

Information and data quality in networked business

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Published online: 18 May 2011

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Information and data quality as a success factor for enterprises

Information and data quality is a topic of highest importance for enterprises. A survey among 173 companies in the German-speaking parts of Europe, for example, has shown that data quality management ranks among the five most important information technology (IT) topics (out of 32) (Capgemini 2011). Basically, information is defined as “data processed” (Van den Hoven 1999). This notion corresponds with the understanding of information being a product manufactured from data as a raw material (Wang 1998; Wang et al. 1998). The analogy to the world of physical goods is true also for the understanding of information and data quality. Quality is subjective and, consequently, whether the quality of information or data is high or low always depends on the user’s context. The quality of logistical data describing the dimensions and weight of a

product, for example, might be of minor relevance to the demand planning department of a consumer goods manufacturer. The same issue is a top priority, though, for the logistics department of the same company, because high-quality information about product dimensions and weight prevents the company from wasting money for redundant transportation capacity (if weight values held in computer systems are too high, for example). Besides being context-dependent, the quality of information and data is also a multidimensional concept, i.e. there is no single characteristic describing quality as an integral whole. There is rather an array of dimensions which are used to describe information and data quality. Typical information and data quality dimensions are accuracy, consistency, timeliness, and completeness. A customer address record, for example, might be complete (i.e. no field contains a null value) but at the same time inaccurate if the information given in the fields for street and zip code refers to a previous address of the customer.

High-quality information and data is a critical prerequisite for enterprises to meet a number of strategic requirements. In the telecommunications industry, for example, the change of business models from being mainly fixed-line carriers toward customer-oriented information and entertainment service providers has led to increased awareness regarding the role of information and data quality. Or, as a consulting company puts it: “Data ascends from the basement to the boardroom” (Deloitte 2009). Another strategic requirement is posed by a growing number of regulations companies must comply with. The reformation of the European insurance market (also known as Solvency II), for example, requires insurance companies to formalize information and data quality management as a corporate function (European Commission 2008). Apart from that, the continuing trend toward reduced vertical ranges of

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manufacture and the evolution of networked business have brought about new requirements with regard to information and data quality management between multiple business partners.

The role of high-quality information and data in networked business

Tapia defines a networked business as a “web of profit-and-loss responsible business units, or of independent companies, connected by IT that work together for a unifying purpose for a specific period of time” (Tapia 2006). While the term “networked business” relates to the question of the organizational form, the notion of “Business Networking” (Österle et al. 1999) takes the perspective of the focal company in a network. Both terms imply the prevalence of three concepts, namely networkability, service enablement, and management of the ecosystem. Networkability refers to the ability to establish, conduct and develop IT-supported business relationships (Alt et al. 2000). Service enablement relates to the shift from focusing on products toward providing customer solutions. An example of service enablement would be Endress + Hauser, a manufacturer of automation technology based in Switzerland. The company not only offers physical products to their customers, but supports the entire customer process from technical specification to replacement and disposal through an online service portal (Kagermann et al. 2010). Management of the ecosystem, the third concept of Business Networking, refers to the coordination of the business network (Riemer and Klein 2006).

The quality of information and data plays an important role in enabling Business Networking. Alt and Fleisch (1999), for example, point out that Business Networking Systems (as a prerequisite for networkability) rely on the sharing and exchange of high-quality data. Also, the quality of information is a key parameter for the acceptance and success of online service systems (Loonam and O’Loughlin 2008; Park and Kim 2003). And Madnick et al. propose the concept of a corporate household supporting companies in managing the quality of their business partner data (Madnick et al. 2004).

The importance of information and data quality in networked business is also stressed by studies from the practitioners’ community. The ultimate goal for information flows in a networked business would be to “get all the data I need to track where problems might occur, not when they have occurred” (Global Commerce Initiative, Capgemini, & Intel 2006). And IBM (2010) proposes data management in the value chain to reduce the “high cost of low data quality”.

Contributions in the focus theme section

The focus theme section at hand is a plea for intensifying research at the intersection of information and data quality and networked business. Five papers have been accepted for publication after a rigorous review process.

In their position paper entitled “Information and Data Quality in Business Networking: A Key Concept for Enterprises in its Early Stages of Development” Boris Otto, Yang W. Lee, and Ismael Caballero review and examine the current literature in the field in order to map out future research trajectories. The paper presents an overview of the existing literature as a way to introduce and integrate the current state of research on information and data quality with the field of business networking, and it provides a direction for future research and practice.

