

Chapter 11

BIN: Business Intelligence Networks

Matteo Golfarelli

University of Bologna, Italy

Federica Mandreoli

University of Modena & Reggio Emilia, Italy

Wilma Penzo

University of Bologna, Italy

Stefano Rizzi

University of Bologna, Italy

Elisa Turricchia

University of Bologna, Italy

ABSTRACT

Cooperation is seen by companies as one of the major means for increasing flexibility and innovating. Business intelligence (BI) platforms are aimed at serving individual companies, and they cannot operate over networks of companies characterized by an organizational, lexical, and semantic heterogeneity. In this chapter we propose a framework, called Business Intelligence Network (BIN), for sharing BI functionalities over complex networks of companies that are chasing mutual advantages through the sharing of strategic information. A BIN is based on a network of peers, one for each company participating in the consortium. Peers are equipped with independent BI platforms that expose some querying functionalities aimed at sharing business information for the decision-making process. After proposing an architecture for a BIN, we outline the main research issues involved in its building and operating, and we focus on the definition of an ad hoc language for expressing semantic mappings between the multidimensional schemata owned by the different peers, aimed at enabling query reformulation over the network.

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INTRODUCTION

Cooperation is seen today by companies as one of the major means for increasing flexibility and innovating so as to survive in today uncertain and changing market. Companies need strategic information about the outer world, for instance about trading partners and related business areas (Hoang & Nguyen, 2009). Indeed, it is estimated that above 80% of waste in inter-company and supply-chain processes is due to a lack of communication between the companies involved. Traditional information systems, that were devised for individual companies and for operating on internal information, give limited support to inter-company cooperation. Even business intelligence (BI) platforms, that support decision making and strategic management activities, are aimed at serving individual companies, and they cannot operate over networks of companies characterized by an organizational, lexical, and semantic heterogeneity (Abiteboul, 2003). The existing approaches in this direction are basically aimed at data mart integration (Banek et al., 2008; Torlone, 2008), so they cannot support dynamic scenarios like those of mergers and acquisitions, nor can they preserve autonomy of individual actors.

In this chapter we propose a framework, called *Business Intelligence Network* (BIN), for sharing BI functionalities over complex networks of companies that, though they may operate in different geographical and business contexts, are chasing mutual advantages by acting in a conscious and agreed upon way, through the sharing of strategic information. A BIN is based on a network of peers, one for each company participating in the consortium; peers are equipped with independent BI platforms that expose some functionalities aimed at sharing business information for the decision-making process, in order to create new knowledge.

In order to get maximum benefit and effectiveness from the BIN framework, some key issues must be taken into account:

- BIN participants are *collaborative*, even if with different grades: local bodies and health-care agencies, as well as enterprises belonging to the same holding, show higher inclination to sharing management information than companies belonging to an individual product supply-chain or companies that belong to the same business area but operate in different geographical markets.
- Inclination to collaboration should not reduce *autonomy* of each participant, that must be allowed to define and change the set of shared information as well as its own terminology and schema without being subject to a shared schema.
- A BIN must be completely *decentralized* and *scalable* because the number of participants, the complexity of business models, and the user workload are unknown a priori and may change during the BIN lifetime.

The main benefits the BIN approach aims at delivering to the corporate world are the possibility of building new inter-organizational relationships and coordination approaches, and the ability to efficiently manage inter-company processes and safely sharing management information besides operational information. Other practical benefits arising from activating a BIN depend on the specific corporate context. In companies that belong to the same supply-chain or operate in the same market, (partial) business information sharing is required by users to allow inter-company processes to be monitored and markets to be accurately controlled. Remarkably, the BIN approach can be applied both to large enterprises and small-medium size companies. As to companies belonging to the same holding, a BIN can lead to a faster activation of shared BI services; this topic is particularly relevant in case of mergers and acquisitions, that are very frequent in the banking area. Finally, as to networks of municipalities, local health-care departments, or chambers of commerce, a BIN en-

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