DIGITAL ART'S ROLE IN THE RESTORATION OF LOST IDENTITY SCENES

دور الفن الرقمي في استعادة مشاهد الهوية المفقودة

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ABSTRACT

In the preceding decade, computer technologies and digital recreations were exceedingly used in the field of cultural legacy; one of the most crucial applications of virtual reality is that which contributes to the reconstruction destroyed by conflicts or nature, which may include the essential archaeological heritage. By presenting it in virtual visits and simulating things in their actual reality, the research adopts the methods of virtual applications to allow visitors to view events related to these cultural sites. In the reconstruction of one of the important sites that were destroyed in Syria in 2013, the researcher developed an equation to derive the stages of work from rebuilding the stationed sites in an interdisciplinary study between (archaeologist + Surveyor) + (Graphic designer) to restoration again; the research focuses on the role of graphic arts to restore the virtual identity and preserve the cultural heritage.

KEYWORDS

digital recreations, virtual reality, augmented reality.

الملخص

تم استخدام التقنيات الرقمية للحاسب الآلي على نطاق واسع في مجال التراث الثقافي في العقد الماضي؛ أحد أهم تطبيقاتها هي الواقع الافتراضي الذي يساهم في إعادة بناء كل ما دمرته النزاعات أو الطبيعة، والذي قد يشمل التراث الأثري المهم، وذلك من خلال الزيارات الافتراضية، ورؤية الشكل العام أو التفاصيل الدقيقة للمواقع التراثية والأثرية، وهو ما يتناوله الباحث حيث يعمل على آلية الوصول لمراحل بناء المواقع الاثرية الناتجة عن الصراعات في القرن الواحد والعشرين وبالأخص اعادة بناء احد المواقع الهامة التي تم تدميرها في سوريا عام ٢٠١٢. طور الباحث معادلة لاستنباط مراحل العمل لإعادة بناء المواقع الموجودة في دراسة بينية بين كل من ((عالم أثرى + مساح) + (مصمم الجرافيك)) لاستعادة الموقع مرة اخري. وبذلك يركز البحث على دور فنون الجرافيك لاستعادة الهوية الافتراضية والمحافظة على الإرث الحضاري، نقدم دراسة حالة مبنية على محاكاة ذكاء اصطناعي لإعادة بناء الموقع الاثري المحطم واستعادته مرة أخري.

الكلمات المفتاحية

التقنيات الرقمية، الواقع الافتراضي، الواقع المعزز.

1. INTRODUCTION

The virtual and physical worlds are colliding the most enjoyable - and revolutionary - possibility for virtual and augmented reality technologies to build virtual vision.

One day, the merge of graphic designers and archaeologists also architects may be able to design in an entirely virtual environment; These files may be used directly via digital processing; visitors or users will be able to see the digital and the physical side by side to guide the site process whether (old or new). Augmented reality can provide ideas for restoration of virtual identity, and this is to the comfort of their users. When that happens, most of the historical sites will be radically changed forever (Jürgen P. Schulze, 2021).

In 1990, (Paul Reilly), an archaeologist and computer scientist characterised using computer-based simulations of archaeological prospecting. He added that new users should understand what a computer-based visualisation seeks to represent, such as the current state, an evidence-based restoration, or a future state, a fictitious rebuilding of a cultural heritage object or site, as well as the scope and nature of any location, and the extent and nature of any significant uncertainty (Jan, M. 2020).

Restoration of virtual identity is designed according to the idea of creating an interactive space in which information is communicated smoothly through a virtual tour around a three-dimensional space similar to a site with the possibility of obtaining information through a database. Therefore, the design relies heavily on the VRML Virtual Reality Modelling Language that allows adding 3D dynamics to a web page (Caudell, T. 2020).

There are three primary stages for creating a restoration of virtual identity, Information collection (archiving), (photography), and finally, (converting it into digital information).

