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Embracing the Present Without Compromising the Past: Multisensory Universal Design and Interior Architectural Strategies in Cultural Heritage

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Introduction

The prevailing rigid paradigm of inalterability regarding the conservation of historical environments is currently in an increasingly profound spatial conflict with the right of access, a fundamental requisite of contemporary society. This conflict places a highly challenging yet equally critical question at the core of conservation practice and spatial design: Should a historical interior space be merely a purely visual museum intended solely for untouched observation, or should it function as a breathing, living organism capable of being experienced inclusively by all segments of society?

Particularly in the context of cultural heritage sites, a traditional dichotomy is evident between the reflex to preserve the authentic spatial fabric and the endeavor to ensure universal inclusivity. However, spatial accessibility is not a detrimental threat to the historical structure; rather, it is an integral component of cultural sustainability that socializes the heritage by integrating it into contemporary life. In this commentary, by transcending the aforementioned paradox of conservation and accessibility, I aim to discuss how spatial adaptations should be approached not merely as physical interventions or legal obligations, but as multisensory and universal interior architectural strategies that embrace the present without compromising the spirit of the past.

Inclusive Tourism and Multisensory Experience

In contemporary literature, the concept of accessibility is defined not merely as the elimination of physical barriers, but as a fundamental human right—as articulated in the United Nations (2006) Convention [1]—and as an equal, dignified, and independent spatial experience for all, in accordance with the principles of Universal Design established by Mace (1997) [2]. This paradigm, further substantiated by Buhalis and Darcy's approaches within the context of tourism, fundamentally signifies that no individual's right to participate in public spaces and activities should be restricted, thereby ensuring that the provided products and services are usable by diverse user profiles. Presently, this concept is being recontextualized along the axes of equal opportunity and inclusivity, in direct alignment with the United Nations' 2030 Sustainable Development Goals (SDGs).

Disability, or a lack of accessibility, is not inherently an attribute of the individual; rather, it is a condition emerging from the inadequate or flawed configuration of the physical environment, which can be ameliorated through appropriate spatial interventions. Accordingly, within the tourism framework, accessible tourism aims to ensure that individuals with mobility, visual, auditory, and cognitive requirements can partake in the tourism experience independently, equitably, and with dignity, facilitated by universally designed tourism products and environments.

Spatial experience is not solely confined to visual perception. The discipline of architecture provides users with a multisensory experiential realm where senses interact and amalgamate,

extending beyond the classical five senses. Consequently, while a primary focus on physical barriers in urban spaces or newly constructed public buildings may be deemed somewhat sufficient and is generally codified by regulations, it is imperative to expand our focus to encompass sensory and cognitive accessibility within cultural heritage sites. Tactile models and auditory sensors at the Canadian Museum for Human Rights, or advanced wayfinding systems in botanical gardens, serve as prominent examples of the successful implementation of this multisensory approach.

Overcoming the Paradox of Conservation and Accessibility

When accessibility adaptations in historical environments are brought to the agenda, the most frequently encountered resistance is the apprehension that intervening in the structures of archaeological sites and monuments will compromise the authenticity of the cultural heritage. This justified concern is fueled by the approach of the 1964 Venice Charter, which defines historical structures as "priceless witnesses of the past" and dictates the preservation of absolute authenticity. However, contemporary conservation practice extends far beyond a static act of freezing a space in time. ICOMOS declarations and the Burra Charter, which advocates for balancing the cultural significance of a site with its contemporary utilization, emphasize that historical fabrics must be preserved as living entities without being detached from societal life. In this context, the reality that historical structures cannot be exempt from accessibility imperatives is increasingly resonating.

To focus on a solution within this paradigm, the objective should be to develop site-specific and rational strategies that balance these two opposing necessities without sacrificing one for the other. In establishing the equilibrium between these two concepts, two fundamental principles of contemporary interior architecture and conservation theory-reversibility and distinguishability-must directly govern the design process.

Reversibility dictates that any subsequent addition to the space, such as a ramp, an elevator, or a capsule exhibition unit, can be dismantled in the future without inflicting any physical damage on the historical fabric (e.g., original stone paving or a frescoed wall). The new design must be a freestanding entity that does not impose a structural load on the historical building, capable of being removed, when necessary, thereby acting as a tribute to the cultural heritage.

