the way one of the challenges was working. In each of our libraries, we needed an identifiable and visible 'champion' who could understand the nuts and bolts, as well as the overarching purpose of the initiative.

8 How is this relevant? What's next?

For both WCL and KCDL, we saw this AR initiative as an affordable and achievable pilot. Due to our communities' positive response to the experience, we now have confidence to keep going in this direction. We have built a solid platform by increasing understanding – particularly within our library teams - of AR technology, how it works and what it can achieve. We therefore wish to evolve it from here from a pilot to a "business as usual" approach to our delivery of library services.

Specific uses of the technology could include:

- layering point-of-need meaning and detail into clean and simple library signage. This would create an uncluttered and therefore intuitive wayfinding experience for users (and particularly new users) in a library's physical environment, with all additional information available in AR form via trigger images or icons placed at particular locations.
- providing an AR-enabled link between the results of a catalogue search, and the exact location of a specific item, or browsable collection, within the library.