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Overcoming Communication Barriers for CMC in Enterprises

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ABSTRACT

The importance of electronic media (especially CMC) for intra-organisational communication and for the transfer of information within multi-national corporations will be illustrated. In addition, a number of different barriers to communication which can emerge in the context of information-based industry will be discussed. A further component of this paper will comprise of an approach to the identification, description and classification of barriers to Computer Mediated Communication in Business.

Keywords

Barriers to communication, Business communication, communications model, CMC

INTRODUCTION AND MOTIVATION

CMC is at the center of intra-organisational communication for internationally active companies. Before coming to the barriers to free-flowing communication it is necessary to emphasise the increasing importance of intra-organisational electronic communication. Intra-organisational communication will be viewed as a management function in an organisation, and the communication processes analysed from the standpoint of an organisation theory approach to communication. With this in mind and placing the emphasis on processes of intra-organisational communication, Computer Mediated Communication (CMC) will be understood for the purposes of this paper as the following:

“[...] a process of human communication via computers, involving people, situated in particular contexts, engaging in processes to shape media for a variety of purposes.”. (Thurlow et. al 2004, also see McQuail 2005).

The aim of CMC is to allow for and to support synchronous and asynchronous communication between personnel (see Walther 1997). The study will focus on CMC within the framework of communication processes, specifically those within an organisation. Further CMC approaches (e.g. regarding social communication) will not be taken into account. The aim is to prove the success of an enterprise as contingent on these processes running smoothly through the application of electronic media. The frames of reference in this paper will focus solely on supporting information exchange by dismantling any extant barriers to its flow.

Communication theories

The examination of classical and modern approach of communication theories as the starting point of this paper serves to compile and collate the 'classic' factors or necessary elements for successful communication. From this, corresponding obstacles can be deduced in the presence of which communication can not be successful. This research was necessary, on the one hand, to check whether the model developed in this paper covers all these classic factors and obstacles and on the other, to serve as a basis for the selection of indicators for the identification of critical areas of an organisation.

Examples from these classical contexts, this paper will make use of the Laswell Formula (Maletzke 1988), technical message transmission as per Shannon and Weaver (Shannon and Weaver 1949), Berlo's SMCR Model (Berlo 1960), the circular model of Schramm and Osgood (Schramm 1954), Gerbner's General Model of Communication (Gerbner 1956), the Spiral

Model as per Dance (Dance 1967) and the Organon Model put forward by Bühler (Bühler 1978). Modern contexts of communication theory are often found in technical literature under the umbrella term 'agile communication', for example in (Boehm and Turner 2003), (Korkala and Abrahamsson 2007) or (Pikkarainen et al. 2008). These models aid in bridging geographical gaps within distributed development projects. They are often spoken of in the context of software development and can be carried over to other types of project.

Intra-organisational communication. Definition of terms

The starting point for the theoretical examination of intra-organisational communication is the model developed by Grunig and Hunt (Grunig and Hunt 1984) in which management functions of intra-organisational communication were put forward and defined as follows:

„Public relations, therefore, is the management of communications between an organisation and its publics“. (see Grunig and Hunt 1984, p. 6)

Grunig and Hunt developed four Public Relations models; Press Agency, Public Information, 2-Way Asymmetric Communication and 2-Way Symmetric Communication. The difference between these models is determined by the definition of two variables: the direction as well as the purpose of the communication. As a result, it is not only whether the communication taking place is one-way or two-way - which is to be investigated; but furthermore, whether its effect on the parties is balanced. The model for symmetric communication describes the excellence of a communicated message where the communication is understood as a dialogue between the locutors and their purpose is mutual influence and understanding. This paper concerns this communication model and investigates the importance of the smooth flow of intra-organisational communication.

Einwiller, Klöfer and Nies set up a number of different classifications for intra-organisational communication with typical characteristics, for example: the information flow and the degree of formality (Einwiller, Klöfer and Nies 2008). The former differentiates between upwards and downwards communication (communication between different hierarchical levels in an organisation, from the upper levels to the lower and vice versa) and horizontal communication (communications between persons on the same level in the organisation's hierarchy) and the latter differentiates between informal and formal communication. Horizontal communication is of great importance for the coordination of projects as well as for supporting the socio-emotional needs of employees. While targeted formal communication within an organisation will invariably be kept within strict official channels and frameworks, informal communication is far removed from the organisational structure and regulations (so called *Berichtswege*). Schick defines informal communication as a necessary lubrication for the wheels of an enterprise (Schick 2002, p. 144) and gives examples of a number of communication platforms that could be set up in order to support the creation of informal communication channels and networks.

