

Computer Supported Cooperative Work in newspaper organizations

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Abstract: - With the recent advances in communications technologies and decentralization of work practices, there has been an increase in distributed, remote, computerized work environments. With the change from a physical to a virtual environment, opportunities for collaboration often go unnoticed. New dimensions of cooperative publishing can be exploited in the case of newspaper production. This paper investigates the integration of information technology in newspaper organizations. The study defines the level of integration that can be found and speculates on the opportunities that arise from the use of the information technology.

Key-Words: - computer supported cooperative work, newspaper organizations, distributed publishing systems

1 Introduction

With recent advances in communications technologies and the widespread adoption of computers by organizations and individuals, new work practices have emerged. It has become more common to encounter individuals working at their computers and remotely collaborating with others. A tendency towards the decentralization of work has also gained strength, as teams come together temporarily to work on projects. As more organizations adopt cooperative work tools, individuals are led to the establishment of remote collaborations and working together in virtual environments [1].

Computer-based systems are frequently used to support the work of individuals. People use computers to help them with whatever task they are doing. Often this is an individual task—that people are doing on their own, e.g. using a word processor to produce a document. However, there is often a broader task and context for this work and in this context they may be collaborating with other people to complete a project or series of activities. Alternatively, if a group of people are developing a newspaper article, the generation of ideas and the development of the article may involve exchanges of ideas and drafts between various members of the group [1]. Computer Supported Cooperative Work, or CSCW for short, is a multidisciplinary research area that focuses on effective methods for sharing information and coordinating activities. CSCW systems are often categorized according to the time/location matrix [2].

High speed wide area networks such as the Internet encourage the transfer of large volumes of data between potentially distant hosts. Novel

collaborative technologies now allow geographically dispersed groups of co-workers to interactively conduct a range of work-related activities. [3]

The published newspaper is the net of the integrated accumulative work of a group of people. The traditional publishing systems used by the majority of the newspapers organizations limit the ability to enter the new era of conducting business. Successful organizations continually renew their basic architectures and platforms to take advantage of new technologies [4-5]. One important objective of the newspaper organization is to improve the publishing process using the technology as a key enabler [6].

As a consequence of the global nature of the phenomenon, actual views and perspectives at many, widely distributed locations, would have to be composed into an in-depth article as a group effort for which even the focus (or main thrust) would grow out of cooperative work. Instead of traditional correspondent reports groups of experts/correspondents at different locations would have to cooperate to create in-depth articles. Except for conferencing software capabilities so far unknown the different and distributed competence of the correspondents creates partial and overlapping responsibilities which have to be respected during the cooperative process of creating a competent article based on the partially competent contributions. Also some major newspapers are published in various geographical locations around the world. In order to achieve that newspaper organizations employ high speed internet connections supported by extensive information infrastructure.

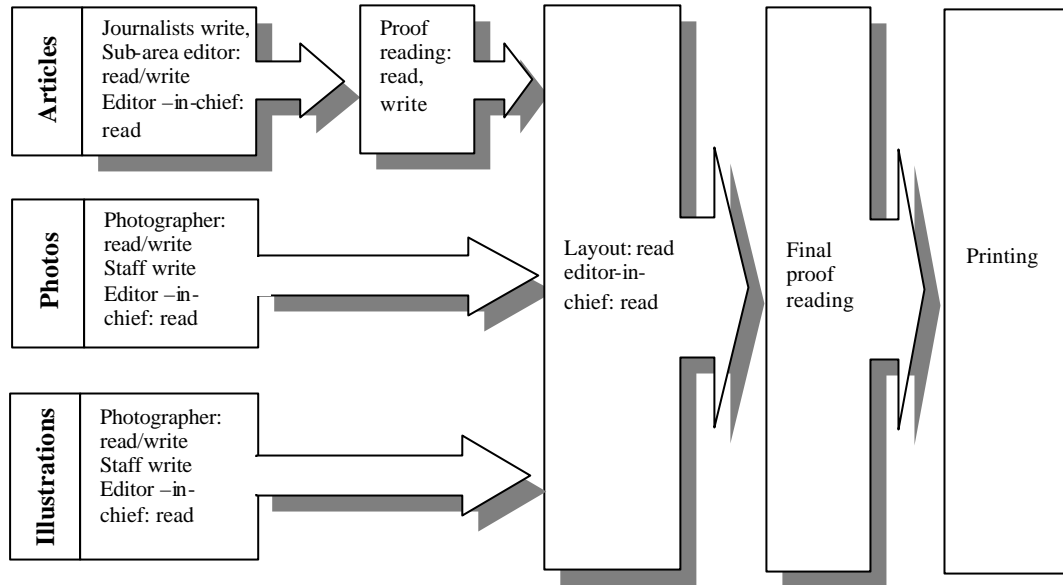


Fig.1: Work-flow in a newspaper.

