Research Report

Situation Awareness in Financial Service Institutions through Social Collaboration Platforms

THE INCREASING ABSENCE OF FACE-TO-FACE COMMUNICATION IS A CHALLENGE FOR EMPLOYEES AND ENTERPRISES IN ORDER TO MAINTAIN SITUATION AWARENESS.

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Introduction

With its information-driven business processes, continuously changing customer demands, and above-average volatility, the financial industry critically relies on an efficient exchange of information. However, as work becomes more global, distributed and non-collocated, it also becomes more difficult for workers to stay aware of all relevant information in their business environment (Gutwin and Greenberg, 2002). Specifically when collaborating with others, individuals often lack what has been labeled situation awareness (SA). In short, SA is defined as an individual's knowledge about what is going on in its immediate environment. With respect to collaborative work, individuals need to know, e.g., about their colleagues emotional state or whom to ask about the solution for an issue which needs to be solved. While in traditional work settings, SA is gained in face-to-face communication, information systems (IS) are needed to create and maintain SA between people working apart from each other. In this regard, social collaboration platforms such as Enterprise Microblogging (EMB) are suggested to be a promising solution to solve this challenge.

Originally rooted in social psychology, SA is the result of exchanging and processing environmental information in order to develop a mental picture of the situation as guidance for further action. Based on this definition, two separate types of SA can be distinguished from a collaboration point of view: Team situation awareness, which is defined as the aggregation of the individual SA across all collaborators, and shared situation awareness, i.e. the individual's SA with respect to the activities of its co-workers.

Within IS research, the focus has been largely on how to support SA from a rather technical point of view. Due to this predominant technical orientation, attention has shifted away from the original concept of SA as a cognitive process. As a result, the concept lacks the clear theoretical understanding needed to support SA with IS effectively.

Accordingly, we develop a general conceptual model to enhance our understanding of SA in distributed collaboration and to provide guidance for the design and evaluation of IS that support the creation of SA. Further, we demonstrate how the model may be utilized by evaluating an existing social collaboration platform regarding its ability to support the creation of SA. Specifically, we conduct a content analysis on a rich dataset of EMB data from a financial services provider.

Development of the Conceptual Model

Since SA is inherently based on information, IS are needed to provide individuals with specific awareness information about their environment. However, and with respect to distributed collaboration in particular, it is not clear which specific kind of information IS should provide to support SA. Therefore, we conducted a systematic review of the literature in order to determine categories of awareness information being needed.

The first identified category, activity awareness (AC), includes all SA subtypes relating to activities needed to achieve a common goal. Structure awareness (ST), which we define as an aggregation of all subtypes of SA related to knowledge about informal and formal structures at work, is specified as the second category. The third category includes all subtypes of SA relating to social interaction between collaborating individuals and is labeled social awareness (SO). Finally, we conceptualize context awareness as an aggregation of all subtypes emerging from the 3 categories of SA over time. Since information holds little value without context this category provides individuals with a general sense of the context in which things are happening.

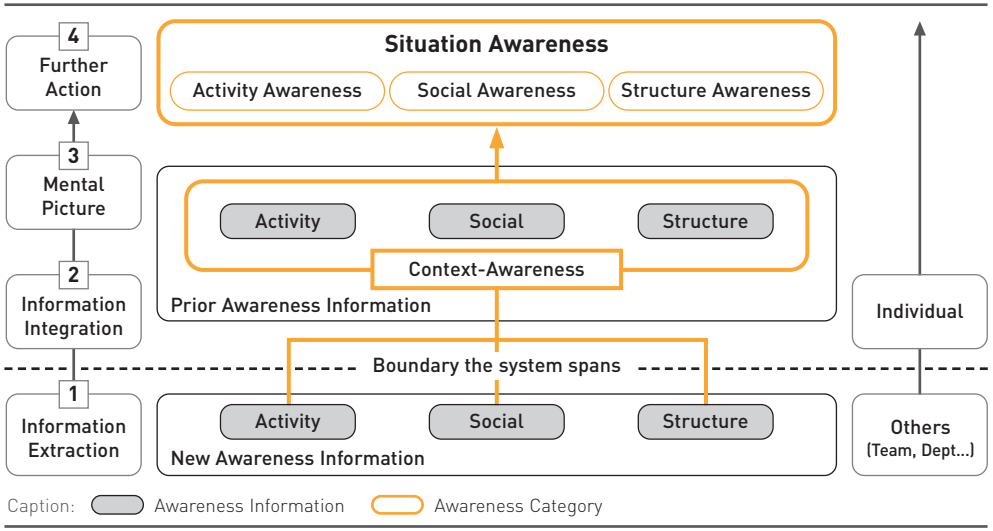
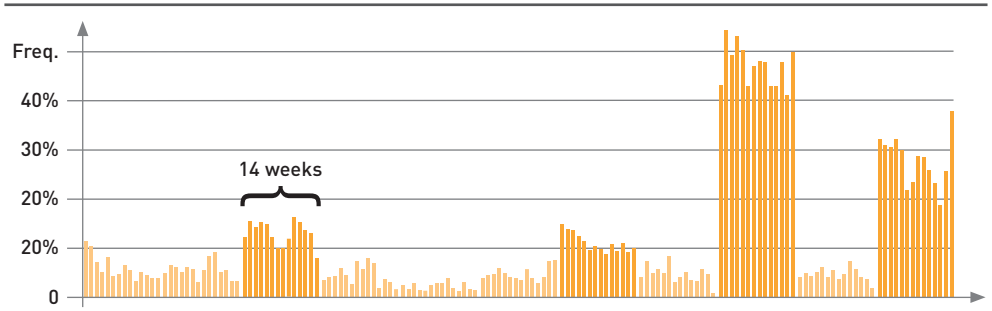


