A BPTrends Column March 2009

MDA Journal

David S. Frankel
Lead Standards Architect – Model Driven Systems
SAP Labs

David.Frankel@SAP.com
Mr. Frankel's SAP WebLog is:
https://www.sdn.sap.com/fr/sdn/weblogs?blog=/pub/u/55914

Author:
Model Driven Architecture:
Applying MDA to Enterprise
Computing

Business Network Transformation

Upstream supply chains and downstream distribution channels have existed since the advent of the industrial revolution. However, contemporary macro-economic factors and technological advances are magnifying the importance and power of collaborative relationships among business partners.

Macro-Economic Driver: Business Networks for Competitive Advantage

Business Process Management (BPM) advocates correctly point out that, in the 21st century economy, innovative and agile business models are at least as important for competitive advantage as is innovative technology. Core innovative business has to be carefully distinguished from supporting activities that may be crucial but are not differentiating.

This trend leads to the need for a level of collaboration among companies beyond the relatively straightforward supply chains and distribution channels of the past. A company's network of suppliers, distributors, customers, partners, and supporting financial institutions is itself an increasingly important source of competitive advantage.

Technological Driver: Digitization of Business Networks

A wave of adoption of enterprise software applications in the past thirty years has digitized many aspects of companies' internal operations, and BPM is beginning to make those automated and semi-automated operations more flexible than software has made possible to date.

The next wave of digitization addresses the need for members of a business network to share information across corporate boundaries. Whereas previously the data in enterprise application systems largely stayed locked up behind corporate firewalls, now more and more of that data is flowing over digital networks that form the technical backbone of business networks. This digitization is transformative, driving business networks to greater power and efficiency.

Structured vs. Unstructured Collaboration

The exchange of information across a business network takes two basic forms. Unstructured collaboration involves tacit interactions among knowledge workers to accomplish a task such as

negotiating a price, brainstorming about improvements in logistics, resolving a payment dispute, and so on. Social networking tools are increasingly important for this kind of collaboration, taking advantage of digital networks.

Structured collaboration, on the other hand, involves automated flows of information across business networks, such as automatically ordering a part from a supplier once inventory has dipped below a specified level, or initiating an electronic payment to a vendor when dictated by rules that maximize discounts for timely payment. Structured collaboration applies to routinized transactions that are amenable to automated processes, whereas unstructured collaboration applies to collaboration that cannot be automated because it requires "on the fly" human judgment and the exchange of unstructured data.

Synergies Between Structured and Unstructured Collaboration

There are interesting synergies between structured and unstructured collaboration.[1] For example, the unstructured collaborative activity of resolving a payment dispute is aided by the structured electronic flow of invoices and payments with automated matching of remittance data, which gives payables and receivables managers new tools to zoom in on a problem.

Conversely, working out a mapping among business partners' data formats in order to set up a structured collaboration is aided by social networking tools that make it easier for the partners' analysts to collaborate on the mapping.

Relationship to BPM and Enterprise Application Software

The internal business processes that companies need to manage also have an intertwined mix of structured and unstructured tasks. BPM languages, tools, and execution engines are rising to meet this challenge. Although BPMN 2.0 is still a work in progress, it is already clear that it will support the modeling of processes that integrate human and automated tasks to a greater extent than BPMN 1. In the arena of languages for business process execution engines, BPEL4People and WS-HumanTask are important new adjuncts to BPEL's support for automated tasks.

BPM is also starting to deal with collaborative processes, with substantially expanded modeling support in BPMN 2.0. Service-enabled enterprise applications increasingly have direct support for end-to-end structured processes across business networks – such as straight through processing of electronic payments – which has broad implications for BPM suites that use the services.

Enterprise applications also are starting to integrate with social networking systems to facilitate unstructured, collaborative decision-making across company boundaries in order to plan for and resolve issues regarding structured collaboration.[2]

Barriers to Business Network Expansion and Efficiency

Despite genuine advances in the digitization of business networks, there are some real obstacles that restrain progress, particularly those affecting structured collaboration.

