

Collaborative Genres for Collaboration: Genre Systems in Digital Media

JoAnne Yates
MIT
jyates@mit.edu

Wanda J. Orlikowski
MIT
wanda@mit.edu

Julie Rennecker
MIT
interact@mit.edu

Abstract

Using the concept of genre, we examined the use of Team Room to facilitate collaborative work in one organization. Team Room is a collaborative application built within Lotus Notes and designed specifically to support teams within organizational settings. We studied three teams' communication in Team Room over seven months and found that some of the genres they enacted formed sets of interdependent genres or "genre systems," which facilitated collaboration among team members. The teams' use of these genre systems (meeting documentation, collaborative repository, and collaborative authoring) varied in ways that reflected differences in team size, task, and orientation towards the new technology. The three genre systems observed in Team Room demonstrate different forms of electronic collaboration that both build on and vary from collaboration in traditional media. Based on the notion of collaborative genres, we suggest insights for research and practical implications for system designers and users.

1. Introduction

As the use of digital media such as electronic mail and groupware has become more widespread, attention has turned to the effective uses of such media for organizational communication. Several studies of the implementation of digital media have focused on the barriers and facilitators to adoption, identifying the importance of critical mass, sponsorship, training, appropriate expectations, and compatible structures and cultures [5, 12, 15, 19, 20]. In this paper we address the use of digital media after implementation, examining in particular how such media are used in organizational communication, and with what consequences.

In previous work [21, 24], we proposed the notion of communication genres as an analytic device to study how organizational actors use new electronic media over time, and how such use influences their communicative practices. For the exploratory field study reported on here, we similarly used a genre lens to examine how three teams within one organization used a new digital medium--Lotus Development Corporation's Team Room technology.

In our study, we found that a number of the genres enacted by the teams within Team Room were specifically

interconnected, representing genre systems or sequences of complementary genres that constituted the teams' collaborative activities. These genre systems both resembled as well as departed from those already established in traditional face-to-face and paper media. After describing our analytic framework and providing some details of the study itself, we discuss these genre systems and their use in practice. We conclude by suggesting practical and research implications of our findings for both the use and design of digital media in organizations.

2. Genre and genre systems

A genre of organizational communication, such as the resume, project meeting, or research article, is a typified communicative action performed by members of an organizational community in response to a recurrent situation [3, 17, 24]. Genres are identified both by their socially recognized communicative purpose and by common characteristics of form [21]. A genre's communicative purpose is not simply the individual's intention in engaging in the communication, but its purpose as construed by members of the relevant organizational community. For example, the purpose of a resume -- as widely recognized in organizations operating in industrialized economies -- is to provide information about a person's work history to aid potential employers in making hiring decisions. A genre also has characteristics of form, which are observable aspects of the genre such as communication medium, as well as structural and linguistic features. For example, resumes are usually paper-based documents with the individual's name and address information at the top and with specific structured fields such as education and work experience, which list detail items in chronological order.

Some rhetoricians have asserted that a genre may only be defined at one level of abstraction (e.g., if a report is a genre, a trip report may not also be a genre), at least in any given time period [17]. We have argued, however, that such an arbitrary restriction makes the notion of genre less useful as an analytic tool for studying communication in organizations [24]. Instead, we argue that genres may usefully be identified on multiple levels of abstraction, depending on the phenomenon under study. Highly abstract genres (such as the memo) have a very general purpose (to

document communication within an organization) and may have a distinctive form marker (e.g., the memo heading); they may overlap with more specific genres (such as the proposal) which can be realized in that general form [21]. Shared characteristics of purpose and form are likely to become more specific and the scope of the community within which a genre is recognized is likely to shrink as the genre becomes less abstract. This process of reducing the level of abstraction (and thus narrowing the scope of a genre's recognition) is limited, however, by our social definition of genre: that is, it must be invoked or at least clearly recognized and responded to by some community, even if that community is as small as a project team. Thus while the resume genre is relatively abstract and widely recognized, we could also identify the academic curriculum vitae and the one-page business resume as different genres on lower levels of abstraction. If we wanted to focus on the relationship between the resume genre and one of these less abstract types of resumes, we could identify the two subtypes as subgenres of the resume genre. The term subgenre is relative, however, shifting on different levels of abstraction.

In previous work [21, 24] we have argued that individuals may reinforce (typically) or change (occasionally) a genre through a process of structuring. While community members typically enact and thus reinforce existing genres, they can also vary from genre norms, either deliberately or inadvertently. When changes to established genres become widely shared among members of a community, genre variants or even new genres may emerge. Such changes may be triggered by a range of factors including the introduction of a new communication medium.

