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Teaching e-Business Within Collaborative Contexts

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Abstract

The paper describes the development of subjects on electronic commerce within a business major in electronic commerce. The paper describes the impact of technology on business processes and provides a framework for teaching how to use technology to improve business processes. The material is taught in parallel with practical work where business students analyze, design and setup a system prototype while becoming familiar with technologies used in electronic business.

Keywords

Electronic commerce, collaborative systems, groupware

INTRODUCTION

Two views of electronic commerce are emerging. One is electronic commerce and a commonly held view as a “new” economy. The other view is electronic commerce as providing new technologies to improve existing business models with the real impact being on the way business is carried out. In recent times the latter approach tends to be gaining ground. The business models espoused by the dot.com companies of the “new” economy are beginning to be proven as unsustainable. Instead business models based on sound financial management, maintaining cash flows, and generating profits have proven to hold in spite of many new economy claims. Consequently there is now more emphasis on greater support for using technology to continually improve business processes again placing emphasis on sound system analysis and planning in the introduction of such technologies.

Questions can then be raised as to whether the way to consider electronic commerce is as a redefinition of business processes in the context of the new technologies. Such redefinition has been happening over many years. Introduction of transaction based systems to replace batch systems was the first example of such reengineering. Database integration and use of personal workstations was another. The difference now, however, is that now new processes are being addressed, those primarily concerned with what are known front end processes of dealing with enterprise customers and partners. Hence the considerable importance being placed on integrating legacy systems with front office systems. A further difference is changes in work practices when compared to the automation of tasks in earlier transitions.

The questions that are then to be addressed are how this new environment is to be presented in courses. Questions such as are new analysis methods needed, what new technologies are to be taught, and are there differences in some of the fundamental concepts that are presented to students.

This paper addresses these issues and describes a number of subjects that have evolved over time and which address these issues.

THE ENVIRONMENT

Figure 1 illustrates the processes that now are the accepted terminology in electronic commerce. Thus rather than talking about traditional systems, such as accounting, human resources, we introduce a new layer of “front-office” systems. Instead it is now common to talk about customer relationship management, portal technologies, e-procurement and supply chains among others. These processes differ from the traditional systems in that they include teamwork, collaboration, distribution and knowledge sharing as an integral part of the process.

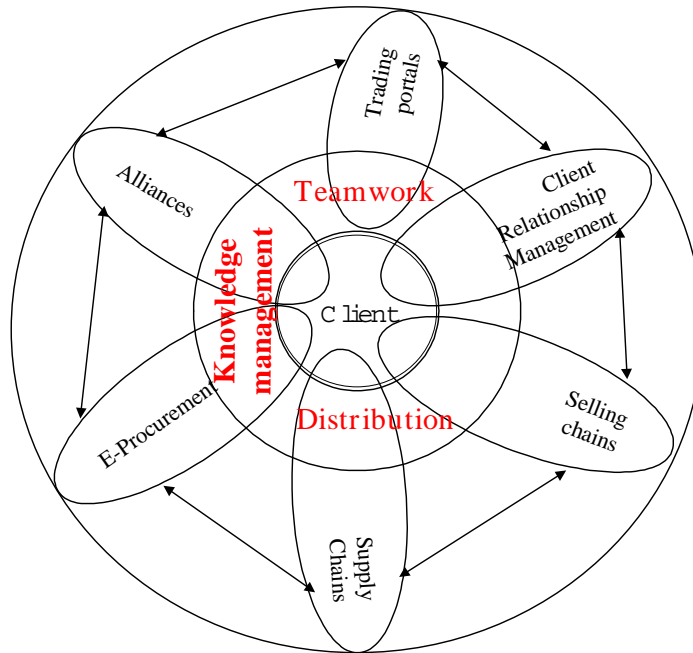


Figure 1 – e-Business Processes

Thus there is the central ring of knowledge, teamwork and distribution. In a sense without these there would be no difference from running totally independent systems.

Networking the Enterprise

The distribution and personalization introduces another dimension to Figure 1. This is how to network in a productive and process focused way. What is suggested here are workspaces that can be networked across the enterprise. A general view of workspace structures within a business framework for a knowledge-based enterprise is shown in Figure 2. Here there are the the traditional business systems supported using an ERM system. These are presented generally through an enterprise workspace, usually the IntraNet home page. Additional workspaces are then established to support particular areas and projects within the enterprise. People can set up their own private spaces that link to the organizational project spaces. They can also set up joint workspaces for their groups.

