The effect of e-mail use and adoption on organisational participation: The case of a public administration

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Abstract. Improving organisational participation is becoming more and more important as organisations are trying to shift from a bureaucratic model based on work specialisation and division of labour towards knowledge-intensive organisations built on competence sharing and team working. The aim of this paper is to investigate participation in decision making mediated by e-mail (e-PDM) among organisational members that are in similar hierarchical positions. The conceptual background of the study integrates the organisational theories on PDM and the computer-mediated communication (CMC) literature. Data analysis, based on an empirical research conducted in an Italian governmental agency, investigates the factors that affect the adoption of horizontal e-PDM in the workplace and to what extent this is mediated by the interplay between technology and social context. Our results suggest that social structuration of technology and social processes in organisations do have an impact on e-mail use for participative purposes, and that, along with group characteristics, leadership plays a major role in enabling work group members to increase horizontal e-PDM.

Keywords: E-mail communication, organisational participation, CMC

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1. Introduction

Most of the literature on the effects of Computer Mediated Communication (CMC) on organisational participation has focused on the supposed increase of democracy in the relationships among superiors and subordinates as a consequence of CMC technologies' adoption. According to several scholars [14, 25, 38, 39], the narrow bandwidth of e-mail causes a limited transmission of status indicators and thus enhances the uninhibited participation of lower level organisational actors in decision making processes.

However, more recent studies have challenged these results. First, it is not true that non-verbal cues are completely filtered out in e-mail communication. Byron and Baldridge [10] found that receivers’ personalities influenced their perceptions of the e-mail through perceptions of non-verbal cues such as emoticons and text formality. Second, e-mail communication does not occur in a social vacuum and status indicators may persist. Gupta and Jacob [23], for example, showed that the status embedded in the signature of e-mails was taken into account by the participants in two experiments: high status solicitors received more responses than low status one. Third, the status structure within organizations, being inherent within all work practices, is unlikely to be undermined by e-mail. In their fieldwork study, Biggiero et al. [6] have found that low status organizational participants were aware of status differences in both face-to-face and e-mail communication.

Also, organisations which favoured offline participation in decision making were more likely than less participative organizations to present forms of participation also via e-mail communication.

Some studies [5] have also considered the effect of CMC on group decision making. Nunamaker et al. [36], for example, argued that the characteristics of electronic meeting systems provide several advantages in terms of participation over face-to-face meetings. McDaniel et al. [32] found that Computer Mediated Asynchronous Communication permits a greater volume of discussion than face-to-face meetings.

Although e-mail is the most diffused form of electronic communication in organizations, most studies have focused on synchronous, text-based electronic systems: electronic meeting systems, instant messaging systems, and group decision support systems [2].

Even if some of the results on the use of synchronous electronic communication can be applied on the use of e-mail communication, research will benefit from a more focused approach. To help address this gap in the literature, this paper focuses on participation mediated by e-mail among organisational members that are in similar hierarchical positions.

Previous research on CMC has adopted two differentiated views on how technology affects the organisational members’ behaviour [30]. The Technological Imperative perspective considers technology as an exogenous variable that forces or strongly constrains the behaviours of individuals and organisations (technology causes behaviour). According to this view, the objective features of e-mail (asynchronicity, rapid transmission and reply, text based communication, dyadic and multiple connections) deterministically lead to an increase of organisational participation in the workplace. As a result, this approach assigns a small role to the social and organisational context in influencing the actual use of e-mail for both vertical and horizontal participation. The Emergent Perspective refuses the idea that e-mail features alone are sufficient to enable organisational participation. Adoption and use of e-mail is rather a result of the interplay between e-mail system appropriation and social interactions. In accordance with organisational theories on
PDM [8, 12, 13, 27, 41], the emergent perspective suggests that electronic participation depends on several contextual factors.

Drawing from the emergent perspective on CMC impacts and the theory on organisational participation, this study examines the effect of task attributes, workgroup’s characteristics, leadership style and individuals’ attributes on horizontal electronic participation. The paper is structured as follows. In section 2, theoretical considerations are developed to derive hypotheses on the contextual factors which may affect the adoption of electronic horizontal participation. In section 3, we outline the research design of the study by describing the empirical context and the methodology used. In section 4 hypotheses are tested on a data-set of 137 employees of a large public organisation. Finally, in section 5, the paper offers concluding comments on the research findings and a discussion of the theoretical and managerial implications.