Gathering information is to build a comprehensive database from the definition of the exhibits, the visitors, traditions and the culture of the community. As for photography, it is the beginning to give a virtual character to the exhibits, after which comes the stage of converting images with several digital techniques into information that we form a database used in the virtual restoration (Pietroni, E.R., Ferdani, D.L., 2020).

1.1 The Restoration of Virtual Identity Features

- It is a virtual site on the Internet or an accurate location, not an entity.
- The site-seen holdings do not belong to one entity but rather an inventory of several holdings of a common nature, wishes are an extensive collaboration between (Graphic designers, Archaeologists, and Surveyors).
- Restoration of virtual identity uses high media technology to link sites with studies and research.
- Some restoration of virtual identity use 3D virtual reality technology to display their sites holdings, and the user's role is to navigate through the mouse pointer or 3d glasses.
- Some virtual use 3D still images to visualize the interaction interface of their website and compare it to the actual interaction interface; as a platform for large-scale reconstruction of sites damaged by human conflict or natural disasters, technologies have enormous potential.

2. RESEARCH PROBLEM

Undoubtedly, every nation has its rich heritage, which it is proud of and derives its nationalism and affiliation. But unfortunately, in 2013, one of the oldest sites was destroyed by ISIS in Syria; this historical site was beaten to the ground; perhaps the technology gave us the chance to reconstruct the area too, but it is only virtual.

The middle east includes many rich archaeological sites that were destroyed after the conflict problems from 2011 till now with a unique cultural character that might use this technology, and this is what the researchers are looking for to put a method to rebuild it again. despite all this, some organizations start investment in these projects, to keep this heritage for the future.

The research question aims to find answers to the following questions:
What is the role of technology in the restoration of damaged sites? And how did some graphics contribute to restoring areas in virtual reality?

3. RESEARCH OBJECTIVES

The paper aims to use a descriptive method and analyses the content of the models presented objectively and in a practical experiment.

First: Defining the restoration of virtual identity features.

Second: How virtual reality works?

Third: Project exploring the virtual reality of heritage sites: Palmyra Syria after the civil war.

The research paper's objectives:

- Learn about methods to rebuild historical sites.
- Find relations equations between multidisciplinary studies (archaeologist, surveyors' graphic designer).
- Learn about virtual reality's role in restoring virtual identity.

4. LITERATURE REVIEW

Virtual Reality Technologies and Cultural Heritage Applications, a Special Issue: Virtual heritage's goal is not limited to digital reproductions. Without materiality, the model's interaction processes, which can be assigned semantic values, emerge as fundamental values. Furthermore, this interaction is the source of cognitive function. The theoretical discussion is supported by exemplar case studies conducted by the authors over nearly two decades. Finally, since the digital era, the concepts of uniqueness and authenticity must be re-examined. Indeed, real, and virtual should be considered a continuum because they exchange information, promoting new interactions and critical thinking processes (Pietroni, E., Ferdani, D. 2022).

In another study, the gap concluded that Virtual platforms are undefined, unlimited, flexible, ever-changing, and have an autonomous ground rather than the traditional one. The media are created as a projection of the natural world in space where the rules of physics do not exist. Since virtual platforms emulated from the physical world are composed of intangible materials, boundaries, textures, colours, and other unlimited indicators that are downloaded and constantly change, the change provides an experimental state. (Kilicaslan, H., Sağlam, K. 2022).

With the spread of covid in 2021, this paper surveys innovative concepts and technologies used in virtual museums (ViM), highlighting their benefits and drawbacks. In comparison to actual

museums, we describe critical lessons learned while developing three major virtual museums between 2010 and 2020 with university partners from Armenia, Germany, and Chile. Based on their categories and features, we distinguish content-, communication-, and collaboration-centric museums. With a particular emphasis on learning and co-curation, as well as the role of virtual reality in the design of this museum; this study sheds new light on the role of identity in virtual environments when the virtual representation of self is used to support the construction of an online museum (figure 1). (Baloian, N., Biella, D., Luther, W., Pino, J., and Sacher, D., 2022).
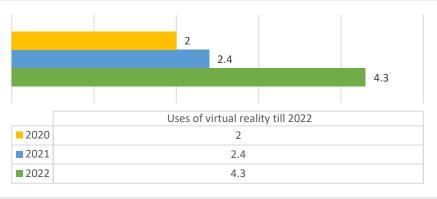

Uses of virtual reality till 2022	
■ 2020	2
■ 2021	2.4
■ 2022	4.3

Figure 1: The growing of virtual reality uses in the last three years
Source: Baloian. N, Biella. D, Luther. W, Pino. J, Sacher.D, 2022.

