

The Participative Framework as a Design Model for Newsgroups: PartRoOM

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Abstract. The main objective of this paper is to show that a participative-role oriented model (PartRoOM) could be a guideline for designing an innovative kind of newsgroup. We adopt the Participative Framework Model, in which audience roles are distinguished and ranked, according to whether or not the participants are known, ratified or addressed by the speaker. We firstly present here our model (described with UML), then a proposition of implementation of this model in a system. This system permits a user to choose the primary or secondary recipients of his/her message, and to choose if he/she wants to let his message visible to the ones which are not addressed, or in contrary if he/she wants to have a real private conversation. We also define a profiled interface which permits users to visualize threads sorted by his/her participative role. We finally describe how PartRoOM could fill the lacks of existing newsgroup, and improve discussion management and organizational dynamics.

1. Methodological statements

Several studies have already described communication problems with existing newsgroups (we propose a synthesis in section 2). Contrary to some authors who claim that writing bridles communication, we will focus our attention on the communicational model out of which these newsgroups are designed. In fact, our hypothesis is that existing newsgroups are based on a communicational model which is too far from face-to-face model, and which only allows speaking to no one in particular. In order to validate this hypothesis, we propose in this paper a participative-role oriented model, which could be a guideline for designing a new kind of newsgroup. We assume that this type of newsgroup could afford advantage mainly for group communication (and indirectly for collective problem solving or decision taking), especially in intra-organizational context. This thought processes is in accordance with the abstract approach as defined by [7]. These authors identified three different approaches for designing Computer Mediated Communication systems which take care of social cues:

- The realistic one, in which the system is designed to overcome lacks of communication due to a limited mutual perception. Face-to-face situations, as for example conversations in small groups ([26]), are simulated.
- The mimetic one, in which the hypothesis is that the human-computer interaction would be improved if the computer simulates a human, as, for example, the recent study on the impact of the use of avatars in ([9]).
- The abstract one, in which it is admitted that text conveys social cues that are described by a model or a graphical description.

In this abstract approach, we can find studies with different goals:

- On one hand, some authors aim at structuring conversations, by typing posts regarding to model's categories. The difference between these studies is the origin of the categories; some are based on speech acts ([28], [18]), and others on Problem-Solving strategies ([20]).
- On the other hand, some authors aim at helping the conversations' reader by presenting the messages and/or the threads sorted by actors' behaviour or conversational activity. This sort can be visualized graphically, as in Chat Circles or Loom ([6]), or not, as in ([8]), where important members in a newsgroup are put forward, their importance being based both on objective metrics and subjective ones (peers evaluation).

We present here another way to follow the abstract approach: we consider that the design of a newsgroup has to be based on a coherent theory of multi-party conversation. In that sense, it seems necessary to take advantage of the theories of multi-party discourses proposed by several researchers, in the field of conversation and discourse analysis (for example [30], [17], [3], [12], [16]).

The analysis of multi-party (or polylogal) conversations challenges the postulate that any speech (or utterance) has a specific identifiable function in conversation, whereas a great number of conversational models used for designing discussion tools are based on this postulate. Indeed, in a polylogue, a message could have a specific conversational function for a particular recipient and other functions for the other participants. For example, the same utterance could perform two different illocutionary acts addressed to two different recipients. "*Close this window*" is at the same time a directive act for the target recipient and an assertion for another participant, who is a mere member of the audience.

In fact, analysing the dynamics of multi-party discussion requires the adoption of a model, based on the Participative Framework. In this model, audience roles are distinguished and ranked, according to whether or not the participants are known, ratified (acknowledged but not necessarily addressed), or addressed by the speaker. This model was developed as a tool for conversation analysis by [1], [19], [4] or [5], for example. Fundamentally, it is based on the interactionist micro-sociological concept of production and reception format elaborated by Goffman ([10]). According to him, four categories of potential recipients of a message can be theoretically differentiated:

- Ratified recipients: they are the "official" recipients of a message. Two types of ratified participants can be distinguished: direct (addressed) and indirect (unaddressed) recipients. A direct recipient is regarded by the speaker as his main partner in the discursive exchange. In principle, a direct recipient of an utterance is identifiable owing to certain discursive marks, as explicit addressing marks (for example [15]: 86-101).
- Bystanders: they compose the audience of a discussion from which they are theoretically excluded. Within this category, an overhearer can be distinguished from an eavesdropper. A speaker is aware of the former's presence, even if this presence is fortuitous, whereas the latter is an intruder, who listens to a speech without the speaker's knowledge.

