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*Research Article*

# Cultivating Responsible AI: For Cultural Heritage Preservation in India

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## Abstract

Artificial Intelligence (AI) has a great potential and can be used as a powerful tool of application in various domains and sectors. But with the application of AI, there comes a wide spectrum of concerns around bias, accountability, transparency, and privacy. Hence, there is a need for responsible AI which can uphold ethical and accountable practices to ensure that things are transparent and fair. The paper is a combination of AI and cultural heritage preservation, with a greater focus on India because of the rich cultural legacy that it holds. India's cultural heritage in itself contributes to its identity and the economy. In this paper, along with discussing the impact culture holds on the Indian economy, we will discuss the threats that the cultural heritage is exposed to due to pollution, climate change and urbanization. Furthermore, the paper reviews some of the exciting applications of AI in cultural heritage preservation such as 3-D scanning, photogrammetry and other techniques which have led to reconstruction of cultural artifacts and sites. The paper eventually moves into the potential risk and challenges that AI poses in cultural heritage preservation. These include ethical, legal and social issues which are to be addressed by organizations and government authorities. Overall, the paper strongly argues the need for responsible AI and the important role it can play in preserving India's cultural heritage, while holding importance to value and diversity.

**Keywords:** Object recognition, Voice assistance, Visual impairment, Navigation assistance, Supermarket navigation

## INTRODUCTION

Artificial Intelligence (AI) is currently becoming increasingly common in a variety of fields and technologies. AI has a lot of potential, but it also has a lot of faults and poses important safety concerns. With the growing concerns over biases, accountability, transparency, privacy, and social influence, there is a great need for a responsible AI. Responsible AI is defined as a set of ethical and accountable practices that guides the development and deployment of AI technologies thereby ensuring that AI systems are designed and used in a way that they are transparent, fair, and just (Ali et al. 2023). Linking the concept of responsible

AI with cultural heritage can hold great value as both can together bring in a very responsible way of preserving our rich heritage.

Due to the great diversity that India holds as a country, cultural heritage preservation comes with great significance. The significance of cultural background in India is multifaceted *i.e.*, it not only reflects the country's rich heritage and diversity but also contributes to tourism and greatly to the economy and nation's identity itself. Therefore, necessary precautions must be taken to preserve these treasures that are under constant threat of pollution, climate change, and urbanization. The use of AI in cultural heritage preservation is a very promising solution as it can

facilitate the digitization of artifacts, which makes it easier to analyze and interpret different cultural content, reconstruct damaged heritage sites virtually, and even preserve different language (Ghatak, 2023).

In recent years, there have been very exciting applications of AI in the preservation of cultural heritage sites and artifacts. Archaeologists along with various specialized historic preservation officers are now making replicas of ancient ruins using 3-D modeling and scanning technology which are powered by AI. These replicas can be used to further study and understand ancient history, not just for historians but also for common people to learn. Out of the many other exciting applications, another application of AI in cultural heritage is its ability to understand and analyze different cultural patterns. With the help of machine learning algorithms archaeologists can now analyze large databases of cultural artifacts and various historical documents. With the help of AI-powered translation software, we can transcribe the inscriptions which contain historical text into different languages making it more accessible to people who speak different languages and for people from different parts of the country (Manchidi, 2023).

Responsible AI not just holds importance in one industry but it holds significant importance in every industry. Many companies have started maintaining a list of principles that AI or machine learning models should follow. Microsoft, and Google are at the top of the list for having these principles. The principles cover topics around having a transparent and accountable AI system.

## MATERIALS AND METHODS

In this research paper we will discuss the importance of responsible AI and the major roles it can play in preserving India's diverse culture along with addressing the potential risks, bias, transparency and privacy issues which are associated with AI. This paper will also touch upon the pros and cons of AI application and technology in heritage preservation. It will also discuss various efforts taken by organizations and governments to tackle these challenges as this approach is very vital to save the rich culture along with upholding values.

### Problem statement

With the increasing scale of the growth of AI, there is a huge factor of responsibility. At this stage where AI's growth is unpredictable, there are many misuses of AI technologies. According to an independent AIAIC (AI, Algorithmic, and Automation) repository database that keeps track of incidents related to the misuse of AI have stated that there has been a 26 times increase in AI incidents between the

years 2012 and 2021 ("Artificial Intelligence Index Report 2023," 2023). The deep-fake video of Ukraine president Volodymyr Zelensky surrendering and the US prisons using call monitoring technology on their inmates are some notable incidents where AI was misused (Allyn, 2022). The increasing number of AI cases such as stealing user data, deep-faking, and various attacks show that the increasing growth of AI is directly proportional to the unpredictability of AI technology, which is directly proportional to the importance of having a responsible AI.

