What is the effectiveness of narrative approaches, immersive spaces, and interactivity in design for exhibitions and museums?

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Introduction

At its core, exhibition design is about the "dialogue between the object(s) to be exhibited and the space in which they are presented" (Dernie, 2006, 6). This simple definition may encompass the majority of the industry, but the purpose of individual exhibitions vary, creating a wide variety of design approaches that help to forward these aims. In this report, three exhibition design techniques have been chosen for closer examination, and examples selected. The intention for this report is to study the use of narrative, immersive, and interactive approaches, and analyse their effectiveness in achieving the aims of specific exhibitions. It will consider changes in the purpose and design of exhibitions throughout their history, from the opening of some of the first public museums in the eighteenth century to the growing influence of the experience economy today. It is important to note that although the examples will be studied for their use of a particular technique, all approaches are likely to be present in the broader design of each exhibition, as they combine to accomplish the aims of the museum. It is important to understand the contrasting aims of museums and the effectiveness of various design approaches in meeting these aims, in order to develop a deeper understanding of how to design an effective museum exhibition.

Part 1: Context

Before the middle of the eighteenth century, museums were private collections; curiosities collected from around the world and displayed in the homes of wealthy and powerful individuals, to inspire awe and discussion from their guests (Roppola, 2012). As political viewpoints shifted left across Europe (Britannica, 2015), the opening of museums to the public represented a sharing of knowledge; a shift of power between the many and the few (Roppola, 2012). The British Museum, opened in 1759, was one of these, and as the "world's first free, national, and public museum", it paved the way for other institutions to follow (The British Museum, n.d.). The museums were limited in terms of exhibition design; imposing architectural structures that held their collections in glass cabinets, they were more "physical encyclopaedias" than designed exhibitions (Roppola, 2012, 15) (Figure 1).

Figure 1: Ethnographical Galleries at the British Museum (Donald Macbeth, 1908)

The nineteenth century saw the emergence of replication in museums; taking far-away locations and reconstructing them in an accessible location, creating habitat dioramas in natural history museums, and recreating architectural interiors for visitors to explore. By the

early twentieth century, replication had spread to science and technology museums, where visitors could interact with working models of factory equipment. These ideas of replication and interaction grew slowly, but were gradually adopted by traditional museums as a way to supplement their collections, and by the 1980s interaction in museums was implemented internationally (Roppola, 2012). The Black Country Living Museum (Figure 2) is an exceptional example of replication in museum design. The breadth of replicated scenes has grown steadily since it opened in 1978, when houses and shops were relocated and replicated brick-by-brick to create an accurate representation of Victorian life in the Black Country (Birmingham Updates, 2017). *The Launchpad* at the Science Museum in London (Figure 3) was revolutionary in its high level of interactivity when it opened in 1986, aiming to "inspire through participation" (The Science Museum, 2015). At this time, education of a wider audience was the primary aim of museums, rather than research as it had been before, and the theory that learning is improved by active participation backed the international rise in replication and interaction (Roppola, 2012).

Figure 2 The Black Country Living Museum (VisitBirmingham (2021)

Figure 3 Launchpad at the Science Museum (Science Museum, 1986)

By the end of the twentieth century, the experience economy had emerged. First defined by Pine and Gilmore (1998), the "experience economy" is an evolution of previous economies: agrarian, industrial, and service. Pine and Gilmore note the rise in popularity of "experiences"

outside of the entertainment industry, with customers beginning to desire a memorable, perhaps even personal, experience to accompany their goods and services (Pine and Gilmore, 1998). Build-a-Bear is an example of a business that successfully utilizes the experience economy method; it is a stuffed toy store that goes far beyond the expected goods economy retail model that exchanges goods for money. The fun, factory-themed stores offer customers the experience of customising individual stuffed toys, told through a story in which the customer brings them to life by inserting a small heart (Figure 4). This layer of experience adds value to the goods being sold and is the reason for the business' success (Pine and Gilmore, 2011).

Figure 4 Build-a-Bear (HRDS, n.d.)

Adding value to goods and services is how experiential businesses are so profitable; customers would rather pay more for a cup of coffee in a cafe that offers a sense of ambience than buy a cheap coffee from a fast-food outlet (Ibid.). Therefore, designers are an integral part of the success of the experience economy: in order for more expensive cafes to bring in customers, these spaces must be designed to heighten the coffee drinking experience, creating ambience that makes the customer want to stay for longer and order another drink.

