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8. ERICOM case study - Collaborative practices

A. Decisions

The DELTA team used a general list dominated by researchers, overall, with a limited role of the project coordinator, and the other coordinators, especially in the beginning and the end of the project. Moreover, the initiation of the communication and the exchange of documents were the same for researchers and coordinators. The managerial list was somewhat dominated by the project coordinator, who was also the main responsible for the initiation of communication. Indeed, the use of the general list there allowed the participation of more members in decision-making processes, and justification of decisions on the basis of “the team”, which was not evident in the managerial list. What can we learn about this from ERICOM?

I first explore the extent to which ICTs are used in a different way by central and peripheral researchers (coordinators and researchers respectively), with regards to the frequency of communication, and the initiation of communication. Next, I focus on how decisions were taken in ERICOM.

General emailing list

The results were completely opposite to that in DELTA, as scientific coordinators in ERICOM dominated the list: 28% of the emails were sent by researchers, as opposed to 72% of emails sent by scientific coordinators. If we only take into account the active members, it would mean 83 emails per coordinator on average, and 19 emails per researcher on average. But does this relationship change over time? The following figure (Figure 15) shows the relative dominance of the coordinators in the emailing list over time.

On the whole, the coordinators’ dominance of the general list decreases over time, especially from month 19 onwards (group 4 left the team in month 18). Nevertheless, the prevalence of researchers in the list was restricted to specific periods: months 19-21, 29-30, 33, 37-38 (when the line goes below 1), and these months overall represent 59 emails in total. Therefore, the figure reflects more the abandonment of the general list,

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68 Active members are the one sending at least 7 emails (1% of the total emails). I remind that the analysis was performed on the total amount of emails to the general list N=697.
69 This figure presents the number of emails per coordinator divided by the number of emails per researcher each month. The line gives the moving average trend line (period 2).
70 Indeed the numbers were inserted in an SPSS file and a negative linear trend was identified (Sig. 0,000, Beta -568, Adj. R. Sq. 0,303 N=39).
and the move towards the managerial list, especially by the coordinators, than the alleviation of hierarchy in the general list.

![Relative power of coordinators over time](image)

Figure 15: Relative dominance of coordinators over time

The second issue, whether the initiation of new topics in the emailing list is related to the hierarchical status of the members, was analyzed with the use of the subject header of the emails. Almost 63% of the emails sent by researchers were original contributions, whereas that percentage was 42.5% for coordinators. It seems that coordinators were discussing the issues in the general list, whereas researchers raised new issues, or merely announced or reported work.

A One-way ANOVA between the status of the members and the number of attachments sent also showed statistically significant results: overall researchers tended to send slightly more attachments than scientific coordinators.

Management list

In comparison to the DELTA team, the managerial list in ERICOM was not as restricted: some coordinators asked for the participation of their researchers in the list. This could be related to the multiple roles that the management list played in the team: coordination and planning discussions or announcements were circulated there, and work was sometimes sent. In general the management list in ERICOM included topics of general discussion much more than the managerial list in DELTA, which was exclusively for sensitive managerial (mainly resource-related) issues.

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71 Using the database containing one email per row (N=697) I cross-tabulated the existence of “Reply” indications in the header with the hierarchical status of the members: phi 0.183 Sig. 0.000 for the whole period. When the cross-tabulation was broken down by month only six months showed a statistically significant result (months 11, 13, 15-17, 28).

72 Same database as before (N=697) Sig. 0.013, researchers Mean: 0.52 coordinators mean: 0.26
Researchers participated in the managerial list, but they were not active at all, sending 6.7% of the emails, whereas 57.7% of the emails were sent by the coordinators (N=391). The rest 35.6% of the emails were sent by Pedro, the project manager. Especially from week 64 on (when he was hired) Pedro was responsible for 50% of the emails in the managerial list. This is a much higher level of participation than Mario’s 34% of emails. This indicates that the managerial list was almost exclusively dominated by scientific coordinators and in the second phase by Pedro, together with coordinators. Researchers hardly participated in the discussions about coordination of work, or managerial issues.

The amount of original contributions in the managerial list also related to the status of the members: 70% of the researchers’ emails were responses, 64% of the emails by coordinators were responses, whereas 93.5% of the emails sent by Pedro were original contributions. This shows that the difference between Pedro and the rest of the team was very pronounced. He was the one raising new issues and initiating communication in the management list. The number of attachments sent through the managerial list was also dependent on the status of members, with researchers sending more attachments than coordinators, and Pedro sending the most attachments.

In conclusion, coordinators participated more than researchers in both lists and Pedro seemed to dominate the communication in the managerial list. Researchers were generally absent from discussions, in both lists. Therefore, we would expect that decisions through the general and the managerial list would be less participatory than in DELTA, and we would generally expect coordinators, and Pedro, to dominate decision-making processes. The qualitative analysis below will examine this.

The DELTA case indicated that in cases of multiple competing and interweaving levels of authority, the individual style of leadership did not influence the decision-making processes. Decisions there were influenced by the four levels of authority, (the project coordinator, the WP leaders, the management committee, and the local context) as well as the publicness of the medium, which allowed for the participation of researchers and also influenced the argumentation and justification of decision-making process. But, how were decisions taken in ERICOM, which had a different balance of coordinators and researchers in the online media?

According to the technical annex of the contract, there would be three levels of authority in the ERICOM team:
1) Project director: Laura (director of Jose’s institute) whose tasks would be to coordinate work, chair meetings, appoint people to work for tasks, represent the project (technical and managerial aspects);
2) Project Manager: Jose, whose task would be to solve administration problems, ensure deadlines are met, manage project archive, ensure financial issues;

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73 The database contained all emails sent to the managerial list (N=391) Phi 0.558; Approx. Sig. 0.000
74 The analysis was in the same database (N=391) A one way ANOVA resulted in Sig. 0.000; researchers: Mean 0.27, coordinators: Mean 0.09, Pedro: Mean 0.58.
3) WP leader: from the group with the most resources in the WP, “responsible for planning and over-seeing the progress of the tasks and Deliverables”.

