Mitigating Reputational Risks - A Proposal With A Knowledge-Based Stakeholder Information Leitstand

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ABSTRACT

The Internet plays a crucial role in the communication strategy of organizations. However, information is often distributed at the "wrong" time and does not always satisfy the particular requirements of key customers, suppliers, governments, shareholders or financial analysts. Serious mistakes might not only create negative sequela, for example, stakeholders remain unsatisfied, downgrade their opinions about products and companies, and subsequently make 'wrong' decisions. Such mistakes could also have tremendous effects on the primary objectives of an enterprise, e.g., the reputation suffers and subsequently the share price plunges. In this paper, we present how companies can take advantage of actively providing targeted information with a knowledge-based Stakeholder Information Leitstand (information planning and control center). It helps executives stabilize relationships with key customers, journalists, politicians, investors, and assists in promoting trust and enhancing reputation, especially in times of risk situations. We focus on the design phase of the system, and propose that current decision support systems could be enriched with "business content", i.e. predefined situation-oriented and individualized information categories and messages.

Keywords: risk management, expert systems, information filtering, stakeholder information systems, user modeling, Leitstand.

1. INTRODUCTION

The well-known examples of the Exxon Valdez oil spill or the Challenger space shuttle explosion illustrate how critical situations were made even worse when top managers did not meet information requirements of stakeholders, i.e. persons and institutions who either influence the company's performance or are influenced by it [1]; examples are key customers, suppliers, employees, journalists, government officials, investors, rating agencies, and financial analysts.

A more recent example is the collapse of Bear Stearns which shows how market rumors, here about a cash crunch, can drive even a well-established company out of business within days. Independent from the nature of the rumors, there is a significant demand to respond to those and other "events" with highly automated individualized information systems situated at a top management level. Once such instrument is the knowledge-based Stakeholder Information System which can mitigate reputational risks and increase stakeholders' trust (see section 5 for details). The advantage is that in those crises situations, personalized e-mails, for example, can be dispatched swiftly to those affected, like journalists, key customers, financial analysts, or members of the directors' board.

In such moments of crises, stakeholders often receive the 'wrong' information in the 'wrong' dose at the 'wrong' time to the 'wrong' addressee and in the 'wrong' display format. Unless managers publish prompt information, they run the risk that news reporters misinterpret the crisis. The absence of information has an even worse effect.

Although companies are enhancing their communication efforts in general and, for example, are re-launching corporate websites specifically to better convey these objectives, we observe, however, that companies are often not well prepared for risk communication to stakeholders. This is based on our evaluation (since 2001 more than 1,200 communication cases) of how companies reacted in risk situations on their websites in German, English and Chinese speaking countries (see at length [5, 6]).

While remedying the physical and financial flow during critical situations, managers and employees may not have the luxury of time to provide information to interested parties from scratch. Consequently, it is invaluable to have wisely formulated formula texts, images, and data sources at their disposal which are at the core of knowledge-based Stakeholder Information Systems (SIS). Figure 1 illustrates an Active SIS that disseminates information from the firm to its environment.
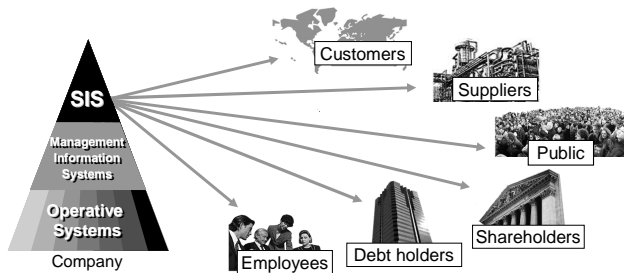
Figure 1. Active Stakeholder Information Systems

Approaches to advance stakeholder communications have scarcely been given any serious consideration in research resulting in a considerable scientific gap in the overlapping field of strategic management and business information systems.