The use of the internet for the presentation of information in multimedia format is an extremely interesting topic, especially for content providers, such as newspaper organizations. Newspaper organizations gain a lot using the Internet infrastructure, by providing easier, cheaper and faster their products to the customer. World Wide, newspaper organizations, have already created electronic versions of their newspaper using the Internet technology [7].

This paper investigates the integration of information technology in newspaper organizations. The level of integration may vary. The study defines the levels of integrations that can be found in the newspaper organizations, and speculates on the opportunities that arise from the use of the information technology. The rest of the paper is organized as follows: In section 2 the overview of a newspaper organization is presented. The levels of CSCW that can be found in newspaper organizations are described in Section 3. Concluding remarks and future extension of this work can be found in Section 4.

2 Overview of a newspaper organization

The traditional editorial procedure, with its various activities, is indicated in the time scheme given in fig. 1, where the access rights of a user or a group at a certain point of time are shown. Staff members and other groups of personnel (for printing, proof reading etc.) are active at different times, with varying access rights [8]. Their activities overlap

partially. If a staff writer creates a new document in a text editing system, for an article or a section thereof, photographs or graphical illustrations could be easily inserted. The staff writer would be enabled to build his text around them. The editor-in-chief has access to all documents for putting the newspaper edition together. The writing/editing of documents has then to be finalized by the editorial deadline. Before printing they have to be proofread or corrected. Every staff writer would release a document he is responsible for, to proofreaders as soon as he has finished it, in order to help speeding up the production process.

In the traditional systems, all the transactions of data among the involved people are done using hard copies. In other words, the data is delivered manually by hand from one person to the other. In a large newspaper organization, people might be working in different places, floors or even in different buildings. This means, following the traditional model of hard copies for large organizations will be inefficient and will result in waste of time and resources.

3 Levels of CSCW

The levels of CSCW in newspaper organizations may be categorized as follows:

3.1 First level of CSCW

The first level of CSCW involves only the last stages of the publishing process, which is the printing of the newspaper. The information system used by the newspaper supports in several ways the