Therefore, there again was a multiplicity of authority levels instituted in the project, as in DELTA. However, these levels did not function in the same way as in DELTA. Moreover, at the second phase of the project, the project manager, Pedro, played an increasingly important role.

Jose’s style of leadership was very tolerant and permissive: at no point did he dictate or even suggest to the members of the team how work should proceed. Moreover, he had a problem performing his tasks as a manager: during the first review meeting, the lack of managerial control and leadership became obvious to the team and the project officers; and the project faced the danger of being stopped. Jose’s attempts to resume his managerial and coordination tasks after the meeting were not successful either, partly because of the additional problems that the transfer of the project in two groups (group 4 and 5) created. The managerial and coordination vacuum also resulted in problems for the substantive work: lack of communication with the officers, problems with the quality of data, delay in the transfer of group 4, lack of integration in the deliverables. ERICOM had thus to face a series of issues that were intermingled.

The management committee, that is, the coordinators in the project, started discussing the problems in the team after the first review meeting, and different solutions were identified. The problems were translated in a different way by the members, which meant that different solutions were sought. George focused on the delay of Eurostat to sign the contract and agree to the transfer of the project to his university, and thus the solution was that Eurostat be urged to finalise the procedure. Jack focused on the importance of WP8, and thus his suggested solution was a collective effort on this work package. Moreover, he conceptualised the problem as lack of leadership from Jose and he emphasised meetings. John focused on what the team promised to do in the contract, and thus a professional project manager who would keep to the contract was favoured. Jose focused on the lack of communication and collaboration in the team and emphasised the role of email communications and the team’s help in his managerial tasks.

Moreover, we need to keep in mind that the management committee was not formalized as a level of authority in the contract of the team, the way it was in DELTA. There were no rules concerning which decisions would be taken by the management committee, nor how decisions would be taken. In short, the management committee had no formal role.

So, during the first phase of the project, there were a number of coordination, managerial and substantive problems in the team; Jose and the coordinators were mainly involved in these discussions, without anyone assuming an authoritative role. Rather than imposing a decision, all members were merely urging for a decision to be taken, requesting thus a leading role from someone. The multiplicity of authority levels did not lead to many individuals trying to assume control and impose their views, as in the case of DELTA. Rather it created a managerial and coordination vacuum, because of the style of leadership of the project coordinator, Jose, and the coordinators. Therefore, the
multiplicity of authority levels created tensions in a different way than in the case of DELTA, by creating a decision and coordination vacuum.

At the substantive level, this vacuum resulted in the partners working rather independently on their own clearly-defined tasks. The WP leaders also had a very permissive approach: under their WP the other groups could develop more or less their own working plan without any need for integration or common decision-taking. When more integration was necessary, as in the case of WP8, this resulted in bottom-up spontaneous solutions from different individuals, which were immediately taken up, in view of the lack of leadership. “[I]deas would be followed without discussion, there was generally no disagreement on how to proceed… it was more that lack of leadership and guidance on how to proceed… and every idea that sounded reasonable and good was followed” (Hendrik). At the managerial level, this decision and coordination vacuum was problematic as it threatened to breach the contract with Eurostat. The process that led to George’s resignation (see next section) is also indicative of this: nobody was taking any decision for the problematic situation. So, the decision and coordination vacuum created tensions and prepared the ground for Pedro’s role.

Pedro had no problem with taking decisions. His dominance of the managerial list and his style of communication, with most of the initiation of new topics, are indicative of this. He was hired to manage and coordinate a team which had problems coordinating and managing itself: in this sense, he did not impose his decisions on the team, per se. It is rather that he followed actions which he often did not discuss with or inform the team about. A good example is the process that he followed with the setting of agendas for the meetings. An agenda would be compiled and sent to the team before the meetings, and any comments or additions from team members would often be ignored, which more than once caused tensions. Another example is the unilateral decisions and actions he took concerning the group 8 and their work on WP8, often without informing the team. Jose, who was still the scientific coordinator of the project, rarely intervened.

So how were decisions made in the ERICOM team? Before Pedro’s arrival, the multiplicity of levels of authority, in combination with the leadership style, contributed to the emergence of a managerial and coordination vacuum, which led to lack of decisions on managerial and substantive issues. At the substantive level, this resulted, on one hand, to work being carried out independently and locally and, on the other hand, spontaneous proposals being taken up for common work. At the managerial level, this created a lot of tensions. When Pedro came, decisions were taken by him unilaterally, sometimes without informing the team, which also created tensions. Other times, a different opinion would be bypassed or ignored, and this was especially true via email.

Very often comments about the agenda, or the work process, or about the lack of information on some issue would be ignored and not followed up. During meetings, however, this was hardly the case. In this sense, there was a clear difference between the decision-making processes in ERICOM and in DELTA. In ERICOM, the emailing lists were hardly used to take decisions, before or after the hiring of Pedro. Suggestions or
proposals via the lists would be ignored, or sometimes a discussion would take place but it would not lead to a decision. Instead, the issue would be abandoned.

In meetings, however, and especially after the first review meeting, decisions would be taken and recorded in the minutes. Usually, a proposal for a line of action would emerge bottom-up, not necessarily by the WP leader, or the coordinator. The discussion was followed more by some members and less by others. Nevertheless, the presence of each group representative in a meeting meant that they would be explicitly asked for their opinion and in the end a decision would be adopted. Through the list it was easier to ignore issues and very often members did so.