These categories and the classifying criteria they obey are summarized in the following table 1, from the most to the less addressed participants.

Table 1. Reception roles of a message

	Known	Ratified	Addressed
Addressed recipient: addressee	+	+	+
Non-addressed recipient: auditor	+	+	-
Overhearer	+	-	-
Eavesdropper	-	-	-

We make the assumption that designing a newsgroup based on this hierarchical participative model will permit to elaborate a tool for written communication which will be near a face-to-face conversation abstract model. It will be a profiled newsgroup, in the sense that the interface of the system will be structured depending on the participative role of the recipient. In other words, each member of the conversations will visualize them in a different way. We will then be able to represent the fact that the perception of a conversation depends on the participative role of the actor who perceives it.

This participative role model can be seen as a conceptual (and sometimes physical, in face-to-face conversation) representation of the distance between a speaker and the other participants. Thus, the concept of participative role designates the position occupied by a participant in the reception format of a message, and not a type of interactional activity (like host or joker, for example). However, there can be a connection between a participative role and an interactional activity. For example, we assume that the host of discussion is always a ratified recipient ([23]).

The model of Participative Framework is at odds with a linear (or telegraphic) model of communication and allows understanding the way participants manage a polylogical discussion. For example, the way a participant identifies his/her reception role determines the turn-taking system and the next speaker selection. Generally, the definition of its recipient(s) is a necessary condition for analysing a message, its content, its illocutionary or argumentative force, its function in discussion dynamics, etc.

Participative Framework has been already used by several previous studies for comparing face-to-face with computer-mediated discussions (for instance [29]) or for analysing the importance of different participative roles (main or peripheral) and the mobility from a role to another, like [24] and [25], for example. In these papers, the concept of Participative Framework is useful for understanding in a subtle way interaction situations and conversational phenomena. Some principles of design for mediated-discussion tools are then inferred from this analysis: supporting the management of parallel discussions, monitoring of turn-taking, and integration of peripheral participants by giving them access to the system and ensuring them some visibility in comparison with main participants.

Our approach comes within the scope of these papers but can be distinguished by the operationalization of the Participative Framework. In our mind, Participative Framework is not only a useful concept for preliminary analysis of communicative interactions, but it can constitute by itself an implementable model for designing computer-supported discussion tools.

2. Communicational problems of existing newsgroups

The usual newsgroups (for example the Usenet newsgroups) structure the multi-party discussions according to heterogeneous criteria: date (the discussion is a chronological list which reproduces the temporal dynamics of the conversation), sender (an alphabetical list),

subject (a list which is hierarchically organized into sequences). This kind of structure and the asynchronicity of the discussion lead to several problems.

2.1. The Participative Framework

Some papers deal with the question of Participative Framework in computer-mediated communication, by electronic mail [27] or newsgroups [23]. The conversational analysis of usual newsgroups (like Usenet newsgroups) brings to the fore that the Participative Framework of such a discussion tool is incomplete and “rigid” (in comparison with a face-to-face polylogal discussion) insofar as it only defines two types of recipients and these types constitute the only way of organizing reception into a hierarchy ([23]).

In face-to-face conversation, the selection of the addressee is based on verbal and non verbal signs (pronouns, terms of address, content of the message, body orientation, eye-contact). In newsgroups, participants have less means for selecting a recipient; the content of the message, terms of address and the position of the message in the conversation structure.

By default, when a participant posts a message which initiates a thread, he cannot select a recipient and is constrained by the system to address no one in particular. When a participant sends a responding message, he selects a unique addressed recipient because the newsgroups system requires the users to choose the message they answer. But, even if the message has an addressed recipient, it remains readable by any person connected to the system.

