

Exploring Digital Network Models for Museum-University Partnerships

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Executive Summary

This report was commissioned by the Museum University Partnership Initiative (MUPI) to give an insight into success factors related to the design and delivery of digital platforms for museum-university networks. The report explores academic literature related to digital networks and virtual communities and evaluates the contemporary landscape of data aggregation and digital network forms, analysing findings to offer a set of recommendations for future practice. An overview of the four sections of the report is below:

1) Literature Review

This section of the report begins by exploring structural characteristics of networks including programming, switching and weak ties: reflecting on the way these characteristics inform networked communication online and offline. The review then goes on to explore fundamental success factors for online communities. Factors are grouped into five categories: Critical Mass, Network Cause and Purpose, Clearly Defined and Regulated Roles, Governance and Trust, and Site Usability and Service Quality. Thirdly, the review gives an overview of overarching motivations to contribute to virtual communities, defined here as: Helping the Community, Reputation Building and Recognition, Enjoyment, Recreation and Fun, Specific Interest and Personal Learning, Relationships and Knowledge Exchange and Self-Expression and Self-Efficacy. Finally, the report looks at reasons for network failure.

2) Data Aggregation

This report section explores the contemporary landscape of data aggregation through five current academic and museum-based projects. An insight is offered into technology and licensing, with a focus on using Linked Open Data, Creative Commons Licensing and Open Source Software. An overview of platform functionality and project support and sustainability is also delineated. The section concludes by considering the utility of data aggregation for new museum-university projects.

3) Review of Current Network Forms

This report section evaluates a range of current network forms, drawn from analysis of 250 platforms within both museum and university communities and the wider cultural context. Network Support Websites, Mailing Lists and Social Media Groups and Pages are explored in relation to previous research undertaken into museum and university networks by Laura Crossley (2017). Broader applicable network forms are also analysed, including Dedicated Discussion Forums, Crowdsourcing Platforms, Sharing Economy Websites, Crowdfunding Sites and Spontaneous Social Media Networks.

4) Recommendations

Drawing on findings, eight recommendations are made for a new digital museum-university network:

- Build an online-offline hybrid network
- Use overarching success factors and motivations to frame a unique site design
- Take account of network lifecycles
- Recognise reasons for network failure as well as success
- Build data aggregation slowly around a project
- Use a modular site design including a range of network functions
- Use the site for action, not just discussion
- Consider a digital network as an ongoing commitment

Literature Review



Literature Review

Section A: Network Context and Characteristics

For theorists such as Eran Fisher (2010) and Manuel Castells (1996, 2000, 2009), contemporary society is understood to be a form of networked, communicative, Digital Capitalism, fundamentally based on the structuration of the network in an overarching sense. In a more microcosmic way too, Digital Capitalism has given rise to a diverse range of new networked digital forms impacting culture, economy and society.

As maintained by theorists such as Manuel Castells, all networks operate according to two basic functions: network programming, and the bridging of different networks - a role Castells calls 'switching'. Programmers of specific networks have a decisive role, because they determine the 'ideas, visions, projects, and frames' (2009, 46) which generate programmes. As Castells states: 'once programmed, the network will perform efficiently, and reconfigure itself in terms of structure and nodes to achieve its goals' (2009, 46). Meanwhile, switchers 'control the connecting points between various strategic networks' (2009, 46), allowing alliances to be formed between networked groups and communities.

Digital networks are also said to have defining communicative features characterised by weak ties. The theory of weak ties was first introduced by Mark Granovetter in the 1973 article 'The Strength of Weak Ties' which explored the ability of weak ties to spread ideas and information. As Andrea Kavanaugh et. al state, the strength of network ties is determined by 'the amount of time, emotional intensity (mutual confiding) and reciprocal services that characterise the tie' (2004, 121). Strong ties emerge from the centre of a given network and operate to 'diffuse information and exert social influence' (Liu et. al 2017, 7). However, weak ties also have specific instrumental capacities in terms of spreading relevant, heterogeneous information throughout a network, increasing the reach of content across audiences and offering professional opportunities and social integration (Kavanaugh et. al 2004, Liu et. al 2017).

Weak ties can also be understood as a form of 'bridging social capital'. Bridging social capital creates weak ties across diverse social groups, where bonding social capital creates strong ties within social groups (Putnam 2000). However, both forms of social capital are needed for strong communities (Putnam 2000). As Andrea Kavanaugh et. al state: 'bonding capital creates and continues the connections which keep individual community groups viable, while bridging ties facilitate the exchange of information between otherwise disconnected groups and organisations' (Kavanaugh et. al 2004, 120). In this way, we can compare the role of bridging capital to the central role of the switcher in Castells' network theory.

Research related to civic participation has also indicated that weak ties in online networks can help facilitate offline interactions, strengthen interpersonal ties and increase participation in civic activities. Kavanaugh et. al suggest that: 'the internet, in the hands of bridging individuals, is a tool for maintaining social relations, information exchange and increasing face-to-face interaction' (2004, 119). This is an assertion mirrored by other theorists including Homero Gil de Zúñiga and Sebastián Valenzuela who suggest that online networks can effectively increase existing local interactions offline and create new networks that continue offline as well as promoting geographically dispersed networks of shared interest (2011). Indeed, theorists such as Joonmo Son and Nan Lin have found that networks based in weak ties are more effective than strong ties in facilitating civic activities (2008).

This dynamic also seems to operate vice-versa. As Gil de Zúñiga and Valenzuela state: 'it may well be that engagement in civic activities also enhance citizen communication networks, especially if participation in these networks allows people to meet and get to know others who have a common interest' (2011, 403). This is an assertion shared by Hsiu-Fen Lin, whose more general research into successful digital network design suggests that offline activities increase member's sense of belonging to a virtual community and positively influence their use of the virtual community in this way (2007, 132). For this reason, Lin suggests that 'to sustain a successful virtual community, attention must be paid to enhancing both online and offline interactions' (2007, 132) and that 'community providers should...build mechanisms that facilitate offline communication into their websites' (Lin 2007, 133).

Section B: Network Success Factors for Online Communities

Online communities can be defined as 'any virtual space where people come together with others to converse, exchange information or other resources, learn, play or just be together' (Resnick and Kraut 2012, 1). There are many studies which explore success factors for online communities in terms of design, development and regulation. The field is extremely broad and ranges from 'lists of strategies to design principles and theoretical frameworks' (Iriberry and Leroy 2009, 15). However, across the literature there are certain recurrent design indicators, expressed here as Critical Mass, Network Cause and Purpose, Clearly Defined and Regulated Roles, Governance and Trust, and Site Usability and Service Quality.

1) Critical Mass

Critical mass refers to the need for online communities to include 'a sufficient number of people to make an online community viable, attractable, and sustainable' (Cheung et. al 2005, 82) and is considered central to network success or failure (Hiltz and Turoff 1978, Cheung et. al 2005, Preece 2000, 2003, Iriberry and LeRoy 2009, Rice, Grant et. al 1990). Building critical mass is a matter of urgency for any new online community, when, as Paul Resnick and Robert E. Kraut state: 'a fledgling site doesn't yet have enough content to attract users and there are thus too few users to create the content that might attract others' (2012, 3). Indeed, digital sites are only understood to reach maturity when 'a critical mass of members and member-generated content is achieved' (Iriberry and LeRoy 2009, 24).

Critical mass is also considered essential for sustaining online communities. As Karen Cheung et. al assert: 'critical mass is a central concept to explain community success and failure. Planners need to attract and keep a "critical mass" of members to create a sense of belonging, intimacy, connection, and camaraderie, as well as to generate enough content' (2005, 87). Critical mass also refers to the number of active members within an online community. As Jennifer Preece suggests: 'it is well known that if there are too few people contributing to an online discussion it will die because there will be insufficient new messages to hold the interest of existing members' (2003, 612).

Despite its centrality to network success or failure, critical mass is considered difficult to quantify, because as Preece states: 'critical mass will vary from community to community, according to its focus and personalities and its participants' needs, activities and policies' (2000, 172). For this reason, 'what may be enough people in one community may not be in another because members of different kinds of communities have different expectations' (2003, 612). Therefore, critical mass must be quantified on a case by case basis related to specific sites.

2) Network Cause and Purpose

The idea of having a network cause, and expressing site aims and objectives very clearly onsite also recurs in multiple theories surrounding success factors for online communities (Cheung et. al 2005,

Whittaker, Issacs and O'Day 1997, Kim 2006, Erlichman et. al 2015, Wei-Skillern and Silver 2013, Fontainha and Gannon-Leary 2008). For many theorists, a shared goal or interest represents the primary reason for belonging to an online community and so needs to be clearly represented and communicated to network members. As Amy Jo Kim states in her influential guide to online community building: 'a successful community serves a clear purpose in the lives of its members and meets the fundamental goals of its owners' (2000). A clear purpose is also understood to help generate a collaborative community of participants. David Erlichman et. al argue that 'by clarifying purpose and context, each network member becomes keenly aware that they are just one among many participants working across the system. And in the process, they begin to understand and embrace the network principle of acting as a node, not hub' (2015).

A clear cause is also considered important right from the inception of designing online communities. As Kim states: 'to create a successful community, you'll first need to understand why you're building it and who you are building it for, and then express your vision in the design, technologies and policies of your community' (2000). This vision should be communicated and contextualised to all design team members, to 'guide the organisation of an online community' (Glezakos and Lazakidou 2012, 63). It is also considered essential to write the purpose of the site very clearly into the site homepage as 'potential members need to know what the online community's purpose is before they can decide to participate' (Iriberry and LeRoy 2009, 19). From a design point of view, potential site members should be able to 'easily and simply' recognise tangible value as an immediate outcome of their interaction with the community' (Glezakos and Lazakidou 2012, 63). For Iriberry and LeRoy, focus of purpose is also considered essential. As they state: 'creators must decide on the need they will address and identify characteristics of the target audience...they need to ensure that they cater to those needs' (2009, 19).

For Jane Wei-Skillern and Nora Silver in their work reflecting on non-profit digital networks, it is also considered essential to recognise that clarifying purpose is an ongoing endeavour: '...it must be clear enough initially to identify the right partners and encourage them to meet. As these individuals and groups convene, the network should refine its purpose' (2013). Similarly, for Kim, it is not only at the inception of a virtual community that clarity of purpose is important, but throughout, as something which needs to be continually refined with the growth of a given network (2006).

3) Clearly Defined and Regulated Roles

The idea of having clearly defined and regulated roles onsite is present in literature across the field (Cheung et. al 2005, Wei-Skillern and Silver 2013, Preece and Maloney-Krichmar 2003, Kim 2006). As Jane Wei-Skillern and Nora Silver state: 'the most effective networks assign and coordinate roles' (2013). In their article 'The Development of Successful Online Communities' (2005) Karen Cheung et. al delineate substantial detail associated with onsite roles. This article analyses a range of online communities to come up with fundamental principles for successful network formation; two of which relate to onsite roles. As Cheung et. al assert, 'even if online communities differ in purpose and architecture, the same basic social roles emerge repeatedly' (2005, 87).