So how did differences among media influence the process of decision-making in ERICOM? The general lists were hardly used by the team to reach decisions on a topic, even though there were attempts for decision-making. Generally, an email discussion or issue would be only followed by specific members, whereas it would be ignored by others. This became clearer in the second phase of the project, when members of the team felt that it was indeed Pedro’s responsibility to take decisions and present them with a final choice. Decisions would be only taken in meetings. Thus, the use of the lists for decision-making processes (for managerial and substantive issues) enabled the ignoring of issues, and suggestions. Responsibility about decisions was diffused through the lists, whereas in meetings responsibility was taken on by the representative of each group. This was the case in both stages of the project: the first with a lack of clear leadership and the second with clear, authoritative leadership.

And did the use of ICTs increase the pace of working processes in a team? The analysis above indicates that this was not the case. The use of the emailing list for decision-making led to issues being ignored and postponed. We can therefore understand the decision-making processes in both DELTA and ERICOM, as being influenced by the levels of authority and the media used, with the style of leadership as an intervening variable: a lack of leadership or an authoritative style of leadership might contribute to the use of electronic communication for the diffusion of responsibilities in the decision-making process. In these situations, there is a clear difference between face-to-face meetings, which enable the focussing of responsibility, and electronic communication, where responsibility is diffused. In situations with multiple contesting leaders, the use of the team-wide lists contributed to the justification of every decision; and thus the more public the medium, the more inclusive and transparent the decision-making process.

Peripheral researchers in ERICOM were absent from coordination and managerial discussions in general, whether in meetings or through the lists. This also becomes obvious from the quantitative analysis in the first section. In discussions on substantive issues, and their related decisions, they played a role mainly through initiative taking and suggestion of solutions. This again was more obvious in meetings, when work needed to be done, than via the general list, where often the suggestions were ignored.
B. Conflicts/ tensions

The analysis of DELTA showed that most conflicts resulted from the competing levels of authority in the project, over control of the project. The increased use of ICTs did create few misunderstandings; the publicness of the media used influenced the balance of power in conflicts, the translation of the issues at hand, as well as the conflict-resolution mechanisms. Was this the case with ERICOM, given the different role of the authority levels there?

After the first review meeting, when the managerial and substantive problems surfaced and the project was under threat, there were often tensions and conflicts in the ERICOM team. Here, I briefly describe and then analyse the process which led to the resignation of group 4, in order to bring out the interplay between the use of different media in conflicts.

The group requested the transfer of affiliation from a private research institute to a university. During this process, the institute stopped carrying out tasks for the project and supporting the members of group 4, George and Marc, financially; the university authorities requested the signed contract in order to support them. In short, group 4 existed in limbo, in an administrative vacuum. In the meantime, group 4 refused to take on leadership of WP8, which the project officers emphasized, until its position was clarified with a new contract. However, Eurostat delayed taking a decision about this. In essence the problem was created by the difference in the regulations between the local institutional context (George’s university) and the funding context (Eurostat) of the team. Therefore, different regulations in the two contexts in which the team was embedded resulted in a tension in the team.

When Pedro was hired, a tension between Pedro and George erupted, when Pedro criticized George’s work in the public emailing list. George sent an email to the managerial list requesting an apology from Pedro “in the same mailing list where his e-mail was first directed. As this is a very sensitive issue for me, I'm posing it to the management mailing list.” Pedro apologized to both lists and the tension was temporarily resolved. The strategic use of the media comes to light: Pedro sent his criticism to the general list, where the original text was sent. George replied in the managerial list “as this is a very sensitive issue” and demanded an apology. Pedro sent his apology to the managerial list, replying to George’s email, and recognizing the sensitivity of the issue. However, George wanted an apology to be made publicly, to the list that the original “pejorative” email was sent. The movement from one list to another, in this sense, was a strategic choice of both George and Pedro.

Two weeks later, in the general meeting of the team, George gave a presentation about WP8, which was received critically by members of the team, as it seemed unrelated to the thematic focus of the project groups. The situation became eruptive and what followed was a vote among the partners whether group 4 should remain in the project or not: the majority of the members wanted to keep group 4 in the project.
If we compare the tension created when the text was sent to the general list and when it was presented in the meeting, there are again differences. When comments were made through the list, a substantive discussion started about the topic of the text and how the work could develop. The comments and discussions, however, were not incorporated in the text: responsibility, again, was diffused through the general list. When the same presentation was made in the meeting, it was not ignored, and the comments and criticisms led to an issue of responsibility: George’s argument was that he was the WP leader and thus responsible for its content. The team’s argument was that the team had an overall responsibility to integrate work (and thus a focus on a different topic). The substantive issue was thus translated into an issue of authority and control (who is responsible for the content of WP8) in the meeting, and contesting responsibilities emerged.

It is not a coincidence that the problem was created with WP8: it was the only work package which included many different local groups, on almost equal footing (see Table 10, chapter 6). Moreover, the topic of the work package, as noted before, was very innovative, and there was a general uncertainty as to what exactly was expected, or how the indicators would be developed. Therefore, the intended output, and the task allocation, made WP8 the focus of a tension between different authority levels. In this way, the same presentation through the list raised substantive discussions, whereas in the meeting raised responsibility and authority discussions and tensions.

However, the following week the tension took a different twist. Immediately after that meeting (week 76), Pedro went to Luxemburg to discuss with the project officers, and on his return, he sent an email criticizing the project officers for the delays and suggesting that the team should produce letters of rejection of group 4 from the team. George forwarded this email to the project officers. This forwarding of email was considered a problem by some members, since it jeopardized the relations between the team and the project officers. Different solutions to the problem were suggested through private emails and private phone-calls, whereas through the managerial list Jose as the manager, insisted that group 4 remains in the project. Pedro also sent an email to the managerial list asking George to apologize and to resume work for WP8. To this, George responded with his resignation, with a personal email to him and the project officer.

