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Hopkins, Peta; Hare, Jo; Donaghey, Jessie; Abbott, Wendy

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GEO, AUDIO, VIDEO, PHOTO: HOW DIGITAL CONVERGENCE IN MOBILE DEVICES FACILITATES PARTICIPATORY CULTURE IN LIBRARIES

by

Peta Hopkins phopkins@bond.edu.au

Wendy Abbott wabbott@bond.edu.au

Jo Hare jhare@bond.edu.au

Jessie Donaghey idonaghe@bond.edu.au

Bond University Library

ABSTRACT

Libraries are often hailed as the cultural and learning hub of their communities. In order to deepen community engagement and social inclusion, libraries are adopting new technologies to facilitate a participatory and learning culture. Jenkins et al. (2006a, 5) reported on the rise of participatory culture in contemporary society and characterised it as typically having “low barriers to artistic expression and civic engagement” and “strong support for creating and sharing”. Another characteristic identified by Jenkins et al. (2006a, 6) was informal mentorship where experts pass on their knowledge to the beginners. In a participatory culture “members feel that their contributions matter” and they “feel some degree of social connection with one another” (Jenkins et al. 2006a, 6).

With the recent market saturation of the smartphone and tablet and their associated apps, new affordances for content creation, curation and sharing are on offer showing great potential to enhance participatory culture.

The typical smartphone or tablet now incorporates digital technologies such as geo-location, audio, video, photo, and web technologies. Bringing all of these technologies into a single device has enabled the development of apps such as Instagram, HistoryPin and SoundCloud. It has also changed the way users engage with established social networks such as Facebook and Twitter, and photo-sharing sites such as Flickr.

Users can now create and share content on an unprecedented scale from any accessible Wi-Fi or mobile phone network. Libraries are embracing these technology-rich apps to interact with their customers in many different ways. For example, HistoryPin allows libraries to share their archival collections connecting images with *physical* space through the use of the HistoryPin GPS app. HistoryPin also facilitates *online* social interaction where customers are

invited to share comments or memories about pictures and contribute their own photos to match old images.

In this article the authors use examples to examine how libraries are taking up opportunities enabled by the convergence of technologies into mobile devices in the participatory culture context – tapping into new communities, engaging with their stakeholders in meaningful ways, enhancing their social impact and transforming their essential roles in today’s knowledge society.

INTRODUCTION

“Welcome to convergence culture, where old and new media collide, where grassroots and corporate media intersect, where the power of the media producer and the power of the media consumer interact in unpredictable ways” (Jenkins 2006b, 2).

For libraries the converged media environment presents unprecedented challenges and opportunities. The latest wave of mobile technologies including geo-location, audio, video, photo, and web technologies is enabling libraries to interact with their customers in new and different ways. Libraries have always practised community engagement but the new mobile technologies are leading to a whole new model of engagement and participation; a model that encourages conversation, facilitates collaboration and promotes the creation of new content. Most importantly this new model is leading to a new sense of community amongst library users.

This paper will introduce the concept of digital convergence and provide examples of libraries taking advantage of converged media applications and social networks to engage their communities in a participatory culture. The aim of the paper is to stimulate thought about how these and forthcoming applications could be exploited in the future.

KEYWORDS

Libraries; participatory culture; digital convergence in mobile devices

IMPLICATIONS FOR BEST PRACTICE

1. Increased discoverability of library collections can be achieved through creative leverage of established and emerging converged media platforms, thereby increasing the value of library collections to the community.

2. Libraries can continue to evolve as transparent, engaged, responsive cultural organisations through the principles of participatory culture, by going beyond the role of trainer to become an active participant.
3. Libraries can enhance connections and must seek more meaningful participation with online communities through opportunities presented in the converged media environment.

LIBRARIES IN A CONVERGED MEDIA ENVIRONMENT

Since 2006 multi-function mobile phones were proliferating in the market long before the mainstream of users comprehended how these devices could be properly exploited. "I didn't want a video camera, a still camera a web access device, an mp3 player, or a game system.... I didn't want the electronic equivalent of a Swiss Army knife." Jenkins (2006b, 4-5) was advised by mobile companies that "they don't make single-function phones anymore". For Jenkins, this was a powerful demonstration of how mobile phones had become central to the process of media convergence.

