

THE DEVELOPMENT OF E-GROUPWARE IN THE COLLABORATIVE WORK OF ARCHITECTURAL DESIGN

Subtitle

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Abstract. The emergence of the computer networking, especially the internet has been a very useful tool for the construction industry, The AEC (AEC: Architectural, Engineering and Construction) has adopted the computer technology to the collaboration design work (CSCW: Computer Support Collaborative Work). It used to be that people work together in the real physical space like an office or design studio but now in the virtual design place. This is to accommodate the work that is being done among the designers or construction teams that are far apart. Though Web Application these people can work together from different.

1. The Groupware for Collaboration Design Work

There has been a continuous development in the area of Web Application. AEC is using one called Groupware which can be categorized into two big categories. One is the free open source and the other is that you need to pay for it. The advantage of paying for the groupware is that the module you buy is specifically designed to fit your needs. For examples the AutoDesk Buzzsaw which is online collaboration software for design and construction work (more information can be seen at <http://www.autodesk.com/buzzsaw>). The services provided including Sever preparation, Network system and Security system for the organizations. On the other hand the Open Source Groupware, this application is available free of charge to the public. Though it is not as specifically customized to fit your purposes as the other option but people can use this as a starting point and develop it into what they needs. Most of the times, these open source applications are not designed specifically to fit any particular type of industries. So to be able to use this software in the area of architectural design, some development works need to be done.

In this research, we used one type of the Groupware called eGroupWare for implementing an experiment of the collaboration work of the Project International Centre, Rangsit University. The purposes are to research and

study the productivity of the eGroupWare through the use of the current communication systems including PC computer, Pocket Pc, and Mobile phone using Symbian OS. Since the information is being placed on three different platform, the outputs will be different from one and the others. Therefore, the data generation must take this into consideration for flexibility of information. Also the arrangements of the information is to be considered (information hierarchy) for file management within the Project.

2. The Concept of the development of Groupware Design

“Received information of collaboration Anytime, Anywhere” is the main concept of this case study of in International Centre Project, Rangsit University. The people who work on this project can have their own space ready for exchanging information including construction plans, drawings, picture, calendar and schedule which help each team member to plan their own specific tasks. This enables an architect who works in the office to communicate with another one who is not.

eGroupWare was designed specifically for International Centre Project, Rangsit University. Different modules were used for the most capability. Almost web application will not have any problem in the synchronous mode. Some additional program might be needed, for example MSN, We used works through file manager in eGroupWare module (asynchronous mode).



Figure 1. The use of eGroupWare on the different device.

Type	PC	Pocket PC	Symbian phone
Processor Speed	3.06 GB	400 MHZ	220 MHZ
Memory	80 GB	128 MB	Up to 64 MB
Ram	512 MB	128 MB	Up to 64 MB
Display	1024 x768 pixels 32 Colors	LCD240x320 pixels 65,536 Colors	352x416 pixels upto 16M colors
Connection	Modem, LAN 10/100	GPRS	GPRS
Action	Keyboard, Mouse	Stylus	Keyboard, Joystick
Web Access	Internet Explorer	Pocket Internet Explorer	HTML browser, XHTML browser

TABLE 1. Review system on each devices.

3. Limited to share information between PC, Pocket PC and Symbian phone

3.1 INTEGRATION SOFTWARE AND FILE TYPE BETWEEN PC, POCKET PC AND SYMBIAN PHONE

By analyzing the tools and computer programs that is being used in the field of architecture, the following file type was found

Application	File Type
Microsoft Word	*.doc
Microsoft Excel	*.xls
PowerPoint	*.ppt
Adobe Acrobat	*.pdf
Image File	*.jpg, .bmp
AutoCAD	*.dwg

TABLE 2. Application and File type of International Centre Project .

Each file type requires a certain type of programs to open it. The capability of each program is not the same and may need some adjustment to fit all the needs. File type can also be change if the program cannot open a certain type. For example, a file from AutoCAD program is a *.dwg which not good enough for running on Pocket PC and Symbian phone. But they can open *.pdf file through Acrobat Reader. We use a Acrobat Reader as a middle for reading many kinds of document such as *.doc, *.xls, *.dwg, so a conversion of file type is needed.