According to research done by Accenture, in 2022, they found out that 77% of global consumers think organizations must be held, responsible or accountable for the misuse of AI. This report significantly shows the need for a responsible AI. As much as it's important to have a general system for responsible AI it is also important that each of the organizations also have an AI system that works with proper principles and rules. Out of the many problems associated with the development of AI technology, some of the major problems include Biases and discrimination, lack of transparency, privacy, and security.

**Biases and discrimination:** Biasness is often something that's inherited by humans, due to cultural and personal experiences. The reason why AI bias occurs is because human beings choose the data that these AI systems get trained on and because these models have data inherited by the humans, these AI models also inherit biases which eventually can lead to producing potential harm. The two most popular and commonly used databases for training the systems are Concept net and Generics KB. According to research conducted by researchers from the University of South Columbia, 38.6% of Generics KB data and 3.4% of Concept net data that are used for input into AI training systems are biased. The research also shows that the data was favoring and not favoring different categories like religion, gender, race, and profession. They also found out that certain religion is associated with words like terrorism, certain nationality is associated with poverty and certain professions are associated with death, pedophilias, and dishonesty (Gruet, 2022). In another survey conducted by an independent research firm named Insight Avenue, which is based on interviews with more than 640 businesses, 66% of the organization believe that AI and machine learning systems will become their reliable source in the coming years. This indicates an urgent need to ensure relevant principles are put into place by authorities and that they are relevant not just now but will also stay relevant in the coming years.

**Lack of transparency:** The output systems on which the AI is trained can include content such as predictions, recommendations, images, text, or even decisions which are used to help the AI system make decisions. These systems are known as black boxes.

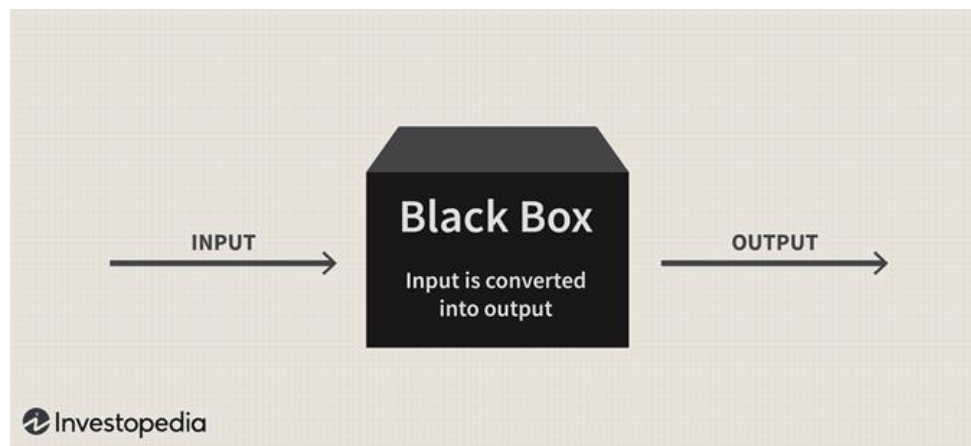


Figure 1. Black box model.

The working of these models is more often not predictable by humans or it's not known by the user at all therefore these models can be said to lack transparency. Broadly under the umbrella of AI transparency, that at three levels.

- Explainability of the technical components
- Governance of the system
- Transparency of impact.

**Explain ability of the technical, components:** This refers to the system's ability to explain the integral mechanism of the algorithm and what's happening in the AI system. The explanation can be specific to

- Design and development of the model,
- Techniques that are used in the output of these algorithms as they are the major decision drivers of the model.
- How the algorithms behave in high data sets and also at lower or individual levels.

**Governance of the system:** This level of transparency refers to the regulation that governs the systems. The internal policies around the creation and use of AI systems hold major significance.

This document will also refer to the documentation of the establishment and implementation of these systems from the early stage of development to deployment along with the information on updates made to the system.

**Transparency of impact:** The transparency of impact refers to the communication and transparency about the AI system's capability and purpose to its direct and indirect stakeholders. Whether or not there is timely communication which is clear and accurate. The communication here also refers to the users in terms of the users being aware of what forms the output and how the output will be used.

**Privacy and security:** Privacy and Security are other major problems associated with the development of technology as they can cause harm to individuals through identity theft or fraud. Privacy and security are very crucial as we are not aware of the complexity of algorithms used in AI systems.

With AI reaching new heights of technology, AI can now make decisions by studying patterns which can be challenging for a human to understand or interpret. This is a great concern if we, the users, are not informed about our personal data being used by these algorithms. Hence, it's important to make sure that AI systems are not used. With the increased advancement of AI, it can now make decisions based on certain patterns in the data which are difficult for Humans to interpret. This can put individuals at great risk if we are not aware that their personal data is used to make decisions that can affect them. Therefore, it is important to ensure that AI systems do not use individual data to manipulate or discriminate against them. They should also ensure the protection of privacy and that the data is used ethically and responsibly.

