

# DIGITAL ARCHITECTURE PRAXIS AND ITS STATUS IN PAKISTAN

**Shabnam Nigar Mumtaz**

*Assistant Professor, Department of Architecture and Planning  
NED University of Engineering & Technology, Karachi*

**Lubaina Adnan Soni**

*Research Associate, Department of Architecture and Planning,  
NED University of Engineering and Technology, Karachi*

## ABSTRACT

Some frequently asked questions (FAQ) amongst the local architects of Pakistan is that what is Digital Architecture? What we need to know? Can we practice it? Why should we practice it? This article aims to answer these FAQs. The methodology adopted to answer these questions is through Desk Research, including case studies of projects of two prominent architects viz. "Frank Gehry" and "Peter Eisenman" who are pioneers of Digital Architecture, and interviews with some relevant local practitioners and academia, personal observation and experience of working in the architectural profession locally. The objective of this study is to present various dimensions of Digital Architecture to the local architects, also highlighting the issues of local praxis and some suggestions for their consideration for the future.

**Keywords:** *Digital Architecture – Pakistan – Architectural Praxis*

## INTRODUCTION

By the late seventies and early eighties the application of computers had changed the design methodology of architectural offices. Many manual tasks of making 2D and 3D drawings have been replaced by computers working with various available software designed for such tasks, the most common of which is AutoCad. With the communication revolution (the use of internet etc.) the working of Architectural praxis changed worldwide. The task of making 2D/3D drawings, storage, retrieval and editing by computer became a norm. Using computer for

above tasks as a tool is understandable for most of the architectural communities, even to those who could not operate computers, but some resistance is still there in architectural schools where manual methods are still given preference.

The new projects done by Frank Gehry, Peter Eisenman whose creation of amazing forms and spaces with the help of computers, created a new debate in the architectural community regarding new methodologies of design, documentation, construction and manufacturing methods by computers and its impact on architectural praxis and societies.

## WHAT IS DIGITAL ARCHITECTURE?

"Frank Gehry and Peter Eisenman designs like "Museum" at Bilbao, the "Concert Hall at Disneyland" and the "Cultural City" at Galicia are the sample Designs of Digital Architecture which are produced by the combination of new architectural efforts and digital technology." (Tung, 2000). In another instance Eisenman et.al in the Charter of Zurich (Barzon et. al., 2002) defined "Digital Architecture is also that whole combined group of construction engineering technologies, new materials production and construction processes, that the computer has allowed, facilitated and discovered". Tung argues "If the digital technology does not influence the design thinking, design method and spatial theory then it can be treated as merely a new tool." In the following sections I have picked up some information on the praxis of Frank Gehry and Peter Eisenman to explain digital architecture in more detail.

## HOW FRANK GEHRY DOES IT?

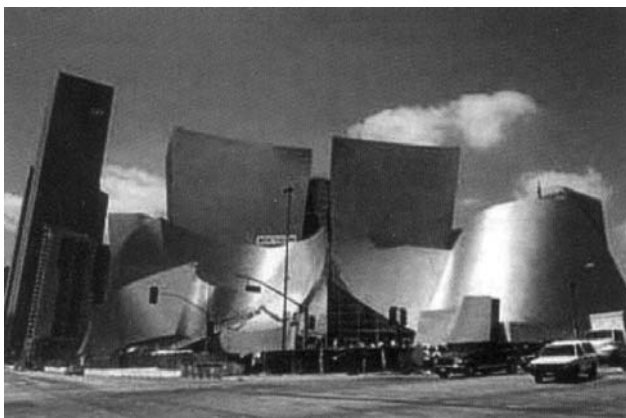
According to [www.wired.com](http://www.wired.com) Frank Gehry is an American Architect who started fabricating through digital medium in the 1990. He used new technologies to make complex buildings which were not possible before.

Gehry Partners begin the design process by creating hand-built models in order to capture the design intent. Once these models have been reworked and refined, they are digitized to create three-dimensional computer models, also known as building information models (BIM) or master models.

Small SLA (Stereo lithography Apparatus) models are used to physically verify the digital geometries to Gehry Partners and their consultants and accurately represent the design intent to clients.

Frank Gehry supervises every project personally. He is assisted by his very experienced partners in his design endeavors through technical advancement and construction management. The firm uses "Digital Project", an advance 3D modeling program to thoroughly document the designs to help the building, fabrication and construction processes.

In a conference at the European CATIA forum Gehri explained how he entered the digital world of CAD.



