

Improving the quality of information exchange among top managers

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Abstract

Purpose. The paper aims to identify the factors that can affect the quality of horizontal information flows at top management level and suggest a method for their removal.

Methodology. From a theoretical perspective that draws from studies on managerial information systems, on top management horizontal communication and on total quality management, a method (narrative action research method, NARM) has been proposed, which is based on the direct involvement of the participants in the flow, in this specific case top managers. The method has been tested on 18 large organizations. Individual interviews of top managers and collective meetings with them were set up to assess their degree of satisfaction in relation to the quality of the flow.

Findings. This method has allowed to find that the factors which the quality of the information flow depends on are mainly organizational-relational in nature, thus highlighting the circular causality relationship between the quality of the information flow and organizational well-being.

Research implications. From a theoretical-conceptual viewpoint, this study has focused on the issue of the strategic information flow and its problems from a relational perspective that appears to have received less consideration in literature.

Practical implications. The method has proved effective in improving the quality of the process, with benefits in terms not only of decision-making capacity but also of organizational climate.

Originality. The method is the result of the original combination of the action research principles of change promotion and narration and problem solving techniques, which are respectively at the base of role-playing and quality circles.

Keywords

senior executive information flow; communication among top managers; information quality; organizational well-being

1. Introduction

The *information flow at top management level* is a topic that has raised interest in literature as it is linked to decision-making in the more consolidated corporate areas (production, marketing and sales, finance and control, etc.) and involves corporate figures (department chiefs or top managers) that participate to a significant extent in value creation.

Even though they more frequently refer to the overall information system, researchers have undertaken many an investigation on the issue, mainly, however, from an organizational and information technology viewpoint.

This study is based on a different perspective which, considering the information flow as a process involving individuals, timeframes, methods, places and motivations, combines the technical-formal dimension with the more emotional human component, in line with what has been described as a *socio-technical approach* (Avgerou and McGrath, 2007; Stahl, 2007; Prida and Grijalvo, 2008; Xiang et al., 2014). We adopt in this way a perspective that in turn combines the information systems discipline with the intra-organizational communication approach referred to horizontal top management relationships (Mom et al., 2007; Raes Anneloes, 2011). The information indeed is integrated by behaviours, values, meanings, emotions and moods which have a significant impact on internal relationships and the results that they can produce.

The dual technical and social dimension that comes into play in information exchanges creates obstacles of a different nature that can make the flow fluidity complicated.

Based on these considerations, the study aims at identifying the factors that influence the quality shortfalls of the information flows and suggesting an effective method to identify and remove them, beginning with the following research questions:

- *What does the quality of top management information flow depend on?*
- *How can the quality of top management information flow be improved?*

To this end, the paper has been structured as per the following stages:

- Literature analysis aimed at: 1) contextualising the study within the discipline of managerial information systems and suggesting contributions from a horizontal top management communication perspective; 2) defining the concept of quality of the information flow from a user's viewpoint.
- Methodological considerations relating to the organizations taking part in the investigation (unit of analysis) and to the research strategy.
- Description of the data collection methods (interviews, narrative action research method and final phone interviews).
- Presentation of the results (factors that may create flow quality shortfalls, method for identifying and removing them).
- Discussion: interpretation of the results in light of the research questions.
- Conclusion: research contribution and limitations.

2. Conceptual background and hypotheses

2.1 *The managerial information flows from a relational perspective*

The topic of information exchanges among top managers is typically a part of the discipline of “information systems” that, in summary, collect, process, store and spread information in order to support the various corporate activities (Maggioni, 1983; Kanter, 1984; De Marco, 2000). A whole range of different elements contribute to these systems, such as, data and information, rules, processes and organizational-information technology procedures, technological infrastructures and individuals. The obviously different nature of

these elements logically justifies the multi-disciplinary approaches adopted, with investigations that range from information technology considerations, to organizational and economic-managerial aspects, without neglecting communication and psycho-sociological elements.

In this context, however, the critical areas on which studies since the Sixties have specifically focused on are linked to the *organizational architecture*, i.e. the processes to design, develop and maintain effective data processing methods, and *information technology infrastructure*, i.e. those technologies (calculators, computer networks, electronic information storage and transmission procedures) required to implement these processes.

Despite resorting to different logics, both approaches have shown a particular interest in managing information for the *managerial activities*, probably stimulated by the objective difficulty to formalise a manager's job as a set of procedures, in view of the complexity of the decisions that a manager has to make (Maggioni, 1983; Finkelstein, 2003; Snowden, 2004; Satyakama Paul, 2014; Smith, 2015; Kelman et al., 2016). Proof of the ample space given by literature to this topic is the proliferation of studies on *managerial information systems* (Keen & Scott Morton, 1978; Sprague & Watson, 1989; Bullinger & Huber, 1990; Turban, 1993; Martinez, 2004; Laudon & Laudon, 2006), including Management Information Systems, Decision Support Systems, Executive Information Systems, Group Decision Support Systems and Business Intelligence Systems.