### AI and cultural heritage

AI has been tapping into special sectors and industries. Having an accountable AI has become a way of life. AI and historical preservation can be vital as it forms a valuable component for our identity, as many cultural and historical sites are at more harm due to changing weather conditions because of selfish human activities.

Some of the issues that can arise due to the lack of responsible AI in cultural and heritage, preservation are:

**Cultural bias and misinterpretation:** AI algorithms when trained on biased databases their output can be culturally biased. This can lead to the records or data favoring one specific culture while neglecting others. This can cause inappropriate preservation or restoration efforts which are not fair for other cultures.

**Loss of information:** The digitization process of historic artifacts which are powered by AI may have errors that can lead to the loss of valuable historical information. This error can result in the omission of crucial data which will lead to misinterpretation of artifacts and might lead people into believing false stories which affect the basic values that these artifacts hold.

**Privacy and data concerns:** Digitization of cultural heritage data can raise concern over data privacy as there can be chances of them being misused. This includes privacy

concerns for individuals who represent these historical records. There can also be possible misuses such as data theft. This means that it can lead to the creation of fake historical stories and objects, which eventually lead to the exploitation of cultural heritage for commercial uses.

These problems increase the concern around the use of AI in preserving cultural heritage. There is a need for authorities and the government to take responsibility and enforce responsible AI to maintain justice to these cultures. It's critical to take necessary steps and act fast before it is too late. Our cultural background is a precious asset that holds a giant quantity of records which are valuable. We should make sure that it is preserved and that the tales that it holds are not lost.

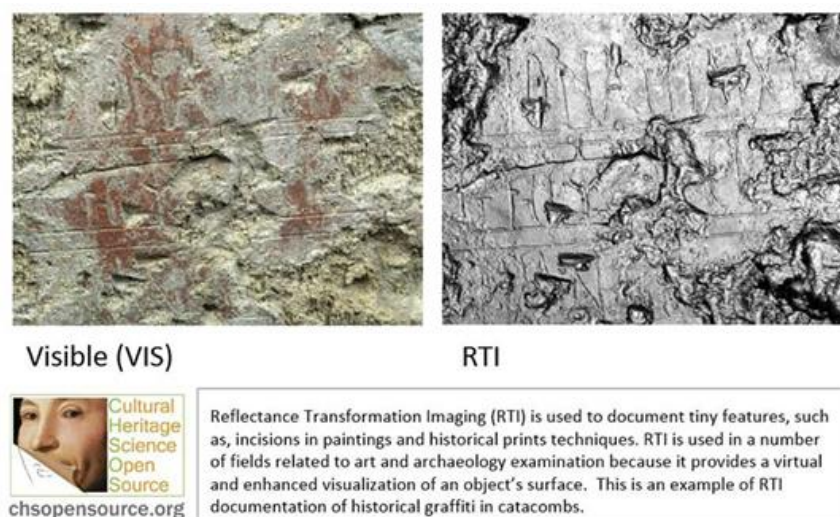
### Advancement in cultural heritage preservation technologies

AI along with technology have led to many innovative preservation methods. In simple terms, Artificial Intelligence (AI) is essentially a computer system that is trained to perform and improve based on the training that it's given. The training is carried out in such a way that the systems operate as closely as possible to humans. These computers have two parts that help them learn and solve problems: Machine Learning (ML) and Deep Learning (DL). Machine learning is a set of algorithms that learn from data whereas deep learning is a subset of machine learning in which complex problems are fed along with a lot of data. Deep learning uses techniques similar to those in the human brain called artificial neural networks. These neural

networks help to extract important information from the data provided. When machine learning algorithms are models that make estimates based on information, deep learning takes it a step further with the help of neural networks to analyze data and draw conclusions. Using the concept of machine learning, and deep learning, one can translate text from one language to another.

Neutral language processing and AI can play an important role in preserving cultural heritage by converting text into an electronic format that machines can read and understand. These technologies along with the integration of enhanced scanners and 3D printers, have reached a significant peak as these technologies are widely used by large companies and organizations to preserve cultural heritage. Along with increasing new techniques, the most commonly used techniques to preserve cultural heritage are:

- **Reflectance Transformation Imaging (RTI):** This is a new imaging technique that creates hyper realistic imagery that helps us to see objects in incredible detail on a computer. The process involves analyzing multiple digital images of the subject while keeping the subject and camera in a fixed position. The variation of lighting can be achieved by moving the light source at a constant radius across the object in different positions. These images are then studied according to the subject's interaction with light at each pixel level. RTI is very useful and can be used to document and research objects of various sizes and types along with the ones which are difficult to capture using other methods.



