

CIB-conference Tokyo 1990

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Papers

Appropriate theme: Integrated CAD in Practice / Database in Practice

0.0 Abstract:

Multicad is an integrated CAD-system developed in Norway and Belgium. The CAD-system is aimed at the building and construction industry, and is a new system loaded with all of the features and attributes as only MS-Windows routines can provide. The program is quite easy to learn with its icon-driven MSW-environments, and it is easy to communicate with all the other programs under the same environment.

The user can create his own intelligent primitives. Walls understand they are walls and behave accordingly. Whenever this wall is drawn you can produce a report with amounts of materials, cost of materials, cost of labour, dimensioned list for prefabrications, volumes, masses, various types of area report and even assembly instructions

The system is the 3. generation CAD-system developed by the Norwegian architect Leif Smedbakken. He is one of the worlds pioneers in the designing of integrated CAD-system and he developed his first microcomputer-based system early in the 70s.

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1.0 Introduction

1.1 CAD in Norway

Norway has a long tradition in developing CAD-systems. This goes back to the 60th with system for the mechanical industry and later on for the off-shore-industry. Among 10 different Norwegian CAD-system are now on the market.

The building and construction industry want integrated CAD-system, systems that include both drawing, calculation, reports and project management. Due to the role of the Norwegian Building Standardizing Council we have got a unique basic concept with national standards for building coding and data exchange. This ideas have been carried out to practical result through the different vendors.

1.2. The man behind Multicad

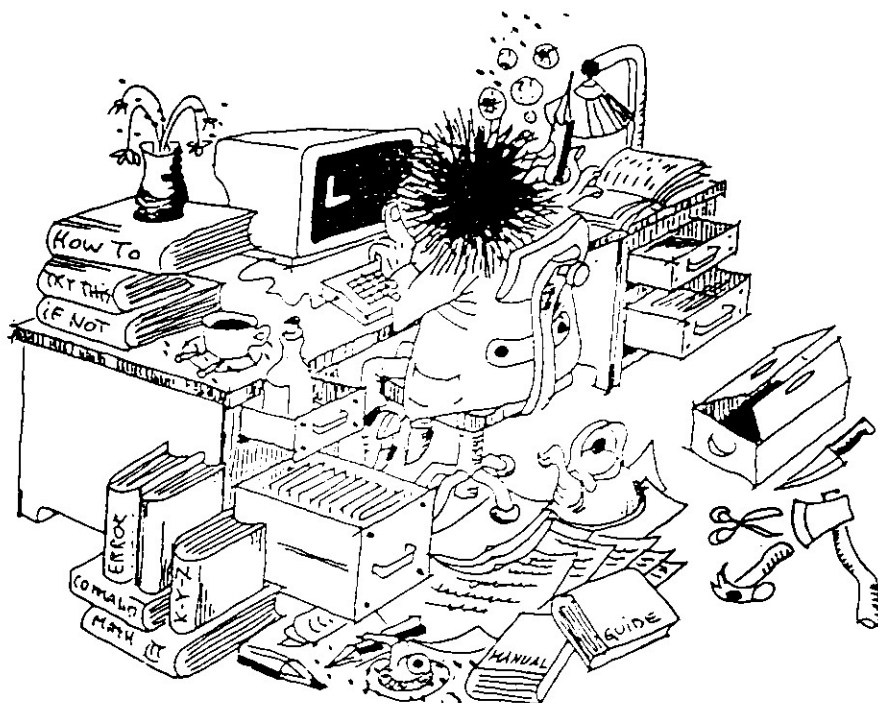
Leif Smedbakken is born i Russia, has spent more than 11 years of his life in Brooklyn, NY and is now living in Belgium. Early in the 1970's, after having worked as an architect for many years, he got interested in computer technology and started to look for ways the new machines could benefit architects and designers. One of his first efforts was a computer -based system where the computer stored all the information about the various materials used in the building of a particular house. The system was based on a huge Mainframe computer. A few years later he went in the opposite direction, developing a drawing program based on an inexpensive home computer.

In 1984 he finally had his breakthrough as developer of a professional drawing program for architects and designers with a software package called UniCad, to be used by numerous Norwegian manufacturers of prefabricated dwellings.

But the UniCad-system was still somewhat difficult to use, due to the fact that personal computers of that time still lacked the user friendly interface of today's computers. So while the UniCad was still selling well, Smedbakken started working on his next idea, a house design program so easy to use that even a child could use it, if not to professional standards.