5. METHODS

How the concept of Virtual Reality will change the present and future of archaeological site and the role of Graphics in the restoration of virtual identity features; over several years, virtual reality and related technologies have gone from mere ideas to become widespread. These technologies can revolutionize the design process thanks to a few designers and developers. The concept of virtual reality is a means through which the individual can see, feel and even touch information on the computer, as it makes him interact with the world similar to the actual year by creating simulations of imaginary environments, by conducting experiments or passing through buildings or describing a city for example. He can see the three-dimensional scene by determining its dimensions (Figure 2), whether in proximity, depth, or distance.

5.1 The Role of The Three-Triangle Angle

1. Surveyor (Geolocation survey).
2. Archaeologist (all database studies).
3. Graphic designer (stratify all studies).

5.2 Graphic Design Role

Figure 2: The three relatives are working on restoration projects. (Source: Author)

This technology provides the ability to create a three-dimensional virtual world that allows people to be present and interact with it using virtual reality glasses and devices, simulating experiences from the real world such as training to perform specific job tasks or imaginary worlds such as what happens in electronic games, in this step of research we providing the efforts of a graphic design role, whenever virtual reality technology differs from 3D technology in that you can interact with

all components of the virtual world and integrate through built-in sensory features such as hearing through external speakers that provide 3D distributed sound and movement through motion tracking sensors and immersion in a realistic experience that provides vision 360 degrees for highly interactive integration.

List of programs used in these projects, 3D printing and software for 3D modelling (Blender, Maya, Inventor, Solid works, Sketchup), photogrammetry (Agi soft Pro/Standard and Reality Capture), video editing (Adobe Premiere), image manipulation Sound editing (Adobe Audition, Garage Band), media-rich website creation (Dreamweaver, Flash, FileZilla), and essential productivity tools (MS Office, web browsers, Adobe Acrobat Pro).

5.3 How Virtual Reality Works

Across the United States, most archaeological institutions are beginning to incorporate virtual reality into their work at an accelerating pace. However, due to a lack of understanding of the concept of virtual reality, we see that understanding this technology and what distinguishes it from other similar technologies - such as (reality augmentation) or (mixed reality) - may be confusing.

With the spread of global shut down by 2021, there are abundant applications for augmented reality in museums and historical sites. The most obvious application is for adding interpretations to the pieces—performances of the elements. When viewing exhibitions using augmented reality, visitors will gain more information. It can be used in museums to display digital reproductions of artists' work alongside their originals. These 3D characters then provide the narrative. Augmented reality allows you to add a third dimension to your screen and fetch objects or scenes to life. There are already diversified organisations using augmented reality all over the world. These projects add something new to existing collections while also magnetising new audiences. Here are some innovative ways museums are utilising augmented reality.

5.3.1 Six stages involved in establishing a virtual reality when restoring virtual identity

The following were the main findings of this study:
1. Preparation phase
2. Investigation phase
3. Modelling phase
4. Evaluation phase
5. Publication phase
6. Updating phase

5.4 The Difference Between Using Graphic Technologies in Archaeology Sites

Table 1 compares Virtual Reality to Augmented Reality:

SOFTWEAR TECH	(AR) Augmented	(VR) Virtual
Site	Onsite	Offsite
Tour	Throughout the tour	Prior to and following the actual tour
Podium	Android or iOS	Online web
Equipment	Mobile Devices with 5,4 G	PCs, HMDs, and so on.
Signification	Site information in bite-sized chunks (text, animation, video,	Large amounts of information (text, animation, video, audio,

	audio, images from the early years, suggestions for where to go next, what to do next)	virtual tour with 360-degree panoramic images)
Tincture	Insightful, interactive, and immersive	Insightful, interactive, and immersive
Expedition	Tourist marketing tool, informative and educational, interactive actual visits, virtual tour guide	Tourist attraction marketing tool Prior-visit tour planning, informative and educational visits, virtual visits, and post-visit updates

Table 1: Ab. Aziz and Siang Virtual Reality vs Augmented Reality
Source: Vol. 1 of the International Journal of Social Science and Humanity. September 2014, No. 4

This technique can capture people's attention and keep them focused on exhibitions for a more extended era of time. The organ performed a scan before launching the AR installation. They discovered that the average visitor to the museum's collections spent about 2.31 sec for each picture. In today's frantic world, where visitors are not always inclined to stay, museums can use augmented reality technology to transmit and captivate their attentiveness.

5.5 Elements of Graphic Design in Virtual Reality Design

There are several specifications that must be considered and made available to the graphic designer to design the virtual reality of the destroyed archaeological sites:

- Simplicity: By designing it in a simplified way that is easy to use by those in charge and its beneficiaries, the default design is more likely to achieve its goal.
- Integration: Virtual reality must allow for the integration of various procedures within the documentation process (surveyor + archaeologist).
- Flexibility: Virtual reality must be flexible when adding, deleting, or modifying data to ensure that the documentation process runs smoothly.
- Compatibility: The virtual museum's compatibility with other digital systems should be considered.
- Security: The virtual museum must be secured during the development of a system to determine its beneficiaries and the availability of documented materials.
- Speed: This includes data processing speed and information access speed, which saves time and effort in the search and retrieval of documented materials. Favourite.
- Multiplicity: The system must allow multiple people to search for and retrieve the same article at the same time.

5.6 Tools for Virtual Reality

Virtual reality tools are divided into two categories:
1. Equipment for creating virtual environments.
2. Virtual environment-related equipment.

5.6.1 Equipment for creating virtual environments

It is a necessary component of virtual reality, allowing us to see and feel everything in three dimensions, as if it were real. These tools are computers and programmes that allow the creation of three-dimensional models. Dimensions and simulation of the real environment, as well as audio software for creating stereophonic sounds to augment the virtual environment

5.6.2 Virtual environment-related equipment

It is the hardware that enables us to interact with the virtual environment, and it includes visual display devices such as computer monitors, head-mounted display devices, stereoscopic vision glasses, and projection devices.

6. RESEARCH FRAMEWORK RESULTS

The world's most contrived locations have been resuscitated in virtual reality (VR) environments, and this rostrum also boosts visitors. Throughout history, natural calamities and human conflicts have destroyed sophistication, wiping out a significant portion of our global heritage. Virtual reality (VR) needs a headset, computer, and high-speed Internet connection for new visitor service, The world's most well-known locations will then be shown to us most efficiently.

6.1 Exploring the Virtual Reality of World Heritage Sites: Shaping the Future of Travel (a Google project in collaboration with UNESCO)

The Open Heritage Project is a collaboration between Google and the California-based nonprofit (CyArk); the experiment began 15 years ago, intending to create a permanent registry of ancient sites browbeat by natural circumstances or contamination. As a framework for this research, this preliminary produced online 3D models of twenty-six heritage places in eighteen countries, including this one. This concoction has the scope to protect our cultural inheritance while also enabling everyone, in any case of a site, to watch these magnificent places effortlessly.