For these theorists, one of the principles of successful online communities is a strong champion who takes on a large workload to drive community development and encourage participation onsite. Champions are considered particularly important at the beginning of projects but are also required in an ongoing way to sustain site engagement (Cheung et. al 2005). Expanding on the work of Preece and Maloney-Krichmar (2003) Cheung et. al also discuss further functional roles online, including 'Thought Leaders' who spend time and effort improving onsite discussion, 'Active Members' who share information and answer queries, 'Administrators' who monitor and sanction discussion and

behaviour and the 'Soul of the Team' who contributes emotionally rather than instrumentally to the community by be-friending others (2005, 83). Cheung et. al also refer to neutral roles here, including 'Lurkers' who engage with a site or community without actively contributing content, and dysfunctional roles, such as 'Advertisers' and 'Cynics' who disrupt onsite activities (2005, 85).

It is essential for functional roles to be encouraged onsite for many reasons, including the fact that this small minority tend to contribute most of the content (Resnick and Kraut 2012, 5) and that online communities tend 'to follow the most active or socially exposed members' (Glezakos and Lazakidou, 2012, 70). However, the tendency for online communities to be fluid and dynamic means there is 'a dynamic flow of resources in and out of the community (Faraj et al 2011, 1224). For Samer Faraj et. al, this fluidity means 'roles will be taken up for short periods of time within the community, and the community needs to be able to work with this in its design and management' (2011, 1234). By monitoring the balance of onsite roles, it is possible to recruit new functional members of the community where necessary to help communities sustain themselves (Cheung et. al 2005, 87).

4) Governance and Trust

Related to the mixture of roles onsite is the need for clear governance and mechanisms to build trust online (Kraut and Resnick 2012, Cheung et. al 2005, Whittaker, Issacs, & O'Day, 1997, Iriberry and LeRoy 2009, Lin 2007, Kim 2006). Governance includes the development of rules and regulations, sanctions and rewards for members of the networked community. As Iriberry and Leroy state, project leaders of virtual communities 'need to establish regulations clearly to be able to contain possible conflicts and allow for effective monitoring of member's behaviour' (2009, 19). For Kim, an important part of this process is setting up 'ground rules for participation and... systems that allow you to enforce and evolve your community standards' (2006, 5).

One way of achieving this is to delineate etiquette in the form of community guidelines, as well as more formal, legal terms and conditions, which can be enforced if site guidelines are breached. As Cheung et. al point out: 'each on-line community has its unique internal etiquette. Formulating rules is a good start, making sure they are enforced is an important task' (2005, 87). Enforcement can be facilitated through various design techniques, including the ability to recognise users through validated site profiles, and the ability for moderators or site leaders to deactivate or block accounts through 'permeated control' (Iriberry & LeRoy 2009, 15). Nonetheless, sites should not include too many regulations or inflexible rules. As Cheung et. al state: 'rules and regulations need to be strict enough to guide community behaviour but flexible enough to change as the community evolves. Designers have to understand that too many rules will kill social capital of on-line communities' (2005, 87).

Alongside sanctions and rules, it is also considered helpful to include rewards onsite for good behaviour such as leadership, exemplary or altruistic behaviour (Whittaker, Issacs, & O'Day 1997). Kraut and Resnick find that these rewards and sanctions can take the form of awarding status in the community, or a more tangible form such as moderation privileges, money or prizes (2012). Rewards might otherwise take the shape of positive feedback from facilitators or social recognition (Iriberry & LeRoy, 2009, 16). A related concern to rules and sanctions in online communities is the building of trust, which for theorists such as Ehrlichman et. al helps decrease the need for top-down regulation of community interaction and behaviour. As the theorists' state: 'cultivating trust intentionally, rather than passively, provides the basis for a culture in which network participants embrace the network principle of trust, not control' (2015). For Iriberry and Leroy, trust can be actively generated through reliability and transparency onsite, including ensuring site members privacy and security, clearly

identifying site operators, incorporating sponsorship from reputable organisations and offering accessible member profiles (2009, 23).

5) Site Usability and Service Quality

Site Usability is another quality considered essential to the success of online networks. Indeed, for Hsui-Fen Lin, in a survey of 165 diverse networks, site usability is considered one of two fundamental features determining successful online communities, the other being 'perceived usefulness' (2007, 132). For Lin, usability or 'ease of use' is itself determined by two interrelated components: 'system quality' and 'service quality'. Here system quality relates to the usability and functionality of the website, and includes 'system reliability, convenience of access, response time and system flexibility' (Lin 2007, 124). Meanwhile, service quality refers to the provision of effective, responsive and personalised online support, something which impacts both ease of use and perceived usefulness of online communities (2007, 124).

Usability is also a key category of design for Kraut and Resnick, who suggest online communities need to find ways to 'select, sort and highlight things so that people can find the ones that are best for them' (2012, 7). Similarly, Elsa Fontainha and Pat Gannon-Leary highlight usability as a key success factor in university-based virtual communities of practice (2008, 5). Other theorists also highlight the importance of usability to participation in digital networks. For instance, Jennifer Preece and Ben Shneiderman suggest good interface design can lead to increased participation and leadership in online communities (2009, 16), while Youcheng Wang and D. R. Fesenmaier find that in online travel communities 'ease of communication in the virtual environment has been found to be a significant facilitator contributing to active contribution' (2003, 43). As a result, these theorists suggest that 'online community developers should focus on developing technologies accessible to a wide range of users on a variety of devices, and at the same time to make certain that software supports sociability; that is, effective social interaction online' (Wang and Fesenmaier 2003, 43).

Lifecycles in Online Communities

It is also important to recognise that online communities operate in lifecycles. Iriberry and Leroy review an extensive variety of online communities and find they have specific needs at different junctures in the lifecycle process; something which has also been highlighted by Kim (2000). For Iriberry and Leroy 'the five stages of the community lifecycle are as follows: 'inception, creation, growth, maturity and death' (2009, 13). In Iriberry and Leroy's terms, at 'inception', online communities need purpose, focus and codes of conduct, taglines and funding. Conversely, at 'creation' technological components to support site usage become very important, as does focus on user needs, security of data and interface usability. At the 'growth' stage, success factors shift again, towards up to date and quality content, and a smooth user experience for new users in terms of understanding the community and their possible role within it. Offline meetings and events also become important at this stage in terms of community building. At 'maturity', sites require a critical mass of members and content, delegation of control to subgroups and reward for member's contributions. Finally, at 'death', members either leave the group because it is no longer of interest to them or sustainability occurs, and collective action may begin (2009, 24).

Cheung et. al also discuss life cycles in relation to sustainability in various online community forms, including 'recurring event', 'topic' and 'project' communities (2005, 85). In these theorists' terms, project communities tend to be defined by the lifespan of a given project, and so are often dissolved when the project is completed. Conversely, recurring event communities are 'identified by decline and renewal, in which the community activity repeats itself and therefore results in repeated renewal stages, although with changing membership and member roles' (2005, 85). Finally, 'topic

communities, with long maturity, are defined by the length of interest that exists in the topic...the topical body of knowledge always expands and therefore all members of the community are in a continual 'learner' role (2005, 86).

Section C: Motivations for Online Participation

Online communities draw participants for a range of different reasons. However, like the success factors described above, recurring motivational tropes exist across diverse online communities. The following section draws these factors together under the following five headings: Helping the Community, Reputation Building and Recognition, Enjoyment, Recreation and Fun, Specific Interest and Personal Learning, Relationships and Knowledge Exchange and Self-Expression and Self-Efficacy.

1) Helping the Community

A key motivator for participation on a range of different virtual communities is helping the community (See for example: Wasko and Faraj 2000, Porter 2011, Antikainen and Ahonen 2010, Malinen 2015, Nov 2007, Preece and Shneiderman 2009). Indeed, Molly McLure Wasko and Samer Faraj found that in technical knowledge exchange communities 'giving back to the community in return for help was by far the most cited reason for why people participate' (2000, 170). Meanwhile, in her exploration of firm-sponsored virtual communities, Constance Porter lists 'helping others' as a core need for participants, stating that 'virtual community members find value by helping others within a community, especially those with whom they have a personal connection' (2011, 85).

Members of online communities are also found to participate due to moral obligation and altruism. As Preece and Shneiderman state: 'altruism has been identified as a major motivator for encouraging contribution and collaboration' (2009, 21). For Wasko and Faraj, altruism can stem from a sense of loyalty to a given field or community, giving rise to the intention to 'set standards and spread ideas throughout the profession' (2000, 168). The intention to help community is also related to the idea that helping is 'the right thing to do' and associated with 'a desire to advance the community as a whole' (2000, 170). Oded Nov has also found altruistic concern for others to be a strong motivator for contributors to Wikipedia. As Nov states: 'contributing content to Wikipedia enables participants to actively show their concern by sharing knowledge with others' (2007, 62). As Preece and Shneiderman suggest, this form of altruistic participation in online communities can be a desire to give back on an individual basis or can otherwise be a form of 'generalised reciprocity...in which an individual gives back to a community, rather than a person from whom the contribution was received' (2009, 21). This form of altruism is considered a type of 'collectivism, which refers to the belief in helping members of a person's community' (Preece and Shneiderman 2009, 21).

2) Reputation Building and Recognition

A second motivating factor for engagement with online communities is reputation building and recognition (Budhakhoki and Haythornthwaite 2012, Wasko and Faraj 2000, 2004, Porter 2011, Malinen 2015, Antikainen and Ahonen, 2010). In an extensive review of various online communities, Maria Antikainen and Mikko Ahonen find that 'since individuals want recognition for their contributions, one considerable motivational factor for online communities is undoubtedly reputation' (2010, 106). Meanwhile Sanna Malinen highlights the efficacy of reputation as reward for online participation, suggesting that a range of studies into incentivising participation have shown prestige and reputation to be 'the most effective rewards' (2015, 234).

In their work on technical knowledge exchange communities, Wasko and Faraj also find that some community members participate specifically to 'receive some sort of personal gain or status related to their professional position' (2000, 166). As they state: 'participants indicate that the community is an important resource to enhance standing in the profession, to establish a reputation that will hopefully translate into a job, or even to generate clients for consulting business' (2000, 166). Perhaps unsurprisingly, this kind of instrumental reputational motivation is particularly evident in professional and creative communities (Malinen 2015, 233, Wasko and Faraj 2005). However, a slight correlation has even been found between career opportunity and participation in Wikipedia (Nov, 2007). While recognition by peers constitutes one aspect of this dynamic, studies suggest 'firm recognition is even more important than other peer's recognition in company-hosted online communities' (Antikainen and Ahonen 2010, 106).