From the beginning of the story there are several elements involved: the managerial aspect, with the tension between the two contexts involved (the regulations of the local context and those of Eurostat); the substantive aspect with delays of work and different ideas about the content of WP8; the authority and responsibility aspect, with George refusing to act as the WP leader in the beginning and then wanting to maintain his authority as a WP leader. This multiplicity of elements enabled the different translation of the issue by different members through different media. The solutions identified at each stage and through each medium were different: through public media (meetings and the managerial list) each translation and solution had to be justified and negotiated. Therefore, a more global solution would be suggested (the voting during the meeting, the substantive discussions on WP8 through the list). Through private media, the actors tried to push their own translation and solution and impose it to the rest of the team.
Here, as in DELTA, the use of personal media (telephone and private emails) for the conflict resulted in a one-way translation of the issue at stake, and a resolution mechanism resulting from this translation. The more public the conflict was, the more people involved, and the more potential translations and resolution mechanisms. In this sense, the meeting and the use of the managerial list offered more possible solutions than personal media. At the same time, the power balance became more complex as more members got involved through public media. The difference between the tension through the managerial list and through meetings is that in the former case the responsibility for the solution was diffused, whereas in the meeting the responsibility was contested.

So, the multiple levels of authority combined with the leadership style, created the managerial and coordination vacuum that was described in the previous section, which created tensions in the team. The use of different media, and especially their degree of publicness, influenced the outcome of the conflicts. This is consistent with the results of DELTA. In addition, the style of leadership also affected the influence of the media, since through the list responsibility about the conflict resolution was diffused, and in the meetings, responsibility about the conflict resolution was focussed on specific individuals.

In the second phase of the project, there were fewer tensions, rarely reaching the level of a conflict or eruption, mostly between Jack and Pedro. The tensions were created by the leadership style of Pedro, the unilateral decisions, and the lack of information to the team. So, the tolerant and very permissive style of leadership of Jose in the first phase, as well as the authoritative style of leadership of Pedro in the second phase, created tensions in the team, more in the first phase than in the second.

Finally, was the use of ICTs edgy and immediate, creating therefore conflicts in the team? The analysis so far suggests that the main reasons of tensions in the team, were not related to the use of ICTs per se, but rather to the coordination and decision vacuum, in the first phase, and the authoritative leadership style of Pedro in the second phase. Even though the email that Pedro sent to the list triggered negative reactions (such as George’s reaction described above), the use of ICTs as such was not the reason for the tensions in the team.
C. Socializing

Some questions in chapter 3 address socializing, and whether it is an activity that is supported through different media: To what extent are different media used for socializing? Do ICTs really “do away with pleasantries”? The DELTA team used both meetings and the general list for socializing, and this helped create and maintain a shared feeling of a team. Socialising activities in the list increased over time, and they were related to the status of the participants. Researchers, being the ones most involved in work, engaged more in socializing and the creation of a team spirit. How did it function in ERICOM, with the different balance of power between researchers and coordinators, but also the different task allocation? As noted in chapter 2, higher interdependence is expected to lead to more personal relations between members of a team.

The ERICOM team used meetings for socializing, and exchange of personal information: they were vital, especially in the beginning of the project, to get to know each other. The general list was also used for socializing, but mainly during the first phase of the project. Appraisal of each other’s work, season’s wishes, and personal information were exchanged. Even during crisis situations, an informal tone was maintained and emoticons were often used. Farewell emails were also common: the announcement of someone leaving the project, and often informing about future career plans.

During the second phase of the project the exchange of jokes and emoticons stopped and the emails with socialising purpose were restricted to exchange of pleasantries, such as thanking messages when someone sent work, or congratulating messages when the project received good review. Socialising changed in character. This transformation in the socializing activity, (from jokes, emoticons, and wishes, to pleasantries) reflects a change in ERICOM: what was a team, in the beginning, with collective communication and collaboration patterns, slowly became a collection of members who were working under the same project. We can understand the collective socializing activity as an indicator of a team identity, which seems to dissolve in the second phase of the project.

How can we understand the lack of a team identity? The ERICOM members, in the second phase of the project, lacked a sense of collective responsibility for the course of the project. Local and bilateral activities were the only focus during the second phase. Further, decisions about the project were left to the manager, meetings took place to inform the rest of the partners about local activities, and the focus of the project shifted: the important thing was what the team had promised to Eurostat. In contrast, during the first phase, and especially after the first negative review, a collective effort was made on WP8, and collective responsibility was exhibited by the groups both for the managerial and for substantive problems and issues.

The erosion of a team identity in ERICOM in the second phase could be related to two factors: the first is the influence of Pedro who was often critical about the project, its substantive results and its progress. In one of his first emails he proclaimed: “shameful results! my profound disappointment... evidence of my initial pessimism concerning the

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bad shape of the consortium... What you need is a dramatic change of attitudes...”. In general his attitude was critical of the project throughout its end, which often reflected his managerial mentality towards it: he criticized work and results that did not explicitly take the users’ considerations into account, and were purely technical, and he commented on the delays of the deliverables. It could be the case that this negative and managerial attitude affected the team members, and eroded the team identity. The insistence on the Commission’s recommendations and the managerial attitude slowly taking over the substantive issues certainly did not foster the collective identity of a (mainly) research team.