Distinguishability, as stipulated by the Venice Charter, requires that the newly implemented intervention is clearly legible as a contemporary addition, avoiding any chronological falsification (imitation). The utilization of contrasting materials (for instance, a transparent and lightweight glass/steel construction appended adjacent to an ancient masonry stone wall) concurrently displays the traces of the past with honesty and resolves contemporary accessibility needs through a modern design lexicon.

Establishing a correct relationship between the historical environment and accessibility grounded on this theoretical foundation, and bringing both approaches to a common denominator, necessitates a systematic methodology:

i. First, existing physical and communicational barriers to access must be identified.

ii. Users' access requirements must be comprehensively analyzed in accordance with universal design principles.

iii. The impact of all these requirements on the historical, cultural, architectural, and archaeologically significant features of the site (defined as cultural significance by the Burra Charter) must be meticulously evaluated.

iv. Ultimately, a harmonious interior architectural solution must be developed that strictly adheres to the principles of reversibility and distinguishability, without compromising the authentic character of the site.

There are highly successful global precedents where this theoretical framework translates effectively into practice. The League of Historical and Accessible Cities (LHAC), initiated in 2010, emerges as a pilot project focused on enhancing the accessibility of historical towns while concurrently promoting the development of sustainable tourism and the preservation of cultural heritage. To date, accessible tourist itineraries have been established across six different European cities (Avila/Spain, Lucca/Italy, Mulhouse/France, Sozopol/Bulgaria, Turin/Italy, and Viborg/Denmark).

Implementations such as the accessible routes in Avila, Spain, or the Prospelasis Project—which encompasses six major Byzantine monuments in Greece (Acheiropoietos, Saint Demetrios, Saint Nicholaos Orphanos, Hagia Sophia, Rotunda, and the Heptapyrgion Fortress)—demonstrate how accessibility can be augmented through astutely designed technological and spatial interventions without conceding the authenticity of historical heritage. The quintessential value that elevates these projects beyond mere initiatives of goodwill is the bold and honest spatial dialogue they establish with the historical fabric.

For instance, the accessibility intervention executed at the Rotunda Monument under the Prospelasis Project merits examination regarding the conservation-inclusivity equilibrium. The 15.5-meter pedestrian bridge added to provide unimpeded access to the Imperial entrance of the monument, along with the modern elevator system integrated into the interior, were designed utilizing contemporary, lightweight, and contrasting materials such as metal and glass, thereby avoiding the fallacy of imitating the historical Roman and Byzantine masonry stone fabric. This material preference successfully satisfies the principle of distinguishability by ensuring the newly added structure is distinctly differentiated from the historical one. Furthermore, these freestanding modern additions, which impose no structural load on the antiquity, demonstrate absolute fidelity to the rule

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of reversibility. They stand as a testament to how profoundly universal design can be integrated into a space without undermining the authenticity of the cultural heritage.

In conclusion, as underscored within accessibility standards, historical environments and structures cannot be excluded from binding inclusivity legislation such as the ADA (Americans with Disabilities Act). Similar to the United States—a pioneering nation possessing some of the oldest and most advanced disability laws globally—unhindered access to all historical structures serving the public is fundamentally both a universal human right and an indisputable right of citizenship [3].

From Theory to Practice: Universal Design Strategies in Historical Fabric

Within the framework of international conservation criteria and universal design principles, the imperative of non-intervention regarding the historical fabric during interior modifications can be effectively navigated through innovative interior architectural detailing. The primary strategies, congruent with contemporary interior design practices, encompass the following:

i. Detachment from the Historical Wall and Capsule Modules: Instead of exhibition units directly mounted onto historical wall surfaces (frescoes, original plaster, or stone masonry), freestanding micro-architectural structures and modular capsules should be designed. A shadow gap established between the newly introduced element and the historical surface accentuates the chronological contrast while simultaneously preventing any physical load from being imposed on the original structure.

