Structuring of genre repertoire in a virtual research team

Roberto Dandi, Caterina Muzzi
Luiss Guido Carli University, Italy
rdandi@luiss.it, cmuzzi@luiss.it

Abstract. Genres are considered "as socially recognized types of communicative actions that are habitually enacted by members of a community to realize particular social purposes" (Orlikowski and Yates, 1994, p. 542). This paper studies the evolution of an e-mail-based genre repertoire and examines whether it is related to the degree of complexity associated to different tasks and to the phases of group development. The analysis focuses on the case of an international research team involved in a European project that uses mainly e-mail and other CMC technologies in order to execute different kinds of tasks.

Introduction

The analysis of communication genres within organizations may shed light upon the processes through which tasks are performed in virtual communities (Yates and Orlikowski, 1992). The introduction and use of Computer-Mediated Communication (CMC) influences the variety and variability of organizational genres since these may be created, reproduced or abandoned (Crowston and Williams, 1997; Davidson, 2000). Genre repertoire evolves over time and is deeply attached to the idiosyncrasies that characterize the community in which it is generated.

The paper investigates the evolution of an e-mail-based genre repertoire and asks whether it is related to the degree of complexity associated to different tasks and to the stages of group development. The analysis has studied the case of an

international research team involved in a European-funded project that uses e-mail and other CMC technologies to accomplish different kinds of tasks.

Brief literature review

> «Drawing its origin from the sphere of classification developed in classical philosophy, a genre is commonly understood as a particular class, category, type, kind, style of a communicative practice, which is described, classified and recognized to belong to a group in accordance with some characteristic and distinctive features of its form, content or employed technique in its development» (Boudorides, 2001)

According to structuration theory, genres are considered "as socially recognized types of communicative actions that are habitually enacted by members of a community to realize particular social purposes" (Orlikowski and Yates, 1994, p. 542). A genre may be identified by its socially recognized purpose and shared characteristics of form.

Rather than serving an individual's own communicative intentions, a genre is constructed and recognized to serve the purpose of a relevant organizational community, whether small or large.

Its form refers to the observable aspects of communication, such as communication medium, structural features and linguistic ones.

Orlikowski and Yates (1994) and Yates, Orlikowski and Okamura (1999) used a coding scheme of genres in e-mails based on the two dimensions constituting the definition of genres (Tab. 1).

The structuration of genres over time occurs through a self-reinforcing mechanism in which different combinations of purpose and form are created and institutionalized through interactions among actors.

Genres emerge within a particular social-historical context and are reinforced over time as a situation recurs. Orlikowski and Yates (1994) believe that genres and genre repertoires are by-products of a history of negotiations between social actors that results in shared classifications, which gradually acquire the moral and ontological status of taken-for-granted events.

By using different genres in everyday life communication, actors generate the genre repertoire of their organization or community. Therefore, genre repertoire is "the set of genres enacted by groups, organizations, or communities to accomplish and express their work" (Orlikowski and Yates, 1994, p. 1).

When alterations to recognized genres or to established repertoires are performed enough to become widely accepted within a group, genre variants or new genres are formed and new repertoires are created. Therefore people produce, reproduce and change genres through a structuring process.

Genre repertoires vary in two ways:

(1) New conjunctions of purpose and form may arise and old genres can be abandoned. Therefore the composition of the repertoire varies.

(2) There are shifts in repertoire use (e.g. in the frequency of genre use). In this case the intensity of use of certain genres varies.

These variations spring from several causes: “Over time, changes in task constraints, institutional procedures, media capabilities, and contextual factors may trigger changes in the genres that members choose to enact, producing variations in existing genres or even introducing new genres into the repertoire” (Yates, Orlikowski and Okamura, 1999).

Examples of purpose of e-mails:	Examples of form of e-mails:
• Non-work-related	• Opening/greeting
• Work-related	• Aside to an individual (personal)
• Technical	• Completed subject line
• Administrative	• Embedded message
• Question	• Embedded files (codes etc.)
• Response	• Graphical elements (emoticons)
• Solicitation	• Headings and subheadings
• Proposal	• Word/phrase emphasis
• Meta-comment	• List/specifications
• Apology	• Set-apart information
• Report	• Ellipsis (…)
• Announcement	• Signature
• Recreational	• P.S.
	• Informal/colloquial
	• Language/dialect used

Tab. 1 – Purposes and Forms of genres

Among the above mentioned causes we studied task changes, as we consider them the most probable influential factor in the evolution of repertoires. in other words, variety and variability in genre repertoire depend mostly on the variety and variability of the tasks performed by the actors. This argument is supports Ashby’s law of requisite variety (1956): "the variety in the control system must be equal to or larger than the variety of the perturbations in order to maintain stability”. In our context, communication patterns (the behavior of the control system) should be complex enough to execute effectively (maintain stability in) the performed tasks (the internal environment of the organization).

The composition of a genre repertoire varies according to the perceived variety of tasks that actors need to perform. If new tasks have to be accomplished, or different agents have different perceptions of the same task, new genres may arise in order to deal with this changed task complexity. In other words the variability of tasks allows for the emergence of new socially shared genres.

Task complexity has been defined in several ways (Campbell, 1988). For the purposes of this study we use interdependence as a proxy for complexity. According to Thompson (1966) there are three types of task interdependence:

- Pooled interdependence is the lowest form of interdependence among organizational actors. In this form, work does not flow between actors. Each

actor contributes to the common good of the organization, but does his or her work independently.