"It is the worst cultural heritage crisis since World War II" says Boston University archaeologist Michael Danti. Technology can assist us in keeping up with the destruction and expose those responsibly. The world's cultural heritage faces numerous threats under the banner of (Preserving the Past), but it can be protected. The team used the graphic technique to build on the most destroyed sites in the Middle East; after destruction by ISIS, the ancient city's most famous monuments were desecrated, particularly in this study's case of Palmyra in Syria; (Figures 3 a 4). Other notable artefacts survived the destruction of this ancient city, and experts hope that the entire site will be restored; The virtual identity site restoration allows visitors to see the site in a virtual view and see the destructive effect.

(Figure 3) palmyra in Syria 2010 (before the conflict source: news.un.org/en/story/2017/01/549902-alarmed destruction-palmyra-security-council-reiterates-need stamp-out-hatred (2020)
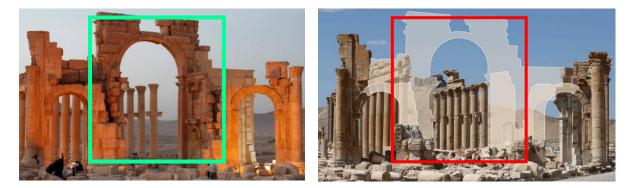
(Figure 4) palmyra in Syria 2015 (After ISIS) source: Digital Media Lab of California university https://library.ucsd.edu/computing-and-technology/digital-media-lab/index.html (2015)

T ; the main temple building was destroyed when Isis blew it up in August 2015. The temple is
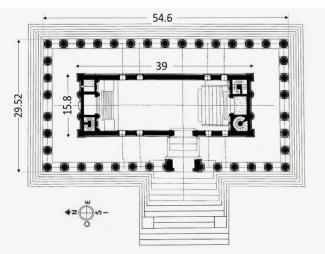
dedicated to the Phoenician god of storms and the sky, and its columns bear Greek and Palmyrene inscriptions (figure 5 and 6), in 2015 the Digital Media Lab of California university provided a space for media creation and editing; they used the reconstruction based on the three processes of working methods we mentioned (Archeologist + Surveyor = Graphic work).

(Figure 5) palmyra in Syria 2010 (before the conflict) source: news.un.org/en/story/2017/01/549902-alarmed-destruction-palmyra-security-council-reiterates-need-stamp-out-hatred (2020)

(Figure 6) palmyra in Syria 2015 (before the conflict) source: Digital Media Lab of California university https://library.ucsd.edu/computing-and-technology/digital-media-lab/index.html (2015)

Scanning the site (Surveyor Role):

His duties are to investigate the sites, take the actual measurements and provide topographic maps or drawings of whatever exists. Using laser scanning technology allows you to capture entire environments in 3D rapidly. In addition, laser scanning will enable you to capture natural settings in 3D rapidly; it is quicker and provides more complete data than other surveys, such as Total Station or GPS surveys (figure 7).

(Figure 7) palmyra site map (study case)
source: Digital Media Lab of California university https://library.ucsd.edu/computing-and-technology/digital-media-lab/index.html (2018)
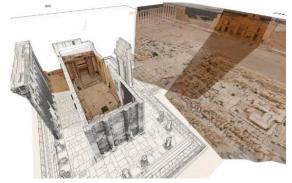
The restoration of virtual identity (Graphic design role):

The world of VR, AR & MR will not be the only thing that graphic designers transform, is very accurate, as we should start by drawing studies (Figure 8) Since its inception, then virtual reality steps to add this drawing into programs changing how they design their world and create (Figure 9).

(Figure 8) palmyra Drawing 1 (after the conflict) source: http://syrianheritagerevival.org/palmyra/ (2021)

(Figure 9) palmyra Drawing 2 (after the conflict) source: http://syrianheritagerevival.org/palmyra/ (2021)

This project is among them, as virtual reality is one of the essential mediums for reconditioning critical archaeological sites. It provides an interactive trial of a new identity environment in which existing technology objects like augment real-world objects. Moreover, voluptuous information is sometimes obtained through multiple sensory modalities such as visual, auditory, haptic, somatosensory, and olfactory We can see the difference between (Figure 10) destroyed and (Figure 11) after returning through (VR) model by (UCSD) Library Digital Media Lab, which is why the restoration of the site by virtual reality can be defined as a system that achieves three essential features:

1- A hybrid of the real and virtual worlds.
2- interaction in real time.
3- precise 3D capture of virtual and natural objects.