2. DEMAND PULL AND TECHNOLOGY PUSH

From the strategic management perspective, SIS is a valuable instrument both to detect critical problems and issues which could lead to crisis situations and to communicate systematically to stakeholders and to preserve shareholder value. Major factors contributing to the demand pull include (see Figure 2):

1) Contribution to shareholder value: The demand pull for SIS is triggered, for instance, by the positive relationship between a company's value and its reputation. Evidence for this is found in responses to questionnaires, theoretical and empirical models, as well as event studies (see table with more than 60 citations in [7]). According to a study by the Economist Intelligence Unit, organizations regard reputational risk as the greatest threat to their market value [8].

2) Situation-oriented and individualized information demands: Stakeholders set high standards for the provision of information. For instance, shareholders demand 'timelier, broad disclosure' [9]. Evidence for the extent of these information demands is shown by the willingness of Internet surfers to pay for tailor-made content [10].

3) Legal information duties: Companies have to deal with a world of increasing reporting obligations (Compliance Management, Sarbanes Oxley Act, etc.). Recently, the European Union has passed several laws to tighten legal requirements for risk management systems.

4) Crisis/Disaster communication: Recent crisis due to fire, contaminated food, earthquakes (e.g., China), and the credit-market failure demonstrate that even multinational companies are not well prepared. The lack of planning for crisis communication is shown, e.g., in the studies of [11] and [12], and is emphasized by a panel of experts (e.g., at the National Center for Food, Protection and Defense) [13].

5) Rationalization: Improving the process of information logistics brings about the possibility to streamline processes in the area of middle and upper management. One SIS from

a major German stock listed company originated from the spokesman of the board of directors after finding out how much time he spent on the phone with stakeholders. Especially in times of crisis, top-managers repeatedly have to respond to similar questions, such as Bob Murray after the Utah Mine Collapse in August 2007 to CNN reporters, investors, and families of the victims.
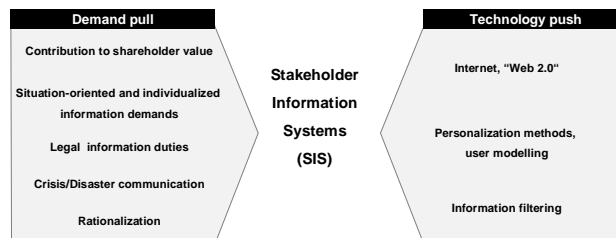

Figure 2. Contributing Factors to the Importance of SIS

With the demand pull for such systems, a technology push comes along which is primarily derived from the Internet. Rumors and bad news can easily spread in the "Web 2.0"-environment. Further, keywords represent the ubiquitous availability of information and the high media penetration. There are also many information technology-related details like Business Information Warehouses as well as the progress in user modeling and methods of information filtering.

3. RESEARCH OBJECTIVES AND FOUNDATION

Many of the outlined ideas in the paper are results of the research project AIDAR at the Bavarian Research Center for Knowledge-based Systems (FORWISS), Germany. The research center developed advanced software applications on the basis of artificial intelligence and expert systems respectively. We extended our research to the University of Dayton, Ohio (USA), Nanjing University and Jilin University (China).

While improving the information logistics to stakeholders, we tried to find answers to: What factors influence the information requirements of stakeholders? What "business content" do stakeholders need for their expectations, decisions and tasks in different situations? What are requirements, functionalities and system components for knowledge-based SIS? Our pragmatic research objective was to design an instrument, which enables companies to build up their own Stakeholder Information Leitstand.

Our vision is that electronic stakeholder relations in general, and responses in risk situations in specific, are considerably enhanced with information systems which (semi-)automatically adapt to situations, roles and persons. Such a system can reduce the information overload of stakeholders, lead to better and faster decisions, and lessen reputational corporate risks while closing perception gaps, e.g., of shareholders.

While solving real-world problems with scientific methods derived from various disciplines, our work is based on several theories and concepts - mainly from the following domains (see at length [7]).

1) Management Science: contingency theory (e.g., [14, 15]), stakeholder theory [1], role modeling (e.g., [16, 17]), Leitstand concepts [18], risk communication [19, 20, 21].

2) Information Science: selective dissemination of information (e.g., [22]), Active Management Information Systems [23], expert systems, user modeling, and personalization.

In terms of methodology, we combine a multimethodological approach which is particularly valuable for the development for innovative information systems (see [24] for details) with the paradigm "research through prototyping" - a method that has a long successful history in the German research community in business information science. In addition, we have been begun testing new theories with empirical studies.