- Sequential interdependence exists when the outputs of one actor become the inputs of another in serial form. This is a higher level of interdependence than pooled interdependence. The preceding actor must thoroughly complete his or her tasks to allow the subsequent actor to successfully perform his or her own. It therefore creates a higher need for horizontal integration mechanisms.
- Reciprocal interdependence is the highest level of interdependence. It occurs when the output of one actor serves as the input for a second actor, and the output of the second actor serves as the input for the first actor.

Each of these interdependences is associated with coordination mechanisms so that actors can perform their tasks effectively.

When a task requires pooled interdependence there should be a mediating technology that allows organization members to work independently but consenting to add up all the actors' performance outputs. The most common mediating technology for this is supervision: a boss distributes work among subordinates and then adds up all the reports coming from them. Actors share little interdependence because they are only connected through the mediating role of the boss.

In sequential interdependence among actors, the most efficient way to coordinate the efforts is to establish uniform procedures to complete the work units and design a specified serial order to perform them. Standardization is therefore the prominent mechanism for coordinating sequential interdependence. Actors have a medium degree of interdependence among them.

Finally with reciprocal interdependence, reciprocally interdependent actors work together closely and must be directly coordinated. This is the highest degree of interdependence that can occur among actors. Coordination is achieved only through mutual interaction, and participatory and horizontal structures are appropriate.

Both supervision and standardization can be considered hierarchical means of coordination because they present two properties (Biggiero, 2004): (i) asymmetry of authority (the boss decides subordinate behavior, not the contrary, and the standard cannot be changed by subordinates) and (ii) imposition of authority (the boss and the standard are imposed in a top-down logic, that is they are not chosen by people of lower hierarchical ranks).

Contrarily, mutual interaction and adjustment are democratic ways of coordinating people, as everyone may express opinions in the decision making process.

Burns and Stalker's model (1961), and other contingency models, theorize that "mechanic" systems (those with low interdependence and hierarchical coordination mechanisms) show hierarchical communication patterns, while

"organic" systems (those with tasks with higher interdependence and higher mutual interaction mechanisms) need more participatory communication patterns. Less deterministically, constructivist perspectives (Weick, 1979; Salancick and Pfeffer, 1978) argue that task features are not objective but enacted, selected by the individuals' interactions and social perceptions. The higher the perceived complexity (or ambiguity and uncertainty) of tasks, the stronger is the need for collective sensemaking and therefore communication and interaction.

The model in Tuckman (1965) and Tuckman and Jensen (1977) describes the evolution of face-to-face groups over time and we will test whether this model is adapt to explain repertoire's evolution or not. Current research suggests that there are significant differences in group evolution patterns between online and face-to-face teams (Armstrong and Cole, 1995; O'Hara-Devereaux et al., 1994; Bordia, 1997; Goodman et al., 1987). However Furst et al. (1999) highlight the need for further research dealing with virtual teams in order to establish what aspects of face-to-face team and group development are generalisable to virtual team development.

According to Tuckman and Jensen (1977) groups undergo five phases of development:

(1) Forming: in this orientation phase group members find out about each others' attitudes, competencies and task responsibilities.
(2) Storming: in this phase individuals reveal their personal goals and interpersonal conflict becomes more likely.
(3) Norming: in this cohesion phase members establish working rules and role allocations.
(4) Performing: by this stage, the group has developed an effective structure, and everyone is committed to the group's objective, jobs are well defined and collaboration occurs more likely.
(5) Adjourning: in this final phase the group may disband, either because the objective has been accomplished or because members have left.

During the first phases (forming and storming), it is reasonable to expect genres of communication with few formal features and oriented to questioning and debating the ways to accomplish group objectives. In organizational terms, task complexity in these phases is high, as there is high interdependence between actors. In contrast, during the final phases of group development (norming and performing), it is more likely to find genres with higher formalization because routines have been established, and more operational genres such as reports and memo (Yates et al. 1999). Task complexity decreases and coordination mechanisms tend to be more hierarchical (more standardization and supervision).

Classification of organizational genres: proposal and hypotheses

We hypothesize that whenever perceived task complexity is low or medium (that is there is pooled or sequential interdependence among actors) emergent genres are those with command-and-control purposes such as directions on what others should do, reporting on what has been done, and deadline reminders. We also think that with low and medium perceived task complexity formalization is more likely to occur in terms of opening and closing greetings, the structure of the message, and the presence of a signature.

These assumptions derive from the above mentioned classification of coordination mechanisms. Hierarchical and formal genres are communication patterns that fit with pooled and sequential interdependences, as they require hierarchical coordination mechanisms to be dealt with.

In contrast, when task complexity is higher and actors are forced to mutual adjustment, under conditions of reciprocal interdependence, we hypothesise that genres showing participatory and interaction purposes (ballots, dialogues, proposals, requests of explications) are more likely to occur. Formalization associated to these genres is likely to be low (lack of structure, lack of formal greetings, emoticons and quick replies). This derives from the assumption that higher interdependence results in a more participatory coordination mechanism.

Drawing on Tuckman and Jensen's (1977) model of group development we hypothesise that during the early stages of the project (forming and storming phases) people use more participatory and informal genres of communications, while afterwards they rely more upon hierarchical and formalized genres of communication.

In the light of the two dimensions outlined (formalization – in the form - and degree of hierarchy – in the purpose) we obtain four classes of genres (Tab. 2).