For example, C2 Cafe and Bar, by Various Associates, is designed to create the sense of a cabin retreat, giving customers a break from the hustle and bustle of city life (Figure 5) (Crook, 2021). Compare this to Waves Cafe, a traditional cafe and fast food shop that fits within the service economy (Figure 6). When buying a coffee at C2, the customer pays far more than at Waves, because they are paying for the additional experience of relaxing in a "sanctuary" away from the crowded city streets (Crook, 2011). In this way, the experience economy allows businesses to engage their customers in new ways, providing them with a designed experience that is more memorable, and sometimes more personal than goods and services business models.

Figure 5 C2 Café and Bar (Feng Shao, 2021)

Figure 6 Waves Café (Google Maps, 2014)

Museums and exhibitions were not exempt from this changing economy, and their aims and approaches have shifted in order to adapt to this new economic environment. Yellis (2010) likens exhibitions in the experience economy to plays; using narrative design to portray an underlying storyline that has the potential to emotionally affect the visitor, with galleries and individual exhibits working as acts and scenes. Indeed, the connections between theatre and exhibition design have become so strong, that in recent years the term 'scenography' has

become an accepted synonym for experiential exhibition design within the industry, with some design agencies, such as Atelier Brückner (Figures 7 and 8), referring to themselves as 'scenographers', rather than exhibition designers (Atelier Brückner, n.d.). Forrest defines scenography (in relation to exhibition design) as "an approach to spatial communication in which form, content and media are inseparable components of an experiential whole" (Forrest, 2014, 18). The integral role of 'the experiential whole' confirms that these exhibitions are becoming a part of the experience economy and conforming to the general public's desire for a memorable experience, thus creating an environment for visitors in which learning is more emotional and impactful.

Figure 7 Der Haus der Berge (Atelier Brückner, 2013)

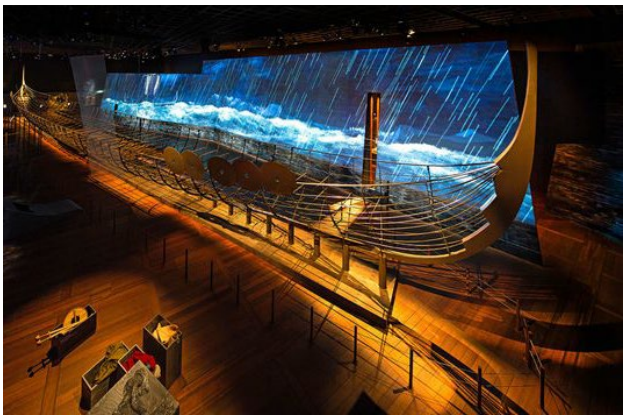

Figure 8 Viking (Atelier Brückner, 2013)

In order to achieve these new goals of visitor-centred, experiential exhibition design, visitor desires need to be studied. However, one study, by Zahava Doering, was met with objection from traditionalists within the museum industry, who believed that using a visitor-centred approach to museum design is pandering to the public's desires and will result in a simpler, watered-down approach that prioritises entertainment (Doering, 1999). These views are shared by Nick Prior, who sees this change in priorities within museums as a shift from "an aesthetics of distinction to a culture of distraction", comparing new experiential exhibitions to theme parks (Prior, 2006, 518). However, Packer disagrees, believing instead that "learning

in educational leisure settings reflects a synergy of education and entertainment… [A] new experience is produced that differs qualitatively from the singular notions of each" (Packer, 2004, 181). Falk and Dierking agree that experiential museums aid learning, as it becomes a "whole-body, whole-experience, whole-brain activity" (Falk and Dierking, 2000, 10).

Part 2: Narrative Design

According to Dernie (2006), narrative is, in simple terms, a method of structuring an exhibition by placing objects and exhibits in an order that tells a story. In its earliest form, it was a way of creating context for artefacts so that they may be better understood by a visitor. However, more recently, there is "an emphasis on creating a storyline which evokes an emotional response as a key component of the experience" (Dernie, 2006, 11), likely in response to the growth of the experience economy.

