Transforming our World Through Design, Diversity and Education
G. Craddock et al. (Eds.)

doi:10.3233/978-1-61499-923-2-151

Using Design Thinking to Develop New Methods of Inclusive Exhibition Making

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Abstract. Museums and galleries are now making significant developments in the area of inclusion and awareness of disability rights. There have been noticeable advances in the design of cultural, physical and digital spaces, which provide wider access to a museum's physical and intellectual resources, for individuals of diverse ages and abilities. However, responses have varied in consistency, efficacy, and legacy. This year-long design research project, in partnership with the Wellcome Collection and the Helen Hamlyn Centre for Design, Royal College of Art, develops a working set of tools that can be used by museums to improve accessibility in a more permanent and reiterative manner, with a view towards gathering and sharing relevant data, and design responses, within a broad network of museums and cultural institutions. This paper outlines recent approaches by relevant experts in the field and outlines a new approach to incorporating inclusive design within the process of exhibition creation. It uses co-design methods to provide a set of principled guidelines that respond to all relevant stakeholders. These guidelines are predicated on the understanding that establishing empathetic links between exhibition-makers and exhibition audience members is essential, resulting in a positive collaboration, combining the skills of museum professionals with the lived experience of people with disabilities. A central goal of the research is to explore how design issues surrounding access can be framed as an essential and positive component of the design process, and, more importantly, an opportunity for innovation, not simply an obligatory requirement. This paper comprises the observations of a current research project of a 12 month project, commencing in September 2017 and concluding in September 2018.

Keywords. Design thinking, accessibility, museums, exhibition making

1. Introduction

Museums are places where curious people go to learn something new, to explore topics of interest, to increase cultural knowledge, and to interact socially with others and have pleasurable experiences. [14]. Going to museums is an important way to understand the world we live in, and can play an important role in enhancing general well-being in people's lives [7].

Fundamentally, exhibition design is a form of storytelling, and the design of visitor experience. The goal for museums, when hosting exhibitions, is usually to facilitate some form of enjoyable learning experience, encouraging visitors to engage with new

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knowledge. The central issue for exhibition makers/designers is to communicate the story of the objects and layers of information through a coherent, understandable narrative. This goal is not simple to achieve; museums are complex spaces, usually consisting of large amounts of objects, each with their own accompanying story and complexity of information and meaning. When visiting museums, most of us recognise the feeling of sometimes not properly understanding the deeper meaning of an exhibition theme, not being able to see things properly, losing our way in labyrinths of objects, and simply feeling overwhelmed, tired, or in other ways limited in our experience. This complexity is naturally a pertinent issue for people with disabilities, a term which covers a far broader spectrum than is commonly understood.

In The International Classification of Function, Disability, and Health [25], the World Health Organization (WHO) describe disability as intrinsic to human experience. In this document, WHO defines disability as a contextual and variable dynamic that can develop over time, and in relation to circumstances. In other words, an individual can identify as more or less disabled based on the various evolving relations between person and the social, physical environment they interact with. In this way, disability is not a permanent feature of an individual, but highly contextual [8]. Unfortunately, many museums do not provide the opportunity for everyone to interact and have engaging experiences [7]. Museums generally target a rather narrow group of visitors: people with 'normal' physical, sensory and cognitive ability. Because of this, people with disabilities, who might fall outside of the conventional spectrum of a museum's visitor-type, sometimes feel excluded from museum experiences. Exclusion manifests as 'barriers' to the designed environment of the museum inhibiting people from experiencing content. Barriers can be physical - architectural barriers such as heavy entrance doors, a lack of angled access ramps, places to rest, or suitable access to toilet facilities can cause disabled visitors to avoid visiting museums. Barriers can also be sensory and cognitive, creating difficulties for visitors to connect with content. Museum exhibitions are traditionally centred around visual experiences, and going to museums today is still primarily a visual experience [2, 9] This type of user experience, which mainly stimulates just one of a visitor's senses (i.e. vision), caters to a rather narrow visitor group. Not only are there potentially more than two million visually impaired people in the UK [20] who might be more excluded from experiencing this type of display, but all visitors are likewise missing out on engaging through multi-sensory experiences.