These systems have added important sophistication levels and, albeit aimed at times, at replacing the individual, they still retain an *instrumental* role vis-à-vis the decision making-process, which, however, should not be taken for granted given the resistance typically put up by managers (Martinez, 2004; Laudon & Laudon, 2006). Perhaps, also for these reasons and considering the separation at least at conceptual level between the information system and the information technology system, whilst acknowledging the great potential offered by information technology, literature appears to be experiencing a fall in contributions merely related to technical issues and application systems (De Marco, Imperatori & Isari, 2010). Indeed, technologies exist only to the extent to which there are individuals who own them and decide to use them (Martinez, 2004).

Therefore, in addition to organizational procedures and information technologies, focus was also placed on the understanding of the individuals who relate to and use the information systems to interact with one another in line with the so-called *socio-technical approach* (Williams & Edge, 1996; Mumford, 2000).

These contributions are mainly in the technology-user relationship area (Agrifoglio & Metallo, 2010). However, we believe that useful contributions could also stem from the study of the ways of mutual conditioning between information exchanges and relational mechanisms from an intra-organizational communication perspective. In other words, an information system may not work properly not only due to the obstacles linked to the use of technologies and the resistance that these generate, but also due to issues linked to relationships between the individuals who exchange information. So, if it is true that if two people who have chosen beforehand not to communicate it is unlikely that they will do it for the sole effect of information technologies (Zack & McKenney, 1995), it is also true that their interpersonal communication problems may generate an impact on the quality of the information and vice versa.

According Hambrick, "executives act on the basis of their personalized interpretations of the strategic situations they face and these personalized construals are a function of the executives' experiences, values and personalities. As such, the theory is built on the premise of bounded rationality. Informally complex, uncertain situations are not objectively "knowable" but, rather, are merely interpretable" (Hambrick, 2007; Buyl et al. 2016).

On the basis of these assumptions we have the first hypothesis: *the information quality problems depend on relational communication issues rather than technological and organizational factors.*

This hypothesis refers specifically to top management whose decisions typically require, in addition to experience and judgment skills, a knowledge based on different information sources and the involvement of other managers (Sprague, 1980; Daft, Lengel & Trevino, 1987; Laudon & Laudon, 2006) thus implying interconnection and interdependence conditions.

From this perspective, in this study we adopt the organizational communication approach from an interpersonal point of view and within the top management team working processes (Smith et al., 1994; Amason & Sapienza, 1997; Zorn & Tompson, 2002) based on the following theoretical justifications:

- the information is the link that connects the parties that make up the corporate system (Saraceno, 1973; Maggioni, 1983). Similarly to language, information has sense and meaning only if is used by at least two people within formal and informal networks (Spence, 1969; Daft, Lengel & Trevino, 1987).
- The giving out and receiving of information is the elementary objective of all kinds of communication (Spence, 1969).
- Executives' decision-making difficulties involve communicating with the people involved (Alavi, 1982), also because information is often conveyed through symbols and language systems and influenced by the so-called "equivocality" generated by the lack of a common perspective (Daft, Lengel & Trevino, 1987).

In this sense, the way in which information is defined, found and used, and of which a manager may be, depending on the circumstances, either a designer or a spectator, can determine or derive from the internal climate by structuring and re-structuring power, conflict and alliance relationships (Laudon & Laudon, 2006; Mastrobernardino, 2010; Yang, 2015; Kano and Verbeke, 2015; Desai, 2016; Bosse and Phillips, 2016).

The way in which organizational climate is determined by information exchanges has been the subject of special interest in literature. In this connection, an aspect on which researchers focused, albeit with reference not only to the top management teams, concerns the relationship between perception of quality and adequacy of information received (getting enough information) and trust (Ellis & Shokley-Zalabak, 2001), which in turn influences the employee's involvement (Thomas, Zolin & Hartman, 2009) through the perception of general openness in the organization (listening to the others, encouraging difference of opinion, being frank and candid with others).

Several studies have also shown a positive relationship between communication satisfaction and organizational commitment (Postmes, Tanis & de Wit, 2001; Trombetta and Rogers, 1988; Varona, 1996) or organizational climate, albeit in a very wide and multidimensional sense, of which communication among top managers represents just one of the many variables (Invernizzi et al., 2012; Fiocca, 2002).

In any case, such relationships appear to be mainly investigated in terms of the impact of information on interpersonal relationships. At this point we should also stress the existence of a reverse relation, i.e. interpersonal interactions-information, as part of a dual circuit.

2.2. The identification of information needs from a quality perspective

The research hypothesis outlined in the previous paragraph underlies the concept of quality of the information flow which can draw from the studies on Total Quality Management (Juran, 1981; Ishikawa, 1985) according to which this quality lies in the ability to meet the expectations of the counterpart which, in this specific case, are top managers. This approach is based on the assumption that the knowledge of their activities and information expectations

can be an effective impulse to developing proposals for managing information in line with the approach that in the area of marketing is defined *demand pull perspective*, which, however, is not shared by those who maintain that the initiative should be taken by information technology and organization specialists.