3) Enjoyment, Recreation and Fun

A third motivating factor which is often referred to in literature on digital networked communities is enjoyment, recreation and fun (Ridings and Gefen 2004, Porter 2011, Wasko and Faraj 2000, Budhakothi et. al, 2010). Indeed, as Budhakothi et. al state, 'fun is a motivational factor found across the literature' (2010, 408). As Porter states, in firm-based networks, 'virtual community members are gratified by achieving flow states while interacting with others by having control over their experience with a community' (2011, 81). Wasko and Faraj also found that in online knowledge sharing communities, participants find the process of learning and sharing fun. As they state: 'participation in the community 'is fun' in general, and many people note that they participate in the community because they enjoy learning and sharing with others' (2000, 166). Nov finds that fun is the top motivation for engagement with Wikipedia (2007, 63) while Linus Torvalds and David Diamond have written extensively about the relationship between fun and open source community engagement in the development of Linux (2001). Similarly, Catherine Ridings and David Gefen have also explored the centrality of recreation and enjoyment in relation to adventure and role-playing communities online (2004) and Budhakothi et. al, have highlighted the relevance of 'hedonic gains derived from the pleasure of creation; profound and fulfilling satisfaction of desires' on volunteered Geographic Information Projects (2010, 408).

4) Specific Interest and Personal Learning

Another important motivation for accessing online communities is to gain information on specific topics, contributing to the personal learning of members (Ridings and Gefen 2004, Porter 2011, Wasko and Faraj 2000, 2004, Nov 2007). Indeed, in an overarching literature review exploring access to virtual communities, Ridings and Gefen suggest that the 'most frequently cited reason in the literature is to access information' (2004, 2). As Porter states: 'members find value in a community when they can access information that will help them take action or solve problems (2011, 81).

For Ridings and Gefen, citing Horrigan (2001), information-seeking is something which is particularly marked in entertainment, professional and sports groups (2004, 3). However, Wasko and Faraj also find that participants in open technical knowledge sharing communities participate to contribute to their own learning and to access new, dynamic information and knowledge (2000, 166). In Wasko and Faraj's study, 21.5% of surveyed participants aimed to gain tangible returns from participation in electronic communities, including 'access to useful information and expertise, answers to specific questions, and personal gain' (Wasko and Faraj 2000, 163). Participants also found that 'answering questions is a challenge, and that working through problems helps to refine their own thinking' (2000, 167). Knowledge communities such as Wikipedia are also strongly correlated with personal learning. As Nov suggests: 'through volunteering, individuals may have an opportunity to learn new things and

exercise their knowledge, skills, and abilities. Thus, contributing content to Wikipedia allows contributors to exercise their knowledge, skills, and abilities' (2007, 62).

5) Relationships and Knowledge Exchange

Relationships and knowledge exchange are another important factor for collaboration in online communities, understood to function as a sort of knowledge-based gift or exchange economy, where 'gifts of information' and advice are often offered not to specific individuals, but to the group as a whole (Wang and Fesenmaier 2003, 35). Distinct from personal learning, where expertise within the community helps individuals develop their own knowledge base, this dynamic refers to a sense of belonging and relationship building, where 'virtual community members desire a sense of attachment to a community as a whole, and...strive to build productive relationships by interacting with others within a community' (Porter 2011, 85).

In some communities, these relationships can be specifically about knowledge exchange rather than being social. In Wasko and Faraj's study of technical online communities, 41.9% of respondents stated they participated in order to 'exchange knowledge pertaining to practice, and that they value the exchange of practice related knowledge within a community of like-minded members' (2000, 167). However, these comments specifically suggested that 'people do not use the forum to socialize, nor to develop personal relationships' (2000, 167). Conversely, in other communities, social motivations are understood to contribute to participation online. Indeed, for Ridings and Gefen 'social support exchange' and 'friendship' constitute key motivators for community engagement. As the theorists state: 'many studies suggest that virtual communities are places where people go to find emotional support and a sense of belonging and encouragement, in addition to instrumental aid' (Ridings and Gefen, 2004, 3). This assertion seems to tally with Malinen's suggestion that similarity of participant interests and experiences 'positively influences member satisfaction and intention to participate in community activities' (2015, 234); and that when people 'concentrate less on the specific content of a website and more on each other the community begins to evolve' (2015, 234).

6) Self-Expression and Self-Efficacy

Self-expression is defined by Porter as 'the self-awareness achievement of being a member of the community and the gratification earned from it' (2011, 81). This is a dynamic explored in detail by Budhathoki et. al (2010) in relation to 'serious leisure' in online communities. For these theorists, members of serious leisure communities tend to identify strongly with the activities they undertake and derive personal rewards from them, including 'enrichment, self-actualization, self-expression, self-image, self-gratification, re-creation, and financial return' (2010, 319). The category of self-expression also seemingly relates to the dynamic of 'enhancement' delineated by Nov in relation to Wikipedia, referring to opportunities online for 'contributors to serve the ego and publicly exhibit their knowledge' (2007, 63-4).

A related motivation to self-expression in online communities is the sense of self-efficacy members achieve from participating in online communities. As Wang and Fesenmaier state, there is 'well-developed research literature that has shown how important a sense of efficacy...and making regular and high-quality contribution to the group...can account for the attachment or commitment one can have to the community as a motivation to contribute' (2003, 35). Antikainen and Ahonen also highlight this feature of online contribution, stating that 'making regular and qualitative contributions to the group can help individuals believe that they have an impact on the group and support their own self-image as an efficacious person' (2010, 105).

Why Networks Fail

Literature surrounding online communities can also offer a broad range of insights into why digital networks fail. For Iriberry and Leroy, networks tend to fail if communities stop being useful to their members, or if platforms 'experience poor participation, lack of quality content, unorganised contribution and transient membership' (2009, 24). Meanwhile, Lin focusses on usability, stating that 'many community members are reluctant to use a website when they experience lack of access, difficulty in navigating the web site, frequent delays in response and frequent disconnection' (2007, 124). Malinen makes the point that members often leave sites when they are redesigned, or at the platform inception if critical mass is not reached (2015, 234). Further, that sites might fail if their members do not feel valued: if participants onsite have few ties, have not had an active response or feedback from the community, or do not find site content interesting (2015, 234).

In Malinen's research site content is found to be more crucial to success than technical efficiency. For Malinen: 'technical problems or poor usability are not the main reasons for abandoning a community. Instead, users value interesting content and people and are likely to stop frequenting an online community if these cannot be achieved' (2015, 235). Ridings and Gefen also highlight this point in their work, citing Sreenivasan's argument (1997) that 'virtual communities must have compelling content, and that they might fail if they do not have good standards for their content (Ridings and Gefen 2004, 3). These assertions seem to tally with findings by Vincent Dutot and Elaine Mosconi, who suggest that interaction with members, real engagement with a community and interesting content are the key factors to avoid disengagement with a virtual community (2016, 238).

Conclusions

This part of the report has aimed to offer an overview of some of the overarching success factors and fundamental motivations for engagement with online communities, as well as a sense of some of the defining structural features of online networks. Despite the recurrence of these factors across the literature each network will of course 'reflect its specific motivations in the design, technologies and policies of the community' (Kim, 2000). There is no one-size-fits all formula for network success. However, a new museum-university network may wish to take these recurrent factors into account as a starting point when planning its specific site motivations, design features and platform objectives.

Data Aggregation



Data Aggregation

Introduction

Processes of data standardisation have been in development in the Gallery, Library, Archive and Museum (GLAM) context since the late 1960's (Waibel et. al 2009, Seifert et. al 2017). However, despite continued investment and effort, museums and archives remain 'challenged with the adoption and introduction of standards for both museum management processes and metadata schemas' (Christin Seifert et. al 2017, 2).

Data aggregation aims to address concerns with standardisation by collating and integrating metadata¹ from different systems and organisations into centralised repositories using standardised formats. It can be defined as 'a service (provided by an organisation) that collects, formats and manages metadata from multiple data providers, providing services such as offering their own portal and acting as data provider' (Europeana 2018). Processes of data aggregation within universities and the cultural industries are still being developed, innovated and refined, but have grown substantially over the past decade, helped by the development of Creative Commons Licensing², Linked Open Data³ and the Semantic Web⁴, as well as growing investment in associated projects by governments and funding bodies in the USA and Europe (Voss 2012).

Examples of Current Cultural Aggregation Platforms

There are a range of established data aggregation providers in the USA and Europe which function to draw together cultural, museum or academic data. 'Open Context' (opencontext.org) and the 'UK Data Archive' (data-archive.ac.uk) are examples of academic data aggregators, which archive and enrich research data and preserve this for future use. Open Context also 'partner with academic presses to augment and enrich conventional publishing with rich, interoperable, and dynamic datasets and media' (Open Context 2018a). This platform is managed by the Alexandria Archive Institute in San Francisco and contains 1,422,913 records at the time of writing; preserving these with the University of California Digital Library (Open Context 2018a). Meanwhile, the UK Data Archive, providing the UK Data Service and based at Essex University, is delivered in partnership with a range of UK universities and supported by the Economic and Social Research Council (ESRC) alongside other funders. The UK Data Archive acquires 'data from academic, public sector and commercial sources within the United Kingdom and abroad' (UK Data Archive 2018a).

There are also a range of general and subject-specific aggregation platforms for cultural material. By far the most established site in Europe is 'Europeana' (europeana.eu), which aims to provide an overarching platform for the digital cultural heritage of Europe. Europeana currently represents 3,500 institutions across Europe and contains '51,374,012 artworks, artefacts, books, videos and sounds' (Europeana 2018a). To aggregate such a vast amount of content, Europeana works with a network of sub-aggregators across Europe, which can be national, sector based or theme specific (Europeana 2015).

¹ 'Metadata is differentiated from data or assets in this case, which refer to the holdings themselves, be they digital surrogates of photographs, objects, books or digitized books, etc. The metadata may describe what the book or photo refers to, where an image is located on the web, what the copyright or licensing restrictions are, etc.' (Voss 2012)

² All Creative Commons licenses...help creators...retain copyright while allowing others to copy, distribute, and make some uses of their work - at least non-commercially (Creative Commons 2018)

³ Open Linked Data is 'data or metadata made freely available on the World Wide Web with a standard mark-up format' thus allowing it to be shared (Voss 2012)

⁴ The Semantic Web 'provides a common framework that allows data to be shared and reused across application, enterprise, and community boundaries' (Voss 2012)

Sub-aggregation platforms are frequently substantial projects in themselves. For instance, 'Swedish Open Cultural Heritage' (SOCH) (ksamsok.se) aggregates data from cultural organisations across Sweden and itself contains over 3 million records from 48 organisations (Pekel 2015). Meanwhile 'OpenUp!' (open-up.eu/en), a sector specific Natural History Aggregator, represents data from significant European Natural History Institutions in 12 European countries, and contains 3.2 million records (Openup! 2018a). The United Kingdom's principle aggregation platform for Europeana, 'Culture Grid' (culturegrid.org.uk) no longer takes new data. However, during its operation from 2009-2015, this site collated over 3 million objects from 200 collections (Poole 2015).