File type	PC	Pocket PC	Symbian Phone
Word	MS Word	Pocket Word	“The ability on mobile”
Spreadsheet	MS Excel	Pocket Excel	“The ability on mobile”
CAD drawing	AutoCAD, Autodesk DWF Viewer	PocketCAD PocketCAD CE	Visiarc (program plug-in)
Data, Picture (.pdf)	Adobe Acrobat	ClearVue PDF v2.41.386	Acrobat reader LE 1.5
Presentation	PowerPoint	ClearVue Presentation v2.41.386	“The ability on mobile”
Images	ACDsee	“The ability on Pocket PC”	“The ability on mobile”

TABLE 3. Comparison application on PC, Pocket PC and Symbian phone.

3.2. MANAGE FOLDER

The type of works being done in the field of architecture can be separated into many different parts. The file in eGroupWare should be organized in the same way. There should be different spaces to keep different types of works and files to ease the user work when finding the files to use. For example, an AutoCAD files which is the plan of building is saved in *.dwg but when uploading the file, there should also saved in *.pdf file in the main folder for Pocket PC and Symbian phone.

3.3. HARDWARE AND SOFTWARE ENVIRONMENT

The database from the International Centre Project, Rangsit University was stored in the eGroupWare through the use of Server as a center of information storage. Any member from the project can access this information when needed through the use of internet. So the Server needs to be stable and reliable source of information for the efficiency of work flow.

Pro.	Con.
<ul style="list-style-type: none"> - Easy for transfer data - Sharing resource - Better for collaborative - Reduce cost for long term 	<ul style="list-style-type: none"> - Server not stable and reliable - Speed of network not stable, it difficult to connect from the other place

TABLE 4. Comparison Table.

3.4. USER INTERFACE

Because of the work can be done in PC in which different size screen, the transfer file will be created the problem for the Pocket PC or Symbian phone who want to upload it. The problems of crossing the platform between Pocket PC and Symbian phone, will be different size of the screen being

used in each of them. These different which make it harder for a Pocket PC or a Symbian phone to view the *.dwg file compare to a normal PC. We can solve this problem by converting the *.dwg to *.pdf file with enough resolution when zooming it to view them.

3.5. TECHNOLOGY IN USE

The technology of the internet is used for accessing the eGroupWare. The use of network also used for PC within the office, Pocket PC and Symbian phone uses wireless LAN for access the eGroupWare. Thus, and architect who works outside can be access through GPRS system in which have the current speed at 171.2 Kbps. (in the future is expected to be 2 Mbps when 3G system is ready in Thailand). The actual speed for GPRS in Thailand is 115 Kbps.

For this research we chose GPRS system that charge the service fee through the amount of the data uses for lower cost because some data can be stored in memory card of the Pocket PC and Symbian phone instead of downloading it.

4. Project for Study

International Centre Project, Rangsit University is being built as an experiment collaboratively through eGroupWare. It is divided on 3 operating system of user. PC user within the office, Pocket PC users and Symbian phone users work together through eGroupWare as a center of communication.



Figure 2. *International Centre, Rangsit University.* .

5. Further Development

After the use of the development of eGroupWare in architectural design collaboration. Architect can work more convenient and faster due to the mobility of the device, they carry around to choose the information from eGroupWare immediately. When architect want to know for understand or clear in some point of their work. However, there are still problems that

needed to be fixed like the network, speed of the GPRS system, the stable of server when logging into eGroupWare or the limit of the viewing screen of Pocket PC and Symbian phone.

Conclusion

The result of this research has shown that the work done within the organization has significantly improved. It is shown that working through the use of eGroupWare applications helps solve the communication problems within the organization which resulting in less work for the employees, there were fewer mistakes had been made. Hence there was a decrease in cost and time of operations because now they can check up on the works at anyplace and anytime.

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