A genre system [2] is an interrelated sequence of genres enacted by members of a particular community. For example, the set of precisely defined speeches and rebuttals in an intercollegiate debate form a carefully choreographed genre system. Similarly, the job ad, job letter and resume, and rejection letter (or invitation to interview, interview, and job offer) form a genre system. Such systems are composed of a well-coordinated set of communicative moves that together accomplish an interaction (such as the job search process, ending in rejection or in a job offer). In these cases, the system as a whole, as well as the individual genres constituting the system, can be said to have a socially recognized purpose and common characteristics of form. In a study of a group of distributed professionals using electronic mail to perform a design task [21], we identified a genre system which we labeled balloting -- used to poll opinions and test consensus among the participants -- consisting of three interrelated digital genres: the ballot form issued by the group coordinator, the ballot replies generated by group members, and the ballot results, a summary of the replies issued by the coordinator.

In earlier work on communication in new digital media, factors related to a new medium were often conflated with those related to habitual communication

practices (for example [8]); the notion of genre allows us to separate these factors for better analysis (for example [22]). In this paper, we expand upon this concept by focusing on and developing the notion of genre systems. We suggest that the notion of genre system may be particularly useful for studying collaborative communicative activities in electronic media, because a genre system is an interlocking and interdependent set of genres that, by definition, requires collaboration. Collaborative intent is obvious in the balloting genre system, but even in an apparently oppositional system such as the debate, where opposing debate teams have conflicting arguments and goals of winning, all members of the debate community (including teams, coaches, and judges) must collaborate to enact the debate genre system according to the rules and customs of intercollegiate debate. In the study reported here, we use the notion of genre system to examine how team members in one organization coordinated their collaborative activities using a newly introduced groupware tool.

3. Research setting and methods

The groupware technology we studied was Team Room, a collaborative application built within Lotus Notes and designed specifically to support teams in organizations [6]. We investigated the use of Team Room in a high-technology company in northeastern US, known here as Mox Corporation. At the time of our study, several teams within Mox were serving as beta-sites for the Team Room application.

Team Room provides a team-oriented structure for Notes databases yet retains more flexibility than earlier structured groupware products (e.g., the Coordinator). The structure includes a Mission Page and fields which facilitate database organization and communication among team members. The Mission Page, one structural feature distinguishing Team Room from Notes and other Notes-based applications, provides a template for a team to record its agreements about team goals and about how Team Room should be used, as well as other information about the project or group norms. Two key fields which serve as the primary organizing framework of the Team Room database are "communication type," which indicates the purpose of a message (e.g., Discussion, Reference), and "communication category," which indicates the topic (e.g., Planning, Education). A few default communication types and categories are provided to help teams get started, but team members are expected to create their own types and categories when initiating a new database, tailoring them to suit their context and projects. Specifying types and categories (even if just endorsing the defaults) is a required part of completing the Mission Page before messages can be entered into Team Room. The level of detail included in the more open-ended parts of the Mission Page (e.g., team goals and agreements) is determined by the team.

We studied three teams within the Mox Corporation. The Philanthropy team comprised five members spanning

three levels of hierarchy who described their mission (in their Team Room Mission Page) as follows:

To facilitate the sharing of a portion of the company's profits, products, and people in ways that assist individuals and communities, particularly those racially and economically disadvantaged, in achieving their highest potential in terms of social and economic development.

The team leader supported the team's use of Team Room in order to promote collaboration among the members. Though each member of the Philanthropy team had used at least one Notes database prior to using Team Room, the members reported great variation in their level of comfort and expertise with computers, and noted some early technical difficulties getting started with Team Room.

The second team we studied was the IS Leadership team. It included 12 members who had defined their mission as follows:

To improve the productivity of Mox by connecting the desktop to corporate data, seeking opportunities to reengineer business processes using technology, and enhancing Mox's ability to perform its business.

Prior to using Team Room, the IS Leadership team primarily used email and a Notes database for their communication. The team leader believed Team Room would facilitate communication among the members by creating one main channel for communication and would simultaneously produce an archive for several long-term projects. Team members reported a high level of comfort with information technology as the primary communication medium. Several of the members worked remotely at least part of the time.

The Quality Improvement team consisted of three core members, two of whom were also members of the IS Leadership team, and approximately 30 extended team members who varied in their degree of involvement in the team's project. Their mission was defined in their Mission Page as: "Oversee and drive the implementation of TQM in Mox I.S." The core members of this team are considered "staff" with a direct reporting relationship to the head of IS and no line relationship to the members of the extended team, who also report to the head of IS. The team leader, one of the core members, initiated the use of Team Room as "a way of creating a running documentation for the quality improvement project that would also support interdependent work and inclusion of those outside the immediate work circle." Similar to the IS Leadership team, team members reported high comfort levels with electronic communication.