Other more thematic and project based cultural initiatives can be understood to have aggregation functions. One established example is 'Historypin' (Historypin.com). This project aims to facilitate the development of co-produced citizen history, acting as: 'a place for people to share photos and stories, telling the histories of their local communities' (Historypin 2018a). However, over 3,000 cultural heritage organisations are also members of the site (Historypin 2018b). Site members can independently pin content to a Google Map, or otherwise join projects developed by Historypin or other associated organisations. In June 2017, the platform hosted '365,951 stories pinned across 27,844 projects...across 2,600 cities...by a community of 80,000+ storytellers, archivists and citizen historians' (Historypin 2017). This number is continually growing. Although it is not described as a data aggregation platform per se, Historypin aggregates the artefacts it hosts on a case by case basis and has made its metadata freely available to the public using the same licensing process as Europeana (Voss 2013).

Technology and Licensing

Open Context provides each academic record with a URI⁵ and links its onsite data with other research collections on the web using Linked Open Data, Creative Commons licensing and 100% Open Source technology (Open Context 2018a, 2018b). The UK Data Archive also encourages the sharing of data and uses persistent identifiers known as ORCID IDs⁶ to deliver 'automated linkages between users, their funding and their research outputs' (UK Data Archive 2018b) ensuring credit remains with each data contributor. On this site, contributors must decide the copyright license they wish to use to enable access to their work (UK Data Archive 2018c).

Europeana has created the Europeana Data Model (EDM), which standardises metadata from different organisations, while 'accommodating the range and richness of community standards such as LIDO for museums EAD for archives or METS for digital libraries' (Europeana 2018b). The EDM format 'facilitates Europeana's participation in the Semantic Web, basing itself on an open, cross-domain, semantic web-based framework' (Europeana 2018b). It is also a Linked Open Data format, meaning 'all data is linked between organisations, enriching the content with information from various institutions' (Europeana 2018b). While all metadata contributed to Europeana is published under the terms of the CC0 Creative Commons Licence⁷ (Europeana 2018c), the digital objects this metadata pertains to will be licensed under one of 14 rights statements, as chosen by data contributors (Europeana 2018i).

⁵ Unique Resource Identifier: a persistent identifier which means a resource can be found across the web

⁶ 'ORCID provides a persistent digital identifier that distinguishes you from every other researcher and, through integration in key research workflows such as manuscript and grant submission, supports automated linkages between you and your professional activities ensuring that your work is recognized' (ORCID, 2018)

⁷ This license is completely free of restrictions: placing data 'as completely as possible in the public domain, so that others may freely build upon, enhance and reuse the works for any purposes without restriction under copyright or database law' (Creative Commons, 2018).

As aggregators to Europeana, Openup!, SOCH and Culture Grid all act to convert metadata to the EDM format (Openup! 2018b, Pekel 2015, Culture Grid 2010b). Each of these projects also shares data with other partners and organisations through semantic enrichment and a commitment to open data (Openup! 2018d, Pekel 2015, Culture Grid 2010b). Culture Grid and SOCH also have Open APIs, allowing new applications to be built upon them (Culture Grid 2010, Pekel 2015). Within Historypin, individuals and organisations upload digital content under a range of self-selected rights licenses, either individually or using a bulk uploader. However, Historypin has built an associated site API which then uses Open Linked Data to make metadata available to Europeana (Historypin, 2018d). Historypin has also followed Europeana in making all its site metadata available as a CC0 License, to 'join the effort to maximize the re-use and discovery of cultural heritage assets in a way that everyone can benefit from and build upon' (Voss 2013).

Functions within Data Aggregation Platforms

Data Aggregation platforms tend to work with cultural organisations to provide technical support and assistance in collating and standardising metadata. For instance, Open Context editors act to 'review and clean datasets, then organise media, documents and geospatial information with other data' (Open Context 2018a). The UK Data Service also provides guidance on how to prepare data for aggregation to its platform and reviews every data submission to the repository in communication with the submitting depositor (UK Data Service 2018d).

Openup! offers tailored support to smaller and medium sized organisations, in terms of mapping data standards, licensing and enriching metadata for Europeana. There is also a helpdesk as part of this organisation and 'specialised transformation routes which allow the transformation of Natural History Metadata standards to the Europeana Metadata Standard' (Openup! 2018c). Europeana itself also works with organisations to ensure they meet the criteria for submission of metadata to the site. Potential participants must answer questions about the level of digitisation of a particular collection and must be able to export information in a standardised way with freely available metadata and copyright clearance to share the digital object. As it states onsite: 'if an organisation's data fits the requirements for Europeana, they are passed on to aggregators who do the work of publishing the metadata' (2018d).

Some platforms also go beyond the aggregation and linking of data and offer other specific functions. For instance, aside from harvesting metadata from memory institutions in Sweden and delivering this to Europeana, SOCH has three other functions. First, as mentioned above, SOCH has developed, and now manages 'an API that allows third parties to build on the data in the SOCH web service' (Pekel 2015). This API has been used to develop multiple new applications by commercial and museum teams, including a 'mobile application displaying ancient monuments on a map layer' (Pekel 2015). SOCH has also developed 'Kringla', a search application which links related objects in Europeana, SOCH, Wikipedia and Libris, the Swedish national search service for publications. Finally, SOCH operates 'Platsr', a website for collecting user-generated content and democratic historiography (Pekel 2015).

Europeana itself also specifically develops projects to encourage and facilitate the re-use of its content, including projects such as Europeana Creative, which ran from 2013-2015. Within this initiative, six pilot applications were produced, focussing on specific disciplinary areas such as social networks, natural history and design. Building on these pilots, five open innovation challenges were launched 'with entrepreneurs from the creative industries to identify, incubate, and spin-off more viable projects into the commercial sector' (Europeana 2018e). Outcomes stemming from this project include the digital Europeana Labs platform and physical 'Living Labs' in Barcelona, Brussels and Helsinki (Morley and Stricker 2015, 68). Europeana Labs remains an active website and includes over

a million objects in curated datasets which are directly accessible and often openly licensed to enable maximum reuse (Europeana 2018f). The site incorporates funded challenges, match-funding calls and four free APIs to help generate new projects (Europeana 2018f). Europeana also has a separate annual grants programme which 'extends grant funding to promising and innovative research projects that use cultural heritage found in Europeana Collections' (Europeana 2018g). Similarly, as abovementioned, Culture Grid uses an openly available API and specifically states onsite that 'the unique range of collections information within the Culture Grid can be used to create new services that enable more people to engage with collections' (2010).

Historypin is a crowdsourcing site which can be understood to create an aggregated archive of content over time. Beyond the generation of aggregated content, Historypin generates an online community of participants. Each member of Historypin has a profile and the capacity to comment on the work of others and contribute to a discussion forum, as well as the ability to build onsite collections and contribute to the collections of others. As mentioned above, this platform also includes community projects facilitated both by Historypin team members and external partnerships.

Project Support and Financial Sustainability

The projects explored here all have robust management groups and ongoing financial support from governments, large companies or organisations. Europeana is managed by a small team in The Hague, but partners with a much broader network of aggregators and is funded by the European Commission, with additional support from Member States Ministries of Culture and Education (Europeana 2018h). Similarly, the SOCH initiative is funded at a governmental level through the Swedish National Heritage Board, where the organisational team are also based (Pekel 2015). Meanwhile Openup! is supported by the European Commission and Europeana with partners in 30 organisations across Europe (Openup! 2018a). As noted above, The UK Data Archive and Open Context are also both supported in an ongoing way by Universities and National Grant Programmes, while Historypin was developed in 2010 by the non-profit company Shift (formerly We Are What We Do) and developed in partnership with Google (Crow 2010).

The need for ongoing financial support presented a substantial challenge for Culture Grid. This project was developed through a time-limited Arts Council Grant which has since lapsed (Culture Grid 2010b), meaning that the Collections Trust and technical partners Knowledge Integration Ltd. have not been able to continue developing the site, and have had to halt new submissions to the platform. Collections Trust do however continue to fund a 'dark aggregator'⁸ facilitating continued UK submissions to Europeana (Poole 2015).

Challenges and Opportunities

In a blog post for the Museums Computer Group, Nick Poole, CEO of Collections Trust, highlighted some of the challenges faced by Culture Grid during its funded lifespan. For Poole, there were three key challenges. First, Collections Trust found that for organisations 'the investment of time and effort required to participate in platforms like the Culture Grid isn't matched by an equal return on that investment in terms of profile, audience, visits or political benefit' (Poole 2015). Second, that the process of standardising data is complex and time-consuming: 'In the 7 years of running the Culture Grid, we have yet to find a single museum whose data conforms to its own published standard, with the result that every single data source has required a minimum of 3-5 days and frequently much longer to prepare for aggregation' (Poole 2015). Third, and most importantly for Poole, that metadata alone is not a cultural experience, and that the 'most 'real' value proposition for metadata is in powering additional services like related search & context-rich browsing' (2015). Indeed, Mia Ridge

⁸ An aggregator without a public interface or 'front end' (Europeana 2015, 6)

raises a related concern to this, surrounding museum audience's engagement with aggregation platforms. Ridge highlights the fact that although large aggregated collections are good for certain researchers and building services based on content, museum audiences prefer 'snackable' content and struggle to wade through extensive lists of data online (2011).

For Poole, a sustainable strategy for future aggregation in the UK would need to include ongoing funding, support and training for museum professionals in data aggregation, peer support in preparing metadata, ongoing partnership for development and support from software providers; and a programme of projects and developments to improve the value proposition for aggregation, perhaps through partnerships with other cultural organisations (2015).

In terms of funding, sector and technical support, some of the other more established aggregation projects cited above offer helpful models for sustainable future practice. Certainly, it seems that substantial ongoing financial support has enabled these organisations to provide training and guidance for cultural organisations in data aggregation, and even to manage the entire aggregation process for organisations in some situations. Meanwhile, Open Context's ability to richly annotate and integrate data, SOCH's Kringla search platform and projects such as Europeana Creative or Europeana Labs seem to facilitate reuse of aggregated content for new and broader audiences.

