



[Introducing ArchiSafe by ArchiTangle](#)

As Europe's most visited monument burned, people across the world were left stunned, horrified by footage of the catastrophic fire. The fire that decimated the Notre-Dame cathedral ignited a longstanding debate on how to best protect cultural sites - places that are known to be associated with disasters ranging from fire to conflict. Over time, hundreds of cherished sites across the world have crumbled - examples include Brazil's National Museum which was decimated in a fire or the Adad and Mashki Gates of Iraq that were destroyed by the Islamic State. Can we indefinitely preserve the legacy of heritage sites that are symbolic to the history of a nation?

A monument brings together two distinct enterprises, that of the architect and the archivist. The architect is the instigator of new creations, an all-round consultant who is responsible for planning, designing and constructing buildings. Archives, on the other hand, can be described as memory machines: each sketch representing the enthusiasm and passion of its creator. Architecture inextricably relates to change, wherein the built environment ages and weathers over time while being subjected to radical reconstruction. Once they leave the drawing room, architectural plans, sketches and sections are visualized as an archive. By resisting the passage of time, archiving offers a means of collecting, cataloguing and protecting representations of the artifact.

Archiving photographs, construction drawings and designs serve as a solid means of record keeping. Museums with a varied archive collection seek to preserve the integrity of their collection. In the case of the Notre-Dame, a digital archive could hold the key to restoring it - thanks to Dr. Andrew Tallon, an art historian who used lasers to archive the entire masterpiece. Storing and retrieving architectural knowledge is important to preserve disaster-prone heritage sites and buildings that have outlived their original function. With the museum community comprising of over 55,000 institutions worldwide, driving drastic change would be difficult to imagine.

Many universities leverage their centralized IT infrastructure to store data associated with museums within their orbit. Local servers are prone to power outages, ransomware attacks, or physical faults in the server caused by hard disk failures. Interestingly, the US National Cyber Security Alliance found that 60% of small businesses shut down within six months of experiencing a cyber-attack.

Such firms shelled out an estimated \$700,000 to mitigate the damage after such an attack.

A single point-of-failure aside, centralized systems do not guarantee that the integrity of data stored on such servers. For instance, records in a traditional database are not protected because server administrators can possibly manipulate/delete information. Documents that are hundreds, thousands of years old lose their integrity over time, as they could be manipulated many times depending on the political regime. Centralized networks also offer limited scalability due to all the information being housed in a single server. Adding more storage or processing power to the server would not be a cost effective solution in the long-term.

However, the digital age potentially alters that status quo by bringing with it new tools to store, access and visualize information. The continuous broadening of horizons in times of digital transformation, has seen architects switch from paper-based to digital design processes. Countless CAD files, coupled with copious amounts of paper are produced by architects over the course of their practice. As architecture firms grapple with this mass-flow of information, both during and after the delivery of project services, records management becomes a challenging task.

Architects, universities and cultural institutions such as museums have found it difficult to preserve representations of artifacts over a period of time, given that they are not well-equipped to deal with the emergence of rapidly evolving technologies. A continuous influx of new technologies over the past decade has made it difficult to attribute a specific standard for archiving, with many records being inaccessible to this date. Data is the new oil and a standardized archiving system is the need of the hour to manage massive amounts of information.

“It’s like putting a guard at the front door to ward off bank robbers, without giving him or her training on what to do in the event of an actual robbery!”

- Thomas Koulopoulos, Delphi Founder

Correspondence with clients, historians, administrators and other stakeholders require architects to make such sensitive data available on request. For instance, German civil law requires architects to preserve their work for a minimum of 30 years for purposes of legislation. Due to ease of access, portable drives such as USB sticks appear to be the most favored means of physical storage. However, they can easily be lost or stolen and sensitive data could be put at risk. Upon analyzing 25,000 running hard drives, online backup company BackBlaze found that 90% of hard drives only survive for three years. The high failure rates of hard drives could be attributed to factory defects, random failures or parts that wear out after much use. The bottom line is that hard drives are mechanical and therefore bound to eventually fail.

Storage of information in the digital age has evolved by transitioning to cloud-based platforms such

as Dropbox or Google Cloud. A cloud is a remote server (usually in data centers), where you store your data. Rather than owning the server, you rent server space on a platform. In short, users hold no control over data stored on such servers, putting sensitive records at risk of manipulation. Information stored on centralized servers is also vulnerable to hacking, network outages, data-loss, and human error. Furthermore, users have no access to their data once their subscription ends.

With that being said, is it possible to store all kinds of digital content in a secure, permanent manner? If yes, can we be assured of the authenticity of the archive's holdings, particularly in times of political turmoil and ever-changing regimes? And finally, is it possible to have a consistent, decentralized archiving system in place wherein data can be accessed until perpetuity?

Introducing ArchiSafe - ArchiTangle's Flagship Service

Keeping record inviolate, i.e. protected from manipulation and unauthorized destruction has been quite a challenge over the years, with methods ranging from restricted permissions to listing of file contents. Such methods have proven to be ineffective, as seen by numerous instances of record tampering and removal whenever there was a strong enough motivation. As massive amounts of information continue to flow online, there is a pressing need for a consistent recordkeeping process that ensures inviolability of data over a passage of time. Architects are slowly realizing the legacy they might have in shaping cultural history over the long term. Sketches, specifications and working drawings demonstrate the thought process behind their work, making retention of these records incredibly important.

ArchiTangle is a multi-sided platform that offers an archiving solution to preserve architectural data through perpetuity, in addition to providing a customized publication service for architecture projects. ArchiTangle aims to solve most of today's recordkeeping shortcomings through a blockchain-based archiving platform that stores data immutably and permanently. ArchiTangle's flagship service, *ArchiSafe* is the premier Blockchain-based archiving system for architects where data manipulation is impossible.

Barring centralized file management servers, there is no dedicated archiving solution for architects on the market. A blockchain is a decentralized, distributed computer architecture wherein all records are stored permanently and cannot be forged. The features of Blockchain-based networks, also known as Distributed Ledger Technology (DLT) make it an ideal solution for permanent data storage.

ArchiTangle's infrastructure is fully decentralized implying that the owner has exclusive control over their data, and no third-party can gain access without the owner's permission. Through a digital peer-to-peer platform, users can store, manage, and exchange project data on a global scale. Unlike traditional storage mediums, data stored on ArchiSafe can be accessed by users until perpetuity,

even after their subscription has ended. In short, you only have to subscribe for uploading data.

By adopting a sophisticated permission layer, ArchiTangle enables architects to gain secure, infinite access to his/her work. ArchiTangle offers an affordable means to hold exclusive control over your data, without worrying about expensive installation or maintenance issues. Data can be made available on request, for purposes of legislation, knowledge exchange or in the case of a claim. The authenticity of these cryptographically secure documents can be verified against the blockchain and by dematerializing documents, distributed ledgers avoid the risk of misplacing or falsifying such records.

Digital permanence requires safeguarding information against two primary failures: loss of data integrity and destruction of the storage medium. Architects can no longer rely on existing storage mediums to bestow permanence, often resenting to believe that even the hardest stone will crack under the slightest bit of force. While technological advances bring with them societal challenges, they also create new mechanisms that offer better performance. ArchiTangle's ArchiSafe solution moves away from the familiar and provides a secure means to protect data that the world potentially depends on.