In fact, the usual newsgroups impose users a poor and simplistic selection of the recipients of their messages. Besides, the distinction between ratified participants and bystanders becomes less meaningful, because messages sent to usual newsgroups can be read at any moment by anyone who is connected to the system. In other terms, it is impossible to know who belongs to the conversational group at any moment. When a participant sends a message, he has no way of knowing who will read it but can only hope that, if he is addressing a specific recipient, this one will be the one to answer.

Furthermore, the way the discussions are structured in usual newsgroups does not take into account the particular participative and interactional role of the host ([22]).

2.2. Topical coherence

Several studies, like [13], [14] or [23] show that computer-mediated discussions are often confused and have a low level of interactional and topical coherence, because of the “proliferation” of discussion threads and parallel conversations.

Thematic digression is a very frequent phenomenon in newsgroups: the various discussion threads could deal with topics which are very distant and, within one discussion thread, the thematic development resulting from the sequence of messages could be similar to a real “topic decay” ([13]).

To a large extent, this thematic incoherence is the consequence of some difficulty for the users in having a global reading of the messages sent to the newsgroup, which would be a necessary condition for identifying which topic is off the subject ([14]: 82-83). Thus, the considerable number of discussion threads and irrelevant messages prevents a user from knowing if the message he reads and he wants to answer creates or not a “topic decay”. At last, the possibility of joining in various parallel discussions does not invite the participants to maintain a high thematic coherence.

2.3. Readability of the sequential structure

Messages are sometimes inaccurately positioned in the sequential structure of the conversation, and, even if it is not the case, the discussion structure is sometimes misunderstood by the newsgroup users. For example, its content could signify that a message is an answer whereas it initiates a new discussion thread ([23]).

2.4. Exchanges length

In a usual newsgroup, exchanges of messages are often truncated. When exchanges are not truncated, the conversational sequences are generally very short. ([23]).

2.5. Conversational history

Moreover, in a usual newsgroup, it is impossible to know the extent of the participants' knowledge of the discussion in which they are taking part. Golopentja ([11]) has described the important function of "conversational history" for the collective management of discussion, which means the participants' capacity to have a shared knowledge of the previous communicative exchanges within the group. In actual newsgroups, no participant can know the other participants' knowledge of the discussion.

3. PartRoOM: a Participative-Role Oriented Model for designing a profiled newsgroup

As we already expressed, our hypothesis is on the one hand that the limits which we listed above come from the non appropriateness of the underlying communicational model, and on the other hand, that a newsgroup based on a model which takes in account the Participative Framework might bypass this limits.

According to the Participative Framework (cf. section 1), the identification of the recipient(s) of a message is an essential point to interpret its content, its pragmatic or argumentative value, its role in the exchanges' dynamic, etc. Thus, our proposition to improve newsgroups' interfaces in order to fulfil the existing limits consists firstly in allowing a user to differentiate the ratified member(s) from the audience of the conversation.

Consequently, the system will have to permit a user to choose the recipients of his/her message, and more precisely, the major or secondary recipients, to choose if he/she wants to let his/her message visible to the ones which are not ratified, or in contrary if he/she wants to have a *real* private conversation. Secondly, we want to define an interface which allows the user to visualize threads sorted by his/her participative role, which can change depending on the messages; in fact, a user could be an addressee (major recipient) of a message, then be an auditor (secondary recipient) of one of the answers, and then be excluded of a small conversation taking place between other participants of this thread.

In order to take into account these conditions, we propose a model, named PartRoOM (Participative Role Oriented Model). Contrary to existing tools based on semi-structured messages ([21]), a PartRoOM-based newsgroup will not force a user to type his/her message according to a content category, or to follow a selected format, but it will impose to select explicitly the recipients of the message.

After explaining the organizational metaphor which a PartRoOM-based newsgroup takes into account (table 2), and the interface that could display the conversations (table 3), we will then describe PartRoOM with the UML language ([2]), showing two state-charts diagrams, the first on thread management (figure 1), and the second one on the dynamics of a conversation (figure 2). Finally, we will illustrate the use of a PartRoOM-based newsgroup with a use cases diagram (figure 3).