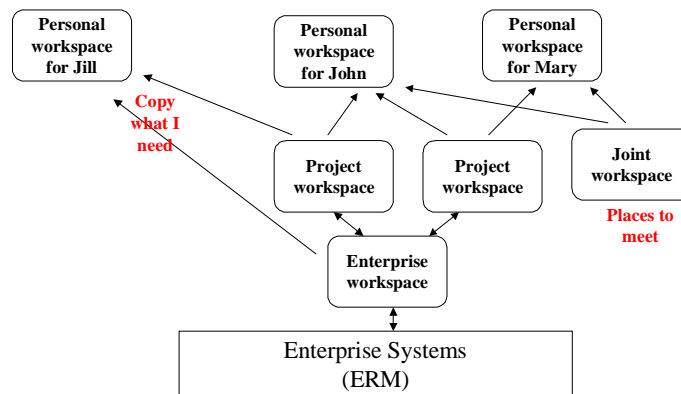


Figure 2 – The Networked Enterprise

The arrows here indicate the source of information in each workspace. Thus for example the personal interface for Jill includes information from Project 1, to which Jill is assigned and general enterprise information. The workspace for John includes information from two projects because John has been assigned to two projects. The networked enterprise applies to other fields. For example in education the project workspaces would be subjects and the personal interface for each student would only include those subjects currently taken by the student. The joint workspace may be a case study some group of students are involved in.

The design objective then becomes to identify the needed organizational workspace structures for the kind of networked organization shown in Figure 2 – that is to fit into the organizations culture.

SOME FUNDAMENTALS

The approach of emphasizing e-business processes and the networked enterprise has a number of implications especially on the presentation of materials on processes, knowledge management and the design of workspaces.

Processes

A greater range of processes must be supported. The characteristics are:

- Processes are emergent and not predefined. They are opportunistic in nature [Dourish, 1998], result in islands of disconnected work activities, which nevertheless must be coordinated towards some common goal. Furthermore, activities evolve dynamically and sometimes rapidly as new situations arise. Evolution can include changes in participants, goals, and methods of collaboration as people begin to understand the collaborative tools and learn how to collaborate electronically.
- Any process evolution must be user driven and any collaborative tools should allow the users themselves to initiate such change and modify their processes. Thus it should be possible at any time for an activity participant to initiate some new actions and define events and milestones which may need follow-up actions. It should also be possible for each participant to personalize their place of work.
- The tools provided to workspace participants center on knowledge sharing combined with actions that facilitate interpretation and evaluation [Nonaka, 1994]

This paper proposes that one way to describe activities requires a paradigm that naturally expresses changing relationships within a dynamic environment composed of a large number of interrelated activities.

Knowledge Management

In this sense knowledge management includes ways of capturing tacit knowledge and its integration into processes. Collaboration plays a major role here although it is now realized that a more strategic approach to knowledge management is needed. Differences are now being identified in codified and personalized approaches to knowledge strategy and ways of integrating them into processes and culture.

Workspaces and Personalization

Knowledge management requires ways in which people can coordinate their activities, share their knowledge and create new knowledge. Each activity is defined as a set of roles, which are responsible for taking actions within the activity and can view or change documents. The activities are all going on at the same time and ways to coordinate and maintain continuous awareness between them are needed. In addition information is shared between the activities and messages can be passed between them.

The new technologies

The goal of the course is to introduce technology as fundamentally based on architectures rather than programming. Rather than simply looking at identifying processes and building systems, the goal is to adopt the approach shown in Figure 3, where one looks at defining business services with published interfaces and combine them into applications (Fingar, 2000). The published services may be composed of more fundamental components.

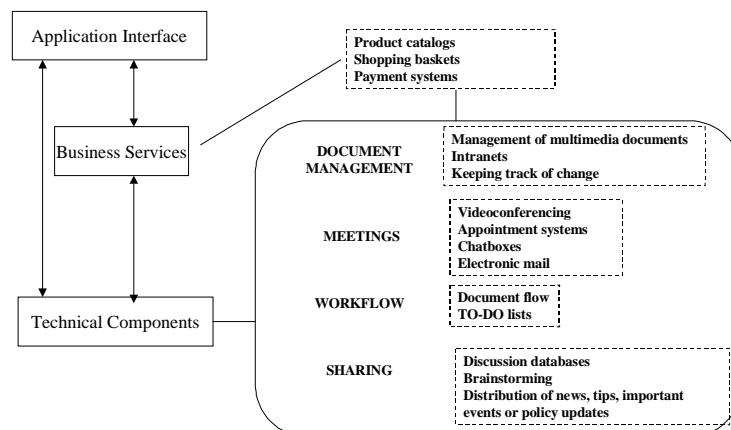


Figure 3 - Components and Services

The architecture of the systems themselves then follows the approach shown in Figure 4 where components may be chosen from a vendor or middleware framework and integrated with legacy systems to form an application. Associated with this are design processes that emphasize selection of services and components needed to meet business objectives.