In view of the above, the discipline of information systems, when referring to the *quality of the information flow*, focuses on the *information attributes* from a contents, time, place and form-method perspective. In summary, with special reference to managerial decision-making processes, information should be (Maggioni, 1983; Laudon & Laudon, 2006):

- *relevant*, excluding any useless information which, in addition to not being necessary, may, in the not infrequent cases of “information overload” (van der Heijden, 2009) be even harmful, especially for managerial processes that typically require summarised information;
- *reliable or accurate*, albeit approximate, which is a function of both the loaded data and the data processing procedures, which also includes its *completeness*;
- *clear*, a function of the complexity of language, of the possible electronic format and transmission procedures, which may render information inaccessible and therefore unusable;
- *prompt and/or timely*, both in terms of response times and regularity. At any rate, the recipient should receive the information early enough to make his or her choices;
- *immediately usable*, without the need for further processing.

But above all, information should meet the requirements of its recipient taking into account the peculiar features of the choices to support or a multitude of special information needs (Baccarani, 1988) which, in the case of managerial activities, are subject to frequent change.

From the perspective of information exchanges that we have adopted herein, it may be worthwhile contextualising the information flows in a typical process logic where each manager is at the same time “internal supplier and customer” (Berry, 1981) of information.

Therefore, when defining a quality information flow, a first step is to correctly identify suppliers and recipients, also with a view to reducing the risks of information *overload*, which occur when the same piece of information is provided by different centres, as well as *ambiguity and inconsistency* which is typical in cases where the one information need is met through different and/or conflicting information. In this respect, we should consider that the interrelationships that the information system generates among top management departments are rather complex and hard to define, also due to the integration perspectives among different information subsystems.

Then it is essential that the corporate figures know and are able to express their information needs, specifying the types of information that they consider essential as well as the procedures and timeframes of their presentations, which, again, is not a simple thing for a manager (Aron, 1969).

Different methods have been devised to know what are the information needs of corporate figures, including *business system planning*, *critical success factors analysis* and *systems analysis* (Maggioni, 1983; Laudon & Laudon, 2006).

The *first two methods* are both based on interviews of a sample of managers in order to understand how the information required to make decisions is obtained and used. However, in the second case, the assessment is limited to top managers and the information needs are linked to a small number of variables considered by such managers as relevant for the purpose of observing the activities for which they are responsible (Rockart, 1979).

Wider and more complex is the *systems analysis* procedure that requires a 360 degree mapping of a company and its information systems, based not only on user interviews, but also on records, procedures and operations examined by an analyst for the purpose of identifying possible problematic areas. In this case, an improvement-oriented perspective

stands out as an additional element. Under this procedure, we can assess alternative solutions in economic-financial, technical and organizational terms by comparing the cost-benefits of each alternative.

The methods described above are part of the logics that are typical of auditing and that require systematic and documented checks by external analysts, in any case by entities other than the individuals who make use of the information systems (Kanter, 1984). The summary considerations that we can make on such methods include:

- users, managers in particular, are involved only indirectly through interviews;
- these are rather complex and time consuming methods due to the quantity of data, records and procedures to be analysed and assessed and, as a result, they are more expensive;
- a critical issue is often the identification of the actual information needs in a process logic (when, where and how);
- the improvement-oriented perspective is not always included;
- the identification of the reasons behind the different information types and issues does not appear to have been considered.

By overcoming the critical issues described above, the second research hypothesis suggests that a *useful method for identifying top management's specific information needs, for the purpose of improving the quality of communication exchanges, should include the following prerequisites:*

- *simple procedures and exclusive focus on information flows;*
- *direct involvement of participants in the flow from an internal supplier-customer perspective;*
- *identification of issues underlying possible shortfalls;*
- *improvement-oriented approach;*
- *reduced role of external analysts to aim for independent operating conditions.*

To this end, the research came up with a model incorporating these features, which was later tested on 18 organizations.

3. Methodological considerations

3.1 Unit of analysis

The investigation was conducted on 18 organizations selected in light of the degree of their organizational complexity in terms of departments, where the complexity was linked, among many other factors, to the size of the organization.

Indeed, in large organizational complexes, not only is the volume of required information wider, but also the communication circuits are larger, the number of interconnection points is greater, the processing and dissemination of records become more complicated and the information production process plays a key role.

The background assumption, in other words, is that in structured and formal organizations, the issue of top management communication is more urgent and likewise the need to have a quality communication flow. The full availability and the high degree of interest shown by the participating companies is a clear confirmation of this.