The second factor could be George’s resignation under a heavy atmosphere, with a series of managerial and substantive tensions and problems. This must have created a negative feeling for the members, who, after that, stopped the collective, until then, effort on WP8 and resumed their bilateral or independent tasks. In general, the socializing activity of the general list indicates the creation of a rather collective identity in the first phase of the project, which seems to be absent or disappearing in the second phase. The low use of the general list and the lack of general discussions through it are also indicative of this. In this respect, the general list was used, in the first phase, for the exchange of emails with a socializing character, which reflected and helped create a team identity and team feeling; this was rather absent in the second phase. The exchange of pleasantries did not re-create this team feeling, and nor did the common meetings.

The DELTA team managed to create and maintain a team identity, because of the collective responsibility for the comparative study and the collective efforts in all local groups involved. Therefore, there seems to be a link between task allocation in the team, tensions and the creation of a team identity. In distributed teams where the same tasks are shared between the groups, the use of ICTs for socializing contributes to the creation and maintenance of a team identity. In distributed teams with a specialized task allocation and limited collective, team-wide work, the use of ICTs for socializing is not the only precondition for the creation of a team identity. Increased levels of tensions, not only between the members or groups, but also between the managerial and the research mentality may erode a collective identity.

So, do ICTs do away with pleasantries? In both DELTA and ERICOM, ICTs were used for the exchange of jokes, emoticons, pleasantries and emotional support: more in DELTA than in ERICOM; and more in the first phase of ERICOM, than in the second.

As a next step, a quantitative analysis on socializing emails was performed. All emails in the general list were coded as to whether they had a socializing purpose and cross-tabulations with the status of the author and time were performed (N=697). In total 24,4% of emails had socializing elements, with jokes, personal information, pleasantries or season’s wishes. Statistical analysis showed that socializing emails were not related to the status of the members. Moreover, around 60% of emails with socialising nature were sent
by just three individual members\textsuperscript{75}. In this sense, the exchange of pleasantries and socializing emails was not a structural characteristic of the team, as in the case of DELTA, but it was an idiosyncratic characteristic of the communication style of some members.

Further, the time dimension of the socializing emails was studied. The percentage of socializing emails over time (Figure 16) indicates an irregular activity, which further supports the argument for an idiosyncratic and not structural feature of the team. Moreover, the meetings were found to be unrelated to the socializing activity in the list, which was confirmed with a cross-correlation of the two variables\textsuperscript{76}. So, even though the meetings were used for socializing activities, they were not related to the socializing activity of the general emailing list. Therefore, meetings did not boost the socialising activity through the emailing list.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{socialising_activity.png}
\caption{Socialising activity in the general list ERICOM}
\end{figure}

So, does socialising in a team take time to evolve? In ERICOM even though there was socialising activity in the first phase, in the second phase it changed character and instead of jokes, and rewarding phrases, it entailed pleasantries. There was no empirical evidence supporting the hypothesis that socialising required time to evolve in the team.

\textsuperscript{75} Jose 46 emails, George 33 emails and Louis 20 emails out of the 170 emails with socialising nature.

\textsuperscript{76} The cross-correlation was performed between the percentage of socializing emails per month and the number of meetings (N=39, number of lags 4).
D. Coordination and task allocation

According to chapter 2, a number of variables are expected to influence task allocation: the type of intended output, the distribution of skills and expertise in the team, the status differences between the members, the stage of the project. In DELTA, team-wide coordination functioned in a successful way and was influenced by all these variables. The challenges of the highly interdependent collaboration were addressed with a formalization of communication processes, and an uncoupling of task dependencies. Different media were used for a different type of task allocation, but that was related to the stage of the task and not to differences among media per se. Finally, the use of ICTs, and of the shared database did not result in the communalization of research.

However, the intended output in ERICOM was more varied and heterogeneous, the distribution of skills and expertise wider, and the stages of the research not linear but parallel (see chapter 7, section A). Moreover, there were bigger status differences in the communication patterns than in DELTA (see current chapter, section A). Finally, the initial allocation of tasks among the groups was expected to lead to a specialized task allocation, with a complementary type of collaboration (Hara et al., 2003), and therefore a lower degree of interdependence, in some work packages, and a higher degree of interdependence in other work packages (WP8, WP2). So, we would expect coordination and task allocation to be entirely different in the ERICOM team.

There were different types of coordination and task allocation depending on the type of output that ERICOM produced; but in most cases, task coordination was a bilateral issue, which emerged bottom-up and not suggested or decided by each WP leader. There were local initiatives of two- or three groups, for the development of a tool and its implementation, or for the testing of indicators. These informal, bottom-up arrangements had a certain degree of intellectual freedom, and emerged in meetings. They would rather follow ideas of the members, than what was promised in the contract. In these configurations, through local or bilateral initiative taking, task allocation and coordination of work was informal, through face-to-face meetings, or personal means of communication.

Even though these bilateral collaborations entailed a specialized division of labour (one group developing a tool, the other group testing it with analyzing data) the work exhibited higher interdependence than suggested by Hara et al. (2003) in complementary collaborations. This was the case especially because the intellectual focus of the project was uncharted territory. Data gathering, for instance, was the responsibility of mainly group 1 and group 4. However, a high degree of bilateral coordination was needed to clarify what type of data would be gathered, to agree on the metadata, to deliver them in a format compatible with one of the software tools of the project. Furthermore, the development of software tools, and especially by group 4, was done in close collaboration with group 5, which would then use the tools for data harvesting. The logic behind the analysis and the design, the technicalities of the tool, were all issues to be negotiated and coordinated between the two groups.
In this respect, the initial task allocation, which favoured bilateral collaborations, the intellectual focus of the project, which was quite innovative, and the intended output (database, software or report) influenced the coordination and task allocation in the project. This would generally take place in either face-to-face meetings or through personal media, such as email or phone-calls. The media used did not influence the coordination mechanisms as such. This type of coordination resulted in higher interdependence between groups, than suggested in the literature, where coordination took place informally and locally, or bilaterally.