The high level of resourcing, management and commitment required for successful data aggregation projects certainly presents an ongoing challenge, particularly as Culture Grid is not currently in receipt of funding. However, in lieu of a national aggregation platform, Historypin does provide an alternative model for aggregation on a case by case basis. As explored above, Historypin aggregates content around a cause in a piecemeal fashion, delegating responsibility for this to its contributors. In so doing it gradually develops a critical mass of content whose metadata can be shared freely. As a network for cultural engagement, Historypin also creates a network and a community around the data it creates, writing projects and challenges directly into the site's structure.

Findings in relation to Museum-University Partnerships

- The current landscape in data aggregation indicates that there are technical processes in place to standardise, share and aggregate both museum and academic research data
- Projects suggest that aggregating cultural data in ways which foreground sharing, reuse and openness using Linked Open Data, Creative Commons licensing and Open APIs is best practice.
- A new national data aggregation platform would need substantial funding, centralised management and commitment as a major ongoing project to be successful
- Such a platform should write in extended uses for aggregated data and facilitate projects and partnerships which allow the data to be used in new, culturally valuable ways
- In lieu of a national aggregation platform, a smaller project which aggregates data from museums and universities on a case by case basis as part of project work, perhaps borrowing from the model of Historypin would require fewer resources and would inherently include a network or community of contributors

Review of Digital Network Models



Review of Digital Network Models

The third section of this report comprises a review of eight network models for online communication and collaboration, drawn from research into 250 existing digital platforms and networks. For each model, between five and ten examples representative of the field have been chosen for detailed exploration. The first three of these models: Network Support Websites, Internet Mailing Lists and Social Media Pages and Groups are drawn from recent research into existing museum and university networks carried out for MUPI by Laura Crossley (2017). The latter five network models: Dedicated Discussion Forums, Crowdsourcing, Crowdfunding, Sharing Economy Networks and Spontaneous Social Media Networks draw from further research and reflect the wider cultural context.

Network Support Websites are perhaps the most prevalent form of digital platform currently in use in museum and university networks and offer a helpful starting point for future initiatives. These networks primarily operate to share sector-related news, funding opportunities, collections information and advice with members. However, sites often take a modular form, allowing for the inclusion of interactive features. Functionality varies widely across platforms, but can include mailing lists, social media connectivity, matchmaking, discussion and crowdsourcing features. In so doing, sites open out onto other established network models, each with their own parameters, benefits and pitfalls.

Taking this into account, the review section begins with an overview of Network Support Websites before exploring associated and broader network models individually and in depth. For each network form we offer a definition and give an overview of site characteristics, exploring levels of interaction onsite, onsite roles, relationship of digital platforms to offline activities, shared site design features and platform accessibility and complexity. We then consider the benefits and pitfalls of each network model before analysing the potential usefulness of the model to museum-university partnerships. By offering an extended set of definitions surrounding existing network forms we aim to provide a set of technical components and possibilities useful to future partnership sites and a set of helpful case studies within each existing field of practice.

1) Network Support Websites

Definition

Network Support Websites are defined here as websites which are specifically and uniquely developed to support existing networks. The majority of existing Network Support Websites in museum and university communities are multi-platform and modular. Sites tend to include a principle website managed by network leaders, supplemented by connectivity to social media and mailing lists.

Examples

Crossley's report cites a substantial number of Network Support Websites attached to diverse museum and university communities. To give an idea of the scope of the field, an overview of ten sites will be given here.

Network Support Websites are frequently attached to Subject Specialist Networks (SSNs)⁹, including groups such as 'Understanding British Portraits' (britishportraits.org.uk), the 'Social History Curator's Group' (shcg.org.uk/), the 'Geological Curators Group' (geocurator.org/), the 'Army Museums Ogilby Trust' (armymuseums.org.uk), 'Sporting Heritage' (sportingheritage.org.uk) and the 'Association of Performing Arts Collections' (APAC) (performingartscollections.org.uk).

Other Network Support Websites are organised by overarching professional cultural and museum bodies. For instance, 'Engage' (engage.org) which exists as an advocacy and training network for gallery education, the 'Association for Cultural Enterprises' (acenterprises.org.uk) which exists to promote excellence in cultural trading and the 'International Council on Archives' (www.ica.org) which aims to promote the preservation and use of archives around the world. Further sites are managed by local teams at specific organisations, such as UCL's 'Archaeology-Heritage-Art Network' (<https://bit.ly/2qc7NyJ>).

Characteristics

Network Support Websites linked to existing museum and academic communities generally employ a similar overarching design. Sites primarily operate to share news, information and advice to members, as well as advertising offline training and events, sharing publications and resources and circulating jobs in the field. The primary informational function of Network Support Websites is managed by site leaders or administrators through 'one-to-many' communication. However, sites also frequently include social media connectivity to support peer discussion and mailing lists to circulate information amongst members.

Network Support Websites provide varying levels of support and resource. Some SSNs such as the Army Museums Ogilby Trust incorporate regional sub-networks and display these onsite (Army Museums Ogilby Trust 2018a). Other sites such as Sporting Heritage list mentoring opportunities to members (Sporting Heritage 2018a). The Army Museums Ogilby Trust also offers grants to member organisations (Army Museums Ogilby Trust 2018a), while the Understanding British Portraits Group advertise bursaries and fellowships on their platform (Understanding British Portraits 2018a).

Network Support Websites attached to professional bodies also include additional features beyond news and information. For instance, the International Council on Archives run a range of development

⁹ Subject Specialist Networks revolve around a subject specialism and are drawn from established professional membership bodies, or less defined networks of museums. Networks are supported through Arts Council England's Museum Resilience Fund (Collections Trust, 2018)

programmes and use their digital platform to advertise these (International Council on Archives 2018a). Conversely, the Association for Cultural Enterprises includes a 'benchmarking' tool which 'enables cultural organisations to understand and compare their key performance indicators' (Association for Cultural Enterprises 2018a).

Network Support Sites also commonly include collections information, and occasionally incorporate data aggregation functions onsite. The Geological Curators' Group includes an interactive map of UK collections onsite (Geological Curators' Group 2018a), while APAC has aggregated material from over 600 institutions into two separate repositories: Archives Hub and the UK Theatre Collections, the latter of which contributed collections to Culture Grid (Association of Performing Arts Collections 2018a). Similarly, Understanding British Portraits aims to map portraiture collections across the UK in collaboration with Culture Grid (Understanding British Portraits 2018a).

Some networks also facilitate more direct online collaboration between members. For instance, the Social History Curator's Group website hosts 'Firstbase' (shcg.org.uk/firstBASE-home) where members can publicly upload information relevant to the subject specialism of the group. Meanwhile, Sporting Heritage allow users to upload collections to their site on an interactive map, giving researchers a single resource for locating specialist collections across the UK (Sporting Heritage 2018b). Similarly, Engage includes an 'educator locator'. This is a matchmaking feature to help 'organisations to search for freelance education consultants, gallery educators, or artists to meet their needs' (Engage 2018a). Understanding British Portraits is another interesting site in this regard. This platform includes a resource enabling users to crowdsource information and discuss ideas surrounding specific portraits, and also features a database of 'expertise' to facilitate knowledge exchange between site members and a range of toolkits commissioned by the network (Understanding British Portraits 2018b).

Network Support Websites which are linked to SSNs have long histories of collaboration and participation from members. Many of these networks existed long before the digital realm offered new potential for communication and have a lengthy tradition of annual conferences and symposia. Network Support Websites which were founded more recently do not have an ongoing history of participation but have already produced some meaningful outputs. For example, Archaeology-Heritage-Art was launched recently in 2014 but has since organised annual research seminars and collaborated on published papers. These collaborations have been supported through digital platforms to encourage network members to participate and engage in discussion about their experiences.

Benefits

- Network Support Websites utilise multiple platforms and technologies which can be adapted for different networks
- Network Support Websites can help support offline interaction between network members
- The use of informational websites alongside common forms of social media (Twitter, Facebook etc.) and mailing lists provide a range of familiar forms of online interaction for members
- Certain interactive features such as collections maps and archives or crowdsourced queries add interactive and meaningful facets to informational websites

Pitfalls

- In the majority of cases existing Network Support Websites focus on informational content rather than interactive features
- Despite opportunities for many to many communication, most principle site content is currently host generated and does not elicit responses from other members

Usefulness to Museum-University Networks

- Using a modular format would enable a museum-university network to create a bespoke environment for its members
- Including information, support and advice for members could be a helpful feature in a new museum-university network platform
- Developing the use of interactive features onsite such as collections or crowdsourcing would help enrich the forms of collaboration available onsite

2) Internet Mailing Lists

Definition

Internet Mailing Lists, also known variously as email lists or distribution lists, are essentially collections of names and email addresses of individuals of who have subscribed to receive the communications of an organisation. Subscribing to a mailing list will result in receiving communications from the list or all postings sent to the list by other list participants. Discussions, or 'threads' can happen simultaneously and to participate a member can respond via email to the list. Creating a mailing list enables large numbers of subscribers to be contacted with posts collectively rather than individually.

Examples

Many of the existing museum and university networks reviewed by Laura Crossley (2017) use the National Academic Mailing List Service, JISCMail as part of their offering. Examples include 'The Group for Education in Museums' (GEM) JISCMail (jiscmail.ac.uk/cgi-bin/webadmin?AO=GEM), which has been in operation since 1998 and the 'Museums Computer Group' (MCG) community discussion list, also moderated by JISCMail (jiscmail.ac.uk/cgi-bin/webadmin?AO=MCG). Despite the arrival of newer social networking sites such as Twitter (also used by MCG), this site remains extremely active. A newcomer to JISCMail, the regional 'Museums Association Members in the South East' group (jiscmail.ac.uk/cgi-bin/webadmin?AO=MA-SOUTHEAST) that first started using the list in 2017 has yet to develop any significant discussion. The 'Older People Archives' is a JISCMail list (jiscmail.ac.uk/cgi-bin/webadmin?AO=OLDERPEOPLE) that is one of many JISCMail groups administered by The Network, whose aim is to tackle social exclusion in libraries, museums, galleries and archives.

Characteristics

Mailing lists used by networks to communicate with members are primarily portals for information sharing. The Museums Computer Group mailing list has recently engaged in several discussions on the forthcoming GDPR, many of which have been instigated by users posting requests for advice and information. The Archive feature of JISCMail helpfully allows users to search all previous discussion threads for specific topics.

While these discussions are taking place online and benefit from the breadth of expertise afforded by an online network, mailing lists are also platforms that support offline activities. The Older People Archive, along with many of the other networks considered here has used the mailing list to publicise and seek contributions for events and conferences. The ability to include attachments in postings means that conference posters and other materials can be saved and disseminated elsewhere by other users.