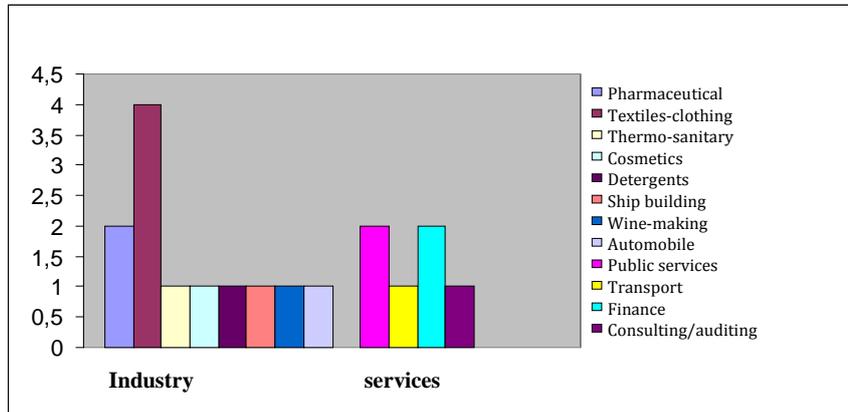
Then, among the many organizations, that in line with this criterion were entitled to participate in the investigation, a selection was made based on previous contacts made by the authors in previous researches.

We cannot name the participating organizations due to their specific request not to do so. However, we can provide an aggregate representation in terms of size, nature of the property, type of reference market, sectors, geographical location and globalisation.

In providing a summary profile, we can say that they are mainly medium-large organizations (16 out of 18, i.e. approximately 89%), private organizations (16 out of 18, equal to approximately 89%), business to consumer organizations (13 out of 18, equal to 72%) and industrial organizations (12 out of 18, equal to almost 67%).

In Fig. 1 the group is further broken down, albeit in a summary fashion, by sectors, which results in a distribution of the sample over a wider range of sectors.

Figure 1. Unit of analysis by sector



Moreover, from a geographical perspective, most of them are Italian companies (16 out of 18), with exactly half of them (9) based in North-Eastern Italy while the other half are spread over the country.

Albeit not a majority, it should be mentioned that almost 40% of the organizations participating in the investigation were globalized.

Then, in each organization the study was conducted on top management. In other terms, the investigation saw the participation of the main department chiefs with a degree of participation between 71% and 92%.

3.2 Research strategy

The research strategy of this study is influenced by Gummesson's *interactive research approach* (2001).

This is a very open and eclectic approach and, intentionally, a bundle of various methods. In this specific case, interactive research, under the influence of the inspiring principles of ethnography (Brewer, 2000) and action research (McArdle and Reason, 2007), is the result of the *joint* application of sundry techniques (collective meetings, individual interviews and narrative action research method, which we will describe shortly) with this application being *repeated* in each of the 18 participating organizations.

In practice, the investigation involved 18 organizations and their main department chiefs with the aim of analysing the process whereby information is exchanged.

The 18 cases were investigated during 10 years of professional experience while the average duration of the involvement of each organization was approximately 6 months.

For each of the organizations being investigated, the methods described below were applied.

Since a prerequisite for the effectiveness and, better still, the commencement of the research was the awareness of the importance of the topic, preliminary meetings with the company top management were undertaken before the actual investigation in order to stimulate this awareness. In this context, the calculation of the overall cost of top management communication, in terms of man-hours, was particularly useful.

The choice to measure, together with the Ceo's, the cost of the human component of communication flows, and quantify it in a single amount, proved particularly effective in attracting the attention of top management and making it aware of possible issues and opportunities linked not so much to the reduction but rather to the optimisation of costs through the search for possible creative solutions.

Moreover, since the study required the direct and active involvement of individuals, another important assumption was the creation of a group climate that allowed individuals to feel comfortable and free to express themselves, and adopt a constructive approach. Thus, *collective meetings* were set up to encourage the participants to listen and participate, especially workshops on social anxiety and self-diagnostic working groups on listening skills.

At that stage, the top managers were *individually interviewed* for the purpose of assessing their degree of satisfaction in relation to the quality of the flow and identifying the ways they assess it.

Once the interviews were completed, the actual investigation was started based on an ad hoc method, i.e. the *narrative action research method* (NARM), which was the result of the original combination of the action research principles of change promotion and narration and problem solving techniques, which are respectively at the base of role-playing and quality circles.

Thus, the top managers were encouraged to reproduce a typical information flow situation according to the role-playing narration technique.

The aim was to detect any factors capable of creating situations of dissatisfaction, but also to promote in participants the ability of analysing the process in order to remove any shortfalls, in line with the problem-solving spirit which is typical of quality circles.

In brief, the directors of the different corporate departments, under the direct guidance and observation of the researcher, were gathered around a table where each was able to express both his or her information needs and requests and, in exchange, their responses to their peers' requests. The aim was to capture their ordinary activities and social meanings in line with the purest ethnography research, even though real-life situations or people in naturally occurring settings were not actually involved.

Furthermore, by adopting the features of role-playing and quality circles, the participants were provided with the opportunity of highlighting their feelings and experiences underlying the situation thus created. They were also provided with the chance to highlight their way to play in the interaction and communication stages, not only in the eyes of the observer but also of the participants themselves, who could then become aware of their attitudes, receive feedback on their behaviour, appreciate different opinions, improve their listening skills and promote changes to real life in line with the forms of action research.