4. STATE-OF-THE-ART

In the following, we outline pertinent results of a study examining the state-of-the-art in SIS concerning content as well as technology (see at length [6, 7]).

Literature Review
To our knowledge, a comprehensive study, which systematically investigates objective information requirements for all stakeholders from a top management perspective, has not been pursued. Nevertheless, there are many ways of deriving information requirements, ranging from a direct approach to the user, to analysis of the documents they use. Results obtained in this way can however be problematic if only subjective needs are noted, i.e. subjective information requirements, and future developments not sufficiently taken into consideration. In order to avoid these disadvantages in the design of the SIS, we proceeded analytically by developing several theoretical frameworks (see details in section 6). Presumably, due to the lack of low hanging fruits, the analytical method is very seldom applied in information science. For the development of Management Information Systems, a notable application could be found at [25] from four decades ago.

Corporate Communication on the Internet
Businesses are insufficiently aware of the possibilities of differentiation in stakeholder communication:

Information filtering: Small to medium businesses, as well as large businesses, rarely direct their internet presence to addressees. A special need for action became clear when the need for information and inquiry-processing became evident. In particular, small companies often get easily overwhelmed with the multitude of legal information duties. A study discussed by [26] revealed only very few websites that fulfill legal requirements.

Reaction time: Above all, in times of risk situations, there was frequently a lack of timely dissemination of information. News reached the recipients too late or not at all.

Electronic channels: An approach via individualized newsletters is very rare. An exception is Schering, a German pharmaceutical company. There, the user has the possibility not only to leave his e-mail-address but also to specify their relationship in regard to the company. Schering distinguishes several stakeholders: Private shareholder, institutional investor, analyst, patient, journalist, student and "others". However, the content of the messages is not tailored to the recipients. We also studied, by using pseudonyms, how companies reacted to online inquiries, e.g., during a huge fire at a factory dealing with natural rubber. Residents were called upon with loudspeakers to shut doors and windows. Our question regarding possible dangers imposed by this event is typical. It was sparsely answered (54 hours later) with a brief notification that the burned rubber decomposed into harmless sand. In essence, companies respond only with standard sentences without addressing any personal preferences in detail.

Software Products
Solutions for situation-oriented and individualized stakeholder information distribution are rare. However, SAP with SEM SRM (Strategic Enterprise Management Stakeholder Relationship Management) has gained a jump start in comparison to its competitors. Nevertheless, the product has insufficiencies, both with regard to ready-made, stakeholder-oriented business content and with regard to inquiry processing. Software providers in the field of e-mail management with their ready-made text elements merely geared themselves towards customers and preferred to compose formulaic expressions of greetings or thanks rather than polished, model answers which have to be expedited without delay in times of risk situations.

Although software for personalization is widely offered in the market, companies seldom put this into practice due to undeveloped automation levels and inadequate integration capabilities.

5. KNOWLEDGE-BASED STAKEHOLDER INFORMATION LEITSTAND

Objectives
SIS aims at delivering relevant information at the 'right' moment to individuals and groups, not the whole public in general. It influences stakeholders and canvasses them while not appearing too forceful. Notably, the objective of SIS is not to substitute personal communication of top managers with stakeholders. Rather it supports to build up and establish "stakeholder relations" with electronic media.

Types
Essentially, we distinguish five types of SIS. An *Active SIS* seems to be powerful (refer back to Figure 1), e.g., business journalists and financial analysts are systematically notified in rapid response to product recalls via individualized e-mails. Adjusting information and display of a portal, for example even

during an Internet session, is the task of an *Adaptive SIS*. A *Reactive SIS* could be characterized so that a stakeholder who sends his inquiries via the net to a company receives a context-adjusted answer. Communication via discussions forums, blogs and communities could be integrated into an *Interactive SIS*. A *Passive SIS* may give the addressee the possibility to access defined stored data.