- *Mechanic genres*: these are the genres of communication associated to bureaucratic and hierarchical coordination, where standardization of tasks and command-and-control are prevalent.
- *Task-oriented genres*: these genres have the same purpose of the previous ones but present less formalization. Actors tend to use command-and-control forms of coordination (information requests for example) but prefer to use an informal style of communication.
- *Organic genres*: these genres are associated to participatory mechanisms of coordination. Interaction is no longer based on asymmetry but occurs at the same level of authority. Formalization is low as tasks require more easy and fast communication. These genres are associated to complex tasks.
- *Formal participation genres*: these genres are as participatory as the previous ones but more formalized. This means that tasks are highly interdependent but some degree of style standardization is present.

		FORM	
		Low formalization	*High formalization*
Purpose	*Command-and-control*	2. Task-oriented genres	1. Mechanic genres
	Participatory interaction	3. Organic genres	4. Formal Participation genres

Tab. 2 – Classes of genres

In this study we test four hypotheses concerning classes 1 and 3:

- (H1) *The higher the interdependence in performing a task, the more likely is the occurrence of genres based on purposes of participatory interaction and on low formalization* (organic genres)
- (H2) *The lower the interdependence in performing a task, the more likely is the occurrence of genres based on purposes of command-and-control relations and on high formalization* (mechanic genres)
- (H3) *During the early stages of group development the occurrence of organic genres is more likely than that of mechanic genres.*
- (H4) *During the subsequent stages of the group development the occurrence of mechanic genres is more likely than that of organic genres.*

In this study we do not test hypotheses on the other types of genres we individuated in Table 2 because they are beyond the scope of this paper.

The case study

The case study is an international research team to which we belonged, involved in a European Commission-funded project called ORGMAIL (fictional acronym), aimed to understanding the organizational consequences of e-mail. Seven research centers from four European Countries participated in ORGMAIL: Italy, Greece, United Kingdom and The Netherlands. They came together by answering to a call for partners through a mailing list and had competences in different disciplines (social-psychology, management, organization theory, computer-mediated communication). The project started on May 1st 2001 and ended on October 31st 2003. During this period the team was composed of 19 members (8 senior researchers and 11 junior researchers) who relied on the mailing list for most of the communications (see frequencies of media use in ORGMAIL, Tab. 3). Other computer-mediated communication technologies were used far more than traditional means of communication (phone, fax and letter) with the only exception of face to face communication. We could therefore define ORGMAIL as a virtual community.

	For retrieving information	For allocating information
Mailing list (ML)	3.87	3.67
E-mails one-to-one	2.93	2.67
BlackBoard	2.87	2.33
E-mails one-to-many	2.53	2.53
Web-site	2.47	2.20
Face-to-face	2.40	2.53
Management ML	2.07	2.00
Phone	1.80	1.73
Chat	1.53	1.60
Fax	1.40	1.20
Letter	1.27	1.20

Tab. 3 – Average frequencies (1=never, 5=very often) in media use for retrieving and allocating information. Source: ML statistics for ORGMAIL's internal use

For the purposes of this study, we decided to analyze just the genres developed through the mailing list, which presents the highest frequency of use both in retrieving and allocating information. In any case a 100% coverage of the communication patterns is impossible, as one-to-one and one-to-many e-mails are not easily accessible, have been deleted or are missing, and face-to-face communication has been only partially tracked through the meeting minutes.

The project officially started in May 2001 and we covered eight months of interactions, up to December 2001. During this period the team was involved in the following tasks:

Task 1 Reporting to the European Commission: administrative/clerical activities such as creating and submitting management reports.

Task 2 Project coordination activities: project management activity.

Task 3 Literature review and identification of key issues.

Task 4 Identification of approaches and detailing research design.

Task 5 Sampling for standardized approach: searching for case studies to be analyzed in a standard way by all partners in all Countries (we call this level of analysis, "level one" or L1).

Task 6 Sampling for differentiated approaches: each partner searching for a case study to be analyzed without standardization or strong coordination with other partners (we call this level of analysis "level two" or L2).

Task 7 Selection of research tools. Development of research methods (survey, interviews structure etc).

Task 8 Scouting of the policy issues: analysis of European policies for the project issues.

Task 9 Policy implications of the field research. In this task ORGMAIL members produced a report to the EC in which they indicated how to address European policies towards better use of e-mail in organizations.

Task 10 Monitoring and self-observation. This task was devoted to an analysis of the ORGMAIL functioning and performance. It was managed and carried out by ORGMAIL members.
Task 11 Dissemination/exploitation: management and design of seminars and of the final workshop.
Task 12 Preparation of the project's brochure.
Task 13 Project web-site design and management.

This list reflects the formal list of tasks of ORGMAIL project as in official documents (project proposal, management reports) with the exception of task 12 (brochure preparation) which was part of task 11 (dissemination) and tasks 5 (sampling the standardized case study) and 6 (sampling the differentiated case studies) which formally were part of a single task (sampling). The necessity for this differentiation from the formal list became evident at the moment of assessing perceived task complexity. Dissemination and sampling, actually, were composed by different activities with different degree of complexity, and we decided to split them just for this reason.

