



# INFORMATION TECHNOLOGY IN MUSEUM PRACTICE IN 21<sup>ST</sup> CENTURY

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**Abstract - This study looks at how information technology can be used in museum practice in the twenty-first century. According to the findings, visitors who visit museums for leisure or enjoyment, as well as students on field trips, can be engaged by technology in a variety of ways. The museum setup must evolve to offer a comfortable experience for visitors to connect digitally as 21st century visitors become more knowledgeable about technology. The employment of outreach packages, social media, and other media strategies, such as a mobile app for the museum and museum screen pads to expose the museum's contents as indicated, is beneficial to both the museum and visitors in general.**

**Keywords:** Information technology, social-media, mobile applications, media strategy, outreach packages.

## I. INTRODUCTION

The museum as an organization for the public in general is regarded as a predate school, an organization made for the preservation of the past. Over time, the museum's collections have told stories about how humanity has survived in its environment, as well as stories about man and the world in general. The museum includes both man-made and natural objects. A museum is an organisation that is diverse with some functions,

such as: collection of historical items, preserving them and educating the public about the past. The National Museum houses the wealth of a nation culturally, safe guarding it for generations through its unique position and functions. It is highly required that the museum collections, in order to ensure their well being against any form of destruction or loss, be cared for and protected. The collections must also be kept track of by proper documentation of the objects' origin. With the organizational willingness to conserve the intangible and tangible items of the museum, the museum collections have been preserved and conserved in different and diverse ways. Museum collections are often faced with lots of challenges in their conservative methods, such as items being stolen, temperature, vibrations, humidity, vandalization, burning, and depreciation. Over time, these challenges have made it difficult for museums to be successful in their purpose as time changes. Therefore, the need for information and technology.

Information and technology intervention come in diverse forms, such as media storage and the technological museum for the purpose of virtual conservation of museum collections and other heritage resources. Museum practice in the 21st century unites with the current trend in information technology that embraces a wide range of digital simulations that will facilitate the functions and accelerate the activities of the museum. Information technology is used mainly



for the purpose of creating information and sharing it, and also for storage and manipulation of information. The digitalization of the museum in the twenty-first century brought forth the museum's features, such as content richness, user experience, and interaction, for complementing and improving the museum. In addition, friendly means of record accessibility and retrieval, generation of income and tourism, and protection of the collected artefacts against theft, vandalism, temperature, and other dangers are some of the contributions of technology to museums to the preservation and conservation of collections. As a result, technology has been adopting adjustments and adoptions in order to satisfy the duties of the museum in particular. Administration, collection and collection management, and audience services are relevant to the use of new technologies to meet the museum's three key roles.

Administrative functions in information and technology are facilitated by facilities management, event planning, and ticketing; marketing, donor relations, and fundraising; and publishing. Concerning ticketing, facility management, and event planning, in the last few years, designs have been made to support the museum in planning and managing events and other functions. Software packages have also been made to facilitate the sales of tickets and the registration of event attendees. Some of the software manages online registrations and online events. Some are also automated for various processes such as ticketing and online renewal of membership. It also assists with retail point of sale, helps the museum with collecting demographic and geographic data, and subsequently manages membership information. Most of the museum management software packages also help the museum with indoor and outdoor event scheduling, tour group management and ticket sales, catering and food

service, facility management, event registration, and customer relationship management. For fundraising, membership and donor relations, donor relations management is one of the museum's most significant activities. The ability of the institution to build solid relationships with donors is critical to attracting possible supporters for museums' sustainability.

To combine the duties of donor relations and fundraising support, information about the museum's visitors and members is gathered using software packages such as event management and ticket sales software. The programme is also used by museum staff to track donor interactions and store critical documents such as word or excel files, as well as to keep track of prospective donors and access demographic data. As regards publishing, the museum publishes materials in print format as well as online tools for promotion and sales reasons. Larger firms that publish in-house rely on software and fundamental production procedures to simplify the design and layout of publications, as well as the printing or digitalization of final goods. Professionals who work on museum publications need to be knowledgeable about both software and processes. Museum personnel must understand that publications remain an important museum product when producing high-quality text and digital photographs for publishing.

Collections and collection management-the collection and knowledge about the objects acquired is a vital feature of museums, and part of the core portion of museum work is the care and recording of the collections. The museum not only collects objects, but it also collects information. The ability of computers to process, store, and distribute information has been demonstrated, and these capabilities are completely compatible. Because the collection is at the heart of each museum's activity, several



have committed to creating databases and/or improving metadata to make their collections more accessible to researchers, the public, and other museums. For data banks, there is a need for shared standard vocabulary and procedures, as well as stricter restrictions among museums. Data-sharing also necessitates that metadata adhere to a set of interoperability standards, allowing information to be easily transferred from one IT system to the next. There is no common form of metadata utilised across all collections, even within a single institution, and there is no defined vocabulary among museums for characterising collections. While groups have helped to improve access to collections, there is still much more work to be done. Cleaning data and adding information to it is, however, a time-consuming and arduous process. It takes time to migrate legacy data to new forms, while the generation of digital assets continues apace. Many museums are unable to deal with the volume and cost of work required. Bad data or information on the internet reflects negatively on museum workers' subject expertise and the museum's authority. Simultaneously, the public demands access to data that museums simply do not have the time or resources to thoroughly examine. The majority of users do not demand 100 percent correctness, and if we wait until all information is 100 percent accurate and available, museums will never transfer their content to the internet. Some have suggested that curators need to "become facilitators rather than representatives of authority, and [to foster] an openness to popular culture, [and] the recognition of different interpretations" as a result of new technology and improved access to information on the Internet. Simultaneously, the public demands access to data that museums simply do not have the time or resources to thoroughly examine. The majority of users do not demand 100 percent correctness, and if we wait until all information is 100 percent accurate

