

# INTEGRATED CAD - THE PROBLEMS AND THE POSSIBILITIES

Rob Howard, General Manager, Construction Industry Computing Association, Guildhall Place, Cambridge CB2 3QQ, United Kingdom.

## Summary

This paper summarises the objectives of CIB W78 and of the Colloquium on integrated computer aided design. It defines the types of integration which are needed - of hardware and software systems, and of the stages in the design and construction of buildings. It discusses what has been achieved and where the problems lie, how development of standards and the exchange of experience can help. Examples of how CAD is being used in different countries are covered by subsequent papers and visits, and, by the end of the Colloquium, it is hoped to establish how CIB can help overcome some of the problems.

## CIB W78 Terms of Reference

These were established for the first meeting in Stockholm in August 1983. They are briefly: to encourage R & D in CAD and organise international cooperation, and to carry out work in computer aided architectural and engineering design.

The programme of work planned was: to collect information on CAD systems, to exchange this information internationally and to relate it to the work of other CIB working commissions.

The objectives of this Colloquium are to hold discussions on papers by experts from different countries in the following sessions:

Experience already gained with integrated CAD systems

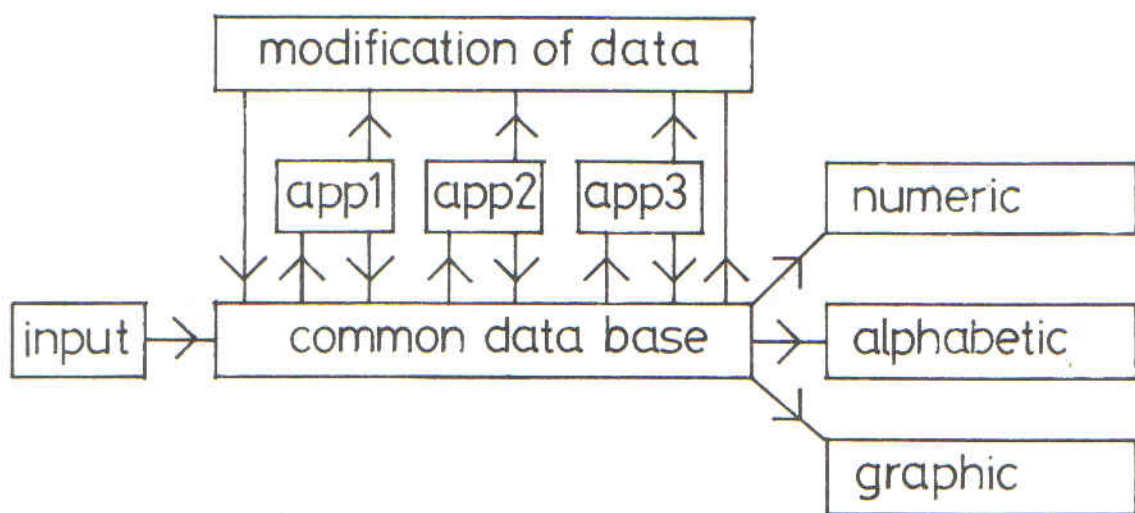
Methods of representing buildings and associated standards

Future possibilities for integration and CIB's role

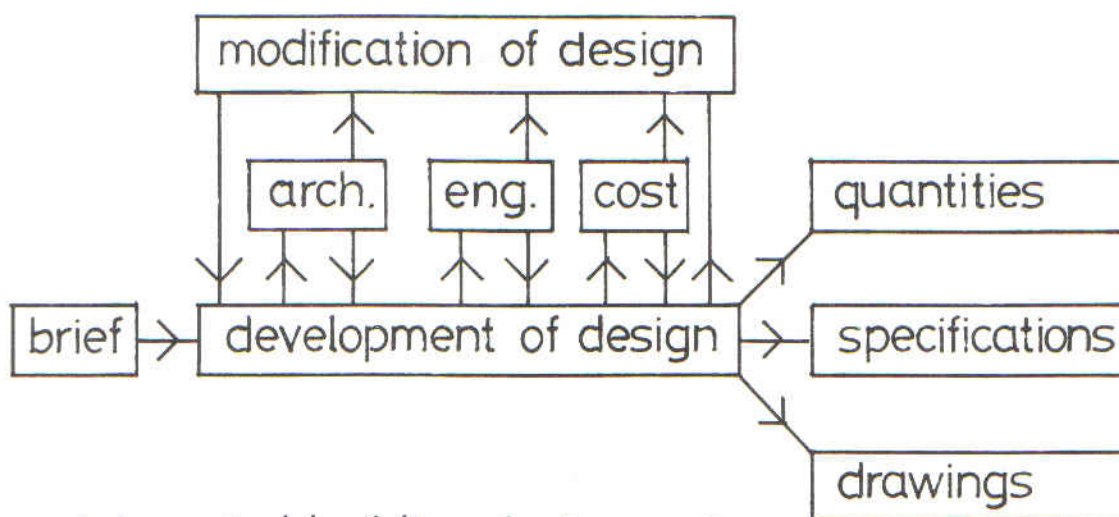
There are also visits to see BRE work particularly on energy, Mobil Operations service station design, the Oxford Regional Health Authority and the Milton Keynes Hospital. There is no time to see the full range of systems in use even in the UK but the examples selected represent experience gained over ten years.

## Types of Integration

Integration to computer people means linking programs, typically by running different applications from the same data base. To people in building it is more likely to mean getting the architect, the engineer and the contractor to work more close together. This implies exchanging information more freely. The two approaches are really the same in that they imply an agreed way of representing buildings and standard procedures for input, modification and output of production information, whether by computer program or by integrating human skills. The computer is the catalyst to focus the attention of a traditional industry on the fact that is concerned with handling information and that this must be defined precisely in order to use new technology.



an integrated computer system



an integrated building design system



## Achievements and Failures

The benefits of integration are obvious but it carries a heavy overhead. It thrives on large public building programmes such as existed in the UK in the early 70's for hospitals, housing and schools. In the interim and, as computer use has grown, there is less continuity in building and these overheads are more difficult to carry. Draughting systems have taken over from integrated CAD and programs are justified on the output they can produce immediately.

There are also reactionary elements concerned to perpetuate particular empires with a vested interest against integration. These may be large computer companies, professional institutions or even national governments. Human nature can be obstructive also with individuals wishing to keep their expertise to themselves and not share it with others.

Above all these problems rise the longer term advantages of an appropriate level of integration recognising the need for individual expression. There is much work on computer standards: for open systems integration, for exchange of graphics data, standard operating systems and international networks. Micro-computers now have a standard operating system and a range of common applications which are likely to be integrated. As micros become more powerful, and begin to influence CAD, their standards may help reduce the present variety of ways of representing buildings in computers. This may then influence the way we represent buildings on paper since many of the international problems still lie here - in language, dimensional systems and contractual relationships.

## Objectives for the Meeting

The main purpose is to exchange experience and ideas and it is unfortunate that only a small part of the work on integrated CAD can be presented. In contributing to the proposed survey, CICA would be happy to provide much of its information on UK systems and encourage input by its fellow members of FACE in the USA, Australia, the Netherlands, Finland and South Africa.

Past experience should not be forgotten. Some of the early systems may have been too rigid to be acceptable and note should be taken from the failures as well as the successes. The most important standards need to be identified and, if they can be successfully adopted in one country, why should they not be used elsewhere.

The prospects for the future are encouraging and, if we can set our sights on the ultimate benefits, there is much which organisations like CIB can do to tackle the problems which will never be solved commercially.