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Influence of social software features on the reuse of Business Intelligence reports

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ABSTRACT

Vendors of Business Intelligence (BI) software have recently started extending their systems by features from social software. The generated reports may include profiles of report authors and later be supplemented by information about users who accessed the report, user evaluations of the report, or other social cues. With these features, users can support each other in discovering and filtering valuable information in the context of BI. Users who consider reusing an existing report that was not designed by or for them can now not only peruse the report content but also take the social cues into consideration. We analyze which report features influence their perception of report usefulness. Our analysis is based on the elaboration likelihood model (ELM) which assumes that information recipients are either influenced by the quality of information or peripheral cues. We conduct an experiment with knowledge workers from different companies. The results confirm most hypotheses derived from ELM in the context of BI reports but we also find a deviation from the basic ELM expectations. We find that even people who are able and motivated to scrutinize the report content use community cues to decide on report usefulness in addition to report quality considerations.

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1. Introduction

Knowledge is a company's most important resource in today's knowledge-based economy (Grant, 1997; Nickerson & Zenger, 2004). While each employee possesses knowledge individually, it is the primary task of the company to manage all available knowledge and to integrate it into products and services (Grant, 1996). Therefore, firms aim to implement effective knowledge management (KM) processes including knowledge creation, capture, distribution, and reuse (Alavi & Leidner, 2001). The first three processes form the basis of KM, whereas the effective reuse of existing knowledge assets can help to gain competitive advantage (Davenport & Prusak, 2000) because it helps to prevent employees from re-creating redundant knowledge and thereby saves time and money (Akgün, Byrne, Keskin, Lynn, & Imamoglu, 2005). Knowledge does not refer only to a single chunk of knowledge but can also refer to complex digital assets such as program code, system design information, an instruction manual, the description of a case and its solution, or a report. Probably the most studied type of

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knowledge reuse in the context of information systems (IS) is software reuse (Frakes & Fox, 1995). Three phases can be distinguished in knowledge reuse:

(1) Retrieval of potentially relevant knowledge.
(2) Evaluation of knowledge usefulness for the task at hand.
(3) Actual use incl. possible adaptations, if the knowledge was considered useful.

Phase 1 has been studied extensively and phase 3 has also received some attention (e.g., in case-based reasoning (Aamodt & Plaza, 1994). The second phase did not receive much attention; it is usually implicitly included in phase 1. However, human decision makers do not all interpret the facts and signals they receive in the same way. They often perceive them differently or pay attention to a different subset of signals. Therefore, we concentrate on the second phase to better understand whether and which facts and signals may influence their decision on reuse.

One important part of an effective knowledge management is Business Intelligence (BI) (Gold, Malhotra, & Segars, 2001) which is defined as a "strategic approach, for systematically targeting, tracking, communicating and transforming relevant weak signs into actionable information on which strategic decision-making is based" (Rouibah & Ould-ali, 2002). It includes the generation and distribution of reusable reports as well as statistical and mathematical analyses (e.g., data mining). In the early days of electronic data processing, reports have been developed by programmers based on user specifications. Nowadays, knowledge workers have been empowered to create reports by themselves which is called self-service BI (SSBI) (Evelson, 2012). Self-service BI is supported by user-friendly tools and an increasing amount of data and new data sources which enable knowledge workers to perform more detailed analyses than previously possible (McAfee & Brynjolfsson, 2012). In addition to strategic and tactical analyses, which are standard tasks of BI systems, operational analyses are increasingly performed (Böhringer, Gluchowski, Kurze, & Schieder, 2009). More granular and current data are available for this purpose, while new and often inexperienced user groups are trying to use the technology. In this situation, organizations have to find ways to disseminate new information more effectively (Bevanda & Pavletić, 2007) and to increase its reuse. How important this issue may become show the figures reported in Eckerson (2008). An energy company found after a few years of adopting SSBI 26,000 reports stored by only one department. This huge amount of reports precluded people from using them rather than attracting them. After perusal of the reports, the number was cut down to 300 reports containing almost the same information. This indicates that with better reuse the growth of the number of (possibly redundant) reports would not have been so dramatic.

Therefore, we study the cognitive preconditions of reuse of previously created reports. People will use them if they find them useful to (partly) satisfy their information needs. Reuse of a report may mean the use of a report as it is, the application of the same reporting procedures to another data set (e.g., a report designed for country A is executed on the data of country B), or an adaptation of the report to include, for example, an additional calculation. Of course, combinations of the latter two adaptations are also possible, i.e., a change of the data set and calculations.

Another advancement of the last years is the rise of Web 2.0 or social media (O'Reilly, 2007). First, they became popular in the private realm but meanwhile they have entered the corporate world where they are supporting the move toward Enterprise 2.0 (McAfee, 2006). This integration of social software tools in corporate intranets offers one possible solution to the challenge of targeted report dissemination and reuse. BI reports can be enriched by social software features such as tagging, rating, information on frequency of use, comments, and information on the identity of the report author or other report users. This is possible if report creators make their reports available on a BI portal so that information on their use by other users can be added over time, partly automatically (e.g., frequency of use). Software vendors like SAP (SAP StreamWork, 2013), IBM (IBM Connections, 2013), and Microsoft (Microsoft SharePoint, 2013) have already expanded their BI portals to incorporate some of the mentioned features. From a research perspective, Meredith and O'Donnell (2010) present a mock-up of an analysis tool with social media functionality while Böhringer et al. (2009) describe a design prototype which integrates social aspects in a BI portal (see Fig. 1).

However, these prototypes are based on conceptual thinking and the suggested features were not tested regarding their influence on report reuse. Thus, our study aims to examine if the enrichment of BI reports by social software features influences their reuse and to reveal the underlying patterns of the influence processes.

The most commonly used theory to examine influence processes in IS research is the elaboration likelihood model (ELM). ELM studies how people form and change attitudes based on the information they receive. Perceived usefulness of an IS or a report is such an attitude. Perceived usefulness of an IS artifact can be defined as the degree to which people believe that the use of this artifact would improve their working performance (Davis, Bagozzi, & Warshaw, 1989). ELM distinguishes two persuasion processes by the type of information processed and explains under which circumstances an information recipient might be more influenced by one process or the other (Petty & Cacioppo, 1986). Utilizing ELM to address the above mentioned research gap can help us to answer the following research questions in particular:

(1) Which social software features influence the perceived usefulness of reports designed by other people?
(2) Are these influences moderated by job-related characteristics of the report user and if so, how?

Answering the two questions is both theoretically and practically important. On the one hand, we advance theoretical knowledge by examining the role and nature of influence processes of social software features in a software environment

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