If museums do not provide options for alternative sensory formats such as audio guides, sign language or objects that can be touched, they automatically exclude a large group of visitors. Access to information online, a crucial locus of engagement, tends to be poorly handled and acts as a deterrent rather than an incentive [24]. Because of the lack of available information and, consequently, the trust that venues will be accessible, up to 92% of people with disabilities do not feel confident about visiting new places [6]. It is important that museums cater to disabled visitors for many reasons; financial, moral, and in the interests of diverse representation of both content and audience, to an institution's cultural significance. Moreover, people with disabilities represent an important potential market for museums [14]: There are more than 13.9 million people with disabilities in the UK, which makes up every fifth person of the population [9] and the number is growing, due to global trends in ageing populations [4]. The spending power of people with access needs in the tourism sector accounts for £12.4bn a year, so unless museums try to be accessible, they could miss out on substantial potential revenue [15]. Besides losing important customers, museums also have a legal obligation to cater to people with disabilities: the Disability Discrimination Act (DDA) came into law in

1995, which placed a duty on service providers to make 'reasonable adjustments', to remove any physical barriers to accessing the building as well as removing any attitudinal barriers. The DDA has now been incorporated into the Equality Act which came into law in 2010 [10].

This project explores new methods of engaging disabled users in exhibition evaluation and design processes in an integrated, ongoing way. It explores new tools for analysing and communicating findings from user engagements, and takes a look at how best to implement these in the work of professional exhibition makers. The project develops a working set of tools and guidelines that can be used by museums to improve accessibility in a permanent and reiterative manner, with a view towards gathering and sharing relevant data, and design responses, within a broad network of museums and cultural institutions. This paper outlines a new approach to incorporating inclusive design within the process of exhibition creation. It uses co-design methods to provide a set of principled guidelines that respond to all relevant stakeholders. These guidelines are predicated on the understanding that establishing empathetic links between exhibition-makers and exhibition audience members is essential, resulting in a positive collaboration, combining the skills of museum professionals with the lived experience of people with disabilities.

2. A new approach: Bringing users into the design process

The greatest challenge for exhibition designers is offering engaging experiences for as many people as possible, catering to different abilities, interests and preferences. A number of design methodologies can be implemented to help navigate this process. Approaches to design for disabled users tend to follow the principles of "universal design", which seeks to order and arrange an environment so that it can be accessed, understood and used to the greatest extent possible by all people regardless of their age, ability or disability [17]. Universal design is often cited as the most beneficial approach for designing for diverse needs: In *The International Classification of Function, Disability, and Health* [25], WHO specifically reference universal design as the most promising framework for facilitators to achieve this. Even though people with disabilities are usually considered the primary beneficiaries of universal design practices, it would be difficult to name an audience who will not benefit from this approach as universal design is about searching for strategies that have universal benefits [13, 22]. For example, everybody benefits from precise interpretation texts, easily readable font style and colour contrast.

However, there are a number of ways universal design can be expanded and improved through the incorporation of other design methodologies. User-centred design focuses on users and their specific needs and aim to involve them at all stages of the process; it considers the user not just as the final step or recipient of a project, but validates their assumptions regarding their behaviours in real world tests. Another well-established design approach, co-design, takes the user-centred design approach even further than inclusive design, and actually brings the user into the design process as a contributing player, requiring professionals to be willing to share control over the project and is grounded in a fundamental belief that all people are creative [21].

Using universal and inclusive design methods to increase exhibition accessibility is now widely recognised by museums, but unfortunately there are still "misconceptions

and apprehension about how best to 'do' access" [19]. Nonetheless, significant advances have recently been made in approaches to accessible exhibition design.

3. Status in the field

When taking a look at the status in the field of accessible exhibition design, there is clearly a broad interest amongst museums in catering to more diverse groups of visitors [14]. More positions are being created for access staff at museums [19] and many strategies are being put in place to increase accessibility. Some examples of interesting initiatives include:

- Professor Anne Chicks design research project which explores the design and curation of cost- effective, non-permanent exhibitions with outstanding intellectual access for visitors with sight-loss at the National Centre for Craft & Design [3].
- The Victoria and Albert Museum's 'Sensory Backpack'-project, which offers young children and families multi-sensory ways of exploring exhibitions through a range of tactile objects connected to the display [5, 23].
- The Beaney House of Art and Knowledge have developed a new technology which allows audiences to interact with paintings through movement and musical audio bits called 'The Beaney Butterfly Machine' [11].
- The Quai Branly Museum in Paris have developed tactile maps for visitors to orient themselves and tactile chromatic ground routes to enable all visitors to explore the museum independently [14, 16].