The methodology

The sample is composed of 583 e-mail messages that were posted within the ORGMAIL mailing list from May to December 2001. Our research strategy may be summarized by the following steps:

(1) Operationalization of task complexity
(2) Codification of purpose and form for each e-mail message.
(3) Identification of emerging genres through a Principal Components Analysis.
(4) Correlation between emerging genres and task complexity.
(5) Analysis of such correlation over time.

Task complexity operationalization

Fig. 1 shows the schedule of these tasks and the ranking according to their complexity. We assigned a score of 3 to indicate maximum complexity (high interdependence), 2 to indicate medium complexity (sequential interdependence) and 1 to indicate low complexity (pooled interdependence). This ranking has been produced by four ORGMAIL members, who are scholars in organizational design and behavior. Most of the messages (62,5%) present task complexity 3, while 37% of them concern task complexity 1. Very few (0,5%) correspond to task complexity 2.

		m1	m2	m3	m4	m5	m6	m7	m8	Task complx
Task 1	Reporting to the EC									1
Task 2	Project Management									3
Task 3	Literature review/identification of key issues									1
Task 4	Ident. Of approaches/Detailing research design									3
Task 5	Sampling L1									3
Task 6	Sampling L2									1
Task 7	Selection of research tools									3
Task 8	Scouting of the policies									1
Task 9	Policy issues for empirical research									1
Task 10	Monitoring and self-observation									2
Task 11	Dissemination and exploitation actions									1
Task 12	Brochure									3
Task 13	Web site implementation									3

Fig. 1 – Task schedule and ranking of task complexity

Coding of the e-mail messages

We selected 6 items for the form and 9 items for the purpose (Tab. 4), following Orlikowski and Yates (1994) and Ducheneaut (2002): only "management" is an original item and refers to communication aimed to directing people and planning activities (top-down communication).

Purpose items:	Form items:
–Question	–Closing formula
–Answer	–Emoticons
–Ballots	–Reply with embedded message
–Management	–Lack of text structure
–Disagreement	–Openings and greetings
–Internal report	–Signature
–Meta communication	
–Technical support	
–Proposal	

Tab. 4 – Coded items for genres analysis

We coded all the messages according to these categories and to the task they belonged to (by investigating which task the content of the message referred to).

Then we added the variable "trimester" 1, 2 and 3 (and coded the messages according to the date they were sent) so as to be able to analyze the evolution of the repertoire over time (although "trimester" 3 is composed of two months: November and December 2001). All the variables related to the purpose and form

were coded as continuous, and the task complexity and the trimester as nominal. Thus we considered our data “as if” they were quantitative, in order to simplify the graphical representation of the factorial axes.

Data analysis

As other authors have done in similar studies (Ducheneaut, 2002; Di Franco, 2003), we analyzed the data through a multivariate statistical method, namely Principal Component Analysis (PCA) and then we made a hierarchical clustering using the SPAD 4.5 software (Cisia-Ceresta, 1999).

We analyzed separately continuous and nominal variables because of their different scales, but then we juxtaposed the different couples of graphical representations in order to integrate the different kinds of variables.

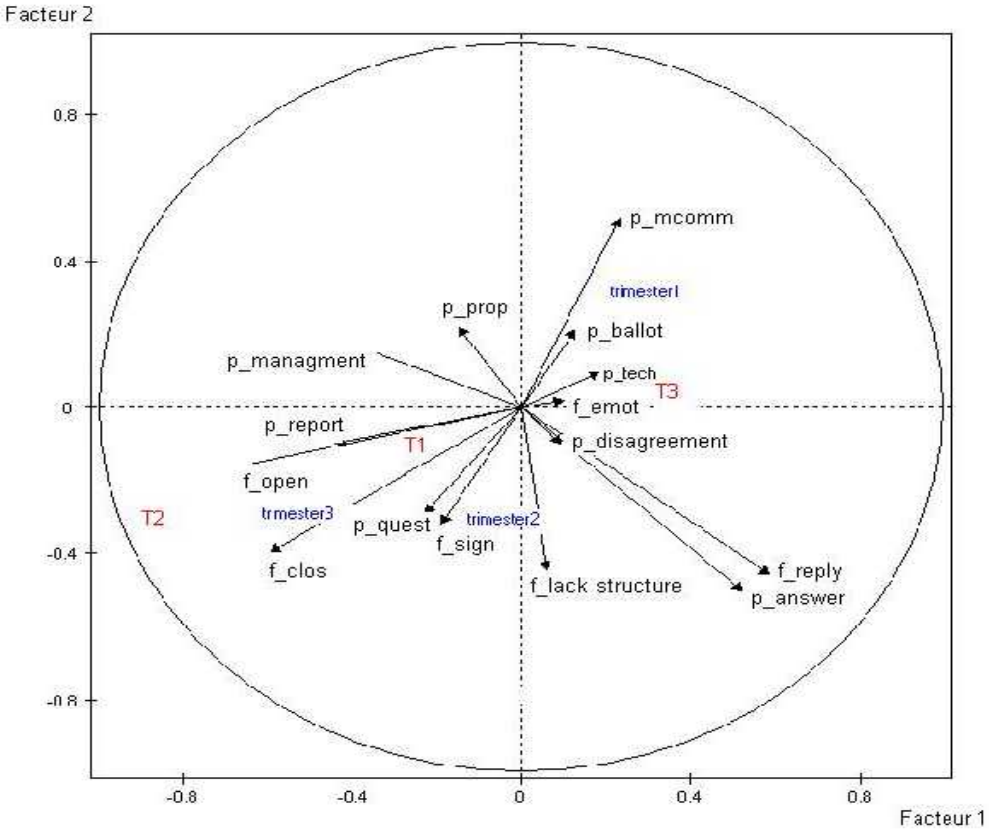

Fig. 2 – Circle of correlation, Factors 1 and 2

The aim of the PCA is to show the proximity of some variables to each other and to the axes (or factors). The position of the variables in the circle of correlation (Fig. 2) and their distance from the two axes indicate the importance of each variable with respect to the factors represented by the axes. When using

PCA, the researcher focuses on trying to interpret the meaning of the axes and thus of the position of the arrows in the two-dimensional space.