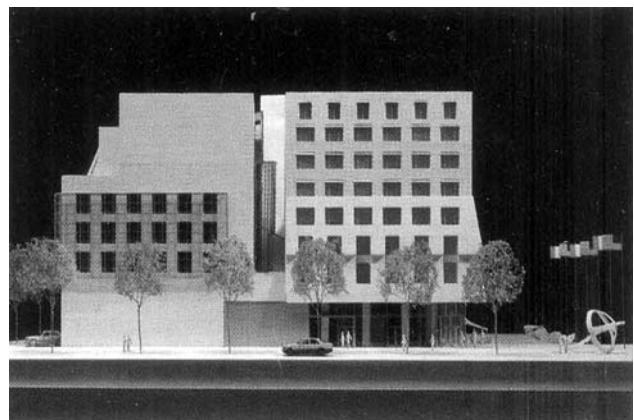
**Figure-1:** Disney Concert Hall in Los Angeles.  
*Source: Archi Times, February 2005.*



**Figure-2:** Sketch of American Center in Paris.  
*Source: Progressive Architecture 01:92.*



**Figure-3:** Model from the West. American center in Paris.  
*Source: Progressive Architecture 01:92.*



**Figure-4:** Model from the North. American Center in Paris.  
*Source: Progressive Architecture 01:92.*

"I started making shapes that were hard to draw. That led us to the computer and to Catia software which made me realize the possibilities and the level and degree of accuracy you could create in your documents and your relationships because of the software."

### HOW PETER EISENMAN DOES IT?

Peter Eisenman is an American Architect, theoretician and a teacher. He has also done some pioneering work in Digital Architecture. Although Eisenman do not claim himself to be a deconstructivist his fragmented forms identifies him with that group.

Eisenman does experiment with the forms and tries to liberate them from all meaning. As digital media can be very helpful in this regard, he has done a number. of projects which can be categorized as Digital Architecture. One such project is City of Culture of Galicia, Santiago De Compostela, Spain.

### CITY OF CULTURE OF GALICIA SANTIAGO DE COMPOSTELA, SPAIN

The "City of Culture" is a new culture center for the province of Galicia in western Spain.

The design methodology according to "Arcspace.com is the superimposition of 3 sets of information. The street plan of the medieval center of Santiago is superimposed on the topographic map of the site. Then a Cartesian grid is laid above the previous two maps then through computer modeling topography of hill side is allowed to distort generating a topographical surface combining the old and new geometries.

There are six buildings in the project. These six building are designed in pairs of three. A winding street connects these buildings culminating in a square.



**Figure-5:** City of Culture, Galicia, Spain..  
Source: [www.CityofCulture.com](http://www.CityofCulture.com)



**Figure-6:** City of Culture, Galicia, Spain..  
Source: [www.CityofCulture.com](http://www.CityofCulture.com)



**Figure-7:** City of Culture, Galicia, Spain..  
Source: [www.CityofCulture.com](http://www.CityofCulture.com)



**Figure-8:** City of Culture, Galicia, Spain..  
Source: [www.CityofCulture.com](http://www.CityofCulture.com)

## **STATUS OF DIGITAL ARCHITECTURE IN PAKISTAN**

Computers were introduced in the studios of Pakistani architectural praxis in the late seventies and early eighties. Autocad/Adobe Photoshop have been the most popular software for creating 2D/3D presentation and working drawings. Most other allied consultants like Civil, Mechanical Electrical and Plumbing consultants also started using it and data can now be shared among consultants on a storage device and can now be saved, edited and retrieved as and when required. Training centers for Autocad are found everywhere. Architecture schools also made it part of their pedagogy. Thanks to the easy availability of pirated copies of AutoCAD and trained people, Autocad has become a must skill for employing young architects and draftspersons. So we can see that digital architecture as a tool is in practice now for quite some time in Pakistan.

When we started, we tried to speak to local architects regarding digital technology and its application in Pakistan beyond its present use, they questioned how does one use the technology when there is no demand for it., Exploratory exercises do not exist in architectural practice in Pakistan and also there is no statutory requirements so we don't see a change in the near future especially on the construction side. The only reason that Pakistani architects can work on it is to get work in more advanced countries of the region like UAE and Malaysia

etc. Some even suggested that it's the gap that we don't have architects with that type of expertise, but after studying Frank Gehry I think it's not about the expertise of architect but the mindset of architect which is open to exploration and collaboration with other disciplines that can bring about the change. There exist a fair expertise of making 3d architectural models on Autocad, 3DMax, Accurender and Revit in the big and medium offices of architectural practices and for those who cannot afford in house there are individuals/consultancies who can offer their services on project to project basis. A recent publication (Mankani, 2009) gives a quite clear picture of the state of practice of Digital architecture in Pakistan. In this article Mankani has identified the following:

"Building Information Modelling has not taken root as a design approach in Pakistan. Building models are used for representation and to some extent for design review and do not contain any information beyond spatial relationships, materiality, colours etc."