To fulfil the idea, Smedbakken had to wait for the computer technology to catch up with the new demands of user friendliness. The solution came with Microsoft Windows and the new powerful personal computers. Windows transforms the computer screen to any number of windows or frames containing text, pictures and other data, to be manipulated by the user with the help of a mouse or another pointing device, instead of typing complicated computer commands that takes months to learn.

2.0 Multicad



- 2.1 There are several CAD-system on the marked
- some can be learned
 - while other can be used

MULTICAD

Introduction

MULTICAD is an integrated "intelligent" CAD-system aimed at the building and construction industry

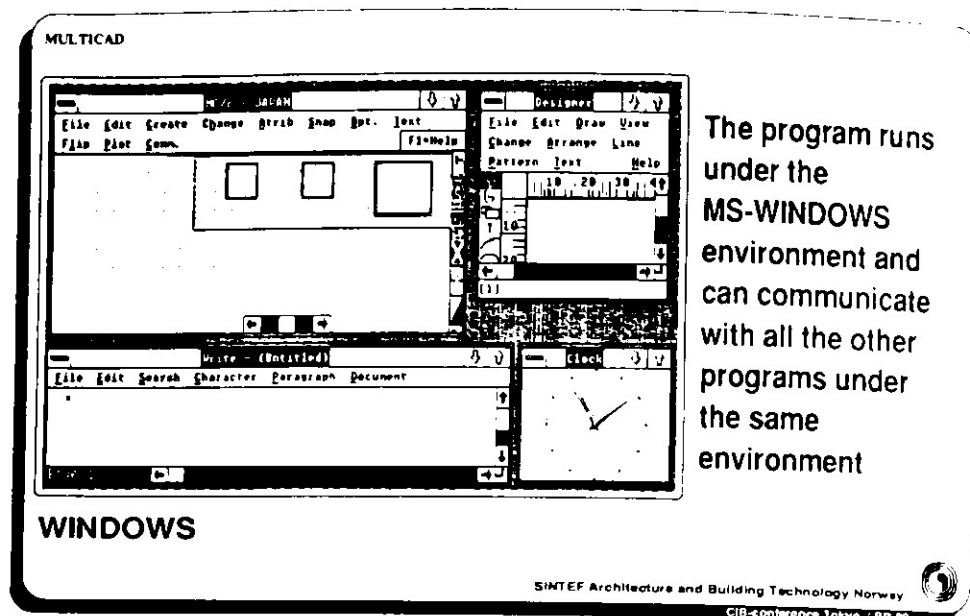
The program is developed by the Norwegian architect Leif Smedbakken

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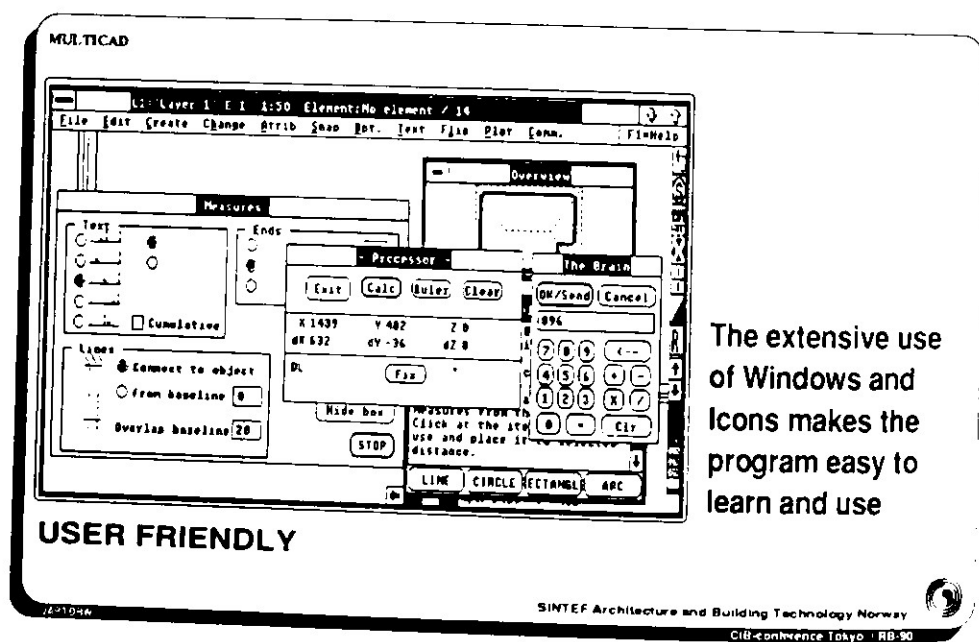


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- 2.2. Multicad is an integrated "intelligent" CAD-system aimed at the building and construction industry. It is not an ordinary CAD-system, but does include applications to create intelligent drawings.