Figure 9 Fish and Folk
(Thijs Wolzak, 2018)

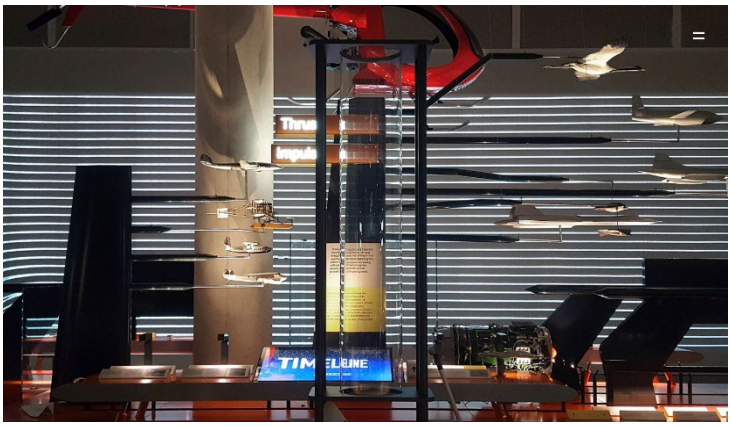

Figure 10 Feathers to the Stars
(Casson Mann, 2017)

Locker (2011) defines three types of narrative design: chronological, thematic, and integrated. Chronological narrative design, as the name suggests, follows a story in the order it happened; the exhibition becomes a detailed physical timeline (Locker, 2011). An example of a chronological approach to narrative is Kossman deJong's *Fish and Folk* exhibition at Reykjavik's Maritime Museum (Figure 9). The exhibition is about the fishing industry, and follows the chronological journey of a fish from its life in the ocean, through the fisherman's net and the factory, all the way to the dinner plate. This narrative is an understandable and accessible storyline for all who visit the museum, allowing people to experience the story from a different angle and showing all aspects of the fishing industry in a cohesive journey (Kossman deJong, 2018). In a thematic narrative, exhibits are grouped into themed zones that

may be explored in any order (Locker, 2011). *Feathers to the Stars* by Casson Mann is divided into three main zones: animal flight, human flight, and space exploration (Figure 10). The themes are distinctly separate, but individual visitors make different connections between them, in effect creating their own personal narrative of the exhibition, dependent upon the order in which they explored it (Frost Science, n.d.). Integrated narrative design combines these approaches, creating a thematic narrative that is explored in a set order, following an underlying storyline or emotional journey (Locker, 2011). One such design is the National Horseracing Museum by Mather and Co. (Figure 11). The themes of equine biology, the development of horseracing, science behind training, and the high emotions of racing day are explored through an emotional journey that follows the hard work and preparation to the excitement of the race (Mather and Co., 2016). This emotional narrative helps to engage the visitor throughout the museum, enabling a more enjoyable and memorable learning experience.

Figure 11 National Horseracing Museum (Mather and Co., 2016)

Early narrative in museums was much more linear, usually taking a chronological or developmental approach. In Fish and Folk, discussed above, the chronological storyline is

unexpected and is as much an emotional journey as a timeline. However, in early chronological exhibition design, objects were arranged in sequences that ended in the present. Botanicals and animals were arranged taxonomically along Linnaean principles, and then according to Darwinian evolutionary theories; art was arranged chronologically. These exhibitions aimed to educate, but the main purpose at this time was still research (Roppola, 2012). As such, these museums were “depositories of artefacts” (Dernie, 2006, 13), and used chronological narratives to structure their collections, rather than take the visitor on an emotional learning journey.

As the priorities of museums shifted towards visitor experience in the 1960s (Forrest, 2014), narrative exhibition design has become increasingly led by this idea of an emotional journey; using variations in intensity and emphasis to convey the underlying message of the exhibition, and making learning in a museum more enjoyable for a general public. Narrative design prioritises visitor experience (Dernie, 2006), and therefore performs an integral role in the design of a museum in today’s experience economy.

