

Time, Culture and Identity

The co-creation of historical research and co-development of visitor experience in China and the UK

1) Context for the project

The audience research evaluation is one element of a fifteen-month Arts & Humanities Research Council (AHRC) funded research project: Time, Culture and Identity: The co-creation of historical research and co-development of visitor experience in China and the UK (TCI). The overall project is tasked with delivering both historical research and an engaging digital visitor experience in China and the United Kingdom (UK). It is focused on the clock and automata collection of the Palace Museum, Beijing.

The home and touring venues of the collection are 'The Hall of Clocks and Watches' in the Palace Museum of the Forbidden City (Beijing), Hong Kong Science Museum (HKSM), and the London Science Museum.

The Palace Museum is the owner of the collection and a permanent gallery devoted to their display (The Hall of Clocks and Watches). Visitors to the Forbidden City are required to purchase a supplementary ticket to their general admission ticket to enter the gallery. **The Hong Kong Science Museum (HKSM)** hosted a temporary exhibition of 120 of the clocks over the period December 2018 to April 2019. The exhibition entitled *Treasures of Time* also required the purchase of a supplementary in addition to that for general museum entry. **The Science Museum, London** is the host institution of the TCI project and will present a temporary exhibition of the clocks in 2020.

Terry Watkins of the audience research consultancy TWRResearch Ltd was commissioned by the Science Museum Group to conduct the audience evaluation phase of the project.

2) Objectives for the audience evaluation

The audience evaluation primarily focused on the *"the ways in which British and Chinese visitor engagement with historic collections differ and converge"* in the context of the collection. This will contribute to the development of a co-designed digital resource aimed at appealing to target and potential audiences in China and the UK. Throughout, a priority was to devise ways in which audience evaluation techniques and methodologies can be developed in partnership between China and the UK.

In order to address the requirements for the digital resource creative brief it was essential to gain an understanding of the awareness, interest and response to the collection according to each location – Beijing, Hong Kong and London.

The evaluation objectives were:

- Ascertain how interests in the collection converge/vary according to gallery and exhibition location.
- Establish levels of knowledge on the subject, distinguishing between enthusiasts and/or the curious.
- Identify the audience for a digital resource exploring clocks and automata from the Palace Museum.
- Define the expectations for an online digital resource that explores these subjects and themes.

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3) Summary of approach and evaluation methodology

The methodology was primarily qualitative and took the form of focus groups (seven in total), informal group discussions, in-depth interviews with experts and influencers, as well as intercept interviews in host and destination locations.

The evaluation also had access to general visitor entry data for The Forbidden City and Hong Kong Science Museum. HKSM also initiated their own survey specifically of visitors to *Treasures of Time*, achieving a sample of over five-hundred participants. This was supplemented by an appendix survey of 50+ interviews using a questionnaire co-designed by the consultant and the HKSM team

The evaluation was conducted during March-June 2019, with two trips to Hong Kong and one to Beijing. In total four days were spent working with the team at the Palace Museum Beijing and eight days in Hong Kong (two trips). The London fieldwork included focus groups, depth interviews and desk-based research. In addition, there were meetings with The London Science Museum as TCI host institution.



Some of the participants in the intercept Interviews at the Hong Kong Science Museum (including a collector sharing his automaton and timepiece interests)

The qualitative sample was as follows:

21st/22nd March 2019	Intercept interviews in the <i>Treasures of Time</i> exhibition, achieving a sample of 28 short interviews with visitors.	HKSM
23rd March	Two focus groups: young Hong Kong residents and an 'international' group that included four Cantonese speakers. Sessions included a brief 30-minute visit to the exhibition	HKSM
26th March	Intercept interviews in The Hall of Clocks and Watches achieving a sample of 35 short interviews with visitors. Translator present to enable interviews in Mandarin.	Palace Museum, Beijing



Some of the participants in the intercept interviews in the Clock Gallery, Beijing

26th March	Focus group with students from Beijing Jiaotong University, primarily reading engineering with interest in robotics. All required to pre-visit The Hall of Clocks and Watches. Session conducted primarily in Mandarin.	Beijing Jiatong University
27th March	Group discussion with five volunteers who know and regularly work in the Hall of Clocks and Watches. Session primarily conducted in Mandarin.	Palace Museum, Beijing
4th April	Focus group with horological experts, watchmakers, collectors, academics, journalists. Passionate academic and collector interest in timepieces; one a museum curator with experience of automata.	Science Museum, London
11th April	Focus group with young exhibition-goers (20-30 yrs). All had previously visited a Science Museum exhibition. Arrived at session unaware of the subject for discussion.	Science Museum, London
16th April	Group discussion with a jewellery creative team, Garrard Creative Director and Stephen Webster jewellers.	House of Garrard, London

31st May	Focus group with Docents working at HKSM, majority had led group visits to <i>Treasures of Time</i> . Session conducted in Cantonese and English.	HKSM
1st June	Focus group with visitors to <i>Treasures of Time</i> , museum volunteers and independent visitors. Session conducted in Cantonese and English.	HKSM
1st June	<i>Group discussion</i> with Hong Kong Collectors Circle . Three major collectors – one a museology academic. All had attended lecture & tour of <i>Treasures of Time</i> .	Hong Kong

Other interviews with experts and influencers have not been listed but are referenced in the report.

Terminology: Focus groups are semi-structured 90-minute sessions of seven to nine participants. Discussions are more informal 'meetings' with variable numbers.
 Note: For brevity we will refer to the **Clock Collection** throughout the document



Three focus groups with visitors to *Treasures of Time*, HKSM & London 'visitor' focus group

Jiaotong University students, Beijing

Clock Gallery Volunteers, The Palace Museum, Beijing

Jewellers, Garrards London

Quantitative analysis relied primarily on existing audience data available from the host museum. In Beijing visitor data focused on total visitor numbers to the Forbidden City. Identifying visitors specifically intending to visit the Hall of Clocks and Watches was challenging. It can be assumed that many visitors include the gallery as one element of a busy and time-consuming day rather than as a specific destination.

In comparison, HKSM undertook a detailed exit survey specifically of the visitors to the *Treasures of Time* exhibition achieving an impressive sample of just over 905 interviews. It measured visitor interest, scored appreciation indices and outcomes, and response to interpretative approaches.

The TCI project team were able to spend a substantial amount of time with their hosts at the Palace Museum and HKSM discussing and sharing research practice. In Beijing, and to a lesser extent Hong Kong, audience evaluation tended to focus on the overall audience to the institution. The project identified ways that in all locations the evaluation could prioritise the Clock collection. Research process

tends to be formed through need and circumstance and, as will be explored in the report, different cultures and context create different approaches.

