

Are Universities ready for Groupware?

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Abstract

Early developments in groupware technology have been aimed predominately at the business community. Lotus were the first to develop a CSCW (Computer Supported Co-operative Working) system with Lotus Notes. This technology leader coined the term groupware. It was and is a high cost CSCW technology solution, as are its many competitors.

Groupware so far has not been aimed at or widely adopted by the university community. This is partly due to the cost and the client-licensing basis of the technology, ie. where a specific copy of a software package is licensed for a certain user, usually only on a certain machine. This does not match to the multi-user computer laboratories employed by universities. In addition university organisations are simply not the same as business ones. However there is an increasing need for universities to embrace this technology in order to give students vital experience, and to compete in the increasingly competitive academic market.

This paper discusses the evolution of groupware, and the latest groupware technologies available. It looks at how businesses have integrated groupware technologies into their working practice and business structure, and how universities will have to adapt to do the same. A case study of university collaborative projects is discussed, and conclusions are drawn about what universities must do if they are to embrace this new technology.

1. Introduction

Most early groupware and groupware research and development was done for the business community. Groupware was and still is a high cost technology solution, which if implemented properly can show a very high return on investment. As the groupware products diversify, other potential customers are showing an interest in this technology. One of these is the academic community.

1.1: Commercial groupware

Commercial groupware is following a typical product lifecycle. Large businesses have paid a high cost to get the early benefits of groupware, which is now becoming more widely available at a lower cost.

Universities are being targeted in this next stage of the groupware lifecycle. Lotus [ref. 15] offers large discounts for academia, and has been developing an academic application called LearningSpace [ref. 16], which uses the functionality of Notes to manage educational courses. Also the latest release of the Lotus Notes server, Domino [ref. 17], allows access via the Internet using a web browser instead of a traditional Notes client, thereby solving the problem of users accessing the server from different machines. Netscape has always been interested in the university market, always making Navigator free to academia, and now pushing its new groupware technology Collabra [ref. 18] bundled with its Communicator package. Microsoft has been offering reduced cost office and development tools to academia and students, and many universities have moved to supporting MS Office instead of WordPerfect as has been traditional. Microsoft are also trying to push their new Internet and groupware technologies such as Internet Explorer, Office 97 and Exchange Server [ref. 19] onto the university market. There are also many video conferencing hardware and software companies [ref. 21, 22] trying to sell the latest Internet and ISDN based on-line conferencing technologies to the university market.

There is also university research being conducted into CSCW producing systems like BSCW (Basic Support for Cooperative Working) [ref. 20]. This product demonstrates the general convergence of groupware with the Internet - which has long been adopted by universities. Along with a reduction in cost of the new and established groupware products, groupware is finally ready to be aimed at the university market, but is the academic community ready for this new technology?

1.2: Academic use of groupware

The university community has a need for groupware. This is partly technology led, with students needing experience with a technology that is becoming common in the commercial and industrial world. Individual universities must also continue to improve their services if they are to compete with the many other universities and courses now available. One way of doing this is to run cross university courses and projects, thereby taking advantage of the diverse expertise of other universities. This will also give students valuable experience of the different teaching methods employed at other universities.

The long term direction of higher education outlined in the 'Dearing Report' [ref. 4], will lead to more students living at home and studying at their local university. Groupware could be used to provide courses or valuable experience not available to some students at their local university. There has also been a lot of discussion about the 'Virtual University' and distance learning. With groupware, it should be possible to make degree courses available online to non-resident students. There are currently correspondence courses that rely on traditional mail delivery for course information, but groupware should allow access to all course information online. This will be of particular benefit to students from remote locations who cannot afford to attend a degree course that could be very valuable to them and their community. For example, The Open University [ref. 9] has already embraced the Internet with 35,000 students online and more than 100 of its courses use Information Technology to enhance learning. Also, The INTERNATIONAL UNIVERSITY™ - The University of the Web™ [ref. 14], has become the first academic establishment to offer degree courses over the World Wide Web.

The adoption of these technologies has usually lead to the restructuring of business organisations. It also relies on people working together and being open to change. These qualities have not always been evident in the traditional universities.