This article makes it clear that In Pakistan, Digital Architecture is understood as a Design Approach where data sharing among consultants is done through a 3d model but although architects have this ability, other consultants like civil and MEP consultants do not use this approach. Talking to faculty members of civil department of a public University, it was clear that the 3D ability of these professionals is at a very initial stage. So is the case with Mechanical, Electrical and Plumbing profession.

The form making, design methodology, construction and project management aspects and use of Digital architecture as done by Frank Gehry and Peter Eisenman, is neither explored nor understood. Mankani has also reinforced that BIM is gaining ground in Pakistan due to the outreach factor.

As the energy issue is gaining more importance, a very few practices are trying to explore the energy and other environmental issues through the Software "Revit" through experimental studies but it is yet to be established as a norm.



---

One constant complain that is heard by the architects who are trying to explore the above issues, is the time factor involved in such experimental work.

The other factor is that these data base software demand too much information at the design development stage.

Some architects also complain that by spending too much time on model making, one is distracted from developing the real design content.

### **GAPS IDENTIFIED**

- Lack of awareness like potential of computer (Artificial Intelligence etc.)
- Lack of communication between digital generation and the existing generation. The gap exists in all the world.
- Architectural schools focus more on arts, history, sociology, psychology and culture and less on technology.
- Lack of statutory demands.
- A lot of time is required.
- All software are not accessible at affordable price.
- Lack of experimentation and research.
- The sharing platform is not there with allied professionals.

### **BENEFITS OF DIGITAL ARCHITECTURE**

- Computers can resolve forms consisting of complex curves etc.
- 3D documentation can be very accurate for documentation, bidding, manufacturing and construction processes.
- Building Infrastructure Modeling can resolve conflicts with services at an early stage.
- Environmental performance of buildings can

be generated at design and preconstruction stage.

- New aesthetics can be developed for the society.

### **CONCLUSIONS**

If we try to analyze the underlying causes of the failure of such attempts in Pakistan we will come to the following conclusions:

We are at a transition stage and we, as architects, are ending up using both the paradigms of 2D and 3D and also doing other consultants' works, and treading into the domains for which we have neither the expertise nor the support. In Pakistan the structure of practices is mostly private practices with limited manpower according to work in hand. So we are bound to have such problems .I would like to make following suggestions to these issues:

1. Architectural design consultants should concentrate on design contents and presentations. More exploratory approaches are required for better design contents incorporating digital forms etc to make more interesting designs.
2. Separate consultancies can be established for having other domains like environmental issues, energy and acoustics etc. If the clients want to address these issues they would be charged for it accordingly.
3. As the environmental issues have become very crucial, the PEPA should make statutory requirements of environmental analyses for at least large consumers of utilities like electricity, water and fuel etc.
4. As "REVIT" is the only software available now for environmental analysis and BIM, other software should also be explored like "Ecotech" etc which may be more user friendly and affordable.
5. Civil, Mechanical, Electrical and Plumbing education institutions should create enough ability in their students to make 3D drawings

---

of their respective works.

6. Civil and MEP consultants should train their personnels to give them this ability.

## REFERENCES

Arcspace.com <http://arcspace.com>

Barzon et el, 2002. Furio Barzon, Peter Eisenman, Derrick De Kercphove, Antonio Saggio; The Charter of Zurich; Birkhauser Basel; 1 edition (April 1, 2002)

[www.foga.com](http://www.foga.com) Gehry Partners.LLP: Home available at [www.foga.com](http://www.foga.com) (Accessed 10<sup>th</sup> November, 2009)

Mankani, 2009. Zain Mankani, Factors Influencing the growth of BIM in Pakistan, Archi Times Volume, 25<sup>th</sup>, October 2009, pp. 18-20.

Tung, 2000. LIU, Y. Tung (ed); Defining Digital Architecture. 2000 FEIDAD Award.

[www.wired.com](http://www.wired.com), [www.wired.com/wired/archive/12.11/gehry.html](http://www.wired.com/wired/archive/12.11/gehry.html)

[www.cityofculture.com](http://www.cityofculture.com)

P.A. Progressive Architecture 01:92. Penton Publishing, U.S.A.