Erwin Folmer, Paul Oude Luttighuis, and Jos Van Hillegersberg address a topic of great importance for the field in their paper entitled “Do Semantic Standards lack Quality? A survey among 34 semantic standards”. The paper investigates the quality of semantic standards, finding that the situation today leaves room for improvement. Moreover, the authors show that while some standards organizations deploy quality assurance measures, they fall short in offering approaches for measuring the quality of standards.

A research topic which is receiving much attention in both the researchers’ and the practitioners’ community is addressed by the paper by Andreas I. Nicolaou, reporting on data assurance in electronic exchanges and particularly emphasizing the perception of users. The results of the paper suggest that data assurance operates as an uncertainty absorption mechanism, minimizing negative effects of perceived risks in data exchange.

In a fourth paper, Hongwei Zhu and Harris Wu address the issue of the quality of standards based on the example of eXtensible Business Reporting Language (XBRL). The authors develop a framework for assessing data standards quality, and they evaluate this framework using the example of the Generally Accepted Accounting Principles (GAAP) taxonomy encoded in eXtensible Business Reporting Language (XBRL).

The fifth paper by Kai Hüner, Andreas Schiering, Boris Otto, and Hubert Österle takes the perspective of the focal company in a Business Networking environment. The paper reports on the identification of business-critical product data issues in the supply chain of Beiersdorf, a leading consumer goods manufacturer headquartered in Hamburg, Germany. Furthermore, the paper develops metrics which allow the quality of related product data to be continuously monitored, hence forming the foundation for sustainable improvements in product data quality.

References

- Alt, R., & Fleisch, E. (1999, 07.06.1999). *Key Success Factors in Designing and Implementing Business Networking Systems*. Paper presented at the Proceedings of 12th Electronic Commerce Conference: Global Networked Organizations, Kranj, Bled, Slovenia.
- Alt, R., Fleisch, E., & Werle, O. (2000). *The concept of networkability—How to make companies competitive in business networks*. Paper presented at the 8th European Conference on Information Systems (ECIS 2000).
- Capgemini. (2011). *Studie IT-trends 2011: Unternehmen fordern wieder Innovation*. Berlin: Capgemini Deutschland Holding GmbH.
- Deloitte. (2009). *Telecommunications predictions: TMT trends 2009*. London: Deloitte Touche Tohmatsu.
- European Commission. (2008). *Amended proposal for a directive of the European parliament and of the council on the taking-up and pursuit of the business of insurance and reinsurance*. Brussels: Commission of the European Communities.
- Global Commerce Initiative, Capgemini, & Intel. (2006). *2016: The future value chain*.
- IBM. (2010). *The high cost of low data quality, and solving it through improved data management*. Somers: IBM Corporation.
- Kagermann, H., Osterle, H., & Jordan, J. M. (2010). *IT-driven business models: Global case studies in transformation*. Hoboken: Wiley.
- Loonam, M., & O'Loughlin, D. (2008). Exploring e-service quality: a study of Irish online banking. *Marketing Intelligence & Planning*, 26(7), 759–780.
- Madnick, S., Wang, R., Chettayar, K., Dravis, F., Funk, J., Katz-Haas, R., et al. (2004). *Exemplifying business opportunities for improving data quality through corporate household research*. Cambridge: MIT Sloan School of Management.
- Österle, H., Fleisch, E., & Alt, R. (1999). *Business networking. Shaping enterprise relationships on the internet*. Berlin: Springer.
- Park, C.-H., & Kim, Y.-G. (2003). Identifying key factors affecting consumer purchase behavior in an online shopping context. *International Journal of Retail & Distribution Management*, 31(1), 16–29.
- Riemer, K., & Klein, S. (2006). Network management framework. In S. Klein & A. Poullymenakou (Eds.), *Managing dynamic networks* (pp. 17–66). Berlin: Springer.
- Tapia, R. S. (2006). *What is a networked business?* Enschede: University of Twente, Department of Computer Science.
- Van den Hoven, J. (1999). Information resource management: stewards of data. *Information Systems Management*, 16(1), 88–91.
- Wang, R. Y. (1998). A product perspective on total data quality management. *Communications of the ACM*, 41(2), 58–65.
- Wang, R. Y., Lee, Y. W., Pipino, L. L., & Strong, D. M. (1998). Manage your information as a product. *Sloan Management Review*, 39(4), 95–105.