2.3. The program runs under the MS-WINDOWS environment and can communicate with all the other programs under the same environment. You may use all the well known Windows-programs like Excel, PageMaker, Words, Superbase etc as application programs to Multicad



2.4. The extensive use of Windows and Icons makes the program easy to learn and easy to use. Once the program is installed you can begin working immediate

MULTICAD The drawing modul

MCCALC Calculation and reports

MCTOOL Toolkit for creating primitives

MC3D 3-Dimension wire-frame

4 Modules

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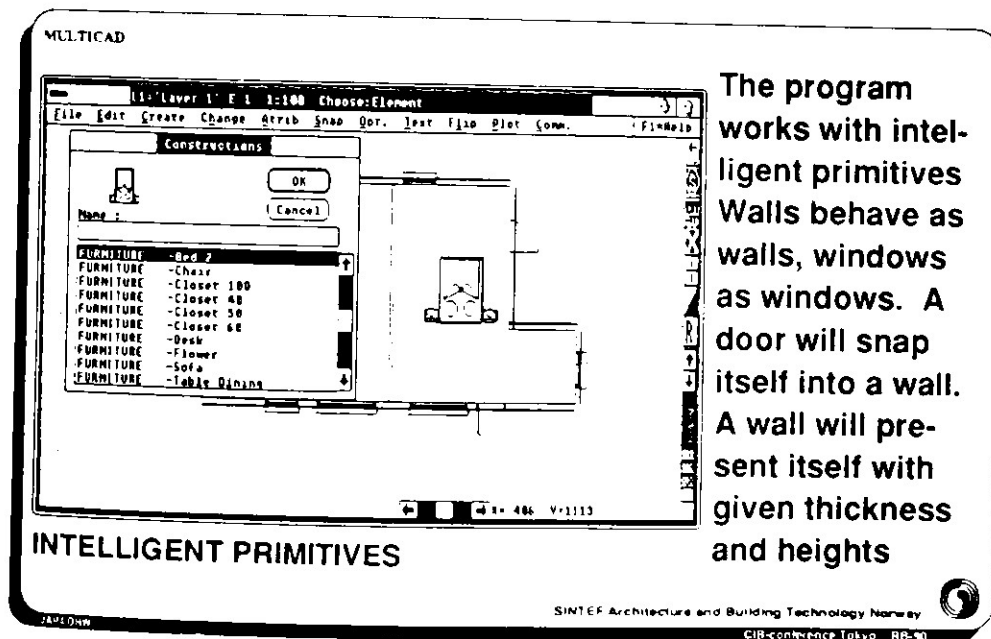
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2.5. Multicad has four main modules:

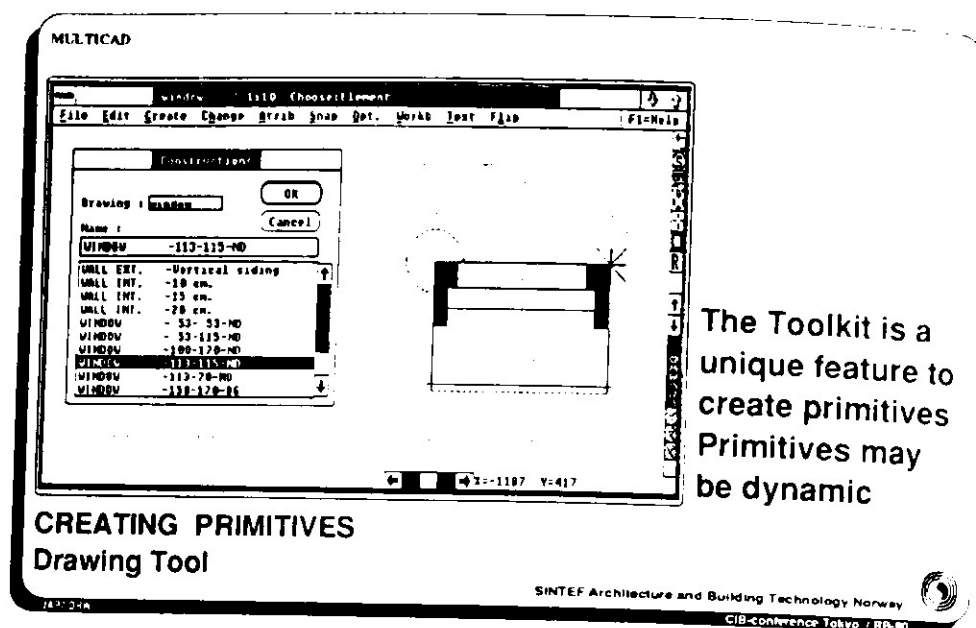
- Multicad - the drawing module
- McCalc - the calculation and report module
- McTool - the toolkit for creating intelligent primitives
- Mc3D - the 3-dimension wire-frame module