and available, museums will never transfer their content to the internet. Some have questioned the museum's authority, claiming that curators ought to "become facilitators rather than figures of authority, and [to foster] an openness to popular culture, [and] the acknowledgement of many interpretations.

The Internet has revolutionised the process of describing museum items, redefining museum audiences, and pushing museums to change "It will no longer be acceptable that the contents of museum databases speak 'for the museum' and with that anonymous authority," says the author. Individuals will now be required to sign contributions to the database and speak on their own behalf. the collections of museums "Frequently, they discover that the audience needs aspects of the description that their curators do not generally provide. Some knowledge representations may be targeted at the general public, or even specific age or interest groups within the general public, whereas the same knowledge may be represented differently for internal usage. The information in the collection management system is critical to managing the collection, whether it is used internally by curators or museum employees or accessed by the public. The collection is jeopardised if the link between specimens and their data is broken. Preserving museum documentation for future use is a more difficult task than preserving it for future access. Information on collections must be provided in the context of those collections in order to be meaningful, supporting and facilitating their interpretation. As a result, collection managers must have a basic understanding of information management strategies as well as database maintenance and use, in which collection management systems play a key role.

A collection management system is used by practically all museum departments, and each



one adds information about a specific object. Museum personnel need to know how collections are maintained and handled, as well as how information about these objects is documented in a collections management system (CMS). Typically, a CMS will keep track of: administrative information, transactional information (such as accession, loan and de-accession), descriptive information, information regarding provenance, condition information, donor and valuation information, rights information, location and movement information. Some collection management systems go beyond this basic feature, allowing users to link digital photographs of things to metadata about the piece, as well as information about donors and fundraisers. Fundraising software that develops and tracks fundraising campaigns, events, activities, and pledges is included in collection management software. WordRite, a full-featured Rich Text word editing software, is also included in the package, which helps "design and print elegant mail merge letters for membership and contact mailings." Video clips, audio files, digital photos, MS-Word documents, Excel spreadsheets, and Web sites can all be attached to multimedia catalogue records.

For many museums, the generation of digital surrogates and the administration of digitally born museum items present both potential and challenges. Some of the possibilities offered by digital technology The ability to produce an almost infinite number of flawless copies of digital surrogates and send them across long distances with no loss of quality is one of the advantages of digital information representation. to provide remote access to information resources for visitors, scholars, researchers, and students; to target unique information needs by either broadcasting information resources or using hypermedia and

multimedia to remove objects from the constraints of physical space and present arrangements impossible in physical galleries; to provide remote access to information resources for visitors, scholars, researchers, and students; and to provide remote access to information resources for visitors, scholars, researchers, and students. Museums, on the other hand, require competence in the creation and manipulation of 2D and 3D photographs in order to reap these benefits. Museum experts can employ 3D authoring tools, such as a 3D camera, to create a three-dimensional image of specimens based on data models. This not only allows researchers to access collections from afar, but it also restricts physical specimen handling. Imaging technology can help preserve the original object while increasing access to the collection.

Though technology and photographs offer exciting possibilities, they also present obstacles, such as copyright issues, the blurring of individual museum identities online, the loss of specific details and a diminished sense of reality, and the concept of the aura or authenticity of digital items. As a result of the spread of IT, there has been a rise in the pace of format obsolescence, and museums today confront significant issues in preserving digital assets.

Some museums have purchased Digital Asset Management Systems to aid in the management and preservation of these assets. Digital Asset Management (DAM), a subset of Enterprise Content Management (ECM), entails the duties and decisions involved in the ingestion, annotation, categorization, storage, and retrieval of digital assets such as digital photographs, animations, videos, and music files. The protocol for downloading, renaming, backing up, rating, grouping, archiving, optimising, maintaining, thinning, and exporting these files is referred to as DAM. Each object is referenced and maintained within a DAM architecture by its metadata. Some museum employees, particularly



curators and collections managers who operate in a DAM environment, must be skilled at the usage of relevant metadata standards, have a good understanding of information management, and be knowledgeable about the care and preservation of digital objects. For many museums, creating digital surrogates and managing digitally born museum items present both intriguing prospects and challenges.

The shift from tangible to intangible objects is forcing museum professionals to rethink fundamental museological concepts. However, digital item preservation is more than a technological issue. This aspect of preservation necessitates museum professionals' awareness of and concern about issues relating to the preservation of digital objects. Museums sometimes mistreat digital photographs because they are viewed as "intangible objects" and are mass-saved onto CD-ROMs and other media storage devices that are strewn about on shelves. Unlike "tangible" film negatives and analogue photographs, which are carefully preserved in vaults, this is not the case. While digital surrogates have caused some museums to reconsider their views on objects, audiences, and their roles in society, digital-born material, such as digital art, has also raised concerns about traditional categorizations and the relationship between curators, conservators, and creators.