From this perspective, the NARM played a dual role in this research. On the one hand, it was a research tool to collect data, especially the factors which the quality of the flow may depend on. However, at the same time, it was also used as a system to improve the quality of the information flow. The research aimed at testing its effectiveness by replicating it and highlighting the relevant benefits across the 18 organizations.

3.3 Data collection and analysis

3.3.1 The interviews

Each top manager being interviewed was first asked to give a score between 1 (min) and 5 (max) to his or her overall degree of satisfaction in relation to the information exchanges with their peers.

The result was an indicator of the overall degree of satisfaction for each organization, with an average score of 2.24 for the 18 organizations, which is definitely less than satisfactory (3).

Then, we tried to identify the criteria on which the assessment was mainly based.

The responses were grouped in the following categories:

- lack of information (“I don’t receive the information I ask for”; “no one is able to provide me with the information I need”);
- lack of clarity of the information (“I can’t understand the information I receive”; “the information is badly written and I have to read it a few times to understand it”; “many terms are beyond my comprehension”);
- incomplete information (“I don’t receive all the information I ask for”);
- superfluous, ambiguous and inconsistent information (“I send the same request to different decision-making centres and receive different and conflicting answers”; “I don’t know whom exactly I should ask for certain information”);
- late information (“I receive the information after I take the decision for which I needed it”; “I’m late in my work because I don’t receive the information on time”);
- unreliable information (“at times I find mistakes in the information I receive”).

Each of these variables has different importance depending on specific case, which makes scarcely meaningful any weight allocated to a variable.

The responses confirm more or less the more common features of quality information. The contribution provided by these interviews was that they also highlighted a situation of information needs that are not made clear in the belief that no one is in a position to satisfy them. This allows us to identify, in addition to the category of “expressed needs” the category of “unexpressed (or latent) needs”, which are better described with the NARM outlined below.

3.3.2 *The narrative action research method (NARM)*

This method has allowed us, in the first place, to take a snapshot of the top management true communication flows, through the perceptions by the various chiefs of department involved.

In other words, inter-departmental communication was examined as a process in its own right, i.e. considering the information as it flows: what, from whom to whom, when, how, where and why.

This phase of the investigation was undertaken in two stages.

Firstly, it was made a *mapping of information needs per department*.

Each department chief played the dual role of “recipient” and “provider”, and expressed “information needs” and “information duties”, respectively.

In other words, each executive defined the information needs of its departments vis-à-vis another, and listed in a specific chart all the information needs, both those expressed and those unexpressed, and showed, for each request, motivations, timeframes-frequencies, flow methods-means as well as the importance of the information.

For the sake of a better outcome of the experiment, managers were asked to highlight only the information that was essential to perform their decision-making duties, with the information being aggregated in macro-categories outlined separately in a detailed document.

At this point, each department was able to view and analyse his or her information duties and learn about the motivations that led to the requests, as well as the flow timeframes and methods, which aspects are not always predefined, perceived or agreed upon.

The charts were then cross-examined to obtain a data matrix containing the various information requests and, as a result, the information duties of each company department.

The data exchange matrix thus created, by revealing in writing and visually the information exchanged for the purpose of achieving the strategic objectives, has allowed an overall background view and a clear explanation of the exact breakdown of workloads, which is an important element for the following phase aimed at *understanding* and *negotiating*.

This phase, compared to the previous more technical phase, has shown a strong relational component that has allowed not just the observer, but also the participants, to better understand the reasons behind the shortfalls, which is an essential prerequisite for their removal and the start of improvement-oriented paths, in line with the very nature of problem solving that, at the time of an analysis, combines learning and change.

The chiefs of the different company departments in their role as both information “suppliers” and “customers” were gathered around a table in the same order as in the matrix to simulate the communication process. The information requests were examined one by one, discussed and, if required, changed or discarded.

This was the more “heated”, delicate and controversial stage, in which objectives of use and needs were clarified, reasons leading to communication conflicts emerged and, above all, technical and especially human issues were revealed. And it was especially in this stage that transparency and listening skills turned out to be prerequisites.

Understanding was followed by *negotiation* mainly between the two individuals directly involved, but where everybody could contribute with suggestions. This led to the redefinition of the terms of exchange and the identification of ways of improvement, by directing the negotiation outcomes into a final matrix.

The most significant contribution of this process was above all in terms of relationships as, at the conclusion of the project, the organizations found a range of benefits, as confirmed six months later in phone conversations with top management, during which the managers were asked to confirm or otherwise the achievement of the following results:

1. greater integration of the major corporate areas with resulting improvement of decision-making skills (participation by and involvement of a growing number of staff in corporate projects), 16 cases out of 18, equal to approximately 89%;
2. better coordination between decision-making centres, 16 cases out of 18, equal to approximately 89%;
3. greater sense of belonging, 13 cases out of 18, equal to approximately 72%;
4. improvement of the corporate climate, 13 cases out of 18, equal to approximately 72%;
5. creation of conditions for a better listening climate also for the purpose of a greater sharing of corporate values, 14 cases out of 18, equal to approximately 78%;
6. language uniformity, 17 cases out of 18, equal to approximately 94%;
7. improvement of the overall satisfaction level per department, all cases.