The new modules are:

- WorkMaster - an automatic drawing system
- PlotMaster - handles and plots drawings from different CAD-systems

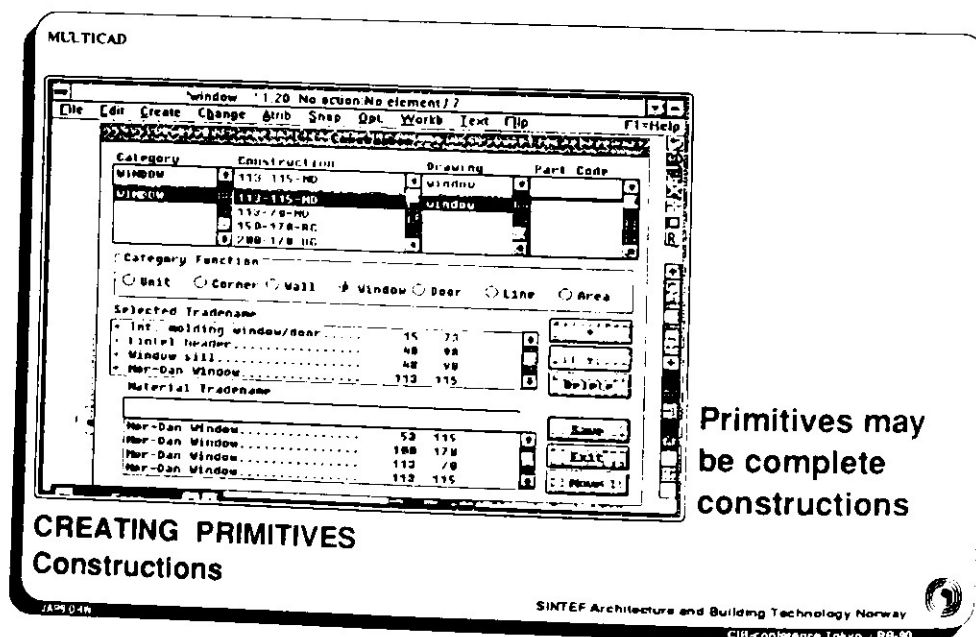


2.6. The program works with intelligent primitives. Walls behave as walls, windows as windows and they behave accordingly. A door will snap itself into a wall. A wall will present itself with given thickness and heights.



2.7. McTool is the unique feature to create primitives. Primitives may be dynamic, etc a wall may be stretched in one, two or three dimensions.

To create an intelligent primitive for a wall you first have to create an image of the plan and then the front.



2.8. Each primitives may represent a complete construction. The construction can be given a name and then filled up with materials to be used in the construction.

With the function loader the material in each primitive is defined. Both the material itself and the material price can be defined