(Figure 10) Temple of Bel, Palmyra, Syria. Destroyed 2015, Source:https://pointcloud.ucsd.edu/Palmyra_Temple_of_Bel_Viewer.html (2022)

(Figure 11) Temple of Bel, Palmyra, Syria. restoration of the site by (VR) 2021, Source:https://pointcloud.ucsd.edu/Palmyra_Temple_of_Bel_Viewer.html (2022)
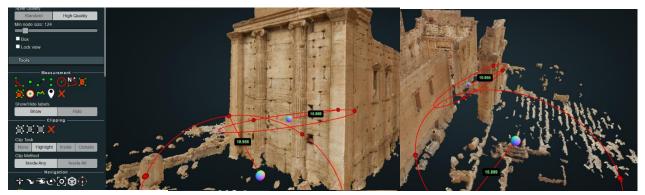
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Built it in a virtual vision:

Overlapping data collected could be advantageous to the environment (i.e., add to it) or harmful (i.e., mask the natural environment). This encounter is a fully immersive element of the external world since it merges so seamlessly with it, this is how augmented reality modifies a person's ongoing perception of their surroundings in the natural world. In comparison, VR technology substitutes a simulated environment for the user's actual environment. Through the outcomes of this project's documentation work employing cutting-edge technology, to provide the necessary documents for the restorations, the fact is tied to two notions that are, for all intents and purposes, the same: mixed reality and computational reality, the legitimacy of the site will be emphasized under international standards throughout this process with the UNESCO.

According to the initial damage assessment conducted on the site last week, images taken by tourists, and media sources, including satellite imagery, several architectural features, such as the podium, stairs, monumental gate, foundations, and columns, are in good condition. These stones will be reused, and identical stones from nearby quarries will be used to fill in the gaps (Figure 11). Monuments can be rebuilt authentically in this manner. Because Palmyra has been added to UNESCO's list of world heritage sites, the outcome of this process will be thoroughly revised.

The Temple of Bel is among Palmyra's most well-known structures. This was constructed in 32 AD it features a 200 m x 200 m outer wall that is surrounded by colonnades. The refuge is 10 by 30 meters.

(Figure 11) Temple of Bel, Palmyra, Syria. restoration of the site by (VR) 2021,
The result of this process will be subject to a full revision by UNESCO as Palmyra is inscribed on UNESCO's
World Heritage List. Source: https://pointcloud.ucsd.edu/Palmyra_Temple_of_Bel_Viewer.html (2022)

6.3 Second Project Exploring the Virtual Reality in Amarna Site

The researcher tries to allow this project on the site of Minya Governorate, 45 kilometres south of the tombs of Beni Hassan, is where King Akhenaten erected his new capital. The old capital's remnants can still be found today. The Amarna tribe arrived and stayed there for a considerable amount of time that included centuries and their lives during the Middle Ages after the land had been destroyed since Tutankhamun rose and changed the capital. An abandoned hill has been transformed into a city, most of the city's buildings were mudbrick and whitewashed to expedite construction. The main structures were made of local stone. It is the only ancient Egyptian city in which many specifics of its domestic layout have been protected, mainly because the town was abandoned after Akhenaten's doom when his successor Tutankhamen settled to leave and return to his native land in Thebes (modern Luxor).
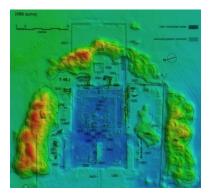
Several of the destroyed affluent homes can still be seen at the northern end of the site, facing the outer wall of the royal palace. The Egyptian Museum has beautiful models of the stucco floor covering that served as the foundation for these homes.

Several tombs have also been discovered in Tell el-Amarna, the most important of which can be found to the north. The tombs of Meri Ra, Ahmose, Bento, and the royal family are among those thought to have been excavated for the king and his family.