4. Results

Whilst the interviews showed a degree of dissatisfaction as to the quality of exchanged information, the NARM allowed to go to the root of the shortfalls and identify the underlying causes.

During the NARM the reasons that may have caused information shortfalls emerged from the direct and open dialogue between the various top managers. The following list stemmed from the analysis of the recorded interviews: inconsistent language codes, unpleasant tone of voice, mistrust, information protection forms, information removal, result anxiety and fear of judgment, mistakes due to haste, misunderstandings and conflicts, difficulties in coordinating the flow, pressures on speed and meeting deadlines, lack of set deadlines, excessive workloads, poor regularity, lack of clarity on the relevance of the sender source.

Each of these factors influences in different ways the quality of the information flow as it may affect the capacity to supply the information, its clarity, thoroughness, consistency, timeliness, reliability and relevance of its source. Fig. 2 shows the logical connection between factors and quality shortfalls depending on the outcome of the “understanding” phase of the

NARM. For the sake of a better clarity, the factors that influence the quality of the information flow are arranged in the two side columns.

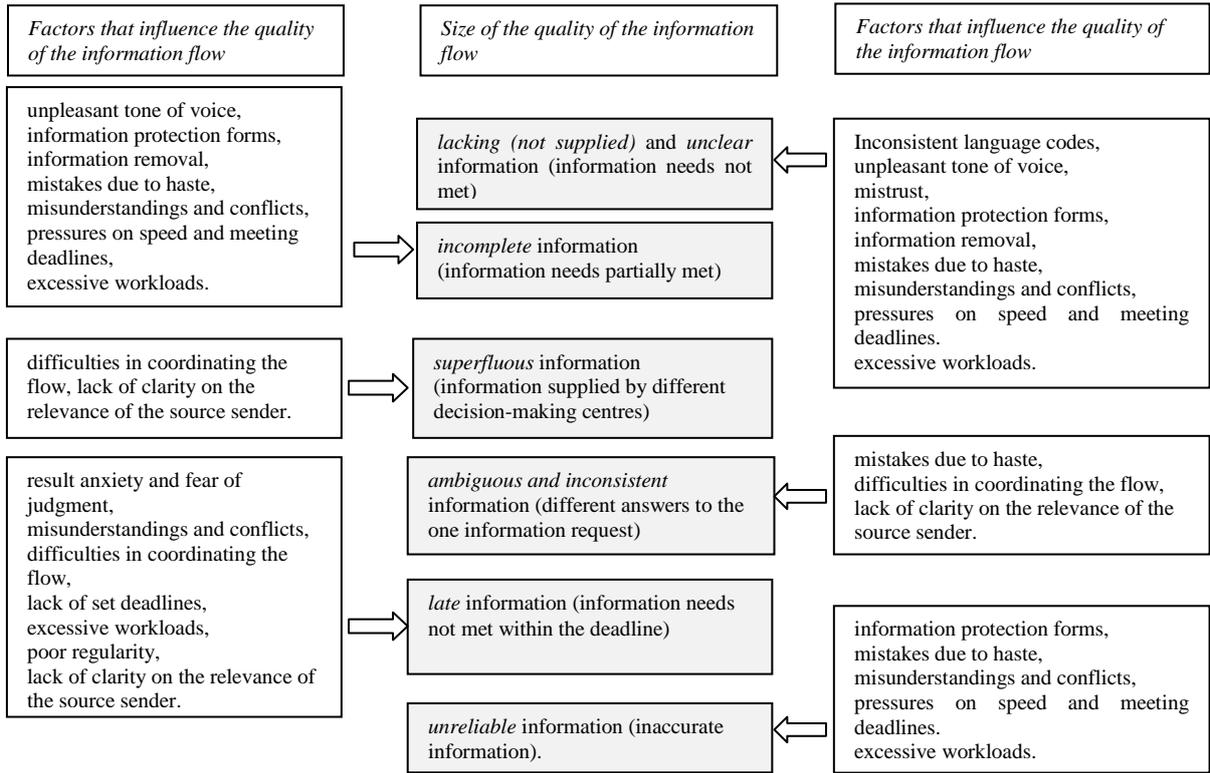
The table shows how different the reasons why the information *is not supplied (lacking)* may be. It may be a genuine choice not to supply the information as a form of protection that may be triggered by the unpleasant tone of the voice of the individual making the request. In the same way, the information may be lacking because it has been removed due to internal conflicts. But at times the information is lacking because it is not even asked for due to a sense of mistrust in peers.

An *unclear information* may be the result of lexical discrepancies arising from the use of different language codes, but also of pressures on speed and meeting deadlines as well as excessive workloads that can cause mistakes due to haste.

At times *information* is there, but *it is not complete*. This situation is brought about by the factors described above, especially excessive workloads that often cause parts of an information request to be neglected.