CREATING PRIMITIVES
Loading with material

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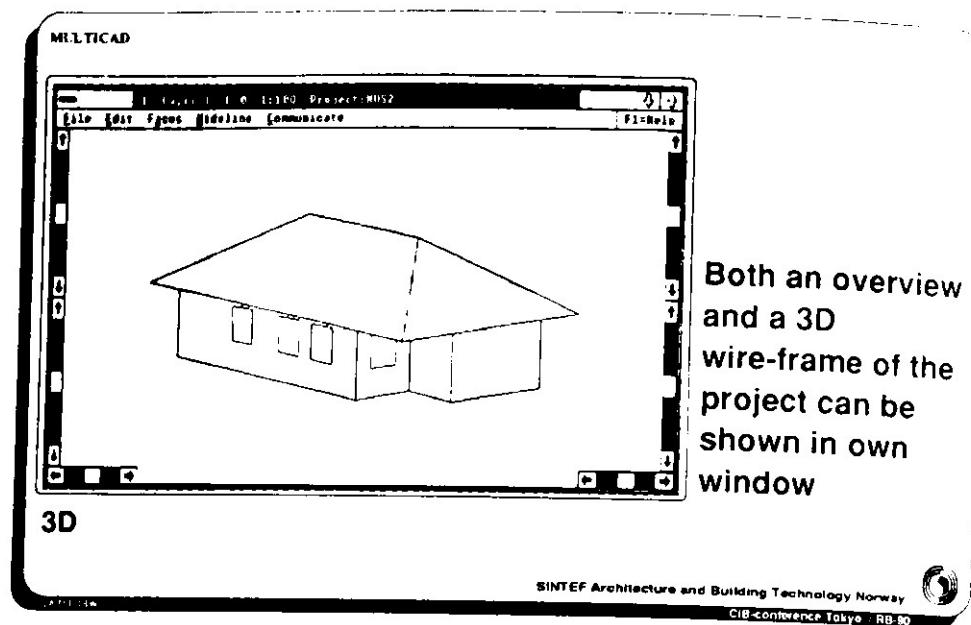
2.9. With the function loader the material in each primitive or construction are defined. Both the material itself, the material price or the assembly costs for the construction can be defined. Whenever a wall is drawn from one point to another the database will produce a report with amount of materials, cost of labour, dimensioned list for prefabrications, volumes and various types of area reports. Each component can be given a specific building code, name or name of the supplier.

All components know what to do and snap themselves in position. The front is created automatically when the plan is drawn

