Building code software wins approval

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BCAider 3.2

Dr Don Sharpe: BCAider lifts productivity.

Australian Design Award

Australian Information Technology Awards
AITA '92
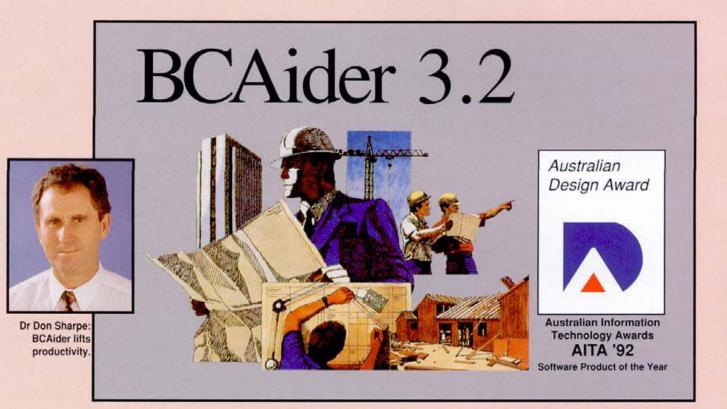Software Product of the Year

Local government building surveyors are using a new software tool, BCAider, to speed the checking of building designs submitted for approval. Delays in this process add to the time and cost of construction.

Assessing designs for their compliance with building regulations used to mean searching through a 400-page volume called the Building Code of Australia (BCA) and a 200-page commentary. BCAider delivers the same information on four recyclable floppy disks: the electronic equivalent to a 200-metre roll of not-so-easy-to-recycle paper.

BCAider was developed by the CSIRO Division of Building, Construction and Engineering in collaboration with the Australian Uniform Building Regulations Co-ordinating Council (AUBRCC), Jennings Housing and Butterworths.

The first version of BCAider was released in April 1991 to a target market of building surveyors, architects, and engineers. It is now explaining the Building Code of Australia to more than 400 users, more than 50% of which are local-government authorities.

The software is an expert system with hypertext (see box story) that runs under the 'user-friendly' Microsoft Windows operating system. It is ideal for inexperienced computer users, allowing them to interact with the software as they would an expert or consultant. A user is asked which parts of the proposed building or code they wish to check and BCAider helps to decide whether or not the design complies.

For example, if a user wants to check the fire safety design of a hospital, they first determine the building class. Next, relevant clauses are processed through a series of 'yes/no' questions to check if the proposed building complies and if not, why not. Responses to questions are displayed in the background, providing a map for the user to move in and out of a consultation. The user is asked to provide fire compartment data to process a clause. Hypertext is used to explain key terms.

Reference information, including Australian Building Systems Appraisal Council (ABSAC) technical opinions, are a mouse click away. Users can also access 400 relevant Australian Standards on CD-ROM which is faster, more convenient and requires no paper.

After further questioning, BCAider generates a compliance report explaining any failure to comply (see Figure 1). It takes only seconds to alter building parameters such as materials

and type of construction, allowing users to explore and test different design options. A link to Autocad has also been developed to allow access to BCAider while undertaking the computer-aided design of a building.

Division of Building, Construction and Engineering researcher, Dr Ron Sharpe says BCAider ensures that designs comply with the BCA and allows the testing of design options quickly and simply. It increases productivity and reduces errors, many of which are often overlooked with manual checks, he says.

BCAider also reduces the costs of paper-based publication, Sharpe says. Electronic information is more rapidly accessed and is cheaper to publish, distribute, maintain and store.

Sharpe and his BCAider team have received widespread recognition for the software. It has won three major industry awards, an Australian Design Award, the Australian Information Technology Award for Software Product of the Year in 1992 and the Powerhouse Museum Selection Award.

A number of enhancements to BCAider are planned, including incorporation of the Australian Model Code for Residential Development (AMCORD). This addition will enable designers and checking authorities to better assess key environmental factors important to residential development. Architects, engineers and planners will be able to quickly explore design options for their compliance with AMCORD standards for streetscape, public open space, drainage and transport networks.

Local government users such as John Spring of Melbourne's Camberwell City Council are advocates of the BCAider software.

'There is no doubt that BCAider has helped lift the building game a notch,' says Spring. 'It has improved the ease and speed of applying the BCA and it is an ideal training aid.'

More than 90% of the plans submitted to Camberwell City Council are residential. Spring, like many other BCAider users, is therefore keen to see the package enhanced further.

In future, BCAider updates will be offered via an electronic network. Further still, designers and checking authorities will be encouraged to exchange plans and approval reports electronically. This method should be faster and cheaper than paper.

To run BCAider, you need an IBM-compatible PC with a 486 or 386DX processor, two megabytes of RAM, 10 megabytes of hard disk space, Microsoft Windows 3.1, a VGA monitor and a Microsoft compatible mouse. BCAider, which also runs on PC networks, costs $1495 for a 12-month licence. The renewal cost is $510. Discounts are made available for volume sales.

An expert in your PC

An expert system is computer software that emulates the behaviour of human experts.

To create an expert system, the knowledge and methods used to solve problems must be acquired from the expert and organised into a form that is easily understood and presented.

Hypertext is a database organised as a network of nodes and links that has cross references allowing the reader to 'jump' to any part of it.

Links are the labels that connect one node with another. When a link is activated, a jump is made to the document the link points to. The link may be embedded in the body of the document as part of a graphic, video image or text.

A node is a single document in a hypertext database. Each node corresponds to one or more screen displays and usually describes a single concept or topic.

In BCAider, hypertext is used to provide background information and examples, adding expert knowledge and context to a specific building code.

Figure 1