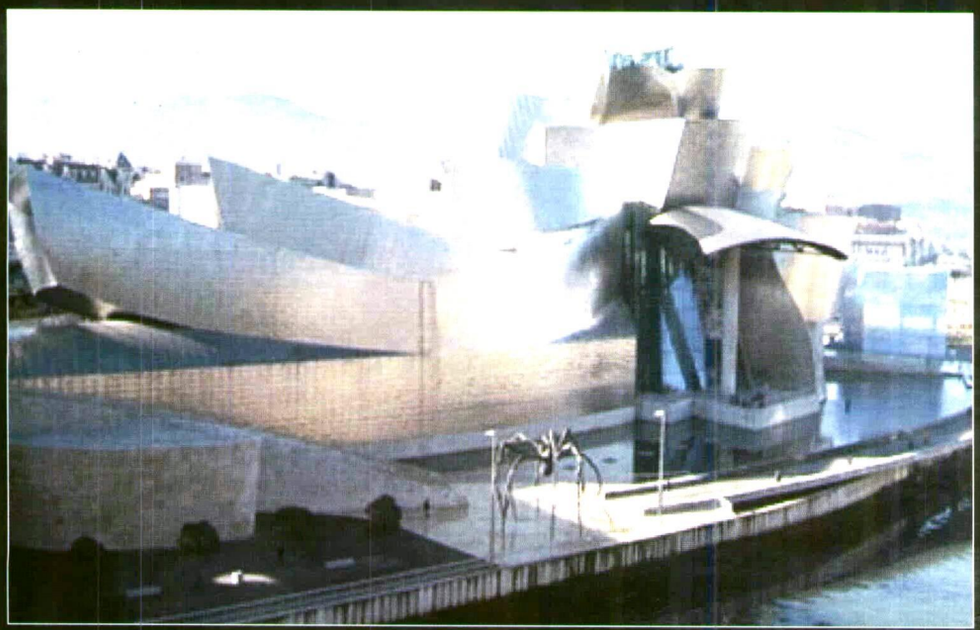

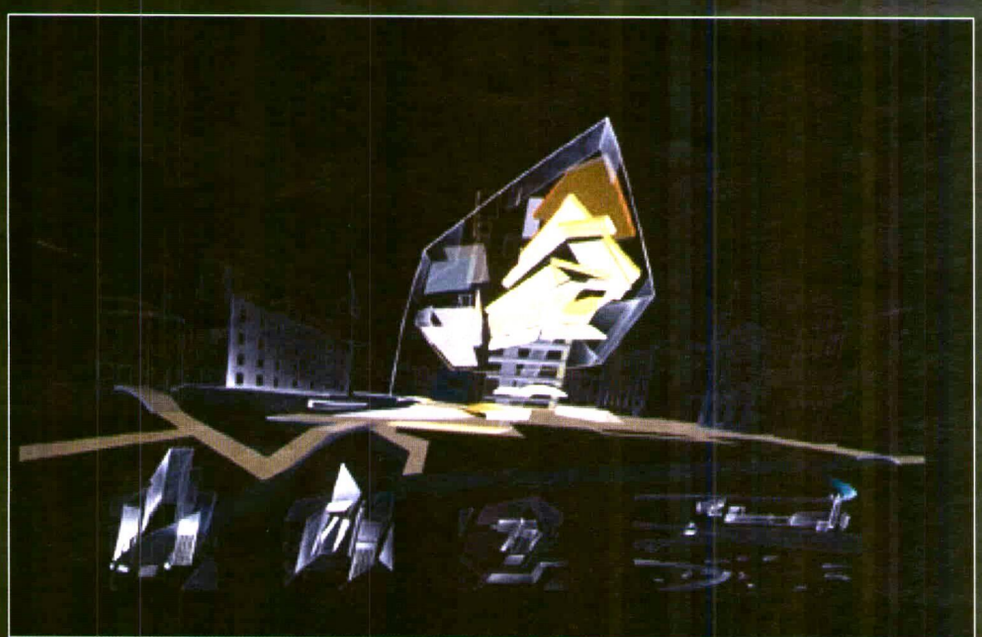

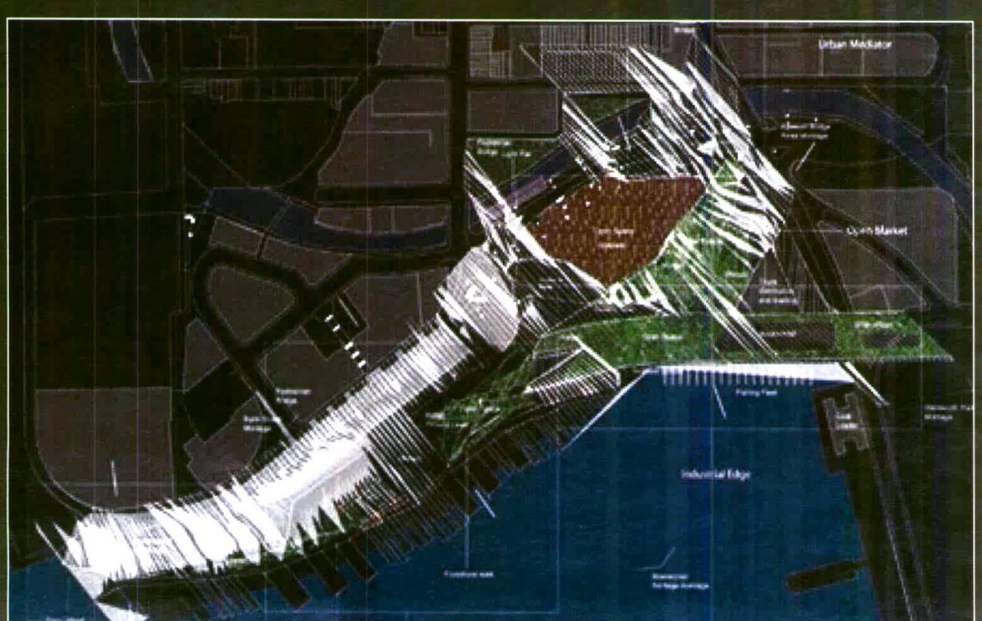


With the increasing and undeniable impact that digital technology is having on Architecture there have been numerous attempts at defining the term 'Digital Architecture'. At one extreme we have the view that architecture and the act of building could never be 'digital' and at the the other extreme there are those who believe that we already do have digital architecture in terms of virtual/ cyber spaces within the context of world wide web and computer games.

While both there arguments have valid points, what is undeniable is the fact that in the recent past architecture as both, a professional and a creative process has formed a unbreakable link with digital technology. While there is a range of inter-related topics such as Digital Pedagogy, Digital Tools, Digital Production/ Fabrication, Digital Visualization, Digital Projects, Digital Design, Digital Representation, Digital Thinking, and Digital Practice(1), for this discussion we will look at the influence that digital technology has on production, visualization and the 'thinking' processes of architecture.

# AN INTRODUCTION TO DIGITAL ARCHITECTURE

### Digital Production Process

Digital design tools in the architectural office no longer are prominent outsiders, but have become ubiquitous tools for all professionals. During the four decades the scope of digital interaction has evolved from mere 'computer-aided architectural design.' into 'totally computer-mediated architectural design' (2). This has radically reconfigured the relationship between conception and production, creating a direct digital link between what can be conceived and what can be built through "file-to-factory" processes of computer numerically controlled (CNC) fabrication. In a way it was the complexity of post modern "blobby" forms(3) that drew architects, out of shear necessity, back into being closely involved with the production of buildings. In the process, they discovered they have the digital information that could be used in fabrication and construction to directly drive the computer-controlled machinery, making the time-consuming production of drawings unnecessary (5). At the same time, techniques and tools developed in other fields for other uses are increasingly being employed in the area of architectural design. Frank Gehry's Guggenheim Museum, Bilbao is an example where both technologies from other fields (employing aeronautical engineering expertise) and numeric processes (extensive use of file to factory manufacturing) have been used (to build a 'blobby' form!).