ii. Raised Floors with Integrated Tactile Wayfinding and Reversible Podiums: To prevent the degradation of original floor finishes (e.g., mosaics, worn marble), mitigate elevation differences, and enable visually impaired visitors to comprehend the space independently, permanent interventions (such as scraping or adhering) on historical floors must be strictly avoided. The rational solution involves the implementation of reversible, modular walkways that rest on adjustable supports under their own weight (freestanding) without damaging the existing floor. Contemporary materials preferred for these podiums—such as transparent glass, matte metal, or brushed wood—can generate a distinct contrast with the underlying historical fabric in terms of both thermal conductivity and surface texture. This physical differentiation and the integration joints function as a natural tactile map, detectable via a white cane or the soles of the feet. Furthermore, raised systems eliminate visual clutter within the interior by facilitating the routing of utilities (lighting, HVAC) through their underfloor cavities. Consequently, conservation, sensory inclusivity, and infrastructural prerequisites can be resolved through a single, holistic spatial intervention.

iii. Volumetric Acoustic Control and Auditory Comfort: The most prominent characteristic of high-volume, masonry stone historical structures, such as cathedrals, cisterns, or caravanserais, is their prolonged reverberation time. This uncontrolled acoustic environment can generate a chaotic and fatiguing experience where sounds conflate, particularly for individuals utilizing hearing aids or those with cognitive sensitivities. Mounting sound insulation materials directly onto historical walls or vaults to resolve this volumetric issue inherently contravenes conservation principles. The rational approach is to utilize freestanding sound-absorbing exhibition panels, micro-perforated wooden surfaces integrated into furniture, or reversible acoustic baffles suspended by steel cables independent of the primary structure, thereby optimizing the sound absorption coefficient without entirely eliminating the original spatial resonance. Such interventions facilitate auditory focus without compromising the visual integrity and historical value of the heritage site.

iv. Ergonomics and Interactive Lighting Design: Lighting is the paramount interior architectural tool that supports spatial orientation and cognitive perception while preserving the historical ambiance. LED strips concealed beneath stair treads or within handrails delineate pedestrian axes in dimly lit environments. It is crucial to design exhibition vitrines to align with the ergonomic eye level of a wheelchair user (90-120cm), supplemented by anti-glare, non-reflective glass, and fiber-optic spotlights designed to prevent visual discomfort.

v. Digital Accessibility and Alternative Experience Rooms: In instances were specific areas, such as a castle tower or the narrow staircases of a subterranean cistern, cannot be rendered physically accessible due to absolute architectural constraints, Alternative Digital Experience Rooms should be established at an accessible juncture within the facility. Through the deployment of virtual reality (VR) headsets, 360-degree projections, or live camera feeds, individuals encountering physical access barriers are afforded the opportunity to experience the inaccessible spatial volumes to the maximum possible extent.

Conclusion: A Dynamic Process Rather than a Static Objective

In conclusion, the future of cultural heritage sites is inextricably linked not only to their fidelity to the past but also to the extent to which they embrace the diversity of contemporary society. In alignment with Prof. Dr. Korydon Smith's approach- which conceptualizes both inclusive design and historic preservation as dynamic processes rather than static objectives-cultural heritage sites are predominantly restoration and transformation projects spanning decades. Consequently, it is imperative that newly developed techniques and emerging theoretical knowledge be continuously and seamlessly integrated into these ongoing processes.

Within this transformation paradigm, endeavors to elevate a city's cultural heritage from being merely a preserved structure

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to an entity integrated with society must encompass two primary objectives. First, to guarantee unimpeded, equitable, and dignified access to historical monuments for all individuals, including those experiencing mobility limitations. Second, to support spatial transitions with a high-quality flow of information, thereby guiding visitors in synthesizing the fragmented remnants of the past; this effectively translates the multi-layered history of the site into a meaningful and cohesive narrative within the public consciousness. Furthermore, to ensure the perpetuation and conservation of architectural heritage, it is fundamental that accessibility interventions be implemented utilizing methodologies that strictly adhere to the principle of reversibility.

As academics and industry professionals operating at the intersection of cultural heritage and accessibility, we must advocate that accessibility does not constitute a threat to the historical fabric; conversely, it is a profound enrichment that ensures these spaces are comprehensively experienced by all segments of society and successfully transmitted to future generations. It is anticipated that the proliferation of holistic and multidisciplinary research within this domain, under the auspices of The Global Journal of Tourism, Leisure, and Hospitality Management (GJTLH), will play a pivotal role in the cultivation of an inclusive tourism industry that renders world heritage accessible to all.

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