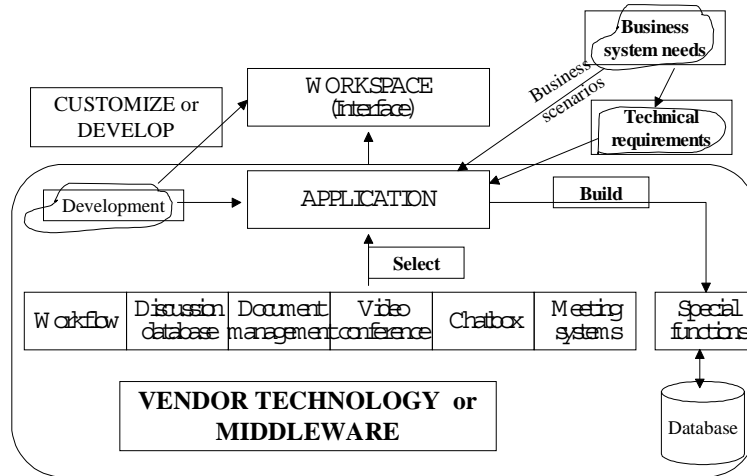


Figure 4 – Technology within the environment

Our goal is to cover material within the context of the emerging environment while giving students experience in analyzing, designing and providing experience in setting up systems

THE SUBJECT STRUCTURE

The subject described here has the goal of introducing students to the basic concepts described previously while giving them the opportunity to develop a basic system using groupware to illustrate the concepts. The central theme focuses on the way to define businesses process and conduct business electronically, and the way communities can be created and managed (Furst, 1999). It is made up of three parts, namely:

- Basic processes and technology, including Internet technologies, business modeling and a basic concepts of knowledge sharing,
- Design processes that develop requirements and design models, and
- Implementation of a prototype using collaborative technologies.

Over time we learned that the best way to do this is to introduce the material in a gradual way where technology is introduced in ways that illustrate how communities evolve. This is illustrated in Figure 5.

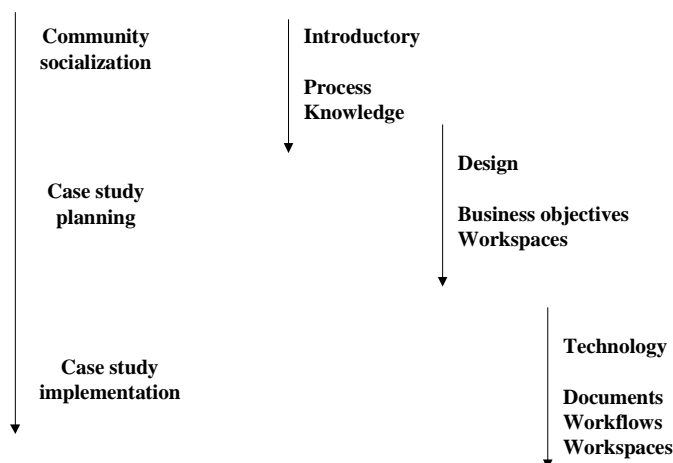


Figure 5 – The evolution of ideas

Here technology is introduced in parallel we run a practical stream in setting up networked workspace structures. We use a product known as LiveNet, which was developed as part of the research work at our Collaboration Systems Laboratory and supported by the DSTC CRC, is used in the subject. Introduction of groupware practical work proceeds through stages described by Salmon (2000), where:

- Students become familiar with the technology in using it for socialization within the subject context. This is done through the provision of overheads, feedback and general administrative material,
- Extending to information exchange through the formation of a group workspace and sharing their case documents within this space. Here students set up their own space to manage case documents in their group case study.
- Go on to develop a simple groupware application, following the steps shown in Figure 6 and implementing part of the system using the ideas of workspaces and personalization. The process followed in Figure 5 is used to define business activities, which are then implemented as workspaces.

Community Interface

This is where students get information about the subject and the ability to use workspace to socialize using community forums. The interface is illustrated in Figure 7. It provides access to general materials, sets general goals and provides the ability to interact in discussions.