### Digital Visualization

Digital Visualization addresses representational challenges from within and without Architecture.
Digital Visualization is used within the profession to explore, understand and communicate architectural information associated with the production of buildings. 3D modeling, rendering, animation and VR (virtual reality) as well as the power of digital media to permit the seamless integration of various data types are unleashing completely new ways to display architecture. It is well worth remembering that boundaries of visualization go well beyond 'presentation' graphics (drawings 3D renderings etc.) into the area of representation and integration of various forms of analytical data (i.e. Thermal efficiency, structural stress detection etc.). It could be argued that, it is these powerful new ways of visualizing that have directed architects towards new digital thinking. Outside the architectural profession Digital Visualization is a rapidly expanding area of expertise with competency ranging from artificial environments (eg. video game worlds, cinematographic stage sets, web) to abstract data representation constructs (eg. information architecture), Whether or not this type of knowledge implies a different type of architect (information architect) is subject to debate. What is beyond argument is the fact that the need for this kind of expertise within the profession will only grow in the coming years. Therefore, it is imperative that architecture programs pay serious teaching and research attention to the areas of digital visualization (6) regardless of their symapthy (or the lack of it) towards 'digital architecture'.

### Digital 'Thinking'

Just as there is a difference between building and architecture, there is also a distinct difference between digitally generated projects and digital architecture, since using digital technology doesn't necessarily constitute creating digital architecture. In digital architecture the core idea must be generated by a digital process but still be scrutinized and manipulated by the author/ designer. Thus, the responsibility for critical dimensions still falls upon the author/ designer (8). While a clear and critical definition of new principles of digital architecture has yet to materialize, Kevin Klinger in his article Digital Technology & Architecture attempts to clarify this as digital principles (from digital technology)+ rigor (from author). Without such rigor and honest commitment to digital technology so called digital designs will remain merely 'interesting' and difficult to understand (as partially intended by their designers?). In fact digital architecture can easily stretch beyond the realms of physicality in to virtual reality and cyberspace. It is argued that such architecture already exists within the realms of video games, World Wide Web and massively structured databases. In either case the authors will have to deal with inherent digital phenomena such as miniaturization (of all that can be shrunk), ubiquity (being everywhere, global), realtime (communing globally in realtime, which is 1/10th of a second), noospherization (networking every-thing), virtuality (all that is solid melts into knowledge), and anamnesia (inability to forget)(10). These phenomena have already changed the way the society interact and communicate. The measures of connectivity and speed have increased by many folds. Design to production processes has increasingly becoming networked affairs. Consequently the architectural practice of the new world needs to recognize these transformations and think accordingly regardless of its faith (or the lack of it) in 'Digital architecture'.

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References

(1). http://www.acadia.org/ Digital Technology & Architecture. White Paper Submitted To The Naab By Acadia Julio Bermudez & Kevin Klinger (Editors) (p1)
(2). ditto (p4)
(3). Rem Koolhaas, (2004) "Box vs. Blob"
(4). http://en.wikipedia.org/ wiki/Frank_Gehry
(5). http://www.acadia.org/ ditto (p4)
(6). ditto (p4)
(7). www.zaha-hadid.com
(8). http://www.acadia.org/ ditto (p5)
(9). http://scan.net.au/scan/ magazine/ Digital Architecture? by Alex Munt
(10). http://www.acadia.org/ ditto (p6)
(11). Burry, M. (2001) Cyberspace The World of digital Architecture

PHOTOGRAPHS:
ABOVE: Guggenheim Museum, Bilbao by Frank Gehry(4),
MIDDLE: Proposal for La Fenice, Venice by Saha Hadid(7),
BELOW: Design for Fish Market & Urban Park, Sydney. A digital architecture project by Jarrod Lamshed, UTS, Sydney(9).
(Image by Jarrod Lamshed)