The above strategies focus on access to museum sites, exhibited objects and interpretational material. However, many of the projects reviewed in this study seem to be stand-alone projects, carried out within a limited period of time. The fundamental attitude of museum professionals and their reluctance in any long-term commitment is a primary obstacle to sustained attention to inclusion in museums [12]. Many studies stress the need for continuous cycles of 'trial and error' [7] and a need for accessibility to be considered from the initial, conceptual stages of exhibition planning [19]. In many cases the implementation of access strategies is limited to specific departments of museums [1]. This is problematic, since experience has shown that getting people collaboratively involved across a whole organisation is one of the most important issues in implementing access as a fundamental part of museum budget and planning, rather than a secondary consideration, or "add-on" [1].

User consultation, and the direct inclusion of people with disabilities throughout the design process, is essential to any successful design strategy. Most of the above examples have successfully incorporated methods of consulting with people with disabilities to identify needs and ensure that solutions are fit for purpose. Looking at relevant accessible exhibition guidelines by institutions such as the Smithsonian, National Museums of Scotland, Barclays [18], Victoria & Albert Museum etc., it is clear that user consultation is a widely-used and successful design approach. Nonetheless, despite this, user consultation is not integrated as a standard, incorporated method in

many museums' approach to exhibition design, due, in part, to perceived time and budget constraints, or a lack of experience in running useful consultations.

Unfortunately, however, this oversight runs deeper than simple managerial and budgetary concerns, and broaches deeper, sociological issues within cultural institutions. Instead of being a primary concern, access issues is often viewed rather as a list of practical accommodations that needs ticking [1]. Access is an acknowledged but often undesired requirement, perceived by exhibition makers as a limit to their creative freedom [8]. Access must not be viewed as an afterthought but as a creative process intrinsic to art and curatorial practice, and exhibition makers should see access as an opportunity to innovate great designs that benefit all visitors.

Apropos of this, my research has aimed at rehabilitating accessibility as a positive and empowering design consideration. I have developed a set of tools and guidelines that allow institutions and design teams to directly consult with users with disabilities, and to create and sustain an ongoing database of examples of good practice, and of quantitative and qualitative user reports.

4. Tools and guidelines

Over the last 12 months, the Wellcome Collection and the Helen Hamlyn Centre for Design has conducted extensive research into how access issues are currently addressed in museums and how they might be advantageously addressed in the future, expressly through the application of co-design and user-centred design methodologies and approaches. The intention has been to develop a set of working tools and guidelines that can be applied and followed in the practice of exhibition design, with a view to encouraging the incorporation of users, specifically those with disabilities, in the entire design process, from conception to installation. These tools and guidelines are intended to impact the physical and logistical aspects of exhibition design, but also to provide an incentive for fundamental ideological change, inviting both exhibition designers and institutional executives to understand designing for disabilities as a positive and exciting opportunity for innovation.

Following the principles of co-design and user based design, my initial research involved extensive user testing and 'user journey mapping', in which the experience of a visitor with visual impairment at one of Wellcome Collection's exhibitions was extensively recorded and 'mapped', both on a quantitative level - noting physical logistics and problems - but also qualitative, viz. the participant's emotional response. The participant, a young woman with a visual impairment, walked through the exhibition, shadowed by the researcher. As she worked her way through the different exhibits her route and all reactions to specific elements of the exhibition was noted down. She walked through the exhibition twice, once to take a look at what objects she would prioritise her attention on, and a second time to engage deeply with the exhibition. The participant generally has a need to view text closely, which can be challenging and awkward in public, this became apparent as she was going through the exhibition. Attempting to use her smartphone, the only aid she uses, she attempted to take pictures in order to view things up close, but struggled to properly engage with the displays due to factors such as low light levels, glare and small text on labels. The main challenges she faced included long theme-texts, physically placed at inappropriate heights for her to get close, small label texts, low light levels, and finally, display cases that were too tall with glared surfaces, which are outlined in the journey map template as seen below (figure 1):

Figure 1. User journey map

This process allowed me to develop Tool1, a set of directions or principled guidelines which help the planning, facilitating, recording and visualising the user-engagement in the design process. Tool1 can be used to review any current exhibitions of an institution by people with disabilities, in order to understand and map various elements which are identified as 'triggers'. Triggers affect users either positively or negatively by enabling or disabling experiences. This collected data can then be used to help an institution such as Wellcome Collection's exhibitions team to establish best practice regarding accessible exhibition design, by allowing the heightened awareness of users to be noted and documented.