3.1. Organizational face-to-face conversations metaphor supported by PartRoOM-based newsgroups

According to the fact that PartRoOM is an implementation of a face-to-face conversational model, our metaphor for the system that we plan to design is the one of face-to-face conversations in an organization. We have identified six main categories of these conversations:

- An event is announced to the entire organization, or to a part of it, but without addressing someone(s) in particular.
- Someone questions someone else, or a group of people in the organization, and the others know about this question.
- The members of a near meeting are notified
- During a meeting:
 - Someone is speaking to the whole meeting,
 - Someone has a private conversation with a part of the meeting, but the others could hear him/her
 - Someone chooses to whisper during a private conversation, which means that the others are not able to hear him/her.

The mapping between these face-to-face conversations in an organization, and communications mediated by a PartRoOM-based newsgroup is described in table 2.

Table 2. Conversation situations taken in account in PartRoOM

Organization metaphor		PartRoOM translation
Announcement		Non ratified, public message
Questioning		Addressed, public message
Meeting start		Message to ratified recipients
Meeting progress	Speaking to everyone	Message to the (ratified) members of the meeting (a kind of "reply all")
	Have a private conversation	Message to a sub-group of the meeting members
	Whisper	Message to a sub-group of the meeting members, "whisper" box checked

3.2. Interface structure of a PartRoOM-based newsgroup

The users will visualize the threads in an interface made of four tabs, as shown in table 3. In order to propose an understandable vision of conversations, we have chosen to not separate the messages of a thread; so, for example, when there is at least a message in a thread where a user is a principal recipient, the system considers that the user will see this thread in the principal tab. We will show in the next section the benefits of this solution, in term of Participative Framework dynamics.

Table 3. Structure of user interface, depending on conversational role of the reader

	Type of tab		Criteria to show a thread in the tab	Name of the tab in the interface
	Live conversations	Ratified	Major	at least one message has the reader in the "To" field
Secondary			the user is never a principal recipient and at least one message has the reader in the "CC" field	CC: username
Bystander		the reader is never addressed and at least a message is public	Public Conversations	
Past conversations			Archived Thread	Past conversations

We propose also a new function which does not come from the implementation of the Participative Framework, but from the analysis of one of the exposed limits in section 2. This function consists in distributing the management of the conversation threads, by giving the responsibility of the thread to its launcher. That means that the author of the first message of a thread (his/her launcher) will be able to decide when to close, to archive, or to delete it. These actions of closing, archiving or deleting threads, represented in the state-chart diagram on figure 1, will be available in a particular tab named "Management of my threads", where only the title of the threads will be displayed. By default, the whole thread will be seen by his/her launcher in the "major recipient" tab, even if there are no messages except the first one.