Leitstand Concept

The question of the appropriate level of automation has long occupied a central place in operations management and especially in production control. The introduction of a "Leitstand" (from German, loosely translated as a control center) for production planning and scheduling within Computer-Integrated Manufacturing has proved its worth [18]. (The term has been adopted in English publications since the late 1980s.) It disrupts the automatic information dissemination between components of the PPS-System from the primary requirement planning to production execution. A Leitstand is necessary, because centralized systems cannot react in an event-based-fashion to the requirements of the production. Moreover, a Leitstand is also the starting point of automatic fine-tuning. It succeeds by enriching optical displays through powerful decision support systems including knowledge-based systems. Thus, individuals and computers jointly work on achieving their common assignments.

The Leitstand-concept could be transferred to SIS. It is not just a Management Cockpit but more. The SIS-Leitstand holds meta-data-repositories, e.g., regarding information requirements and data resources for risk situations, as well as method-repositories regarding information filtering. The Leitstand also provides the 'right' dose for automation. While personnel are released from routine tasks, it can intervene at any time in the information logistics process.

Knowledge Base

A prerequisite for fostering the relationships of stakeholders on the Internet is choosing concisely the 'right words' which could be delicate and succinct, especially when clarification, excuse, justification, or repentance is needed. The "business content" is stored in a knowledge base which comprises not only information requirements for various stakeholders in specific instances and moments but also clozes texts, images, and data sources (internal and external).

Scientifically derived 'information catalogs' in the form of "intelligent checklists" help companies not only to communicate systematically with their stakeholders, but also to react properly in crisis situations with targeted communication. Top-managers get valuable support to find the right formulations in chaotic situations; communication officers get guidance to publish the precise content. Thus, it becomes clear that a knowledge-based SIS has much more 'intelligence' than a conventional CMS (Content Management System), which is used most often simply to inform the general public and lacks more sophisticated capabilities.

Deriving Business Content: In order to analytically derive objective stakeholders' information requirements, we identified the influencing factors, e.g., industry or triggers. By basing our research on case studies, newspaper articles, questionnaires, news items, reports of success from industry and scientific publications, we assured practicability in our approach. Results were discussed with experts.

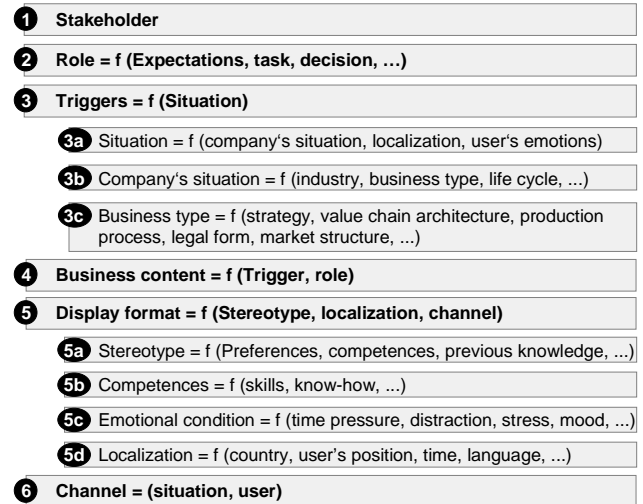In principle, there are six logical components to SIS development (see Figure 3).

Figure 3. Analytical Framework for Deriving Information Requirements (simplified)

First, we have to define the stakeholder ❶. The spectrum of decision, task and expectations is what determines which role the user will occupy ❷. The information delivery is stimulated by triggers ❸. Triggers are distinguishable inter alia by industry, business type, and location of the company as well as its legal requirements. The users' objective information requirements, i.e. business content ❹, can then be deduced from the triggers (e.g., product recall) and the respective role of the stakeholder (e.g., domestic private investor). Then, these requirements are adjusted to personal likes and dislikes. Results take form in different display formats ❺. The distribution of the preferred information finally arrives through a variety of channels ❻, for example, when suitable, by text message. The attention value of a newly arrived SMS is high, particularly during a risk situation where location plays a big role, for example, the concentration of poisonous vapors. A long-term objective might be to grasp the emotional situation of the user more accurately. As a first rough guide the stress levels can be checked by formulations of stakeholder inquiries, furthermore, by the shakiness of the mouse movements or by the increased number of typing errors.

