MSc Graduation Studio 2024-2025
Architectural Desgin Crossovers
Heterogenous City - Madrid
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REFLECTION

Relationship between Project Topic, Master Track, and Master Programme

My graduation project on Madrid's Digital Commons explores how architectural intervention can transform invisible digital infrastructure into civic spaces that promote transparency and democratic oversight. This approach aligns with the Architecture master track's emphasis on architecture as a mediatory discipline and the MSc AUBS programme's focus on interdisciplinary solutions to complex urban challenges. By materializing abstract digital processes through spatial design, the project demonstrates architecture's capacity to reconcile technical systems with social needs while addressing the growing democratic deficit in technological governance.

The project integrates perspectives from architectural theory, digital humanities, and information science, embodying the cross-disciplinary methodology emphasized in the AUBS curriculum. This approach has allowed me to address both the technical requirements of digital infrastructure and the sociopolitical implications of its spatial organization.

Research-Design Dialectic

My research centered on investigating the triple crisis of digital knowledge: infrastructure invisibility, digital literacy gaps, and archive digitalization disruptions. By examining the transition of archives from static containers to dynamic circuits, I identified key tensions between technical processes and civic engagement, particularly in Madrid's invisible data center infrastructure.

The analysis of Madrid's digital landscape revealed critical resource consumption issues, with current data centers using 613 MW of power and 665 million liters of water yearly—a significant impact during the city's drought conditions. This resource intensity, combined with Madrid's planned 300% expansion of data center capacity by 2026, created a compelling context for architectural intervention.

The design process consistently prompted deeper investigation into the physicality of digital systems. As I adapted the cloud-fog-edge model to bridge technical requirements with civic engagement, I encountered complexities in materializing Berry's "post-archival constellation" concept into architectural form. Each design iteration required more nuanced understanding of how to translate the layered complexity of computational archives into spatial experience, with research findings informing more sophisticated architectural responses to reveal these relationships.

Assessment of Methodology and Working Approach

My methodological approach combined Actor Network Theory with spatial mapping, systemic diagrams, and comparative analysis to address the inherently abstract nature of digital infrastructure. This multi-layered approach allowed me to trace associations between human and non-human actors across different infrastructure layers, revealing how various elements interact through network relationships.

The quantitative and comparative analysis examining Madrid's data storage evolution effectively contrasted traditional archives with modern data centers, providing critical insights into their spatial organization, operational efficiency, and building scale. This analysis revealed how data centers' massive computing capacity and energy demands differ from traditional archives, informing strategies for civic integration.

The creation of architectural narratives proved particularly valuable for testing spatial experiences, enabling exploration of phenomenological aspects that conventional drawings cannot fully convey. These narratives helped me imagine how users would experience technical systems through sensory cues rather than explicit explanation.

Academic, Societal Value, and Ethical Implications

Academically, this project contributes to emerging discourse on infrastructure visibility by providing an architectural response

to theoretical positions from Berry's post-archival constellation, Bratton's Stack framework, and Mattern's deep time perspective. It demonstrates how these concepts can be synthesized into a comprehensive framework for reimagining digital infrastructure as civic space.

The project's societal value lies in addressing the triple crisis of digital knowledge through architectural intervention. By transforming isolated technical systems into transparent civic institutions, the design creates environments where citizens can understand, interact with, and shape the systems processing their data. This approach directly counters the democratic deficit where technical infrastructure expands, while they are remaining isolated from civic life and environmental responsibility.

Ethically, the design addresses questions of data sovereignty and algorithmic transparency while challenging prevailing narratives of digital immateriality. By revealing resource flows, energy consumption, and cooling processes, the architecture makes tangible the physical reality of digital systems. The project's spaces for collective governance embody ethical principles of inclusivity, accessibility, and democratic oversight.

Transferability of Project Results

The cloud-fog-edge spatial model offers significant transferability to other cities and contexts seeking to develop more transparent and democratically governed digital infrastructure or knowledge center. This approach creates a flexible architectural framework adaptable to various urban contexts while maintaining graduated transparency between centralized and distributed systems.

The material strategies developed for expressing data flows and resource consumption extend beyond digital applications and could inform designs for other technical facilities that typically remain hidden from public view, including energy production, water management systems, or transportation infrastructure. By making invisible processes tangible through sensory architectural

elements, these strategies provide a broadly applicable approach to infrastructure legibility.

The project's phenomenological approach to expressing technical processes through material qualities—temperature gradients, acoustic properties, transparency variations, and lighting conditions—offers transferable methods for making complex systems comprehensible without requiring specialized knowledge.

Self-Developed Reflection Questions

How can architecture create enduring civic infrastructure for digital commons rather than adapting to ephemeral technological systems?

The project investigates the tension between rapidly evolving digital technologies and the need for enduring civic institutions. By prioritizing human experience and democratic values over specific technological configurations, the architecture establishes a framework that can accommodate technological change while maintaining its core civic function. The design deliberately avoids over-specification to particular technological systems—which would inevitably become obsolete—in favour of creating flexible spatial typologies organized around the enduring social patterns of collective knowledge production and exchange. This approach asks how we might design for the continuity of civic institutions rather than the acceleration of technological cycles. The project suggests that by anchoring digital infrastructure in the stable realm of public space and collective governance, we can create buildings that serve as reliable civic anchors even as the technologies they house transform over decades.

How can the architecture itself become a pedagogical instrument for digital literacy?

Rather than relying on conventional exhibition strategies or didactic displays, the project investigates how the architecture itself can function as an inherently communicative medium that reveals digital processes through direct experience. The building's

spatial sequence creates an embodied narrative mirroring data lifecycle, allowing visitors to physically experience information flows through movement, material transitions, and atmospheric conditions. By embedding sensory cues within the architecture's fundamental elements—its structural logic, material transitions, environmental gradients, and circulation patterns—the building becomes a form of three-dimensional knowledge infrastructure that communicates through experience rather than explanation. This aligns with the project's aim to make abstract digital processes tangible and comprehensible to citizens through architectural intervention.

Looking Ahead to Final Phase

The final phase will focus on refining the programmatic relationships and architectural narrative that demonstrate how digital systems operate within civic space. I will develop a more comprehensive and coherent spatial sequence that reveals the complete lifecycle of data through architectural experience. This will include enhancing the project's urban integration, particularly connections to Madrid's cultural district and transportation networks, while strengthening the narrative progression through the building. Detailed sectional studies will examine relationships between public spaces and technical facilities, with emphasis on threshold conditions where different programs intersect. By clarifying and strengthening these programmatic relationships, the architecture itself will more effectively communicate the systems it houses, translating abstract digital processes into tangible civic spaces that promote transparency, participation, and democratic oversight.