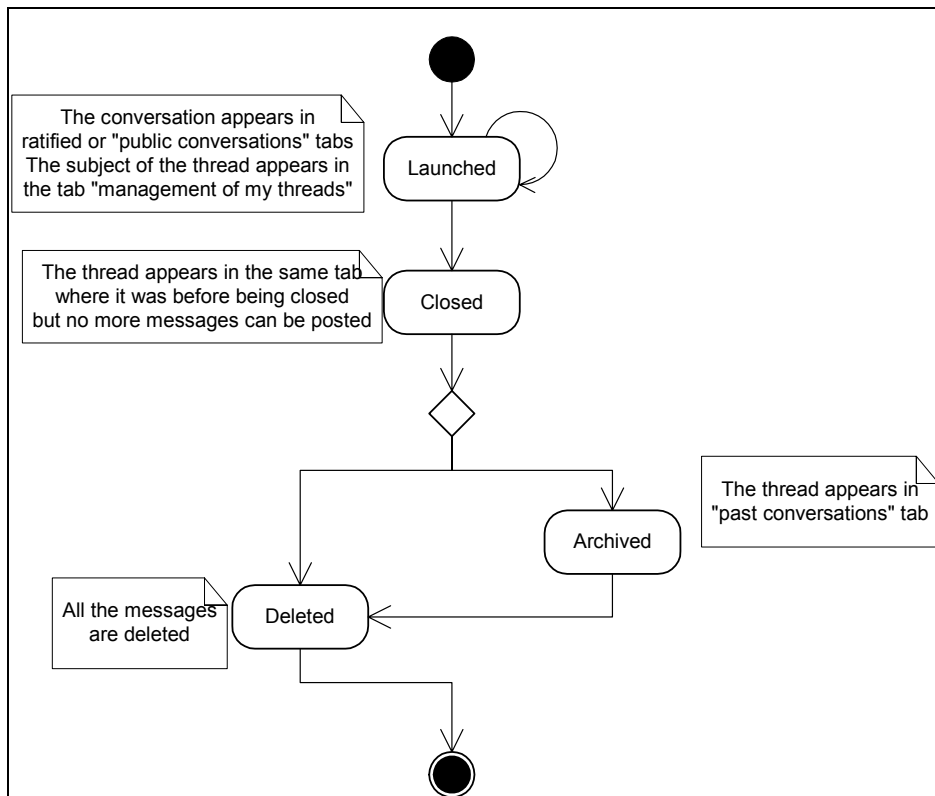


Figure 1. State-chart diagram representing thread management by his/her launcher

3.3. Rules of displaying conversations in the interface

As we have seen in table 3, the principle of PartRoOM is to display the threads in different tabs, depending on the participative role of the reader. Because of our choice to not separate the messages of a thread, and to consider that when there is at least a message in a thread where a user is a principal recipient, the system displays it in the principal tab, we have to take into account all the kinds of messages, the possible flows between messages in a conversation, and their consequences on the visualization of the thread. This description of the dynamics of a conversation is illustrated in the state-chart diagram on figure 2 below.

From the less to the most private, a message can be non addressed (public, by default), posted to a list of members (named L_i in the diagram of the figure 2) *and* public, or simply posted to a list of members; L_i is then a list of ratified recipients (addressed or non addressed in the Goffman sense). When someone replies to a message, the fact that he/she decides to make a private conversation, to whisper, or the fact that at least a message of the thread was public have consequences on the way of the thread will be displayed. Concerning the private conversations and the whispering, when one of the members replies to message, he/she can make a private conversation by restricting the list of recipients (this restricted list is named L_j in the state-chart diagram), and/or by checking the “whisper” box. When it is checked, the previous members who could read the messages of the thread before, and who have been removed of the recipient list, are not any more able to read the new message, which appears in grey in the conversation thread. Or else, if the “whisper” box is not checked, the removed members will still be able to read all the messages of the thread.