The primary data for the study consist of 492 messages posted in the three Team Room databases over a seven-month period: 66 by Philanthropy (13.4%), 188 by IS Leadership (38.2%), and 238 by Quality Improvement (48.2%). Analyzing the Team Room messages, we developed a coding scheme based on the two dimensions of genre: form and social purpose. *Form* categories reflect the formatting features (i.e., subheadings, highlighting) and linguistic practices (i.e., salutations and closings, informal language) used in the messages. *Purpose* categories reflect

the socially recognizable purposes of the messages (i.e., proposal, query) interpreted both from the message content and the communication type designated by the message author. For most of the categories used, intercoder reliabilities measured with Cohen's Kappa ranged from 0.8 to 1, with a few reliabilities between 0.6 and 0.8.

In addition to textual data, interviews were conducted with members of each team at various points in time. Initial interviews focused on the adoption and general use of Team Room by each of the teams and supplied important background information for our subsequent genre analysis [11]. After analyzing the messages using the genre coding scheme, we conducted further interviews with key members from each of the teams. Using a variation of the discourse-based interview [18], we reviewed a sample of the messages with each member, probing to understand the patterns we had observed. These interviews helped to ground and refine our interpretation of the genre systems we had identified and furnished insight into how and why they were used. These interviews also provided information about communication among team members in media other than Team Room (e.g., phone, email) and helped to explain the conditions influencing use of this new medium.

4. Results: Collaborative Genres

In our analysis of the genres enacted by the Mox teams within Team Room, we identified three distinct genre systems in use by all three teams: meeting documentation, collaborative repository, and collaborative authoring. Close to half of the messages (213 or 43%) fell into one of these genre systems, each of which is discussed below.

4.1. Meeting Documentation Genre System

The first genre system we identified in Mox's use of Team Room involved the communicative activity that precedes and follows face-to-face meetings, that is, the announcement of the meeting's logistics and agenda, and the subsequent distribution of minutes of the proceedings. While the activity of conducting and participating in meetings has received extensive consideration [1, 16], and technological support has been developed for this activity in the form of Group Decision Support Systems [9, 13, 23], less attention has been paid to the communication associated with arranging, planning, and recording meetings. The genre system we identified as associated with such communicative activities involved three genres (meeting logistics, meeting agenda, and meeting minutes), although not all instances of the meeting documentation system included all three genres.

The first genre, *meeting logistics*, was invoked the most frequently (25 cases across the three Team Room databases). This genre is typically used to communicate the date, time, location, and duration of a planned meeting. It was primarily identified by purpose (coded as

“announcement” and “meeting logistics”), although it usually included some common features of form. In particular, the use of a list to specify the details of the meeting was quite typical (occurring in 12 of the 25 messages), while the use of text highlighting (with bold, underlined, or color characters) was used about a third of the time (9 cases) to emphasize specific content. For example, here is part of a typical announcement of meeting logistics using a list and some highlighting:

Here are the dates and times for the upcoming staff meetings.

August

15th: Tuesday at 11:00 am

25th: Friday at 10:00 am

September

3rd: Wednesday at 11:00 am

12th: Friday at 10:00 am

The meeting logistics genre also included messages that modified the details of meetings:

Staff meeting for next Tuesday, the 6th has been changed from 1:00pm to 2:30pm. Please let me know if this is **not** a good time for you. Otherwise see you then ...

The second genre in this system, *meeting agenda*, which occurred 17 times in the three databases, is used to announce details of the purpose and content of the meeting. This genre was primarily identified by purpose (coded as “announcement” and “meeting agenda”), and included common form features such as lists (13 cases), text indentation (9 cases), and highlighting (10 cases). Most of these messages also employed a specific linguistic marker by directly referring in the text to “the agenda” or “draft agenda.” The following example shows a typical agenda message, displaying list and indentation features:

The agenda for tomorrow’s meeting is:

1. Updates
 - KJ class
 - Vision session
2. Issues
 - Getting ready for Sept. rollout
 - TQM role in division
3. Other

Meeting agenda messages often included reference to the meeting logistics, as in this example:

REMINDER: TQM MEETING - Thurs Sept 26
from 10 to 11 in 329W BWN

The agenda for Thursday’s meeting is:

1. ...
2. ...

In these cases the message was seen to enact both the meeting logistics and meeting agenda genres.

The third genre in the system was the *meeting minutes*, used to document the proceedings, decisions, and action items that occurred during the face-to-face meeting.

