Chapter 9

Architectures of the physical and virtual: parallel design principles in built and digital environments

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What are the similarities between information / experience architecture and built architecture? How do their practices intersect? There are parallels and divergences in the training given to architects and digital experience designers which impacts the ways design is approached and incorporated into the development process. Architecture students are taught to approach design with both an overall vision in mind and a consideration and respect for the materials to be used and how this is going to influence the final design – in other words, both top down and bottom up design work off each other iteratively. This has both similarities and differences with digital experience design in terms of the tensions between (top down) user-centred interaction design processes and (bottom up) software engineering methodologies. In architecture, there is training in how space and people interact with each other and how all the design disciplines involved in a build must cooperate with each other. However, the consideration of space and the harnessing of other disciplines in digital experience design is yet to reach its full potential.

Top down and bottom up

Meaghan Waters initially decided to be an architect because she was interested in the way that people use buildings. It was people's relationships to buildings that enticed her into the profession, not the desire to just make something on a large scale. This also applies to her work in online environments: it is not creation for the sake of creation; rather, understanding the relationship between user and application is fundamental to developing something that works at a functional as well as experiential level.

The crux of her architectural training was learning to negotiate these two dimensions of design. Architects must have a 'vision' for a building, yet acknowledge that this will be affected by the materials used. The tiles, bricks, etc used in a building are determined by

the overall vision of the architect. Simultaneously, this vision can be realised or compromised by those very materials. The experience and accessibility of a building is made or broken by the materials that constitute it.

In relation to Web design, this means that a digital experience is informed by how a site is developed. There are certain considerations that are non-negotiable. Just as fire alarms in buildings are mandatory, there are aspects of online safety (such as secure socket layers in e-commerce) that are absolutely necessary to protect users. Similarly, designing a Web site to be accessible by means other than a mouse and keyboard should be assumed as in designing a building for different kinds of access: for example, beyond just wheelchair access, there are people with prams or shopping trolleys; emergency exits (when lifts or escalators fail) and entrances (for ambulance crews and fire officers); trucks which need to deliver or remove goods; hallways and corridors that need to be amenable to furniture being transported between floors. How do you get power in and waste out of a building, just as you have data inputs and outputs from a Web site? These issues have to be integrated into the design process, not add-ons after a building or Web site has been developed. As Web design becomes a respected profession, it is becoming increasingly evident that expertise is necessary in establishing and managing a Web site, in the same way that almost all building design and construction requires the input of an architect.

Meaghan describes the architect's vision as a 'top down' approach to design. Particular architectural movements are underpinned by ideological and philosophical trends in what and how buildings should be (see Kohler 2007 and Colquhoun 2002). For instance, classical pre-modern styles of architecture aimed for 'formal and elaborate beauty'; in contrast to Bauhaus which was oriented towards the future rather than the past, embracing the latest technologies and materials to produce buildings which were 'simple and unpretentious' (Bush-Brown 1976: 39). Buildings that are 'vision-led' are distinctive in their design and often articulate the unique style and 'signature' of the chief architect through both form and technology (the materials used and the way it is built). Examples

of visionary buildings include Jorn Utzon's Sydney Opera House, and Frank Gehry's Guggenheim Museum in Bilbao, Spain (see Artifice Inc 2007).

However, there are scarce examples of digital experiences that have a signature design (such as Pixar films, stories and animation). While there are many Web sites that share the same style or look, few are uniquely identifiable as the product of a particular individual or team. Perhaps this is because there is no role within a Web development team that is particularly senior, and it is these egalitarian relationships within a Web team that make it more difficult to move beyond mere agreement about the 'look and feel' (or just form in architectural terms) of a site to a collective vision of its experience and utility (or a marriage of form and function that, as Risebero (1992: 127) suggests, can be seen in the 'close conceptual relationship between aesthetics and technology' of successful architectural projects). These higher aims can also be lost in the struggle to balance client demands with user requirements to the extent that the aim of creating an overarching experience becomes compromised.

If Web development teams were organised similarly to teams working in built architecture, the role of the experience designer on a Web project could be appropriately likened to that of a chief architect on a building project. Based on their market and user research, their responsibility is to develop a vision for the client but aimed at the user, convince the client as well as the project team of its importance, and ensure that it is implemented. The individual vision of a chief architect on a building project is arguably intellectually, conceptually, historically and practically driven. To be visionary requires knowledge of and reference to design theory, history and practices. Good architects draw upon this disciplinary baggage. But can an experience architect on a Web project be expected to do the same given the shorter history, dearth of theory and fewer standards in online design?

