

Web Based Communication

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WEB BASED COMMUNICATION

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1.0 INTRODUCTION

With Web based communication (wbc) in this project is meant the information handling supported by specific web based ICT applications: so called Projectweb Sites (PWS). Potentially this medium offers the possibility to let the central communication of design processes in building projects run through the internet. Good communication is of essential importance in design processes, both within the building team as towards the client and other stakeholders (Donker 1999, de Vries 1996) independent of the form of co-operation and collaboration.

This presentation is given for the Atelcoma partners at the final meeting, supported by the insights gained by the research for improving information handling within design processes by the use of the possibilities of web based ICT.

In this presentation the following aspects will be dealt with:

1. Information handling: activities and exchange
2. Vision on CMC application in building practice
3. The information landscape
4. Properties of CMC:
transparency / openness – sharing – / progress / dissemination / content
5. Information environment of a project web site
6. 'Collective mind' and conditions for this
7. False future prophecy at the introduction of new technology
8. What needs to change in the organization en the processes?
9. What is needed en where does this lead to? The challenge: how do we achieve this?**2.0**

2.0 INFORMATION HANDLING: ACTIVITIES AND EXCHANGE

Regarding the information environment of the designing building team a distinction can be made into four connected areas:

The object to be produced: the building in its specific environment

The participating Organizations and of course the people in it: managers, designers and engineers

The processes: the primary process and the design process in it

The ICT means for communication and information handling

In this case information handling means generating information, saving and re-use of information as well as the information exchange and publishing of information.

Information handling consists of a number of connected activities / processes. These can be divided into:

2.1 Generating information

This is a 3-step process, which starts with 1/ collecting information followed by 2/ transmission and 3/ storage of information.

For example by way of thinking up, looking up and / or selecting (databases, books, norms and rules and alike) reproducing, consultation of experts (experts and expert systems), experience and experimenting.

2.2 Exchange of Information

Sending: The filtering or closer selection of certain useful information to be sent, the transformation of the information into a certain reading for or data structure necessary for a specific way of sending, the sending itself, and the possible accreditation, by giving guaranties about the validity and reliability information to be sent.

Receiving: The getting of the information, possibly also concurrently gaining insight into the information background (the sender, the generator, date and time, location) having insight into the status and routing (transparency) and confirmation of reception, Such as for example on paper or electronically in writing, image, sound and sense (sensors) or smell (perfume – spray can) and at an other time, depending on the recipient, retrieved and interpreted by the recipient. Based on the interpreted information the recipient will react and whether he will send the new information back or request additional information. If the information is unclear in the opinion of the recipient in the sense that it is unclear or can interpreted in several ways he will possibly turn to synchronous information exchange (Bälter 1999).

Interpretation: The -cognitive- translation of the information with the intent to estimate the value and to understand the information, internalise it, and possibly to redefine it in terms of further specification (abstraction level), aggregation (the adding of new information), changing (modifying of the original information) and finally the approval of the information.

Saving: The actual saving of information in the human brain (in the short- or long term memory) or on certain external storage media such as paper or electronically, possibly with a back up on paper or electronically, the addition of source- and meta data (data about the data). The maintenance of the information also falls into this category, the continued accessibility, adjusting and modifying and finally the destruction of the information.

Retrieving: Re-use of previously stored information.

2.3 Publishing Information. This can be seen as a specific form of sending with the purpose of exposing useful information by way of certain public media channels.

On the basis of the formulated activities a number of typical information exchange processes can be defined:

Linear information exchange: This is a one-way process between a sender and a receiver or a group of receivers that consist of succeeding, sequential, activities: generating, publishing, receiving and interpreting. An answer of the receiver is usually not expected. This process can run both synchronous and a-synchronous. Examples of this are newspapers, magazines and web pages.

Dual information exchange: This is a process with interaction that consists of a sequence of linear communication that is characterized by the fact that the receiver of information becomes sender when he answers. In this process an answer from the receiver is usually expected. This process can run both synchronously and a-synchronously. Examples of this are: letters sent through the post or e-mail messages to one or more recipients.

Parallel information exchange: This is a multi-, concurrent process with interaction between sender(s) and receiver(s), which is characterized by the fact that senders of information are also receivers at the same time. This process can run both synchronously and a-synchronously. Examples of this are: talks and evaluations verbally, conference groups and discussion groups on the World Wide Web. E-mail traffic with continuous response is an asynchronous form of dual exchange. The mentioned information-exchange processes are run both verbally and non-verbally and are often supported by certain media, including electronic media. Only seldom will the information exchange go by way of only one medium, because designers have a certain desire to communicate. For this the currently available media will be used and a choice will be made between the several communication media usually on hand (Davenport 1997).