We found 17 cases of this genre in the database, and identified it primarily by purpose (coded as “meeting minutes”), although many of the messages also displayed characteristic features of form such as lists (15 cases) and text highlighting (13 cases). In most examples of this genre, the minutes were included in the Team Room message in text form, but in a few instances the minutes were attached to the Team Room message as a file which could only be read by launching another piece of software (usually a word processing application). Not all occurrences of the meeting documentation genre system included minutes, and some of these minutes were for meetings not previously announced. In general, it appeared that producing meeting minutes was not a common practice within Mox, as two members explained:

Minutes are not a routine thing. Not for staff meetings at all. ... We never do minutes of a staff meeting.

More often than not I think people operate under the assumption that if you were there [at the meeting], you took your own notes because you're the only one who knows what you need to take away from that meeting. ... If you were there, you got it, or you should have gotten it. Having minutes is like having a crutch.

All three of these constituent genres are on a similar moderate level of abstraction, relating in the same way to the meeting genre, which is one level more abstract. Of the three, meeting agenda and meeting minutes are widely recognized genres in organizations, with names and recognized norms. Meeting logistics accomplishes a widely recognized function, but does not have as broadly accepted norms. Thus its norms are more local in scope.

The use of the meeting documentation genre system varied across the three teams, with nearly 15% of the Quality Improvement messages associated with this genre system, in contrast to the much lower 6.1% for the Philanthropy messages and 2.1% for the IS Leadership messages. This difference in usage was also reflected in the teams’ expectations for using Team Room, as evident in the teams’ mission pages where only the Quality Improvement and Philanthropy teams had identified Meeting as a communication type.

Differences in communication expectations evince differences in the tasks being undertaken by the teams, as well as differences in teams’ orientations towards the new medium of Team Room. The Quality Improvement team had a specific, time-constrained project: the development and implementation of a total quality improvement initiative for the IS organization. Hence, they held frequent and regular meetings to discuss the project. The Quality Team’s extended team members were not included in the core team’s daily interaction and meeting planning conversations, thus meeting announcements, advance circulation of agendas, and occasional meeting minutes helped to keep team members with varying levels of involvement informed of team activities. Additionally, the three core members of this team saw Team Room as a

valuable tool for conducting their team work, citing it in particular in support of meeting coordination:

We use [Team Room] to put out agendas on meetings, find out who's coming to a meeting, and put out dates and times, acting as a meeting coordinator ... Meeting management, you could say -- for the agendas and reports on what the minutes of the meeting were.

These interviews reveal that the team members clearly recognized the genre system (here referred to as meeting management) and its constituent genres (e.g., agendas and minutes), and particularly valued their team's use of Team Room as a medium for this system.

In contrast, the Philanthropy and IS Leadership teams were both department staffs who, prior to using Team Room, had already established meeting scheduling practices and group norms for agendas and minutes. Members of these teams were less focused on primarily using Team Room for their communication, as a member of Philanthropy noted:

[Team Room] is just one more type of communication and until we really get clear as a group in sync, instinctively what to use and what not to use, it will be yet another thing to use rather than the primary means of communication.

These teams typically used a variety of media in addition to Team Room for documenting their meetings, for example, circulating a 6-month advance meeting schedule by email, or talking face-to-face to plan meetings. One member observed:

During a staff meeting, we'll sit down and set another meeting. For example if an idea comes up or there is a discussion about a project, we will decide to meet and say "Well, let's look at our calendars since we have them at that moment and decide on a specific time and day."

Given the different tasks, expectations, and orientations of the three teams, it is not surprising that use of the meeting documentation genre system varied across the teams.

4.2. Collaborative Repository Genre System

The second genre system we identified involved using one document as a placeholder for later contributions to the database in the form of comments "nested" beneath the placeholder document. What distinguishes the collaborative repository as a genre system is not the physical arrangement of the messages, a common format in many discussion databases, but that the initial message designates an electronic place for a specific type of contribution by other members. The teams we studied used this genre system to support diverse activities such as coordinating schedules, initiating discussions, brainstorming, and creating topical information repositories similar to bulletin boards.

The system consists of two genres, the placeholder and the response. We identified the *placeholder* genre (21 cases) by its purpose (coded as "meta-comment" and "discussion anchor"), usually specified by the author with a phrase such as, "I'll use this document as a placeholder

and will put in short comments to it frequently," or "Please enter as a comment to this document." Beyond these explicit identifying remarks, two form characteristics appeared in at least a third of the placeholder messages. Eight of the 21 placeholders contained language specifically inviting or requesting comments (coded as "invitation to comment"), and "lists" appeared in one third of the placeholder documents (7 out of 21). An example of the placeholder genre is this one from the Quality Improvement team:

Use this as a placeholder for things we've learned (good or bad) from running this program. Post your thoughts as comments to this doc. Some thoughts Ted and I had were to include things like:

> ...