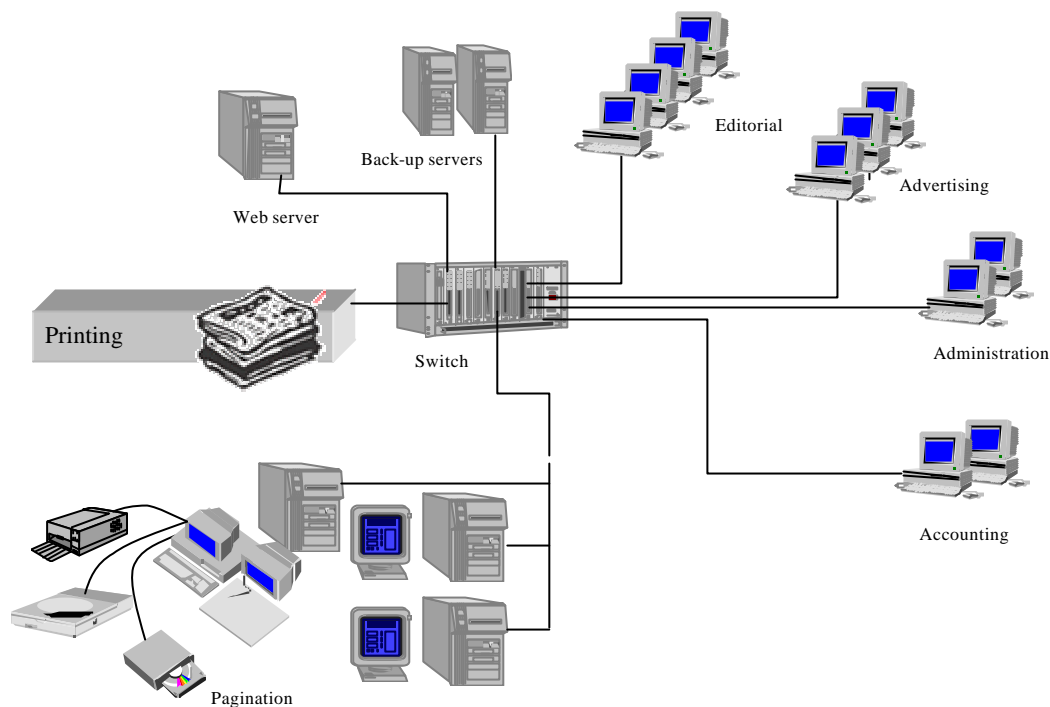


Fig.2: An information retrieval system that supports all stages of the publishing process.

publishing process such as to automate some procedures, provide better communication between the editors, increase the quality and shorten the production time. Actually, this system provides only editing and storing capabilities for the articles as well as basic workflow management. This usually involves several stand alone computers or small local area networks in various departments of the newspaper organization. The newspaper's reporters use also that system to retrieve information concerning the articles of the newspaper [9]. The majority of the newspapers fall into this category.

The main information source inside the organization is the newspaper's archive containing both newspapers clippings and photographs in hard copies. In this case, the information retrieval process is a strictly manual procedure which involves both the reporters and the filing clerks of the archive department. This retrieval process, which is vital for the newspaper organization, has a variety of problems. The information retrieval is a time-consuming procedure because information like photographs or other printed materials have to be manually retrieved. That means that a considerable number of employees is required for accessing and retrieving the information needed for the publishing process. We must also mention that printed material requires more storage space and is not long-lived.

3.2 Second level of CSCW

The problems described above, raise difficulties in the publishing process and make it almost impossible to provide advanced services such as a newspaper online. The second level of CSCW involves the introduction of an information retrieval system, which will effectively support the publishing process. This system will also provide the appropriate information technology infrastructure for a newspaper online service. Dynamic exportation of information, customization of the newspapers' content according to the users' preferences and interaction services, are key issues of a newspaper online service, which prerequisites a well structured information technology architecture.

Such a system will have to focus on the storing and retrieval processes of the newspaper organization, in order to overcome the difficulties presented in the previous section. An important feature of the system is to store all information in digital format. All parts of the newspaper organization are interconnected via the company's intranet (see fig. 2). The system must incorporate all the information in such a way that each user can easily access the information from a central repository. The central repository structure must include all the different kinds of information (text or image, video). An important requirement of the system is to automatically provide the newspaper online service. The web publishing process should

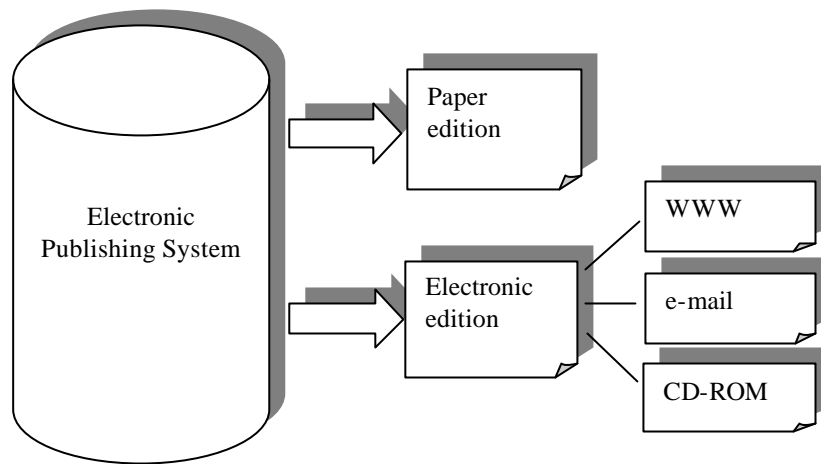


Fig. 3: Forms of publication in the second level of CSCW.

dynamically export the newspaper information from the central repository to the Internet.

The electronic version of the newspaper may include various forms (Fig. 3). The most usual is the online newspaper (WWW) but we must also mention the possibility of sending the newspaper via e-mail in HTML or PDF format or distributing it in CD-ROM format.