The meetings included presentations on UK research practice by the consultant that were well received and stimulated subsequent discussions on respective and potentially mutual visitor evaluation techniques. In Hong Kong the collaborative sessions led to a pilot exit survey for the *Treasures of Time* exhibition that supplemented the enquiry fields of their existing questionnaire to identify a more detailed opinion-based and attitudinal response.

The scale of the sample and robustness of methodology was highly dependent on the assistance, hosting and contact network of the museums. For example, HKSM recruited two focus groups from their volunteer and visitor networks. The Palace Museum provided members of their team to assist and occasionally translate interviews in the Hall of Clocks and Watches. That this assistance enabled the budget 'to go further' is testimony to the success of the collaborative aspect of the project and evidence of what can be achieved by the sharing of best practice.

4) Context – Venues, visitors and factors of environment

The three museums collaborating in the TCI project have different relationships with the Clock Collection, their own unique audiences and represent different stages in the project timeline.

The Hall of Clocks and Watches, The Palace Museum, Beijing

- Visitors are likely to be primarily 'tourists' attempting to see the vast Forbidden City in one visit.
- The context of 'palace' influences perception. Clocks were the 'possessions' of a resident emperor.
- Recent refurbishment has refreshed the gallery but it's still a modest selection from the collection.
- Practicalities of managing significant volumes of visitor traffic influences presentation and access.
- The impact of CCTV's *Masters in Forbidden City* on awareness of the collection is significant.

The Hong Kong Science Museum

- HKSM is extremely popular and well-known as a family-friendly, hands-on, 'Science' museum.
- *Treasures of Time* was a strategy initiative presenting HKSM as also catering for adult tastes.
- That said, it was important for education groups due to the emphasis on the history of timekeeping.
- Breadth of content and themes meant the Clock Collection was the 'star' but not the sole focus.
- As a temporary exhibition, generating awareness and attracting destination visitors was essential.

The Science Museum, London

- Evaluation was a formative process. In most cases, it introduced the collection to new audiences.
- Discussions considered the implications to the creation of the digital resource and a London exhibition.
- Even among the 'experts' awareness of the collection and its connection with the UK was limited.
- The Science Museum as host and collaborator inescapably influences perceptions and expectations.

5) Conclusions

Conclusions – Key point summary

- * A collection of 18th century clocks once belonging to the emperor of China can initially and superficially seem to be a niche subject that will primarily appeal to enthusiasts of timepieces.
- * Interest significantly increases beyond the specialist audience with the appreciation that many are working automata with animated fantasy scenarios that are integral to their elaborate design.
- * When interest is stimulated questions focus on the context of creation and the mechanics of operation (internally and externally). The desire to *see the inner workings* and *understand how they work* are different impulses but consistent outcomes of the curiosity the clocks generate.
- * The fragility of the clocks limits the frequency and access to demonstrations of their movement. Encountering the clocks as static museum exhibits can limit visitor appreciation of their unique qualities. The charm of their movement stimulates significant interest among all audiences.
- * The host environment influences expectations. In a '*palace*' they are the valuable treasures of an emperor's home. In a '*Science Museum*' visitors expect to be told and understand how they work.
- * Cultural factors specific to Chinese and British audiences result in different points of connection. In China the luxury aesthetic is more appealing than for UK audiences. In the UK interest focuses on James Cox and the 18th century trading relationship with China. In China the focus is broader; a European-sourced and China-produced collection from the Palace Museum.
- * The clock and automata created for the UK's trading relationship with China and the significance of James Cox, the produce-entrepreneur, is largely unknown (even among many horologists).
- * All welcome a human element to the story. In the UK this was the story of James Cox. In China the CCTV series on the Palace Museum workshop made a celebrity of the conservator, Mr Wang Jin.
- * Seeing the clocks and automata 'perform' is essential to reaching the maximum audience. The creation of a digital resource offers an ideal medium to demonstrate and explain movement and mechanism. An initiative that can restore the "*magic*" lost in the static context of glass case display.
- * The challenge facing a digital resource is how to appeal beyond the specialist and academic enthusiast. If the objective is to reach the widest possible audience, then the digital resource must instantly capture the imagination and create a desire to discover and explore this remarkable collection. Traffic needs a purpose to visit a website. Seeing 'movement' is crucial to achieving this.
- * There were evident behavioural differences between museum visitors according to culture and nation. This compounded the influence of context (*museum or palace*) on the perceptions and expectations. China is a nation enthusiastically '*rediscovering*' its own history and thriving on the geographic mobility of burgeoning tourism (it was estimated that over 50% of visitors to HKSM *Treasures of Time* were from mainland China). In comparison, the potential museum audience in London and UK cities can often seem blasé regarding the abundance of free-access museums on offer. Also, in major cities pay-to-enter exhibitions are effectively and increasingly competing for visitors.

* In museums in China attention and patience levels are greater than in the UK. There is more reverence for antiquity and academic authority. Objects in a museum command respect. Visitors in Hong Kong and Beijing often assumed the clocks were made of valuable materials (gold not gilt, and precious stones rather than paste). Though this assumption was not unique to China it did result in greater patience with static display and a positive response to a decorative aesthetic more appealing to Chinese taste.

* In the UK, audiences often need convincing that something is relevant. There is more evidence of 'tribes' of enthusiasm, taste and specialism where the unconverted shun that which does not instantly appeal or that is outside the spectrum of their interests. In this context, what might be described as a *clock collection* might seem irrelevant to those who assume this will be antique timepieces rather than fantastic automata. They could be marginalised as the territory of the enthusiast, and in this context evoke associations of the elitism of luxury-goods or the niche specialisms of collectable antiques.

* It was evident in all locations that *seeing the clocks* was essential to engaging the non-specialist audience. Ideally experiencing the automata *'perform'* either in actuality or at the very least seeing a screen-based version of this. The difference between experiencing the *'static'* and *'movement'* was immeasurable. There was an evident delight and amusement when watching a demonstration. Importantly a *sense of fun* prompts a greater appreciation and enjoyment of these as sophisticated mechanical novelties rather than as the precision timepieces of an elite.

* Once curiosity is established there are many story threads and connections that appeal to different interests. This carries implications for the creation of a digital resource that can appeal to both passionate expert and curious explorer. In China, the collection constitutes one episode in an ongoing cultural fascination with the philosophy and science of measuring time. In the UK interest focuses on the 18th century and the seventy-year *'chapter of'* James Cox, the trade with China and the surreal creations that emerged from a nascent relationship between two cultures.