Functions and Instruments of Intra-organisational Communication

Intra-organisational communication has an instrumental function – it coordinates the exchange of information both inside the company and between a company and its public. However, it also has important social functions: to provide a social contact and to fulfil the emotional needs of employees. This shapes the work environment and provides employees with a shared culture in which they can take an active part in (see Mast 2002, p. 244). Therefore this is not only functional on a low-context level but is simultaneously effective on a high-context level for the feelings and relationships of an organisation's employees. To fulfil these various roles, intra-organisational communication uses a number of tools and instruments ranging from written and electronic media as well as inter-personal communication. The rapid change inside an organisation and in the wider world is placing new demands on the instruments of intra-organisational communication. For a long time, the goals of intra-organisational communication were limited to a purely informational function and written media (such as employee newsletters) and were consequently seen as the most important communication tools. These have subsequently been either expanded or replaced by new electronic media, especially in enterprises where the number of offices and workers is particularly high. In internationally present companies it is especially important to successfully leverage new electronic media in order to deal with the demands of international intra-organisational communication (see Quan-Haase et al, 2005; Walther 1996; Galetta et al, 2006). These demands include, amongst others, time differences across international offices, neglect of bottom-up and horizontal communication and the support of top-down communication as well as decreased motivation for employees to take part in communication processes. The more successful an organisation is at meeting these demands, the more successful is their intra-organisational communication and by the same token, the more successful is an organisation's internal communication, the clearer the benefits of symmetric communication become. Therefore, it is important to identify barriers to the free flow of symmetric communication which work on both the requirements of the organisation as well as on the implementation of communications instruments.

Composition of the article and study

The background of this paper, given that the approaches taken are not tied to any one sector or industry, is based on observing the processes of internationally distributed software development. On the one hand, this involves strictly information-based activities which require a high level of specialist knowledge and experience and demand the coordinated exchange of information. On the other hand, this exchange is influenced by the regional and cultural differences of the parties. From this, two main areas of contention come to the fore:

1. What types of communication barriers do exist? How can these be collated, characterised and classified in a systematic and thorough way?
2. How can these barriers to communication be identified in an organisation? When is it pertinent and in which areas and departments does it make sense to actively seek out and study these barriers and to which level of detail?

This paper puts forward an approach to the observation of communication with an emphasis on obstacles to effective management of communication. The main idea is that it is not enough to simply collect, evaluate barriers and to make suggestions for future improvements solely based on communication that is taking place. It is not only the communication which has taken place which is of interest, but also those transfers of information and knowledge which have been corrupted at some point and are now no longer recognisable or comprehensible. Based upon this the following structure of research arises from (see Fig. 1):

The aforementioned classical and modern communication theories concern themselves with the study of focal factors for successful communication. From this, barriers to successful communication can be deduced. With this knowledge, a communications model can be created which also takes into account the type of information. From this model one can systematically deduce different classes of obstacle to the transfer of information. The result will be a corresponding classification system for classes of barriers. At the same time, a classification system for the context in which communication takes place can be similarly deduced. This involves identifying characteristics from which a rough description of an information transfer can be created. This can then be used to identify critical areas of an organisation and related obstacles. This was achieved using specific indicators which can be then empirically tested. These areas will be analysed more comprehensively on the basis of the classification system for barriers. Finally, recommendations for tackling or eliminating these barriers can be developed as well as identify areas where the creation of alternative communication channels or the strengthening of existing channels would be prudent.