The specific uses of this placeholder genre varied (e.g., to brainstorm or to coordinate schedules); a larger data set might have allowed us to identify less abstract subgenres. Like the very abstract memo genre, the placeholder genre can also overlap with less abstract genres (e.g., the circulated draft, with a request to use the document as a repository for comments on it).

The second genre of the system, the *response* (52 cases), was identified by the combination of its relationship to the placeholder document and its purpose ("response"). Comments entered in response to a placeholder, like comments to other messages, are displayed nested beneath the placeholder, and Team Room automatically records the subject line of the placeholder document in the header of the response. Almost one third of the messages were coded as having informal language, suggesting that informality may characterize responses to placeholders in more than one application.

A third potential genre which might be part of the activities supported by the collaborative repository system but which we did not find in any of the three databases is a closure or resolution document, one either marking the ending of the brainstorming session or reporting back on the resolution of a decision or discussion. When questioned about this omission, one team member reported that this practice is common in Mox's use of Notes discussion databases but is not used in any of the three Team Rooms in which she has participated:

I don't think there's a closure process...That seems to not make sense. If you're going to open the question, it seems like you should have an answer at the end. People handle this differently in discussion databases I've seen. For example in one of our open forum [Notes] databases, someone opens up a question...20 people or so comment on the question... [Then] the person who opened the question would close it off at some time, "Thanks for all your comments. I've decided to..." whatever the person decides to do. That doesn't happen here [in Team Room].

Team members did not respond to 5 of the 21 placeholders. One member of the Quality Improvement team offered this explanation:

I think there's an unstated norm in these placeholders or brainstorming that not everyone needs to comment on it. You only comment on something if you have an opinion. Whereas if

there's an action for you, there's a norm that you need to respond to it. But if it's a placeholder.. if you see something in there and you agree or you don't care, people don't comment on stuff like that.

Other explanations offered for the absence of any response included shifts in relative team priorities and communication in other media, though team members were unable to explain why they personally had not responded to specific placeholders.

The three teams varied in their use of this system, both in the frequency of their use and in the activities supported by it. Overall, the collaborative repository genre system represented 15% of all messages. However, this figure reflects only 8.8% of the messages in the Quality Improvement database but 23.9% of the messages in the IS Leadership Team Room, with Philanthropy's use of the system falling between the other two at 12.1% of documents. Only the Quality Improvement team used the system for brainstorming, and this was also the only team not to use the system for coordinating schedules. Philanthropy was the only team to use this system to launch a collaborative authoring project, as when one member requested other team members to post projects they would like to see included in the next fiscal year's plan. Both IS Leadership and the Quality Improvement teams used this genre system predominantly for discussion and bulletin board-type postings, each activity representing 7 of the 21 cases.

The reasons for variation in the use of this genre system among the teams are unclear. At the time of this study, all of the teams were trying to work "collaboratively" and often used the phrase, "I would like everyone's input." Because the collaborative repository system is generally used as a way to get input, one possible explanation for the usage pattern we observed is that it results from variation among the teams in terms of the relative ease or difficulty in obtaining input from all the team's members. For instance, the IS Leadership team membership consisted of twelve members with separate areas of responsibility from whom input was needed prior to making scheduling, policy, and strategy decisions. On the other end of the spectrum, the core group of the Quality Improvement team consisted of only three members, all working on interrelated tasks for the same project, who saw one another frequently. The Philanthropy team's five members reported frequent face-to-face interaction because of the proximity of their offices and the small size of the team, but each member was responsible for separate projects, and one team member worked part-time. Formal staff meetings, where everyone was present, occurred only every two weeks.

The communication types identified by the teams on their Mission Pages suggest that only two of the teams anticipated one use of the collaborative repository system by specifying Discussion as a type, and using it to designate 6 of the 21 placeholders. Further, comparison of the message designation with our coding suggests that the members used the communication types inconsistently.

4.3. Collaborative Authoring Genre System

A final genre system that we identified in Mox's use of Team Room centered around the act of authoring texts collaboratively. Collaborative writing has received considerable attention in the rhetoric, composition, and professional writing areas [4, 7, 10, 14]. While it has often been conceptualized as an act in which a group of people collaborate in all key phases of document creation from drafting to final editing, when Couture and Rymer [7] examined a wide range of writing activities in multiple business settings, they found that the most common model of collaborative writing involved one person doing all the drafting, then revising on the basis of critiques from and interaction with others. A genre system centered around this model appeared in all three Team Rooms studied. This collaborative authoring genre system typically involved two genres (circulated draft and reaction to draft); a third genre (final version) was implicit but only rarely appeared in the Team Rooms. Together, examples of these genres comprised 19.5% of all items appearing in the Team Rooms, making this genre system the most frequently used of the three genre systems identified.