Because of the richness of verbal communication (Ayer 1934) this form of communication is of great importance in our design processes. This is particularly true in the early stages of the design, because the design information from the desires and wishes of the client are multi-interpretable and is therefore not very suitable for means of electronic communication such as e-mail (Bälter 1999). In other cases in the design process richness of communication can cause unwanted static in the information or misinterpretation and it is better to choose for a medium where this static prevented or reduced to a minimum.

Information-exchange can take place synchronously (verbally – non-verbally: telephone conversation) or a-synchronously (fax – letter – e-mail message).

Synchronous information-exchange: Here sender and receiver are connected directly. Generated information is sent by a sender and at (almost) the same time received by a recipient, who stores the information, interprets it and, on the basis of the interpreted information, sends back new information, requests additional information or indicates to wish to continue or end the synchronous information-exchange. Possibly sender and recipient will decide to continue the information-exchange synchronously, or completely or partially a-synchronously by way of information-exchange media to be determined.

A-synchronous information-exchange: Here recipient and sender are not directly connected. Generated information is sent by a sender and stored on an external information-medium.

3.0 VISION ON WBC APPLICATION IN BUILDING PRACTICE

Wbc can grow to become the central communication medium within which a so-called 'collective mind' plays an important part. It becomes the collective brain with current project information that is continually replenished and changed by the partners in the team. The task with that is to keep the information in this brain current instead of letting it develop into a historical project archive in which the definitive decision-making is shown.

At the same time the current information makes it possible to monitor the information process by way of the meta-data and to improve this process continuously.

Designers, engineers and managers, communicate by way of all possible ways and media that are their disposals. In a certain sense there is a continuous desire for communication where they only partly restrict their selves to certain media. This brings the current ness of the collective mind in danger.

Information overload, communication overload, information sharing and information politics are critical aspects with that.

By way of Internet for example we can communicate in several ways: e-mail, discussion groups, conferencing tools, PWs as central information point for partners in projects, central storage of data, and virtual office with agenda, calendar, Name, address and residential data, registration, distribution and alteration of data.

Computer mediated communication have a number of positive and negative properties:

Positive:

- + Overview and simplicity (distribution and registration are automated)
- + Digital durability (because of the meta-data the information is much more accessible than other information such as in archives)
- + Error reduction information (information is in principle only present once)
- + Improvement in the exchange of information (viewing / changing / complementing / version management)

Negative:

- Big brother effects (looking in the kitchen, apply pressure)
- System dependence, management of rights
- Information politics (keeping the information current, joining in)
- Jamming procedures en agreements (killing instruments for design processes)

4.0 THE INFORMATION ENVIRONMENT / LANDSCAPE OF AN ORGANIZATION

4.1 A holistic approach

There is a continuous need for communication within the building team by way of various media: telephone, fax, talks, e-mail, Internet. New media are also emerging continuously (Donker 1999). However, none are disappearing (Davenport 1997). This makes the information environment or the information landscape within the building team and in every participating organisation more complicated and whimsical, it also happens more often that information is present in various forms, with small differences and the status of the offered information becomes more unclear, in other words: mistakes because of outdated, double information can happen easier.

The holistic approach: an information environment as a landscape with almost constant change under influence of a number of factors.

The central question here is: "How do people and organizations handle this environment, concerning the following aspects:

Information architecture	Information management
Information politics	Information strategy
Information behaviour / culture	Information systems
Information processes.	

Critical elements in this context are: Information overload, information politics and information sharing (Davenport 1997).

4.2 Project web sites

The Collective mind or Virtual Office with the functions and information storage for all project data: current data, project data, project history, process data.

A team is put together from the various organizations; therefore several teams from different organizations have different project web sites.

5.0 PROPERTIES OF Web based communication

Web based communication (wbc) can be of help to reduce the information overload, because the information is stored orderly and at a central location. Because of this the view over the information is saved and a certain transparency grows in the available information and the status of it.

Because of the application the dissemination (a bigger group of users can acquire more knowledge of information in a better way, because the information is more accessible and can be applied sooner) of information to all partners and participants is enlarged, which can encourage the progress of a building project. All parties involved can inform themselves sufficiently by way of the offered information. (Better and more current information is available, the quality increases because of that). Which project information is accessible fast? (Distributable, enterable, changeable, unambiguously present)

The properties of CMC largely correspond with the aspects that are important for decision-making processes in multi-disciplinary environments (De Bruijn en in't Veld 1998). Therefore CMC should be usable effectively.

As mentioned previously a 'Collective mind' is the joint, dynamic, electronic memory of the partners in a building team within which all current and relevant (design) information, both object and process information is stored, which is accessible for all participants and can be changed by the various owners of the stored information within a number of agreements and conditions. Because of this, a *knowledge bank* for the project team is formed.