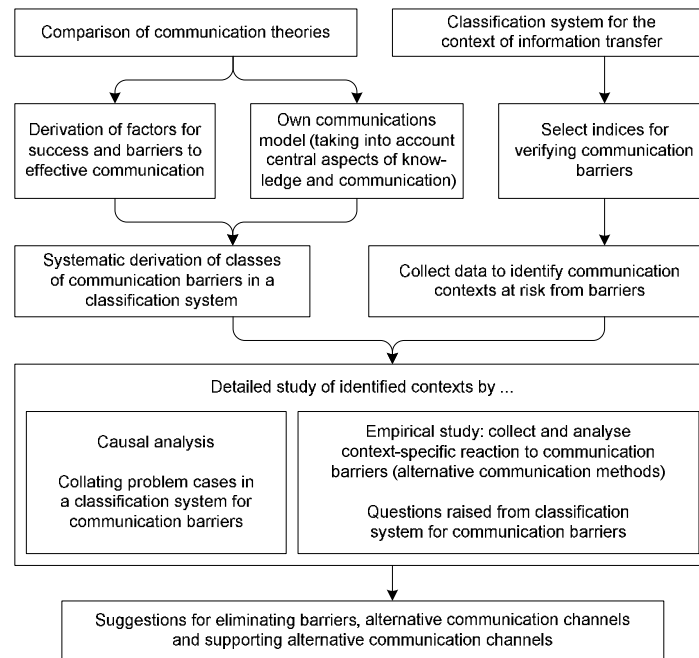


Figure 1: Structure and process of study (authors’ own diagram)

The process of the intensive study is assessed and improved via an empirical study.

CLASSIFICATION SYSTEM FOR CONTEXT CLASSES OF INFORMATION TRANSFER

A classification system contains rules for transferring a set of unsorted elements into a new overall system in order to achieve an ordered representation of these elements. For this one needs to define classification parameters such as quanta, characteristics, dimensions, value and principles of classification (Wersig 1971; Laisiepen et al. 1972, Bailey 1994).

Technical literature provides a great deal of approaches for the classification of information barriers. An overview of approaches can be found in (Bick 2004, p. 92). The classification system developed in this paper (the 'barrier column') is arranged both horizontally and vertically in which the horizontal component follows the approach set out in the classifications model in Schüppel (Schüppel 1996) and is characterised by the following points:

- Subjects of interaction: explicit or implicit individual knowledge.
- Participating actors: Single Person Scenario (one person, arbitrary number of artificial actors) or Multi-Person Scenario (a minimum of two persons).

Each vertical component represents a process area or building block of Information Management according to the selected approach; in this case, the Munich Model (Reinmann-Rothmeier 2001)¹. From this combination of distinguishing characteristics given, the sixteen context classes for communication barriers as shown in Fig. 2 will result.