* On a basic level the digital resource can satisfy the need for an internationally accessible archive of the collection. It would offer the opportunity to see all the operational clocks and automata *'perform'* without the real-time demands of frequent demonstration. It can also provide ongoing access to the work and restoration achievements of the *'Clock Conservation Hospital'* in the Palace Museum. Importantly, it can enable the sharing and collaboration of academic scholarship and debate.

* A digital resource can offer multiple entry-points, narratives and be relevant to different audiences. The interpretative resource in the Hall of Clocks and Watches, *Treasures of Time* and potentially the loan exhibition to the London Science Museum in 2020 *'cry out'* for more interactive screen and QR code accessed demonstration of both exterior performance and interior mechanism. Content created for the exhibition experience that can potentially satisfy pre, post and non-visit curiosity on a digital hub.

* To appeal to the newcomer/novice the digital resource must have instant impact and be very visual. They will not seek the resource without a compelling trigger, tease or gimmick that both captures their imagination and is shareable. The desire to share images on social media was evident throughout.

* In conclusion, the Clock Collection from the Palace Museum is an exciting, engaging and increasingly relevant story that deserves to reach a wider audience and be more than the secret preserve of the academic, enthusiast and tourist visitor to the Forbidden City. The evaluation consistently affirmed that in all locations seeing the clocks and ideally experiencing them as automata is the gateway to

engagement. The digital resource offers an opportunity to be the mechanism that 'assists the discovery' of this unique collection.

6) Overview – the clock and automata collection of The Palace Museum.

In Chinese, *'giving a clock'* sounds very similar to the words for *'attending a funeral ritual'*. It is considered bad luck to give a clock as a gift in China, particularly to anyone confronting their own mortality and conscious that life is ticking away. In comparison, in the UK rewarding years of loyal service with the gift of a clock is the clichéd gift of retirement. This one anecdote provides a reminder that the same object can carry very different cultural associations and implications.

Visitors to museums and galleries bring with them their existing knowledge, experience and cultural associations. They are more likely to connect with that which they recognise and that which is culturally familiar. There is of course the intrigue of the unfamiliar but even in such situations the visitor makes sense of what they see by the comparison and the context of what they know.

The Clock Collection of the Palace Museum is by any standards unusual. Many of the highlights of the collection are the amalgam of the aesthetic and technical skills of two very different cultures. Cultures which also have very different relationships with the concept of time and the instruments of time-keeping.

Visitors in China and Hong Kong of Chinese citizenship/heritage often overlook the significance of the trading relationship with the UK and the James Cox episode of the story. For many the collection reflects the wealth and discernment of an emperor who both sourced internationally and inspired the creation of a comparable Chinese school of clock production.

For visitors in China and Hong Kong this is often perceived to be a collection of *'treasures to display'* more than *'novelties that perform'*. Impressions that are fuelled and compounded by the implied preciousness of static presentation in museum glass cases. The necessities of preservation and protection and abundant decoration also fuel the misconception that these are made of precious jewels and valuable materials rather than being theatrical fantasies that are closer to the charade of a mechanical stage set.

It was revealing how in the Hong Kong discussion group with the knowing 'Collectors Circle' (*session conducted in English*) words such as *"magic"*, *"novelty"*, *"whimsy"* and *"delightful"* abound. In comparison, in the conversations with less informed visitors at HKSM, there are more references to *"jewels"*, *"precious"*, *"valuable"*.

The often bizarre and unusual creations within the collection defy 'silo' classification and prompt the curiosity of a wide audience. They can appeal to the young and those of quite different specialisms who might have been assumed to consider this alien territory.

"I noticed that the clocks are from France, Britain and Switzerland. I noticed that there are differences between the designs, in particular the French ones are more imaginative. They have things like a light tower and a balloon. The British ones are splendid and sophisticated. There are repeat designs like the

elephant and the pineapple, which made me wonder why they were favourites. Was it for India? So, I'm prompted to be curious about the history and culture behind the designs of the clocks."

Engineering student, Beijing Jiaotong University

There is a predictably greater interest in the UK in the clocks from the business and workshop network of James Cox and also in the 18th century trading relationship between Britain and China. The fantastic designs, entertaining and sophisticated mechanisms, and the connections and ramifications to the story extends the appeal beyond the narrow focus of the timepiece academic and enthusiast.

"I think the story of this is far bigger than clocks. It is about the relationships between countries, where people didn't understand each other and made assumptions about each other and this is expressed in this weird world of fantasy clocks".

Horological specialists and timepiece enthusiasts, London

The fantastic decoration of the clocks and that the timekeeping mechanism can almost seem to be an afterthought is integral to their charm and appeal. It also adds to the challenge of recognition and classification. Among the focus group with timepiece specialists and enthusiast in London only four of the eight knew of the collection and the timepieces created by James Cox for the trade with China.

The story and collection can be a fascinating discovery, yet anecdotal digression from established specialisms and dominant narratives of horological history. The clocks are simultaneously delightful and intriguing but can defy established classification.

"I find it interesting that they created this world but were never there. The automata have so many facets to interest so many different people. You have the internal workings, the art side, the stories behind them. That's why they're such a good thing. One object can tell a multitude of stories."

Horological specialists and timepiece enthusiasts, London

It was also evident that the exceptional craftsmanship and intricate external detailing appealed to other specialist audiences. Jewellers were encountered among the visitors to *Treasures of Time* in Hong Kong and their response was enthusiastic. The discussion group with a team from London jewellers House of Garrard revealed there is connection and enthusiasm among specialist audience groups beyond those specifically passionate about horology and timepieces.

"It's obvious why these appealed in China. They love anything shiny, gold and elaborate. Might seem a bit 'bling' here but you can't help but be impressed by the incredible detailing – and they do make you smile, it's like being a kid again."

Creative team, House of Garrard, London

The appeal of the clocks is invariably secured by demonstration. The visitor imagination is captured by seeing, or at the very least appreciating, these to be automata. This factor is going to be more important in the UK where the decoration and aesthetic is not necessarily to the taste of the domestic audience and where collections and galleries dedicated to clocks can seem the dry domain of the enthusiast.

"I don't think any of the clocks are interesting or attractive as clocks, but what they do is fascinating from an engineering and an artistic perspective. The challenge is getting members of the public to engage with what many might initially consider to be elaborate but ironically boring objects."

Horological specialists and timepiece enthusiasts, London

"If I think of collections of clocks I think of old people in tweed jackets and stuffy 'Antiques Roadshow' (the UK TV programme). Seeing them working and their mechanism makes them interesting and stops them being antiques."