1.3: Aims of this paper

This paper looks at what universities can achieve by using groupware. It uses experiences gained from a JTAP funded tri-university project [section 6] to identify possible success criteria for universities using groupware.

In order to look at the steps universities may have to take to utilise groupware, we first need to look at how businesses have achieved success with groupware.

2. Groupware Success Criteria for business

Achieving success with groupware, as with any other technology, depends on there being a real economic benefit to be accrued. It is also dependent on the willingness of people to change the way they work. In addition, there has to be a corporate and political will to change [Coleman, ref. 1].

In his latest book [Coleman, ref. 1] suggests a formula for groupware success:

Groupware success = technology + culture + economics + politics

A particular problem with groupware is that the whole team has to use it or else it becomes ineffective. Thus significant investment in technology and training may be needed. The economic justification for this investment will need to be clear, and in turn, there must be corporate desire for change.

The politics of change relate not only to the willingness of people to use the technology but also to the changes in power and influence that might ensue. Groupware may present a threat to a person by making previously 'private' information available to others. Further problems of a political nature may arise (eg. affecting the career and promotion prospects of an individual). Groupware may have the effect of blurring the individual contribution to a project by increasing the focus on joint documents, joint designs and so on. It may be more difficult to assess or measure the individual contribution. It will always be true that an individual will have different and separate goals from the rest of the group.

Next we look at a case study of university run collaborative projects, using groupware technology.

3. Collaborative University Projects

UMIST, Durham, and Keele universities have been working jointly on a JTAP funded project looking at distributed computer-supported group working.

In the first year of the project, single session on-line conferencing tasks were run for groups of 3 students - one from each university [Brereton et al., ref. 6] . In the second year the project progressed to looking at longer term group working. Each university offered 3 projects to third year Computation / Computer Science students. The

projects were each run with two groups of 3 collaborating students, one from each university, giving 18 students in total [ref. 11, 12, 13].

University regulations do not currently permit students to do projects with a project supervisor from another university. The projects were therefore set-up so that the students did a main project in CSCW at their university - focusing on what particularly interested them. They also took part in a collaborative sub-project with set requirements and deliverables. This was done as a way of properly evaluating CSCW and groupware technology. All the universities run their projects differently and use different time lines, but a 7 week window was found when the students could do the collaborative sub-projects.

Due to the way the projects had to be run, a large number of technical and academic staff were required to support the projects and the student collaboration. Each student at his or her university had a project supervisor (there were at least 2 at each site), a technical support officer (1 at each site), and a sub-project supervisor (who may or may not have been on site, depending on which university was in charge of running the sub-project).

There were 3 project officers employed by the JTAP project who were able to do the jobs of the sub-project supervisor and the technical support officer. Without the project officers it would not have been possible to run and administer these projects and give the students the support they needed. The JTAP project is only for 2 years and finishes soon. We are currently examining whether or not it will be possible to continue giving students this experience when the 3 project officers are no longer available. Passing the technical support given to the students - and to the conferencing lab that was setup by this project, onto the universities current support staff will not be a simple task.

Next we to see how Coleman's criterion fits into the university system based on the experiences of the JTAP project.

4. Groupware Success Criteria for universities

Coleman's success criterion (Groupware success = technology + culture + economics + politics) provides a useful starting point. However, a number of additional factors should be considered which relate directly to the teaching and learning objectives of the university, and the administrative and technical support needed to meet these objectives. Some of the points drawn from the case study include not only the student feedback, but also the lecturer experience and the experiences of the technical support staff. The technical support staff played a vital role in setting up and supporting the groupware technology, and in developing the social protocols for group working.

Technology

Groupware is not an 'off-the-shelf' technology, and therefore must be configured to meet the specific needs of the group. Also there must be equal availability of groupware among group members, both staff and students.

Culture

The lecturer needs to be educated to accept a different relationship with students. This relationship is more of an equal participant in learning. Also a groupware facilitator is

needed to work with the lecturer and the student, to devise and review the social protocols for using the groupware.

Economics

There must be infrastructure investment. All students must have access to similar computer systems. The worst system will always limit the whole groups performance. As with any technology, the necessary financial support from the department needs to be justified.