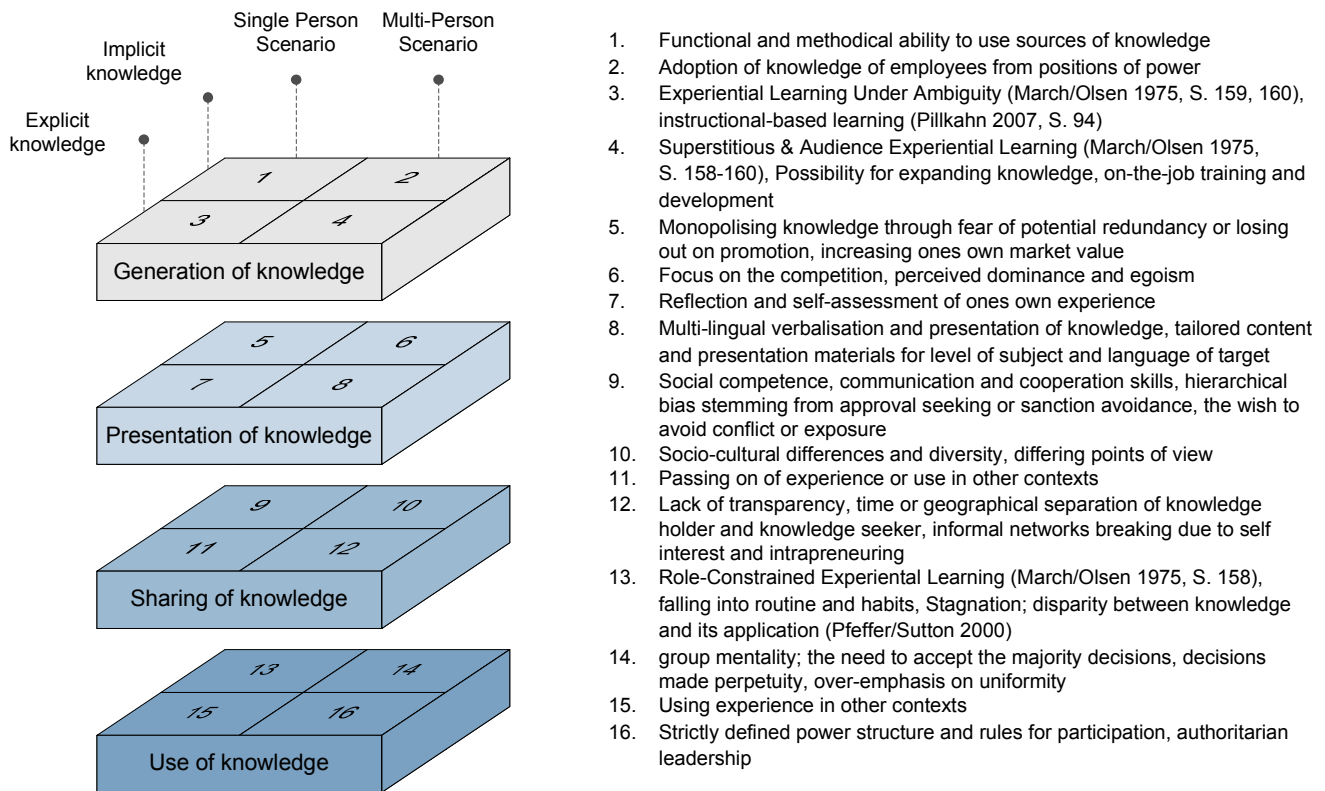


Figure 2: Context classes for communication barriers (authors' own diagram)

The barriers given here combine previous research literature and preliminary in-company surveys. Nevertheless, not every barrier to communication is obvious and thus not immediately identifiable or measurable. In order to identify areas of organisational communication for intensive observation one must assign indices to build context classes. The search for these indices takes place in the form of a standard questionnaire for individual employees of an organisation.

¹ Doubtless there are other applicable models, for example the knowledge modules in (Probst et al. 1999) or the Potsdam Model (Gronau 2009).

LEYERED MODEL OF COMMUNICATION

Structure describes the inter-relation of a system. However, it is also possible to view the system (inter-relation of elements and relationships) or solely the structure as the content, for example if the system or structure is to be copied and transplanted to another system or structure. In this way, implicit knowledge can be transformed into more concrete forms such as Information or Data. Similarly, thought processes can be recorded in the form of concepts or theories. The procedure of mirroring the relationship between implicit notions and more concrete content is defined as interpretation. While the form defines the matter of this interpretation (in terms of individuals) the content proposes how this interpretation is to be transferred, that is to say - interpreted (see Fig. 3). Semantic or syntactic systems can serve as abstract principles from which rules for this transformation can be gleaned. Data is created via syntactic interpretation of characters.

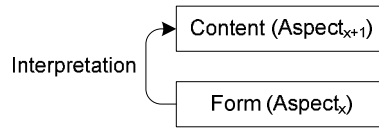


Figure 3: Interpretation of Form and Content (authors' own diagram)

This differentiation of form, content and interpretation can be used as the foundation of a communications model. This model will take the form of a layered model for inter-related objects which will have an effect on one another during communication. This is necessary in order to be able to carry out the coming steps of the study.

These inter-related objects are taken to be those components of communication through which two or more locutors make themselves understood during a communication. It is to be assumed that each object can be viewed in different ways whereas other object characteristics come to the fore. For example, it is possible to view an object as a knowledge object, data object or as a collection of material. However, there are other aspects of the object. The term 'aspect' is used in the context of the way an object is viewed. It is however necessary that these aspects can be arranged hierarchically. This means that each aspect can form the basis for the interpretation of another aspect of the object and so on (see Fig. 4). The specifications of two neighbouring layers can therefore serve to clarify their inter-relationship in terms of form and content.