Figure 1: A conceptual model of SA in Distributed Collaboration



Facet	AC_1	AC_2	AC_3	AC_4	AC_5	SO_1	SO_2	SO_3	SO_4	ST_1	ST_2
Mean	5.46%	5.36%	12.69%	4.23%	1.85%	4.13%	10.47%	4.13%	46.82%	4.38%	27.68%
SD	2.05%	1.60%	2.45%	1.96%	0.70%	1.21%	2.10%	1.89%	4.45%	1.32%	4.98%
Cat.	Activity					Social				Structural	
Mean	22.91 %					53.87%				30.97%	

Figure 2: Freq. of Awareness Information Categories and Facets per Message over Time (weekly)

The conceptual model depicted in Figure 1 illustrates the relations between these elements based on the initial definition of SA. Accordingly, the model's structure is based on four steps: 1) information extraction, 2) information integration, and based upon, 3) development of a mental picture, to guide 4) further action. The information extraction step describes the ability of an individual to extract emerging activity, social or structure awareness information in a timely manner. In the information integration step, the individual needs to integrate this new awareness information in its specific context in order to make sense out of it. Finally, SA emerges as a mental picture of the situation and may then provide guidance regarding an individual's further actions. From a distributed collaboration view, this may lead to more effective interaction between collaborating individuals.

Empirical Results

To demonstrate how the conceptual model might be utilized, we evaluate a social collaboration platform regarding its ability to support SA. Specifically, we analyze the content of a huge dataset of EMB messages obtained from a bank's system to measure to what extent the system provides awareness information to its users. For this purpose, we developed a coding scheme which operationalizes each of the three awareness information categories and their specific facets given in the table below.

Category	Facet
Activity awareness	**AC_1:** What are others currently doing? **AC_2:** What intend others to do in the future? **AC_3:** What need others from me? **AC_4:** How have activities to be done? **AC_5:** What is the purpose or goal of an activity?
Structure awareness	**SO_1:** Who is interested in a specific issue? **SO_2:** What is the emotional state of others? **SO_3:** Who is busy or available? **SO_4:** Who is talking to whom?
Social awareness	**ST_1:** Who is a contact person for what? **ST_2:** Who has which positions regarding an issue?

The results of our analysis show that the messages exchanged via the EMB platform are a rich source of awareness information. 72% of the analyzed posts contain at least one of the three categories of awareness information. Specifically, more than 50% of the messages support users with social awareness information (SO) about their colleagues. However, with a share of more than 30% for structural (ST) and 22% for activity (AC) awareness information, the other two types are well represented in the messages, too. As Figure 2 illustrates, AC3, SO2, SO4 and ST2 occur with highest frequency among all 11 facets of awareness information. At a level of more than 10%, the tool was utilized for exchanging information about what employees needed from each other (AC3) to do their work. Information about the emotional state of the users (SO2) is represented by approximately 10%. Almost every third message contains information about the positions and opinions of the users (ST2). With an average frequency of 46%, the system supports its users with information about who talks to whom (SO4).

Conclusion

The conceptual model developed explains how SA emerges from the extraction and processing of awareness information and illustrates the important role of IS as bridging the gap between geographically distributed workers. Further, we developed a broad categorization of different subtypes of SA and derived categories and facets of awareness information needed to maintain them.

From a practical view, our conceptualization of awareness information might help to form the basis for a rigorous specification and evaluation technique of IS designed to support SA. Further, practitioners may want to assess to what extent existing systems already support SA. Moreover, our conceptualization could be helpful to determine guidelines for the design of new collaboration platforms and their evaluation.

Finally, our work contributes to the few studies on social collaboration platforms, and their usefulness and value for business. Our analysis of the bank's system illustrates how EMB supports the creation and maintenance of SA within financial service institutions as an important dynamic capability to meet the challenges of turbulent environments. Since SA is an important prerequisite for successful collaboration, we thus conclude that EMB can play a crucial role to generate business value from improved SA among employees.

References

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