Integrating Two Organizational Systems Through Communication Genres

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Abstract. This paper describes the integration of two different types of support to the coordination of organizational activities. On the one hand, we have network-based Electronic Meeting Systems (EMS) supporting a cooperative coordination effort. On the other hand, we find Personal Digital Assistants (PDA), supporting the individual effort to coordinate. Considering that organizational efficiency and effectiveness requires a high level of fluidity between individual and cooperative coordination efforts, the problem then is how to bring together EMS and PDA. In this paper, we propose a conceptual framework to tackle this problem based on the concept of communication genre and genre system. We also describe a software system we developed to link EMS and PDA. This system was experimented in an organizational environment. The paper concludes with an evaluation of the methodology and proposed solution.

1 Introduction

A critical issue to team performance is lack of coordination. According to some authors, coordination can be classified as impersonal or by feedback [13]. Impersonal coordination is exemplified by the use of plans, schedules, procedures and workflow systems. Coordination by feedback is illustrated by two significant examples: one-to-one communication and group meetings.

PDA are becoming important tools in the support to impersonal coordination within organizations [6], focusing on the support to organizational information such as “to-do” lists and schedules, possibly the most widely used PDA tools.

In the situation discussed in this paper we explore the PDA support to coordination by feedback, focusing on group meetings rather than one-to-one communication. Our main scenario is a meeting room where people meet face-to-face, use any desktop computers available in the room and bring their own PDA as well. This scenario emphasizes the importance of the link between PDA and the EMS installed in the

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room. This scenario emerged from extensive usage of electronic meeting rooms and empirical recognition that EMS lack mechanisms to integrate "team meeting data" with "personal data."

The EMS/PDA link presents an important problem though: the exchanged information must have the right purpose and shape to be understood by the people using both systems. In this paper we propose a conceptual framework to tackle this problem and describe our implementation of a system linking EMS and PDA in the scenario broadly described above. The system was experimented by an organization, thus drawing some preliminary results also presented in this paper.

2 Overview

PDA can play an important role in a meeting environment. In this context, three specific scenarios may be identified: (i) As individual recording tools of meeting topics, decisions, etc. This functionality is supported by tools like MeetingLog (palmedikal.tipchi.com) or MeetingManager (www.thinkingbytes.com); (ii) As communication devices between meeting participants [7]; (iii) As private spaces used in combination with public spaces such as shared whiteboards [12], [5].

All these scenarios are adequate when there is no EMS available in the meeting room. The EMS has been characterized as a combination of tools allowing users to communicate, deliberate and manage common information in a concerted group effort [9]. EMS highlight some important limitations of PDA, like weak user interface, compared to the EMS, limited support to meeting tasks and processes and barriers to group interactions due to limited richness of the medium.

On the other hand, PDA also bring about some important limitations of EMS. EMS must produce information that is adequate to the limitations of the PDA medium. EMS must discriminate useful from useless information in an automatic way, but this is a very difficult task, considering the informal nature and semantic richness of meeting data. EMS must produce information tailored to the particular needs of the eventual recipients, rather than just producing historical data.

One approach to overcome these problems relies on human intervention – the meeting facilitator. The facilitator is able to specify an adequate level of information richness, preserving process and task information as well as contextual cues of the meeting. This approach makes the meeting facilitator a critical resource in EMS. It benefits the meeting process and outcomes but, unfortunately, also causes significant problems to EMS. In fact, it has been suggested that the human facilitator causes EMS to be self-extinguishing [2].

Several researchers proposed an increased sophistication of the automated solutions to overcome these problems. For instance, Report Browsers allow people tailoring their views over meeting results, zooming in or out specific data to display details or have a high-level view of meeting information [8]. This kind of approach also explores the collaborative development of organizational memory [3].

Another possibility to ponder is to make report production an explicit meeting task. One example of this approach is the Expert Session Analyzer[1].

Considering our goals, this last approach seems to us better suited to integrate EMS and PDA, fundamentally because it requires less PDA functionality and avoids facilitators' interventions. Clearly, one possible drawback of the approach is the additional effort requested to meeting participants.

3 Conceptual Approach

Having in mind the considerations done in the last section, we will now delineate a conceptual approach to tailor report production during meetings and integrate them with PDA. The approach is based on the concept of genre.

The concept of genre was imported from the literature and recently generalized to the organizational context ([10], [11] and [9]) and the Internet infrastructure [4]. A genre of organizational communication is an institutionalized communicative action. it also has a particular social purpose and a recognizable form, entailing recognition and action. According to [11], a meeting is a collection of four genres: logistics; agenda; the meeting itself; and the report. To this collection we added the context genre, sometimes necessary to explain actions and decisions taken in meetings.