This is the context for contemporary libraries - a digitally converged frontier providing unique opportunities to engage physically dispersed communities and to produce original cultural content. This digitally converged frontier represents a "new dimension of connection, as we do not have isolated technologies any more but rather an integrative communication network" (Linke 2013, 36).

This 'integrative communication network', mobilised through convergent digital devices such as smartphones and tablets, allows libraries to engage with their communities and broadcast in ways that weren't previously possible. For example, a library may not have capacity to employ a marketing team to film a television commercial, but they can create a short, informal video using a smartphone and upload it to YouTube. In the past libraries produced and printed newsletters that were circulated by post. Now libraries create digital newsletters to be read on mobile devices or distributed in bite-sized pieces across Facebook and Twitter. Libraries previously curated photo collections, but now also contribute their collections to international photo sharing sites such as Flickr and HistoryPin where customers' input creates invaluable enhancements. These examples represent not just a technological shift but also a cultural one. Libraries are using convergent digital devices to actively produce and share content and to create a sense of social cohesiveness in local and distributed communities.

This transformation has been described by Michael Stephens as the 'Hyperlinked Library' and is a good fit with the characteristics of participatory culture.

"The Hyperlinked Library ... is an open, participatory institution that welcomes user input and creativity. It is built on human connections and conversations. The organizational chart is flatter and team-based. The

collections grow and thrive via user involvement. Librarians are tapped in to user spaces and places online to interact, have presence, and point the way." (Stephens 2007, 256)

PARTICIPATORY CULTURE IN LIBRARIES

The participatory culture movement may be described as the push to enable democracy and promote diversity through grassroots participation in cultural and political decision making (Jenkins 2013). Jenkins and his colleagues have characterised participatory culture as typically having "low barriers to artistic expression and civic engagement" and "strong support for creating and sharing" (Jenkins et al. 2006a, 5). Another characteristic identified by Jenkins et al. (2006a, 6) was informal mentorship where the experts pass on their knowledge to the beginners. In a participatory culture "members feel that their contributions matter" and they "feel some degree of social connection with one another" (Jenkins et al. 2006a, 6).

Underpinning the drive to expand participatory culture is often the assumption that new technologies in a converged media environment place new tools in the hands of 'the people' and that these will inevitably provide everyone with improved opportunities to participate in the transformation of their world. However, the push for popular participation has faced challenges in changing the way established institutions have tried to dominate new media technologies. As Jenkins cautions, "This history should be sobering, as we encounter such a record of bold predictions, promises delayed and deferred, partial successes and unintended consequences" (2013, 269). A more nuanced understanding of how new media platforms can be used to enhance meaningful participation is needed (Jenkins 2013).

In parallel with these theories on the growth of participatory democracy and culture, discussions on the concept of the 'participatory library' have been evolving in librarianship literature. As described by Nguyen, Partridge and Edwards (2012), participation is at the core of the open participatory library of the future. The convergence technologies of Web 2.0/Library 2.0 have been a stimulus for the participatory library and librarians are being encouraged to craft their tools and services to enable users to communicate and join in (Stephens 2007).

The latest wave of technological convergence in the form of mobile devices has potential to usher in a new period of dramatic change in the evolution of the participatory library. In the section below, the key components and affordances of the converged mobile device are described.

CONVERGENT DIGITAL DEVICE TECHNOLOGIES

PHOTO, VIDEO, AUDIO TECHNOLOGIES

The development of digital cameras has significantly improved since Steven Sasson's weighty black and white camera that stored images on cassette tape in 1975 (Friedman 2011). It was not until the late 1980s that the first digital cameras became commercially available, and another decade or so before the first camera phones were released. The first photo shared directly from a camera phone was in 1997, when Philippe Kahn modified his phone so that he could take a digital photo of his new born daughter and wirelessly post it to his friends and family (Maney 2007). Today, our smartphones and tablets have at least one camera installed which takes high-quality pictures. It is often accompanied by a lower quality front-facing camera for face-to-face video messaging and selfies. Not only are they equipped to take still images they have miniaturised digital video and audio recording technologies along with text editing capabilities.

LOCATION TECHNOLOGIES

From an experimental phase in the 1970s for military use, Global Positioning Systems (GPS) was recognised as an important technology for civilian use in 1996 (Fact Sheet U.S. Global Positioning System Policy 1996). GPS has developed into technology which is embedded into smartphones and tablets in use by millions of people every day. This technology, along with cellular network antenna connections, underpins the location awareness capability that enables people to check-in at locations, to obtain turn-by-turn navigation on their smartphones, and to take photos that are geo-tagged at the point of capture.

