

**European Conference
on
Educational Research**

BOOK OF SUMMARIES

Volume 2

**University of Twente
The Netherlands
June 22 - 25, 1992**

COLOFON

Editors:

Tjeerd Plomp
Jules Pieters
Andries Feteris

Editorial assistance:

Harmen Abma
Jeroen Breman
Conny de Koning
Olivia Kramers
Renate Schraa

Cover:

Hanna Schnijder

Print:

Duoprint

University of Twente
Department of Education
P.O. Box 217
7500 AE Enschede

ISBN 90-365-0535-6

Copyright © 1992 by Department of Education, University of Twente

STRUCTURED ELECTRONIC COMMUNICATION IN COMPUTER-MANAGED INSTRUCTION

*Paul van Schaik, University of Twente, Enschede, The
Netherlands*

Abstract

One of the problems of Computer Supported Cooperative Work is the management of communication between computer users. Conversation structures in combination with communication tools for using these structures have been proposed as a solution to this problem. A disadvantage of these conversation structures is that they are fixed and consequently cannot be adapted to users' needs. As a remedy we propose adaptable conversation structures and adaptation tools for these structures. We describe the design and of a system for this purpose. The application of structured electronic communication that we consider is computer-managed instruction.

Introduction to the problem

In recent years there has been an increased interest in the possibilities that computers offer to support people who use computers in cooperative work. The software that supports this work is called groupware. Computer-supported cooperative work (CSCW) is (a) work that is supported by groupware and (b) the scientific discipline that studies the development and use of groupware. One of the problems of Computer Supported Cooperative Work (CSCW) is the management of communication between computer users. Conversation structures and communication tools for these structures have been proposed as a solution to this problem. Conversation structures formally define informal patterns of communication that people use in their work. A conversation structure for a particular class of communicative activity--for example communication between teacher and learner(s) in completing an assignment--includes a specification of roles, actions and their ordering, the sorts of messages to be composed and exchanged, and the organisation of the messages received. An example of a communication structure is the so-called 'conversation for action', in which one party makes a request to another, as described by Winograd (1988). The overall structure of this conversation is presented in the Appendix. For each point in a communication structure, the communication structure specifies a small set of possible action types, determined by the previous history of the communication. A communication structure manager programme, such as the Coordinator (Winograd, op. cit.), makes it possible to keep track of requests and commitments

made. In order to be useful communication structures must be tailorable to the needs of the group.

A disadvantage of systems that offer conversation structures is that these structures are fixed and cannot be adapted to users' needs.

A solution

As a remedy we propose adaptable conversation structures and adaptation tools. Conversation structures are adaptable when their constituting elements--such as roles, actions and their ordering--can be adapted. Adaptation tools can be used to manage conversation structures, for example adapting them or creating new structures.

Application to Computer-Managed Instruction

The application of electronic communication that we consider is Computer-Managed Instruction (CMI). In certain educational situations, such as in software programming education, a large part of the learner activities is performed using computers. In these situations one type of communication is between the teacher and learners about assignments, such as software programs. For example the course of the communication can be as follows: the teacher commissions an assignment, the learner commits himself to deliver the assignment, the learner delivers the assignment as completed, the teacher accepts or rejects the assignment as completed, etc.

The design of system for electronic communication

We distinguish two types of users of a software system for electronic communication based on the notion of adaptable conversation structures: users who communicate via conversation structures and users (communicating users) who manage conversation structures (managing users). We describe the design of such a system that we developed: task structure, data structure and the user interface.

The task structure consists of two main tasks: *Converse* (for communicating users) and *Manage system* (for managing users). For *Converse* there the following subtasks: Start a conversation, Continue a running conversation, View a directory of conversations, and View a directory of conversation types. For *Manage system* there the following subtasks: Adapt system to users' needs and Manage system access. For *Adapt system to users' needs* there are the following sub-subtasks: Create conversation structure, Adapt conversation structure, Create a variant of an existing conversation structure, Enable conversation structure, and Disable conversation structure.

The data structure consists of three parts. First there are *conversation structures*. Their purpose is to provide a common structure for related conversations. Therefore they represent the possible sequences of linguistic actions--such as "commission an assignment"--in a conversation, or, stated differently, "routes that the conversation can take". As an application for CMI a "Conversation for assignment processing" has especially been developed. The purpose of this structure is to support the process of commissioning, accepting, submitting, and grading assignments. Secondly there are *conversations*. Their purpose is to organise several related messages, for example for assignment processing.

Therefore they contain several messages that have been sent (and received). Each message corresponds with an action in a conversation structure. The structure determines possible next actions at each state in the conversation. Thirdly there are *messages*. By means of them the actual communication takes place. Therefore they consist of, among other things, a the name of the message sender, the message text, the identification of the message to which the message is a reply, and a pointer to the next message in the conversation. The user interface largely reflects the task structure and makes it possible to switch quickly between (sub-sub)tasks. Based on this design we developed a prototype system called "Compversations". Compversations runs on personal computers under the MS-DOS operating system.

Conclusions

We have shown that it is possible to design a system for structured electronic communication for CMI. Based on this design a system called "Compversations" has actually been developed. As an application, a conversation structure for assignment processing was realised with Compversations. Result from an experiment on the usability of the system will be reported elsewhere.