As shown in Fig. 2, in the circle of correlations all the variables of purpose and form are represented by arrows. The length of the arrow (that is the distance from the centre) represents the importance of the considered variable with respect to the axes. The cosine of the angle between two variables corresponds to the correlation between the two variables.

When two arrows are collinear but in opposite quadrants, it means that they are negatively correlated to each another.

After the PCA, we did a hierarchical clustering to better identify the emerging genres. We decided to cut the dendogram (the tree) at the fifth class and we included in this way 90% of all the messages. For each class, the software provided us with the list of variables according to which the class itself was above and below the mean of the sample. In other words, for each class we had the list of the most and least characteristic variables. According to the results of the cluster analysis, i.e. the genres that have emerged, we created a new variable in our dataset expressing the different genres being studied.

Results and discussion

Through the graphical representation obtained from the PCA analysis, we have interpreted Factor 1 and 2 as follows:

- Factor 1 (horizontal axis in Fig. 2): the degree of hierarchy in e-mail communication. On the right side of the circle, we find informal characteristics (embedded messages in the e-mails, emoticons) and participative items (ballots and disagreements). We have thus participatory interactions. On the left side of the circle we find formal characteristics (signature, openings and greetings, closing formulae) and hierarchical items (management e-mails and internal reports where collaborators report to their bosses) that is formal command-and-control communication.
- Factor 2 (vertical axis in Fig. 2): the task orientation of e-mail exchange. On the top side of the circle, we find planning or strategic messages (management, meta-communication, ballots and proposals), aimed to decide the "frameworks" for communication and work. In the down part we find more "operational" items like questions, answers, reply messages and lack of structure, that is the day-by-day activities.

The cluster analysis indicates there are five genres of e-mail communication in ORGMAIL mailing list (Tab. 5). As shown in that table, not all items of purpose and form appear in the description of classes. The statistical software indeed shows only those variables that characterize each class in a statistically significant way (test value >2).

Genre 1 represents the expression of disagreement on a given issue. This is usually a reply message that contains the original message. There are no indications about the degree of formalization. Genre 1 can be ascribed to the class of organic genres since disagreement is a form of participation. Just 2% of the messages belong to this genre. Disagreement was mostly expressed in task 12 (brochure preparation): more than one third of messages belonging to this genre concern the brochure preparation. This task was considered highly critical, as it concerned the project's presentation to external organizations (especially those that ORGMAIL wanted to analyze). In order to be effective, the research team concentrated many efforts and interactions in a task that otherwise and elsewhere would have been considered trivial. Some disagreement was therefore likely to occur. Task 2 (project management) presented also some disagreement (almost one third of the messages belonging to Genre 1). The expression of different points of view is, however, self-explaining: budget issues and decisions concerning the division of work are often potential sources of conflicts.

Genre 2 is related to technical and meta-communication issues. About 35% of the messages belong to this genre. These messages are very informal (no opening or closing greetings) and embed the original message, so that we could define them as answers to technical questions. They are composed of explanations about how to use communication media (web-site, blackboard) and suggestions/thoughts about how to behave when using such media (meta-communication). It is worthy to remember that ORGMAIL is a research project aimed to study computer-mediated communication: the team is encouraged to practice self-observation and this study is part of such strategy. Half of the messages in this genre involved communicating information concerning task 2 (project management), while 13% of them concerned task 12 (brochure preparation). These tasks have been coded as complex because they required high levels of interaction. Meta-communication can be viewed as a means for reducing ambiguity and uncertainty as it frames the situations (Weick, 1979).

Genre 3 is encompasses the messages aimed to sponsor interaction and participation: ballots and proposals. About 15% of the messages belong to this genre. We do not have information about the form of such messages, so we can say they are close to the other messages' mean under this issue. One fourth of the messages belonging to Genre 3 occurred when communicating information regarding task 2 (project management), while about 16% of them concern messages regarding task 3 (literature review and key issues), 15% regarding 11 (dissemination/exploitation activities) and 16% regarding task 12 (brochure preparation).

Genre 4 represents quick operational questions, without formality and aimed to obtain fast exchange of information. About 17% of the messages belong to this genre. We can ascribe this genre to the class of task-oriented genres. Genre 4 occurred mostly in messages concerning again task 2 (project management, 20%

of messages in Genre 4), task 5 (sampling level one, 15%) and task 6 (sampling level two, 15%).