Typical organizational aspects, such as difficulties in coordinating the flow and lack of clarity on the relevance of the sender source, can then cause an information overload where the information is supplied by different decision-making centres, and likewise ambiguity and inconsistency, when it is not clear whom a certain request should be addressed to or different and/or conflicting answers are supplied to the one information request, which, again, may be due to mistakes due to haste.

Figure 2. Factors that influence the quality shortfalls of the information flow



Often, the information *does not meet deadlines* (it is *late*), causing chain delays or generating decisions without the support of the required information. In this case, the lack of set deadlines and a poor regularity, may add to the organizational factors earlier described (difficulties in coordinating the flow, excessive workloads, lack of clarity on the relevance of the source sender). Misunderstandings and conflicts can then intentionally delay the

information, but a significant role can also be played by result anxiety and fear of judgment, where the fear of being assessed negatively for providing inaccurate or incorrect information may cause a lengthening of the time spent preparing the information.

Finally, information protection forms, mistakes due to haste, misunderstandings and conflicts, pressures on speed and meeting deadlines, and excessive workloads may generate inaccurate and therefore *unreliable* information.

In addition to the identification of those factors that can generate flow quality shortfalls, this study has enabled us to arrive at a *method* for their identification and removal based on role-playing narration technique and quality circuit problem solving technique, where this method draws inspiration from the action research principles of change promotion.

There are three core elements that define it and Fig. 3 provides a schematic description.

The method allows first of all to achieve a visual representation of the flow as a process, highlighting what, from whom to whom, when, how, where and why it flows (*analysis-narration*). Each department has the option of viewing the exchanged information in a matrix, visualize his or her information requests and duties and learn the reasons behind requests, as well as the flow timeframes and methods, where these aspects are not always predefined, perceived or agreed upon. The horizontal communication flows among the different company departments are basically made transparent, thus facilitating a better understanding of the communication process in its entirety.

Figure 3. The three core elements of NARM (Narrative Action Research Method) for the removal of information flow quality shortfalls

1) ANALYSIS-NARRATION <i>Mapping information needs per department</i>	Analysing information as it flows: what, from whom to whom, when, how, where and why. Graphic view of the information needs per department vis-à-vis other departments (contents, motivations, timeframes-regularity, methods-means, importance). Building up a matrix of information needs and duties per department.
2) LEARNING <i>Understanding</i>	Simulating the communication process sitting around a table in the order of the matrix. Open discussion to clarify purposes, the reasons behind a request and any conflicts.
3) CHANGE <i>Negotiation</i>	Redefining the terms of the exchange and identifying ways for improvement. Building a final matrix into which negotiation work flows

Through process simulation, this method allows us to open a dialogue which, albeit at times controversial, helps to better understand the mutual needs and the reasons behind the shortfalls and reveal the human and technical components of the issues involved (*learning*).

By building on these assumptions, the method completed its cycle by negotiating new exchange terms and identifying ways of improvement, thus conveying the outcomes of the negotiations into a final matrix (*change*). Where feasible and necessary, we can also define principles and projects for reviewing the overall information architecture.

Along with a better logical connection of the flow, these changes can achieve greater levels of listening, respect and trust which in turn may have a beneficial influence on the decision-making capacity and the corporate climate as evidenced by the test conducted on the 18 organizations participating in the investigation, thus giving validity to the method.

5. Discussion

In conclusion, it may be useful to interpret the results in light of the research questions.

1) *What does the quality of top management information flow depend on?*

The attempt to provide an answer to this question relies in the list of factors that, according to the study, are behind the shortfalls of the top management information flow.

The analysis of their nature, in particular, allows us to develop some early useful considerations. In this respect, it is interesting to observe that, contrary to expectations, among them there are no technical aspects such as the computer system (hardware and software) or individuals' technical skills. This does not mean that they are not considered as important. It is more likely that these aspects are taken for granted, i.e. they represent *implicit conditions of quality*.

Therefore, the reasons behind the quality shortfalls, far from having technical connotations, show a different and dual nature. On the one hand, there are reasons associated with the *interaction* between decision-making centres (unpleasant tone of voice, mistrust, information protection forms, information removal, result anxiety and fear of judgment, mistakes due to haste, misunderstandings and conflicts). On the other hand, the remaining reasons are *organizational* in nature (inconsistent language codes, difficulties in coordinating the flow, pressures on speed and meeting deadlines, lack of set deadlines, excessive workloads, poor regularity, lack of clarity on the relevance of the sender source).

Thus, the first research hypothesis (*the information quality issues depend on relational communication issues, rather than technological and organizational aspects*) is partially confirmed. Indeed, significant is the conditioning power of relational aspects compared to merely technological aspects (not even considered), even though organizational issues retain their importance.

In other words, starting with the assumption that the quality of the information flow among top management features three dimensions, *technical, organizational and relational*, in this study the technical component did not emerge as a critical component, as it is probably implicit and taken for granted. Instead, according to the perceptions by the participants in the investigation, the aspects that are more important in influencing the quality of top management communication are those of a relational and organizational nature.

