

Assessing the Role of Computer Visualisation in Planning Control: a recent case study

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ABSTRACT

In papers to previous DDSS Conferences, and elsewhere, the author has developed an argument concerning the use of computer visualisation in the planning process. In essence, it proposes that:

- visualisation can enable lay persons to play a more effective role and this can result in different and more effective decisions;
- the level of realism employed should result from the basic requirements necessary to resolve the issue minimising the cost of production of the images.

These points have been tested in repeated examples. The latest one concerns a new site that Anglia Polytechnic University has established in the centre of Chelmsford, UK. A computer model of the new campus showing both the existing and proposed buildings was commissioned from the author by the University for a visit by HM the Queen in June 1995. This model was subsequently adapted for use in the process of obtaining planning consent and the marketing of floorspace for the next building to be constructed. For this purpose, a higher level of realism was requested. The experience of achieving it confirmed the results of the previous research indicating the strong link between realism and cost. It also contributed new insights into the varying expectations of different professionals concerning the role of such a visualisation. The requirement of the architect for demonstrating all aspects of the design required a high level of realism than that required for planning and marketing purposes and was considerably more expensive. The low cost of use for planning purposes should be stressed but surprisingly, the lower level of realism implied may be easier for the lay person than the professional to accept.

INTRODUCTION

The interaction of new technology with users as it becomes available in the workplace is a vital, although often insufficiently studied, subject. The mode of use of advanced computer graphics in urban planning is of particular interest. The author has been conducting research at this interface since 1987, not in terms of developing new technology but by investigating how off-the-shelf hardware and software can be exploited (Hall 1988 and Hall 1993). The work has concentrated on decision making in the planning process where computer visualisation can enable lay people especially to play a fuller role.

The central issue has been the balance to be struck between realism and cost. At the present state of the art much operator time is required to create realistic images. As the cost of hardware and software has fallen over the years, staff time has emerged as the principal expense. Greater automation of data input, in particular raster to vector conversion, has long had the potential to reduce operator time but it has not yet had an impact in the workplace. Degree of realism in images represents an almost infinite continuum and the position chosen within it is directly related to the time, and therefore money, spent. However, realism is not the same as objectivity. Realism makes an impression on the user but it is objectivity that makes the technique useful for decision making. The objectivity arises in large part from the ability of the computer model to facilitate views from any desired direction and to alter the proposed buildings as required. This may be done interactively in the course of negotiations. The necessary objectivity should relate to the nature of the decisions to be made. The degree of realism should be such as to facilitate the required objectivity. To be economic, the degree of realism should not exceed the minimum necessary for the task in hand. It might be thought that the lay participants would press for high levels of realism with the professionals taking a more cautious view. It will be argued that this is not necessarily the case.

These arguments on realism, objectivity and cost have been developed over a significant number of case studies which have been described at the previous DDSS conferences. The most recent paper was presented at the 1994 symposium work carried out for Colchester Borough Council (Hall 1995 and Hall 1996). This described the visualisation of the historic high street of the town for the study and presentation of a proposed traffic scheme. A "medium" level of realism was used and animated walk-throughs and drive-throughs prepared. The economy and effectiveness of the model proved highly satisfactory. Subsequent use of the model to shadow negotiations for the design of a shopfront produced mixed results. A high level of realism was required. The research indicated that had the technique been employed in the decision making then it would have greatly reduced the time and costs of both the developer and planning officer. However, the high level of realism was costly and there was little advantage in modelling time gained from basing it on the pre-existing medium-level model.

THE ANGLIA UNIVERSITY MODEL

Similar results to the Colchester example were obtained from the work undertaken during 1995. The Anglia University had started to construct a new campus in the centre of Chelmsford. A library cum-administration building and student accommodation had already been completed. A campus amenity building with shops at ground level was due to be constructed during the second half of 1996. Other buildings will follow in the longer term. The University commissioned a computer visualisation of the site as it would appear when completed, with an animated walk-

through, for presentation to HM the Queen when she opened the new campus in June 1995. This was done to a high level of realism, not as high as the Colchester shopfronts example but much higher than the High Street model. It served its purpose well but the question of a more practical use for the model then arose. A model of the campus amenity building at an even higher level of realism was commissioned for use in supporting an application for planning consent and for use in marketing the retail floorspace. New paving and planting had to be modelled. Both the original model of the entire site with all proposed buildings and the enhanced version of the one amenity building took approximately the same operator time, 100-120 hours in each case. It is important to examine why this was so.

The brief that was given required a higher level of realism in the second model compared with the first. Particular features specified were for the windows: transparency through the building and details of the frames and a more realistic rendering of the fabric canopy surrounding the building. Although it was not necessary to repeat much of the work done off the computer in obtaining measurements and deciding how to approach the computer modelling of the surrounding buildings, most of the work on the new model of the building itself was new. The same had been found in the Colchester example. The high level of realism required for the shopfronts meant that little advantage could be taken of the computer model of the High Street. It had become clear that the level of realism was a matter that was most economically determined at the outset. It was costly to vary it later.

Although the University believed that a realistic image was necessary for planning and marketing purposes the pressure for very high level came from the architect of the building. There was a desire for all details to be shown and for the model to be updated frequently even when, as was often the case, there was little or no effect on the visual impact of the scheme. For example, the time spent on modelling window details and accommodating different designs for the location of a cash dispenser for a bank. It could be argued that had the building been designed using a CAD package then representation of all details would be straightforward. However, although much time and money may have been saved if this had been the case, it would not have obviated the problem selection of views and other visual approximations that any visualisation stage requires. They may not convey all details and selective judgement is still required. There was a qualitatively different expectation from the process from the architect compared to those pursuing the planning and marketing and this created a considerably higher level of expenditure.

THE ISSUE

In the very first case study for the research, undertaken in 1987/8 (Hall 1988), a problem was encountered with the architects who complained a view produced did not show all the important aspects of their design. It was pointed out that this was the view that the user would actually see. What had been encountered in this, as in the

current example, was the important distinction between two roles for visualisation in planning and architecture.

- an image that mimics the actual experience of a user;
- an image that reveals the intentions of the designer.

These two are not necessarily compatible. A large scheme may best be illustrated by an oblique aerial view which is not what a user or passer-by would see and would be misleading if seen in this way. The images used to convey the overall visual impact of development need not convey all details but it is important that they represent the actual location of the users and those features that will impact upon them. In the Colchester example, even the medium level of realism found favour with lay people who were able to identify individual buildings without problem. For the University model, lay people were just as impressed by both levels of realism and made no distinction between them. Moreover, both sets of University images were very effective for their purpose. Not only was the two roles not the same, they differ widely in cost. The former was much cheaper than the latter. Unfortunately, little economy was gained by proceeding from one to the other.

CONCLUSIONS

The experience with the model of the Anglia Polytechnic University campus has reconfirmed the experience of the previous work that at present state of the technology for computer visualisation in urban design:

- cost is proportional to realism;
- for town planning decision making low or medium levels of realism are adequate to secure objectivity;
- they must be distinguished from visualisations for conveying architects' intentions which are at a high level of realism and therefore expensive.

Keeping to this distinction should help to persuade users that a town planning role for visualisation is within their day-to-day budgets.

SOURCES

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