From this, one can create a layered model in which each object can or must be used. Each layer deals with a specific object aspect. Only once viewed through a specific object aspect will an object be assigned characteristics implicit to this particular aspect. For example if observation of a character set suggests its classification as a data object it can be that this features a number of syntactic characteristics with one being more prominent. The characteristics of a character set object also apply to data objects (for example the font used of medium of transfer). On the other hand, were the object not to feature any syntactic characteristics, it can not be viewed as a data object and consequently, be taken into account (see Fig. 4).

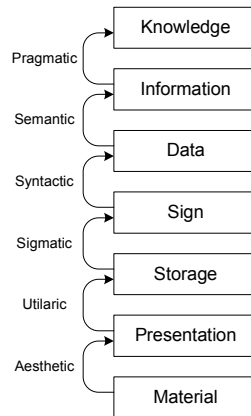


Figure 4: Layer model for communications objects (authors' own diagram)

By following these steps upwards in the definition of an object we can decode its intended message. Encoding a message proceeds in the same way, but in the opposite direction. That is to say, stepping down the layers of the model. In this way, by filtering out the factual context of a 'piece' of knowledge it can be transformed into information. Similarly, by stripping out the semantic interpretation one can transform information into data.

By applying this in different ways, the content of a communication object can be transferred to another object. In this way

once can show a conversation of a certain 'piece' of knowledge. This inter-relation of objects owes a lot to the channel used to communicate the object as each channel would require that the information is pre-processed or post-processed in a different way. In general, the lowest material layer can be used as a common denominator connecting various objects (see Fig. 5).

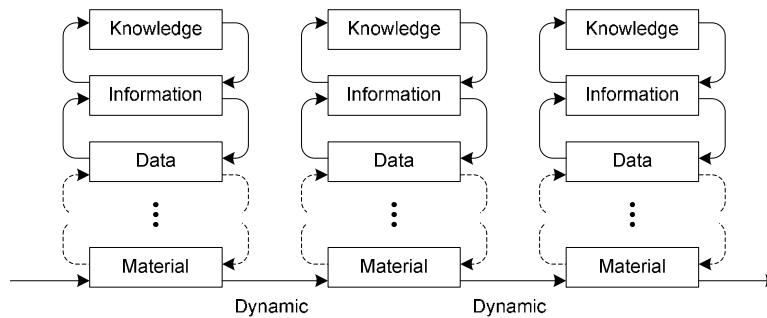


Figure 5: Inter-connected Communication Objects (authors' own diagram)

Ideally, every communications object can serve as the starting point for one or more further 'communicative' interactions.

That a particular aspect can be interpreted in such a way that it exactly mirrors another aspect is the ideal case. In general, depending on the level of detail, there are multiple ways in which the essence of an object can be interpreted through any of the already known characteristics. In order to view a multi-lingual text with graphics as an information object, the interpretation of this demands the knowledge and application of more than one set of semantic rules. For each language or graphical representation, appropriate semantic rules must be applied. Here, the information object serves up its content in various ways. Lower levels can be further subdivided and the branches created used as a separate model for that part of the object or simply ignored. In principle, this same technique can be used on the higher levels and it is left to the discretion of the user of the model how detailed the object descriptions contained within are to be. This allows the user the option to set a limit over which an excessively detailed description would be largely irrelevant or uneconomic. Subdivisions at the higher levels occur, for example, when an object serves as the form for more different content (e.g. two different suggestions connected at a data level). For the purposes of this paper, however, only 1:1 relationships between form and content will be used for the analysis.

SYSTEMATIC DERIVATION OF POTENTIAL COMMUNICATIONS BARRIERS

Each relationship between two layers can be perceived as a potential barrier to communication. A barrier will be formed when the content of a communications object is rendered either completely or partially incomprehensible when viewed on the applicable layer of another communications object. A breakdown in communication such as this can have various causes. These causes suggest characteristic traits for the classification of barriers:

1. Methodological: The receiver has made a mistake during the interpretation of the message or filtered out the desired message. Rules for interpretation have not been followed or have been misused.
2. Legal: The participant can not follow all the required steps to interpret the message due to their lack of the necessary rights.
3. Combinatory: The participant has not brought together the requisite sources to properly interpret the message.
4. Physical-technical: There are technical errors which preclude correct interpretation.
5. Organizational: A required step is impeded by measures put in place by the organization itself.
6. Economic: A required step is hampered or made difficult by economic factors. The ratio of time and money taken to usefulness of a correct interpretation is unjustified.
7. Social: A required step is negatively affected by inter-personal or cultural differences.
8. Political: The intended meaning is corrupted to fit better with personal, political or organizational aims or policies.