Tool1 encourages a walk-through of an exhibition, and a following co-creation session with participants who represent different disabilities and ages. Participants are asked to review the accessibility of exhibitions facilitated by staff from across an institution's exhibition team. On this occasion, participants were split into groups of two, each group led by one facilitator, in order to better enable and record observations and ideas. Participants were encouraged to point out elements and objects that they found significantly positively enhancing, or inhibiting and detracting from their experience. Each chosen element was marked by a post-it note with a symbol of either + (positive), or - (negative) applied to the trigger element. Explanations for each element's effect was noted, and the element's position in the exhibition was photographed.

These notations were collated in a co-created 'trigger-map', which displays the most important physical triggers for their experience. In this instance, we applied red and green dots to a large printed map of the exhibition. A short comment with a description of triggers was added to each dot, elaborating on the nature of experience. An example of a trigger map can be seen (figure 2):

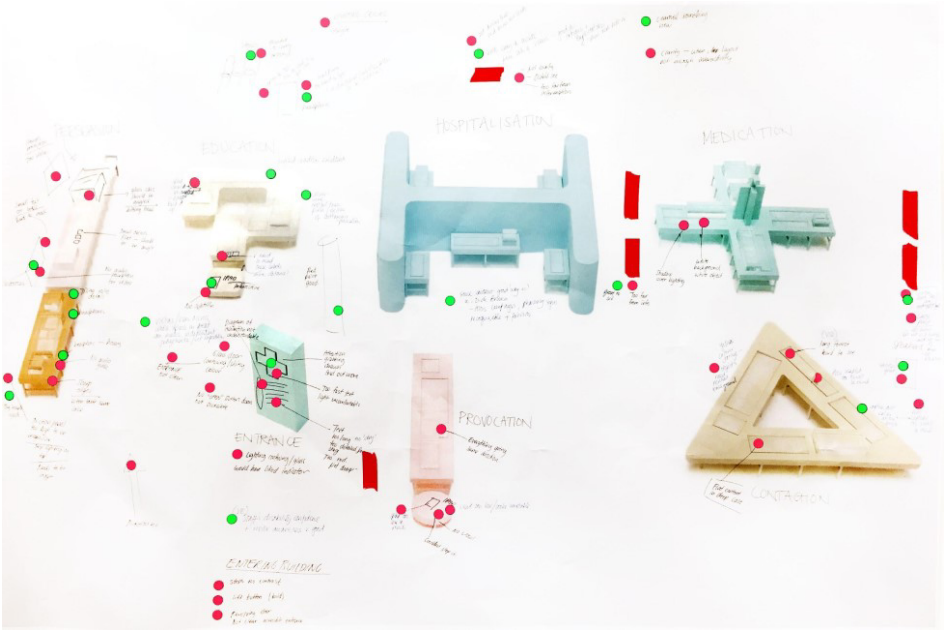

Figure 2. Exhibition floor plan with applied red (negative) and green (positive) "triggers".

The goal of the analysis was to get a clearer picture of the physical triggers and to develop a method of analysis which can be easily replicated and used by Wellcome Collection staff in the future. It is fundamentally important that this method be standardised and easily applicable by exhibition team members as a user-friendly and time-efficient method, in order to ensure that the practice is ingrained as a necessary step in the development process. However, an obvious risk in simplification is misrepresenting what is necessarily a complex, multifaceted and highly personal issue.

It is important to do these tests consistently, so as to aggregate and compile a very rich data set, which increasingly supports future design decisions. The idea is to have an extensive database of trigger maps, both within an institution's own records of user-based exhibition designs - creating a rich library of data - but also on a wider scale, in which a shared network allows access to other institutions' approaches for cross-reference, comparison and collaboration. This database can be used by designers as a resource for design precedents, but also by institutions to assess the various successes and failures of their approaches.

Based on these preliminary user engagements with existing, or 'live' exhibitions, we proceeded to address the design process itself, and the incorporation of a similar methodology into a new project, Tool2. This approach seeks to invite visitors to collaborate with designers, to contribute particular knowledge of lived experience. Specific parts of proposed designs will be built as prototypes and tested with participants.