Younger Museum goer, London Science Museum

There was significant interest in the fantastic surface decoration. Audiences in all locations wanted to know more about sources of inspiration and for the characters, mythologies and astrological references that appear on the clocks to be explained. In many cases these are fantasy Neverland scenarios that are a merging of references from East and West. Inevitably, visitor's own cultural background will influence what they know and want to know. Interpretation emphasis needs to respond to different cultural perspectives according to location. It is a positive outcome of the collaboration that the decoration often evokes the connection with the familiar and equally prompts curiosity about either source or destination culture.

"Many of the clocks seem very Western in terms of mechanics and artistic look. It reminds me of the crazy mechanical devices in Dumbledore's office in the Harry Potter films. They are very imaginative devices."

Engineering student, Beijing Jiaotong University

"I like it being about two cultures interacting. China used to tell time in a very different way. One of the quotes from an emperor spoke about how accurate his clock was and I thought to myself that's a dramatic change in lifestyle."

Young 'International' (focus group two), Hong Kong

"The Chinese-made clocks show there is a different culture of time, mythology and gods. When they have the exhibition in London there should definitely be clocks made in China, to give a more accurate reflection of the culture of China."

Engineering student, Beijing Jiaotong University

Consistently the importance of seeing demonstration emerged in the research and carries significant implications to museum and exhibition interpretation. Importantly, it also indicates the opportunity offered by the planned digital resource.

Future presentation and exhibition promotion will need to challenge the narrow assumptions and specialist associations that the promise of 'clocks and timepieces' might encourage. The curiosity and fascination the collection can engender is an inclusive story that can unite educationally and culturally diverse audiences.

"The trading relationship is more interesting than the clocks for me. There are all these different players and it's about people, connections and stories. I would really hesitate from (the Science Museum) marketing this simply as an exhibition about clocks."

Horological specialists and timepiece enthusiasts, London

"I didn't have an interest in clocks but when I saw the Chinese designs and the English styles I was surprised by how crazy they were. They were very impressive. For me a clock is for utility, to be on time; I didn't expect at that time they would be wanting to add things like music, mirrors and multi-functions. The mechanism inside was impressive, eye-opening and expanding."

Young 'International' (focus group one), HKSM

7) Implications of venue, interpretation and presentation

The visitor evaluation project considered the response to the collection in the context of different and prospective host venues and environments. In addition to relevance and connection, according to the visitor's culture and home nation, there are also associations and assumptions inescapably prompted by the venue where the collection is displayed.

For the non-specialist visitor:

A palace prompts different assumptions and associations than a museum.

A science museum is assumed to have different priorities to a history or art museum.

Static displays in vitrines prompt different responses to mechanism that are demonstrated.

These are factors which carried implications to understanding and engagement with the collection. More importantly they will influence what is assumed to be the emphasis of interpretation and the expected priority of presentation in that particular exhibition environment. Visitors to what is called a science museum tend to expect a more significant emphasis on the explanation of 'how things work'. Visitors to a palace are more likely to respond to the collection as the luxurious and precious artefacts of an emperor's home.

The collection is unusual, even idiosyncratic, and as such defies simple and niche classification. To define it as a 'collection of clocks' can limit appeal and appreciation. The added factor of the associations of host environment can further influence understanding.

"I was expecting it to be more based in the science of how it works. How innovation came from the UK and how it first influenced and then was incorporated in China. That doesn't come across at all and I'm not going to appreciate the fanciness of the art unless I have an anchor in the science of it."

Young 'International' (focus group one), HKSM

"I thought they were presented beautifully as art, but if you were trying to present the scientific aspect of it that probably didn't come across so well. That's if you want to go into gears, how the mechanisms were developed. You would think they would as we are in The Science Museum."

Young 'International' (focus group two), HKSM

In the London focus group with younger exhibition-goers there was initially some surprise that the exhibition and digital resource was a collaboration involving the Science Museum. There was an assumption that it would be from a museum where the priority was history or decorative arts (such as the Victoria and Albert Museum). In this context, the Science Museum as host environment prompted the belief that the priority for interpretation would be objective explanation of the mechanics of operation.

In all locations and irrespective of venue, seeing the automaton 'perform' and gaining some access to the mechanism enhanced quality of engagement and emotional delight. For many, viewing the mechanism is enough to impress and though they will say they want to 'understand how it works', invariably just seeing the complexity and craftsmanship is often sufficient.

The fragility (and condition) of the clocks results in the majority being encountered as static objects in display cases. The movement and sound integral to their design and purpose is missing. At worst, requiring a presentation approach that separates them from the visitor and conveys the impression of

an academic collection gathered to be respected rather than enjoyed.

The demonstrations observed at the HKSM (by necessity limited in frequency) attracted larger audiences than the space could comfortably accommodate, as they were struggling to see. Despite the physical inconvenience, there were consistently sighs of delight from the captivated audience. The impact was similar when showing the video of the restored *'Gilt Bronze clock with country scene'*. The ideal is to introduce the clocks *'in performance'* as it invariably prompts curiosity in the mechanism that enables the magic.

Accompanying accessible 'human stories' help to stimulate empathy and engagement. The characters and connections may have differed between China and the UK, however the power of an accessible 'hero' was evident throughout.

In China, the CCTV documentary *Masters in Forbidden City* was a major ratings success (with a 9.5/10 score on China's ratings website Douban.com). To quote from the *China Daily* the essence of the success was as follows: *"the documentary does not dwell on the past. Instead, the camera focuses on the ordinary individual human beings – the restorers, and their life in Beijing, which creates a bond between the audience and the restorer"*.

The documentary made a media celebrity of the unassuming Mr Wang Jin, Horological Conservator of the Forbidden City. In both Beijing and HKSM the series was cited as both inspiration and motivation for visiting the collection. (HKSM estimates suggest that over 50% of exhibition visitors were from mainland China, where the TV series was likely to be an influence).

During the formative groups in the UK, James Cox emerged as the 'celebrity' of the story. That a London based producer-entrepreneur was creating fantastic automaton to delight an emperor in China was a source of fascination. Empathy with an accessible albeit gifted individual stimulated interest in the many dimensions and threads of the remarkable story.

The fragility of the clocks and consequent limitations on frequency of operation suggest the importance of creating the digital resource that offers greater opportunity to both see movement and to gain access (and understand) internal mechanism. It also provides a way to better understand the role of the museum conservator in the preservation and longevity of operation of these precision instruments.