In addition to this are six decoding relationships (\uparrow -Prefix), six encoding relationships (\downarrow -Prefix) and one transfer relationship (\leftrightarrow -Prefix). These thirteen relationships, combined with the eight types of communication breakdown produce a total of 104 classes of barriers which can hinder or make communication difficult. The inter-operable layers therefore provide us with a further characteristic trait for classification (see Fig. 6). The direction of the interpretation process within the layer model is described via the aforementioned prefixes.

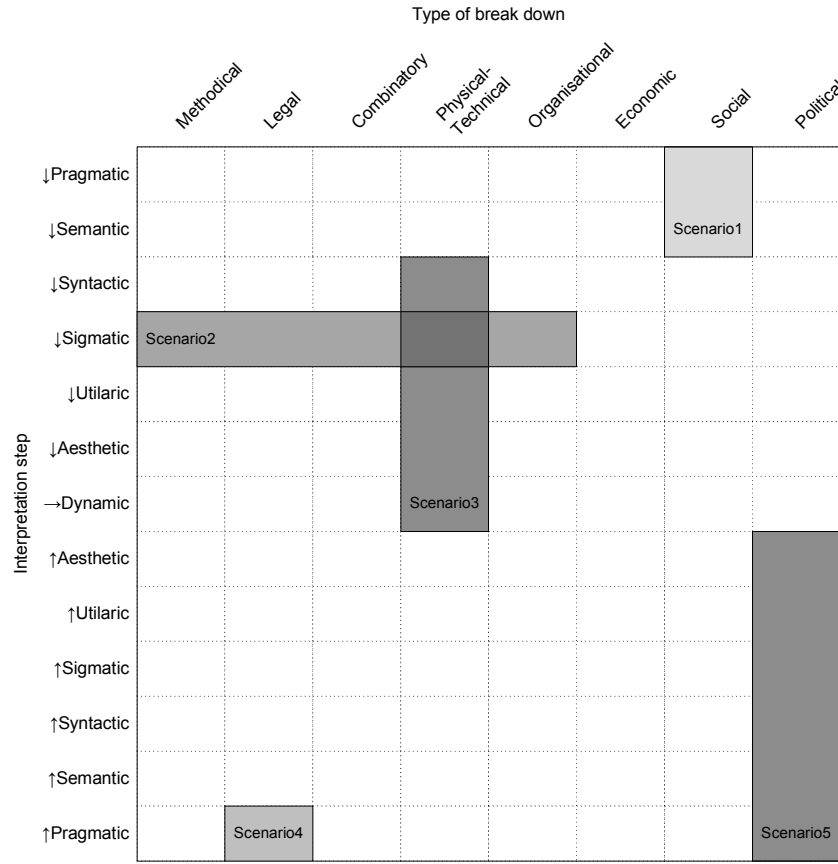


Figure 6: Classes of barrier (authors' own diagram)

EMPIRICAL RESEARCH AND PRELIMINARY RESULTS

Presented below are initial results of the empirical study illustrating the application of theoretical considerations into business practice. In company situations, barriers can be identified through a retrospective process during culminative meetings (after reaching a milestone or completing a project) where each member discusses positive and negative experiences and also develops ideas and proposals for optimizing future collaboration. The ideas can affect the organizational workflow and also be responsible for the implementation of IT systems (e.g. collaborative platforms).

A typical scenario in business situations whereby misunderstanding arises between developer and stakeholder, in particular between developer and marketing and/or customer (see scenario 1 in a Class-8 context): the latter group enters issues into task management or bug tracking systems, e.g. Mantis or Bugzilla. Because the technical knowledge of this latter group is low, these requests are unclearly formulated. From the developer's point of view, the latter group is unable to address and describe a problem adequately (wrong semantic or pragmatic). The different insight of problem areas is based on a different educational background (social cause). Nevertheless the issues are bound to a deadline which has not been negotiated or agreed upon between the individuals concerned. A successful solution for this scenario is the introduction of mediation (e.g. by a software engineer) who is responsible for discussion of domain- or issue-specific requirements - between the parties involved and implementing a feasible timeline, finally technically precise tasks are formulated allowing for successful resolution.