Part 3: Immersive Design

Figure 12 Symbiotic Seeing (Franca Candrian, 2020)

Figure 13 Atelier des Lumieres (E Spiller, 2021)

It is difficult to define exactly what an immersive exhibit is, and the attempt to define immersion in relation to exhibitions is the subject of much debate within the industry. Gilbert defines immersive exhibit design as "a multi-sensory experience which allows visitors to walk into the 'scene'" (Gilbert, 2002, 10). However, Bitgood argues the necessity of walking 'into the scene' excludes exhibits like glass-fronted dioramas that could be argued to have an immersive effect. Instead, he argues that immersive exhibits should be defined by "the designer's intention and the impact of the exhibit on people", although also admits that the feeling of immersion is, in itself, difficult to define (Bitgood, 2014, 177). Common ideas that arise when trying to define this immersive feeling are the sense of being in a different time or place (Bitgood et al., 1990), or having all five senses engaged (Chen, 2021). However, yet again, both of these exclude different types of immersive exhibits, whether they be more abstract immersive art installations, such as Olafur Eliasson's *Symbiotic Seeing* (Figure 12) and the *Atelier des Lumieres* (Figure 13), or one of the many immersive exhibits which do not engage the senses of taste or smell, such as MUSEEA's *We are the Remix* (Figure 14) or MET Studio's Hong Kong Wetland Park (Figure 15).

Figure 14 We are the Remix (Roda Sten Konsthal, 2018)

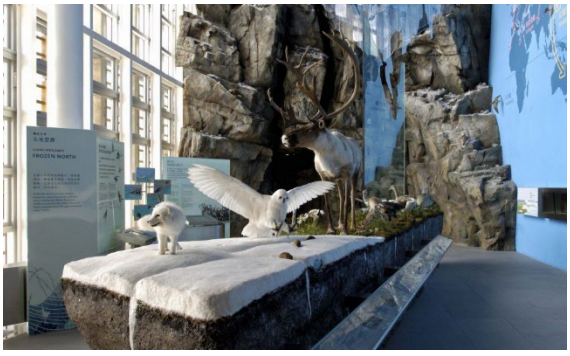

Figure 15 Hong Kong Wetland Park (MET Studio, n.d.)

Roppola (2012) splits immersive environments into three categories: reconstitutive, creative, and interpretational. In reconstitutive immersion, the aim is to replicate a real environment as accurately as possible (Roppola, 2012). An example of this is Hong Kong Wetland Park, designed by MET Studio, which replicates natural habitats indoors for visitors to explore, educating them about, and giving them an appreciation for, the importance of the local wetlands (Figure 16) (MET Studio, n.d. A).

Figure 16 Hong Kong Wetland Park Replication (MET Studio n.d.)

Figure 17 MAE Carbon Fibre Museum (CRA, 2021)

Creative immersion uses the presentation of a fictional environment to educate visitors on real world topics (Roppola, 2012). For example, the proposal for the MAE Carbon Fibre Museum by Carlo Ratti Accociatiati includes a futuristic archive room, where robotic arms retrieve documents and information for visitors to peruse (Figure 17) (Aouf, 2021). This immersive environment conveys a hopeful look towards the future, whilst also demonstrating that the use of carbon fibre is a feature of both past and present technologies. Interpretational immersion interprets a real-world environment or scenario in an abstract or

symbolic way, a technique which is especially useful when the topic is abstract, or not at a human scale (Roppola, 2012). For example, Es Devlin's design for the MET Museum's *About Time: Fashion and Duration* exhibition, uses interpretive immersive environments to communicate the abstract concept of the passing of time (Figure 18). In contrast, MET Studio's design for *Life Underground* at The Chicago Field Museum uses interpretive immersion to educate visitors about the extent of life and biodiversity found in a single handful of soil, by magnifying it one thousand times to a human scale (Figure 19) (MET Studio, n.d. B).

Figure 18 About Time: Fashion and Duration (Metropolitan Museum of Art, 2020)

Figure 19 Life Underground (MET Studio, n.d.)

The effectiveness of immersive exhibits in educating museum audiences is a topic subject to debate. Peart and Kool's 1988 study concluded that immersive environments successfully hold a visitor's attention, but are less effective in educating them than smaller exhibits which teach simply and quickly (Peart and Kool, 1988). However, Bitgood argues that their study held a bias towards factual knowledge, and ignored the value of visual and emotional knowledge. He suggests that the most effective method of educating visitors is a combination of interpretive text and immersive and traditional exhibits, to ensure a memorable experience of gaining visual, emotional, and factual knowledge (Bitgood, 2014). A successful example of

this combination is the Postal Museum, by Haley Sharpe Design, which uses collection artefacts, text, graphics, and immersive replication and projection to engage and educate the visitor (Figures 20 and 21) (Haley Sharpe Design, n.d.).