The first --*circulated draft*-- appeared 41 times in the three Team Room databases, for a total of 8.3 % of all items. It was identified primarily by its purpose (coded as "circulate draft"), but also had some characteristic form elements. In 21 cases, the document was drafted in another application (e.g., word processing, spreadsheet, or Notes), then imported into, linked with, or attached to a message within the Team Room. Mox team members were here taking advantage of Team Room's capabilities to make documents created elsewhere available to all team members within Team Room. Such multi-media drafts accounted for half the circulated drafts we found. In the other cases, team members composed drafts directly in Team Room. A team member explained in an interview:

I tended to compose in Team Room--it was easy for me--and because of the Private view functionality, if you were composing, it was a draft, you could keep it private for yourself.

Commonly, the documents coded "circulated draft" consisted of an introduction plus the draft itself. The introduction ranged from the subject line of the document to a paragraph or two explaining the context and purpose of the draft.

A common linguistic form feature, coded in almost half (19 out of 40) of the cases, was "invitation to comment." This coding category captured the presence of statements such as:

Please comment via Response Document.

Here is a first shot at a course outline....Please comment on what might be missing or over emphasized.

In the circulated drafts lacking an explicit invitation to comment, such an invitation could often be inferred. For example, one draft had no introduction other than a single subject line:

Here's the start of communication strategy (work in progress).

While this introduction included no explicit invitation, by designating the draft as work in progress the person posting it opened up the possibility of receiving feedback.

Reaction to draft is the second genre in this genre system; 53 examples of it are associated with 18 of the circulated drafts. We identified two variants of this emerging genre, feedback on draft providing explicit feedback on the text of the draft (30 cases), and dialogue around draft including discussion of issues raised by the draft or by subsequent feedback (27 cases, of which 4 were also classified as feedback on draft). The following example, which includes an attached revised version of the circulated draft, shows the feedback on draft variant:

Subject: I like this... here are my suggestions

I'll attach my version of your document. My changes reflect a sense of personal accountability rather than staff accountability. You'll see the difference in the way some bits are worded. Please feel free to use them or not as you see fit.

For comparison, the following message--in response to a draft invitation to weekly TQM lunch sessions--is an example of the dialogue around draft variant:

Subject: Great, go ahead and kick it off

I would suggest making it "brown-bag" rather than lunch is provided, just for the ease and expense of it. We could start initially by having the conversation be open, and then as we get going, bring up different topics. I also think that at first, we should all plan to attend (me, Todd, you) and eventually we might be able to rotate chairmanship.

Here, the focus is not on the draft invitation itself, but on the whole notion of the weekly lunches. All examples of the reaction to draft genre were coded as "responses," and those messages belonging to the first variant were also coded as "feedback on draft." The "dialogue around draft" variant was identified after initial coding by subsequent close analysis of messages related to drafts. All examples of both variants of this genre were designated as "comment" message types nested beneath the draft itself or beneath a comment to a draft. In roughly a third of the cases (21 out of 53 cases), all or part of a previous posting was embedded in the comment. Not surprisingly, in almost all feedback on draft variants that had embedding (10 of 11 cases), the embedded passage was an edited version of the original draft (often with comments or suggestions added in a different color), while in all 10 cases of embedding in the dialogue around draft variant, a previous comment was embedded.

The clustering of this reaction to draft genre around a small number of drafts (18 cases) indicates that many circulated drafts received no feedback within the Team Room environment. One team member explained many of the orphaned drafts as follows:

It's how things work at Mox...[I]n this kind of environment...people just sort of float an idea out

there and see if it takes off. If no one responds to it, then you have to decide, 'Is this something I care about enough to push through the organization or would I rather put my energy elsewhere?' Usually, people go with wherever the energy is. And that's what's happened to some of these.

In some cases, he continued, drafts that were not responded to at the time had been revived after the data were collected.

The third genre of this genre system, the *final version* of a document, appeared very rarely. In only 4 cases of the genre system was the final version posted in the Team Room database. These final versions generally replaced their original drafts in the database, exploiting a capability of the Team Room technology.

A further analysis of the collaborative authoring genre system highlights similarities and differences in its use by the three teams we studied. Although there were considerable differences in frequency of use between the three teams as indicated by the differing total numbers of messages they put into their Team Rooms during the same period, a similar substantial percentage of contributions (almost 20%) in all three groups belong to this genre system (18.1% in IS Leadership, 19.7% in Philanthropy, and 20.1% in the Quality Improvement team). Used only slightly less frequently than the collaborative repository system by the IS Leadership team, it was the most frequently used genre system in the Philanthropy and Quality Improvement teams. Both of these teams prepared documents for circulation outside the team as well as for internal use, a task difference which may account for their heavier use of this system.