Only scenarios of the same context class are allowed to be put together in a matrix. Otherwise a local communication barrier would be treated as a global one (concerning every unit of an organization).

The identification of communication barriers of previously defined context classes is survey-based. For this purpose a standardized questionnaire containing indicator questions was given to nine small and midsize companies from which 58 responses were returned. A high accuracy of responses is required to ensure that indicator questions directly concern the specific problem enclosed by the appropriate context-class. This was done using a focused introduction and coaching of staff involved in the survey. Below are explained some of the classes investigated in barrier-vulnerable communication contexts.

The range and material for individual knowledge acquisition is a Class-4 context. For example, the following question with the response options "Very high", "Fairly high", "Somewhat small" or "Very small" was investigated:

"How large is your room for individual knowledge acquisition in the company?"

Contexts of Class-8 are the fact that amongst project team members from various professions, business segments or divisions, specialized industry-specific languages and standards of behavior followed by their working environment are given implicitly. Thus, the following two questions are asked to the employees with the response options in the first being "Yes" or "No" (diametrically) and in second "Regular", "Sometimes," "Rarely" or "Never":

„Are there enough tools for a cross-disciplinary collaboration (for example, glossary, explanatory models)?“

„Are acquired experiences, project results and reports in a form accessible to other employees made available?“

There are then also two contexts of barrier (10 and 12) which are distributed across the primary focus on geographic or international cooperation. Contexts of Class-10 are largely used in the diversity of cultural forms and their degree of inequality, i.e. socio-cultural distance. It is this distance in conjunction with language, work habits, ethics, principles, business practices and political or religious views. The Class-10 contexts, for example in the following two questions focused on cultural diversity-related problems, allow the staff surveyed four possible responses: "Often", "Sometimes," "Rarely" or "Never":

„Do substantial misunderstandings arise in dialogue with employees or customers from different language and cultural backgrounds?“

„Do language or cultural problems arise in collaboration with colleagues or customers caused by different groups working views?“

The uncertainty of existent knowledge and knowledge needs are part of the Class-12 context and occur in situations of rapid business growth where communication between various parties can become complicated leading to individuals being unclear of to whom they can provide necessary knowledge or to whom they need should turn for specific knowledge needs. A typical indicator of Class-12 context is the temporal and spatial distance between knowledge seekers and makers. It features so-called virtual teams, whose members are at locations beyond organizational boundaries, and possibly are also distributed across time zones. Two diametrical questions which exemplify the Class-12-related contexts refer to staff knowledge regarding knowledge-owners and knowledge-seekers:

„Do you have an overview regarding experts to contact if you have a specific question which lies outside of your department?“

„Do you have an overview of the knowledge needs and demands of other employees to whom you can serve as a contact?“

Figure 7 presents an excerpt of the previously collected data. It shows the response to the question of the scope for knowledge acquisition (left) and the overview of the potential demand for knowledge (right). In the first case, it is apparent that company A underperformed in providing room for the acquisition of knowledge for each employee. In the second case, the responses of company B differ significantly from the average. This company is of medium-size with a higher number of employees than the response of this behavior might imply. The investigated barriers serve as the basis for developing an appropriate solution concept.