The online newspaper is an innovative service that supports many unique characteristics. Internet users are provided with the ability to search current and past issues. Also they can download articles and photographs for further study. Customization is another feature that allows the user to personalize the content of the online newspaper. The user is able to indicate his preferences about the content of the articles he is interested in, when accessing the online edition [10]. All the above indicate that the support of an online newspaper requires a well established information technology infrastructure.

3.3 Third level of CSCW

In the third level of CSCW a newspaper organization may be distributed in different geographical locations around the world (Fig. 4). Under the very tight time constraints of a daily newspaper production this is inconceivable without the support of efficient distributed operating system services. Usually the computer platforms used would be heterogeneous. The needed distributed operating system services should be realized on top of these native systems. Thus every user in any geographical locations should be able to run the same applications. The platforms should be interconnected through the intranet of the newspaper organization. For the writing process of an article we are faced with the following problems. Each article should be structured into sections. Among the

journalists groups or correspondents groups distributed around the world one group would e.g. take responsibility for contributions to a section each while everybody else involved in this section would write text that would be included in an appropriate form. Throughout this activity everybody should have to be aware of the current status of the section. In addition he should have to learn about the current versions of the other sections as they are shaped, in order to take updates and structural developments into account, potentially resulting in corrections to previous contributions of their own. Also we must have in mind that responsibilities for a section, or a whole article, may change over time [8].

Various projects or commercial solutions are available for this kind of distributed newspaper organization.

Print-it

The Print-it [11] project was funded by European Union and its overall objective was to bring the printing and publishing industries in-line with currently available and emerging information and communications technologies. The specific objectives were to: build a Distributed Printing network integrating ISDN, Satellite and ATM transport with specific developments for network management facilities; develop missing tools and modules required to create a Distributed Publishing Service; run two pilots to demonstrate the viability and benefits of Distributed Publishing to potential users such as Content Creators, Service Providers, and End-Users; conduct a techno-economic survey defining and promoting the development and acceptance of this new service; deliver recommendations and guidelines for Distributed Publishing service development scenarios.

Dragon Slayer III

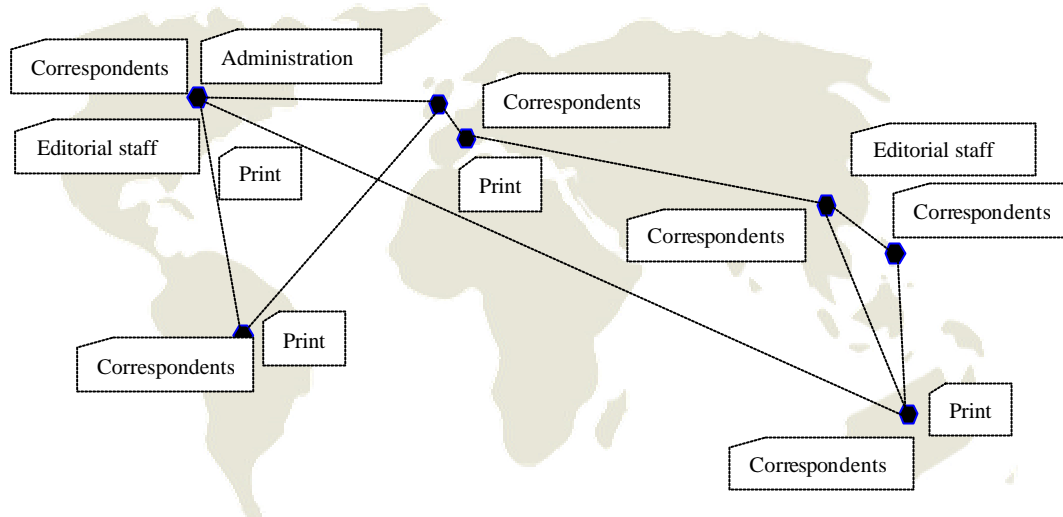


Fig. 4: A widely distributed newspaper organization.