	Genre 1 (N=14)	**Genre 2** (N=211)	**Genre 3** (N=89)	**Genre 4** (N=101)	**Genre 5** (N=109)
Presence of	P_disagreement F_reply_message	p_meta_comm p_technical f_reply_message p_answer	p_ballot p_proposal	p_question f_opening_greetin	p_internal_report p_management f_lack_structure f_closing_greetin f_opening_greetin
lack of		p_ballot p_management p_disagreement f_opening_greetin f_emoticons p_internal_report p_question f_closing_greetin f_signature	p_management p_technical p_internal_report p_answer p_question f_lack_structure	p_proposal p_ballot p_meta_comm p_management p_answer	p_proposal p_ballot p_meta_comm p_question p_answer f_reply_message

Tab. 5 – Genres from cluster analysis

Genre 5 is the opposite of Genre 4. It concerns messages aimed at supervising people (management) or reporting to others. Formality is manifested through opening and closing greetings. However this genre is associated with a lack of structure, therefore this is a moderately strong form of mechanic genre. About 19% of the total amount of messages belongs to this genre. Almost 30% of messages included in this genre concern task 3 (literature review and key issues), while task 6 (sampling level one) and task 2 (project management) are also highly represented in this genre (about 16% of messages in Genre 5, each). This can be explained by the fact that task 3 is the perfect example of pooled interdependence (members wrote separately their literature reviews by topic), while task 6 has a high presence of report messages (people reported the improvements in approaching multinational companies to the mailing list in order to gain access to the same organization throughout all the Countries involved in the project).

To put together these results we matched each genre to each category of our classification (Tab. 6):

		FORM	
		Low formalization	*High formalization*
Purpose	*Command-and-control*	2. Task-oriented genres: Genre 4	1. Mechanic genres: Genre 5
	Participatory interaction	3. Organic genres: Genre 1, 2 and Genre 3	Formal participation genres:

Tab. 6 – Classification of the ORGMAIL mailing list's genres

The ORGMAIL mailing list's genres can be traced in the PCA analysis as in Fig. 3. Along factor 1, we find genres 4 and 5 placed on the command-and-control side, and at the opposite, genres 1, 2 and 3, on the participatory communication side. Along the factor 2, we find genres 1, and 4 placed on the operational side, and at the opposite genres 2 and 3 and 5 on the strategic/planning side. These findings are consistent with our hypotheses because:

(H1) Mechanic genres (Genre 5) result associated with the lowest degree of task complexity T1 (task complexity 1) and T2 (task complexity 2)

(H2) Organic genres (Genres 2 and 3) are closer to the maximum degree of complexity T3 (task complexity 3)

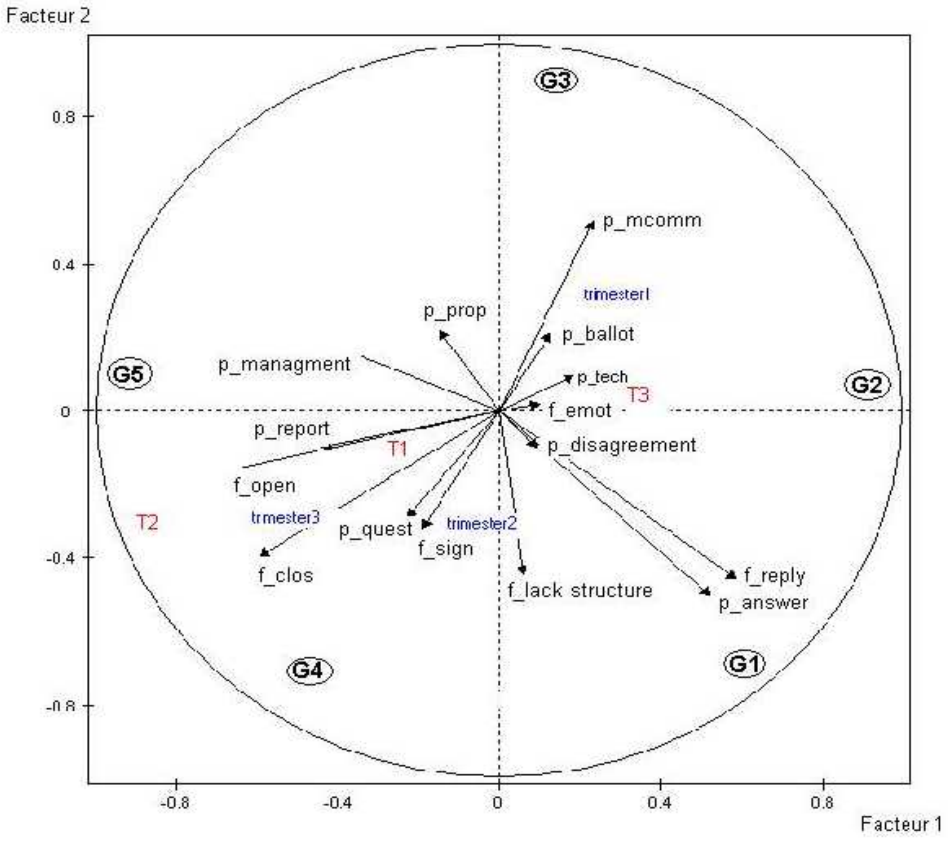

Fig. 3 – Genres and PCA factors

Finally, we ranked the five genres according to two criteria (based on the factor analysis): degree of participation (5=participation, 1=hierarchy) and degree of strategic orientation (5=strategic decision, 1=operational interaction). Then we averaged the two criteria in order to obtain a single hierarchy of genres, according to what we called the degree of genres complexity (maximum complexity reached with maximum participation and maximum strategic orientation). The correlation among task complexity and genres complexity resulted significantly positive (Spearman =0,134, $p<0,01$).