2. Theoretical background and hypotheses

2.1. Horizontal and vertical electronic participation in decision making (e-PDM)

Although numerous researchers have attempted to clarify the term “participation,” a variety of disparate definitions exist [31]. Among the more commonly used are influence sharing [34], joint decision making [27], and degree of employee involvement in decisions [33]. Drawing from Locke and Schweiger’s definition [27], we consider e-PDM to be joint decision making mediated by e-mail. This definition is general enough to include three distinct dimensions of e-PDM: horizontal e-PDM refers to electronic joint decision making among workgroup members in the same hierarchical position. Bottom-up (vertical) e-PDM refers to subordinates’ electronic participation in decision-making with supervisors, and top-down (vertical) e-PDM concerns supervisors’ electronic participation in decision-making with subordinates.

2.2. Leadership style, group culture and horizontal e-PDM

Leadership style is widely recognised as one of the most influential factors in PDM. Literature on leadership [4, 27, 40] individuates several leadership styles in the continuum ranging from the entirely autocratic to the purely democratic. Stewart and Manz [40] crossed this dimension (autocratic-democratic) with the degree of leader involvement (highly involved or laissez-faire). According to these authors, autocratic leaders undermine the emergence of a climate of communication openness, information exchange, self-management and participation in decision-making among subordinates that reduce the likelihood of PDM both in vertical and horizontal relationships.

Besides leadership style, the organisational literature also includes the group’s culture, norms and attitude as relevant contextual factors affecting PDM effectiveness. As Locke and Schweiger [27] state: “Groups can be just as autocratic as supervisors, if not more so, and may thereby inhibit the expression of new or unpopular ideas” (p. 321).

In the CMC literature, deterministic approaches to organisational consequences of technology have largely underestimated the influence of leadership style and group culture on electronic participation. Thanks to its technical characteristics, e-mail is often viewed as an intrinsically democratic medium [28] that increases uninhibited communication among organisational members and information sharing. In this perspective, the objective features of e-mail (openness, informality, reduced social cues, higher reachability) are expected to increase electronic participation independently from social factors linked to leader and group’s attributes. The Adaptive Structuration Theory [17] opposes this view. According to DeSanctis and Poole [17], although the technical features of e-mail could facilitate and support participation, the social context of the organisation can undermine this potential kind of technology appropriation. Consistently with the emergent perspective, Danzi and Schiavi [15] found evidence that communication patterns (through several media, including e-mail) among colleagues working in units with autocratic leaders and low group participative culture are less dense than patterns among colleagues in units co-ordinated by participative leaders and characterised by a group climate that supports freedom of speech.

Hypothesis 1: Autocratic leaders inhibit horizontal e-PDM

Hypothesis 2: The level of group participative culture will positively influence horizontal e-PDM

2.3. Task attributes and horizontal e-PDM

In the PDM literature, task complexity has been associated with a higher demand for organisational par-
organisational members will use more the e-mail to
itates information exchange and co-ordination, then
not ambiguous, and empowering medium that facil-
sational context, e-mail is perceived as a clear,
ship between task complexity and e-PDM is
plish complex tasks. This deterministic view of the
tories [35]. Highly complex, non-routinised and
and this enhances the need for horizontal participa-
C. Media Richness Theory predicts that
ormative than peer-to-peer ones. This may imply that the type of relationship
ly argues that media choice depends on the socially con-
will use e-mail for horizontal participation when they have to accom-
Hypothesis 3: The perception of e-mail features will
Hypothesis 4: The higher is the member’s attitude to
are high
ments. This implies that organisational members use
ugher media, such as face-to-face (FtF) and tele-
ms. This deterministics view of the
opposed by the emergent perspective on computer-
that is the degree and the way of
opposition of it, is an emergence of the course
This, if in a specific organis-
SIMPLISMA