One area that requires special attention is new media art, particularly in terms of how the life cycles of ephemeral things are recorded. Contemporary artists tend to use any means or media necessary to make their work, making it particularly difficult to categorise. Sometimes, what causes the shock is simply digital art's tendency to hybridise and stray across media boundaries (another digital art name from the 1990s was, of course, multimedia). Contemporary artists tend to use any means or media necessary to make their work, making it particularly difficult to categorise. "Within and

outside of the museum, the creation and preservation of new media art crosses disciplinary boundaries." Collaborations between archivists, technicians, and curators, for example, can help achieve more long-term stability than the shifting grounds of curating alone. Museums, as previously indicated, are undergoing a conceptual transition, which many believe is being caused by the introduction of networked computer technology. Collections have always been the sole domain of curators. However, information technology now permits each collection to be shared, at least in the form of metadata and digital images flowing across huge telecommunications networks. While the museum will always maintain its collection, allowing public access has shifted the institution's focus away from preservation and toward contact and engagement with the public.

**Audience services** are also new ways of thinking about connecting with the public online and involving the public in the museum environment thanks to the development of Web technology. Museum visitors access the museum before they physically visit it and continue to visit the museum website after they return home, thanks to the development of Web technology.

**Onsite visitors** to the physical museum have different objectives than visitors to the museum's website: Museum visitors are looking for experiences—learning experiences, maybe, but experiences nonetheless. The Internet, on the other hand, was designed to facilitate resource sharing and communication. This divide influences the existing motivational disparities between the two businesses. People go to locations that shape their identities, and virtual museums do just that. As a result, it is critical for museums to continue to develop exhibits for their physical premises rather than relying solely on the internet. In reaction to new technologies,



the way displays are created and implemented has changed. Museum workers, for example, employ a variety of technology to plan displays and exhibit spaces. AutoCAD, a document and design drafting software that enables curators to envision the three-dimensional space of gallery and museum exhibits, looks to be the most important platform for exhibition design. Using AutoCAD necessitates a unique skill set that requires extensive training. The Virtual Gallery, for example, is based on design programmes and collection management systems, allowing designers to input photos from the collection management system to create 3D views of the museum. Curators "may hang paintings, arrange sculpture or other 3D objects, move and/or paint walls, estimate building expenses, and execute other operations in a 3D virtual gallery that they would normally perform in the physical world" when planning and constructing exhibits. Not only can this software assist curators in visualising an exhibit, but it may also assist donors in visualising an exhibition at the planning stage, thereby persuading them to donate materials or finances to the display. Visitors can also digitally 'walk through' the museum, interact with museum objects, add audio or video content, view the show from afar, or construct their own exhibition using the programme. Curators frequently integrate kiosks and other interactive components into physical museum displays to entice visitors to learn more about the works or the authors of these works. Kiosks used to be confined to the corners of most museum spaces, but technology is now taken into account earlier in the exhibition planning process. Members of the IT department should be included in exhibition teams so that they have appropriate IT experience at all phases of the development of new exhibitions.

Museum staff must be able to work with kiosks and create new applications for their use. Kiosks and other interactive components necessitate

expertise in multimedia authoring. Multimedia authoring is a term that refers to the process of creating multimedia applications such as interactive web exhibits, tutorials, brochures, movies, walk-through demonstrations, and corporate presentations. By using a scripting language to bring together text, graphics, and audio data, authoring tools such as Adobe Flash and Adobe Fireworks make it easier to create these multimedia applications. Many museums are implementing multimedia apps into their current websites, as several respondents mentioned, both as online displays and to urge the public to visit their facilities. The growth of mobile devices has also spurred museum professionals to begin thinking about multimedia authoring tools that re-appropriate web information and make this content accessible to users of cell phones and other pocket browsers. This procedure could be as easy as posting an RSS feed to mobile phones, or as complex as generating audio tours to be downloaded and utilised on personal mobile devices. Making audio tours available to the public on personal mobile devices, according to one respondent, relieves museums of the financial burden of purchasing and maintaining traditional audio tour equipment. As a result, there is a push to build applications that provide interpretative information about the institution and its collection and make them available to the public without requiring face-to-face interaction with museum workers, particularly in larger institutions.

Regardless of the aim of identity-shaping space, museum websites can improve online visitor experiences and allow visitors to participate in the museum. Moving exhibitions online and away from physical museum spaces has had a significant impact on cultural heritage organizations. Also, we are witnessing a shift from a museum environment that is prescribed,





authored, physical, closed, linear, and remote to a space that is more dynamic, discursive, imagined, open, radial, and immersive, as both physical forms (architecture) and our notions of them (discourse) are modified. A transition from 'hard' to 'soft' space, if you will. The Web and social networking are, unsurprisingly, the most important and rapidly developing set of new technologies in the contemporary scene. Web design and development refers to a second generation of design and development that allows for secure information sharing, interoperability, and cooperation between a host and the general public. Wikis, blogs, video-and music-sharing programmes, social bookmarking, and content syndication are examples of Web technologies.