Geo-tagging generates location metadata for photographs, videos, SMS messages, QR codes and many other file types, thereby facilitating an additional access point for organising, searching and presenting data. While this kind of metadata has been used and developed since the early days of hand drawn maps, the location awareness technology now common in smartphones, cameras and other portable devices means that the capture of this data can be automated and saved with the billions of files being created every day. If the files are uploaded to multiple repositories then each of those repositories can easily make use of this access point.

COMMUNICATION TECHNOLOGIES

"Instagram CEO Kevin Systrom got it right when he said "You take a moment in the world, and you take a photo or video, and you create a space for conversation." Photo messaging is about communication. Instagram is "built into phones," not cameras, and "phones are communication devices." We have seen a "visual communication revolution" in which tools use the visual storytelling power of images to amplify messaging.

The circle is completing with the addition of messaging to photo apps just as we saw the reverse as photos were added to messaging apps and messaging apps were being built around photo sharing." (Murphy, Instagram Direct Photo Messaging and thoughts for Libraries, 2013 <http://joemurphylibraryfuture.com/instagram-direct-photo-messaging-and-thoughts-for-libraries/> Accessed 11 Jul 2014)

Joe Murphy's blog post highlights the importance of communication in the success of apps such as Instagram. The communication technologies are the key enablers that led to the proliferation and versatility of smartphones rather than the smart-cameras, or smart GPS navigators. And it is communication that is the key to participatory culture. Today's smartphones make use of radio waves in a number of wireless technologies including Wi-Fi; wireless local area networks (the de facto standard for private homes, offices and public hotspots); Bluetooth and near field communication (NFC) for short distances; and cellular data service for connection to mobile phone network towers over a much greater distance. The practical applications are extensive and innovation for consumer use appears continuous.

SOCIAL MEDIA

"Libraries have always been places that people go to for information, but, with the explosion of mobile technology, our patrons are more and more expecting information to come to them... People today are tied to the mobile phone as the center of their information ecosystem, and more and more these phones are providing an interface to nearly all of their informational needs." -- (Griffey 2010, 5)

Griffey connects the explosion of mobile technology with people's expectations about access to information, however, it can be argued that the expectations of library patrons had already changed prior to this explosion. This is demonstrated by the claims that the 'Internet is the death of libraries' which have been promulgated for more than a decade (Miller 2006; Anonymous 2005; Libraries still hold place in our hearts, 2001). People were already expecting more information to come to them online, but the mobile technology explosion has extended that expectation to online anywhere and everywhere.

One of the ways Libraries have responded to the expectations of patrons in the networked world is through the use of social media, in particular Facebook, Twitter, Youtube and Flickr. Smeaton and Davis (2014, 73) in their study of Australian public library's use of social media argue that it is not enough to just be present in these media - that thoughtful engagement is needed. Enough experience with these established networks has been gathered to inform handbooks for libraries on how to use these services for community building (Garofalo 2013). It is relatively easy to find examples in each of these platforms where Libraries are establishing or participating in online communities.

MOBILE APPS

These technologies, miniaturised to fit into portable hand-held devices, need software for users to be able to harness them. Mobile operating systems and the subsequent rise of cheap or free mobile apps through distribution platforms, commonly known as app stores, has turned the phone into the Swiss Army knife of digital content creation - they fit in your pocket, can be used almost anywhere and for all sorts of creative purposes.

Camera (video and still images), audio and text apps might be considered the basic building blocks for content creation. However, the apps that have been developed for the social media platforms on the web can be considered the power-houses for bringing mobile computing to participatory culture. It is in these apps that the text, photo, video, audio content is wrapped up with location data and shared to the community's huge array of platforms and devices largely independent of operating systems.

EXAMPLES

Next, this paper explores some of the more recent social media platforms, in particular those that depend on, or have developed and grown in response to the affordances of the technology aggregation in smartphones and tablets.

The examples selected operate on converged media platforms, and support participatory culture as defined by Jenkins et al. (2006a), and summarised here, through:

- Low barriers to artistic expression and civic engagement
- Strong support for creating and sharing
- Some form of mentorship
- Members who believe their contributions matter
- Members who have some degree of social connection

The examples illustrate how libraries are innovating with these platforms and becoming more transparent, participatory, socially inclusive and creative.

