Digital memory, real futures: How BIM is helping save Kerkennah's endangered heritage

By Wiem Alimi

Kerkennah, an archipelago off the east-central coast of Tunisia and just east of Sfax, is not simply an island. It is a fragile frontier : between land and sea, memory and disappearance, heritage and erosion.

In a time of accelerating climate change, rising sea levels, and socio-economic precarity, vulnerable coastal territories like Kerkennah are becoming the silent casualties of global inaction. Yet, in the quiet erosion of its traditional architecture, in the cracks of its memory-filled walls, a different kind of urgency calls us: the urgency to document, preserve, and regenerate; before it's too late.

This is where digital innovation can make a difference. In this context, technology is not a luxury, it is a form of architectural care. A way to give memory a future.

What is BIM?

Building Information Modeling, or BIM, is a digital way of understanding buildings. Imagine it as a smart 3D model that doesn't just show what a building looks like, but also tells us what it's made of, how it ages, how it interacts with its environment, and much more.

Originally used in large construction projects, BIM helps architects and planners simulate and manage spaces more intelligently. When adapted for cultural heritage, this approach becomes Historic Building Information Modeling (HBIM): a method that helps us digitally preserve historic buildings with precision, combining scans, digital data processing, and human knowledge.

It's not just drawing old walls in 3D. It's about giving memory a digital form, so we can understand it, care for it, and plan with it in mind.

Why BIM? Why Now?

Kerkennah is vulnerable: to erosion, rising tides, and the slow fading of its architectural identity. The traditional architecture, built with local knowledge and shaped by the island's climate are rapidly vanishing.

Building Information Modeling (BIM) is no longer reserved for futuristic smart cities or high-tech construction sites. When applied to cultural heritage (HBIM), it becomes a powerful mechanism for integrating historical knowledge, real-time environmental data, and forward-looking sustainability models, all in a single, intelligent system.

By using HBIM in Kerkennah, we can digitally preserve this architecture, simulate how it degrades, and inform more resilient planning. It allows us to create a kind of "living archive",

one that can guide restoration efforts, support decision-making, and involve the local community through visual, interactive tools.

In this way, digital innovation is not about replacing reality. It's about protecting it.

Why Is This Novel in Tunisia?

In Tunisia, much of the built heritage, especially in rural or insular areas, remains undocumented. Access to advanced tools is often limited, and digitization moves slowly.

Yet recent studies are beginning to shift that landscape. At the archaeological site of Oudhna, researchers have applied laser scanning and drone photogrammetry to develop integrated HBIM models: a pioneering effort to document and preserve the past in a new language **(Empler & Alimi, 2025). This work represents a first in Tunisia, propelling the country from BIM Level 0 to Level 3 in one ambitious leap.** Bringing HBIM to Kerkennah builds on that momentum.

Bridging Heritage and Sustainability

This work is part of a broader effort to localize the Sustainable Development Goals (SDGs); not as abstract policies, but as concrete, community-rooted actions. It speaks to the need for cities and communities to be more resilient (Goal 11), for climate action that's grounded in place (Goal 13), and for inclusive innovation that reaches the peripheries (Goal 9).

Applying HBIM in Kerkennah marks another step forward. It shows that even small, under-resourced communities can participate in future-oriented planning. Through fieldwork, collaboration, and open data sharing, we can create tools that support both memory and resilience. Kerkennah becomes more than a case study. It becomes a prototype, showing how tradition and technology can shape a shared future.

What Is at Stake?

Kerkennah is more than a map point. It is a symbol:

A symbol of places often left behind in digital transitions.

A symbol of how technology can serve not capital, but cultural and climatic justice, that memory can become data; not to be abstracted, but to be preserved with care. And a symbol of how research can become repair.

My Research Contribution

As an architect and researcher rooted in the Mediterranean, my mission is clear: To create tools that help communities not disappear, but reappear in digital, political, and urban futures.

This digital model is not just about conservation. It is about empowerment. It offers a way for local knowledge to live on, not just in books or archives, but in plans, policies, and the hearts of those who inhabit space.

This HBIM prototype is more than a model; it is a message: We can no longer afford to separate heritage from sustainability, nor tradition from technology. And we no longer need to. HBIM will serve a smart methodology that helps us plan better for the future. These are not abstract outcomes; they are concrete instruments for climate adaptation, cultural continuity, and inclusive governance.

The SDGs are waiting to be grounded in Tunisia: in sand, stone, code, and care.

Let's build this future.

Suggested Reading:

Souza, E. (2025). *How did BIM help Notre-Dame rise from the ashes?* ArchDaily. Available at: How Did BIM Help Notre-Dame Rise from the Ashes? | ArchDaily