Many museums have embraced Web technology and use it to inform the public about their collections, future or existing exhibits, and educational programming. In a Web setting, geographic information systems have also been utilised in conjunction with online displays. A Geographic information system (GIS) is a software programme that collects, saves, analyses, organises, and displays data that is connected to a specific location. Users can utilise GIS software to create interactive queries, analyse specific data, change map data, and exhibit the outcomes of these actions. Several institutions use GIS to link artifacts with archeological information in the form of a digitized map. There are also efforts to use GIS data to harness traditional knowledge, and to connect this information with the museum collection.

## II. STATEMENT OF THE PROBLEM

Today's museums are undergoing significant transformations. These transitions reflect global alterations in connections between dominant western civilizations and indigenous, minority,

and marginalised cultures. People have traditionally viewed museums in their own conservative light. As a result, archivists in museums are responding to people's conservative instincts, resulting in moral difficulties and planned challenges. Despite the difficulties, it is critical to remember that museums play an important role in the development of culture. Meanwhile, the major objective is to promote knowledge through a constant reinterpretation process. Aside from that, they concentrate on collections that are multidimensional and diversified in order to appeal to a broad variety of audiences. As a result, museum regulations, designs, and housed items are all subject to change in order to achieve their primary aim. This paper explores the issues that museums confront in the modern period as a result of these many dimensions of change. Furthermore, the discussion will focus on the best ways to respond to such difficulties. One of the most significant issues confronting museums is their failure to prioritise audience preferences. Since this appears to be a serious worry, museums have worked tirelessly to find solutions to accommodate a large number of visitors. On the same note, they seek to expand their research positions. Because scientific inquiry extends beyond the visible and tangible world, research and audience interest may not always align. This expertise is used by archivists to create, categorise, and maintain museum collections. Furthermore, the majority of museums fail to identify their primary target audience. In this scenario, they create their own artistic exhibits, which their audiences find inappropriate. For a long time, museums have followed the standard procedure, oblivious to the fact that new ideas and practices have altered people's perspectives. At this point, it is clear that museums are struggling to decide what to display in order to appeal to their target audience's likes and inclinations. Acceptance



from the target population can be hampered by a museum presentation. Museums are known to change regularly in order to meet the wants and expectations of their target audiences. In reality, determining how to form collections, develop exhibitions, and organise activities is a major task.

The unlawful trafficking of artistic items and ethnic relics is another serious concern for museums. Some communities have regained ethnic artefacts that were taken from them in recent decades. Some of the monumental artefacts are claimed by ethnic communities, who, to some extent, do not submit them to museums. Furthermore, museum policies regarding the acquisition of monumental objects have changed throughout time. Individuals from various regions of the world have claimed items that were moved from their country to other places, according to critics. This has sparked a debate around the world because it is thought that returning such objects will cause harm. It is certain that site seers travelled regions and brought items of material culture back to their homelands during the 17th and 18th centuries. Artifacts like these were eventually handed over to their country's museum. The movement of museum artefacts was restored with the goal of better reflecting ancient values and phenomena at the time of acquisition. As a result, museums have placed a greater emphasis on presenting artefacts to the public rather than producing meaning. There are long rows of items crammed together, each with its own theme. However, the labels that are attached to such objects usually provide only a limited amount of information. The major issue is that museums have long been thought of as educational institutions for the well-educated. Furthermore, visitors who lack proper background information regarding the museum's items are disadvantaged. As a result, visitors are less likely to appreciate the objects

on show due to a lack of understanding. As a result, museums have long been seen as credible places where people may learn about material culture while also having fun. This, however, can only be accomplished by involving the legacy in interpretations. People do not learn about museum items due to a lack of experimental approaches, such as movies and multimedia displays. Nonetheless, there are several viable solutions to the problems. The international museum community, for example, should prohibit the unlawful trafficking of museum items. It's worth noting that relics obtained before should be viewed with caution due to the numerous values, sensitivity, and reflections of old age. Additionally, museums should purchase monumental artefacts that have been identified through legal processes. Purchasing, portaging, and paying the immediate communities that are already a part of the museums are all procedures that should be employed. Communities will be more willing to protect such monuments as part of their legacy if this is done. Furthermore, policies governing the acquisition of archaeological and cultural items should be consistent and favourable, allowing the communities concerned to peacefully surrender them.

Museum archivists should consistently construct their exhibits to appeal to the interests of a variety of target audiences, including visitors, learners, and the general public. They should also give artefacts with a well defined subject in terms of their original context, as well as specific information about their surroundings. Museums should not change abruptly as technology and values evolve. They should instead include items from both ancient and modern civilizations. Despite the changes in museums brought about by industrialization and cultural progress, objects continue to be good at demonstrating human civilisation. They describe the progression of human culture from antiquity to





the present day. It's worth noting that museums are intended to educate and inform society as well as entertain. Furthermore, museums should not serve the needs of a single country's audience. Nonetheless, by working together on a global scale, the current issues that museums face can be overcome.

#### **Research questions**

- What are the factors determining innovation technology in museums?
- What is the impact of museum exhibitions on visitors?