Participation levels in mailing lists depend on the longevity and efficiency of the moderating body. The Museums Association Members in the South East Group, like many of the other regional Museums Association members groups, being new to JISCMail have yet to establish a large enough following to elicit many posts. More active mailing lists such as The Group for Education in Museums have now been around for up to twenty years, that is, prior to newer social networking platforms. Facebook and Twitter therefore might be prioritised by network members as modes of communication over the mailing list due to their prevalence and more spontaneous nature. Additionally, as mailing lists use email to deliver posts rather than a strategically designed interface that encourages engagement (such as that used by Facebook) there is potential passivity on the part of the recipient.

Benefits

- Mailing lists offer the opportunity for an unlimited number of members
- Mailing lists are free to use
- Mailing lists enable members to easily follow posts and discussions as they are delivered directly via email
- Mailing lists are easy for potential members to sign up to

Pitfalls

- Posts often do not encourage responses from members and therefore may only function as information boards
- Communication with the network must be approved by the host or administrator
- Aims, rules and regulations are often not specified
- Mailing lists require champions that encourage discussion
- Mailing lists may limit the reach a network has beyond its own members

Usefulness to Museum-University Networks:

- A mailing list could provide a cost-effective mode of communication for a museum-university network as part of a multi-platform network model
- A mailing list could provide a platform for a museum-university network to signpost to relevant publications and events, offline meetups or activities
- A mailing list could facilitate information exchange for a museum-university network

3) Social Media Groups and Pages

Definition

'Social media are technologies that facilitate social interaction, make possible collaboration, and enable deliberation across stakeholders' (Bryer and Zavatarro 2011, 327). Social network platforms such as Facebook are the primary form of social media that are currently employed across museum and university networks. Rather than connecting strangers, a distinctive feature of social network sites is 'that they enable users to articulate and make visible their social networks' (Boyd and Ellison 2008, 211). The primary purpose for engaging with a networking site is that it facilitates communication with those already part of a wider network rather than as a way of meeting new people (ibid). This point helps explain why many social networking groups and pages considered in this section did not exist in isolation but were a supplementary feature of Network Support Websites.

Examples

Social Media Groups and Pages are another network form which feature strongly in Crossley's research into existing museum and university networks (2017). The examples considered here are drawn from Crossley's report, and account for the differing functionalities of Groups and Pages. In Crossley's research, Facebook was by far the most commonly used social network site (SNS), which enables the creation of either a Page or a Group profile. The 'Association of Critical Heritage Studies' includes a public Facebook Page in addition to a broader digital offering (<https://bit.ly/2Jv3re3>). Meanwhile, the 'London Emerging Museum Professionals' (LDNEMP) network (facebook.com/LDNEMP/) is an example of a group that appears to be working predominantly on the Facebook platform but is part of the larger 'UK Emerging Museum Professional' network (<https://ukemp.com/>). The 'Learning in Museums and Galleries' network has a Facebook Group that has been in existence since 2008 and has a growing membership. A lesser used SNS is Yahoo Groups, used by networks including the 'Chinese Collections Group' (<https://bit.ly/2H5TTrA>).

The professional social network site Academia.edu has over 60 million members and facilitates the creation of a page profile enabling academics to 'share their research, monitor deep analytics around the impact of their research, and track the research of academics they follow' (academia.edu/about). Finally, LinkedIn, primarily known as being professionally orientated and a place where individuals and/or businesses can create a virtual CV, is used more frequently by museum/heritage professional but also provides a platform for university and museum networks, such as the 'Art Collecting Network' (linkedin.com/groups/138530/profile).

Characteristics

Different types of communication are enabled depending on the social media platform in question. For example, a Facebook 'Page' enables an organisation to create a public profile that can be 'liked' and/or 'followed'. The Association of Critical Heritage Studies Facebook Page is primarily used by the network to make announcements, share and publicise events (conferences) and opportunities (PhD and job posts). The structure of the page allows individuals that are not members of the wider network to share and comment on these posts. The network administration is responsible for generating the posts rather than members creating their own content. Therefore, the page functions like a notification board for the network.

Conversely, the Facebook Group provides a community space, performing more like a forum that facilitates discussion. While the LDNEMP Facebook Group has only been in existence for two years the network has reached over 700 members and has clearly defined moderator roles that facilitate discussion and activity. The LDNEMP Group advertises meet-ups that generate collaborative projects, an example of which is the recently held Collaborate and Create event that was planned and organised online, held offline and generated ideas for collaborative projects, the planning and discussion of which is continuing back online. The fact that the group is localised does arguably lend itself well to more regular offline activity. Similarly, the Learning in Museums and Galleries Facebook Group uses Facebook's Group functions to share information and materials and post queries, which elicits discussion and feedback from members. A clear benefit of the Facebook Group in this instance is the ability to share knowledge and best practice. These examples demonstrate how the Facebook Group differs significantly from the Facebook Page in that it enables and encourages collaboration to take place both on and offline.

The Chinese Collections Group is one of the few museum-university networks found that uses Yahoo Groups. Established in 2015 it is a restricted group of 67 members that encourages posts on job vacancies, conferences and events, and research and identification queries. There have to date been very few posts and as access is restricted to members it is impossible to tell whether these posts have elicited any comment or discussion. The Yahoo Group differs significantly from the Facebook Group in that it operates as a hybrid mailing list and forum.

The SNS Academia.edu is one of the largest academic networks enabling researchers to create their own profile page and upload and share their work. Academia.edu therefore differs from reference sharing sites such as Mendeley and Zotero through the emphasis on sharing a user's own output rather than that of others. The social networking capability of academia.edu enables individuals to build a public profile that other users can connect to and follow. In this case academia.edu functions much like the Facebook page, providing a platform for publicising and sharing output along with the ability to connect to others. Finally, the Art Collecting Network is an example of a group that has successfully transitioned from being an offline idea to an online network of over 60,000 members on LinkedIn. The LinkedIn model provides a platform for simultaneously building reputation and sharing outputs. While LinkedIn may retain the perception of being a primarily business and employment orientated SNS the networking features such as messaging and 'following' it shares with other SNSs might benefit groups such as the Art Collecting Network in terms of gaining traction across the academic and professional board.

Benefits

- Many social media platforms such as Facebook are well established and familiar modes of communication and networking
- Social media enables a wider reach of people to become both familiar with and join a network
- A visitor need not be a member of the larger network to receive and interact with communications via social media
- Social media can facilitate online and offline engagement
- Social media can facilitate different types of communication between groups and individuals via public postings and private messaging
- Social media can facilitate the sharing of information and material
- Social media does not require funding in order to be utilised

Pitfalls

- Most social media platforms require a personal account to receive communications and/or interact with the network
- Successful social media networks require administrator resources and commitment from members
- Success in using social media depends on selecting the appropriate platform (e.g. page or group) to meet the aims and objectives of the network

Usefulness to Museum-University Networks

- A museum-university network can benefit from using a social media page to communicate with existing members with the potential to reach a wider audience
- A social media group can facilitate knowledge exchange and collaboration both on and offline
- A museum-university network can benefit from the public profiling and brand building that social media pages can provide

4) Dedicated Discussion Forums

Definition

As Scott Wright and John Street state: 'there are literally thousands of different types of online discussion forums – from bulletin boards, which are designed to be similar to traditional community centre information boards on which replies are not encouraged, right through to CoWebs and Wikis, on which users actively create the environment as they add new features' (2007, 854). All have in common the fact that they enable large and diverse groups of people to make public comment online.

Examples

There are various examples of dedicated discussion forums online within the museum and academic context. Some, such as the 'Association of Art Museum Curators' discussion forum (<https://bit.ly/2JqjFVI>), and the 'Radical Pedagogies' (<https://bit.ly/2H0hSIC>) forum are linked to wider professional subject specialist websites. Others are linked to more general discussion forum platforms such as 'Reddit Museum Pros' ([reddit.com/r/MuseumPros](https://www.reddit.com/r/MuseumPros)), which includes a Wiki. Many wider cultural discussion forums such as 'Talk Photography' (talkphotography.co.uk/forums/) or 'Discuss Fossils' (discussfossils.com) attract a wide public of professionals and amateur enthusiasts alike.

Characteristics

Discussion forums support discussion on a wide range of topics, offering advice and answers to community questions, marketing relevant events to group users, posting links and sharing skills and expertise. The display of the discussion forum often follows a similar format, facilitating the creation of threads of information on particular topics which can be responded to across the community. Many discussion forums allow the upload of images to accompany posts. Forum profiles generally include statistics which show activity onsite, and often rate posts and threads (Reddit 2018a). Site members may contribute to multiple threads over time. However, the level and complexity of collaboration onsite is single-faceted in terms of being limited to discussion across distributed groups. Sites include moderators and administrators who manage site content and enforce community guidelines, while site members have individual profiles (Radical Pedagogies 2018a). Moderating sites requires staffing resource, but the ability to use existing platforms such as Reddit to host content makes financial requirements around Discussion Forum use less extensive than other more unique website designs.

Benefits

- Discussion forums require comparatively little financial resource to set up
- Discussion forums allow distributed discussion on a range of topics and can reach large numbers of site members
- Discussion forums are well established modes of online communication with clear design parameters, which are simple to use

Pitfalls

- Discussion Forums allow for simple communication rather than complex project collaboration
- Discussion Forums require resource in terms of moderation and administration
- Discussion Forums might be seen as an anachronistic mode of communication in the era of social media connectivity

Usefulness to Museum-University Partnerships

- Discussion forums are used less frequently than JISCmail discussion lists or Social Media sites in existing museum and university networks
- However, a dedicated discussion forum on a Museum-University site might be beneficial in terms of encouraging debate and rendering this visible to the community directly

5) Crowdsourcing Sites

Definition

Crowdsourcing was first defined by Wired editor Jeff Howe in 2006 to describe corporate outsourcing (Howe 2006). However, since this time crowdsourcing has been applied in a wide range of commercial, cultural and social contexts. The process of crowdsourcing can be characterised overall as: 'a type of participative online activity in which an individual, an institution, a non-profit organization, or company proposes to a group of individuals of varying knowledge, heterogeneity, and number, via a flexible open call, the voluntary undertaking of a task. The undertaking of the task of, variable complexity and modularity...always entails mutual benefit' (Estellés-Arolas and González Ladrón-de-Guevara 2012, 198).

Examples

As mentioned above, some Network Support Websites include crowdsourced elements within them, such as the query section of Understanding British Portraits, which allows individuals with specialist knowledge to help contextualise portraits onsite. Another such example is 'Art Detective', part of Art UK, which asks participants with specialist knowledge to answer questions about public artworks (artuk.org/artdetective/). Other museum and academic examples of crowdsourcing include 'Transcribe Bentham' a transcription project around Jeremy Bentham's work at University College London (UCL) (ucl.ac.uk/transcribe-bentham/), 'Old Weather' (oldweather.org), a citizen science transcription project led by Galaxy Zoo and the National Maritime Museum and 'Lives of the First World War' (livesofthefirstworldwar.org), a photography research project developed by the Imperial War Museum and genealogy website 'Findmypast' as part of the First World War Centenary. Wider examples of cultural crowdsourcing projects include 'Open Ideo' (openideo.com), an Open Innovation platform which enables distributed teams to work together to develop new social impact projects.