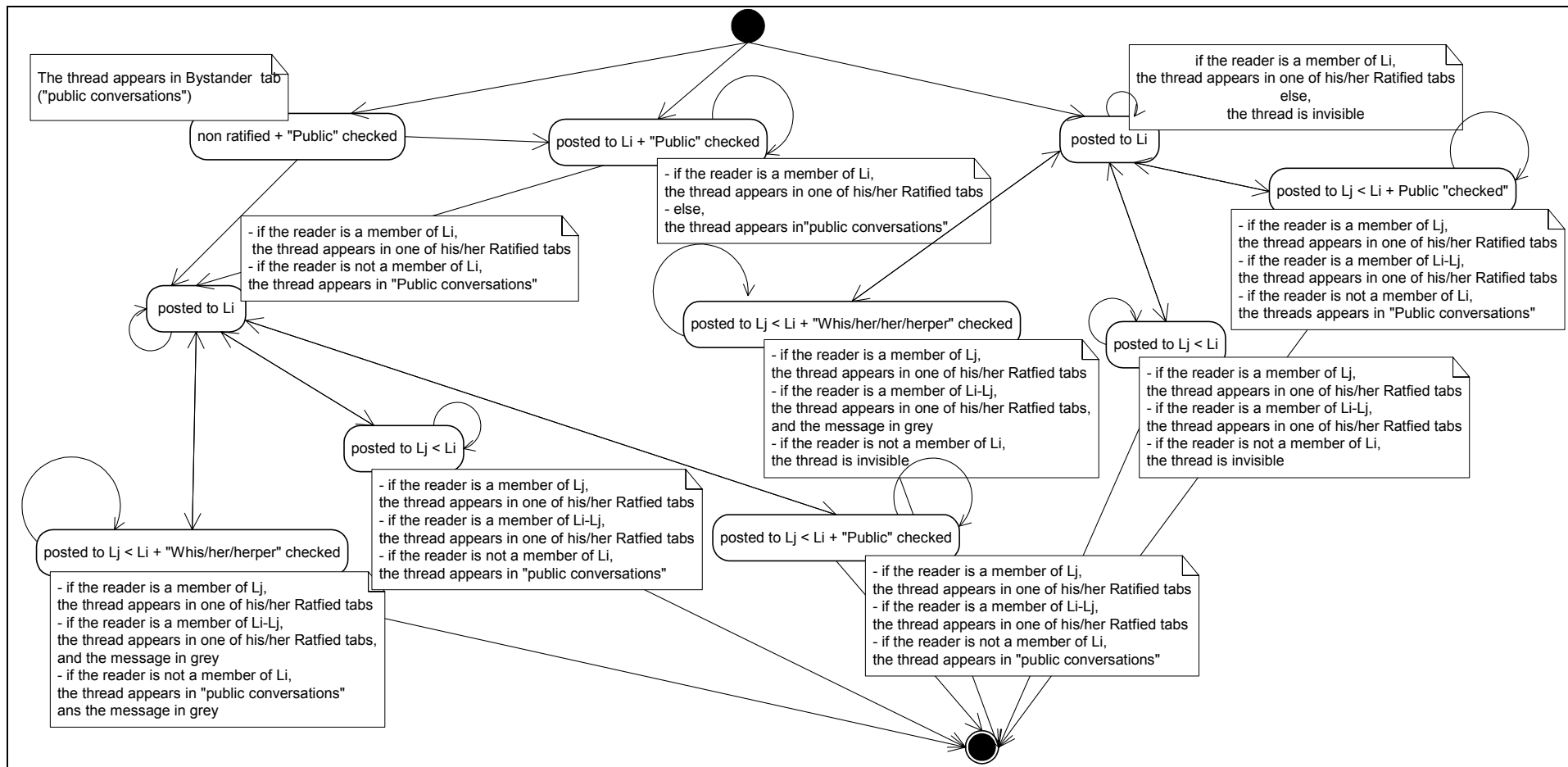


Figure 2. Messages' State-chart diagram and impact on the visualization of the threads in the tabs

To conclude with this presentation of PartRoOM, we could say that our design aim brought us to reconfigure a little bit the participative model, but without distortion. Actually, we can find in PartRoOM the two categories of ratified actors: a member is addressed when he/she is in the “to” field of a message, he/she is unaddressed (in the Goffman sense), or an auditor when he/she is in the “cc” field of a message. We also find two categories of bystanders, but not the same as in the Participative Framework: on one hand, we can not call overhearers the ones which read the messages in the “public conversations” tab, because they do not read them by accident, so we prefer to call them “hearers”. And on the other hand, we do not find eavesdroppers in our system –apart from hackers–, because members have to be identified to read messages, but we find another kind of bystanders which we call the “non-hearers”, who are the users which see some messages in grey, when they are excluded of a private conversation (the author of the message remove them from the recipient list and checked the “whisper” box).

After having presented the design principles, we are now going to present the use cases of this kind of newsgroup.

3.2. Use cases of a PartRoOM-based newsgroup

As illustrated in the use cases diagram on figure 3, an identified member of a PartRoOM newsgroup is able to:

- Read the existing threads classified in the four different tabs according to his/her participative role in the conversation: (1) a tab where the reader will see all the threads where he/she is the principal recipient of at least a message, named “TO: username”, (2) a tab where the reader will see all the threads where he/she is the secondary recipient of at least a message, named “TO: username”, (3) a tab named “public conversations” where the reader will see all the threads where he/she is never addressed, but whom members have decided to let the conversation visible, (4) a “past conversations” tab where the reader will see all the archived conversations.
- Participate to an existing conversation: the member can reply to a message, which is a part of a conversation, in several ways: (1) without modifying the list of recipients (a kind of “reply all” in an e-mail system), (2) by restricting the list of recipients if he/she decides to have a private conversation with some members, (3) by enlarging the list of recipients if he/she decides to open the conversation to other members. The second and third ways have some possible extensions. Firstly, when the member wants to have a private conversation, he/she can on the one hand let it visible to the excluded members (as in a meeting, when one is speaking to someone in particular, but the others can here what he/she says), or the second hand, he/she can check a “whisper” box to hide the message which will appear in the thread, but in grey for the excluded members. Secondly, the opening of a conversation could be maximum by checking a “public” box, which consequence is that the whole thread will appear in the “public conversation” tab for the members who were never addressed before in this conversation.
- Create a new conversation (or thread): the user proposes a new subject by posting a message, which can be ratified to some members or not, and public or not. This action of “thread launching” allows him/her firstly to see another tab named “management of my threads”, corresponding to the subjects of all the threads which he/she has launched, and secondly to make use of management functions of his/her threads in this tab: closing, and then archiving or deleting them.