In Figure 3, we also have the graphical representation of the nominal variables (task complexity and trimesters). It emerges that during the first trimester of the project the consortium had to deal with complex tasks (the variable T3 is on the right side of the circle close to “trimester 1”) more than with simple tasks. During the second and the third trimesters instead, the consortium dealt with less complex tasks (see the down left side quadrant). This finding confirms our hypotheses in evolutionary terms too: as shown in Fig. 4, organic genres (2 and 3) score the maximum absolute frequencies during the first trimester and decrease as time goes on. The mechanic genre 5, at the opposite, reaches the maximum during the last months, while it shows the minimum score during the first trimester when task interdependence was highest.

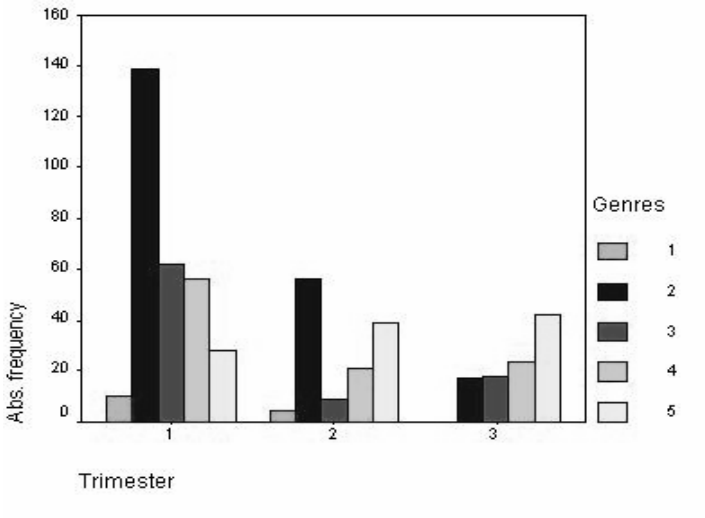

Fig. 4 – Frequencies of genres over time

These findings confirm also the hypotheses based on the model of group development:

(H3) Organic genres occurred more in the initial phase of the project (forming and storming). In particular, during the first trimester, messages with purposes such as disagreement (genre 1), meta-communication (genre 2), ballots, proposals (genre 3) occurred more than during subsequent periods. Formality in these messages is lacking.

(H4) Mechanic genres occurred more during the subsequent phases (norming and performing). In particular, during the second trimester, messages with question as purpose occurred more (genre 4); during the third trimester, messages with the purpose of reporting and management were predominant (genre 5). Formality increased, compared to the first trimester, as opening and closing greetings, and signature were more likely to occur.

Status	Trimester		Genre type					Totals
			1	2	3	4	5	
junior	Trimester 1	# of emails	3	37	18	18	12	88
		% of Total	0.6	7.1	3.4	3.4	2.3	16,8
	Trimester 2	# of emails	0	21	2	9	23	55
		% of Total	0.0	4.0	0.4	1.7	4.4	10,5
	Trimester 3	# of emails	0	10	5	10	25	50
		% of Total	0.0	1.9	1.0	1.9	4.8	9,5
	Total junior	# of emails	3	68	25	37	60	193
		% of Total	0.6	13.0	4.8	7.1	11.5	36,8
senior	Trimester 1	# of emails	7	102	44	38	16	207
		% of Total	1.3	19.5	8.4	7.3	3.1	39,5
	Trimester 2	# of emails	4	34	7	12	16	73
		% of Total	0.8	6.5	1.3	2.3	3.1	13,9
	Trimester 3	# of emails	0	7	13	14	17	51
		% of Total	0.0	1.3	2.5	2.7	3.2	9,7
	Total senior	# of emails	11	143	64	64	49	331
		% of Total	2.1	27.3	12.2	12.2	9.4	63,2
TOTAL		# of emails	14	211	89	101	109	524
		% of Total	2.7	40.3	17.0	19.3	20.8	100.0

Tab. 7 – Frequencies of emails by time, by status of the sender and by genre type

An explanation of these phenomena derives from the status of the senders of the email messages. As showed in Table 7, senior researchers (research unit heads) of ORGMAIL participated more in group discussion than junior researchers, especially during the early stage of the project. Furthermore, messages from senior researchers using organic genres (1, 2 and 3) and genre 4 outnumber messages from junior researchers with the same genres. At the opposite junior researchers use genre 5 (a mechanic genre) more than senior researchers.

This means that during the early stages of the project (forming and storming) senior researchers adopted organic genre messages to propose new ideas and identify group goals and task responsibilities, while during the subsequent stages (norming and performing) senior researchers limited their participation for management activities and junior researchers increased their participation for report activities

Conclusions

Through this study we found that ORGMAIL mailing list repertoire is composed of 5 genres. The repertoire evolved according to the evolution of the set of tasks performed, and to their complexity.

Genre repertoire changed over time in two ways: (i) in the composition, since during the last months there is no more trace of genre 1 (disagreement in reply messages). (ii) in the intensity of use of each genre, as frequencies in Fig. 4 easily show: organic genres prevail in the first months while the mechanic genre prevails in the last ones.

These findings confirm Orlikowski and Yates' (1994) frame; which describes genres as an output of social structuring, and confirm that the evolution of genre repertoire is correlated to the perception of task evolution and complexity.

Genres varied over time according also to Tuckman and Jensen's (1977) model on group development. In initial phases, when organization and task assignments are unclear, more participatory and informal genres occurred, while in later phases (last two months) mechanic genres became predominant.