"I feel quite suspicious when I see that garden scene one working because there's definitely been a lot of parts replaced. At what point is it not the same object anymore? In saying that, it retains the fingerprints of the makers all the way through the years – which is inspiring and fascinating in itself."

Horological specialists and timepiece enthusiasts, London

8) Audience and visitor evaluation specific to location

As it has been established, the cultural context, presentation, host environment, visitor knowledge and expectations will result in different experiences and connections. In order to establish the opportunity and specification requirements for the creation of a digital resource it is important to review the response to the collection in the three host environments of the collaborators.

(i) The Hall of Clocks and Watches at The Palace Museum: Visitor evaluation.

The Hall of Clocks and Watches has recently reopened after major refurbishment and interpretation refreshment. The vast numbers of tourist visitors to the Forbidden City guarantees a constant flow of traffic that bring unique practical and logistical 'crowd control' challenges. Keeping visitors moving,

ensuring this is in a consistent directional flow and minimising diversions and dwell-time is a priority. The congestion that would result from practical demonstration is impractical and the most tolerable extended dwell-time can be the regular sequencing of video demonstration.

The suggestions from the discussion group with the Hall of Clocks and Watches volunteers and comments from a few of the intercept interviewees who knew the former space is that the new gallery forfeits some of the 'disorganised character' of the old gallery but is a significantly more efficient space for coping with visitor numbers and demand. That said, the exhibition floorspace is smaller and only a small proportion of the collection can be on display at any time.

"The previous gallery was quite spacious – it had a front and rear hall and an H shaped hallway. There were screens with stools for people to sit and watch an animation. There were many more exhibits than the current one."
Hall of Clocks and Watches Volunteers, The Palace Museum, Beijing

The volunteers confirmed the impression that there are slightly different connections and points of emphasis to the 'story' according to exhibition location and indigenous culture.

"The front hall here was mainly for Chinese and British pieces. There was the opportunity to compare the two. The rear hall was for the French and other pieces from different regions. The timepieces came from different sources; there were those from the Imperial Commission from within China. A larger number came from Britain and other foreign countries through the trade system."

Hall of Clocks and Watches Volunteers, The Palace Museum, Beijing

While this is certainly not a contradiction, it does reflect a greater emphasis on the broader perspective of the emperor's collection rather than the story of James Cox and the trade in clocks with the UK that so particularly fascinates the audience in the UK.

Observation and intercept interviews confirmed much of the practicalities and insight shared by the project team from the Publicity and Education Department from The Palace Museum:

- Majority of clocks are displayed along the walls of the gallery and seen through 'window' apertures.
- 'Star' exhibits (elephant carriage, writing automaton) are in free-standing cases that can be circulated.
- Intercept interviews encountered several returning visitors with an interest in the Gallery of Clocks.
- Significant numbers of Chinese visitors referred to having seen CCTV's '*Masters in the Forbidden City*'.
- Pressures on visit time and limited text access due to crowding had implications on visitor 'learning'.
- Many of those interviewed assumed the clocks were made of precious stones and materials.
- Story of the trading relationship is seldom known – these are treasures in the emperor's palace.
- Video of clock demonstration and the restoration workshops are popular and enhance appreciation.
- Prodigious numbers of photo images are taken; often to share the experience and record favourites.

Context and practicalities of the Hall of Clocks and Watches further support the benefits of a digital resource that can both enhance the interpretative provision in-gallery and importantly increase access to the fuller collection and provide a resource for more considered study. This is particularly appropriate as discussion with the volunteers confirmed the contradictory demands posed by excessive visitor numbers and the curiosity generated by the inspiring CCTV documentary.

"Frequently the visitor only understands how the clocks work by our explanation. In the old one we had a video which showed how the clocks actually worked. That really helped the audience appreciate the artefacts. Otherwise they have to imagine it."

Hall of Clocks and Watches Volunteers, The Palace Museum, Beijing

"Some visitors have watched the TV documentary and seen the bird pop out from a clock chirping. They come to the gallery wanting to see it and to know how it works".

Hall of Clocks and Watches Volunteers, The Palace Museum, Beijing

The focus group with Engineering students from Beijing Jiaotong University highlighted several practical limitations that could potentially be addressed by a digital resource. The lack of access to exhibits 'in the round' was considered a disadvantage and low lighting made it harder to see the detail (though perhaps a conservation consideration). Though sympathetic regarding the need to manage vast visitor numbers to the Hall of Clocks and Watches, there were positive suggestions regarding the way interpretative technologies could enhance the quality of experience.

"Google recently had an amazing homepage for the 300th anniversary for Bach. They had a cartoon of a piano and little gears so that the viewer could play it and see it work. It would be fantastic to have a similar animated explanation for the gallery."

"With the number of visitors each person has a very short time to look at the exhibits, so it would be a great idea to create a 4D cinema to demonstrate an entire piece and to show how it works."

Both quotes from the focus group with Engineering students, Beijing Jiaotong University

(ii) Treasures of Time at the Hong Kong Science Museum: Visitor evaluation

Response to the exhibition was extremely positive, with 67% of the 905 exit interviewees recording the highest available approval rating for quality and range of exhibits. It can be assumed (though not confirmed by actual data) that a high proportion of those interviewed were specifically visiting HKSM for *Treasures of Time*. This is implicitly confirmed by HKSM staff estimates that at least 50% of visitors made the journey from mainland China.

The exhibition narrative opened with significant floorspace and exhibit emphasis on the history and philosophy of timekeeping and the innovations of Ancient China. This was of particular interest to school and education groups, which was reflected in observed length of dwell time. Teachers and group leaders spoken to in the 'intercept interviews' confirmed the importance and relevance of this topic to the school syllabus.

There was a significant 'interactive area' at the end of the exhibition which was highly appropriate for the 'family' audience that tend to dominate the visitor profile of HKSM and certainly 'on brand' for an environment that is famous for exhibits that explain science by interaction and exploration.

The *Treasures of Time* exhibition was a major HKSM initiative. It reflects a long-standing commitment at HKSM to temporary exhibitions that attract adult visitors and that challenge the limiting perceptions of a 'science' Museum. As with the Science Museum London, there is a rationale and strategic emphasis on the relevance of science to the visitor's everyday experience.

"It's more history than science. In the Science Museum I would expect more about how it works"

Volunteers and Visitors group, HKSM

This assumption that a 'science' museum '*explains how things work*' was more of a problem for several members of the museum's Docent team, many of whom were from science education backgrounds and felt underprepared to lead groups around what they considered to be essentially a history and art exhibition. (Note: it was evident that appropriate briefing had been provided for the docents however several felt the exhibition theme was beyond their skill-set and confidence.)

