

e-Business in Manufacturing Industries: A Source of Competitive Advantage?

**An e-Business W@tch Workshop
at the DIW Industrial Conference**

Berlin, 11th May 2005

About 25 international participants from industry, academic and research communities and the European Commission attended the workshop on "Electronic business in manufacturing industries", organised by the Commission's *e-Business W@tch*. This workshop was hosted by DIW Berlin on Wednesday, 11th May 2005, as part of the DIW Industrial Conference, an annual meeting of manufacturing industries representatives.

1 Background and programme

The main objective of the workshop was to discuss whether and how investment in e-business technology can lead to sustainable competitive advantage. The focus of the workshop was on three manufacturing sectors of the EU, namely pharmaceutical, automotive and machinery & equipment manufacturing. The purpose was to present the most recent *e-Business W@tch* results on these three sectors, stimulating debate and providing corporate decision makers with better insights into how e-business could be beneficial for their company.

In manufacturing sectors, e-business tools are primarily used to reduce costs. This conclusion, drawn from earlier *e-Business W@tch* studies, raises strategic questions about e-business investments: What are promising e-business strategies for firms in the manufacturing industries to obtain sustainable competitive advantage? Is this possible at all, or is the strategic value of e-business limited to being a means of survival? Or, alternatively, is there no need to invest in e-business at all?

In the introductory session of the workshop, Tapani Mikkeli (deputy Head of Unit 'Technology for Innovation; ICT industries and e-business') presented an overview of e-business related activities of the Commission's DG Enterprise & Industry; Philipp Koellinger (of DIW) presented the results of an academic paper that analysed the strategic relevance of IT. The second session focused on the automotive industry and the pharmaceutical industry. Daniel Nepelski (of DIW) presented the most recent results on e-business usage in the automotive industry, based on results of the 2005 *e-Business W@tch* survey and new case study evidence. Jerzy Kopiec (of intelligence Poland) provided insights on e-business strategies in the Polish automotive industry from the perspective of an IT consulting firm. Andreas Stiehler (from Berlecon Research) discussed RFID and Auto-ID approaches in the pharmaceutical industry as a concrete example of e-business in this industry, its potential benefits and challenges. Michael Latzer (of Academy of Sciences Austria) 'challenged' the preceding presentations from an academic perspective, brought forward interesting views and indicated topics for further research.

In the third session of the workshop, Brigitte Preissl (of DIW) introduced results from the May 2005 *e-Business W@tch* report on the machinery and equipment sector. Cecile Pompanon (of the French

Federation of Mechanical Engineering Industries) presented examples of e-business activities in this sector and discussed strategies of the Federation's e-business club to raise awareness and to support e-business developments. The workshop concluded with a panel discussion, in which Gilles Morin (of Export and Development, Canada), Michael Stamm (of Technologiestiftung Berlin), Thorsten Wichmann (of Berlecon Research) and Tapani Mikkeli, wrapped up the discussions by providing their personal perspectives on the strategic relevance of e-business.

2 Major Points

The workshop provided new insights into the how and why e-business technologies remain an important topic for firms in the manufacturing industries. There was general agreement that the potential of ICT in general and e-business in particular are far from being exhausted. A strong link between ICT adoption and innovation was emphasised: The introduction of new ICT and e-business tools can enable process and product or service innovations. Empirical results and case study evidence indicate that more important than the technologies themselves is what firms do with them, i.e. if and how they use the new technologies to innovate. The ability of firms to gain strategic advantage from e-business depends on:

- ⇒ the appropriate choice of technologies (not all technologies are relevant for all firms);
- ⇒ a successful attempt to either improve processes or to create new valuable services or products to customers, and
- ⇒ the extent to which firms can differentiate their e-business related activities from those of direct competitors.

