

Managers' Email: Beyond Tasks and To-Dos

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ABSTRACT

In this paper, we describe preliminary findings that indicate that managers and non-managers think about their email differently. We asked three research managers and three research non-managers to sort about 250 of their own email messages into categories that "would help them to manage their work." Our analyses indicate that managers create more categories and a more differentiated category structure than non-managers. Our data also suggest that managers create "relationship-oriented" categories more often than non-managers. These results are relevant to research on "email overload" that has highlighted the use of email for activities beyond communication. In particular, our findings suggest that too strong a focus on task management may be incomplete, and that a user's organizational role has an impact on their conceptualization and likely use of email.

Author Keywords

Managers; relationship; task and contact management.

ACM Classification Keywords

Office & Workplace; Computer-Mediated Communication.

INTRODUCTION

Research in HCI and CSCW has demonstrated that people use email for much more than communication. In 1988, Mackay [8] showed that email was being used for task and time management. Whittaker and Sidner [14] extended this

finding to indicate that email boxes were regularly being used as reminders of "to-dos", "to-reads" and "on-going correspondence," as well as a place to maintain items of "indeterminate status" until their importance became clear. They labeled this phenomenon "email overload" indicating multiple, unanticipated uses by email users. These findings have prompted researchers and designers to investigate and build support for task management [1] and to-do tracking [5] in email clients.

Despite the current focus on task management, it is important to remember that the email overload literature has also demonstrated significant diversity in how users appropriate email [8, 14] to support their work. In this paper, we present data showing that managers create more numerous and more differentiated categories for their email than non-managers. The data suggest further that the role an individual plays in an organization influences the way he or she categorizes email. Specifically, managers place a noticeable emphasis on relationship-oriented email.

RELATED LITERATURE

Previous studies of email use have frequently included managers among their participants [3, 8, 14] but have only briefly commented on results for managers. For example, Mackay [1988] notes in a description of one of three managers included in her sample that rather than using email to communicate with members of her group, the manager also finds that email "... is an efficient way to keep informed about the events in the lab... ." Ducheneaut and Bellotti [3] report strong correlations between one's role as manager and the use of email to distribute agendas and to document one's activities. These two bits of data suggest that at times managers use their email to manage their group's relationship with other entities in their organization.

WHY EXPECT DIFFERENCES BETWEEN MANAGERS AND NON-MANAGERS?

In characterizing the work of managers, Mintzberg [9] has likened them to the neck of an hourglass: a manager links his or her organization to a network of outside contacts. Summarizing the work of others as well as his own, Mintzberg [9] argues that this linking function is defined by the roles the manager plays in an organization. These include three “interpersonal” roles (e.g., act as liaison with outside organizations) and three “informational” roles (e.g., disseminate information within organization), as well as four “decision-making” roles (e.g., negotiate with other organizations). The manager’s power and ability to function effectively as a manager depend on receiving and processing information relevant to these functions.

The manager’s need for information is typically suggested as the reason why as a group managers spend so much time in informal communication with others. For example, based on self-reports, Panko [11] found that managers spend 20-60% of their time in communication, whereas using shadowing of managers to collect data, Sproull [12] reported this to be 80%.

The impact of email on the distribution of information in an organization has been much debated in the literature. Kraut and Attewell [7] summarize previous findings, some that support the attenuation of peripherality through the broadening of the distribution of information and others that show that email largely reinforces patterns created through face-to-face interaction. In their own research, Kraut and Attewell [7] found that extensive email use was associated with being better informed about one’s organization. They hypothesized that this was due to “information spillover” whereby focal participants in discussions included other, peripheral members in email distribution lists.

OUR STUDY

The data we report was collected as part of a larger project aimed at developing algorithms and interfaces to support the use of email for task management. We collected data from a small sample of first-line managers (i.e., those with 5-8 direct reports) and non-manager researchers to test the performance of an algorithm designed to produce task groupings of an email dataset given a starting “seed” message [2]. Managers have research responsibilities in addition to their management duties. We used a card-sorting methodology that has been used frequently in a “generative” mode [13] aimed at determining a user’s mental model about a topic. A non-directive method was suited for evaluating the algorithm and gauging the importance of task-groupings to users in their interaction with their email. The present paper grew out of our surprise at finding that overall our subjects categorized only a little more than 40% of their email into task-based groupings. Our ensuing analysis focuses on understanding the nature of the remaining 60% of the participants’ groupings.

Method

Six long-time users of email, three research managers and three non-manager researchers from our 1000-person research facility, participated in a one-hour session each. Each participant sorted about 250 pieces of his or her email in a way “that would support the management of his or her work.” We eliminated the potential influence of email management strategies [6, 14] on the sample composition by instructing our subjects not to remove any mail from their mailboxes for one week prior to the study.