The variety of themes and historic periods covered by the exhibition was significant. For some the narrative was too expansive and transitions from one theme to the next could be a little confusing (for example, the transition from the London Workshop to the Palace Museum collection). Respondents in the focus groups and visitors in the intercept interviews did not always appreciate that many of the clocks were created in London and the workshop was effectively scene-setting for the story of the sing-song trade.

In both Hong Kong (and to a lesser extent in Beijing) there is more to the story than the James Cox episode and the 18th century trade with London. The following themes and zones featured in *Treasures of Time* and were commented upon by visitors:

- China's cultural fascination with measuring time.
- Models of timekeeping instruments 'invented' in China.
- Matteo Ricci – Jesuit connection and exponent of calendrical science.
- Clocks by Cox and workshop, obtained via the trade and tribute system.
- Clocks sourced from other European countries for the Chinese emperor.
- Inspiring Chinese clock-making workshops and a unique domestic school.
- Family interactive gallery that focuses on the 'science' of time and timekeeping.

"The transition between different areas is a bit abrupt. In the first part we're shown some ancient instruments used to measure time, then we enter a workshop with the figurines and then the main collection, and then we go on to a play area for kids. I think the first parts needed to be more smoothly and obviously connected."
Volunteers and visitors group, HKSM

"I was amazed at the Italian guy bringing mechanised clocks to China, and before that everyone was using water wheels. Well, that's what I learned from the video at the beginning. I was surprised that the West took clocks to the East."
Young 'International' (focus group one), Hong Kong

All of these themes are very relevant but does result in visitors tending to focus on what they find interesting and sometimes missing a unifying narrative thread. Those with an affinity to Chinese culture, whether from mainland China or of Cantonese heritage, were more likely to focus on and connect with the story of emperor as collector rather than James Cox as creator. From a 'Chinese' perspective the quest to understand and measure time is more than the story of a seventy-year trading relationship with 18th-century Britain.

As with all locations, demonstration significantly enhances engagement and stimulates a curiosity to explore mechanism (both to understand and to see). The demonstrations were extremely popular but by necessity limited in frequency. The interactive models explaining elements of the mechanism were also very popular, both because they focused on simple 'tricks' (glass simulating pouring water) and because the high production values compared sympathetically to the collection. It was evident they provided playful relief in a gallery that could seem formal and static.

Video excerpts of the Clock Conservation Hospital from *Masters in Forbidden City* were very welcome, though they might have been given greater prominence. Many ideas also emerged that are directly appropriate to the opportunities of a digital resource:

"Visitors asked if it were possible to have animations to demonstrate movement. The film can seem too technical. Although the object was created hundreds of years ago it was a daily object that's close to us and people use it for entertainment; it should be explained simply." Volunteers & visitors group, HKSM

"What is shown of the clocks on the video is limited. The majority of what people see is static with just a description on the side. I think people are interested in how it works because they want to see 'the magic'. How does it make the bird flap its wings? Not just how the mechanism works."

Volunteers & visitors group HKSM

The exhibition can be judged a success and hosting this prestigious loan from the Palace Museum was a major coup for the HKSM. That said, awareness of the exhibition might have been better in Hong Kong and there is the suspicion this may have been due to a 'science museum' not being the venue where many would expect to see this collection.

An interview with the editor of a Hong Kong magazine that gives significant space to luxury collectibles and art revealed they were unaware of the exhibition. Members of the Hong Kong Collectors Circle said that they discovered the collection was coming to Hong Kong when visiting the Palace Museum and that they might have missed it if they had been dependent on Hong Kong publicity and media. Hong Kong society seems to operate in exclusive circles that don't stray far from their social set. The success in attracting visitors from mainland China might also suggest the comparatively limited ability to draw audiences from within Hong Kong to a destination exhibition.

Seeing CCTV's *'Masters of the Forbidden City'* captures the imagination and attracts audience. One Hong Kong-based journalist (born in mainland China) interviewed by email was actively involved in reporting the *Treasures of Time* exhibition for local media. The focus of her enthusiasm confirms the importance of finding human stories that breathe life into the collection.

"I think the clock collection is so interesting, not only because of the importance of the items but more importantly because of the lovely people and stories behind them. It is a pity that not many Hong Kong people know about this documentary. On the opening day of the Treasures of Time, when I did the interview with Mr Wang Jin, other journalists present did not have a clue who he was."

Hong Kong-based video journalist, Chinese heritage

There are other factors that may have influenced interest and attendance in Hong Kong. There are *'Hong Kongers'* who are wary of the increasing cultural presence and influence of mainland China. An extension of the Palace Museum opens in Hong Kong in 2022, other Palace Museum-linked exhibitions have been in the past and more are ahead (one at the HKSM). It might simply be an issue of novelty burnout. A collection from the *Forbidden City* is likely to excite a London audience but it might not have the same resonance and sense of uniqueness in Hong Kong.

"...If you asked me which is the most exciting: treasures from the Palace Museum' or 'treasures from the British Museum', I would say British Museum instantly." (Note: *A History of the World in 100 Objects* British Museum touring exhibition had just opened at the Hong Kong Heritage Museum.) Volunteers and visitors group, HK

The overall success of 'Treasures of Time' at HKSM is evidenced by its ability to attract new audiences (largely from mainland China). It also challenged and stretched prevailing assumptions of what a science museum can offer. By focusing on the human fascination with the concept of time and the history of timekeeping it made the 'science' more relevant and accessible. The creative indulgence of many of the clocks often prompted an emotional connection that led to greater interest in the 'mechanism behind the magic':

"The exhibition changed my perception of what a science museum is. It's not just about understanding how things work. It's about the history and background stories, rather than just understanding how gears and mechanisms work."
 Young 'International' (focus group one), Hong Kong

(iii) Response at research sessions at the Science Museum, London: Formative evaluation

The London phase of the evaluation introduced the collection to audiences who would potentially be interested in either or both exhibition and digital resource. The two focus groups were recruited to offer two different perspectives on the proposition.

It was assumed that the horological specialists and timepieces enthusiasts might well know the collection and be excited by the prospect of access to a digital resource and a London exhibition presence. The reaction of the second focus group of young Londoners was harder to anticipate (note: all had previously visited Science Museum exhibitions). The suspicion was that the younger group might stereotype a 'clock collection' as the preserve of the mature antique collector – a niche obsession rather than one that has on-trend appeal and wider relevance.

The focus groups were initially introduced to the collection using a video demonstration (*Gilt bronze clock with a country scene*). The sessions also included a presentation summarising the history of the collection (including Chinese inventions and the story of Matteo Ricci).