Another contribution of this study is that it adds some clues for framing the genre phenomenon through a tentative classification of genres. This classification (Tab. 2) was obtained crossing the dimensions of the hierarchy/participation degree and the formalization degree.

From a theoretical point of view our findings can be placed in the systemic perspective flow. We applied Ashby's law to demonstrate that there should be an association between task complexity and genre repertoire. Furthermore, we tried to integrate organization theory with communication theory of genres by linking genre types with coordination mechanisms, and genres types with phases of group development. Finally, we integrated computer-mediate communication theory with organization theory

From the point of view of computer-mediated communication theory our findings confirm that e-mail, far from being a medium intrinsically democratic (for a review on this issue see Mantovani, 1994), can be used both for participatory/peer and autocratic/vertical relations. This result is coherent with the Emergent Approach (Markus and Robey, 1988) which claims that e-mail use is flexibly dependent on the group's appropriation of the medium, and is not pre-determined by the technology features.

This study has some limitations. Firstly, the study analyses social and organizational communication in a mailing list but does not include any assessment of social context: mutual acknowledgement, prior collaboration, identification in the group, trust among the actors. These social relationships may shed light upon the evolution of genres over time, too. Secondly, we analyzed just the electronic genres emerging through the mailing list. Even if this medium scores the highest frequencies of use (Tab. 3), we recognize that an analysis of the

genres developed through all available other media would be more complete and interesting. Last but not least, our findings need to be validated by further investigations in order to be generalized to other contexts.

References

Armstrong D.L.., & Cole, P. (1995). Managing distances and differences in geographically distributed work groups. In S. Jackson & M. Ruderman (Eds.), Diversity in Work Teams: Research Paradigms for a Changing Workplace , Washington, D.C.: American Psychological Association: 187-215.

Ashby, R.W. (1956) An Introduction to Cybernetics, London: Chapman & Hall

Biggiero, L. (2004), Organizzazione e Trasformazioni d'Impresa, in Pilotti L. (editor) Strategie Innovative e Impresa della Conoscenza nella Competizione Globale, Roma: Carocci.

Bordia, P. (1997). Face-to-face versus computer-mediated-communication: A synthesis of the experimental literature. The Journal of Business Communication, 34(1): 99-120.

Boudourides M. (2001) Introduction to Genres. ORGMAIL Internal Report

Burns, T. and GM Stalker (1961). The Management of Innovation. Oxford: Oxford University Press.

Campbell D.J. (1988) Task complexity: A Review and Analysis. Academy of Management Review, 13: 40-52

Cisia-Ceresta (1999) SPAD 4.5, Montreuil

Crowston K., Williams M. (1997) Reproduced and emergent genres of communication on the World-Wide Web, Proceedings of the XIII Annual Hawaii International Conference on Systems Sciences, Wailea, HI, available at http://florin.syr.edu/~crowston/papers/webgenres.html

Davidson E. J. (2000) Analyzing genre of organizational communication in clinical information systems Information technology and people 13 (3): 196-209

Di Franco G. (2003) L'analisi multivariata nelle scienze sociali: Modelli log-lineari e variabili categoriali, Roma: Carocci

Ducheneaut, N. (2002). The social impacts of electronic mail in organizations: a case study of electronic power games using communication genres. Information, Communication, and Society, 5(2): 153-188.

Furst, S., Blackburn, R., & Rosen, B. (1999). Virtual team effectiveness: A proposed research agenda. Information Systems Journal, 9: 249-269.

Goodman, P. S., Ravlin, E., & Schminke, M. (1987). Understanding groups in organizations. In L. Cummings & B. Staw (Eds.), Research in Organizational Behavior ,Greenwich, CT: JAI Press, 9: 121-173.

Mantovani G. (1994) Is Computer-Mediated-Communication Intrinsically Apt to Enhance Democracy in Organizations? Human Relations, 47(1): 45-62

Markus M. L. and Robey D. (1988) Information Technology and Organizational Change: Causal Structuring Theory and Research. Management Science, 34(5): 583-598

O'Hara-Devereaux, M., & Johansen, R. (1994). Global Work: Bridging Distance, Culture, and Time. San Fransisco: Jossey-Bass Publishers.

Orlikowski, W., and Yates, J. (1994). Genre repertoire: Structuring of communicative practices in organizations. Administrative Science Quarterly, 39: 541-574.

Salancik G. R. and Pfeffer J. (1978) A Social Information Processing Approach to Job Attitudes and Task Design. Administrative Science Quarterly, 23: 224-253

Thompson, J. (1966) Organizations in Action, McGraw Hill

Tuckman, B.W. (1965) Developmental Sequence in Small Groups, Psychological Bulletin, 63: 384-399.

Tuckman B.W. and Jensen M.A. (1977) Stages of small group development revisited, Group and Organizational Studies, 2: 419-427

Weick, K.E. (1979) The Social Psychology of Organizing, Addison-Wesley, Reading, MA

Yates, J., and Orlikowski, W. (1992). Genres of organizational communication: A structurational approach to studying communication and media. Academy of Management Review, 17 (2): 299-326.

Yates, J., Orlikowski, W., and Okamura, K. (1999). Explicit and implicit structuring of genres: Electronic communication in a Japanese R&D organization. Available at: http://ccs.mit.edu/papers/CCSWP188.html