Politics

Students need to be motivated to use the technology, for example by making its use part of the assessed coursework. Also to be accepted, staff members from the highest level must be involved and actually use the new systems.

Learning

Universities must have a clear idea of what it is they are trying to achieve by using groupware. Possible uses include as an aid to learning and for improving groupworking skills.

Training

Groups need to learn how to collaborate using the specific technology. Existing person to person collaboration skills do not necessarily transfer. There needs to be a period of 'confidence building' in using the technology before any serious (assessed) task is undertaken. In order to achieve this, students and lecturers need training in the effective use of the technology.

Assessment

Groupware has the effect of blurring the individual contributions, and consequently it will be more difficult to assess a project member's work. Project assessors will need to have access to records of student usage of the groupware tools. Many groupware products record all information related to a user's 'online' actions.

Support

A 'technical' groupware facilitator is needed who can set up the groupware environment, organise and manage its use, and monitor student usage. Also students and lecturers will also need ongoing support.

Thus success criteria in a university setting suggests an extension to Coleman's formula:

$$\text{Groupware success} = \text{technology} + \text{culture} + \text{economics} + \text{politics} + \text{learning} + \text{training} + \text{assessment} + \text{support}$$

The next section concludes the main points of the criterion and speculates on the future direction of groupware in the university community.

5. Conclusions

In conclusion, this paper indicates that the success of groupware in a university setting depends upon a number of key factors:

1. It must be clear what you are trying to achieve by using groupware.

There are four different ways that universities can use groupware:

1. To give practical experience in groupware
2. To teach groupware principles and theory
3. To improve project groupworking
4. To support courses for non-resident students (eg. from another university)

2. Students and lecturers need training in the effective use of the technology.

In order to use the full functionality of the technology all users must have training. Just installing it onto staff and lab PCs is not sufficient.

3. Lecturers must be willing to accept a different, equal relationship with students.

Groupware gives the students greater and easier access to lecturers (eg. providing email addresses), and can also give all members of the group an equal status within the groupware environment.

4. Students need to be motivated to use the technology

If the primary aim is to give students experience at using groupware, the students must have a real need to do something, and not just be given the opportunity to experience the communication. This could be achieved by making its use part of assessed coursework, or by giving them specific tasks to achieve while communicating.

5. Groupware technology of the same quality must be equally available to all group members.

In order for groups to work well all members must have access to the same level of groupware. Certain users with inferior PCs or network connections will not be able to participate as fully as other members. The whole group will then start working at the level of the lowest user's access (ie. like a motorway bottleneck).

6. Groups need to learn how to collaborate using the specific technology.

As well as training in the technology, users need to learn how to collaborate in a new distributed way. Existing person to person collaboration skills do not necessarily transfer.

7. Social protocols for group behaviour and groupware usage will need to be developed.

As a result of learning how to collaborate and use the technology, social protocols will need to be drawn up. These are probably different for each group and cannot just be adopted from a standard.

8. A technical groupware facilitator is needed who can set up the groupware environment, organise and manage its use and monitor student usage.

Someone needs to take on the task of introducing and maintaining the groupware. This may not be possible within any existing support framework.

It may be that any university which wants to run these types of collaborative tasks will need to appoint a groupware support staff officer, and probably a groupware educational staff member as well. A large part of their roles will be communicating

with any collaborating university or industrial partner to make sure there is a standardisation of collaborative environments (network, hardware, software, lab orientation, etc.). If this is not done and universities do not take part in some standardisation during the initial stages, then running cross-university projects will not be possible later. This is surely the long-term aim. While groupworking with people from the same university can be very useful, it will not take advantage of the opportunity to share the differing ways of teaching, learning and working that all universities have developed.

If individual universities take these issues into account, they may be able to give students experience in the important and growing area of groupware. This will be the first step towards offering distance learning for non-resident students through groupware. Only after universities have successfully managed projects in their own environment, can they expect to be able to branch out and manage project members at varied locations. This will be especially true when the remote project members have a varied level of technological experience, and also differing availability of hardware and network access.

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