5.1 Navigation aid for the primary process

In the Collective mind data are also used about the process that the project has gone through (meta data). This makes it possible for the partners to reach improvements during the process on the basis of the activities that were done and the processes that the process went through: with that CMC becomes an instrument for improvements during the process, and a navigation-tool for the team.

With the development of a 'collective mind' another purpose also enters the picture: up to date data for the management of the building during the total lifespan. The knowledge bank is a useful aid for the building manager to maintain the building with the help of the stored data, to renovate and change during the life cycle.

The most important conditions for an effective application in such a case are that the participants:

1. All apply CMC, because of which the current ness is assured;
2. Have sufficient trust in each other;
3. Have something to offer each other and are therefore willing to exchange and share information;
4. Similarities among partners in vision and information culture;
5. A low grade of process modelling and agreements (simple and easy);
6. Have sufficient skill with electronic aids to also exchange and share information electronically in the right way.

6.0 FALSE FUTURE PROPHECY

At the introduction and application of new technology false future prophecies can easily lead to wrong, ineffective implementation of the new technology. De Wilde (De Wilde 2001), a philosopher of the University of Maastricht developed the following theses about this subject.

- New technology has to fight for its place in society;
- Social dynamics are underestimated

An example of this is the invention of the radio:

A reporter of an American newspaper writes the following about this around 1920 (De Wilde 2000):

"Radio offers the listener the possibility to surf past all stations of political parties and to determine his choice for the election in this way. Therefore radio is a means to enhance democracy."

Now compare this to the appearance and application of CAD, 15 years ago. Designing and drawing in 3D, drawing in 2D would disappear. However, little has changed in this respect. We still make drawings in 2D, and designing in 3D using the computer never really caught on in the building world.

7.0 WHAT NEEDS TO CHANGE IN THE ORGANISATION AND THE INFORMATION HANDLING?

The question how Computer Mediated Communication can be used to become more efficient and higher quality information handling from the processes that is necessary for the participating organizations to realize the object.

With that the currentness of the information is paramount. This can be done by way of time boxing that can make sure that information is refreshed within certain units of time of for example a day. Design information is continually developing. We have to learn to work with that in a better way. Waiting until information is definitive before taking action is no longer possible. It is a continuing process where the collective interest is paramount. New means of communication in the process lead to new ways of communication, promised to be faster and more effective. But we have to look at this in the broader perspective of the total information environment to see if this will also lead to more effective communication and a rise of efficiency within the design process for a building process, which often grows technically more complex, and a growing design team.

The information landscape within the design team is changing because of the aforementioned developments with regard to the object and the building team and furthermore because of the application of electronic communication means.

This has its effect on the information handling within the team.

In this framework information handling is viewed as: all information handling activities of all information exchange processes in an information environment.

CMC means a high level of applying a-synchronous communication: sender and recipient are not in contact with each other at the same time, but regularly at changing times. Writing is replaced by typing.

For that reason it is absolutely necessary to tune Information Management interdisciplinary by structuring, normalising, regulating and controlling the information handling.

Information management can be defined as the explicit interdisciplinary organizing of the information handling that is necessary for designed and outfitted information-exchange processes. In this context I mean by this: the strategic design, the implementation, the operating and control of all design information-exchange processes necessary for the architectonic design of a complex building project.

8.0 WHAT IS NEEDED AND WHERE DOES THIS LEAD TO?

A better structuring, normalising, regulating and control of information handling is needed to use effectively web based ICT-tools within information processes to improve the efficiency of the process.

This lead to the improvement of information flows, better distribution of information and good information given to the partners within a designing building team leads to better and faster decision-making.

In short, if we adjust our information behaviour as managers, designers and designers, practitioners as Schön describes them (Schön1983), in such a way that we can use means for the mentioned purpose, then that can lead to a substantial achievement improvement of the building team, concerning:

- Time (cycle time of partial processes)
- Costs (reduction of failure costs)
- Quality enhancement of information processes (current ness, storage, history and re-use)

This message is our contribution to Atelcoma.

9.0 THEREFORE THE CHALLENGE IS:

- a. Changing our information behaviour with regard to ICT
- b. Integrating the digital aids in the communication within our building teams.

This means that we have to improve the information handling processes. The application of those means automatically revert to our information handling processes. Because principally we are going to do things differently and do things that were first done by others.

That is the challenge that we are facing today. If we succeed in that together! , than the Internet will become fortunately more than just en electronic mailbox and Computer Mediated Communication can truly become significant in the form of a Collective Mind for the Designing building team.