Following the initial research stage, and the development of these tools for incorporating a user-based approach in exhibition design, we proceeded to prepare a guidelines document. The purpose of the guideline document is to ensure that designers fulfill accessibility criteria. The document is intended to be given to commissioned designers, architects or artists. Considerations of these guidelines are taken into account when an institution such as Wellcome Collection appoint commissions. Unfortunately,

common accessible exhibition design guidelines tend to be rather 'heavy' and prescriptive. This was also the case for the former Wellcome Collection guidelines. The format of guidelines can contribute to designers feeling like designing for accessibility is a chore, or 'tick-box exercise'. To explore this, interviews were conducted with designers to understand how they perceive and use current guidelines. The goal of redesigning the guidelines was for them to function as an easily understandable framework for creating new, innovative ways of designing accessible exhibitions.

The document focuses on a selection of 'interventions' that can be implemented in the design process. These interventions aim to contribute to an inspirational tone while still steering parts of the process that have to be non-negotiable requirements. An overall invitational tone was established from the beginning through an the initial statement of intent introducing the guidelines and avoiding industry specific language. The introduction was written as an invitation to work collaboratively with Wellcome Collection and its visitors. To highlight, practical information was reorganised and drawn out in boxes. Secondly, a system of colour coding was implemented in order to visually split the text into suggestions/prompts and set requirements. Illustrations were inserted to make the document intuitively understandable and to help clarify written requirements. Finally, the guidelines were moved to an online format called 'Frontify', offering opportunities for building a living document which can be updated regularly. Moving the guidelines online also offered an opportunity to add links to other webpages or parts of the guidelines. It is the intention to build a 'library of good examples' that can be accessed through Frontify as a source of inspiration. The guidelines are currently being developed in collaboration with professional exhibition makers, a content writer and user tested by exhibition designers.

5. Conclusion

Despite obvious advances, designing for disabilities still appears to be somewhat of a fringe topic or secondary consideration in exhibition design. There still lingers a general belief that incorporating accessibility issues directly into the design process might result in the limitation of creative freedom, over-regulation, and a systematic upheaval of traditional aesthetic elements. Moreover, agreeing on one 'correct' approach or methodology in implementing universal design becomes quickly problematized by the sheer scale of difference in both disability types, but - perhaps more importantly - difference in personal preferences and personalities. This was an issue that repeatedly revealed itself in the development of the tools and guidelines: in our workshop discussions, it became clear that users rarely agreed on what they like or need. It is important to maintain a degree of flexibility, both in the limitations placed on design teams by institutions, but also regarding how users with disabilities are incorporated into the design process: one size does *not* fit all, and adhering to a strict design criteria can just as often inhibit a successful exhibition as result in its success.

Nonetheless, the benefits of a co-design approach to exhibition design is obvious, as my research has revealed: by directly including users with disabilities in the considerations of an institution such as Wellcome Collection, clear empathetic links, increased awareness, and a direct and sustained dialogue developed, within which executive decisions could be made concerning the ethos, approach and direction of future exhibitions. Users could voice opinions and concerns, and could consequently see them taken into consideration and implemented into design thinking. This value of

empowerment should not be underestimated: users can feel that they have a hand in design choices which directly affect them, and institutions can build up an invaluable set of personal, qualitative data, through which they can assess the respective successes and failures of their ongoing approach to accessible design.

More importantly, these empathetic links are taken into consideration by designers from an exhibition's inception, and remain a central consideration of the design process until completion. The tools described in this paper encourage design teams to implement methods of co-design directly into their process, and also provide them with a wide and detailed set of data and past examples, against which they can evaluate the efficacy of their current work. In this way, the disabled user plays a central role both on a 'micro'-level - in direct communication with the designer - but also on a 'macro'-level, as represented in the guidelines, but also in the 'library' to which the exhibition-maker is encouraged to have recourse.

Finally, this project has identified the creation of clear, concise, and - most importantly - incentivising guidelines as a crucial, necessary factor in a universal approach to exhibition design. Making sure that designers feel like they are not obliged, or demanded to follow overly pedantic and stifling requirements, but rather encouraged and inspired by a reconsideration of access design as a space for innovation and experimentation, is a necessary in fostering and maintaining the principles of co-design, and a dialogue between user, institution and design team.

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