

## Knowledge Management through Groupware Technology

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This work aims to analyse how the use of groupware technology influences the process of knowledge management, in the largest Brazilian electricity company. The study, based on a qualitative approach, analysis different groupware technology tools and their relationship as facilitators of knowledge management. The results suggest that groupware technology deployed in the company has facilitated the operational work and improved the informational level in the company, from information management, but is not used systematically for the transfer and sharing of organisational knowledge.

**Keywords:** Knowledge management, groupware technology, Intranet technology

### Introduction

Information and communication technologies play a decisive role in globalisation and organisational management<sup>1</sup>. To meet the new demands of the market, small, medium or large organisations need to review their management techniques, as well as their strategies of global and local action, reconciling them with knowledge assets and their management<sup>2</sup>. In this sense, information technology plays the important role of infrastructure to increase the reach and speed of knowledge transfer and management, making it more efficient for strategic, tactical or operational decisions, as it is increasingly well-stored, made available and shared throughout the organization<sup>3</sup>. Knowledge management directs policies, strategies and techniques that support organisational competitiveness by optimising the conditions necessary to improve efficiency, innovation, and collaboration among employees<sup>4</sup>. Knowledge management represents the process that helps companies to identify, select, organise, distribute and transfer information and specialised knowledge that is present in the company's memory in an unstructured way<sup>5</sup>. Commercial organizations are gradually looking for applications of innovative technology in their business in a way that represents a competitive advantage feature, using a varied and complex set of technologies in their productive and

administrative process, aiming to reach higher strategic levels of productivity through greater agility in the processes of obtaining and manipulating information<sup>6,7</sup>. In this context, the objective of this work is to analyse how the use of groupware technology influences the process of managing, creating and sharing knowledge in CHESF, the largest Brazilian electricity company.

### Groupware Technology

Groupware tools are based on three concepts associated with how people can work in groups: a) Communication: Supports quick and easy integration of groups by sending information, requests and instructions<sup>8</sup>. b) Collaboration: Allows people to work together on joint projects or processes, allowing combining experience (tacit knowledge) and sharing information. Collaborative technologies are being influenced by two significant trends: network technology and globalization<sup>8</sup>. c) Coordination: Allows the automation and sequence management of actions or tasks that aim to achieve a goal. For this, the order in which the tasks are performed and the people involved in the tasks are defined; processes are triggered by commands sent by those involved or by pre-programmed automatic actions<sup>8</sup>.

### Method

The qualitative method of content analysis was used, wherein a period of eighteen months the research was done using document analysis, access

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to the corporate network of the company, through a created login account and use of the corporate network within the company, observation of the work of the employees and in-depth interviews with employees of diverse sectors, functions and hierarchical positions. The research has a temporal and longitudinal sectional character. The longitudinal period covers an initial eighteen months period during the years of 2002 and 2003, and a two-month period fifteen years later in 2018, to carry out a new investigation using the same method, having a vision section with a longitudinal perspective, aiming at observing how knowledge management processes have evolved. After the detailed categorisation of the transcription of all interviews, the most evidenced dimensions were observed. A cluster study was conducted to investigate which dimensions were related, based on Pearson's correlation. Another technique used was the Sentiment Analysis, which consists of identifying the positive or negative perception concerning each dimension investigated.

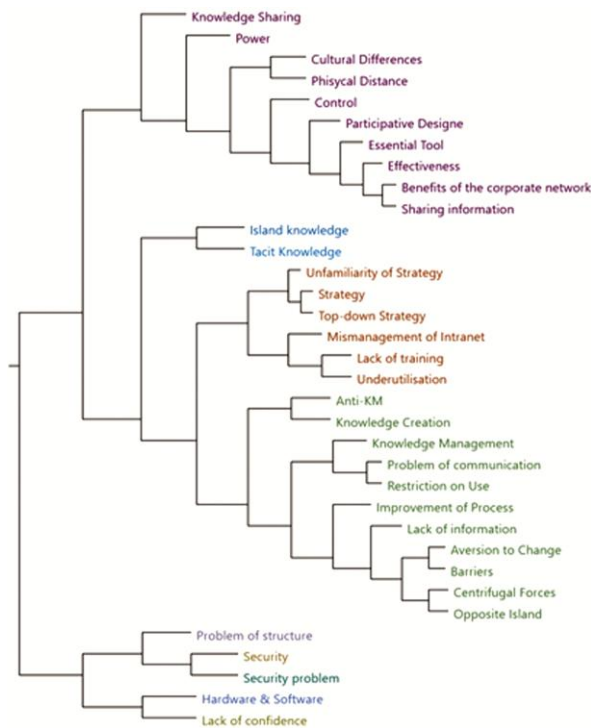


Figure 1 — Cluster Analysis

Table 1 — Sentiment Analysis – Groups

	Very Negative	Moderately Negative	Moderately Positive	Very Positive
Managing staff	013%	034%	040%	013%
Operational staff	019%	030%	040%	011%
Technical Staff	020%	014%	036%	030%

It should also be pointed out that, when the interviews with the people of the three groups and the different sectors were carried out, once the data saturation was noticed, the cut was performed, that is, when the responses began to become repetitive, after the analysis of the transcribed texts, the interviews in that sector or group were stopped.