In the literature there is no reference of a supposed
However we wanted to investigate the possibility of
Consequently, we decided to introduce an exploratory
meant that the actual use of e-mail in verti-
cal relationships may affect the members’ likelihood to
because in work organisation vertical relationships are
upposed to be more formal and normative than peer-to-
other work
Figure 1 summarises the hypotheses outlining the
effects of contextual factors on e-PDM discussed in this

3. Data and methods
3.1. Research setting
Research was undertaken in an Italian governmental
agency that will be referred to as IPA. IPA was a former
department of one of the Italian Ministries that gained
autonomy (in organisational, managerial, administra-
tive, financial and patrimonial issues) in January 2000
as a consequence of an important process of decentral-
isation and reorganisation of the Ministry and, more
generally, of the Italian Public Administration.
IPA is a large and complex organisation with about 37,000 employees and a geographically dispersed structure designed along 3 main geographical levels: central, regional, and local. At the central level, there are 7 departments: three of them are focused on the core activity of the Agency while the other four include External Institutions Relationships, Human Resources Management, Administration, and Systems and Processes. At the regional level, there are 19 Regional Departments (one per region) and 2 Provincial Departments (due to the existence of 2 provinces that have a special administrative status similar to the regional one). At the local level, there are about 385 Local Offices located all around the Italian peninsula.

Since its creation, IPA has made significant efforts to overcome the bureaucratic culture inherited from the past. Before the establishment of IPA as an autonomous agency, the internal communication system was mainly based on traditional communication channels (reports, official notes, memos) following a strict top-down flow. Recently, IPA has launched the implementation of electronic communication as an important means to improve internal communication, to strengthen the sense of affiliation to the organisation, and to enhance the overall level of employees’ participation. In order to achieve these goals, IPA’s top management has sustained the creation of a community of practice called “network of internal communication supporters” with the aim of facilitating the implementation of the new internal communication strategy and especially, of the e-mail system. This group of volunteers was created in January 2001 and now it counts up to 600 persons. Members of the “network of internal communication supporters” have the role of facilitators and technology-use mediators [37] of the e-mail system and other forms of internal communication.

When the decision of implementing a common e-mail system throughout the whole organisation was taken, only top managers had a personal e-mail address. Some regional and local offices had a collective address while some regional directions had independently adopted their own informal e-mail systems. The implementation of the common e-mail system was undertaken gradually. The criterion chosen in order to...
prioritise the attribution of personal e-mail addresses was the position held in the organisational hierarchy. Therefore, in the initial stage of implementation of the electronic communication system, having a personal e-mail account was a status symbol that increased the status difference perceptions within IPA. At the time the study has been conducted, the process of e-mail implementation was almost completed. In central directions, all employees had already a personal e-mail account. Only in some local and regional offices there were still collective addresses managed by the offices’ responsible or by the local supporter of the Network of Communication Supporters.

### 3.2. Sample and data

The research integrates qualitative and quantitative data collection methods in a two-stage case study design. At first stage, we collected organisational documents and conducted in-depth qualitative interviews focused on the introduction of the e-mail system and its relation with the on-going process of organisational change. All the interviews were based on a common interview guide. The first interviews were done collectively by the authors and by a research assistant well familiar with the research topic. Subsequently, the interviews were carried out individually and were tape-recorded and verbatim transcribed. The target groups for the interviews were the HRM department, the Systems and Processes Department and the Network of Supporters. Within the HRM department we interviewed employees from the Internal Communication Office and the Quality Management Office. The Internal Communication Office is part of HRM department and is responsible for all the activities related to the internal communication, including the content management of the intranet. The Systems and Processes Department is in charge of all the activities that relate to the technical management of IPA’s information systems.

Qualitative interviews and documentary analysis were aimed to gain in-depth knowledge of the role that e-mail adoption has played in the process of change that IPA has encountered. Specifically, the interview guide focused on the criteria followed in the implementation process. We carried out 18 interviews (14 men and 4 women) with 12 managers and employees of the central departments and 6 members of the regional and local offices (at regional and local level we interviewed employees that were involved in the Network of Communication Supporters). As it concerns document analysis, we collected the organisational chart, the role descriptions for the people we interviewed, general information from the website and also from the intranet, copies of the internal communication newspaper, the internal rules about e-mail use and the FAQs on the same subject and some samples of work-related e-mails.