On the other hand, WP8 exhibited different patterns of coordination and task allocation, as expected. Work on WP8 started after the third meeting, in the month that its first deliverable was actually expected. It was the most collaborative work package, in a team which generally worked individually or bilaterally, and had not developed codes and routines of cooperation, responsibility and collective action as a team. The insecure status and lack of resources of group 4, which was supposed to lead WP8, aggravated the problem, and so was the innovative aspect of the work package. Moreover, WP8 depended on data collection from group 1, which was already delayed.

Under these conditions, there were several attempts of semi-formalised team-wide task allocation, mainly in emergency meetings organized specifically for WP8. These attempts were characterized by initiative taking. During these meetings, a list of responsibilities for each member was compiled and then sent to the general list. However, the attempt was not very successful, mainly due to the lack of a clear authoritative voice. After group 4 resigned, group 1 took over WP8 temporarily. The following meeting was dedicated to this task, and resulted in two directions: first, a revision of the first deliverable, on the basis of collective contributions of all members; and, second, a revision of the wording of the work package, so that complexity in the work package could be reduced.

Indeed, when group 8 took over WP8, a meeting with the other groups was organized; but generally the rest of the groups did not contribute much from then on to WP8. The coordination for this work package assumed a formal character, as a new summary for the work package was presented to the project officer, to get his formal approval. The work of group 8 was dictated by practical reasons, such as lack of time and work already performed in other work packages. In essence, the final output of WP8 was a summary of analyses performed in the other work packages. So, the work package which entailed the higher degree of interdependence was broken down to discrete tasks, with a clear responsibility of one group and followed formalized procedures.

Summarising, task allocation and coordination in ERICOM was local or bilateral, with specialized division of labour among the members, following informal procedures and bottom-up initiatives. It took place in meetings, or through personal means of communication. The team had a problem organizing and coordinating the main team-wide task, mainly because of: the lack of a clear authoritative voice on how to proceed; the lack of a clear idea on what the topic of the task was; and the lack of already-established routines of teamwork. The way of collaborating through informal bottom-up
initiatives was simply not adequate to so complex a task. The steps undertaken by the team entailed the reduction of complexity, both at the substantive level, as well as the level of participating groups. The task was carried out rather successfully from an administrative point of view, as it was delivered on time, and was accepted by the project officer.

Therefore, in ERICOM, as in DELTA, both the type of intended output, as well as the distribution of skills and expertise in the team influenced the initial task allocation, which in turn influenced team-wide coordination. In ERICOM bilateral collaboration was mainly complementary, with a clear specialization between groups; and informal procedures were enough to ensure coordination. The challenges of the highly interdependent task (WP8) were addressed (in the beginning) with meetings and a collective coordinated effort, and (later) with formalization of task allocation, and an uncoupling of group dependencies, as in DELTA.

So why were the many meetings, especially in the first period of collective effort, not enough for the task to be coordinated? It could be because of the lack of formalization of communication procedures, or the lack of authoritative voice; but it could also have been because of the increased complexity of the task. It could be also related to the fact that, even though there was a wider variety of skills and expertise among the members, the initial attempts of WP8 were based on an unspecialized task allocation, which simply meant that not all members would be able to provide the same type of input, because of their different backgrounds. Whatever the case, the continuous meetings on WP8 did not result in a successful coordination on the task.

Did the use of ICTs and especially shared databases change the allocation of work between collaborators, and bring communalization of research at an earlier stage? Even though ERICOM used a shared database, this did not lead to communalization of research, but to an uncoupling of group dependencies, as in the case of DELTA, through the formalisation of task allocation.

Status differences also influenced task allocation to a certain extent, and especially in groups 1 and 4: there, data gathering was performed exclusively by researchers, whereas the coordinators were the ones writing the reports, or presenting the results in conferences. Therefore, it was not the status difference between the members in the team per se, but rather local status differences at the level of each group that influenced task allocation. Status differences in the communication patterns through the lists (see section A above) did not reflect status differences in the collaboration patterns.
E. Output production

According chapter 2, output production is related to a number of variables, among which decision-making processes, conflicts and tensions, control and leadership style and frequency of communication are important. In a relatively heterogeneous collaboration, such as ERICOM (see chapter 6, section A) the infrequent communication patterns (chapter 6) were expected to result in low productivity (Pelz, 1956). However, the existence of external evaluation and the different disciplinary backgrounds are expected to lead to high productivity.

So, on one hand in the ERICOM team there was infrequent communication in a rather heterogeneous collaboration, which is expected to lead to lower productivity, on the other hand FP5 regulations which are expected to enhance productivity. The decision-making processes with very permissive, tolerant authority structures in the beginning, and authoritarian decision-making in the second phase are also expected to influence productivity negatively. Taken together we would expect that the amount of output of the team would be low.

Contrary to expectations, the external scientific products of the ERICOM team were numerous: nine book chapters (most of them proceedings of conferences), 49 conference presentations, twelve articles in peer-reviewed journals, (parts of) two PhD dissertations. In addition, there is still output being produced on the basis of the results of the project, unlike DELTA. Moreover, the team produced three databases, and seven software tools for data gathering, visualisation, and information retrieval. With respect to the internal products, the team’s work was not always considered satisfactory: eight deliverables were returned to the team for revisions, as their quality was considered low, and most of them were delivered with a considerable delay to the project officers. From an administrative point of view the project was not very successful, and it was also at risk of being stopped.