The relative role of the constituent genres in the system varied by team, however, with the Philanthropy team having an equal number of drafts and reactions to draft, IS Leadership having many more reactions than drafts, and the Quality Improvement team having fewer reactions than drafts. In Philanthropy, all of the reactions concerned 2 of the 6 drafts, and most of them (4 of the 6 reactions) related to editing mechanics, rather than to the drafts themselves. While this pattern could be interpreted as an indication of a low level of collaboration in this group, interviews revealed that technical problems in the introduction of Team Room encouraged members to resort to other media (email, Notes databases, face to face) they found to be more reliable. When asked, members also noted that many of the "drafts" appearing in the Team Room database had already been through some revisions in another Notes database. In IS Leadership, by contrast, there was extensive discussion and input (26 reactions) on only 4 circulated drafts. Finally, in the Quality Improvement team, many drafts (28 cases) were circulated, but the total of 22 reactions were posted to only 13 of them.

5. Discussion

Our study of three teams' use of Team Room revealed the use of collaborative genre systems to support activities previously managed in other media. The same

three genre systems--meeting documentation, collaborative repository, and collaborative authoring--appeared in all three Team Room databases though the teams varied in size, task, and comfort with technology and had received no common formal training in the use of the medium. The three genre systems we identified together comprise 43.2% of the messages in all three databases -- 37.9%, 44.5%, and 43.6% of the messages in the Philanthropy, Quality Improvement, and IS Leadership teams, respectively -- a substantial proportion of the communication of each team.

These collaborative genre systems all have analogs in either paper or face-to-face communication as well as in electronic media with the electronic versions modeled (at least originally) after their more traditional predecessors (e.g., "electronic brainstorming" [23]). A key distinction of the genre systems we observed in the Team Room databases compared to their analogs in other electronic media is that the team members structured the genre systems themselves. Other electronic environments designed to support collaborative activities generally impose a structure for the interaction. By enacting interacting genres within their shared digital medium, team members both replicated established genre systems, for example, meeting documentation and collaborative authoring, but also went beyond these to innovate with the capabilities of the new medium, for example, by embedding documents created in other media, by highlighting text changes in amended documents, and by expanding the scope of involvement and speed of turnaround typically associated with team discussion, brainstorming, and writing. The flexibility and multi-media capabilities of Team Room also allowed elements of a genre system that might normally be separated because they appeared in different media (a draft and the telephoned or handwritten comments provided by different colleagues) or were handled differently (meeting minutes, often stored as an official record, and meeting logistics, often a more ephemeral, though still paper-based, communication).

When queried about how each of the activities would have been handled without Team Room, members responded that most would have occurred one-on-one via email. Arguably the biggest change resulting from the shift to the Team Room medium, then, is an increase in team involvement and interaction among the team members. For example, though a team member may have sent a message initiating the genre system, such as a draft or placeholder, to all other members, prior to using Team Room, the other members' responses (for the most part) would have been directed to the original author rather than to the team, minimizing the interaction among members. One Philanthropy team member noted a specific incident in which she was able to contribute to another member's project based on her own past experience a contribution she would not have been able to make had the project been managed in another medium:

[Without Team Room] I probably would not have had the chance to post my comments. It would just get handled between the people involved.

The same member cited another example where using Team Room changed the communication pattern for initiating new projects. She perceived the new pattern to be more aligned with the group goal to "work as a team":

This [Team Room] made it possible for me to post something to the group...[Before using Team Room], I would probably have gone to Ted [her boss] with the idea, then discussed it with him, seen what he had to say, then presented it at a staff meeting. But it would have gone through him first. This way sort of bypassed him.

Several patterns in the use of the three genre systems surfaced in all three databases. The most obvious pattern was the frequency of incomplete genre systems where one or more of the genres constituting the system were missing. Idealized models of each of the three systems include an initiating message, some form of response or further information, followed finally by a closing message. Relative to this idealized model, most of the systems we observed were incomplete. In the case of the meeting documentation system, meeting agendas were posted without prior announcement, announcements were not always followed by agendas, and minutes for announced meetings were rare across the three teams. All examples of the collaborative repository genre system lacked a closing message summarizing or synthesizing the contributions. Additionally, some received no response at all. Similarly, many circulated drafts received no input and only a few final versions of collaboratively-authored texts appeared.