Associated to genres we find the notion of genre system. Genre systems are the glue linking several genres together and giving insight over the way communities of practice communicate and structure work. This view over work structures is very different from other approaches, e.g. enterprise modeling, which emphasize work procedures and processes. Fundamentally, the former highlights emergent work structures while the later describes formal structures and regulated workflow.

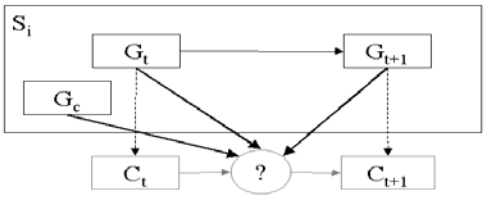

Fig. 1. Proposed approach

The conceptual approach is graphically presented in Figure 1. Our proposal is that the information associated with genre systems (Si) may contribute to create a "translator" between different communication artifacts (Ct and Ct+1) such as the ones managed by EMS and PDA. Each genre system supplies a set of clues explaining the linkage between Ct and Ct+1. Associated to each genre (Cc, Gt and Gt+1) there are specific purposes, forms, places and times where the genres may occur, as well as specific people that participate in the genre system [11].

The translation mechanism can be tailored to the specific organizational context and user needs because there is additional information behind, provided by genres. Of course, this approach has one important implication: it requires a process of genre

elicitation. Such a process can be implemented through ethnographic techniques, analyzing the communication artifacts used by a community of people, identifying genres systems and then building up the corresponding translation tools. Or in can be implemented in a much longer process, where the specific community of people builds up their own set of genres and translators with the support from the EMS.

4 Using the Approach

In this section we describe a practical application of the proposed approach. The target organization was a small financial consulting and accountancy company. Both the types of structure (small, flat) and core business (independent consultancy) of this company stress the role of meetings as primary coordination mechanisms.

The organizational context

The target organization was already accustomed with several technologies to support coordination. Web Chat, Net-Meeting and e-mail are frequently used to support one-to-one coordination. An EMS (GroupSystems, www.ventana.com) was used on an experimental basis to coordinate the group. However, some cultural factors contributed to an unenthusiastic view of this technology. In fact, the employees, especially accountants and consultants considered that the technology imposed too many boundaries to meetings. The target organization also assessed the possibility of using workflow tools. However, the restrictions imposed by this technology to a small and informal structure, leaded the organization to continue with the same situation.

The genre elicitation process

The genre elicitation was done in cooperation with several employees. In order to obtain the data, we participated in several weekly meetings. In general, those meeting were performed every Friday, and the participants were two senior consultants and one accountant. It was observed that this organization used paper and pen to write the conclusions from the meeting. Typically, after the meetings, they wrote the results in "to do" lists and calendars supported by PC and PDA. All employees have PDA, but one of the consultants uses Psion while the others use PalmOS devices.

Among several situations that were discussed with the employees, the following meeting genre systems were identified: process definition meeting (PDM), planning meeting (PM) and briefing (B).

After identifying the above genres, the related genre systems were analyzed in detail, identifying the purpose, expected outcomes, participants, structure, format and media used.

Table 1. The meeting genre system.

	Agenda	**Logistics**	**Meeting**	**Context**	**Report**
PDM	There is no formal	Decision about date	Purpose: Clarify an important organ-	Context information includes:	Process description

	agenda.	and time, in an informal base	isational process. Typical phases: - Generate task list; - Identification of processes	- Task list - Process description	
PM	Has just one item: "Planning activities"	Decision about date and time, in an informal base	Purpose: allocate tasks to each person, and guarantee that a process will be executed	Task list is used as support to the planning process	Outcomes are individual: - List of tasks; - Event in the calendar of each person
B	The "official agenda" has just one item: "Briefing"	Decision about date and time, in an informal base	Typical items: - Analyse what was done and what was not concluded - Discussion - Re-scheduling	Each participant should take notes about what she/he has done or not before the meeting	Individual Outcomes: - List of tasks that each person should do - Event in personal calendar

Artifacts used to support genre systems

Once again, the specification of artifacts that could best suit the needs of the target organization was done cooperatively; through EMS meetings (we used GroupSystems). In order to support genres, the following artifacts were selected:

- The agenda should be supported by a "topic list," both available and synchronized in a web page and a PDA;
- Logistics may be supported by e-mail;
- The meeting genre should be supported by a simple cooperative tool allowing participants to edit topics, comments, tasks and actions;
- Context information should be imported by EMS;
- Meeting reports, consisting of "topic lists," "to-do lists" and calendars, should be available in a web page and downloaded to PDA.

The Prototype

The prototype was developed after analyzing actual communication genres and artifacts. Basically, the prototype consists of a cooperative tool, allowing participants to edit topics, comments, tasks and actions, were implemented with Internet technology and a relational database. The cooperative tool runs on the Xitami (imatix.com) web server. The topic and to-do lists were implemented on the PDA using Tom Dyas' DataBase (pilot-db.sourceforge.net). The to-do list has the following fields: Task, Due Date, Fixed Date, Complete, State, Notes, Responsible. The native Date Book from the Palm Pilot provides support calendaring information.