Figure 20 The Postal Museum (hsd, n.d.)

Figure 21 The Mail Rail (hsd, n.d.)

John Dewey theorised that all education stems from experience, but not all experiences are educational (Dewey, 1938); the use of immersive experiences to educate museum visitors is no different. To have 'experienced' something implies a level of active engagement, and exhibits aren't an experience in themselves; rather, they are "platforms for experiences" (Hennes, 2010, 25). Therefore, it could be suggested that the visitors themselves have a large impact on the educational effectiveness of an immersive experience, and that their "intentions, activities, imaginings and recollections" determine the educational effectiveness of the exhibit (Roppola, 2012, 43). The impact of the experience economy here cannot be ignored; *experience* is at the forefront of every discussion about the effectiveness of immersive environments. Indeed, these discussions almost tend towards the effectiveness of experiential exhibition design as a whole, with immersiveness being a single component, rather than the sole subject. Gilbert's findings show that immersive exhibits are not only effective in educating visitors in a memorable way, but are also highly successful "competitive leisure-time attractions" (Gilbert, 2002, 10), showing that they are an effective design technique for museums in the modern-day experience economy.

Part 4: Interactive Exhibits

Bitgood defines an interactive exhibit as "a device in which the visitor's response to the exhibit produces a change in the exhibit" (Bitgood, 2014, 116). This definition seems to typify the common ideas surrounding interactivity. However, Kennedy argues that interaction is not limited to physical interaction, but can also be invisible - a mental interaction whereby the exhibit instigates a dialogue in the visitor's mind (Kennedy, 1990). Economou's definition encompasses both of these, covering all areas of interactivity by stating that interactive exhibits "actively involve visitors physically, intellectually, emotionally, and socially" (Economou, 2008, 137).

Figure 22 Your Heart (Chicago Museum of Science and Industry, n.d.)

Figure 23 MoonCity (MoonCity, n.d.)

Witcomb divides interactive exhibits into three categories: technical, spatial, and dialogic. Technical interaction represents Bitgood's definition, and therefore the traditional idea of interactivity: physical participation (Witcomb, 2003). At the Chicago Museum of Science and Technology, the *Your Heart* exhibit features a 13-foot-tall heart animation, showing the interior and exterior of the heart and explaining how it functions. Visitors can use a pulse sensor, which connects to the animation and makes the giant heartbeat in time with the visitor's pulse (Figure 22) (Chicago Museum of Science and Technology, n.d.). This element of interaction connects the giant heart with the visitor's own body, and gives them an

understanding of how their heart and their pulse connect. In spatial interactivity, visitors make their own connections between exhibits based upon their spatial layout and relation to each other (Witcomb, 2003). In this type of interactivity, it is not necessarily the form or content of the exhibit that makes it interactive; rather, it is the impact of the exhibit on the visitor and how its spatial relationship with other exhibits forces the visitor to actively engage with the subject matter and create their own connections. An example of this is MoonCity, an exhibition by Archimedes for Porsche Holding, which uses spatial layout and lighting design to convey the theme of the exhibition: energy (Figure 23). LED strips flow between and around individual exhibits, creating visual connections and forming an "energy network" that centres around a light installation, demonstrating the central role of new electric developments in the journey to a more sustainable world (Archimedes, 2019). Dialogic interactive exhibits create dialogue in the visitor's mind by posing questions and presenting contrasting viewpoints and objects. Above each exhibit at Kossman deJong's design for *Project What If?* hangs large lettering which poses the questions that the exhibits will answer (Figure 24) (Kossman deJong, 2021). The text serves to draw people towards the specific exhibits they are interested in, while also triggering curiosity, making them consider their own ideas and possible answers to the questions before they find out at each exhibit. By asking these questions before giving visitors an answer, they engage the visitor and make them more interested in finding out. Atelier Brückner's design for the *European Elections since 1979* exhibition in Brussels is also an example of dialogic interactivity, as the exhibition presents many different political viewpoints and encourages visitors to reflect on their own beliefs and priorities (Figure 25). One exhibit combines technical and dialogic interactive techniques by asking visitors to 'vote' on which policy topics they think are the most important. The exhibit moves and tilts

according to which areas have the most votes, demonstrating the importance of one's individual vote (Atelier Brückner, 2014).