Where does this discrepancy come from? It could be the case that the innovative character of the project and its topic was a factor that negatively influenced the reviewers’ evaluation of the deliverables. However, comments from reviewers often related to the issue of overall integration of the deliverables, the precision of the data used, or the adequacy of the theoretical background. In this sense, they did not reflect unawareness of the topic. It could be that, because the members focused so much on output production, they tended to consider and treat administrative requirements (deadlines, technology implementation plans etc) as insignificant. This is a more likely explanation.

It could also be the case that the variety of output, with big databases, different analysis/visualisation/software tools and different conceptual foci meant that more and different publications could be produced. The ERICOM team created more than one databases,

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whereas DELTA only one (based on data from one international company). ERICOM also created a number of visualisation and analysis tools, all of which could be used at a subsequent stage to create more publications in different contexts.

From the twenty-five technical deliverables of the team, five were the development of original prototypes (software development), four of them reports on the application of these prototypes, one was on the development of an online database, and another on the metadata and data description of this database. These types of output were completely different from the other fourteen deliverables, which were reports that (more or less) had the traditional academic design: a theoretical background, an empirical design, data analysis, a conclusion and discussion.

I first examine the media configuration used during output production. In DELTA, public media were hardly used for feedback and knowledge production; when they were used, it resulted in a more chewed, negotiated output. The questionnaire, for instance, was commented by most members (the scale used, the phrasing of the questions, the order of questions etc.) and in this sense it was a negotiated product. However, most of the output was based on individual contributions produced locally; it was communicated through personal media, and it was not a result of co-authorship but of copy-paste. ERICOM, with different intended output, was expected to show different patterns.

I selected two types of internal output (a deliverable on a prototype and a deliverable with a traditional academic format) and an external scientific output to trace their constitution in communication media over time. I expected to find different communication patterns for the production of external and internal output, as the distinction is based on different audiences, which are also relevant for the communication media involved. I also expected to find different communication patterns for the production of the two internal substantive outputs: prototype development and application would be more independent than a case study report, because of the different expertise required.

One of the software tools developed by group 4 crawled the Web and gathered online data from websites. The tool was developed by Marc, discussed locally with George, and presented in meetings of the team, where its usefulness and construction was discussed. During three bilateral meetings between group 4 and group 5, the layout, design and functionalities of the tool were improved, according to discussions about research needs of WP5. These discussions were about the specificities of the tool, as well as about general issues of web data. Often the ideas and discussions were “translated” to programming code and put in the tool on the spot. Different versions of the tool were developed and comments about the tool were discussed mainly in bilateral meetings, and with the limited use of personal emails. The final version of the tool was used for data collection in three WP5 deliverables and one WP6 deliverable.

The software tools and prototypes of the ERICOM team followed similar communication trajectory: the ideas and basic construction of the tool was a local activity, communicated to other team members in bilateral or general meetings. There, feedback and comments from other team members were used to revise the tool. The end product was delivered to
team members on a CD, and put on the internal forum of the website. Therefore, tools were mainly produced and developed locally, with face-to-face meetings playing the most important role in their improvement, and streamlining into the needs of other partners and work packages. In this respect, the tools were not a negotiated product, but a product incorporating different aspects, reflecting the needs and expertise of other members. The tool itself was not discussed, but only its functionality, the format of the output etc. In this respect, tools became multi-faceted products incorporating different viewpoints in the team.

A deliverable written by group 5 was an example of a traditional academic report, based on the work of other groups as well. The work was developed through discussions with the local team members. In the following general meeting, the ideas and substantive results were presented to the team, which provided comments and feedback. Collaboration with group 6 was also arranged, with a specialized division of labour (group 6 gathered the data and group 5 did the analysis and wrote the report). This collaboration was coordinated via personal emails. Another part of the deliverable consisted of collaboration with group 3. Again, the coordination of the collaboration and the ideas about the design were discussed in a general meeting, and they were based on specialized division of labour (data collection through a tool developed by group 3). After the meeting, private emails were used for the coordination of work. During the course of the work, versions of the deliverable were presented in general meetings, and there was some feedback by team members. The deliverable was also sent through the general list to all team members, and some members sent their (minor) comments through private emails, and also through the general list.

As in the production of the software tool described above, the production of the deliverable was a mainly local activity, coordinated and designed locally. It was presented in the general meetings of the team, where some feedback was obtained, and collaboration with other groups was discussed face-to-face. The collaboration had a clear division of labour (one group delivering data, another group writing the report, another group delivering a software tool) and was coordinated in meetings and through personal emails. The end result was sent to the general list, and comments were sent, either through the list or, mainly, through personal emails.

A similar media use trajectory was followed for most deliverables of the team. The first note is that, as in the case of the software tool, the meetings (general and bilateral) were the main medium for the presentation of work, for output production (through comments, feedback and brainstorming) and for coordination of collaboration between groups. The collaboration had a clear division of labour, with each group contributing to different phases of the work: data collection, data analysis, visualization, writing of the report. The coordination and specificities of collaboration were communicated via personal emails, and the end result was sent to the team through the general list for comments. Therefore, the end result was still local but more of a team-product, than software tools, with different phases of the product being the contribution of different groups, even though the writing was local.
To turn to the production of an external scientific output, a journal article by group 5 is traced. The data were gathered with an online tool developed by group 4 and in a bilateral meeting between group 4 and group 5 ideas about the report were discussed, the data were processed collaboratively and their analysis patterns were discussed. The work was presented in the team meeting, where feedback and comments were obtained. The work was finalised by group 5 and sent for publication to a journal.