These conclusions bring the issue closer to the established studies on *service quality*, where in addition to the technical component of quality, an important factor is the *functional quality* resulting from interactions by the customer, albeit in this specific case, the customer is "internal" to the organization (Gronross, 1984). Indeed, even in our case we are dealing with quality of a service, i.e. the information service that runs between internal suppliers and customers.

2) *How can the quality of the top management information flow be improved?*

The study has validated a method in order to improve the quality of the information flow, featuring the prerequisites suggested through the second research hypothesis:

- *simple procedures and exclusive focus on information flows;*
- *direct involvement of participants in the flow from an internal supplier-customer perspective;*
- *identification of issues underlying possible shortfalls;*
- *improvement-oriented approach;*
- *reduced role of external analysts to aim for independent operating conditions.*

Indeed, the method thus tested:

- *is simple, as it is based on the coordinates of a visual representation of the information flow and on an exclusive focus on the information flow at top management level;*

- involves the participating managers not only through interviews but also directly through role-playing and quality circle techniques, making them facilitators of change independently from an external analyst;
- promotes improvement based on the identification of the issues behind the information shortfalls in line with its three core principles: analysis, learning and change.

However, in order to be effective, it requires that at least one condition is met: commitment by the top management.

The feasibility of successfully tackling the communication issues that hinder the top management information flow depends to a large extent on the awareness of such management in perceiving the importance of the quality of information exchanges and relevant implications, not only from a financial perspective but also from a strategic viewpoint in terms of the impact they have on the corporate climate and the decision-making process.

Only where there is a very high awareness of an issue, can people focus on it and act to identify possible actions to change the situation.

And considering the special conditioning power of relational factors, the method makes sense only to the extent to which it is part of a wider project aimed at creating increasing levels of well-being inside the organization.

Whilst literature has maintained that the quality of information flows can affect the levels of well-being, the study has clearly revealed that a state of internal unease, which is implicit in interactions and within the organization, can affect the quality of the information flow, as part of an obvious circular causality relationship.

Therefore, the improvement of the quality of the communication among top managers is reliant on a more general satisfaction in the workplace, which in turn is associated with the levels of well-being. In this context it may be useful to recall the services “quality wheel” (Heskett, 1987), a sort of virtuous circle that is shaped as in Fig. 4.

Figure 4. The quality wheel in top management communication



Source: our adaptation from Baccarani, 1988

By adapting the model to the quality of top management communication, this figure shows how it is the result of widespread levels of well-being inside the organization and these can, in turn, be influenced by the quality of communication.

In a mechanism of mutual conditioning, the data availability and accessibility required to work and live in the organization improves interactions among peers, generates trust, listening skills and respect thus spreading the organizational well-being with increasing levels of

emotional investment. This, in turn, reduces misunderstandings and conflicts that can potentially be the cause of flow shortfalls (Bonfanti, 2005).

This model is particularly valuable with reference to the interactions at top management level which are typically very close and frequent and that are significantly influenced by behaviours, values and meanings and supported by fragile balances of power.

6. Conclusion: contribution and limitations of the research

From a theoretical-conceptual viewpoint, this study has focused on the issue of the strategic information flow and its problems from a relational perspective that appears to have received less consideration in literature.

Under the impulse of the action research principles applied to management – including a focus on the promotion and management of change inside an organization and the cooperation among the individuals involved in the project – we arrived at a method capable of detecting and removing the problems behind communication flow shortfalls.

In the study, this method played the dual role of both research tool and result, and such roles, rather than being “separate, consecutive stages”, combine together to merge in line with the perspective which is typical of the interactive research approach adopted herein.

Considering the prevalent relational and organizational nature of the issues thus identified, the method devised offers a contribution that links top management communication to the issue of corporate well-being which in turn depends on the interpersonal and organizational relationships.

From an operational point of view, the study provides a method that, compared to the systems more commonly used, is relatively simpler as it focuses directly on the top management flow. But its most significant contribution is the overcoming of the need for an external analyst, as it provides for improvement-oriented paths set up directly by the managers-customers. In this sense, the information that can be obtained from the exchange matrix on which it is based can be of support, as it assesses, for instance, the commitment of a decision-making centre vis-à-vis another, the quantity of incoming and outgoing information handled by the one decision-making centre, the relationship between existing and non-existing information requested by the same department, the weight of the features of a piece of information (random, occasional, regular, existing, non-existing, etc.), and so forth.

As for its limitations, the success of the method may have been influenced by the exclusive reference to senior level managers who may appear to be more aware of the issues that concern their communication and that affect their decision-making effectiveness. In this context, it would be interesting to extend this method to lower levels, starting with middle-level management.

Again among the limitations, significant weight has the system’s capacity to live a life of its own independently of the research. In the study, an external “direction” gave impulse to the method and directed it through the albeit silent presence of the observer. The ability to turn it into a concrete operational tool depends on the will of the company top management. Thus we go back to the question of sensitivity towards these issues linked to the awareness of the importance of top management communication for fostering corporate well-being and the importance of corporate well-being for fostering communication.

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