In Figure 4, we focus on one element of our analytical framework, namely triggers. As mentioned, they promote the active delivery of information, e.g. during a risk situation. Among the triggers are those, which occur unexpectedly and contain the

hidden potential to influence the industry negatively by attacking financial strength or damaging the company's reputation. They can originate either within the company or come in from the outside world. Especially important are those trigger that occur frequently and are typical in a specific industry (80/20-rule) since we see that companies have already difficulties in coping with events that are not highly salient and unreplicable. However, recent examples show that it makes sense not only to fulfill the Pareto principle but also to tackle the next 5%.

Figure 4. Classification of Negative Events Exposing Risks

Examples of Business Content: From an issue management perspective, the starting point for information logistics toward stakeholders are the legal reporting duties due to the stern requirements imposed on companies by the Sarbanes-Oxley Act passed in 2002. Already before the tragic series of floods in China, the USA (New Orleans) and in East Germany ('Hundred Year Flood') we had chosen this catalyst as one of our examples (see Figure 5).

Figure 5. Business Content for the Triggers "Flooded Plant"

It is typical of certain regions and shows the delicate nature of supply chains, especially those which are based on factory sites which have evolved historically. A car manufacturer can be almost certain to get negative comments from investors in a supply chain disruption such as this. Analysts are interested in the state of the machines or also the compensation settlements.

6. SYSTEM ARCHITECTURE

The starting point of our system is the Detector ❿ (see Figure 6). This element is responsible to identify critical issues in the environment of the company and to alert top-managers. The main component of the Stakeholder Information Leitstand is the Configurator ❶ with the knowledge base in which business content and business rules are stored.

To maintain roles and users, an administrative component is available ❷. With several Generators ❸ the Leitstand personnel (communication officers) can build-up and maintain situation-based and individualized portals, messages and questionnaires both to stakeholders ❹ and to top-managers (e.g., sending alerts). Stakeholder inquiries are taken with the Communicator ❺. This component supports personnel response to inquiries. Stakeholder Controlling ❻ observes the information behavior of stakeholders and anticipates future information requirements and display preferences. The latter component also helps (semi)automatically adjust the knowledge-based ("closed loop"). Finally, a management support system can be accessed, in order to evaluate the effectivity of SIS Ⓐ and to monitor its efficiency as a running system Ⓑ.
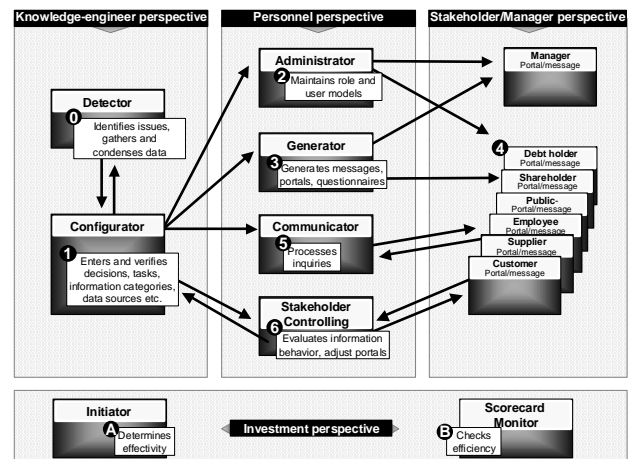
Figure 6. Overview of our Prototype

Details of knowledge-based Stakeholder Information Systems and our prototypical applications at leading industrial companies, in part with top management consultancies, has been described previously (see [7]).

7. CONCLUSION

The contribution of our results is a small step towards bringing electronic stakeholder relations to a new level and towards achieving a "Resilient Enterprise" (Yossi Sheffi).

Since business content is stored in an expert system, it can be easily extracted upon demand of top managers and communication specialists. Especially in times of risk situations, when information disclosure is under particular scrutiny, the provision of "right" information is worthwhile.

The "right" dose of information logistics automation, which helps top-managers save time and lessen stress, is realized with the Stakeholder Information Leitstand concept. It is a recent example of how industrialization finds its way into the software industry and how it affects information processing.

Interested in sharing your opinion about Risk Communication and Stakeholder Information Systems, we would value your comments and participation in completing our survey accessible at:

www.stakeholder-communication.com

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