Dragon Slayer is a decentralized system, where control of resources is not dedicated to a single central instance [12]. The Dragon Slayer environment consists of a set of computers, which are connected to each other via networks. The Dragon Slayer system presents a uniform view of the system to the users independent of their location. In the distributed operating system Dragon Slayer III they have developed the services indispensable for such innovative CSCW applications in such a way that even conventional application systems essentially need not to be modified for operating in the context of distributed group work [8]. Assuming the novel feature of really up-to-date newspaper articles cooperatively created by distributed correspondents with varying expertise under very tight time constraints, operating system services have to be provided that guarantee transparent, effective and reliable access to replicated files that are created and/or owned by groups of experts. Typically such experts would be responsible for updating a certain part of a file corresponding to a section of the article only while reading information from, or even giving suggestions for writing into, the remainder of the file. Thus an efficient distributed management of partitioned files, with replicated parts or fragments would be required, a reliable broadcast communication supporting the complex traffic in the distributed transaction processing discussed in the following sections. A key issue under these application circumstances are novel concepts and practices in distributed security.

NIS

Diwan NIS (Network Information System) is a fully integrated solution for any large organization to

manage their documents and the people that work on them [13]. NIS is a new editorial and information management system for busy publishing environments or for any application where groups of people work together on shared documents. NIS not only manages the documents but also the people working with them providing security, a hierarchy of access and messaging between users.

The chart in Fig. 5 summarizes the three levels of CSCW against the geographical location of the organization and the form of the information it delivers.

4 Conclusion and future work

Information technology had a major impact on the way a newspaper organization operates as well as the form of the product it produces. The newspaper is the basic product resulting from the publishing process. The introduction of information technology in the publishing process offers the opportunity to exploit CSCW in the newspaper organizations. We have defined and discussed three levels of CSCW in a newspaper organization. The first level involves several stand alone computers or small local area networks in various departments of the newspaper organization. The second level supports the introduction of a central information retrieval system, which will effectively support the publishing process. All data are processed in digital form. The third level involves the distribution of several parts of a newspaper organization in different geographical locations around the world. The second and third levels of CSCW fully support

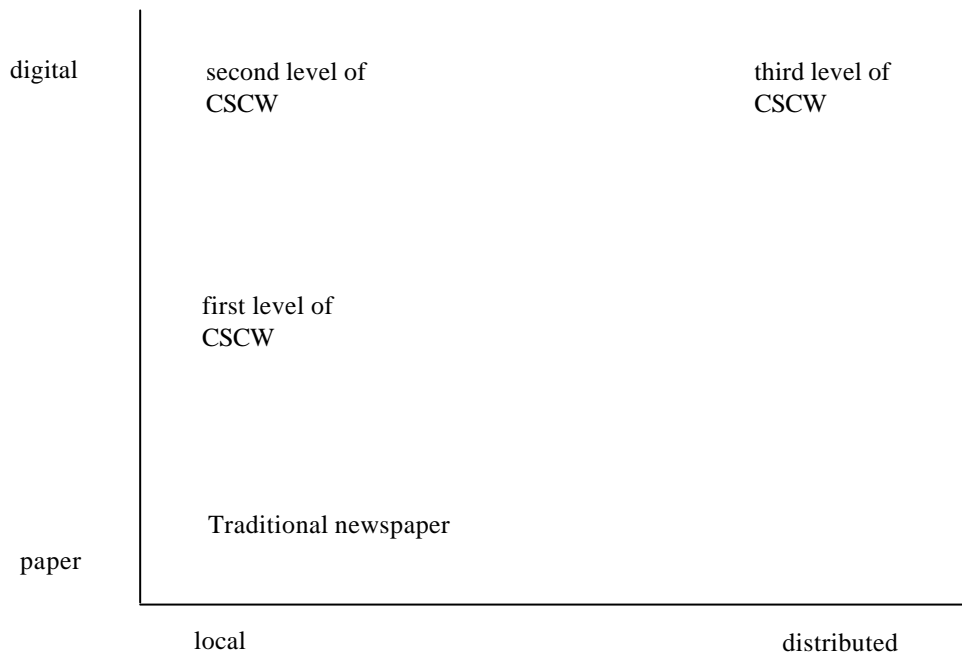


Fig.5: The three levels of CSCW against the geographical location of the organization and the form of the information.

the production of an electronic edition of the newspaper.

A future extension of this work will include a detailed discussion of various aspects of a distributed publishing system that supports a newspaper organization.

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