INSTAGRAM

Launched in 2010, Instagram is a photo-sharing app on both the iOS and Android platforms with third party compatible apps available for some other smartphone operating systems. Instagram has more than 200 million users and is the fastest growing social media platform (Digital Trends <http://www.digitaltrends.com/social-media/instagram-is-growing-faster-than-twitter-facebook-and-pinterest-combined-in-2013/#!bbT3Uu> accessed 10 July 2014).

Its success draws on the intersection of smartphone technology and social networking combined with the cultural phenomenon of photo-sharing that started long before the digital age (Abbott, et al, 2014 pp. 1-3). The app integrates with smartphone cameras to capture images and short videos, and it provides a set of filters and effects for simple image editing. Users can add comments and hashtags and optionally turn on geo-tagging for sharing.

The barriers to participation with Instagram are very low. The official app, and an account are free and supported on the two largest smartphone and tablet operating systems. The app, which is very easy to use, provides tools to grow the network through integration with contact lists on the smartphone or tablet, Facebook contacts, and by suggesting people to follow.

The Instagram application programming interface (API) is published and accompanied by comprehensive documentation for the development of third party applications to use Instagram content in innovative ways; an indication of the strong support for creating and sharing of content. Indeed, the Instagram app itself offers options to share to other social networks including Twitter, Facebook, FourSquare and Flickr. The sharing functionality now built into iOS and Android operating systems promotes sharing from other apps to Instagram. Users can produce their content in any number of other creative apps and then push them into the Instagram app.

The features that support social connections include commenting, liking and hashtags. While hashtags might initially be considered as keywords that describe the media, in Instagram they are often used to loosely identify group membership or common goals. For example #igers is often used as a prefix to a place name to describe the contributor not just the image. For example #igersmelboure stands for Instagrammers of Melbourne. Another example of a hashtag as a community identifier is #fmsphotoaday (Chantelle, Photo a day challenge lists: see them all here <http://fatmumslim.com.au/photo-a-day-challenge-lists-see-them-all-here/> accessed 7 Jul 2014). In this example, the hashtag identifies the image as belonging to an online community of users who take part in a shared challenge. The challenge is to take a photo every day associated with the daily theme and community members are all playing the same game.

The importance of participation in Instagram is indicated by contributors who take time to be very creative or innovative with their media, to comment on other contributors' efforts or to provide minimal feedback by 'liking' their content.

Although geo-location is optional in the app, it is a key mechanism supporting photo-sharing and conversations about localities. Although not all businesses and organisations have an Instagram profile, it is quite likely that their customers are posting images and videos about them on Instagram and also onto other sites such as Foursquare and Facebook.

A rapidly growing number of libraries are establishing Instagram accounts to build their profiles, promote their events and engage their customers in conversation through photo-sharing.

The New York Public Library has used Instagram for a Favourite Authors Knock-out competition, wherein the community was invited to compare two authors and indicate their preferred author. Through a series of 'voting' rounds the community's favourite is determined. (<http://instagram.com/p/mPu1ufzVo9/> Accessed 8 Jul 2014)

The authors' presentation at VALA 2014 showcases several examples of libraries innovating with Instagram_(Abbott et al. 2014, The Perfect Storm: the convergence of social mobile and photo technologies in libraries. <http://vala.org.au/vala2014-proceedings/805-vala2014-session-7-abbott> Accessed 8 Jul 2014) including special campaigns such as Madison Public Library (Wisconsin) promotion of its maker space, and Queens Library (New York) raising awareness of proposed library budget cuts.

HISTORYPIN

Launched in 2010, HistoryPin is an online, collaborative photography archive containing content shared by individuals and organisations, including 100 libraries archives and museums who were foundation partners in the beta testing phase (HistoryPin.com <http://www.historypin.com/faq/#title1> Accessed 11 Jul 2014). In comparison with other photo-sharing services such as Flickr, HistoryPin users can create a geographic context for the image that other users can then comment on, or update using the app. Images are featured on a Google Map, and users can make 'repeats' by uploading new photos of the same location to show how it has changed over time. Many library photographic collections lack the ability to pin images to a location on a map, hence, HistoryPin provides a valuable feature incorporating a digital map with street view capability to switch between current and historical views (Baggett and Gibbs 2014, 15, 20). Another point of difference for HistoryPin is the use of location rather than keywords as an access point to search for images.