**Results & Discussion**

After a thorough categorisation of the transcription of all interviews, the most evident dimensions were observed, and how they were related (cluster), as shown in Figure 1. A clustering was made from the analysis of the interviews, and it was possible to identify the four major domains, as follows:

**Nature and benefits of the corporate network**

This domain focuses the analysis on the image and perception that employees make of the corporate network, as well as the benefits perceived from the use of it. This perception is essential to analyse if the corporate network can effectively be used as support for knowledge sharing, and facilitator of its creation. \*Findings: concerning the information technology implemented in the company, it was noticed the similarity of the image and perception between the groups surveyed, being the company very well equipped technologically, which is crucial to the company. All respondents recognised this level, highlighting the availability of information, the democratisation of information, cost reduction and speed increase in internal communication processes, as well as an operational improvement and flexibility of resources.

**Corporate network strategy**

It is related to the group's vision of the knowledge about the company strategy behind the corporate network. The information gathered from the groups diverged, that is, the company's strategy for some groups is not perceived in the same way.

Table 2 — Sentiment Analysis - Dimensions

	Very Negative	Moderately Negative	Moderately Positive	Very Positive
Barriers	035%	025%	022%	019%
Benefits of the corporate network	007%	024%	047%	022%
Centrifugal Forces	018%	035%	033%	014%
Management Strategy	000%	033%	061%	006%
	000%	044%	045%	011%

\* Findings: in relation to the strategy, there seems to be no perceived strategic alignment among the groups studied, a fact that is highlighted by the heterogeneity of perception and divergence between the groups, where for some there was increased control, participatory planning, agility and efficiency in the communication process, while for others there was no transparency in determining the strategy behind the corporate network, where discourse distances itself from practice.

#### **Barriers and impediments to the effective use of the corporate network**

It observes the factors that clutter and make difficult the use of the corporate network as support to knowledge management. We note heterogeneity in the optics of the studied groups, with contradictory assertions between groups, where the group that most exposed aspects of limitations and barriers to effective use of the network was the operational/administrative. \*Findings: Concerning barriers and impediments to the effective use of technological resources and to groupware technology, several inadequacies were observed, such as lack of knowledge of the tool, underutilization and poor use of the tool, as well as lack of intra and interdepartmental communication. The creation of islands was one of the topics highlighted concerning the barriers to the effective use of groupware technology, especially Intranet. As there was lack of information management in the network, island groups were created, which became competitors within the company, that is, instead of Intranet favouring the integration of the company, through a centripetal force, it created fission in the company caused by centrifugal forces. Intranet, therefore, presents itself as an essential tool for the support of Knowledge Management, but it lacks management of its use for the promotion of an effective Knowledge Management programme. What can be done, for now, is information management. The cultural issue and lack of change of mentality for improved use of the tool by some employees were other factors highlighted. Another shortcoming within the theme of existing barriers to the effective use of groupware technology concerns the large volume of non-corporate information circulating within the network.

#### **Knowledge Creation and Sharing**

This domain presents itself as the most complex and controversial within the research. Similar to the barriers identified previously, the perceptions of the groups are presented in a heterogeneous way not

only between the groups but in the group studied. In general, the opinions portrayed the need for a greater sharing of knowledge in the company, using more the technological resource, evidencing that the Information Technology factor can serve as a tool of knowledge management. \*Findings: about the creation and sharing of knowledge in the company, the inadequacies that stood out most were the lack of a culture of knowledge sharing and a lack of change of mentality. Knowledge is seen as a source of power, a factor that hinders its sharing. Moreover, within this domain, the lack of registration and documentation of knowledge, which enables the capture and subsequent transfer of knowledge, together with the lack of a systematic policy by.

With regard to the company being researched, it was possible to verify three situations capable of bringing critical evidence about the current way of knowledge management, as well as the use of information technologies, more specifically groupware:

1) It refers to the reduction of personnel that the company has gone through, resulting in a reduction of 40% in personnel in the last four years, which means that many sectors today have 1/3 or less of the staff they had 5 years ago, requiring a character of multifunctionality and overload for those who remained, hindering the fruitful process of knowledge creation in the company, in addition, to hinder outsourcing and documentation by employees.

2) As a consequence, there was a loss of knowledge of expertise when employees left, driven by an incentive dismissal programme, these employees having several years of experience and knowledge in the company; knowledge that was taken with the people who left since there was no systematic process of sharing this knowledge.

3) Finally, there was a change in the company's scenario and market, where new managerial positions, modes of negotiation and market coverage by CHESF are now required. It is necessary, then, to analyse what knowledge is essential for the company today and what knowledge will be necessary for the future of the company. Concerning the creation and sharing of knowledge in the company, the most prominent agents were the lack of a culture of knowledge sharing and a lack of change of mentality. Knowledge is seen as a source of power, a factor that hinders its sharing. In addition, lack of registration and documentation of knowledge, which enables the capture and subsequent transfer of knowledge, together with the lack of a systematic policy for registration

and documentation and the lack of a knowledge management policy that encourages and promotes both the creation and sharing of knowledge in the company, were presented as determining factors.

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