Characteristics

Many crowdsourced sites draw on a collective workforce to complete specific tasks and are therefore focussed around action. Some crowdsourced projects, such as Transcribe Bentham, foreground individual work by a group of people, rather than facilitating group working in a co-creative sense. Others, such as Lives of the First World War also rely on individual work to complete crowdsourced tasks but include a discussion forum for members onsite (Lives of the First World War 2018a). A still more participatory mode of operation can be found in projects such as Art Detective, where a discussion forum sits beneath each artwork (Art Detective 2018a). Meanwhile, Open Innovation projects such as Open Ideo rely on collaboration quite fundamentally to solve problems onsite.

Crowdsourced sites include activities of differing complexity. Tasks to be completed span from common-sense activities such as text transcription on sites such as Transcribe Bentham to more specialist activities such as Art Detective's contextualisation of artworks. Sites such as Lives of the First World War include complex activities such as genealogical research, while Open Ideo relies on crowdsourced ideation. In many cases, activity is often guided by templates for action. For instance, Open Ideo includes a visualisation of the design process from ideas, to refinement to review, to facilitate collaborative ideation onsite (Open Ideo 2018a), before a winning project is chosen from diverse potential entries for development offline. Sites such as Old Weather and Transcribe Bentham also use a template for onsite activity, guiding transcription activities to help ensure accuracy.

Access to crowdsourcing sites tends to be open to all, though sites frequently include gamified profiles to foreground popular site content and reward active contributors. For example, Old Weather

has used hierarchised profiles so that site members begin as ‘cadets’ and work their way up the ranks to being ‘Ship’s Captain’ as they undertake transcription work (Old Weather 2018a). Similarly, Open Ideo offers points for research, ideas, evaluation and collaboration onsite, and the option to display this on user profiles. Projects also tend to afford site leaders the capacity to delete or block accounts if site users breach site community guidelines. Sites vary in technical complexity depending on the tasks they require completing, but demand substantially further resource and functionality than a single function network such as a mailing list.

Benefits

- Crowdsourcing facilitates specific forms of collaboration to undertake specific tasks or participate in collaborative ideation
- Crowdsourced projects are oriented towards action rather than just discussion, and therefore create impact through the networks they produce

Pitfalls

- Some crowdsourced projects require moderation and technical resource to function effectively
- Many crowdsourced projects function through individualistic work by dispersed individuals rather than true collaboration in the sense of co-production by members of a given network
- Complex forms of collaboration may need to operate offsite

Usefulness to Museum-University Networks

- A museum-university network might use crowdsourcing as a supplementary feature in terms of including transcription or research tasks to be completed by members of the community
- A museum-university network might wish to include certain community moderation features prevalent in crowdsourced sites such as the gamification of profiles or the use of templates to ensure accuracy in online projects
- A museum-university network might wish to translate the Open Innovation model utilised by Open Ideo to challenges relating to museum collections or cultural heritage research

6) Crowdfunding

Definition

Crowdfunding is traditionally defined as an open call for raising financial funding from the public, represented by a group of people, by using internet-based platforms (Bouncken et al. 2015, 409). More recently, crowdfunding has expanded to include organizations willing to match-fund donations from the public (Goteo 2018a).

Examples

As mentioned above, existing Network Support Websites sometimes include grants, bursaries and fellowships from centralised organisations. Crowdfunding offers a decentralised alternative to this and been used as a model by commercial, charitable, cultural and academic organisations. For instance, 'Indiegogo' (indiegogo.com) crowdfunds innovations in tech and design while 'Change.org' specifically crowdfunds for charitable causes. In relation to cultural projects, crowdfunding has recently been used by Europeana through 'Goteo' (Goteo.org), which is 'a platform for civic crowdfunding and collaboration on citizen initiatives and social, cultural, technological and educational projects' (2018a), and includes match-funding from organizations. Meanwhile, 'Digventures' (digventures.com), a crowdsourced and crowdfunded archaeological dig site, has been running successfully since 2012, and 'Micropasts' (micropasts.org), is a crowdsourced project between UCL and the British Museum also incorporated crowdfunding into its model to micro-finance projects.

Characteristics

In crowdfunding projects, participation operates between fundraisers, or 'creators' and investors, or 'backers', using a digital platform which acts as a bridging organisation. Creators put forward a cause or product that is supported by backers. Creators provide the majority of content for a crowdfunding network, with reviews, comments and support made by the backers. There is little discussion between users and this type of network does not usually facilitate collaborations or connections between site members. Participation in the network onsite does lead to impact offsite however, through the development of new projects. Sites necessarily include project profiles, which clearly delineate the needs of projects requesting funding (Goteo 2018a). Some sites, such as Change.org also include gamified personal profiles for site members, determining site activity and interests, or rewards for different levels of pledge to a given project (Change.org 2018a, Digventures 2018a). Sites often offer social media connectivity, blogs and information about the crowdfunding organisation, its background and motivations. Not all ventures are successful. Micropasts struggled to mobilise its crowdfunding aspects, suggesting this could have been because of poor promotion, pitching to the wrong audience or focusing too much on the crowdsourcing aspects of the site (Pett 2016).

Benefits

- Crowdfunding networks can highlight areas of priority, as dictated by members
- Crowdfunding networks may be a method of raising funds for ideas, campaigns or products where alternative funding bids have been unsuccessful
- Crowdfunding networks such as Goteo can support match-funding for cultural projects

Pitfalls

- Crowdfunding networks do not facilitate discussions or collaboration regarding products
- Crowdfunding networks rely on promotion, strong marketing, time and resource to function successfully

Usefulness to Museum-University Networks

- Crowdfunding may be a potential method for raising funds for specific Museum-University partnership collaborations
- Existing crowdfunding platforms such as Goteo could be used in conjunction with a museum-university network
- A new museum-university network could include crowdfunding as part of its offer, using discipline specific models for crowdfunding such as Digventures as a model

7) Sharing Economy Platforms

Definition

'The expression sharing economy is commonly used to indicate a wide range of digital commercial or non-profit platforms facilitating exchanges amongst a variety of players through a variety of interaction modalities that all broadly enable consumption or productive activities leveraging capital assets (money, real estate property, equipment, cars, etc.) goods, skills, or just time,' (Codagnone et al. 2016, 29). The sharing economy is part of a broader shift within society towards what Rachel Botsman and Roo Rogers call 'collaborative consumption' (2010) which is differentiated from previous forms of capitalism in that it is based in peer-to-peer exchange of privately-owned goods and services, rather than the purchase of goods and services from sellers (Dillahunt and Malone 2015). Sharing economy sites 'matchmake' members offering a service to those with a corresponding need; frequently monetizing the transaction.

Examples

Sharing Economy technologies are comparable to interactive elements of existing Network Support Websites, including Understanding British Portraits' expertise database and Engage's Educator Locator which link skillsets together. However, matchmaking technology on these existing platforms consists of a simple search function and could perhaps be extended and enriched by borrowing from other specialist, established projects outside the sector. Examples explored here include 'Airbnb' (airbnb.co.uk), the popular room rental and events site, 'Shapr' (shapr.co), a professional networking site which links user interests using an algorithm, 'Streetbank' (streetbank.com) which allows users to share resources in their local neighbourhood, 'Taskrabbit' (taskrabbit.co.uk) which links community members to undertake one off jobs and 'Liftshare' (liftshare.com) which allows users to share cars on specific journeys.

Characteristics

Within specialist sharing economy networks, online platforms usually aim to produce offsite collaborations, and to function instrumentally to facilitate links between individuals which lead to action of some sort. As matchmaking initiatives, a crucial feature of these sharing economy sites is granular, advanced search functionality. Search might function manually as in Airbnb, or automatically through an algorithm, as in Shapr (Shapr 2018a). Chat functionality is also important to enable users to determine suitability for collaboration. Individual profiles necessarily exist on these sites, often with statistics showing a user's activity and trustworthiness. For instance, Airbnb includes references for users and statistics showing site activity, as well as including 'Superhosts' who are particularly active and well rated (Airbnb 2018a). Similarly, Streetbank includes 'champions' and a 'leaderboard' of users who are responsive onsite, include detailed profiles and offer skills or services to the community (Streetbank 2018a). Sites are not obviously moderated but do include terms and conditions which enable platform owners to cancel or block accounts. Site design is relatively complex compared to a discussion forum or mailing list, including features such as profiles, gamification, advanced search capability and mapping facilities, as well as content and blog features. Many sites are commercial, which helps increase available resources for research and development. Meanwhile, as a non-commercial site, Streetbank relies on funding from Nesta and the UK Government (2018a).

Benefits

- Sharing economy models enable site members to collaborate in geographically dispersed locations
- Sharing economy models allow site members to connect in relation to specific needs and interests
- Content onsite is user-led and guided by the site design itself, meaning moderation is minimal
- Facilitates action offline around specific set of interests or needs

Pitfalls

- Tends to foreground individual connections over collaborative interactions
- Current sites tend to operate in an instrumental way to complete one-off tasks rather than developing a broader community
- Site design is relatively complex, implying substantial set up costs
- Connections on existing sites principally surround simple tasks by members of the public rather than high level collaboration between professionals

Usefulness to Museum-University Networks

- Sharing economy networks can help matchmake a wide range of skills, sectors and demographics providing the potential for innovative new approaches to projects
- A new museum-university network could extend the functionality of existing projects using onsite matchmaking by borrowing technologies from established sharing economy projects outside the cultural sector

8) Spontaneous Social Media Networks

Definition

‘A social network that is limited in time and space and dedicated to a single event’ (Laforest et al. 2014, 131). Spontaneous social media networks usually form out of a need from a group of like-minded individuals through social media networks such as Twitter through a shared hashtag, often leading to more concrete networks and activities through this means.

Examples

Examples of spontaneous social media networks include networks which develop temporarily around events, projects or concepts, such as the Museums Computer Group Conference 2017’s hashtag #musetech17 or #museumsarenotneutral. There are also examples of spontaneous social media networks which lead to more regular and formal activities and memberships. For instance, ‘Museum Hour’, a UK based weekly museum drop-in on Twitter attracts 5,500 followers from all over the world (Goskar 2016) and has also led to the development of ‘Museums Skills Builder’, a skills-sharing platform for Museum Professionals. A similar example is ‘TrowelBlazers’, which developed out of a conversation on Twitter between four individuals and is now an established online and offline group ‘dedicated to outreach activities aimed at encouraging participation of women and underrepresented groups in archaeological, geological, and paleontological science’ (TrowelBlazers 2018a).