**Figure 2.** Reflectance Transformation, Imaging (RTI) vs. visible view of the object.

- Photogrammetry is another technique that is used in the preservation of cultural heritage, where it's a technique that uses photography to create 3-D models from 2-D images. It also includes survey and mapping techniques. Where sites are studied along with tropical mapping, which includes capturing aerial

views, it is heavily used because of its accuracy, and efficiency in capturing and preserving information. Compared to other methods like laser scanners. It is very cost-efficient and it has high speed and quality. But one of its drawbacks is its climate status affecting the aerial photogrammetry process.



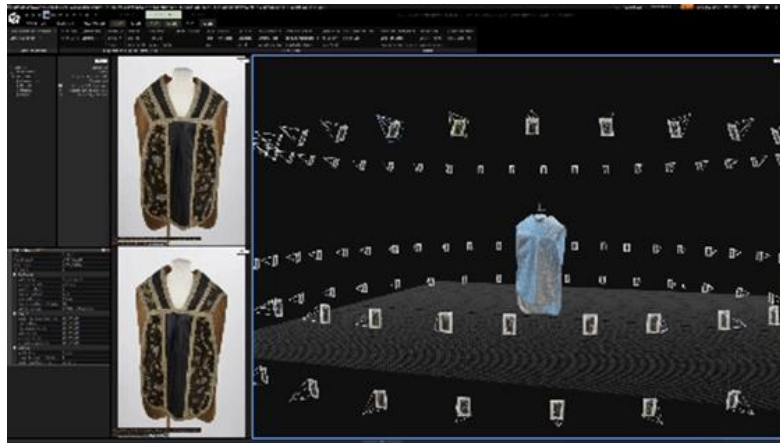


Figure 3. Photogrammetry process.

- 3D LIDAR (Light Detection and Ranging) technology has become important for preserving historical sites because it produces accurate measurements. The process of this technology includes combining various technologies such as 3-D printing, digital mapping, and

many more along with the data collected from monitoring these sites. This technology creates great detailed and accurate representation in the form of 3-D which helps historians to get a better understanding of the artifact.



Figure 4. 3D breakdown of an artifact.

### India and its heritage

India is home to 1.4 billion people, 387+ languages, and 12+ different religions. With each of these religions and languages holds different stories, cultures, clothing, and food. This shows that India is an epitome of cultural diversity. But, with the increasing population and the decreasing availability of land along with not prioritizing the historical monument have led to the destruction of many historical monuments.

Due to the presence of tectonic plates, the Himalayan region and the adjacent plane of India is prone to natural disaster. India is one of the world's most disaster-prone areas where 27 states out of the 29 states and seven union territories are exposed to recurring natural disasters such as cyclones, earthquakes, landslides, floods, and drought. To highlight the significance of this statistic a report was published by the Times of India. The report says that during the time duration from January 1 to September 30, 2022, out of 273 days, 42 days faced natural calamities in the

country. This has led to the destruction of monuments from the ground or submerging them. Many monuments are on the list of untraceable monuments, one such being Delhi's Barakhamba cemetery which was a tomb that was named after 12 pillars supporting its roof and now it's unreachable. Due to this huge unpredictability, there was a huge need for cultural and heritage preservation.

**Cultural preservation through AI in India:** The Indian Heritage in Digital Space (IHDS) has taken steps to harness the power of emerging technologies such as computer vision, graphics, audios, and video technologies. Their goal is not only to store and share heritage data but also to create a great experience for the public. This can help anyone from the field of studies to conduct research and widen their knowledge. The initiative taken by IHDS is transforming the landscape. There have also been initiatives like digital library projects that have already begun their work to digitize written documents and manuscripts by promising to preserve the history and the cultural wealth for the future generations while keeping them accessible to

people across the world.

Archaeological Survey of India (ASI) and NGOs like INTACH and ITR RHD along with government bodies are actively contributing to the cultural heritage preservation. They have employed technology such as 3-D, laser scanning, LIDAR, and drone surveys to understand monuments and sites. These bodies have also collaborated with international partners to bring in advanced exploration and excavation techniques to enhance conservation practices. As a part of the G20 tourism working group, India has greatly focused on preserving archaeological sites through “Promotion of architectural tourism: Discovering shared cultural heritage” This initiative talks about the positive impact of this archaeological tourism on local communities. The successful showcase of technology-based solutions, including 3-D scanning, deep learning, tools and platforms to preserve and promote cultural artifacts have promoted India’s authentic cultural and hidden treasures to the world. Virtual walk-throughs, augmented reality, experience, and 3-D printed replicates were also other digital models that were used. However, there are challenges that come along the way such as limited awareness on technology and the difficulties in storage of this huge data (Shah, 2023). But India thriving through these in itself shows India’s commitment towards cherishing the rich cultural heritage to generations that are yet to come.