In the experimental session, the participant was handed a stack of 2” by 2.5” cards, each of which contained the first 100 words of one of the emails in his or her sample. One or two experimenters (selected from among the first, second and fifth authors) observed each study participant as he or she laid out his or her messages into groupings on a table. This took between 15 and 25 minutes. The remainder of the session was devoted to understanding the groupings the participant made and the reasons for those groupings.

Results

Hierarchic Categorical Sorting

All six participants partitioned their email into two-level hierarchical structures. According to the conventional view of the results of generative card sorts such as we used, categories produced by participants reflect distinctions that they draw cognitively between different types of email. An example produced by one participant is a top-level category, *miscellaneous requests*, comprised of 32 emails, and further subdivided into 21 second-level categories.

PARTICIPANT	TOP-LEVEL	SECOND-LEVEL
Manager MB	5.5	58.8
Manager JL	15.6	69.2
Manager KA	13.2	76.3
Mgr. Mean	11.4	68.1
Non-mgr. BB	5.9	2.9
Non-mgr. AS	8.1	24.3
Non-mgr. ET	5.2	43.9
Non-mgr. Mean	6.4	23.7
Combined Mean	8.9	45.9

Table 1. Number of participant-generated top-level and second-level categories (normalized to 250).

Table 1 shows the number of top-level and second-level categories created by managers and non-managers. Since the number of emails sorted by the six participants was not equal (it ranged from 224 to 321), we express the data as the number per 250 emails. A 2x2 ANOVA on role (Manager, Non-Manager) vs. hierarchy (Top-Level,

Second-Level) showed significant main effects for role [$F(1,11)=13.88, p=0.0058$] and hierarchy [$F(1,11)=31.08, p=0.0005$], as well as an interaction between the two factors [$F(1,11)=8.8, p=0.018$]. Managers created almost twice as many top-level categories per 250 notes and almost three times as many second-level categories. These data support the conclusion that managers differentiate more types of categories than do non-managers.

Types of Category Labels Generated by Participants

Examining the labels participants created for the first-level categories, we were struck by two things. First, we were surprised at how few project-related groupings participants produced (an average of 2 out of an average of 9 top-level categories per participant, accounting for just over 40% of the actual number of email messages sorted, as mentioned previously). Second, a distinction emerged between project and relationship based groups. Participants grouped project-related mail into groups with such labels as *on-going projects*, *technical work*, and *CBM: the project*. They also created groups with labels that reflected people or organizational entities such as *my department and group manager*, *getting to know Bob*, and *external visitors*.

PARTICIPANT	PROJECT	RELATIONSHIP	OTHER
Manager MB	46	74	109
Manager JL	73	82	69
Manager KA	166	138	39
Mgr. Mean	95	98	72
Non-mgr. BB	148	20	98
Non-mgr. AS	167	38	42
Non-mgr. ET	62	64	113
Non-mgr. Mean	126	41	84

Table 2. Number of emails in Project-related, Relationship-related and Other categories for Managers and Non-Managers.

We examined this phenomenon further by categorizing participants' email groupings into Project-related, Relationship-related and Other. The "Project" category included groups with messages that dealt with the participant's technical work. The "Relationship" category included groups with messages related to organizational entities. This included both people-centered (*getting to know Bob*) and role-centered (*my VP*) groups, and bureaucratic/structural entities (*corporate financial stuff*). "Other" consisted of everything that did not fit into the previous categories (e.g., *trash* or *touch-once and throw away*). Two authors (Author 1 and Author 3) individually

categorized the 55 top-level groups generated by the participants. The categorizations were made primarily on the category labels. The initial pass produced agreement on 50 of the 55 categories (inter-rater reliability by Cohen's Kappa=.86) and subsequent discussion resolved the five disagreements.

Table 2 shows the distribution of email messages from these groups across the categories for managers and non-managers. A chi square test performed on the mean number of messages in each category by role was significant $\chi^2(2, N = 516) = 28.29, p <.0001$, suggesting that managers' and non-managers' email messages exhibit different patterns across the categories.

PARTICIPANT	PROJECT	RELATIONSHIP	OTHER
Manager	44	124	33
Non-Manager	16	28	24

Table 3. Number of second-level categories by category type (Project, Relationship, Other) and role (Manager, Non-Manager).

Table 3 shows a more detailed analysis of the distribution of second-level categories by role. The chi square test on these data was significant $\chi^2(2, N = 269) = 12.39, p <.002$. Inspecting Table 3, this result suggests that managers create many more second-level categories and the number of relationship-oriented categories is particularly pronounced. Managers seem to make more distinctions based on people or organizational entities with whom and with which they interact.