Characteristics

Within spontaneous social media networks, collaboration often operates in a hybrid way both on and offline and includes both discussion and action. Event based hashtags often influence proceedings through questions which are fed back to a live audience, while project-based hashtags such as #museumsarenotneutral can advertise or influence offline aspects of a project or event. Meanwhile, projects such as TrowelBlazers have resulted in events, media coverage, artworks and academic articles (TrowelBlazers 2018a). We can also say that the development of secondary networks such as Museum Skills Builder is an example of discussion leading to action. Spontaneous social media networks are also marked by their openness, in that anybody with a social media account can join a network simply by using the hashtag. The in-built features of a site such as Twitter also means that members of the network have profiles which are gamified with statistics and can facilitate interaction with other site members. Given that these spontaneous social media networks sit on top of existing social media, they require very little technical and financial resource to set up and sustain.

Benefits

- Spontaneous Social Media Networks are quick and simple to use, with low barriers to access
- Spontaneous Social Media Networks allow fast-paced discussions
- Spontaneous Social Media Networks can lead to offline activities and more formal projects
- Spontaneous Social Media Networks allow network members who are not physically present at an event/activity/discussion to participate

Pitfalls

- Cannot control who is a member of a Spontaneous Social Media Network
- Cannot control reach of Spontaneous Social Media Network. This means it may be difficult to distribute information to all members
- Requires active and engaged members to be sustained

- Reliant on likeminded individuals to advertise and promote network

Usefulness to Museum-University Networks

- A museum-university network may use Spontaneous Social Media Networks to gain reactions/opinions quickly on questions and concerns regarding the sector.
- A museum-university network may use Spontaneous Social Media Networks to start discussions regarding the sector
- A museum-university network may use Spontaneous Social Media Networks to bring together likeminded individuals that previously had no connections
- A museum-university network may use Spontaneous Social Media Networks to allow network members to be involved in workshops/events or projects without being there physically.

Analysis and Recommendations



Analysis and Recommendations

1) Build an Online-Offline Hybrid Network

As described in the Literature Review, online activity is understood to positively impact offline activity in networks, and vice versa (Kavanaugh et al 2004, Homero Gil de Zúñiga and Sebastián Valenzuela 2011, Son and Lin 2008, Lin 2007). As Hsiu Fen Lin states: 'to sustain a successful virtual community, attention must be paid to enhancing both online and offline interactions' (2007, 132) and that 'community providers should...build mechanisms that facilitate offline communication into their websites' (Lin 2007, 133). Similarly, it is noted within the project review that many existing museum and university networks function both online and offline. Therefore, we suggest that a museum-university network could helpfully include offline interactions, as well as online.

2) Use Overarching Success Factors and Motivations to Frame a Unique Site Design

As explored in the Literature Review, there are fundamental success factors in the design of digital networks, and recurrent motivations for engagement with virtual communities. As described above, success factors include developing and maintaining a critical mass of participants onsite, developing a network around a clearly defined cause and purpose, including specific roles onsite and regulating these roles, developing mechanisms for site governance and trust, and ensuring a network platform is designed with good usability and service quality.

In terms of motivations for participants onsite, a similar overarching set of principles are present across the literature. As illustrated in the Literature Review, participants join digital networks to help a given community, to build their reputation or status, for enjoyment, recreation or fun, as a result of a specific interest and for personal learning, to develop relationships and exchange knowledge, and for reasons of self-expression and self-efficacy. However, it is also clear from the literature that every network has a different set of priorities which influence primary site motivation, as well as specific design features online (Kim 2006). Therefore, we suggest using the overarching success factors and motivations as a starting point to help orient a unique network design for a new museum-university network.

3) Take Account of Network Lifecycles

Networks are understood to have lifecycles (Iriberry and Leroy 2009, Kim 2006, Cheung et. al. 2005), which either lead to network death or sustainability. Networks have different requirements at inception, creation, growth, maturity and death/sustainability, which need to be accounted for in design and management of online platforms. Further, in Cheung et. al's terms (2005), networks which are built around recurring events or topics and more likely to be sustainable, as new content creates an ongoing lifecycle of participation onsite. Therefore, we recommend that a new museum-university partnership site retains flexibility to allow for lifecycles, and perhaps functions around recurring events or topics; in order to remain sustainable.

4) Recognise Reasons for Network Failure as well as Success

Literature surrounding online networks offers an insight into network failure (Iriberry and Leroy 2009, Lin 2007, Malinen 2015, Ridings and Gefen 2004, Dutot and Mosconi 2016). Reasons for network failure are commonly inversely related to network success factors as stated above. For instance, theorists cite low levels of participation and lack of critical mass, poor usability and lack of site organisation among the reasons for site failure. Lack of quality content is also a commonly cited reason for disengagement with networks, as is a lack of real engagement with the community. Project examples cited in this report also offer further insights into network failure. As described above, UCL's

project 'Micropasts' struggled to mobilise the crowdfunding features of the project, suggesting this could have been because of poor promotion, pitching to the wrong audience or focusing too much on the crowdsourcing aspects of the site (Pett 2016). Meanwhile, Culture Grid's project leaders suggested that the museum community did not find the proposition offered by data aggregation enough of a draw to commit the time and effort required to participate in the project (Poole 2015).

Beyond critical mass, usability and good site organisation, we would therefore recommend considering the need for community investment, good marketing to a clear demographic, energy and commitment to the project and participation onsite, engagement with the onsite community and engaging content as supplementary factors to consider in a new museum-university partnership.

5) Build Data Aggregation Slowly Around A Project

The data aggregation section of this report suggests that existing data aggregation initiatives tend to be supported as major, ongoing projects by governments and cultural organisations which require substantial staffing and technical and financial resource to maintain. The United Kingdom's national data aggregation platform, Culture Grid, is currently not taking new material, since its Arts Council funding finished in 2015, though the Collections Trust continues to lobby for further resource (Culturegrid 2018a). In the absence of a funded national aggregation project, options for data aggregation remain in the development of smaller projects which aggregate data on a case by case basis around a specific theme or concept. Existing projects noted within this report include Historypin and other projects linked to Culture Grid, such as Understanding British Portraits or UK Theatre Collections. Smaller projects remain able to follow standards of best practice in data aggregation by using Linked Open Data, Creative Commons Licensing and Open APIs, but aggregate data by stealth, therefore requiring less resource to function sustainably.

The idea of aggregating data around a project responds to Nick Poole's assertions around challenges associated with Culture Grid; which suggest data aggregation alone is not enough to constitute a cultural experience, and that additional services built on top of aggregation of metadata are necessary to improve engagement with material (2015). Case by case aggregation also relates to Mia Ridge's point that large amounts of material on data aggregation sites can overwhelm audiences (2015). Indeed, as described above, larger projects such as Europeana specifically offering smaller datasets for accessible re-use in relation to challenges, through initiatives such as Europeana Labs. Taking these findings into account, our recommendation would be that a new museum-university network employed data aggregation as part of a broader project, collating collections material and metadata on a case by case basis.

6) Use a Modular Site Design Including a Range of Network Functions

As described in the project review, existing Network Support Websites offer a helpful starting point for new museum and university platforms. These sites use include a range of features including sharing information, funding opportunities, advice and resources. Sites also often use a modular, multi-platform design to link to mailing lists and social media, as well as including elements of crowdsourcing and match-making. We would suggest borrowing this modular format as a starting point for a new museum-university network, as it allows agility and flexibility, enabling the needs of a specific community to be accounted for. Existing Network Support Websites also offer a helpful multi-faceted functional framework which could be translated for a new museum-university network.

However, a new site might benefit from exploring the wider field of networked models and technologies such as crowdsourcing, sharing economy and crowdfunding platforms; translating and extending the use of these technologies and platforms in order to push innovation further within the

sector. As the review has shown, each of these network forms has its own benefits and pitfalls. A modular site could therefore select and utilise different technologies according to the specific motivations of its network.

7) Use the Site for Action, Not Just Discussion

Different network forms facilitate different levels of complexity in relation to collaboration. The design of a given network necessarily specifies the kind of collaboration possible within it and uses templates to guide and facilitate participation onsite. As described above, a mailing list facilitates very little collaboration online, often instead circulating information relating to offline opportunities. Meanwhile, discussion forums allow for group conversation on a range of topics but do not lend themselves to the development of complex projects onsite. Some crowdsourcing sites support collaboration around very specific tasks, while open innovation platforms such as Open Ideo use digital technology to facilitate co-creation of new ideas to be developed in offsite projects. It is also relevant to note that crowdsourcing, crowdfunding and sharing economy sites are oriented fundamentally towards action, rather than discussion and the sharing of information for its own sake. By using technologies such as these in a new museum-university network, it would be possible to build a community not only capable of exchanging knowledge and ideas, but of building new projects and partnerships, leading to mutually beneficial impact for the sector.

8) Consider a site as an ongoing commitment, not a time-limited funded project

A final recommendation drawn from the findings of this report is the need to develop a digital network as an ongoing initiative rather than a time-limited, funded project. Culture Grid offers a clear example of the need for ongoing funding in digital projects, to ensure sustainability. However, all digital projects rely on ongoing resource to maintain their success factors, in terms of producing new, relevant content leading to critical mass, monitoring and maintaining onsite roles, moderating content and keeping sites technically up to date to ensure good usability. Therefore, our final recommendation is to treat a new digital network as an ongoing commitment rather than a time-limited project, and to find way to secure and safeguard the sustainability of a new site.

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- Association of Art Museum Curators (<https://bit.ly/2JqjFVI>)
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- Micropasts (micropasts.org)
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- Museum Hour (twitter.com/museumhour)
- Museum Skill Builder (museumskillbuilder.wixsite.com/home)
- Museum Computer Group JISCMail (jiscmail.ac.uk/cgi-bin/webadmin?A0=MCG)
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- Museums are not Neutral hashtag (https://bit.ly/2GFlwYX)
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- Radical Pedagogies (https://bit.ly/2H0hSIC)
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- TrowelBlazers (trowelblazers.com/about/)
- Understanding British Portraits (britishportraits.org.uk)

Context of the Report

This advisory report was commissioned by the Museums Universities Partnership Initiative (MUPI), an Arts Council Funded programme led by the National Co-ordinating Centre for Public Engagement (NCCPE) in partnership with the Share Academy project and Paddy McNulty Associates. The research team associated with the report also developed the MUPI funded 2017-18 pilot 'Research Matchmaker'. This project meant researching and developing a digital prototype for a platform linking academics and curators of exciting but under-researched collections and is now a MUPI case study.

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The Museum-University Partnership Initiative (MUPI) was supported by public funding from Arts Council England. It sought to enable museums and universities to meet together and develop mutually beneficial partnerships. A range of resources have been created, drawing on the learning from the MUPI project. You can find all these resources on the NCCPE website.



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