Barriers to participation with HistoryPin are low. The app is free and supported on iOS, Windows and Android devices. Accounts are also free, supporting its aim "To get as many people as possible taking part in the history of their family, streets, country and world." (HistoryPin.com <https://www.historypin.org/faq/#title2> Accessed 5 Oct 2014)

The HistoryPin mobile app takes advantage of GPS, mobile, photography and internet technology to allow users to upload content without the need for a stationary computer. HistoryPin is by its nature collaborative and is an example of how digital convergence can lead to new types of sharing and participatory cultures. HistoryPin is unlike other social media sites such as Facebook or Twitter that are more broadcast-centric.

While there is no API available, HistoryPin does provide an easy method to generate code for embedding content on other websites to share content more widely.

The features that support social connections include commenting, favouriting and the ability to become a fan (or follower) of a profile. In addition the inbuilt sharing buttons on the website version include the major social networks. Use of these features and uploading 'repeats' of older photographs demonstrates the perceived value of contributions by the community of users.

Informal mentoring amongst HistoryPin users and conversations with HistoryPin developers is facilitated through a Google Group.

Perhaps the most valuable feature of HistoryPin for libraries is its ease of use, making digital photographic collections in the library more easily discovered. In research conducted in 2014, Baggett and Gibbs found that images from digital collections uploaded to HistoryPin were accessed nearly three times more often on HistoryPin than in their original location on a library's website. "Pinning items to HistoryPin takes collections that are hidden several layers deep within the library Web site and shares them on a platform with an established user base that is interested in historical photographs" (Baggett and Gibbs 2014, 17).

Thus HistoryPin is a natural fit for libraries hoping to distribute their digital photographic collections more widely in a more engaging way. For example, the Library of Congress has pinned archival content to maps all over the world, way beyond its city, state and country.

Public, state and national libraries and historical museums can contribute to a collective photographic memory for local or national communities. Queens Library in New York has collaborated with HistoryPin to create the Queens: Neighbourhood Stories project, inviting locals to "build a picture of local lives" (<http://www.historypin.com/project/40-queens/#!map/index/#!/geo:40.672413,-73.816419/zoom:14/> Accessed 8 Jul 2014). More than 850 content pieces covering the period 1840 to 2014 have been contributed as part of this project by the Library and the community.

School Libraries might consider a HistoryPin project to complement school excursions, or to support history classes.

Academic and public libraries could consider showcasing historical and archival images in self-guided or hosted walking tours in their localities for visitors and new arrivals.

The State Library of Queensland collaborated with HistoryPin to host a history walking tour for delegates at the ALIA Online conference in 2013 (Conference program <http://www.information-online.com.au/network.html> Accessed 8 Jul 2014). Similar walking tours could be organised collaboratively with groups in the community such as historical or special interest groups, to showcase image collections.

SOUNDCLOUD

The community of SoundCloud users is extensive with over 40 million registered accounts and reaching 200 million listeners globally (Graham, 2013). Founded in 2007, SoundCloud is an audio distribution platform geared for musicians, wherein users can create, promote and distribute their audio recordings via widgets and apps. (Butcher, Mike 2010. Now a million on SoundCloud – This startup is scaling globally <http://techcrunch.com/2010/05/18/now-a-million-on-soundcloud-this-startup-is-scaling-globally/> Accessed 11 Jun 2014)

While the desktop computer can be used for recording or uploading sound files, the availability of the SoundCloud app for both IOS and Android devices has put very easy-to-use audio recording tools into the hands of smartphone users, who are using the service in imaginative ways. For each sound file uploaded a photograph can be attached along with optional geo-tagging, and a description. In the desktop browser additional metadata can be managed. This includes selecting a licence, indicating the type of recording such as 'spoken' or 'sound effect' from a select list, a genre, record label, associated URLs from video sharing sites such as Vimeo, a URL to an online store, beats per minute and musical key if desired. Recordings can be public or private, and private sharing options are available. On logging in to the service a stream of sounds is displayed based on who the user is following.

The technologies used in the SoundCloud app include audio recording, social networking, location awareness, and camera.

The barriers to participation in SoundCloud are low. Free accounts are available although these have limited storage space, and the official apps for Android and iOS are free and simple to use.