In the second phase, we collected quantitative data through an on-line structured questionnaire. Preliminary results based on interviews and documentary data were also used to guide us in design of the questionnaire. The sample for the study consisted of 530 employees randomly selected (250 from the Network of Supporters). To secure a representative sample of the organisational population, we obtained basic information from the organisation on the population characteristics with respect to gender, geographical distribution (by macro-regions: Northern, Central and Southern regions) and organisational levels (central, regional and local departments/offices).

Surveys were distributed on-line in May 2003 and the confidentiality of completed surveys was guaranteed to all respondents. Three on-line questionnaires were returned as “Undeliverable” by the System Administrator, so the actual sample counted 547 persons. Finally, the return of 228 completed questionnaires yielded a response rate of 41.7 percent. The average age of the respondents was 42.28 years (s.d. = 7.5), and 37.95 percent of them were women. Forty two percent of respondents received a personal e-mail account from the organisation after 2001, 40.6 percent in 2001, 15.6 percent in 2000, and only 1.8 percent of respondents had a personal e-mail account before 2000. 77.4 percent of respondents were employed in local offices and 22.6 percent in Central and Regional Directions. 11.5 per cent of respondents had a master or Ph.D., 33.6 per cent were university graduates, 52.7 held a high-school diploma, and 2.2 of respondents held only an elementary school diploma. The sample respondents had demographic characteristics very similar to those of the target population, suggesting it was a representative one.

### 3.3. Measures

**Horizontal e-PDM** was measured by four items that asked about the individual’s willingness to use the e-mail with other colleagues with a similar hierarchical position to 1) influence their decisions; 2) to propose solutions to their problems; 3) to let them follow what one does; 4) to raise or express a critique. All items used...
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To reduce the likelihood that individuals’ demographic characteristics would confound the hypotheses examined in the study we included the following measures as control variables.

**Age:** Elder people are usually less likely to adopt and trust electronic devices. Therefore we wanted to control if this occurred in our sample and had an impact on their degree of electronic participation. Age was measured in number of years.

**Gender:** Gender differences may also influence participation outcomes. Denton and Zeytinoglu [16] found that women were less likely than men to perceive themselves as participating in decision-making, even when controlling for other relevant variables. According to a deterministic view of technology, participation of female members in organisational decision processes is likely to increase in virtual settings. According to the Reduced Social Cues Theory [39], e-mail allows a relative anonymity and reduction of perception of the gender that can let female members participate more easily than Ff. However, recent studies found that gender differences are not completely filtered out in CMC. Empirical evidence was found that men are more likely to be dominating and controlling, whereas women are more expressive and likely to try to maintain relationships in e-mails, instant messaging, and Internet relay chat conversations [3, 20, 24]. To control for differences among men and women, we included gender as binary variable (“man” = 0, “woman” = 1).
Technology-use mediators: as we had respondents that were members of the “Network of Internal Communication Supporters”, we also used a dummy code to control for effects related to the specific role of technology-use mediators played by the supporters in the organisation (“member of the network” = 1, “not member of the network” = 0).

Frequency of e-mail sent locally: we measured the frequency of e-mail use with colleagues located in the same room or in close ones to control for the effect of physical proximity on horizontal e-PDM. Frequency of e-mail sent locally was measured with a one-item five-point scale ranging from “never” to “daily”.

For each scale with multiple items, we used the average values as the focal variables.

### 4. Results

Table 1 reports the means, standard deviations, and correlations for the dependent and independent variables.

The means of the three measures of electronic participation are quite low. However it is worth noticing that horizontal e-PDM scores the highest value. Among the control variables only gender was not significantly correlated with horizontal e-PDM. This result suggests that, in the studied organisation, there are no gender inequalities in peer-to-peer electronic participation. However, since we did not measure non-electronic PDM, we can not assess the actual impact of e-mail on reducing possible gender inequalities in horizontal participation. As expected age was negatively correlated with the dependent variable ($r = -0.163$, $p < 0.05$) while both the frequency of e-mail use locally and technology-use mediator variables shown a positive and significant correlation. Among the explanatory variables, only autocratic leadership was not significantly correlated with horizontal e-PDM. Both the vertical e-PDM variables exhibited the highest correlation coefficients. As can be seen in Table 1, some of the independent variables were intercorrelated (e.g. the correlation for e-PDM top-down and bottom-up was 0.419 and significant at $p < 0.001$).