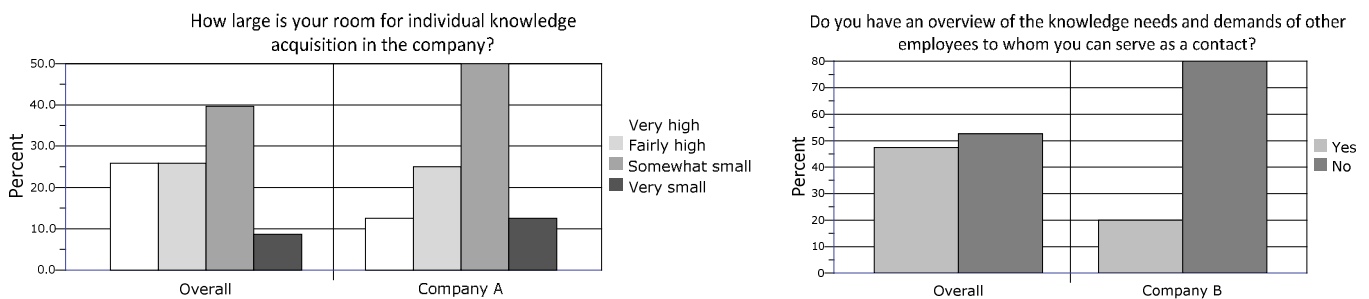


Figure 7: Scope for acquisition and overview to the demand of knowledge (authors' own diagram)**STUDY OF AT-RISK COMMUNICATIONS CONTEXTS**

The classifications system for barrier classes provides us with a road map which can be used to localize systematic communications barriers. There are two approaches to achieving this aim. The first method is to mark the obvious barriers and breakdowns in communication in terms of their causes and the step at which they occur. Depending on the level of detail into which one goes, the same barrier can stretch across multiple fields. By regularly documenting instances of communication breakdown one can identify the critical steps or causes.

The second method is to use this road map in order to find specific barriers. Using at-risk communications contexts at a starting point one can then create breakdown scenarios and alternatives to avoid such. One scenario describes a hampered communication context or one difficult with clearly defined causes and processing steps. Barrier classes can be found in multiple scenarios just as multiple scenarios can feature multiple barrier classes. An example for a scenario could be that the recipient of a message misunderstands due to a lack of specialist knowledge or that a transferred file is in an unreadable format. Instances of such scenarios in an organization are studied empirically. Employees working in the department to be studied are asked to document any communication breakdowns as described in the scenario to be studied. In addition they are required to also note which of the possible ways of the alternative courses of action they chose to employ and how well this alternative managed to help them reach their actual goal. This data can then be evaluated to provide the following information:

- At which step of the communication process was the intended meaning corrupted?
- Which types of cause were responsible for the breakdown?
- Which alternative courses of action are preferred by the employees taking part in the study?
- How susceptible to breakdown are each of the different methods of communication?
- Which alternative methods are so successful that these can come to replace or expand the pre-existing methods of communication?

The study itself has several challenges to face. The most prominent of these is to design the study in such a way that it will not itself be a hindrance to the everyday tasks and responsibilities of the employees, that it is self-explanatory and readily available. There are several ways to minimize the amount of documentation needed; one possibility is to work with rough estimates made at the end of the day rather than having to interrupt the workflow of an employee every time a communication breakdown were to occur, the number of scenarios taken into account could be limited or participants left out of the study. However, as in many other contexts, the better the information one can obtain, the more meaningful the results will be.

APPLICATION AND FUTURE WORK

For the purposes of this study, this paper does not make the distinction between pure CMC and direct inter-personal communication. This will be decided by the scenario in question. However, even when a barrier scenario is designed for the purposes of investigating a CMC tool, one can not simply ignore other types of communication, such as 'conventional' communication. In this way it can be seen by how much CMC tools can replace or replicate these 'conventional' communication methods or even by how much and how fast different CMC tools are substituted for one another.

This approach to the study of communications barriers was conceived in the framework of a research project for inter-organizational software development in consideration of adaptability and reusability. Parallel to this a second approach was followed which focused on the actual communication taking place. Even though critical structures can be identified there is a lack of accounting for communication which suffered a breakdown. The usability of the investigation tools used for the creation of the model presented in this paper, which took the form of a paper-based questionnaire, revealed itself to be a weak point of the study. Respondents reacted positively to the idea of looking at 'negative communication. Frequently occurring sources of communication breakdown in the everyday workflow and the provided communication tools could be readily identified.

Further investigation of communications barriers needs to be undertaken. The relevant communications contexts for this can however, already be established.

The barrier dimensions proposed and investigated in this paper are to be further researched in the context of business practice to ascertain their validity and importance. Only then will it be possible to propose to the companies a generalized concept of self-analysis. A further intention is to provide a catalog of concrete counteractions when barriers in business practice are

identified.

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