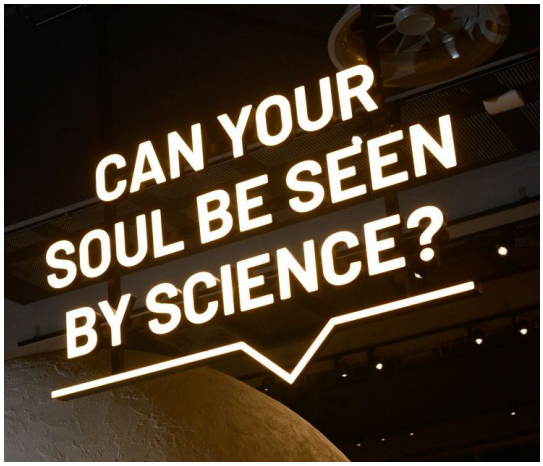

Figure 24 Project What If? (Lisa Whiting, 2021)

Figure 25 European Elections since 1979 (Atelier Brückner, 2014)

Digital technology is a common feature in modern day interactive exhibits - *Your Heart*, discussed above, is an excellent example of the effective use of these technologies. However, there are many different methods of incorporating them into exhibitions, and these methods have changed since their initial introduction. The National Gallery's installation of their digital 'micro-galleries' in the early 1990s allowed visitors to access more in-depth information if they desired it. It catalogued collection items and information into different indexes, allowing for easier navigation for the visitor. The 'micro-gallery' was "impressive in the quality and range of images", but it was not well integrated into the museum; visitors had to deliberately find, approach, and use the system, which therefore only appealed to those visitors with an already vested interest (Fahy, 1995, 91). Similar museum elements still exist today, but with the rise in the experience economy, the importance of integrating databases into the larger, experiential whole has been brought into greater focus. Casson Mann's *Lascaux Cave Centre* contains very little interpretational text in the space; instead, all visitors are given a multimedia guide that enriches their experience with augmented reality that interacts with

exhibits, and provides different levels of information dependent on the individual visitor's desires (Figure 26) (Casson Mann, 2018). The accessibility of this information makes the visitor much more likely to access it, and their ability to choose exactly when in their journey through the exhibition they wish to find out more means that they can answer any questions as they arise - rather than having to remember them when they find the database system. Of course, it is important to remember that the National Gallery's 'micro-galleries' were the height of their technology at the time, and were perhaps the most effective way in which that technology could be implemented into museums. Therefore, the increased effectiveness of database systems in museums can be linked to both the growing understanding of the experience economy, and the development of technology in the intervening period.

Figure 26 Lascaux Cave Centre (Casson Mann, 2018)

Interaction in museums is an effective learning tool, as it encourages the visitor to question their understandings and learn by doing. However, taking part in hands-on activities does not necessarily mean that the visitor is learning; the interaction experience needs to be valuable, rich in both educational and engaging aspects; the visitor must be engaged in order to be

educated (Roppola, 2014) (Bitgood, 2014). This idea links back to Economou's definition of interaction; interactive exhibits can only be categorised as such if they "actively involve" a visitor. Therefore, it can be said that if an interactive exhibit succeeds in this, it will provide an effective platform for both learning and entertainment in the modern experiential museum.

Conclusion

As the principal aims of museums have evolved, exhibition design methods have adapted to suit these aims. Narrative approaches, immersive spaces, and interactive exhibits all have an important role to play in the modern-day experience economy, where museums aim to entertain as well as educate, due to their ability to engage a visitor in the subject matter. This active engagement allows visitors to enjoy the learning process within a museum, aiding museums' shift from research-focused educational centres to public-focused places of learning that hold a valuable position in the leisure industry. It is important to note, however, that exhibits themselves can only go so far to engage audiences; visitors must also be willing to actively engage themselves with the exhibits and subject matter. This is the "co-produced" museum experience (Mclean, 1993, 18). It is the role of the exhibition designer in today's experience economy to create environments that encourage the visitor to actively engage; therefore narrative, immersive, and interactive approaches are extremely valuable, due to their effectiveness in creating engaging learning environments.

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