We tested our hypotheses with hierarchical (block-wise entry) multiple regression analysis. Before conducting regression analysis we examined residual plots to verify that assumptions of linearity and homoscedasticity were met. Model 1 included estimated effects for a baseline model with only control variables while model 2 included also the explanatory variables. Table 2 reports regression results for the two models. Since we found that some independent variables were intercorrelated, we checked the VIF and tolerance statistics in order to assess multicollinearity problems. For the two models the VIF values were well below 10 and the tolerance statistics all well below 0.2. The average VIF was 1.031 for the baseline model (model 1) and 1.173 for the full model (model 2). Therefore we could safely conclude that collinearity was not a problem for the two models.

### Table 1

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D.</th>
<th>1</th>
<th>2</th>
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<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Horizontal e-PDM</td>
<td>2.90</td>
<td>1.57</td>
<td>1.00</td>
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<tr>
<td>2. Top-down e-PDM</td>
<td>1.72</td>
<td>1.65</td>
<td>0.577***</td>
<td>1.00</td>
<td></td>
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<tr>
<td>3. Bottom-up e-PDM</td>
<td>1.99</td>
<td>1.27</td>
<td>0.419***</td>
<td>0.689***</td>
<td>1.00</td>
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<tr>
<td>4. Task complexity × perception of e-mail</td>
<td>19.08</td>
<td>8.33</td>
<td>0.339***</td>
<td>0.342***</td>
<td>0.385***</td>
<td>1.00</td>
<td></td>
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<td></td>
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<td></td>
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<tr>
<td>5. Group participative attitude</td>
<td>4.03</td>
<td>1.24</td>
<td>0.266**</td>
<td>0.106</td>
<td>0.089</td>
<td>0.179*</td>
<td>1.00</td>
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<tr>
<td>6. Autocratic supervisor</td>
<td>0.44</td>
<td>0.50</td>
<td>-0.043</td>
<td>0.070</td>
<td>0.077</td>
<td>0.081</td>
<td>0.201**</td>
<td>1.00</td>
<td></td>
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<tr>
<td>7. Frequency of e-mails locally</td>
<td>1.23</td>
<td>1.13</td>
<td>0.269***</td>
<td>0.144*</td>
<td>0.110</td>
<td>0.082</td>
<td>0.155*</td>
<td>-0.060</td>
<td>1.00</td>
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<tr>
<td>8. Technology-use mediator</td>
<td>0.67</td>
<td>0.47</td>
<td>0.145*</td>
<td>-0.006</td>
<td>-0.001</td>
<td>0.246**</td>
<td>-0.021</td>
<td>-0.040</td>
<td>0.003</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Gender</td>
<td>0.33</td>
<td>0.47</td>
<td>-0.025</td>
<td>-0.051</td>
<td>0.055</td>
<td>0.30</td>
<td>-0.113</td>
<td>0.072</td>
<td>-0.114</td>
<td>0.026</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>10. Age</td>
<td>41.74</td>
<td>7.61</td>
<td>-0.163*</td>
<td>0.021</td>
<td>-0.109</td>
<td>-0.076</td>
<td>-0.059</td>
<td>0.098</td>
<td>-0.146*</td>
<td>-0.126</td>
<td>0.075</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*p < 0.05, **p < 0.01, ***p < 0.001.
*N = 137.
As can be seen in the baseline model including only the control variables (model 1), only frequency of e-mail sent locally was significant and positively related to horizontal e-PDM (Beta = 0.277, p < 0.01). This shows that horizontal electronic participation is more likely to happen when group members use e-mail to communicate with physically close colleagues, that is when they perceive e-mail as an appropriate means for participating in decision processes with physically close colleagues. This result may confirm – as Bikson et al. [7] argued – that electronic links (as the emergent perspective states) primarily enhance existing patterns of communications rather than creating new ones [p. 102].