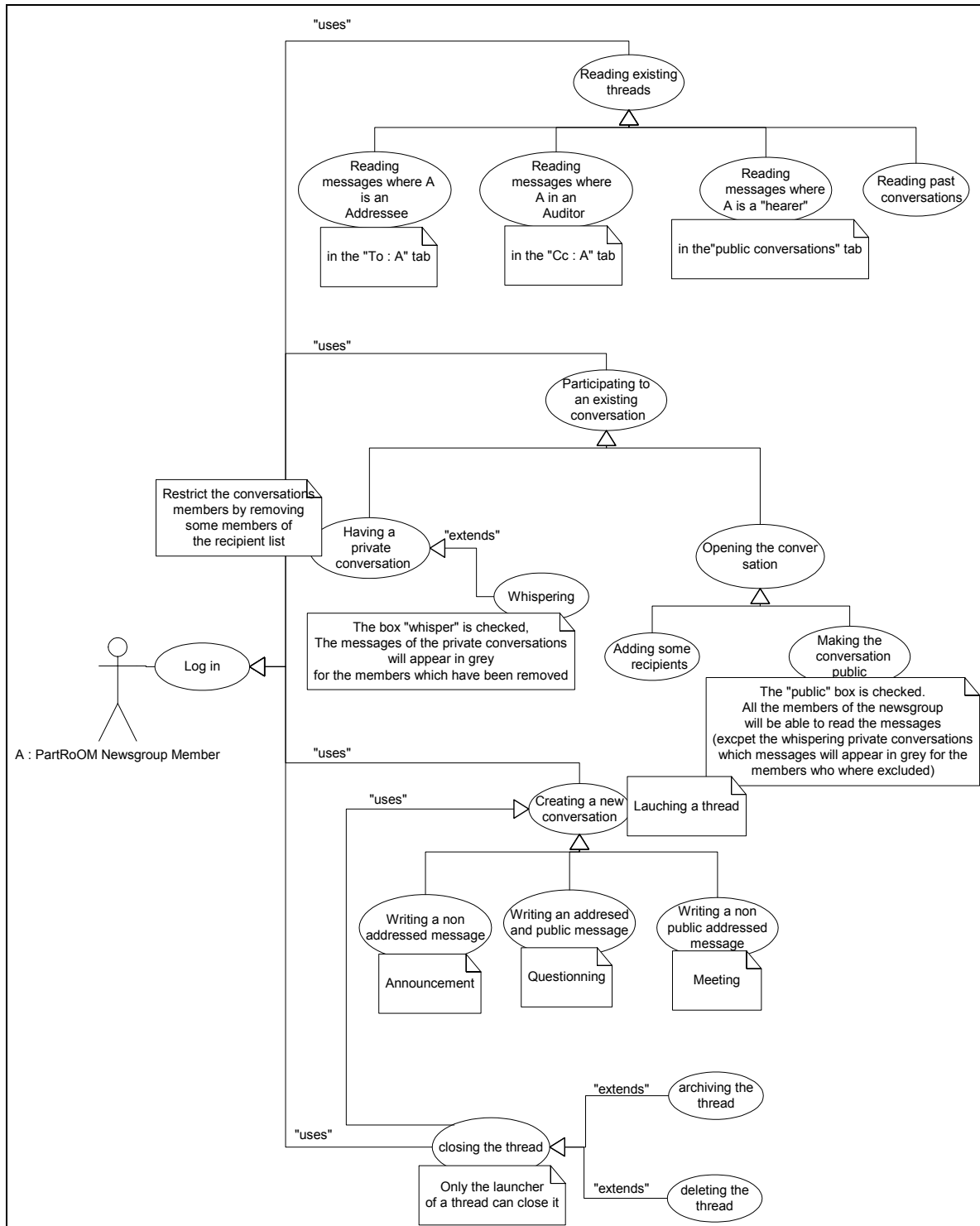


Figure 3. Use Case Diagram of a PartRoOM based newsgroup

After this presentation of PartRoOM and the potential use cases of a newsgroup based on this model, we are now going to propose how, to a certain extent, this kind of newsgroup could fulfil the actual limits of newsgroups.