#### **Objectives**

- To examine the factors that determine innovation in technology in museums
- To examine the impact of museum exhibitions on visitors

#### **Methodology in cultural resource management and museum studies:**

This study examines how information technology may be integrated into museum practice in the twenty-first century. Visitors attending museums for leisure or entertainment, as well as students on field trips, can be engaged in a number of ways through technology. Museums are well-known as one of the most popular cultural tourist destinations. As a result, the presence of interesting museums could aid in the growth of tourism in the area. The museum's primary function today is to transform visitors from educational objects into social creativity topics. The rise of technology in museums is a feature of the present era of integration of museum and school teaching activities.

The fundamental objective of technology in museums was to assist the basic tasks of museums as cultural centres: the preservation of artefacts, research materials, display illustration, and activities aimed at enhancing the teaching aspect of museum content. Museum technology

is an information and communication technology-based communication route for disseminating cultural assets. The use of technologies in museums aids in providing open access to historical and cultural items that have been visualised. Their integration into the educational process opens up the possibility of presenting the visitors' extensive materials for in-depth value in a unified cultural and information space. With the support of web-technology, the twenty-first-century museum facilitates their integration by increasing appeal and emotional perception. The knowledge is presented not just as factual, but also as scientific and literary texts. This type of literature is mastered not just cognitively, but also value-semantically. Representativeness, multilayering, and interdisciplinarity are all characteristics of information.

Qualitative research was conducted in this study. The perceptions of technology, as well as the link between innovative technology at the museum and the impact of the exhibition on visitors, were determined using secondary data collection methods. This study can help museums create appealing objects or historical display presentations to attract more visitors and encourage them to value what they should value.

### **III. CLARIFICATION OF CONCEPT**

#### **Museum**

Many institutions, such as the American Association of Museums, the Museum Association of Great Britain, and others, define museums on a regular basis. ICOM (International Council of Museums) has gone through a few changes since its founding in 1946 to adapt and update the concept of museums to meet the evolving expectations of professionals. ICOM's definition of museum, adopted on August 24th, 2007, during its 22nd General Assembly in Vienna, Austria, revised the



previous definition, which was amended in 2001. A museum, according to ICOM, is a public, non-profit institution dedicated to the advancement of society that acquires, conserves, researches, communicates, and shows the tangible and intangible legacy of humanity and its environment for the purposes of education, study, and enjoyment.

Alexander (2008) defined a museum as a structure that stores collections of things for viewing, study, and leisure. This definition shows that museums are not just gathered objects that are displayed for tourists to see, but also a place for visitors to receive information and derive enjoyment. Geoffrey D. Lewis described a museum as a non-profit organization dedicated to conserving and understanding the fundamental tangible evidence of humanity and the natural world. The museum differs significantly from the library, with which it is sometimes contrasted, in that the artifacts stored in a museum are mostly unique and serve as the raw material for study and research. They are frequently divorced from their original context in terms of time, location, and circumstance, and they interact directly with the spectator in ways that other media can not.

### **Information Technology**

Information technology encompasses a wide range of topics, including software and hardware that enables organisations and businesses to organize, collect, and assess data. Information technology (IT) is defined by Rendul and Dzaja (n.d.) as a technology that employs computers to gather, process, store, secure, and transport information. The methods and modes of interaction of the organization's control and managed systems based on the use of modern instruments for information transformation are referred to as information technology management processes. Prikhno, Kuksa, and Mihaylov (2021). IT is frequently associated

with the application of technology to address business issues. As a result, the IT workforce is concentrating on advanced technologies such as hardware, operating systems, and software applications. IT expertise is required to identify the hardware and software components that should be used to improve a certain organizational process. IT professionals work with a variety of technologies, such as server operating systems, communications hardware and software, and mobile applications. Castagna and Bigelow (n.d.).

With the introduction of computer-based information technologies, business models and processes have realized that they can act as subsets of information technology. Many people, even small firms, have already begun building computer programmes to assist with company processes. The study of the design, implementation, development, management, and maintenance of computer-based information systems that assist diverse organisations in meeting their operational needs is known as information technology. Information technology includes software and devices that assist organisations and businesses in organising, collecting, and analysing data. Finally, analysing this data helps firms achieve their objectives. This also covers workflow approaches that can aid the organization's capacity to generate income.

### **Literature review**

Scholars have debated the use of technology in museums (Luiza and Borza 2016; Bognar 2017 and Khawan 2021). In order to make the use of information technology a communicative medium in museums, research suggests that good production structures might impact visitors' experiences of discovering meaning in technology in museums.



#### IV. TECHNOLOGIES IN THE MUSEUM

**1.0 Personalization/Wearable Devices:** badges, wristbands, or cards worn on the body to activate chips and other technology, resulting in a stronger link between the visitor and the store. Including a personal link increases the visitor's knowledge and ties them to the narrative content on a more intimate level.

**1.1 Virtual reality:** Exhibits and artefacts can be brought to life in new and engrossing ways when museums superimpose their virtual world right over what is actually in front of visitors.