If the community space is not in SoundCloud itself, the content can be reused in other spaces easily. The sharing options for common social networking sites, embedding widgets and email messages are built in to the desktop interface. The apps make use of smartphone sharing features for integration with social networking sites such as Facebook, Twitter and Pinterest. The SoundCloud API is published along with documentation for the development of third party applications to contribute, update and share content; demonstrating a strong support for content creation and sharing in line with participatory culture characteristics.

SoundCloud supports participatory culture through its use of social features. Listeners are able to comment and those comments are attached to specific points in the recording. Likes can be registered, and the networking effect of 'reposting' promotes sounds more widely through users' streams. Creating and joining groups is a key feature for developing communities around audio content on the site.

The importance of participation in Soundcloud is shown by contributors who take time to comment and offer feedback on contributors' efforts, to repost others' content, to produce

high-quality sound recordings or to share historical or topical audio recordings as a way of documenting events.

Playlist creation offers libraries potential for managing collections of content relevant to their communities, and for hosting and distributing their own audio collections. For example, an academic library may compile a playlist about its institution and include sounds published by local citizens and radio stations to SoundCloud. Playlists would also be useful for compiling vox pop interviews at a community event.

One example of a library using SoundCloud is the United Nations Audio Library. It posts recordings of meetings and events at its headquarters for journalists and broadcasters covering UN activities. (<https://soundcloud.com/unaudiolibrary> Accessed 5 Jul 2014).

Other examples of use by libraries include Portland State Library's distribution of lectures and interviews (<https://soundcloud.com/portland-state-library> Accessed 5 Jul 2014); The British Library posting recordings of bird calls, traditional music and symposia to SoundCloud (<https://soundcloud.com/the-british-library> Accessed 5 Jul 2014); Bond University Library's exploration of the platform for hosting a self-guided audio tour, and curation of recordings about the University including radio interviews with its academic staff (<https://soundcloud.com/bondlibrary/sets> Accessed 5 Jul 2014).

Examples of the kinds of community groups on SoundCloud that would be appropriate for libraries to interact with as part of outreach programs include:

York St John University Composers' Group (<https://soundcloud.com/groups/york-st-john-university-composers-group> Accessed 5 Jul 2014)

Edinburgh University Dance Music Society (<https://soundcloud.com/groups/edinburgh-dance-music-society> Accessed 5 Jul 2014)

[Fusion Festival](#) - Alternative Music Festival in Lärz, Germany (<https://soundcloud.com/groups/fusion-festival> Accessed 5 Jul 2014)

VINE

With over 40 million users Vine has fast become one of the most popular social video platforms (@vineapp Tweet 20 Aug 2013 <https://twitter.com/vineapp/statuses/369911739782946816> Accessed 10 Jul 2014). The potential seen in the platform sparked enough interest for it to be acquired by Twitter before its release in 2012 (Hofmann Introducing Vine, 24 Jan 2013 <http://blog.vine.co/post/55514427556/introducing-vine> Accessed 10 Jul 2014). Vine is an Android and IOS app which allows users to create six second looping videos to post to

followers of their profile. The evolution of mobile phones to digitally converged tools is evident in the creation of Vine, with its appropriation of the built-in camera and audio recording capabilities to become an instant video recorder, combined with social networking capabilities. When teamed with the Twitter app for sharing videos beyond the Vine users' community geo-tagging also comes into the mix.

Vine's advantage as a potential tool to support a participatory culture is manifested in its simplicity and versatility. Its ease of use complemented with free accounts and free apps for iOS, Android and Windows set the barriers to adoption of Vine very low.

The six second limit encourages users to push creative boundaries and the possibilities for creating different types of videos are numerous; vine is used for art, citizen journalism and as a substitution to traditional one-to-one communication. Acknowledgement and appreciation of creation and sharing of users content on Vine is evident through the use of hashtags, likes, comments, the 'Explore' feature, and the ability to 'revine' (i.e. reposting) a favourite video. The Vine API enables third party applications to reuse content and data such as timelines, hashtags and individual posts. The publication of this API shows support for sharing of content and use of Vine content in innovative ways, beyond the standard sharing to popular social networks that are built into the app.

There is a strong social connection among Vine users, as features of the platform include the ability to connect to people from your contact lists and to post your videos to Facebook and Twitter.