## RESULTS AND DISCUSSION

### Primary research

**Introduction:** Indian cultural heritage is a valuable asset that needs to be preserved for the future generation so with increasing technological advancements such as artificial intelligence, AI, this space holds a lot of potential. The fusion of AI in cultural preservation offers great opportunity yet it has scope to bring ethical and potential downfalls. The impact of AI is highly visible on people both in a positive and negative aspect so exploring the real life experience of individuals and getting their perspective can be crucial in implementing responsible AI practices. To better understand people’s perspective on AI a survey was circulated. The survey’s focus was to analyze expectations and experience people have on AI, especially in context to heritage preservation.

**Research methodology:** The survey consisted of multiple-choice questions, ratings and open ended questions. The survey targeted university students under the age of 24, who have used AI at least once. The aim of the survey was to understand participants’ experience and perception about AI in general and also the opinion on using AI in cultural heritage preservation. The survey question also tries to capture people’s view on AI misuses and biases, and AI’s ability in rectifying its mistakes etc.

### Results

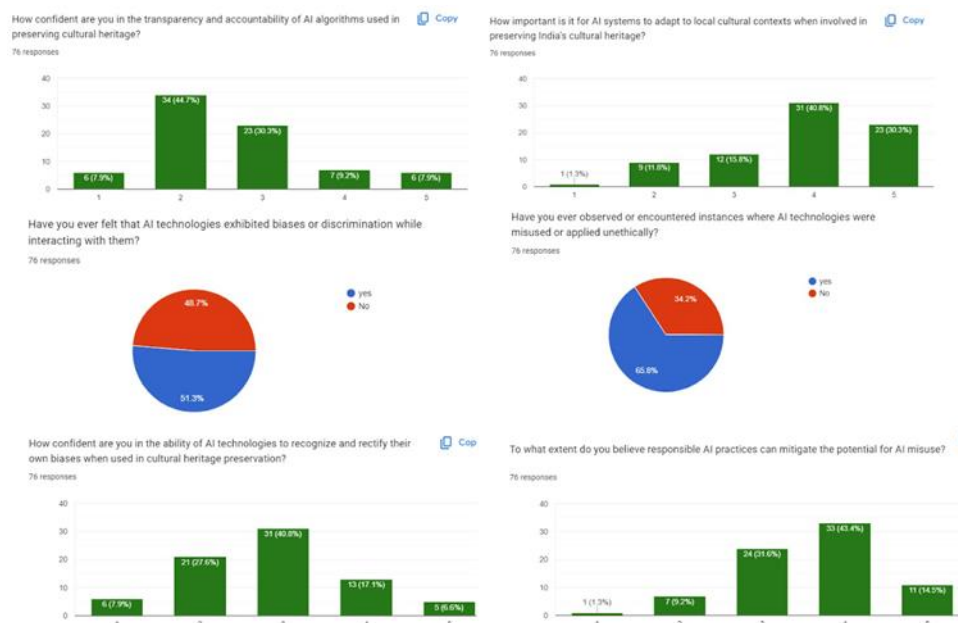


Figure 5. Survey results.

**Insights:** The survey shows a notable division in perspective when it comes to AI misuse. Out of the 76 people responded, 65.8% acknowledged that they have encountered situations where AI was misused. According to the Artificial intelligence index report 2023 by Stanford University, the major reason why the majority of people have encountered such situations is because of the

increasing number of incidents along with the increase in awareness around AI misuses.

In regards to perception of bias and discrimination in AI technology, 51.3% acknowledged that they have felt AI technologies exhibited biases or discrimination while they have interacted with them. The report by the World Economic forum supports this data as it has mentioned that

AI systems can exhibit biases because the data which they are trained in are biased. According to research conducted by researchers from the University of South Columbia, 38.6% of GenericsKB data and 3.4% of Conceptnet data that are used for input into AI training systems are biased.

43% of people rated 4 out of 5, for the effectiveness of responsible AI in reducing the misuses of AI. 31.6% acknowledged the fact at a very moderate level, indicating that the majority of people believe that with the coming of responsible AI it can reduce the misuse of AI. There is a small minority of people still believing that responsible AI cannot reduce the misuses of AI. Similar goes for AI system's ability in recognizing and rectifying business where 40.8% of people rated 3 out of 5, which indicates that while there is a belief in AI capability to actually correct themselves, there is a notable portion expressing lower confidence in AI's ability to do so.

The importance of a system adapting to local cultural context in preserving India's cultural heritage shows a significant support with a combination of 71.1% rating four 5 out of 5 showing a great recognition of the importance of AI with culture. This shows that with specific measures and framework along with deep learning and understanding of local customs, tradition and values, there can be an effective way of incorporation of AI systems to adapt to local cultural context.

