Information technology in architecture: a stocktaking

1 Introduction

This paper attempts to provide a succinct perspective on the state of IT in architecture after two and a half decades of fun and frustration. The presentation structures current applications under four headings:

- graphic media in the representation of form
- simulation modelling in the assessment of function
- design decision support for the integration of form and function
- communication, collaboration and critique

It then offers, very tentatively, a view of the way forward.

2 Graphic Media in the Representation of Form

- The high risk entry levels which progressive practices suffered when they committed to 2-D drafting systems in the 1970s have, thankfully, not been problematic in the adoption of 3-D modelling systems now regularly and effectively used for presentations to clients and developers. The work of Frank Geary’s office is of particular interest [4].

- While the search for concept sketching software remains elusive, the evidence in Schools of Architecture confirms the view of the early optimists that young people can wield the mouse as effectively as their elder siblings wielded the 4B pencil. This is amply evidenced in the FormZ competition results [5].

- The relevance of multimedia and internet software (eg. Macromedia Director, QTVR and VRML) is revolutionising the means whereby architects and architectural students can present and disseminate the complex set of ideas which are embodied in any existing or proposed design scheme. The richness of the range of applications of multimedia was evidenced at ECAADE in 1995 [6].

- Immersive VR systems, based on projection onto spherical section wrap-around screens rather than heavy headsets is showing great potential for the design of specialist environments and/or for the specialist needs of impaired users of the built environment [7].

3 Simulation Modelling in the Assessment of Function

- Whereas the earliest endeavours in CAAD were focused on the modelling of the functionality of building layouts [8]; there has been proportionately less commitment to this area as CAAD has developed.

- Nonetheless, certain developments have yielded high-value outcomes. Notable is the application of radiosity modelling to the realistic visualisation of photo-realistic images of building interiors [9], the impact of heat-energy modelling on the design of buildings which are more energy-conserving and environmentally friendly [10], the emergence of simulation models of room acoustics [11] and the revival, amongst the Facilities Management community of interest in movement simulation [12].

- Regrettably, the use of such software to inform architectural education, is minimal [13].
4 Design Decision Support for the Integration of Form and Function

• It is heartening to see a re-surgence of optimism and effort focused on the early idea that real benefit - to practice and education - will accrue from an integrated appraisal of form and function based on a single computer based model of the design concept.

• A number of significant R+D endeavours have been initiated in this field; they are summarised in the paper by Maver [14] and include:
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5 Communication, Collaboration and Critique

• Computing and communications technology has been on a path of powerful convergence for the past 5 years and is now presenting the potential to transform, out of all recognition, the way in which education is delivered and received [15].

• Glasgow is currently the most "cabled" city in Europe and, in the emerging nation-state of Scotland, all 80 HEIs are inter-connected by Metropolitan Area Networks at a speed of 155 m/bits per second. This makes possible the most intimate sharing of teaching and learning resources and opportunities, as exemplified by the collaboration between the two Schools of Architecture in Glasgow [16].

• The technology opens up the achievable notion of the Virtual School of Architecture (VSA) within the Virtual University (VU) with shared lecture, seminars, crits and design projects.

6 A (tentative and possibly contentious) View of the Way Forward

• It seems to be in the blood (and in the water) of architectural practice and architectural education that every thing has to be continuously re-invented from scratch.

• If the potential of information technology is to be fully realised for the benefit of those who live, work and play in the built environment (i.e. all of us), we need to get better at acting collaboratively.

• A number of agencies exist to facilitate such collaboration viz: the Computer Teaching Initiative [17], ASCA [18], ACADIA [19], CAADRIA [20] and ECAADE [21].

• Heads of Schools of Architecture should be asked to engage in a Reality Check; sign up to CTI, ASCA, and ECAADE and get a tiny bit more ambitious about the future of architectural education.