Team members cited organizational norms to explain such incompleteness. There was no expectation that everyone would respond to every placeholder; members only responded to those messages about which they had strong opinions. If members were uninterested in a topic or were in general agreement with the original message, the norm was *not* to respond. Members we interviewed offered the same explanations for circulated drafts without feedback. Some offered shifting priorities as an additional explanation for incompleteness in the collaborative repository and collaborative authoring genre systems:

This was a project that got put on the back burner. We're starting to do something with it now...at the time I think I thought there were other things going on that were more important than this.

This one just fell off the radar screen.

This pattern of incompleteness at Mox suggests the important influence of organizational norms and work practices on use of collaborative genres. In other contexts where a norm for closure is well established, we might expect that norm to be incorporated when genre systems are invoked in a collaborative digital medium such as Team Room.

Another interesting pattern we observed in the teams' use of the three genre systems is that the genre systems often overlapped and interlocked. Team members collaboratively authored meeting agendas, placeholders were used to solicit input for a collaboratively authored document, and a meeting announcement also served as a

placeholder for team member input on the project to be discussed at the meeting. In one example, a response to a placeholder itself became a placeholder. Although such overlap is also present in traditional media (e.g., where a report becomes an attachment to a meeting agenda), an electronic medium such as Team Room, which allows relatively easy merging and linking of documents from multiple sources, may encourage further overlap and interlock among genre systems.

A final pattern that emerged from our analysis is inconsistency in the use of Team Room's "communication type" field. The notion of communication types is based on purpose, the key element of genre, so we would expect some consistency in how genres were designated. In fact, the developer of Team Room was familiar with the concept of genre and told us that he drew on it in designing communication types. The users of the Team Rooms, however, do not seem to have understood the concept of communication types very clearly. All the teams designated six to seven communication types, all fairly generic in their communication purpose, and drawing heavily on the default communication types offered (e.g., Action Open or Discussion). None of the genres making up the genre systems we identified in the data mapped directly to teams' designated communication types. While the Meeting communication type was relatively closely related to the meeting documentation genre system, the communication type does not discriminate between announcing, providing an agenda for, or documenting a meeting. Two of the teams designated a Discussion communication type and one team created a communication type that seemed to reflect the purpose of the circulated draft (Work Paper). However, neither communication type was used consistently as to purpose or form in any of the teams.

This inconsistency and the highly generic or abstract quality of many of the communication types seem to indicate a lack of understanding of the notion of communicative purpose. It may also reflect the emergent quality of some of the genre systems. Teams may not have anticipated their heavy use of the tool for certain types of collaborative activity. The developer of Team Room expected communication types to be updated as the team's use of the Team Room medium evolved. Of the three teams, however, only the Quality Improvement team updated any aspect of its Mission Page, and it only updated the categories (or topics) when it shifted phases of the project, not the communication types. This failure to update may reflect lack of attention to communication types, as well as lack of real understanding of what these types are and how they might be used to signal communication norms in teams.

6. Implications for research and practice

In this study, we identified a number of genre systems that team members used to enact collaborative communicative activities. We turn now to some of the

implications for both practice and research that emerge out of these findings.

Earlier research has suggested that users may benefit from explicitly identifying within their communities the kinds of genres that they will be enacting in a new electronic medium [21, 25]. Team Room supports this recommendation by prompting users--before they begin to use it--to specify the communication types to be used by the team in the process of completing their Mission Page.¹ In this study, however, we have seen that some uses may be unanticipated at the time when teams complete their Mission Pages. This suggests that in their initial articulation of how they should collectively use a new electronic medium, team members may want to explicitly recognize that some genre will likely emerge in practice, through their use of the medium. Thus they will want to adopt a practice of periodically updating their Mission Page so as to capture the emergence over time of new communication norms.

The use of collaborative genres within the Team Room technology also has implications for developers of new electronic media. In particular, it suggests that developers may want to provide explicit technological support for collaborative communicative activities such as the three genre systems we identified here. Rather than relying on users to import or invent their own conventions for coordination and collaboration, developers could offer more specific guidelines for such activities in electronic media, for example, by building in a number of "collaborative templates," and by providing mechanisms for modifying them over time.

For researchers, our findings suggest that the genre lens can usefully be augmented with the concept of genre systems. In particular, the genre system focuses on interdependence and interaction among genres, and thus many of the collaborative uses of communication media may be analyzed through such a lens, which specifically addresses the contextual and temporal interconnections among individual genres. This expanded lens now allows researchers to capture the explicitly collaborative uses of a medium, and as such, may be a valuable analytic device for examining the digital communication engaged in for the purposes of coordination and collaboration.

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¹The commercial version of Team Room enforces this recommendation by requiring the technology to be sold with a bundle of team building consulting services which include assisting users in completing their Mission Page.

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