While looking into the transparency and accountability of AI algorithms while serving cultural heritage data shows that 44.7% expresses a confidence of 2 out of 5 and a significant 30.3% shows 3 out of 5 in their confidence of AI systems and algorithms being transparent. In a blog on responsible AI, it talks about how the working of these models is more often not predictable by humans or it's not known by the user at all therefore these models can be said to lack transparency. This shows that there is a need for transparency and accountability in AI algorithms where the systems should be audited regularly for biases and discrimination and that these data should be available publicly so that people can understand how the system works and arrive at their own conclusions.

## Solution

The need for responsible AI for cultural preservation is driven by the concerns around the safety and security of these cultural data. The main goal for having a responsible AI is to safeguard and promote valuable historical artifacts and documents. This approach is important because it identifies fundamental principles and practices that must be prioritized for the well-being of humanity while preserving cultural diversity and protecting our history. Among the many reasons that justify the need for accountability. Here are some key pointers to look into while establishing a responsible AI:

- Safety is very important, in terms of cultural heritage preservation, it is important to ensure that AI systems used to catalog and digitize objects are secure to

prevent unauthorized manipulation and falsification of data. Additional safety measures should also be taken to avoid accidents or damage caused by technologies to the valuable heritage.

- Nondiscrimination laws need to be implemented in a way that maintains equal value of cultural legacy for all communities, irrespective of their religious beliefs and guarantees. AI should not be biased so that no community or group is subjected to unfair treatment. Also, it's critical that these AI systems do not favor one group over another. To make sure that all cultural contributions are acknowledged, this principle should be applied in the algorithms of these AI systems.
- The right to privacy and data protection is important, especially when AI is used in the digitization of artifacts. It is important that the data collected from this heritage preservation must align with international laws. The personal information related to the heritage sites and their owners has to be treated with care and that it's not misused or exploited.
- AI technologies can contribute to the misappropriation of cultural heritage when applied without any ethical consideration, therefore it is important that responsible AI ensures that artifacts, artwork, and historical records are used with proper consent and acknowledgement. This also shows that the properties and cultural rights of communities and nations are respected.
- It is also important to look at the environment and ethical concerns in terms of cultural heritage preservation. We have to make sure when AI is used for cultural preservation and it does not lead to any ecological damage and that the AI technologies are incorporated not at the cost of any environment or any ecosystem. Responsible AI should consider the environmental impact of preservation efforts and ensure that no harm is done to the surrounding ecosystem.
- Bias in cultural preservation through AI is a very important concern as these AI technologies inherit bias present in the data that they are trained on. AI's use in cultural heritage preservation can have effects of bias as we mentioned in the initial part of the paper. These biases can result in the wrong interpretation of artifacts. This can lead to marginalized communities. Therefore, it is important that enough attention is given to responsible AI in cultural preservation and that they are monitored to prevent bias and respect every community.

**Emerging technology canvas:** To better frame the understanding of Responsible AI as a technology in cultural heritage it's important to arrange the information. Emerging technology canvas is one such arrangement where one can understand the technology, get a wider perspective of the technology and then analyze emerging technologies around the same.