Discussion and Implications

These data, especially the comparisons between the managers and the non-managers, are only suggestive given the small number of observations. However, if these are real differences, what might account for them? One interesting hint comes from how managers and non-managers treated highly similar emails. For example, a broadcast note from the corporate CEO to all employees was categorized by one of the managers into *Corporate 2: Not urgent but of interest* while one of the non-managers put it in his *touch once and throw away* category. That is, the manager assigns the email to a "Relationship" category but the non-manager treats it as "Other." Thus, the card sorting technique was successful in enabling participants to surface the different meanings that individual pieces of email have for them — managers and non-managers conceptualize their email differently. Managers sort a sizeable portion of their email from the standpoint of the person or entity to which it relates, perhaps putting them in a better position to function as the "neck of the hourglass" with respect to their organizational context [9].

Our data suggest that while people obviously DO things in their work, assuming that "tasks" per se are the major operating principle may be too simplistic. In this respect our data agree with early reports [8, 14] that highlight the diversity of functions supported by email. We believe this is in part because a host of relationship and pragmatic issues influence or dominate how users mentally structure their work. These more subtle dimensions can be seen better when using a generative technique based on email content, such as the card-sorting method used in our study, which does not constrain the user to typical email client functionality (e.g., folders).

Our data suggest that especially for managers, a useful dimension to surface in an email client is one that reflects people and organizational roles. Unlike project-based groups, these groups are not topic-based, but centered on the user's social or pragmatic stance towards a person or organizational entity. One of the managers (KA) noted: "I care about the source because it helps me to strategize what to do about it and with what urgency." This makes sense given the responsibility that managers have with respect to mediating between their unit and the larger organization [9].

The importance of people as an element in users' email has been previously recognized [3, 8]. An interesting example of a relationship-based organization of information is Contact Map [10]. According to Nardi and colleagues, "people invest considerable effort in maintaining links with networks of colleagues, acquaintances, and friends, and [...] these networks are a significant organizing principle for work." The Contact Map studies emphasize the role of personal social networks in accomplishing work and explore people-based representations that tend to implicitly represent work projects. In contrast, the growing "task management" and "reinventing email" literature emphasizes how tasks can be more prominently represented and manipulated within email systems. Our data confirm that both perspectives have merit. Beyond this, however, a person's organizational role and responsibilities affect how they view and manage their work, and therefore how an email system might best support it. The surprising dominance of non-task-related email clusters in our study, and the extensive use of pragmatic and organizationally nuanced clusters by managers suggests there are useful and intriguing designs for email systems yet to be explored. For instance, a design enabling users to tag and then sort their email with values on dimensions that are important to them, including the more relationship centered categories observed here, might better support managers in their work. Or users might be provided with some kind of organizational or relationship based representation to support new modes of interaction. As such novel design ideas are pursued, we have no doubt that further empirical observations of users' behavior and conceptual models will be critical in fostering insight and innovation.

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REFERENCES

1. Bellotti, V., Ducheneaut, N., Howard, M. and Smith, I. Taking Email to Task: The Design and Evaluation of a Task Management Centered Email Tool. In *Proc. CHI 2003*, ACM Press (2003), 345-352.
2. Dredze, M., Stylos, J., Lau, T., Kellogg, W., Danis, C., and Kushmerick, N. TAXIE: Automatically Identifying Tasks in Email. Manuscript available from the authors.
3. Ducheneaut, N. and Bellotti, V. E-mail as Habitat: An Exploration of Embedded Personal Information Management. *Interactions*, 8, 5, (2001), 30-38.
4. Ebel, RL. Estimation of the reliability of ratings. *Psychometrika* 1951;16:407-424.
5. Gwizda, J. Reinventing the Inbox – Supporting the Management of pending Task in Email. In *Proc. CHI 2002*, ACM Press (2002), 550-551.
6. Gwizda, J. Email Task Management Styles: The Cleaners and the Keepers. In *Proc. CHI 2004*, ACM Press (2004), 1235-1238.
7. Kraut, R.E. and Attewell, P. In S. Kiesler (Ed.), *Research Milestones on the Information Highway*. Mawah, NJ: Erlbaum, 1996.
8. Mackay, W.E. More than Just a Communication System: Diversity in the Use of Electronic Mail. *ACM Transactions on Office Information Systems*, 6, 4 (1988), 380-397.
9. Mintzberg, H. *The Nature of Managerial Work*. Harper and Row, New York, 1973.
10. Nardi, B.A., Whittaker, S., Isaacs, E., Creech, M., Johnson, J., and Hainsworth, J. ContactMap: Integrating Communication and Information Through Visualizing Personal Social Networks. *Communications of the ACM*, 2002, 89-95.
11. Panko, R.R. Managerial Communication Patterns. *Journal of Organizational Computing*, 2 (1), 95-122.
12. Sproull, L. S. The Nature of managerial Attention. *Advances in Information Processing in Organizations*, JAI Press, 1984, 9-27.
13. Warfel, T.R. Modeling Organization – Methods for Increasing System Findability. Downloaded from <http://messagefirst.com/downloads/modelingorganization.pdf>.
14. Whittaker, S. and Sidner, C. Email overload: Exploring personal information management in email. In *Proc. CHI 1996*, ACM Press (1996), 276-283.