The hierarchy within a building project allows the chief architect to exercise similar responsibilities to that of an experience designer, back-end developer, and visual designer on a Web project. In other words, the architect ultimately directs the user experience of

the building as well as how it looks, and the materials which form it. But it is the role of the team working under him/her to work out the best possible process by which to realise this vision and then implement it. It is at this point where the top down approach (the vision that has come from the top) has to be reconciled from the bottom up (in the detail and procedures which allow the building to be built as well as function as it should).

The risk of having a predominantly top down approach is that the integrity of the vision is maintained while everything else can get compromised as it drives down into the detail. This can be seen in buildings that have a gorgeous facade but do not actually work well on the inside. The Sydney Opera House is an internationally recognised icon that successfully brands Australia. However, as an opera house, it does not seat the numbers originally intended and is not large enough to stage full-scale operas; the orchestra pit has been reported as too cramped for the musicians; and the high roof has resulted in problems with the acoustics. The inside does not live up to the outside, in part, because it was not faithful to the original vision of chief architect, Jorn Utzon. It was so compromised by budget cuts and political interference that Utzon resigned mid-project and his designs were subsequently altered (see Watson 2006).

This prioritisation of style over substance is a familiar one in online design, when the 'bells and whistles' overpower the utility and purpose of a Web site. Even in cases where the experience architect has developed a clear vision and strategy on a project, this is not always respected by other members of the Web team, particularly when there is a lack of coordination in the bottom up approach. As Meaghan says:

'…architecture does train you for the disappointments that interaction design also gives to you. You design something and then someone else comes along and builds it. To some extent, they get the last say…'

A bottom up approach entails integrating all the components in a way that will work. If it is done well, it should still be consistent with the vision. However, when working at a micro level 'upwards', preoccupation with detail can mean the vision can be lost. For

example, the garden shed that is built to accommodate the lawn mower and gardening tools may be fine for that purpose, but it may be in the wrong place in the garden if it is unintentionally visible from the street. Likewise, Meaghan contends that much software design is done this way: cobbling together functionality in an interface before thinking about how this will be used in everyday work practices and its effects on workflow as well as work culture. Web-based applications internal to organizations, such as customer or employee databases, often illustrate the dangers of a bottom up approach in the absence of a high level vision.

'…it's basically anything where you can't easily move from one piece of it to another piece in a common task that has been designed from a bottom up approach with no one actually looking at the overall view on it... anything where you get a lot of pop up windows coming up, one after the other after the other, is a great example of no one ever having thought about how it's all going to hold together.'

On the more positive side, *Facebook* exemplifies an application that has numerous component parts that are held together by a broad vision and purpose of social networking. *LinkedIn* operates similarly on a functional level, but has a different vision and purpose of professional networking.

From architect to seamstress
After studying architecture during an economic recession, Meaghan found opportunities for employment in the field limited. She therefore fell back on her dressmaking skills to supplement her income, designing and making wedding gowns. Although the transition from architecture to dressmaking may not seem a logical one, but the relationship between buildings and the body is not a new one. Historically, buildings based on the body can be found as far back as the Renaissance and are articulated in more contemporary ways with notions of bodies as temples and cosmetic surgery as a form of architecting bodies (Jones 2007: 186). Thus, in dressmaking, Meaghan was still able to apply architectural principles of balancing top down and bottom up approaches to design and construction.

Firstly, her clients each had a vision for their wedding dress, having been unable to find what they wanted from retailers. But the dressmaker has to be clear about what the client envisages.

'Everyone has a vision of what they want to look like on their wedding day, and it was my job to tease out that vision, convey it back to the person who's going to wear it and then make it happen in a way that matches to the vision.'

Next, the dressmaker has to work out how the gown is to be constructed while still ensuring it can be worn practically:

'It's got to be built in something and it's got to fit the person that's wearing it. They've got to be able to walk in it and they've got to be able to do all these things in it.'

Dressmaking could be described as small-scale architecture in that you are designing for one person and one day. But the negotiation between the top down and bottom up approaches remain the same: the bride has to feel fabulous as well as be able to breathe, walk and eat in her dress. A wedding dress has an emotional impact that long outlives its utilitarian value. How the bride felt wearing the gown, how the fabric felt against her skin will forever be associated with memories of her wedding day.

Like built architecture, dressmaking involves the design of space – the space around the body, how one moves and functions in that space, and the emotions that are attached to that space. These spatial-affective elements are well understood in architecture and dressmaking, but the role of space in emotional design has not been fully explored in digital experiences. While there has been research on the emotional responses of users in 3D virtual environments (see Li, Dougherty and Biocca 2003), Web interactions are still primarily two dimensional. There is still much to be understood about the emotional design of everyday online transactions.

