The Architecture of Information

by Martyn Dade-Robertson

The relationship among architecture, information and information architecture can be thought of from the perspective of architectural prehistory. The first instance of architecture may not have been a structure but the more conceptual designation and naming of territory, an information activity. Early representations of digital space drew heavily on images of buildings and cities as a visual medium. As information space has evolved, the link to any physical reality has vanished, though we retain the metaphor of navigation to make real the experience of interacting with the abstract on multiple levels. Users relate with information in semantic space, screen space and interaction space, each of which must be addressed by the information architect. The rise of ubiquitous computing may disrupt much of that conceptualization, leaving only an abstracted link between information and user action, with that interaction itself shaping the architectural space.

KEYWORDS

nformation architecture	metaphors
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hat was the first architectural gesture? It's an ambiguous and abstract question but one that I ask my architecture students every year. The response is consistent. Architecture, whose primary responsibility is to design buildings and, thus, provide shelter, must have started with the first basic dwelling. While this response is plausible, it is flawed, in my view.

The technology required to construct a self-supporting structure capable of providing accommodation and shelter indicates a highly advanced culture and society. Is it not more likely that our first architectural gesture was to make more primitive modifications of our environment, perhaps designating a meeting place or setting out a significant ritual territory? Perhaps, as the architectural historian Spiro Kostof suggests, the first architectural gesture was the naming of territory [1].

This question is important to me. Understanding the pre-history of architecture is to understand that the discipline we associate with the design of the built environment is fundamentally an informational pattern-making activity. This knowledge is also critical to a second question I have been asking myself for the past decade, namely, where is the *architecture* in information architecture? *Information architecture* (hereafter IA), a term coined by Richard Saul Wurman [2], himself a trained architect, has collected many analogies to traditional architectural practice. Rosenfeld and Morville for example, in their now seminal textbook *Information Architecture for the World Wide Web* invoked the famous Winston Churchill quote – "We shape our buildings; thereafter they shape us" [3, p. 3].

The 1990s were littered with proposals for graphical interfaces that made use of architectural spaces as visual backgrounds to digital information. For

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example, Microsoft's short-lived Microsoft Bob, along with a talking dog (a precursor to the much maligned Mr. Clippy), supported an extended desktop environment that consisted of an entire office. Complete with roaring fire and MIT's *City of News*, it was an imaged, web-based environment where content was displayed as skyscrapers in an imaginary gridded city [4]. While the desktop of the PC's graphical user interface (GUI) has evolved, we don't, for the most part, interact with digital information through images of virtual buildings or cities. The "hysteria of total simulation" as Johnson put it [5, p. 60], which gave rise to many GUI proposals, has been greeted by some with incredulity and skepticism (see for example [6]).

It seems increasingly unlikely that the next generation of information spaces will be realized through such direct metaphors of architectural spaces. Rather, if we understand architecture as pattern-making activity and strip away the material reality of the built environment, which is a result of the many functional horizons on which architecture operates [7], we are left with a practice in which we create topological relationships that are addressed through our bodily exploration and navigation. In my thesis *Information Architecture in Screen Based Semantic Spaces* [8] and later my book *The Architecture of Information* [9], I suggest that the notion, for example, of navigating a website is derived from a need to frame our experience of interaction with an otherwise abstract and disembodied experience by utilizing an embodied metaphor – or what Johnson describes as an *image schema* [10]. When we consider the role of IA, we can't simply consider the information space itself but we must also consider these distinct spaces: semantic space, screen space and interaction space.

Semantic space: This term is derived from the work of Kaplan and Moulthorp [11] and defined as the structure of information held within a computer. It is potentially multidimensional and, in practice, consists of information objects and their relationships to one another described through, for example, hypertext links or database fields. Semantic space can be created by individuals or through automated processes. Semantic space can therefore emerge from computational systems used to analyze information and find meaningful patterns. *Screen space:* The concept of *screen space* emerges as a result of separating out the visual component of information space and defining the space of the screen as separate from the space of interaction. Screen space is constrained by the number of available pixels and the visual language used to display information. It can include web pages, a desktop GUI, a complex graph-based visualization or a 3D world, and each type of representation is constrained by metaphors and their visual rhetoric.

Interaction space: This describes the input actions of a user that change the computer's output. For example, clicking on a link causes a web page to change its content; typing in a search query will cause a list of web pages to appear in Google; pressing an arrow key may cause a virtual camera to move through a 3D space; grabbing a document icon with the mouse curser will cause it to move as if it is being directly manipulated. Different types of interaction are mapped onto different types of screen space so that, in the best case, the two reinforce one another.

While these ideas are still relevant for IA, which is still predominantly a screen-based practice, the last decade has seen the rise of a new paradigm: ubiquitous computing where any object or surface has the potential to be computational and networked.

If the technological predictions turn out to be true, and the course of computing creates a world in which computation is invisible and mediated by computational agents, then ubiquitous computing has the potential to radically change our relationship to real spaces, merging digital and physical until they are indistinguishable from one another. Information only becomes relevant once it is linked to action. By shaping our experience of space and influencing our behaviors, computational information acts as an intermediary between place and action, and software becomes architectural. We are entering an era in which computation shapes architectural space rather than being shaped by it. The shaping occurs not simply on a material level through the creation of computer-generated forms, but also through the process by which we use and experience space as a functional and semantic system. We may not in the future need to distinguish between architecture and information architecture at all.

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