

INTERNATIONAL CONFERENCE ON ENGINEERING DESIGN

ICED 01 GLASGOW, AUGUST 21-23, 2001

Engineering Networks

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September 15, 2000

TOPIC

Knowledge and Information Management

KEYWORDS

Design information management, product data management

CATEGORY

Education

1 Introduction

The design and development engineer from today has to process a lot of information, and the time the engineer has to abstract this information and data is increasingly shorter. Especially small and medium sized enterprises with their own construction and development departments with high technological standards have big problems with information processing. They don't have large information systems and special departments which are responsible for information management, such as large well structured and organized plants. The engineers in these small construction and development departments have to work very often with a lot of programs:

- CAD-systems
- FEM-systems

- PPS-systems
- Data bases
- Spreadsheet programs
- Office communication
- Calculation systems
- Wordprocessing programs
- etc.

In addition to the problem that the engineer has to know how to work with the different computer programs, the workplaces are very often insulated from customers and from suppliers. The present communication system is not very efficient. The manufacturer always has to ask for example the supplier or the customer for information or data during a construction and development assignment.

2 Engineering Networks

A solution for this problem are Engineering Networks. One big advantage of

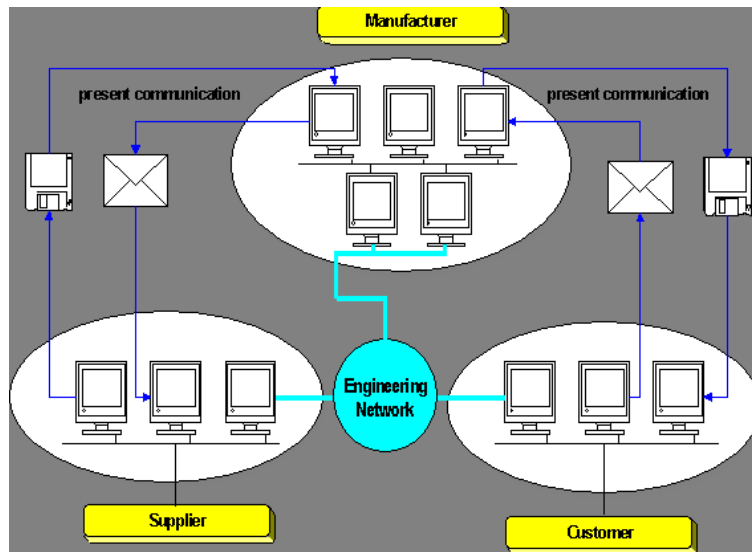


Figure 1: Presskraft

these Engineering Networks is that you don't have to ask the development

partner for information or data and wait for the answer. You only have access though the information at any place and any time you need the information. You don't have to ask at the normal business times into consideration for your information research. Another advantage is that an Engineering Network makes a direct connection between all development partners which are involved into a development or construction assignment possible. The present communication method doesn't include a direct connection between the customers and the supplier. This direct connection makes data transfer and information exchange between the development partners easier and more efficient. These networks do not guarantee perfect information management. Some conditions must be fulfilled:

- The information must be in a structured manner
- The information must be up to date
- High functionality
- The information must be accessible for all persons involved in a development assignment

By way of summarizing Engineering Networks are efficient tools to make the construction and development process more economic.

In reality, construction and development engineers use 30% - 70% of their working time researching and looking up information. A case study of coordination activities and problems in collaborative design by Prof. Crabtree in 1997 shows the problem very impressive. Very often missing information access, missing access to qualified people and the missing development documentation are responsible for problems during development and construction processes. Unknown context and planning problems are of secondary importance.

Unstructured information management and data management have a bad effect on the development and construction of products:

Productivity

- longer development times
- bad structure of construction processes

Quality

- possibility of the development from not marketable products is high

- old technologies and materials will be used

Flexible flow of work

- premature reactions are not possible

Know How

- decisions are not reproducible
- no transparency of the development and construction assignments

Unstructured information and data management can also have a bad influence to social relationships between employees. Plants who handle their information and data transfers in an unstructured manner have very often problems with their working atmosphere. It could happen that the quality of work from an employee is completely dependent on information from one person. This interdependence between employees could result into social seclusion of employees. Very often is the knowledge that it is very important to make information public to all people who are involved in a development and construction project not present. Unfortunately sometimes information is kept wilful back. This is a kind of mobbing which is for the economic success of a plant a very bad. With information management tools like Engineering Networks an information access for all relevant employees can be guaranteed.

During a construction process many changes of the layout design and demands of the product could happen. Especially during such changing processes it is very important that the information and the data will be handled in a structured and understandable manner. A change in a drawing is normally not very expensive. But this change could have enormous effects on production processes logistical processes and the whole workflow after the construction and development process. It is essential that changes of the layout of a product in drawings is combined with a correct and effective information management. Otherwise it could happen that many aspects of the product change will be ignored. The result of unstructured changing activities are high plural flow-up costs and big problems in the following workflow.

3 Conclusions

Especially engineers in small and medium sized enterprises have problems getting the right information, at the right time, in the right place, of the

right quality, quality and in the right form. Well structured information management and data management is essential to develop technologically optimally designed and profitable products. In the future, it will be a challenge to reduce the 30% - 70% of information research with information systems, like engineering networks and other information management tools.

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