'…what you design has an emotional impact and the space has a feel to it… you could walk into a room completely with your eyes shut and you can get a feeling for the space in it because of the way the air feels and the ambient sounds within it.'

How an object and/or/in space (whether building, wedding gown or Web application) can be built for use as well as desirability is the concern of the architect, dressmaker and experience designer. Indeed, any kind of design field and training requires an understanding that an object's use goes beyond just pure utility: people also have to want to use it and the designer's role is to evoke that desire.

'I got into architecture initially because I just wanted to build things and make people feel good…Online design is also about looking great and feeling great to use…People generally want to feel good and you want to build things that make people feel good, whatever it is.'

Architectural training
Meaghan's training as an architect concentrated on four core areas: design, theory, history and practice. Students were exposed to ideas and philosophies of architecture, as well as architectural trends and movements over time. This fed into their own approaches and attempts to design before working in collaboration with other design students to implement their proposals. Within these core areas, subjects were shared with students of landscape design and building services design, so that when it came to practise, the teams mimicked those in which they would be working as future qualified architects in industry (Geddes 2006: 57).

Although having architecture students do the same subjects as students from with other design fields is indicative of the multi-disciplinary nature of design, it is also evidence of the commonalities between what Meaghan calls the 'hard' design disciplines. These are fields of design which involve the production of an object that will be subject to physical interaction: that is, it will be either picked up, walked through, thrown, or pressed, etc. These design disciplines include not only architecture and related fields such as landscape

design, building services design, and interior design; but also industrial design, product design, ergonomics and human-computer interaction.

'…what they're trained to do is understand that people are, in fact, actually going to interact with this. They are going to touch it, to feel it, to move around with it, to do something in it and to directly engage with it, physically engage with it.'

It is this sort of training that was missing in the early days of online design, resulting in the kind of Web sites produced by graphic design bureaux that simply attempted to transfer print design principles to the Web, and which subsequently ignited the usability movement. These had all the information required, but did not address the issue of how it was to be accessed and used.

During Meaghan's architecture training, she was discouraged from taking briefs (for example, from clients wanting to build a family home) in terms of simply asking what kind of rooms they wanted in the house (such as three bedrooms with an eat-in kitchen etc). Rather than just figuring out the component parts, it was necessary to ascertain how the family would use the house (Would the children share a bedroom? Would the study be used by everyone? Does the family eat together at mealtimes? What does each family member need and want in the new home? What were their expectations of the new home?). There are many ways a three bedroom home can be designed. Two homes may have the same facilities (number of bedrooms, laundry, kitchen, living room, etc) but present and feel very differently.

Again, these approaches are beginning to be used online, now that products (such as *Facebook* and *LinkedIn*) which are functionally equivalent have to differentiate themselves through the experiences and vision they bring to their users.

Summary
- Hierarchy is not inherently bad: in built architecture, it enables an architect's vision to shine through and thus can facilitate innovation

- A top down approach is where a creative vision determines the design
- A bottom up approach involves the practical means of realising the vision
- A successful design negotiates the top down vision from the bottom up
- It takes a huge amount of effort, confidence and conviction to push a vision through
- That spatial and tactile design has an emotional impact is well understood in architecture, dressmaking and other 'hard' design disciplines, but has not been fully exploited in 'soft' digital and virtual environments
- Digital experience design must go beyond gathering functional requirements, but also understand how functions are performed and applications used in the context of users' lives.

References

Artifice Inc. (2007) 'Great Buildings Online' [Online] Available: http://www.greatbuildings.com

Bush-Brown,H. (1976) *Beaux Arts to Bauhaus and Beyond*. New York: Whitney Library of Design.

Colquhoun,A. (2002) *Modern Architecture*. Oxford: Oxford University Press.

Geddes,R. (2006) 'Second thoughts: reflections on winning second prize' in Watson,A. (ed) *Building a Masterpiece: The Sydney Opera House*. Sydney: Powerhouse Publishing.

Jones,M. (2007) *Skintight: An Anatomy of Cosmetic Surgery*. Oxford: Berg.

Kohler,C. (8 May 2007) 'A Brief History of Architectural Styles and Movements', *Associated Content* [Online] Available: http://www.associatedcontent.com/article/230545/a_brief_history_of_architectural_styles.html

Li,H., Daugherty,T. and Biocca,F. (2003) 'The Role of Virtual Experience in Consumer Learning', *Journal of Consumer Psychology*, 13(4), pp395-407.

Risebero,B. (1992*) Fantastic Form: Architecture and Planning Today*. London: The Herbert Press.

Watson,A. (ed) (2006) *Building a Masterpiece: The Sydney Opera House*. Sydney: Powerhouse Publishing.