**1.2 Gesture Technology/Non-touch Interactives:** Touchless technologies, proximity sensors, and other technologies will likely gain popularity as a result of the COVID-19 crisis and the increased concern about infection risk. These technologies are getting more affordable while also improving in sensitivity and accuracy, resulting in more stimulating visitor engagement.

**1.3 Mobile Technologies:** Museums have long had mobile apps, but they are increasingly looking into ways to expand and incorporate mobile technologies for a more personalised experience. A museum, for example, may use mobile phone technology to provide immersive guided tours and a virtual reality experience that complements the exhibit content. Mobile ticketing technology simplifies the process, reduces wait times, and allows for touchless payment.

**1.4 Indoor GPS tracking systems:** Museums utilise this increasingly affordable technology to track movement within their facilities, allowing them to confirm how effectively a storyline works, better understand dwell time, and even

determine whether the experience should be changed to help explain the message.

**1.5 Artificial Intelligence:** When it comes to museums, AI may be used in a variety of ways, from the visitor experience to backstage operations, and the technology can take numerous shapes. Visitation forecasting and collection understanding are two current AI applications for operations. Machine vision is used to recognise, categorise, or pattern images. On the public side, AI provides a variety of new ways to engage visitors.

**1.6 LED/Laser Projection Technologies:** To investigate and test how modern lighting technologies and laser projection can be used to create compelling, immersive museum spaces. Using large-scale tensile fabric screening in conjunction with unique media laser projections, the visitor will be immersed in a story that will grab their imagination.

**1.7 Virtual Touring:** a computer-generated recreation of a real-world area, usually consisting of a series of movies or still photos. Other multimedia elements, such as sound effects, music, narration, and text, may also be used. It differs from using live television to influence tele-tourism.

**1.8 Flexible Technology Exhibit Platforms:** Not only can the software and exhibitions accommodate content flexibility, but they can also be quickly changed. We can now adapt the exhibit curriculum into whole new programmes for focus groups, education, research, and special events using newer technology. Museums and attractions can be more adaptable and responsive to new and diverse audiences by utilising remote programme technology.



**1.9 Augmented Reality Selfie-Moments:** The "Instagram" moment has become a "must have" during the exhibit trip, with Social Media now being the largest venue for human communication and connection. Personalizing the visit has become more widespread as digital projection technology has become more widely integrated into museum exhibitions. What was formerly exclusively an analogue experience is now being transformed into a digital one, allowing visitors to digitally "try on" a historic exhibit or even insert themselves into a historic video moment. In every way, modern technology is broadening the range of ways that visitors can engage with and share a museum's identity and goals.

## V. EXHIBITION STRUCTURE IN THE MUSEUM

**2.1 Display Case:** The physical setting and personal experience of the museum's objects are two of the most important variables that can satisfy visitors' experiences. Take, for instance, display cases. To maximise readability and designate stressed functions, each case is positioned with regard to shape, size, and details. Display cases should be readable and not too high to be inaccessible to people who are short or seated. Furthermore, all display cases must have ample space beside them for guests to move around, including individuals who use wheelchairs. It is also possible to create a case in order to attract visitors. An open or closed idea can be used to construct display cases. An open idea allows for all-around sight of the artefacts, whereas an enclosed concept includes backings and stands.

**2.2 Lighting:** Lighting is another factor that aids in a better understanding of the museum's message. Lighting can also be used to create an aesthetic effect, which can influence the visitor by evoking certain feelings and emphasising

specific objects. People who prefer warmth are the majority of museum visitors. The lighting, on the other hand, should be moderate, highlighting the cases and pieces within them so that visitors can plainly view the artefacts and labels. Lighting can provide such a bright and pleasant environment by bringing things out of dark, mysterious voids and allowing them to shimmer and sparkle. Directional lighting, according to the museum's regulations, can improve visitors' perspective and help them understand the show. Because lighting can draw attention to the objects' shape or surface texture. Furthermore, light, as a design element, can add to the message. It can be used to create an atmosphere or add drama to a show. People with visual impairments, on the other hand, may have difficulty with dramatic lighting with high contrasts and regions of semi-darkness between bright exhibits. As a result, they demand a brighter, lighter environment with easier access to contemporary practice.

**2.3 Colour:** in addition to display cases and lighting, colour plays a vital role in every exhibition design. The exhibition room, items, and artefacts can all benefit from the use of colour. It appears to be fascinating. Furthermore, colours allow us to build intimacy and relax in a soothing setting. Because they can survive from one exhibition to the next, temporary displays call for more basic or neutral colours. The 'black box' effect, which employs black or another dark colour in matte tones, can be achieved through the utilisation of thematic exhibitions. To render the huge areas of the gallery, those colours might be employed on the walls and ceilings. so that it is not visible to the naked eye and thus encourages visitors to focus on exhibit components or modules that have been accentuated with unique lighting and colour.



**2.4 Graphics:** Graphics must be appealing and dynamic in order to boost visitor motivation. These features aided in drawing attention to the displays. The gallery should have a basic yet striking design.

**2.5 Text or Scripts:** The importance of text or scripts is that they will communicate the message. Visitors should be given information at different levels of difficulty, thus texts or scripts should be concise and straightforward. Furthermore, a concise paragraph should be relevant to visitors' interests and objectives. In order to have a strong conceptual framework, text arrangement is also crucial. On the wall panels, the wording should be larger. Because such texts deal with concepts, the labelling hierarchy has a hierarchy.