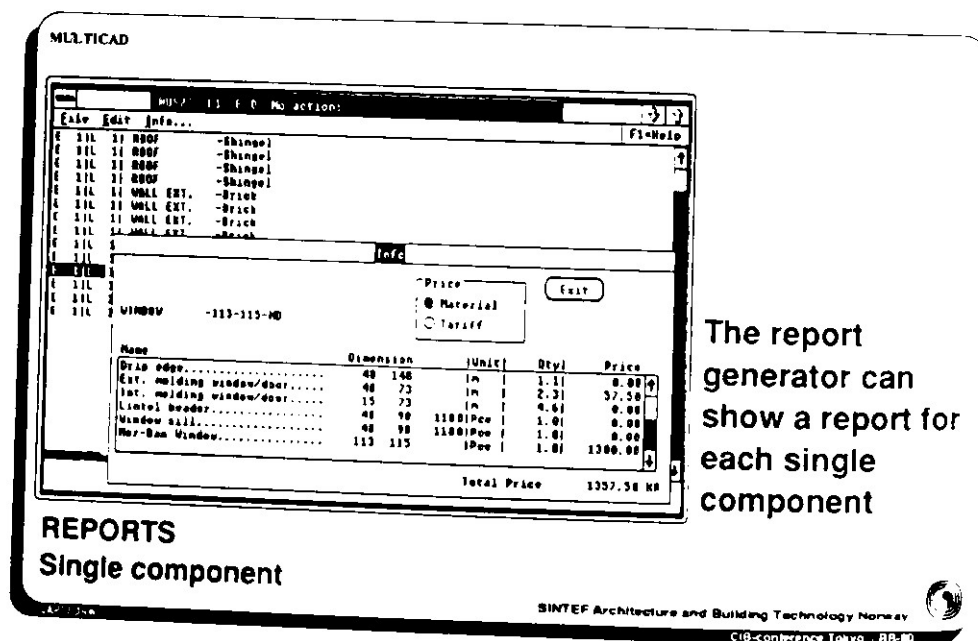
FRONT

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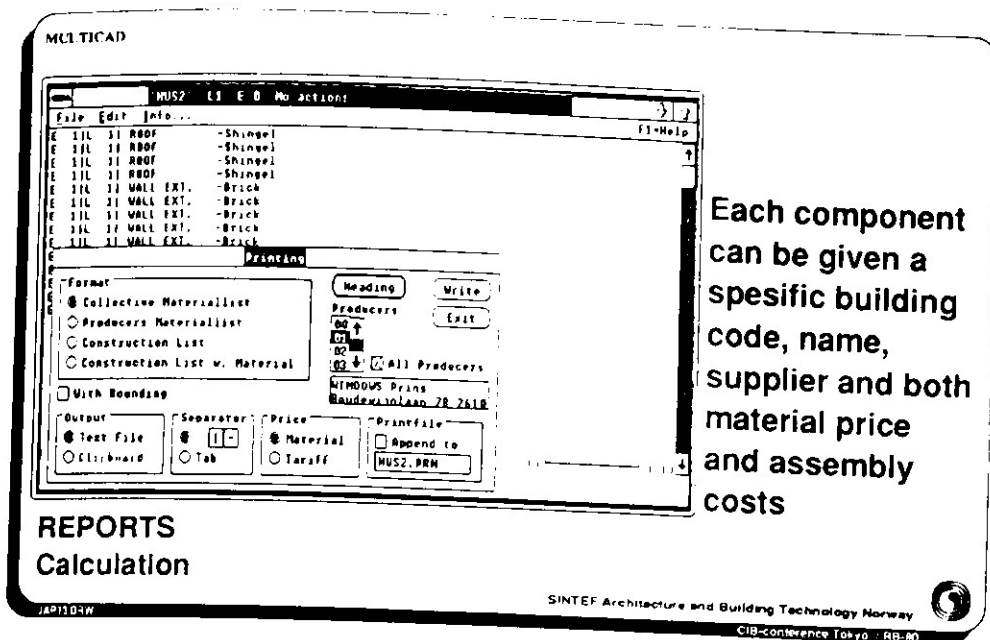
2.10. The front is an automatic function from the plan. All components, even the roof, know what to do and snap themselves in position. The front is created automatically when the plan is drawn. The philosophy is that all functions shall be as simple as possible.



2.11. Overview and a 3D wire-frame of the project can be shown in separate windows.

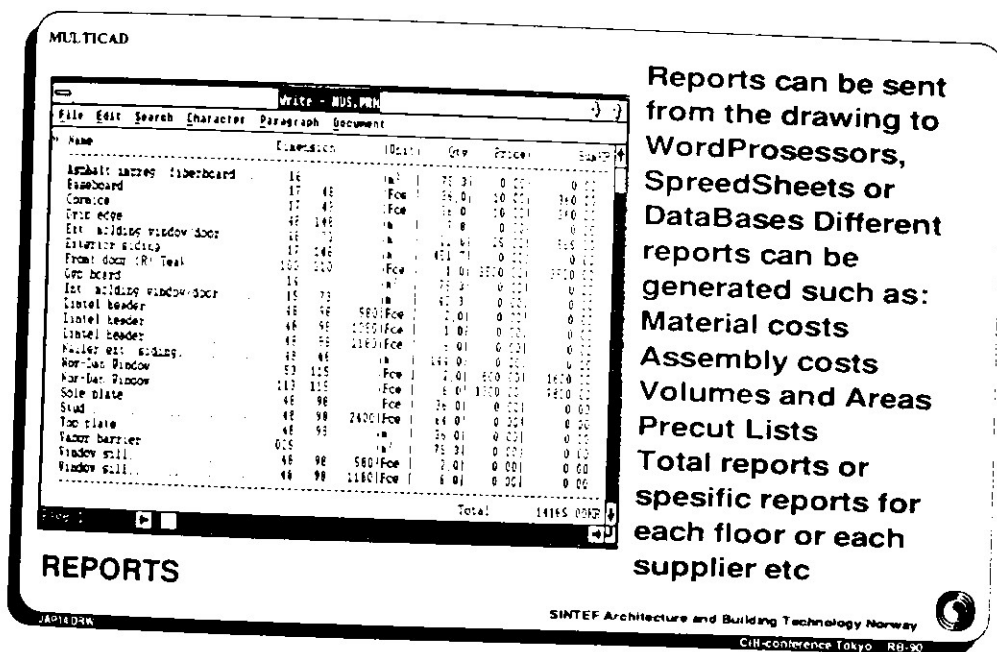


2.12 Every drawing primitive are made intelligent and from the data-base we can get a report for each single component.



Each component can be given a specific building code, name, supplier and both material price and assembly costs

2.13. The calculation module can calculate both the costs of material and the cost of labour



Reports can be sent from the drawing to WordProcessors, SpreadSheets or DataBases. Different reports can be generated such as:
Material costs
Assembly costs
Volumes and Areas
Precut Lists
Total reports or specific reports for each floor or each supplier etc

2.14. Reports can be sent from the drawing to WordProcessors, SpreadSheets or DataBases.

Different reports can be generated such as:

- Cost of materials
- Costs of labour
- Material dimensions
- List of components
- Suppliers specifications
- Building code
- Volumes and areas
- Assembly instructions