Multimedia and Architectural Disciplines

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A CLASSIFICATION OF MULTI-MEDIA APPLICATIONS IN ARCHITECTURE

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Abstract

Drawing on multi-media research and development in the ABACUS Group (Department of Architecture and Building Science at the University of Strathclyde), and on work from other Institutions reported in recent ECAADE and ACADIA conferences, this paper attempts a classification of the applications of multi-media to architectural education and practice. It goes on to identify further benefits which the technology could bring to Computer Aided Architectural Design. Finally, it proposes a mechanism for sharing our multi-media products.

Introduction

Those who were privileged to visit Nicholas Negroponte's MediaLab at the Massachusetts Institute of Technology about a decade ago when it separated from the Department of Architecture and moved to its own Pei designed building, would surely have been hugely excited by the vision of how, ultimately, the worlds of computing, communication and design might conflate into a multi-media environment. What is extraordinary is the speed with which the prototype technology of the MediaLab, through close collaboration of academics and commercial enterprises, has put useful and usable applications software at the disposal of those who teach and practice architecture.

It is timely, then, a decade later and in the context of the 13th annual ECAADE International Conference, to take stock of how multi-media technology is impacting on our shared sphere of interest and to suggest how things might go in the future.

The picture presented in this paper draws from the two different sources:

1. the multi-media research and development carried out by the ABACUS group in the Department of Architecture and Building Science at the University of Strathclyde;

2. the multi-media research and development carried out in other institutions, as reported in recent ECAADE and ACADIA conferences.

The view of the way forward, and of the benefit of sharing our research and development endeavours, is the authors' main contribution to the discussion.

Basics

Multi-media is seen, generally, as a recent and significant contribution to the evolution of interfaces

between humans and computers.

Because the technology is so recent, agreed terminology has still to be defined. The following definitions have been suggested.

media: drawings, photographs, written text, slides, overhead projections, video, computer images, computer animations, spoken word, music, etc.

multi-media: the conflation of a wide range of separate media into one suitable computing environment.

hyper-media: an integrated presentation involving an interactive cross-referenced sequence of multi-media.

For the purposes of this paper the term "multi-media" will cover the latter two definitions above and will genarally refer to products which are targeted on the use of the technology in the teaching and practice of architecture.

Classification

The following main categories of application of multi-media in architectural practice and education are proposed:

- *Presentation of Design Schemes*

In contrast to conventional paper based presentations of particular building (or product) designs, multi-media can offer powerful insights into planning, circulation, structure, servicing, etc. It seems certain that within a few years most students, and many practices, will be seeking to present their design work on screens, rather than paper.

The use of multi-media in the presentation of student designs is particularly well advanced in the Aarhus School of Architecture [1].

An extension of this application is the use of multi-media in the representation of competition entries. An example is th'e Visions competition documented by the University of Strathclyde [2].

- *Explanation of Architectural Cases*

This category is similar to the previous in that particular historical or contemporary buildings are presented, but the distinction is that an explanation of style, theory, typology is offered. Examples are numerous:

1. the seminal work of Sabater and Gassull on Lutyens, Cerda, Loos, etc. [3].
2. Kuhn's proposal for a typological classification [4].
3. the case-based design tool proposed by Zimring and Ataman [5].
4. the work on Chinese Temples by Bradford et al [6].
5. the celebration of Robert Adam architecture by Candy et al [7].
6. Day's investigation of architectural history [8].
7. the hypertext explanation of the Topkapi Palace by Ozcan [9].
8. the hypertext system proposed by Villegas et al [10].

- *Explanation of Urban Environments*

These are fewer, but none-the-less significant developments in the application of multi-media to our understanding of the development of cities and the protection of their cultural and historical quality. Some notable examples are:

1. the work on environmental simulation by Dosti et al [11].
2. the study of Barcelona by Marinelli et al [12].
3. the study of Split by Mortola et al [13].
4. Sabater and Gassull's CD Rom on Cerda's Barcelona [14].
5. the work on urban information systems based on Glasgow and Edinburgh examples by Grant et al [28].

- *Explanation of Technical Issues*

Complex technical issues, including the dominant issue of how design decisions impact upon design

performance, are amenable to explanation using multi-media.

Examples include:
1. the support for energy efficient design proposed by Al-Salleh and Degelman [15].
2. the explanation of vernacular structures by Will et al [16].
3. the explanation of the cost and environmental implications of form and construction development by Petric and Maver [17].
4. the explanation of intelligent buildings offered by Havestadt and Kohler [18].
5. the concept underpinning energy conscious, environmentally friendly buildings, authored by Rutherford and Stewart [19].
6. the database of energy case studies being developed by Vetch [20].

Within this category, might also be considered applications relating to the management of technical information, such as those for fire regulations, choice of lifts, etc., proposed by Ronchi [21].

- *Virtual Museums of Architecture*

Interest is growing in the development of large scale archives of contemporary and historical architecture which will allow cross-reference and comparison. Three papers on this topic have been identified:
1. Choi's proposal for an architectural information system [22].
2. the Archive of European Architecture proposed by Mirabelli et al [23].
3. Laerdal's proposal for "architecture on cards" [24].

- *Documentation*

It can be expected that research reports, essays, treatises and the like (including conference presentations, of course) will increasingly be presented using multi-media technology. An outstanding example is the reportage by Rutherford of his research work on design decision support systems [25].
A number of Schools of Architecture are preparing electronic Prospectuses using multi-media technology to great effect and lodging them on World Wide Web.

Interfaces to CAAD

There are as yet no published papers on this application area, but it is known that a number of groups are working on multi media front-end back-end interfaces to a range of CAD packages which are currently relatively inaccessible to architects (e.g.. structural analysis, thermal analysis, even advanced drawing and visualisation packages). It can be predicted that these developments will be reported in the near future.

- *Experimentation*

As with all new tools, students are often more inventive in their use than teachers and it is good to see some reportage on more experimental usage of multi-media technology. Two examples can be cited:
1. the experiments at New Jersey Institute of Technology reported by Goldman and Hoon [26].
2. the experiments at Sheffield University reported by Ng [27].

Conclusions

The 28 references identified in this paper give ample evidence of the range and richness of applications of multi-media to architectural education. As with the early implementation of CAD, multi-media was used in the first instance to mimic on the screen what previously existed on paper, but there is heartening evidence of more innovative use of the technology.
Some conclusions are put forward:
1. increasingly, students will seek to present their work – not only their design projects but historical essays, dissertations, technical reports, etc. - in multi-media format; they will need to be taught the technical and design skills necessary to use the technology to full advantage.
2. the volume of quality teaching material now available in multi-media format is considerable: ECAADE needs to establish a directory of applications and a mechanism for exchange between schools.

3. we need a commitment to collaborative effort if the big prize of an Archive of European Architecture is to be established.
4. we have yet to see the potential of multi-media as an interface to and integrating environment for CAAD software; hopefully we shall see great steps forward in the next few years.

The 13th annual international ECAADE conference has multi-media as its theme; we believe it will be a mile-stone in the application of multi-media to architectural education.

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