**2.6 Labels and panels:** Labels and panels should be positioned in areas where the majority of people can see them. As a result, they can easily read the labels. Other visual components, such as pictures, maps, charts, and drawings, can be used to enhance viewing, confine display space, and attract visitors' attention. The amount of information available to visitors around the exhibits should be kept to a minimum. Labels that merely enable information to be mediated. It is adequate if the labels describe the object's nature, provenance, and era and are placed near it. To avoid visitors being confused, labels should be positioned near the things being discussed. The label's appearance It might be constructed in the form of a question to promote involvement and attract people's attention.

**2.7 Flow of the message:** The visitors will benefit more from the message flow structure. be familiar with the topic. To have a contextual or thematic context, artefacts, specimens, and other items in displays must be connected to one another. It may be used in room settings or just

displayed in a display case with themes. Multi-layered graphics, as well as a combination of words and pictures, can aid in visitor comprehension and allow them to feel the message's transformational impact. The message's progression It should be plotted out like a narrative. This will help to clarify the topic. It is possible to identify the show and its main themes. As a result, a proper flow of messages is essential for visitors to connect with the exhibit and comprehend the intended message.

## VI. THE RESULTS OF THE STUDY

Based on the information gathered, some 21st-century museums have frequent video presentations with various learning aids. In addition to video projections, some museum exhibitions make use of additional cutting-edge technology to enhance the visitor experience. Although the exhibitions incorporate modern technologies to some level.

## VII. TECHNOLOGICAL INNOVATION

Adopting new technologies for use in products, services, or manufacturing processes is what technological innovation is all about. Technological innovation is the means by which museums can provide visitors with a hands-on experience. People who visit museums are looking for a fun social trip as well as the opportunity to learn new things and expand their horizons. As a result, learning needs to be incorporated into a social activity that includes relaxation, conversation, social connection, involvement, and collaboration. Innovative approaches and the creation of participatory materials using current technologies are examples of how museums might meet this requirement. Below are presented ways in which museums can use modern technologies successfully so as to become more competitive.



**1.1 Technological innovations in collection management:** Because the purpose of museums is to keep records and preserve heritage, any piece of software that aids in the organization and management of a digital data base, which includes all of the goods stored by the organization. The museum is really beneficial. Electronic data bases make management, collecting, and analysis easier. Information is stored, and reports on item movement can be generated depending on it. The number of exhibitions for each object, both within and outside the museum, as well as the restoration protocols that each thing has to go through. They also aid in the organisation and presentation of data. information on the museum's attendance, income, and collections on display As a result, the experts' duty of doing study on the museum's holdings is made easier.

**1.2 Technological innovations trying to enhance the visitor experience The following are the main media utilised in exhibitions from the perspective of the public's visiting experience:** Audio-visual media are employed attractively as part of passive presentations. This generally means video presentations on modest screens or projected on a wall. Guided presentations using audio guides, video projections, and other techniques that accompany visitors during their visit are given as an alternative to expert-led guided tours. Information about the museum's collections and Interactive navigation stations are available. Typically, "press the button" stalls and simple-to-understand interfaces. media that enables direct creation or production, as well as take-away, interactive, and novel experiences. The audiovisual elements in the exhibitions serve a variety of purposes, including: explanation; displaying exhibits that the museum is unable to display due to space constraints. Due to a lack of room, the fragile nature of such

things, or the fact that they require particular handling, visitors experience a specific emotion, which makes it easier for them to participate and interact with them. Exhibits at the museum

**1.3 Technological innovations aimed at automation of processes and activities:** Under the influence of technological advancements, the method of purchasing tickets has begun to change. Despite the fact that the vast majority of museums are still run by their personnel, there are now museums that sell tickets through computerised machines. The latter offers the advantage of allowing visitors to pay with a credit card in a variety of currencies and having a four-language interface. Museums that provide their guests with the option of purchasing tickets online represent an even greater level of innovation. This is a significant benefit for travellers who arrange their own vacations. It also proves to be very useful from the museum's perspective. From a practical standpoint, this eliminates any potential queues forming in front of ticket counters. Museums can provide even more value to their visitors by combining technological solutions with collaboration strategies.

**1.4 Web-based technological innovations:** Museums can utilise the Internet to sell things and conduct research as well as distribute products and services. The majority of online distribution is free as a tool of communication and advertising. Virtual visits to museums are free, as is access to a variety of educational and informational materials. In certain countries, museums also have electronic stores where visitors can buy a variety of products in addition to the aforementioned. The Internet can also be used to promote a museum's mission and events, as well as stimulate public attendance and participation in the museum's activities. All of this, in turn, leads to increased public awareness





of cultural values, as well as community support through volunteerism, donations, and grant-writing.