As shown in model 2, we found support for hypothesis 1. Autocratic leadership had a negative and significant impact on horizontal e-PDM (Beta = −0.124, p < 0.05).

Hypothesis 2 was also supported. As it is shown in Table 2 the group participative attitude had a positive and significantly influence on the use of e-mail to participate with peer members (Beta = 0.198, p < 0.001).

Hypothesis 3 predicted that individuals' positive perception of e-mail features interact with task complexity to influence horizontal participation. As shown in model 2, the interaction variable was not significant and thus hypothesis 3 was not supported.

Hypothesis 4 was strongly supported. Both top-down e-PDM (Beta = 0.342, p < 0.001) and bottom-up e-PDM (Beta = 0.541, p < 0.01) made significant contributions, although the latter had a prominent role.

In model 2, the frequency of e-mails sent locally confirmed its positive impact (Beta = 0.145, p < 0.01) on the dependent variable. Among the other control variables, only technology-use mediators had a significant and positive impact (Beta = 0.156, p < 0.01) on horizontal e-PDM.

The results of the hierarchical regression analysis shown in Table 2 indicate that, when the five explanatory variables are added to the regression model, the $R^2$ for the full model increases from 0.117 to 0.678. In other words, adding the independent variables to the baseline model (which included only the four control variables) enabled the model to explain an additional 56.2 percent of the variance. The incremental $F$ statistic of 44.348, corresponding to the 56.2 percent increase in $R^2$, was significant at $p < 0.001$.

5. Discussion and conclusion

In this study, we revisited an important topic in management research – organisational participation in decision-making – with a focus on the use of e-mail for participative purposes. Building on the CMC literature and the organisational participation theory, we distinguished three different forms of electronic participation: horizontal, bottom-up, and top-down.

Empirical results from the studied organisation shows that the average levels of e-PDM are quite low for horizontal, top-down, and bottom-up relationships. This finding may suggest that organisational members are not willing to use e-mail for participative purposes. However, since we could not compare electronic and non-electronic participation, this result cannot provide any evidence on media preferences for participation. Therefore, the limited e-PDM could reflect a low level of organisational participation. This interpretation finds some support from the qualitative data we collected in the first stage of the case study design. Interviews with managers and employees confirmed that IPA’s culture was still influenced by the bureaucratic management style inherited from the public administration to which IPA used to belong. As previous research shows, this organisational characteristic may act as a barrier to

Table 2

<table>
<thead>
<tr>
<th>Multiple regression analysis</th>
<th>Model 1</th>
<th>Model 2</th>
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<tbody>
<tr>
<td></td>
<td>Beta</td>
<td>t</td>
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<tr>
<td>1. Horizontal e-PDM</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>2. Top-down e-PDM</td>
<td>–</td>
<td>0.342***</td>
</tr>
<tr>
<td>3. Bottom-up e-PDM</td>
<td>–</td>
<td>0.541***</td>
</tr>
<tr>
<td>4. Task complexity x</td>
<td>–</td>
<td>0.066</td>
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<tr>
<td>perception of e-mail</td>
<td></td>
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<td>5. Group participative</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>attitude</td>
<td></td>
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<tr>
<td>6. Autocratic</td>
<td>–</td>
<td>–</td>
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<tr>
<td>supervisor</td>
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<td></td>
</tr>
<tr>
<td>7. Frequency of e-mails</td>
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<td>3.327</td>
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<tr>
<td>8. Technology-use</td>
<td>0.131</td>
<td>1.585</td>
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<td>mediator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Gender</td>
<td>0.010</td>
<td>0.124</td>
</tr>
<tr>
<td>10. Age</td>
<td>−0.101</td>
<td>−1.209</td>
</tr>
<tr>
<td>$F$</td>
<td>4.356**</td>
<td>44.348***</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.117</td>
<td>0.678</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.090</td>
<td>0.655</td>
</tr>
<tr>
<td>$\Delta R^2$</td>
<td>0.117</td>
<td>0.562</td>
</tr>
</tbody>
</table>

*Values are standardised regression coefficients.
effective participation [11]. The rationale for this con-
textual effect is that bureaucratic organisations may
embrace rules and regulations that limit autonomy and
self-expression, thus blocking even the potential for any
form of participation.