World History Encyclopedia:

The non-profit organization's purpose is to connect individuals to their cultural heritage and advance history education globally, (Der Crabben. J.V) is the founder and CEO of World History Encyclopedia, the digital restoration of Amarna as it existed at the time might have appeared is shared on the Amarna:3D Project website started by (Kemp. B) and (Docherty. P), the project began in 2000 with the construction of the Central City complex, which has been featured in numerous documentaries and written publications. The current project goal is to conduct a more detailed reconstruction of the city utilizing current survey data in order to provide a more realistic depiction of the city's character. Since it is impossible to know exactly how Amarna appeared in its heyday, this project will change as new details come to light as part of the ongoing investigation into the city (Figure 12).

(Figure 12) (Kemp. B), the Sanctuary surface height represented by color gradient with 1986 survey (Kemp 1987) overlaid, Source: http://www.amarna3d.com/digital-archaeology-2020/

(Figure 13) 3D reconstruction of the Sanctuary based on plans and photogrammetric survey conducted by Paul Docherty, Source: http://www.amarna3d.com/digital-archaeology-2020/

As material textures or 3D assets, I began this 3D reconstruction of the city. They also wanted to understand the landscape (Figure 13), sounds, scents, temperature, etc. A combination of photography, video, photogrammetry, and casual interviews with the team was used to understand better the site that could not be obtained remotely. As a 3D artist and archaeologist, having a sense of scale for the city layout was important through numerous opportunities to stroll around the city with other team members (and the local police), where being able to visit buildings was important.
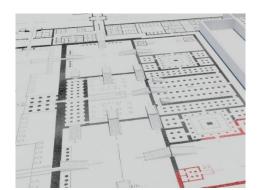
The Great Palace restoration by virtual reality:

This capture allowed (Docherty. P) and (Kemp. B) to see how the houses were built out of brick. The photogrammetric model can be used to create 3D objects and textures. (Figure 14) (Figure 15) shows several large ground areas that could be altered to create finely tiled surfaces. Can be accomplished by locating functional elements and cropping the model to isolate them for later use.
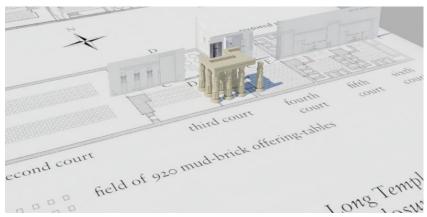
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(Figure 14) The Great Palace
*Source:www.amarnaproject.com/pages/amarna_*
the_place/maru_aten/index.shtml

(Figure 15) The Great Palace plan by (Kemp
2006, 46) overlaid
Source: http://www.amarna3d.com/digital-
archaeology-2020/

Scanning the site (Surveyor Role):

(Kemp. B) his responsibilities include investigating the sites (Figure 13) that show the empty site, Kemp taking actual measurements, and providing topographic maps or drawings of whatever exists. Using laser scanning technology that allows him to capture entire environments in 3D rapidly. Furthermore, it is faster and provides more complete data than other surveys, such as GPS surveys (Figure 16).

(Figure 16) (Kemp. B) The Great Palace in 3D (2019)
Source:www.amarnaproject.com/pages/amarna_the_place/maru_aten/index.shtml

Visitors to the Amarna Museum of Natural History can use their mobile device to conduct self-guided tours of selected exhibits and areas of the site (figure 17), which built it virtual so the visitor can walk in the real site (figure 18) and discover the entire city if he sees it in person. both figures from the same spot, the visual information attracts more visitors and converts them into customers. Furthermore, the tour's visual information will answer most guests' questions, eliminating the need for a tour guide.