It has to be noted that this is not the typical trajectory of the external scientific output in ERICOM. The amount of output, and also its heterogeneity, makes it difficult to trace the media use in each one of them. However, it is indicative that here as well, the meetings played a vital role for output production, as well as coordination of collaboration between the different groups. The work was still local, with contributions from the other groups under a clear division of labour: group 1 gathering data, group 5 writing the design, analyzing data and writing the report, group 4 gathering and manoeuvring the data. Apart from meetings, the coordination of this division of labour took place through personal emails. The general list was only used for the sending of the semi-finished results and comments from the other team members.

The analysis above indicates that 1) the medium used predominantly by ERICOM for output production, brainstorming, feedback and (bilateral) coordination of substantive products was face-to-face meetings; 2) personal emails were also used, mainly for the coordination of the work, and the exchange of specific information about each other’s contributions; 3) when a public medium was used, there were comments from different viewpoints reflecting the disciplinary differences of the members. The last point seems contrary to the results of DELTA, where the use of a public medium for the exchange of work resulted in the co-authorship of the output, with substantive comments and feedback, and a negotiated product.

Hence, the distribution of expertise in the team is a variable influencing the impact of the medium on the type of output. In DELTA, where almost all members had the expertise and background to comment on a questionnaire, its exchange through a public medium, resulted in a co-authorship process. In ERICOM, the public discussion of a software tool or a report in meetings did not have the same impact, because of the different expertise of the members, who were often not in state to provide feedback for a software tool. Their comments and feedback reflected different viewpoints: for a tool it would be its functionality; for an academic report it was the way an analysis tool could be used; for the database it would be about the format of the data and the metadata. In this sense, the variety of expertise in the team led to different types of comments to the work: comments that reflected the multi-faceted interests and expertise of the members. This resulted in a more multi-faceted product that in the case of DELTA.

There were cases of external scientific output that followed different communication patterns, however. Presentations, articles and book chapters by group 1 (mostly Jose), group 2, and group 3, were predominantly local in nature, not using contributions by other groups, such as data collection or different types of tools. In these cases, when the output was produced during the ERICOM project, the work was presented to the team in
the general meetings, and feedback and comments were obtained but no contribution of other group was used. The output produced by group 5 was the most integrative in nature, with contributions from different groups, under clear division of labour.

A final note about the role of ICTs in output production in the ERICOM team is that they were not only used as communication media, but also, and most importantly, as data themselves, means of data gathering as well as information retrieval and analysis tools. The project itself would not exist, were it not for ICTs: it was not only studying ICTs (as was DELTA), but also using ICTs as data and tools for this study. In this sense, it seems contradictory that the medium used predominantly for communication, work, and bilateral coordination were face-to-face meetings. In a team that studied ICTs, used ICTs as data, for data collection, visualization and end products, ICTs were hardly used for team-wide communication. This will be further elaborated in the Conclusions.

In conclusion, the analysis of ERICOM showed that face-to-face meetings were used the most in output production, and that the influence of the publicness of the medium on the type of output produced is related to the distribution of expertise and skills, which acts as an intervening variable. With wide variety of expertise in the team, the use of public media for the exchange of work resulted in a multi-faceted type of output.
Summary of results

So, how did differences among media influence collaborative working practices in ERICOM? The publicness of the medium influenced both decision-making processes and conflicts, opening up for more participants and different translation of issues, but in a team without any clear authoritative voice (in the first stage) public electronic media contributed to the diffusion of responsibility, whereas face-to-face meetings contributed to members taking over responsibility. The lack of authoritative voice and the inability of the team to coordinate at the team-level led to conflicts and tensions, and this was less so with the authoritative management by Pedro in the second stage.

Moreover, the team used socialising through the list and in meetings to develop a sense of collective identity in the first phase, but in the second phase the team lost a sense of collective identity and responsibility. The decrease in socializing over the list and its shift in character (from jokes and wishes to pleasantries) can be used as an indicator of the loss of a collective identity in the team. Socialising in meetings alone were not enough to sustain the sense of collective identity. This erosion of the sense of “team” seems to be related to the negative atmosphere in the team and its inability to coordinate its activities.

Differences among communication media did not influence task allocation and coordination, but they did influence the type of output produced. Meetings played the most important role in output production, for all types of output. However, the publicness of meetings did not result in a “chewed”, negotiated product as in DELTA, but in a multi-faceted type of output. This was the case because of the wider variety of expertise in the team, which meant that the members had different skills and background and thus their comments involved different points of view.

At the same time, collaboration practices influenced the frequency of media use and different events in the team resulted in different functions that media supported in different periods. Events in the team, such as the resignation of one group, the negative external evaluation, the risk of the project being stopped, the hiring of the new project management and the coming of the new group changed the functions of most communication media and their frequency of use. Moreover, the frequency of media used was not evenly distributed in time, but exhibited sudden changes. Unlike DELTA, ERICOM did not manage to create and sustain a stable media configuration in the long run, and the frequency of media use was very sensitive to random shocks, without return to equilibrium, exhibiting path dependence of communication to initial random shocks, and higher complexity than DELTA. Decisions, and conflicts somewhat increased the use of the managerial list, while output production and conflicts somewhat increased the use of the general list.

Finally, the ERICOM project had an initial task allocation reflecting a complementary collaboration (with the exception of WP8), with specialized division of labour among groups and their participation at different stages in the research. This led to higher interdependence between the groups than that suggested by Hara et al. (2003) (see
chapter 2, section A). It also meant that the team did not develop routines to work in a more integrative way, and thus collective work on WP8 was problematic. Again here, the higher interdependence between partners in WP8 was in the end addressed with a reduction of complexity (in terms of participating groups) and formalization of the communication routines. ICTs provided the reason for existence of ERICOM: its data, its data gathering tools, its data analysis tools and part of its output, but failed to help the team coordinate itself.