Another important consideration related to the low
level of e-PDM in the studied organisation concerns
the recent introduction of e-mail in the organisation.
As anticipated in the sample’s description, the imple-
mentation of the e-mail system started in 2000 and
42 percent of respondents participating in the study
received a personal e-mail account from the organisa-
tion after 2001. This recent introduction of e-mail in
IPA could account for the low level of e-PDM found.
According to the Social Information Processing Theory
[42, 43], the organisational impacts of CMC adoption
are time-dependent. In Walther’s view, all other things
being equal, given sufficient time and exchange of mes-
sages, FfF and CMC communication tend to be the
same. Following this approach, it could be argued that,
in IPA, the low levels of e-PDM should be ascribed to
the recent introduction of e-mail and that, in a longitudi-
nal perspective, it would be likely that the use of e-mail
for participation would equate the use of FfF and other
mediated forms of participation. It is worth noticing that
the role of Communication Supporter as a technology-
use mediator is positively related to horizontal e-PDM.
This confirms that trained and motivated people are
more likely to use e-mail effectively for PDM.

Although we found a limited use of electronic partici-
pation in the studied organisation, the empirical results
confirm that horizontal e-PDM is affected by a num-
ber of contextual factors. Our findings show that even
in a computer-mediated setting, leaders attributes and
group characteristics affect peer-to-peer participation.
Although e-mail, in the Technological Alternative per-
spective, is supposed to enhance PDM in any context of
use, our study shows that autocratic leadership inhibits
the use of e-mail for participative purposes and that
horizontal e-PDM is more likely to happen when the
workgroup shares a participative culture.

The study also shows interesting findings concerning
the relationship between participation, task complex-
ity and media choice. Our results provide empirical
support for the contingency assertion [22] that task
complexity, by creating an increase in horizontal need
for information sharing and for exchange of ideas and
suggestions, enhances participation. Indeed, we found
that higher levels of task complexity were associated to
a more intense use of e-mail for participative purposes
with other peer colleagues. This result clearly rejects
the Media Richness Theory argument that organisational
members would not use “poor media” such as e-
mail to communicate and coordinate with their peers
when dealing with complex tasks. It is also interest-
ing to note that this result does not either confirm the
Emergent Perspective which considers that it is not task
complexity alone to determine media choice but the
interaction among technology features and the individ-
uals’ perception of the technology. The results of this
study show that when task complexity increases, elec-
tronic participation grows, even when organisational
members consider e-mail as an ambiguous means of
communication. Indeed, in the studied organisation,
the members’ perception of e-mail did not mediate the
relationship between electronic participation and task
complexity.

Another interesting finding of this study arises
from the relationship between horizontal and vertical
e-PDM. We found that, although horizontal e-PDM is
higher than vertical e-PDM, when the use of e-mail
for vertical PDM becomes an habit, the likelihood for
horizontal PDM also increases. This result has a lot
of intuitive appeal and it suggests that the type of
electronic communication members establish with the
supervisor also influences and shapes their communi-
cation behaviour with peer colleagues. However we
consider this as a preliminary finding which needs to
be theoretically validated and empirically confirmed in
future research.

Our study extends prior research in three ways. First,
it sheds light on the horizontal dimension of PDM,
that has been quite under-analysed in the organisation
literature, traditionally focused on vertical relation-
ships. Even the literature on CMC has preferred to
focus on the supposed equalisation effect of tech-
ology among different-status members. In our view,
horizontal participation is becoming more and more
important as organisations increasingly rely on team
work and knowledge sharing to achieve effectiveness
in a complex environment. Consequently, we have
addressed our interest on peer-to-peer participation.
Second, our study does not support the determinis-
tic assumptions of most computer-mediated literature.
As previously analysed, our results confirm that social
stratification of technology and social processes in
organisations do have an impact on e-mail use for
participative purposes. Third, from a methodologi-
cal point of view, most CMC studies on PDM are
based on one-shot laboratory experiments with under-
graduate students carrying out simple group tasks
[9]. Several considerations induce us to be cautious

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graduate students carrying out simple group tasks
[9]. Several considerations induce us to be cautious
about the extension of the results of these experi-
ments to the organisational context. First, the limitation
of time (few minutes or hours) may force partici-
pants in experiments to use e-mail as a synchronous
medium, like a chat, rather than an asynchronous one.
Second, tasks performed during experiments are quite
different from organisational tasks and students have
different incentives or none to perform the assigned
tasks. Third, differently from students in experimen-
tal settings, organisational members are aware of the
status of people they interact with. Fourth, in nat-
ural settings (as real organisations are), interactions
via e-mail are highly dependent on the pre-existing
interactions through other means of communication.