---

[1] Note that thought leaders in business network transformation – Geoffrey Moore, Philip Lay, and Henning Kagermann, in particular – use the terms *collaboration* and *coordination* in the same way that I am using the terms *unstructured collaboration* and *structured collaboration*, respectively. See "Business NetworkTransformation: Rethinking Relationships in a Global Economy," Henning Kagermann, Philip Lay, Geoffrey Moore, The Global Information Technology Report 2007-2008, World Economic Forum, Section 1.8.

[2] For a sample of some of the possibilities of integrating enterprise applications with social networking, see "Social Networking: Still Challenged by Enterprise Complexity," Louis Columbus, TechNewsWorld, October 20, 2008, http://www.technewsworld.com/story/64856.html?wlc=1235311010

Lack of Semantic Interoperability

I have written extensively in these MDA Journal pages[3] about the fact that a lack of semantic interoperability drives up the cost of integration across company boundaries. In the context of business networks, semantic interoperability is the ability of business partners to exchange information based on a shared understanding of the meaning of the data. In practice, the lack of this kind of interoperability can drag integration projects out for many months, while teams across the network are laboring to get their data exchange working properly.

New techniques and standards for embedding machine-readable semantic metadata in definitions of data and message formats, and emerging tools that exploit that metadata, should soon start to show real progress on this front.

Finding the Right Business Model

It's worth summarizing at this point the positive developments in structured collaboration across digital business networks:

- Enterprise application software is supporting more end-to-end processes across business networks.
- New technologies are finally starting to erode the semantic interoperability barrier.
- Standardization of message formats in accordance with these new techniques is progressing.

Yet as we improve the ability of systems across a network to understand each others' data, we expose another problem. Consider the perspective of a manufacturer who must deal with multiple suppliers, and the viewpoint of a supplier who must deal with multiple manufacturers. The manufacturer has to maintain a separate physical communication connection with each supplier; or, seen from the opposite angle, the supplier has to maintain a separate connection with each manufacturer. Setting up and maintaining the multiple point-to-point physical connections strains the resources of the manufacturer's and supplier's integration teams.

The technical solution to this problem is relatively straightforward – setting up a hub in the "cloud" that functions as a single physical connection point that suppliers and manufacturers plug into on a software-as-a-service basis.

However, finding a business model that provides sufficient incentives for investors to set up and maintain a hub that users can plug into is an order of magnitude more difficult. For example, if a manufacturer with the resources to build and operate a hub makes the investment, why would a competitor plug into a hub that it does not control? Who will be able to charge transaction fees? A number of hub projects have foundered because of struggles over these questions.

When we turn our focus from manufacturing supply networks to financial supply networks, where electronic fund transfers such as credit and debit transfers require some party or parties to assume liability for errors, the equation becomes even more difficult to solve.

This is not to say that there is no future in the hub model. Technically, it has so much merit, and the productivity gains for industry that redound from connectivity hubs are potentially so huge, that we are probably moving inexorably in that direction. But the road from here to there will take all kinds of twists and turns that are not entirely predictable.

In the meantime, the digitization of business networks, and progress on the semantic interoperability front, will yield relatively modest but still substantial and valuable productivity improvements from structured and unstructured collaboration.

---

[3] See MDA Journal in Business Process Trends, July 2007, October 2007, and January 2008 for detailed explanations of the semantic interoperability problem, and of increasingly promising efforts to overcome it.

David Frankel has 30 years of experience in the software industry as a technical strategist, architect, and programmer. He is recognized as a pioneer and international authority on the subject of model-driven systems. He has published two books and dozens of trade press articles, and has co-authored a number of industry standards, including the latest version of the ISO 20022 standard for optimizing financial networks.

David is a member of SAP's Standards Strategy and Management team, which is part of the Global Ecosystem and Partner Group. He focuses on standards for the financial services sector and for model-driven systems. Recently he has been publishing and speaking about the role of semantic interoperability in business network transformation.