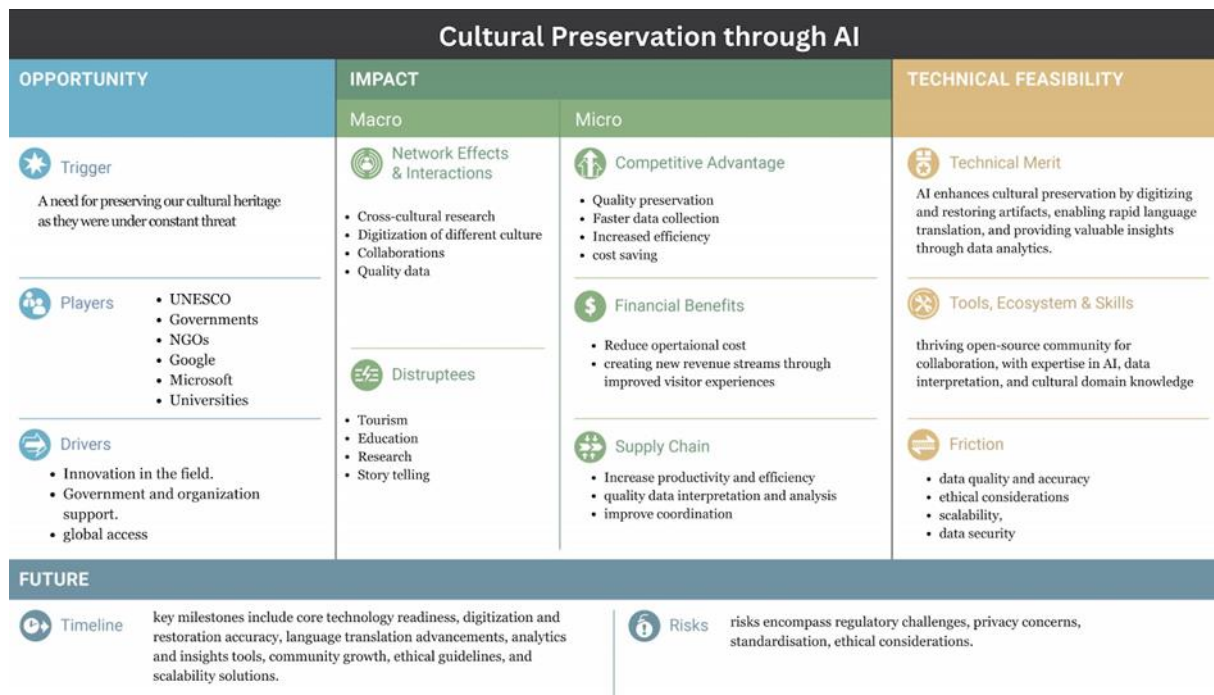


Figure 6. Emerging technology canvas.

**Opportunity:** The major reason that triggered the need for cultural preservation was the constant and numerous threats that this cultural heritage, artifacts, and sites were facing. The major threats that lead to the opportunity for growth in Cultural preservation through AI are:

- War and conflicts have a great impact, not just on human lives but also on human values, cultures, and religion. These conflicts often target great cultures, strip them of their identity, and cause great harm, which might even be accidental.
- Climate change is another issue that is at the forefront of global concerns. This is also one of the major threats to cultural heritage. The rising sea level and changing weather conditions are living facts that show cultural heritage sites are in constant threat.
- With the increasing interest in tourism and the difficulty in managing the visitors have led to unsustainable tourism practices. These unsustainable practices often lead to the destruction of the Heritage sites.
- With the increasing globalization and development projects such as mining and dams impact small-scale tourism. Along with this, the heritage sites are often given the least importance, and more often than not these heritage sites are destroyed for the sake of such projects.
- World heritage sites across the world are under a constant threat by natural disasters like earthquakes, volcanoes, floods, and typhoons.

Major organizations and companies actively use AI technology to solve for cultural preservation. Some of them are UNESCO, government organizations, NGOs, Universities, and big giants like Google and Microsoft.

- UNESCO has adopted the use of imaginary and detailed satellite models known as SD models, which are complex systems that use equations and feedback loops to represent relationships between different components of the system. This helps us analyze various factors to generate information about lost artifacts or monuments.
- Google has a popular not-for-profit online platform called Google Art and Culture that works with Google technologies to preserve in-danger languages. In this a user can take a photo of a real-time object and the app uses the powerful Google Cloud Vision API to analyze and detect artifacts (Sharma, 2021).
- Microsoft initiated steps to preserve and celebrate diverse cultures as part of this they started a program called "AI for cultural heritage" in 2019. Microsoft launched this program with the help of a cultural nonprofit organization by utilizing AI technology to its maximum potential (Thornton, 2019). With the use of AI they developed deep neural network microservice architecture to analyze different numbers of paintings of an artist using a 3-D print scanner, thereby allowing neural networks to capture the smallest details and copy this style to create the missing pieces of art.

The major driver of this technology is the increasing innovation in the field where they use advanced scanning technologies to come up with 3-D models and also use various techniques such as Reflectance, Transportation,



Imaging (RTI), photogrammetry and 3-D LiDAR. Along with the innovation, big organizations like UNESCO, Google, and Microsoft are backing small projects that are based on cultural preservation which is another great driver or motivation for people to build on the technology.

**Macro impact:** The major macro impact can be the digitization of different cultures. With the increasing accessibility of these technologies, different cultures across the globe can be digitized. This can help people from different countries to access this information and learn about different cultures and traditions. This cross-cultural research can foster appreciation and understanding among different communities. This understanding and appreciation can lead to the collaborative study of different organizations, museums and heritage. This can result in a very comprehensive digital cultural archive benefiting many people and institutions. Increased quality of data can be another macro impact. Along with the increasing number of people accessing data and because of the constant feedback loops algorithms have improved their documentation and record keeping resulting in accurate cultural data.

Tourism, education, reach and storytelling are other fields that are disrupted by technology. With the effective use of technology, tourist guides can now be powered by AI, classrooms can be personalized according to each student's learning experience, museums and exhibitions can be digitally accessed which can be made engaging and personalized for the visitors.

**Micro Impact:** The use of AI with advanced digitization technology and algorithms can ensure careful preservation of cultural artifacts and heritage, and make sure our heritage remains intact for future generations. With the help of AI, the process of collecting, organizing and simplifying large data that can be done very quickly. This can help in improving research capabilities, maximizing the use of time and reducing cost thus helping one better understand cultural history better.