Finally, unlike organisational members, participants in
experimental studies expect to have no more future
interactions with other participants. All these consid-
erations severely hinder the assumption that short-time
experiments can provide a realistic proxy of what occurs
in organisations. Our study, by analysing real organi-
sational members in their workplace overcomes these
limitations.

Our study has two main managerial implica-
tions. First, our findings show that organisational
change is not only a matter of technology imple-
mentation, as the Technological Imperative approach
suggests, but it necessitates the assessment and man-
agement of contextual social factors. Empirical results
from this study indicate that every effort of tech-
nological/organisational change, aimed at making an
organisation more flexible and reactive through an
increase of PDM, should take into account the influence
of leadership style and group culture on the employees'
use of technology for participative purposes. Con-
sequently, technology introduction and adoption for
increasing teamwork cannot be achieved without an
organisational effort in changing coherently also man-
ergical practices, leadership style and group culture.

Internal communication should be addressed to spread
the vision of change among managers, and to transform
them into the principal supporters of change. Strangely
enough, in the literature on CMC, this achievement is
quite new and under-represented (Technological Impera-
tive still dominates over the Emergent Perspective). On
the contrary, in organisation theory the role of contex-
tual factors on PDM is a finding that we can track since
the first anti-fordist perspectives such as the School of
Human Relations, Quality of Working Life and Socio-
Technical Theory [19, 27].

The second important implication of this study
is that, along with group characteristics, leadership
plays a major role in enabling and supporting a
group to increase horizontal e-PDM. The latter actu-
ally depends not only on peer-to-peer relationships but
also on the role that immediate superiors play in let-
ting people become accountable and responsible for
the group as a whole. Leaders are those who cre-
ate the organisational climate and the organisational
framework that shape the development of horizon-
tal participation. The lack of leader’s openness and
feedback towards upward communication can increase
status/cognitive distance, equivocality and a sense of
powerlessness among team members: “A «hands-off»
approach fails to cultivate skills required to team self-
management. These skills include self-reinforcement,
self-criticism, self-goal-setting, self-observation, self-
expectation and rehearsal” [29, p. 122]. In particular
the study shows evidence that autocratic leaders
have a negative effect on horizontal e-PDM. Further-
more it is also clear that wherever open relationships
among superiors and subordinates do exist through
e-mail communication, the likelihood of repli-
cating these relationships with peer-level members
increases.

This study presents some limitations. First, we recog-

This study presents some limitations. First, we recog-
nise the importance of time in organisations, due to the
dynamics that are inherent in all social and organisa-
tional processes. Our ability to evaluate those changes
is severely hindered by a lack of longitudinal data. How-
ever this study is only a preliminary step in investigating
horizontal e-PDM: our purpose is to integrate our find-
ings with subsequent data gathering in IPA. As the
learning curves increase and as social joint construc-
tion of the technology develops, we expect to witness
changes in the members’ use of e-mail for participa-
tive purposes as Walther suggests [42, 43]. Second,
because our research design is cross-sectional, the data
from our survey do not allow us to necessarily predict
causality. Future research using a longitudinal design
is likely to provide important insights on causal rela-
tionships among variables investigated in this study.
Similarly, since the variables were measured at the
same time from the same source, common method vari-
ance cannot be fully ruled out. Third, we only analysed
e-PDM. Therefore our study does not include compar-
isons among media impact on horizontal PDM. Future
research might address this comparison by examin-
ing electronic and non-electronic peer-to-peer PDM.

Finally, we conducted the research in one Italian public
organisation. A generalisation of our findings requires
further investigation in different organisational con-
texts.
Acknowledgements

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References