The uptake of libraries using Vine is still relatively low, but there are examples of libraries experimenting with the app. Libraries have taken a similar approach with Vine as with other social media sites in what is shared on the platform; libraries campaigning or promoting an event or their collection, providing 'how to' instruction or tips for using library resources and revealing aspects of behind the scenes in the library.

A good example of Vine being used in a participatory culture is Schaumburg Library's video highlighting students' artwork that was displayed in the Library (<https://vine.co/v/b17je6Bl1DQ> Accessed 11 Jul 2014). In this example, community created media is being shared to the wider community through this social platform.

Another example of libraries using Vine include Nanyang Technological University Library welcoming freshmen by asking students to create stop motion videos in their Project Photo Booth (<https://vine.co/v/hM0urr73g75> Accessed 11 Jul 2014). By allowing students to be participants and creators of the Vine videos, the library was able to provide as well as raise awareness of their profile.

FINDINGS

The examples illustrate how libraries are moving into the converged media environment using a diverse range of social media apps from the fastest growing platform, Instagram, to the emerging platforms of HistoryPin, SoundCloud and Vine. The examples show libraries' willingness to experiment as they harness these new media with imagination and creativity.

Librarians are venturing into the mobile app world to raise their libraries' profiles and to increase the discoverability of their collections in ways that are more engaging than was possible in the past. This often involves representing the library buildings, facilities and collections both physical and digital, to create and promote the library's identity. Photo based platforms like Instagram and HistoryPin are being used to enhance the discoverability of libraries' archival image collections, as demonstrated by Baggett and Gibbs' (2014) findings which showed that images on HistoryPin are more readily discovered than when hosted on a library website.

Librarians are also using these apps to produce and share their educational and promotional content more imaginatively. Vine and SoundCloud in particular place powerful media creation tools in the hands of librarians to record and publish video and audio instructional and marketing content. These tools are showing great potential for creative applications as demonstrated by the use of Vine at Nanyang Technological University Library in Singapore.

The evidence demonstrating participation is more ambiguous. All the apps profiled in the examples incorporate functionality for users to 'like' and post comments and many library communities are responding to the invitation to participate in this way. The examples illustrate librarians engaging in online conversations with their users and creating communities of interest where people may participate in challenges and tasks, such as the New York Public Library Authors Knock-out competition on Instagram. In other examples, library communities are developing and sharing content; for example, sharing photos on Instagram and pinning photos in HistoryPin. The Queens Library (New York) '#savequeenslibrary' campaign incorporated Instagram as one channel to raise awareness of proposed library budget cuts. This is a good example of participatory culture as the campaign sought to rally popular support to influence the council decision to maintain the library's budget for opening hours and online access.

These examples demonstrate varying degrees of personal investment in participation and consequently different levels of social connection.

In making choices to join any of the newer social media platforms on mobile devices, libraries need to consider how well the app will meet their aims to enhance communication, engagement and participation using criteria such as:

- The size of the user base and fit with the Library's community

- The affordances of the technologies incorporated
- The extent to which the app's content can be shared with other platforms
- The scope of the app to complement or replace existing media
- The potential for meaningful community engagement and participation.

As flagged by Jenkins more research is needed into the mechanisms and 'terms of our participation' (2013, 273).

CONCLUSION

In the current networked world, there is great potential for libraries to play a vital role in the participatory culture movement; firstly by supporting people to gain the skills and technology access necessary for meaningful participation in society at every level and secondly, by harnessing the principles of participatory culture to transform libraries into transparent, engaged, responsive cultural organisations. This second role sees libraries connecting with already existing online communities in ways that enhance library collections, make them more widely accessible and thereby increase their value.

The examples demonstrate how libraries can take advantage of opportunities presented by the converged media environment to deepen community engagement and social inclusion, and to facilitate a participatory and learning culture – tapping into new communities, engaging with their stakeholders in meaningful ways, enhancing their social impact and transforming their essential roles in today's knowledge society.

Smeaton and Davis's (2014, 73) view that thoughtful engagement is essential when libraries participate in social media spaces, harmonises with Jenkins' (2013, 273) call for a "more nuanced account of the different mechanisms for participation" than "utopian and dystopian rhetoric" on participatory culture. For Libraries to retain the mantle as the learning and cultural hub of their communities it is important that they seek to achieve meaningful participation as they explore the opportunities afforded in a converged media environment.

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