(Figure 17) The Great Palace in virtual tour Source:www.amarnaproject.com/pages/amarna_ the_place/maru_aten/index.shtml

(Figure 17) The Great Palace in virtual tour Source:www.amarnaproject.com/pages/amarna_ the_place/maru_aten/index.shtml

7. RESULTS & FINDINGS

The next frontier for museums is virtual reality, many exciting virtual reality experiences have demonstrated both the medium's capability and its growing popularity in the field over the last two years, and several current museum exhibitions provide an excellent opportunity to discuss museum virtual reality, Museums use them in a variety of ways, whether interactive or in the form of 360-degree videos, the research show examples of how to use virtual reality technology to benefit tourism field, Egypt is regarded as one of the most significant countries in the world's great cultural and civilizational heritage, the potential to solve these issues while also elevating the damaged site's mission and set a role of (Archaeologist + Surveyor) + (Graphic designer) also Interstudy between the three of them, the medium is lauded for its ability to recreate spaces, remote destinations, or places that no longer exist and transport viewers there simply by donning a VR headset or cost of restoration. As a result, even people with limited mobility can now gain access to the world's best collections without leaving their homes too.

Also, the major findings are:

- The application of targeted virtual reality for research purposes in establishing cultural heritage in Egyptian historical sites damaged by conflicts or natural disasters.
- It paves the way for other people to learn about the nature of the people's cultural heritage in an interactive way.
- The museum, which is based on a three-dimensional visual database, introduces a novel approach to teaching cultural heritage.
- Provides additional detailed information that can be derived or inspired by designers.
- Linking archaeological sites in a sophisticated way while preserving their natural state.

7.1 Benefits of Virtual Reconstruction of Destroyed Archaeological Sites Include

Virtual reality in destroyed archaeological sites is a new ground for presenting knowledge formation, as it is characterized by many characteristics that gave it weight, great success, and wide spread in the world, and distinguished it from real sites, and by looking at the opinions of

specialists in the field of archaeology, where it gave the opportunity by default to feel Without prejudice to the surrounding reality now, and these advantages can be summarized in:

- The ability to simulate the real environment of the exhibits and create a suitable virtual environment for them by displaying those exhibits as three-dimensional models that attract and make the viewers feel it.
- It causes the visitor to approach the museum content in a way that piques his interest and deepens the visitor's interactive relationship with the content.
- It enables the visitor to comprehend what he sees and reads and to form his own opinions about the museum's content.
- Its ability to exchange digital content in various electronic formats all over the world.
- The low cost of constructing virtual reality restorations in comparison to a simulated realistic building.
- Ease of providing necessary information to the public and introducing the museum's identity, as it allows a large segment of the public to obtain a large amount of information about the museum's holdings.
- Virtual tourist sites give the visitor an opportunity to go through experiences that are difficult to achieve in reality, whether because of the risk factor or the distance.
- Allow visitors to interact with exhibits, by adjusting the sizes and measurements of the museum exhibits and enlarging and reducing the display of details in order to achieve an ideal vision that differs from what is available in reality.
- It allows the visitor to adjust his or her field of vision so that he or she can walk around the site and view the museum exhibits from any angle or location.

8. RECOMMENDATIONS

1. Creating virtual museums for archaeological sites that have been destroyed.
2. Virtual reality is being used to restore monuments that are difficult to fully restore.
3. Create virtual websites that aid in the implementation of artificial intelligence programmes.
4. Creating a virtual reality design unit linked to the Ministries of Antiquities and Culture in order to develop Egyptian museums and archaeological sites.
5. Conferences supporting the restoration of destroyed archaeological sites
6. Extending digital heritage documentation and encouraging researchers to conduct interdisciplinary studies in this field.
7. To encourage researchers to study the field, the models that were presented in the research in art colleges specialising in graphics were presented.
8. Encouraging interdisciplinary research between surveyors, archaeologists, and graphic designers.
9. Begin applying for iHeritage and UNESCO calls for funding to implement these projects in Egypt using the research methodology.

9. REFERENCES

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WEB RESOURCES:

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http://syrianheritagerevival.org/palmyra/
http://www.amarna3d.com/project-overview/
https://pointcloud.ucsd.edu/Palmyra_Temple_of_Bel_Viewer.html