We also developed the EMS/PDA translation mechanisms for the data types cited above. These translation mechanisms were implemented with Perl script. These mechanisms operate the following way: (i) Identify the translation context, i.e. if the genre system is a process definition, planning or briefing; (ii)Identify the corresponding genre, expected purpose and form; (iii) Apply a parsing rule, according to the genre and context and load parsed data in the appropriate PDA file or web page.

5 Evaluation

In what concerns the prototype evaluation, two dimensions were considered: an evaluation of the conceptual approach, and an evaluation of the solution proposed to the organization participating in the research work. Considering the first dimension, we will comment each one of the previously mentioned topics.

The firs topic, the organizational context of the problem, highlights a traditionally difficult situation in the field of ISD, concerning wicked problems since neither the problems nor solutions are sufficiently known to drive IS analysis and design. The use of the genre concept, related to the meeting situation, was useful to clarify the organization context of the problem.

Obtaining requirements for this type of system is also troubling. Generally these work situations are not well documented. In addition, the perspectives are also very personal and people avoid sharing strategic data. Finally, the participation of an observer (the analyst) in meetings may also be seen with suspicion. The adoption of a cooperative elicitation process was very useful and efficient however.

In what concerns the selection of artifacts and tools to support communication genres, our approach was to ponder with the users the adoption of tools that were already being used in the organizational context. This phase was especially useful to help users know the potentialities and limitations of the available software systems. It was only at this phase that a formal list of requirements started to be clarified.

The last topic concerns the computer support to communication genres. In this stage, small prototypes were developed and integrated. Each one of the features offered by the prototypes was discussed and evaluated by the users. For instance, we proposed a complex parsing mechanism to convert EMS/PDA data, but the users rejected this solution because they did not find it necessary or useful. Offering a combo box to specify parsing rules was considered much more useful.

Summarizing, to what concerns the conceptual approach, it was found that the use of the communication genres and genre systems contributes to clarify the system development process. The concepts of genre and genre system allowed us to use a language close to the user, necessary to the participatory process. The users adopted the genre view and even discussed the possibility of applying the concept to other software tools. For instance, some more enthusiastic users suggested using genres to categorize chat data and e-mail messages.

In what concerns the solution proposed to the organization, it is not only important to analyze the final solution but, specially, the evolution of the attitude towards EMS. We noticed that the organizational attitude towards EMS and PDA changed with the project. In fact, the initial attitudes were very different. PDA had good acceptance but, when the project started, its use in meetings was declining. Prior experiments with EMS generated strong resistance. The experience with our prototype allowed a rebirth of the enthusiasm towards PDA and reduced the resistance towards EMS.

The adopted EMS, although adjusted to the needs, could have more functionality. The use of a touch screen and electronic whiteboard (like the Smart Board from Smart technologies, Inc.) was suggested, as well as a more refined user interface, reducing keyboard usage, which is very disruptive in meetings. The kind of meetings

that we analyzed must be fast paced. The use of a voice modality to input data in the system was also suggested, especially to the discussion phase.

Some users also suggested the use of SMS to spread meeting results.

The users thought that the simplicity of the EMS/PDA conversion mechanism is adequate to the expectations they have when using PDA. Some users even recommended that the syntax be kept as simple as it is.

Finally, the users suggested increasing the use of PDA in meetings, to support some particular tasks. One task that was pointed out was voting (the target organization has to vote on some occasions). However, to what concerns activities that require text editing, the use of the PDA was considered not useful.

6 Conclusion

This paper brings together EMS and PDA, thus bridging the gap between different organizational coordination mechanisms, in particular impersonal coordination and group meetings. PDA have an important role in the support to individual plans and schedules, but its link with team meeting data is still low.

The conceptual approach proposed in this paper is based on the notion of genre. The genre perspective, originally employed to index literary work, has been adapted to the organizational context to analyze organizational communication, work patterns and structures. We used genres to add context and insight to the artifacts exchanged by EMS and PDA in a meeting situation. Associated with genres, we find purposes, people involved, work patterns and structures. These attributes afford tailoring the EMS/PDA data conversion mechanisms to the specific users' needs and expectations.

The paper describes the application of the EMS/PDA conversion mechanism to an organization in the accountancy field. This work was accomplished with the cooperation of several employees of the organization. The employees had also the opportunity to experiment the developed prototype. As a consequence of the evaluation, it was verified that the weaknesses of the prototype were not related to primary functionalities but with user interface features considered by the users as "not so important." Considering the project results, the project increased users' enthusiasm towards PDA usage and reduced the prior resistance towards EMS usage.

Acknowledgments

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