Being a formative evaluation, without access to collection or exhibition, it was a forum where primary points of connection and interest could be established.

This was significant for Western audiences who might be less familiar with the collection and for whom classifying the genre might be challenging (*'yes...they are clocks, but not as we know them'*).

Interest in the UK instantly focused on the clock and automata of James Cox and the flourishing Sing-Song trade with China in the 18th century. For the younger exhibition-goer group, and even for many in the 'experts' group this was a revelatory discovery where interest and relevance extended beyond the clocks as precision instruments. All were fascinated by the context, inspiration and commissioning process behind these fantastic creations. It is the fanciful designs and automata that captured the imagination and were consistently equally appealing to expert and novice.

As a timepiece enthusiast and a watchmaker pointed out, clock collections without a compelling story can seem dull:

"There are plenty of weird clocks in the Science Museum that people walk past every day. Clocks aren't that interesting for most people."

Horological specialists and timepiece enthusiasts, London

"How they actually work is of minimum interest. When I sell watches it's the stories around them that people get caught up in."
 Horological specialists and timepiece enthusiasts, London

The notion of a London-based clockmakers creating these fantastic automata to delight the emperor of China provides a captivating story; one where the sources of inspiration are as appealing as functional mechanism:

"I love it when you can recognise the animals that the artist would have known. Horses look like horses. The camel is pretty much like a camel and the elephant is not far off. Now when you see a dragon, that's no Chinese dragon. It's virtually the back-end of a dog and the front-end of a swan."

Horological specialists and timepiece enthusiasts, London

The story of James Cox and the clocks from the Sing-Song trade is the gateway story for the non-specialist UK audience and leads them to other threads and connections. The selection of twenty-five clocks coming to London will ensure the exhibition narrative can allow greater emphasis on this episode that has greater resonance for the UK audience. It will also prevent an abundance of clock exhibits and horological themes overwhelming the visitor. This is essential if the exhibition seeks to appeal beyond the timepiece enthusiast.

In the UK there will be significant interest in the prestigious nature of the loan and the appeal of a collection from the evocative 'Forbidden City', particularly one that has an historic connection with London. That the clocks seldom travel outside of China is a significant motivation to visit the London exhibition and will attract an audience who would not usually expect to be interested in a clock collection.

As with all the fieldwork locations seeing a demonstration either live or on video, charms, fascinates and stimulates greater interest. Demonstration is essential to convey the magic of the automata and avoid the assumption that this is a static collection of antique timepieces. Given that opportunities in London to operate the actual clocks will be limited to special events, there is greater onus on the need for video and interactive digital resource to explain and demonstrate. This will both enhance exhibition interpretation as well as attracting and reaching audiences via website and social media.

At the London Science Museum, it is likely to be the charm of the automata, fantasy of the aesthetic and the intriguing history that will reach and captivate audiences beyond the timepiece enthusiast. The curiosity generated will stimulate interest in the mechanism behind the magic and invite creative explanations of the 'science' either as digital resource or via interpretation skills in-museum.

9) Engagement with historic collections and opportunities for visitor evaluation

The report highlights the evident differences, as well as many similarities, between museum visitor behaviour as witnessed in the three locations – Beijing, Hong Kong and London. Museum visitors in the UK and China reflect very different educational and cultural experiences and background (note: this report only focused on museum provision in major cities).

The commitment to ensuring free-access to major museums in the UK has created egalitarian 'leisure environments' that offer access to opportunity for education and development. The visitor is not under pressure to learn nor made to feel inferior. What they may gain, *a learning outcome*, is the product of their own initiative and also based on how interesting and engaging the museum makes the experience. Visitors are consumers of a resource that competes for their time and interest.

This is a challenge for pay-to-enter temporary exhibitions that compete for the discretionary income of UK museum-goers. The frequent priority and objective being to maximise audience appeal and attendance whilst satisfying curatorial integrity for the exhibition and fulfilling the strategy and content remit of the museum.

In this context the UK has evolved visitor evaluation techniques and a market research service-sector that specialises in generating insight to address these specific challenges. The formative motivation might not be as appropriate to other cultures, however many of the techniques that have been developed are applicable in different circumstances.

It would seem that in China there is less pressure on the museum to maximise audience reach but rather to ensure the provision of an environment that is appropriate to collection and ensures academic excellence. Managing the vast numbers of visitors to the Forbidden City is challenging enough before adding the complexity of using entry-data as a resource for understanding demography and visitor profile. That said, if the purpose is to understand motivations and reactions to the Hall of Clocks and Watches then a focused methodology would have benefits.

The HKSM secured over 900 interviews with visitors to *Treasures of Time*. The quality of insight might have been marginally improved with greater refinement of the question formats. The collaboration produced an 'appendix' study that secured a further fifty responses. To a degree it added to the insight, but perhaps more importantly it was a reminder that willingness to participate in interviews and the candidness of response will vary according to the culture of the visitor.

Visitor evaluation techniques in China are sophisticated but reflect a different context and circumstances to the UK. Visitor evaluation is often the responsibility of marketing departments and more likely to focus on the 'big data' of flow, entry and traffic to the institution. Audience evaluation that assists interpretation and formative development is more likely to be the territory of the education department. It is evident that all in China and Hong Kong were very alert to the opportunities of social media, and concepts and ideas were in evidence for using WeChat for visitor surveys and opinion polling.

As another example of comparison: UK museum visitors are more likely to critique and question the quality of interpretation provision and the exhibition experience. This can be extremely useful when the comments are constructive and voiced in an appropriate situation (focus groups or exit surveys), however museum visitors in China display an inherent trust in authority and defer to the wisdom of 'the expert'. They are more likely to need to be actively encouraged to voice any critique.

The collaborative aspect of the TCI project both demonstrated and confirmed the benefits of a shared approach. The scale of the research sample was significantly more extensive than the budget could have achieved if reliant on third-party commercial services. The commitment and willingness of each institution to share their time and talent, and to recruit visitor and volunteer research participants is confirmed by the content of this report.

10) Creative Brief – Considerations for a digital resource

The potential benefits of a digital resource were consistent and evident in all research locations:

- Seeing the 'movement' of the clocks and automata significantly increased curiosity and engagement.
- Appreciating that these are performing automata not static antiques is essential to broaden appeal.
- The fragility of the clocks and the number in working condition limits the opportunity to demonstrate.
- Museum presentation will benefit from a digital resource that assists interpretation and explanation.
- Appeal of the *story* to the collection varies by location – An appetite for context but flexibility is key.
- There is significant interest in the work of the conservation team at the Clock Conservation Hospital.