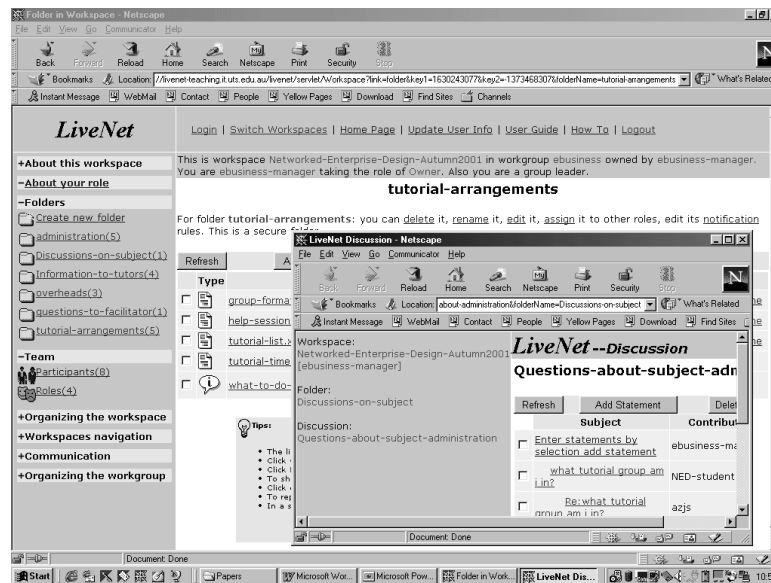


Figure 7 – Interface for subject material

Task based project interface

The next step is to develop personalized group workspaces for case work. The students first setup a workspace to manage their case study. They use this to store their project documents and hold asynchronous discussions. Here students carry out some analysis to specify the business model and then use LiveNet to set up simple collaborative application. The goal here is familiarise students with the semantics of collaboration within a project group by providing a space where they can share materials. They are given a case study and are required to develop a requirements and design model. The models are placed in the workspace and students can share comments on the models and change them as needed.

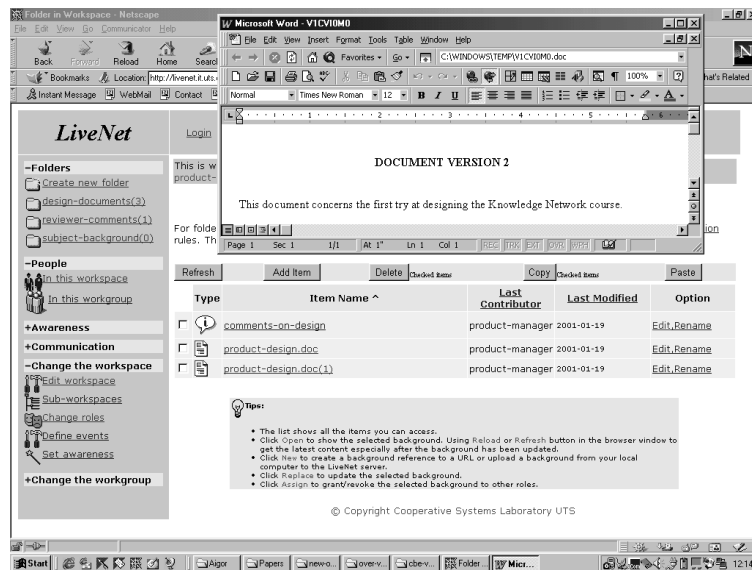


Figure 8 – Task based Interface

Setting up a system

Finally the students set up a prototype using the LiveNet system to implement their design model. Generally, these were successful in the sense that students understood the basic semantics of collaboration and were able to set up prototypes. The support has the further outcome that what students do becomes more visible as the process of forming groups, maintaining group document repositories is supported by the computer system. The social effect of this is to require students to pace their work according to the process rather, as is often the case, leaving it to the last minute.

SOME EXPERIENCES

Our work with workspaces so far has involved an average of 1000 students per semester. In summary students participated especially in seeking clarification of case studies and solutions. One issue that has proven important in the early phase of groupware introduction was the amount of information to be included in the workspace. Initially a separate workspace was set up for each specific subject activity – that is a main workspace for lectures, another for case studies and a third for tutorials. The main workspace supports the community as a whole. The tutorial workspace contains tutorial material, including the gradual release of tutorial answers as well as discussions that seek explanation of any answers. We found this to be sometimes confusing to students, who had to navigate through the spaces to participate in a particular process step. The navigation itself became a problem and in our next version we combined most activities in the one space shown in Figure 7. In concept we thus have a community space and a team space, which tends to be better accepted. In fact we have found an ordered introduction of technology acceptable.

Complexity of workspaces

One lesson emerging from the work is the complexity of workspaces. In earlier version we separated tutorials, lectures and case study into separate workspaces. These drew some objection because of the need for excessive navigation and keeping track of discussions. The more consolidated workspace shown in Figure 7 has proven as the better approach with “virtual” folders used to consolidate references to different subject aspects. We have also found that in case design two alternatives arise. One is folders designated to function, and the other is folders aimed at roles to provide a level of personalization.

SUMMARY

The paper outlined a relationship between learning environments and knowledge sharing and described ways to set up collaborative workspaces that support different knowledge sharing strategies. The paper then described a way to set up different learning environments and some experiences from using them in practice.

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