**1.5 Technological innovations used to manage resources and operations:** The adoption of current technologies to reduce non-renewable resource consumption necessitates, first and foremost, significant investments, which few museums are able to make. When new museum buildings or extensions are constructed, things become much easier. New construction can be made to be extremely energy efficient. The benefit stems from the fact that the museum's operational costs will be cheaper in the long run. smaller. In addition, museums will be able to use the concepts of sustainable growth to a greater extent, improve their market image, and serve as a model for others. Modern technologies can also be used to make environmental management easier and more efficient. Within museums, operations are carried out. This category includes everything from inventory management systems to software for doing specific tasks like accounting, purchasing, and human resources.

**Exhibition impact on visitors:** The benefits of visiting a museum are varied. A museum can influence a person's identity and sense of self by providing a learning experience. As a result, people's perceptions of themselves, their identities, and how they make meaning will shift. This event changes the way a person sees things by broadening their knowledge, both in terms of what they currently know and new things to add to their knowledge base. A museum can boost visitors' mental cognition and educational attainment, resulting in more good social behaviour. Furthermore, visiting a museum might increase visitors' appreciation of the museum. Museums can be a channel for knowledge transfer. All social groups will use

museums to decode knowledge in order to reinforce and make sense of their shared views. As a result, it will either improve or hinder visitors' learning experiences. In order to educate visitors, museums and exhibitions should be aware of the features that can reach children, teenagers, and adults. It's difficult to provide rich experiences for a variety of audiences from a variety of collections. These programmes appeal to school children because they combine teaching and pleasure. While teenagers are preoccupied with establishing their own identities and independence, the characteristics of this type of activity appeal to their sense of adventure. Adult programmes are also available. It was intended to bridge the gap between social classes, cultural interests, and race. Combining traditional academic activities with social activities can help to please visitors. Visitors will be more enticed to come if programmes combine social interaction, active engagement, and a comfortable environment. One approach to educating visitors is through tour guiding. The speaker should have some knowledge or experience in the topic area. Furthermore, utilising modern technology can assist visitors in gaining a better knowledge of the subject matter. Audio instructions, video snippets related to the exhibition's subject, and other technologies can be employed. Being a teacher is difficult. learn new talents and become aware of the visits Expectations might assist visitors to get a better sense of the event's excitement.

#### VIII. RECOMMENDATION/CONCLUSION

Rather than approaching technology from the point of view of conservation of museological contexts, artefacts, logistics, maintenance, or professional learning curves, this paper contributes to the conversation about the application of technologies to enrich the visitor's experience. Museum visits must meet visitors' high expectations for the simplicity with which



they may receive interactive information on the exhibits. Moreover, they must be capable of effectively transmitting a positive message to the general audience. It's critical to emphasise that the focus should always be on the museum's artefacts and themes, regardless of the technology utilised to enhance the public's experience. Instead of diverting visitors' attention away from genuine artefacts and museological themes, those technologies must be correctly created to provide unique and thrilling moments – which will become part of the visitor's future recollections – as well as a spectacular and effective combination of them. Providing entertainment and education, as well as transmitting accurate information and ensuring that it reaches the intended audience.

The presence of museums in the virtual world allows them to engage and interact with users from all over the world. Integrating visitors on the internet into collaborative activities and encouraging conversation. They facilitate conversation on a variety of topics while also facilitating sharing on social media, resulting in global public spaces for deliberation that boost innovation and information diffusion in some circumstances. Multi-touch surfaces, for example, allow for the condensing of information into a small space – magnifying the exhibition without overcrowding the physical space – and enabling communal living, sharing, and collaboration scenarios. Interactive projections, on the other hand, may provide immersive learning experiences throughout the space. It is typical for visitors to interact with the installations by making gestures with their bodies. Virtual reality, which is predicted to introduce and mimic new multisensory settings related to heritage in the future, also allows visitors to fully immerse themselves in exhibitions, making them feel as if they have been transported to another world.

Mobile applications are being utilised to supplement exhibit materials, generate gaming experiences, promote dialogues between visitors and museum employees, and assist in the creation of instructional content. Excursions or making it easier to navigate through museums. Because people want to see the real objects in a museum, tactile user interfaces can merge them with digital content, guaranteeing that details and other instructional content are combined. Visitors are nicked at the same time they are handling the objects. Furthermore, when museum objects can not be directly touched (because of concerns about conservation, damage, thievery, and so on), digitalization and 3D printing, for example, play a vital role since they allow direct interaction with duplicates of pieces in an exhibition that would otherwise be unreachable. Furthermore, digitalized content can facilitate the formation of partnerships and cooperation between museums, such as expanding access to objects to members of the public who are unable to visit these institutions. Wearable technology is promoted as a non-intrusive and light-weight alternative to traditional technologies. Because they allow for constant attention, they can enhance people's experiences while visiting museums. Rather than needing to stare at a screen, and they also represent a fresh chance for learning. Designers to come up with brand-new interactive experiences.

The primary purpose of this study is to emphasise the importance of information technology in museum practice in the twenty-first century in promoting museum exhibitions that are physically, cognitively, sensoryly, and culturally accessible, facilitating the spread of information about the exhibits on the one hand, and contributing to an inclusive community on the other. A museum dedicated to delivering exceptional learning opportunities and enriching the tourist experience. In a museum



setting, technology may be highly interesting. I'm undertaking study into these issues in order to develop simple and authoritative guidelines for individuals who already work with technology in museums and anyone who is interested in this field.

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