The priorities for a digital resource can be summarised as follows:

- Archive of the collection; internationally accessible for academic, enthusiast and novice.
- Create a forum for academic study, collaboration and debate.
- Provide an opportunity to see the performance sequence of the surface automata.
- Provide access and explanation to the interior mechanism – *see it working* and *how it works*.
- Explain the designs, mythology and inspiration according to interests of visitor and culture.
- Offer narratives and storylines appropriate to different interests and cultures.
- Create interpretative elements that enhance in-gallery experience of the clocks.
- Attract and convert new audiences – discoverers and curious, children and education groups.
- Provide instant-appeal awareness and social media triggers to attract interest beyond the museum.

The digital resource has the potential to both enhance the experience for those seeing the collection in a museum and more importantly offers wider access to a collection not trapped inside a museum.

An emphasis on visual access and explanation through video, graphics and simulation will increase immediacy and appeal. Emphasis on visual media will also make the creation of shared content less complicated. Limiting the volume of text will suit formatting in different languages.

The evident delight and emotional frisson among those watching the demonstrations at HKSM was proof that seeing (and hearing) these clocks 'perform' is essential. However, their delicate mechanism is such that frequency of operation has to be strictly limited and always with a trained supervisor present. As such, they cannot to be operated with the regularity to satisfy visitor flow and demand.

Many were created to be automata with the timepiece a modest nod to convention. Seeing movement is essential to appreciation. Yet, for preservation and protection they are more likely to be seen as static glass-cased displays. This Inescapably evokes the metaphorical barriers of the traditional museum vitrine and reduces the delight that these simultaneously whimsical and sophisticated creations can inspire. The digital resource has the significant opportunity to challenge convention and necessity of museum display.

A digital catalogue of the collection has the capacity to show the operation of every clock and automata that is in working order. It can be updated and refreshed to keep pace with the conservation and restoration projects of The Clock Conservation Hospital of the Palace Museum.

For the on-site museum and exhibition visitor the digital resource can provide access to movement, mechanism and backstory that enhances the encounter with the physical object. Increasingly QR codes are used to supplement the visitor experience (adoption and usage is greater in China and Hong Kong than evident in the UK). Video can bring the static to life and, explore and explain the mechanism.

A comprehensive digital archive creates an international resource that can adapt in tone, form and content to suit both focused-academic and curious-tourist. The Gallery of Clocks at the Palace Museum only has the space for a small selection of the collection. Touring and loan exhibitions provide access yet divide and disperse the collection. The creation of a digital archive offers a resource that can catalogue, promote and offer access in a way that enhances the out-of-necessity controlled museum encounter.

Content opportunities for a digital archive:

- Three-dimensional video tours of clock surface and interior.
- Demonstration of the 'performance' of all working automata.
- Access and explanation of the mechanism that creates the 'magic' .
- (Note that some want to 'see' the workings while others seek to understand.)
- Illustrate and explain symbolism, mythologies and fantasy of the clock design.
- Video access to restoration in the Clock Conservation Hospital, Beijing
- Definitive record of creator, history, provenance, connections.

The uninspiring and limiting description of this as a '*collection of historic clocks*' is the reminder of the challenge when trying to capture the imagination of newcomers. In the absence of visual example and animation the 'magic' is lost. Simple verbal and text description tend to convey a niche specialism, likely to be the domain of the horological enthusiast, collector and academic.

A primary objective of the resource is likely to be the provision of an academically robust resource used by an international audience of specialists and experts. It is essential that the creative outcome has the integrity and content to satisfy this purpose.

The resource should provide access to both the interior and exterior of the clocks. This can be filmed actuality, simulation or animation. Cartoon animation can frequently bring clarity to the complex and avoid the distractions of operational machinery. When planning the digital resource, different interests should be taken into consideration when explaining and exploring the mechanism:

- Access to the mechanism enables an understanding of 'how it works'.
(There is evident appetite among timepiece enthusiasts for a 'masterclass'.)
- Access to the mechanism for the visceral pleasure and to satisfy curiosity.
(This was used to great effect in CCTV's *Masters in Forbidden City*.)

The digital resource should work on different levels to suit audience knowledge and interest. The excellent books produced for school visits by the Palace Museum, Education Department show that cartoon illustration offers a playful and effective way to explain historical event, context and timeline within a consistent graphic language - treatments that might inspire animation on the digital resource.

There is an evident opportunity for the resource to reach new audiences and delight those with an impulsive and ephemeral curiosity. However, it must be stressed this audience will not seek out a website if they don't have a reason to and they are wary of anything implying dry archival resource.

Impactful hooks and bite-size teasers that instantly appeal are needed to capture imagination and attract exploration. Social media and instant information formats are particularly welcome and are of course more salient to the media and behaviours of young audiences. Factors worth noting:

- Interviews in the Palace Museum encountered many sharing 'favourite' clocks on WeChat.
- Video of the demonstration of the '*Gilt Bronze clock with country scene*' instantly captivates.

Analysis of the legal restrictions on internet access and online video content in the People's Republic of China are beyond the scope of this evaluation but need to be addressed in the response. The example of CCTV's *Masters in Forbidden City* has proven the appetite in China for video access to the behind-the-scenes story of the collection and is a valuable clue for potential content.

Comments from the focus groups directly applicable to the creation of a digital resource:

"Once I saw the demonstration in the chamber with the lady working all the boxes, hearing the music, it brought all the other clocks to life." Young 'International' (focus group two), HKSM

"It needs to have instant appeal. No one is going to surf the net to see how these clocks work." Young 'International' (focus group two), HKSM

"..because of the delicacy of the originals it would be good to see replicas that reproduce the movement of the timepieces. It would be ideal to see the original timepiece and to have a demonstration to understand its movement at the same time." Engineering student, Beijing Jiaotong University

"Visitors have asked me if it is possible to have a video animation to demonstrate movement. We need to be reminded that though they were created hundreds of years ago they were meant for daily use and by people for entertainment." Volunteers and visitors group, HKSM

"More animation is needed. If it was online something like a TED talk would be good. Explain it in one minute. Also, because the demos in the museum are only on twice a day it would be good to have them on a screen at other times so visitors could be given a tablet, walk to a particular spot and see the demonstration or animation." Volunteers and visitors group, HKSM

"It would be ideal to see something on your phone. It's easier than a human explaining it. Not all the visitors come from very educated backgrounds and don't want to ask 'stupid' questions. Having something they can use to learn by themselves would help."

Gallery of Clocks Volunteers, Palace Museum, Beijing