Optimizing the usage of AI for preservation of culture can have an impact on the finances of the organization as it can reduce operational costs by automating tasks with the help of AI. Automation of labor intensive work such as record management, revival of artifacts, and documentation can help organizations to save costs and allow organizations to allocate resources effectively. Lastly, AI can open up new revenue streams if it is used in effective ways such as increasing the experience and accessibility of data for the audience. This can attract a lot of audience which can result in more revenue.

With the use of AI, streamlining processes of cultural preservation such as restoration of artifacts can increase efficiency and production. This improved research and accuracy can have a great impact while making decisions for the supply chain.

Apart from this, the use of AI can improve coordination between various stakeholders that are involved in cultural preservation projects. This can result in better collaboration of data sharing and overall improvement in supply chain

management of cultural heritage preservation.

**Feasibility:** The use of AI for cultural heritage preservation is truly great as it revolutionized the preservation of cultural artifacts by restoring them through technologies like 3-D scanning and photogrammetry. However, there are the many drawbacks that come along with the use of AI in cultural preservation, such as accuracy of these digital artifacts and privacy and security issues.

Quality use of tools and skills can benefit cultural preservation in great ways. Having open source communities and encouraging collaboration within them can help multiple communities to grow together. Open source communities can be a great place to also exchange AI technologies, data interpretation of each other's cultures. It is also important to have a collective source that helps in effectively using capabilities of AI to ensure protection and storage of culture data.

The possible friction that comes with the use of AI technology in cultural heritage preservation, can be quality and accuracy of the digitized artifacts and secondly it is the ethical consideration. While dealing with sensitive cultural topics it is important to have ethical consideration to ensure that there are no issues over ownership and culture representation. Additionally, managing large volumes of cultural data along with expanding conservation efforts can create a lot of confusion affecting the scalability of preservation.

**Timeline:** Throughout the journey of cultural preservation through AI, there are many milestones that are to be achieved. Firstly, getting a quality level of accuracy while digitizing artifacts is very important. Secondly creating a community which facilitates the exchange of various information that are relevant for each other can be another milestone. Thirdly, it's very critical to develop strong ethical guidelines for processing these data. Lastly, it's the proper

**Risks:** It is important to address challenges and risks associated with the use of responsible AI in cultural heritage preservation. The major risk associated with the technology is the regulatory framework and compliance requirements. The documentation and processing of culturally sensitive data can come with a lot of privacy concerns which will require strict data protection measures. This can be a limitation in the long run if there is no proper regulatory compliance aligning with this and approving the data.

## CONCLUSION

The presence of artificial intelligence, AI in design and culture increased drastically over the years. With the presence of AI, now we have tools that can help in creating greater diversity and cultural expression. The combination of artificial intelligence, and cultural heritage preservation holds great opportunity along with possible challenges as it is associated with AI. With the increasing use of AI, there is an increasing misuse of AI as well. According to the survey conducted around 1580 executives over 510 organizations 86% of the executives say that they are aware of instances where AI have resulted in ethical issues. This shows the

urgent need for having a responsible AI to ensure that efforts are taken against the misinformation and bias.

According to a survey that was conducted around 4400 consumers across countries, 76% of the consumers advocated for regulation for the use of AI where they expect governments and individual bodies to lay down laws and principles that define the use of AI. With the association of AI in culture and heritage, it is way more important to have a responsible body to ensure that AI is not misused while applied in cultural and heritage preservation. The misuse of information, bias and transparency when it comes to culture and heritage can lead to destruction of culture and heritage.

In today's world giant companies, Microsoft and Google are bringing in regulations around AI growth and promoting safe development of AI models. India is taking measures to bring in transparency and inclusion by building frameworks and establishing an Indian data management office under digital India Corporation. But still there is a long way to go until we ensure a safe and transparent AI system but we are not far away from having responsible bodies as with increasing incidence, companies and countries are coming together and drawing attention towards urgent need for having responsible bodies as it is necessary with the AI ecosystem advancing day by day.

In conclusion, the case study has shed light on the huge significance of cultural heritage, which is the essence of our identity. The paper also discusses largely about the issues that come with the use of AI such as privacy, security, bias, and discrimination, and how these issues go beyond technology to affect people as well as societies with the use of AI alongside cultural preservation. We've also looked at the steps that well-known businesses and institutions, such as UNESCO, Microsoft, Google, and many colleges, have made to preserve cultural heritage. We also discussed pointer one has to take care while bringing responsible AI to life.

Cultural legacy is essentially the living past that tells stories of our common humanity and origins. In the near future AI will play a key role in each of our lives and AI will be more

actively used in preservation of culture. Using AI responsibly and utilizing it to the fullest will guarantee that our priceless stories are captured at a very fast pace and this will help our stories stay alive and accessible.

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