4. How the use of a PartRoOM-based newsgroup could solve problems with existing newsgroups

4.1. Benefits for structuring and management of discussion

In our hypothesis, a newsgroup which makes explicit the Participative Framework can be resolve or limit the problems described in section 2.

4.1.1. The Participative Framework

The position and the role of each message in the discussion dynamics are defined by its reception format. Within this system, sending a message implies a choice among several audience roles: major recipient, secondary recipient, or bystander. It allows the senders to define the reception format of their messages in a precise and flexible way. The advantage is even more obvious for the recipient: he knows clearly the role allocated to him by the message he reads. Thus, the way the discussion is structured is specific for each participant.

4.1.2. Topical coherence

Making explicit the reception format allows managing fragmentation and emergence of subgroups in an easier way. In fact, the discussion subgroups are perceptible only by the participants to these groups. Thus, fragmentation becomes a type of discussion management which cannot cause interference on the global discussion.

4.1.3. Readability of the sequential structure

The problems of “misplacements” of messages in the sequential structure do not still exist because the structuring based on thematic and chronological sequential becomes secondary in comparison with the structuring based on the Participative Framework, which is different for each participant, according to his/her participative role.

4.1.4. Exchanges length

PartRoOM is supposed to favour collective and cooperative management of the discussion. In relation to this goal, PartRoOM entrusts the participants with the task of managing the discussion sequence they decide to open: sustaining the discussion, formulating summaries of the sequence, closing, deleting or archiving the sequence. This individual management of sequences is supposed to limit the problems of truncated exchanges or “moribund” discussions.

4.1.5. Conversational history

Finally, we will try to develop a specific functionality of PartRoOM, which will allow identifying the participants who share the same knowledge of discussion.

4.2. Benefits for organizational dynamics

A PartRoOM based newsgroup could also improve organizational dynamics. Actually, when an actor can see at first glance the messages where he/she is a principal recipient, it allows him/her to define some priorities in the messages that he has to deal with. The system permits also to reinforce trust, by avoiding eavesdroppers in conversations. It can also be seen in term of decision aid, because private conversations permit users to build coalitions, which is a crucial function in decision making. Finally, this system provides information on actors' importance in the group dynamics, because their role in the exchanges (excluded, included, leader ...) becomes explicit and easily visible.

5. Discussion and further work

This research is based on an application of the Participative Framework model, coming from the multi-party discussion theories, in order to design tools for computer-mediated group discussion. We have presented here an exploratory work, and this paper introduces a diagnosis of communicational problems observed in usual newsgroups, the PartRoOM Model, and our assumption that a tool based on PartRoOM could solve these problems. This work has of course to be completed with an evaluation, as soon as the development of the PartRoOM-based newsgroup will be achieved. This experimentation will allow us to test our hypothesis of better communication with a tool implementing the Participative Framework Model. Besides, it will permit us to precise some potential limits; for example, the role of this tool in relation to other communication devices. More precisely, how could the user choose between posting an addressed message to a unique recipient in our tool or sending an e-mail ? In the same way, what will be the role of our tool in relation to groupware ? We suppose that the elaboration and the practice of use rules would bypass this problem, for instance, the rule of selecting a unique tool for managing the whole communication events in a work group.

Furthermore, we continue our work on PartRoOM in order to implement other features of the Participative Framework Model. For example, PartRoOM could be completed to take into account the recipient's point of view about his/her participative role (in PartRoOM's present version, the participative role of a recipient is defined by the sender of the message). Another interesting function could be the refinement of the choice of recipients: now, PartRoOM allows users to select recipients in a list, and we think about adding the opportunity of a "negative selection" (a kind of "everybody except X").

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