Automotive industry

Despite macroeconomic difficulties, the survey data shows that the automotive industry is an e-business forerunner. These developments have some important impacts for this industry's value chain. The discussion during the workshop focused on the following issues:

- **Intensive inter-firm collaboration:** Online procurement has become part of everyday business and belongs to the most frequently adopted e-business applications. Large enterprises appear as the leaders in using e-business technologies to automate business processes. The most frequently adopted technologies include Enterprise Resource Planning (ERP), Supply Chain Management (SCM), and collaborative design systems.
- **SMEs as e-commerce leaders:** A closer analysis of online transactions volumes reveals that SMEs emerge as e-procurement and e-sales leaders. One of the possible explanations for this, as discussed during the workshop, is that product complexity increases along the value chain making online trading more difficult. However, despite higher percentages of online transaction volumes among SMEs, small firms remain less likely to adopt complex e-business technologies that are primarily used in-house.
- **ICT still a source of competitive advantage:** The empirical evidence presented at the event confirms that ICT-enabled innovation still remains a source of competitive advantage in the sector. Yet, the economic success of companies does not strictly depend on their endowment with ICT infrastructure. The efficient use of the available technologies and being innovative in the relevant product market are equally important success factors.
- **Policy implications:** Based on the recently collected evidence, some policy issues emerged, the most important among them being: raising awareness of legal regulations among companies and ensuring that the legal framework does not result in additional barriers for e-business, facilitating the process of standardization, and increasing the awareness of ICT benefits and potentials.

Pharmaceutical industry

Due to specific characteristics of the sector (e.g. regulatory compliance and R&D intensity), the pharmaceutical industry often serves as prime example for the usefulness of innovative e-business technologies – so also for the use of RFID. Combating counterfeiting activities currently appears to be a main driver for the deployment of so-called RFID/Auto-ID solutions in this sector.

The role of the pharmaceutical industry as forerunner in this field is further accelerated by the large range of applications suitable, the favourable ratio of tag prices to product values, as well as by the pedigree requirements enforced by some regulation authorities. However, a widespread deployment of this technology within the pharmaceutical industry brings many challenges with it.

- **Global product identification standards:** There are different rules for labelling of products on national levels. To explore the full potential of RFID, harmonization would be beneficial.
- **Specification of technologies and their interplay:** RFID solutions require a large variety of components, including tags, readers, communication protocols, security measures, and radio frequencies. The optimal technical solution depends on the specificities of the desired application, i.e. one “size” does not fit all possible applications. This raises questions about the business case of RFID.
- **Who drives and/or finances the deployment?** RFID developments could either be initiated and led by pharmaceuticals manufacturers or by regulation authorities. If manufacturers take charge of the development, they will face challenges in integrating downstream partners. From a policy perspective, the justification of an involvement of regulatory authorities is still unclear.
- **Who owns the information and operates the network?** Different models are possible. The “conventional” solution is that manufacturers own and manage the network. Alternatively, a trusted third party could operate it.
- **Additional challenges:** There are still concerns about privacy of information, which seem particularly sensible in the case of pharmaceuticals. In addition, it is not yet completely resolved how the well established barcode system can be integrated with RFID solutions.

Despite these challenges, the presentation showed case study evidence for successful implementations of RFID in the pharmaceutical industry, yielding the conclusion that RFID solutions are already feasible, but the general business case remains unclear.

Machinery and equipment

There is a strong trend in the sector of combining the sale of machinery with a whole range of services. This opens up new opportunities for e-business projects. The patterns of adoption in companies have been studied in a series of case studies. The following sector-specific features have emerged:

- **Integrating e-business projects.** An important step in e-business using firms is the awareness in all departments of an e-business strategy. E-business, thus, becomes a common project accepted by all participating teams. An activity which has often been underestimated was the transformation of existing data files and archives in digital files that are compatible with the new e-business system.
- **Standardisation.** Electronic trading and logistics depend on the standardisation of product descriptions. It is still unclear who should be in charge of the organisation of this task. The involvement of public entities could guarantee that standards are not dominated by strong players in the market. However, the initiative must basically be taken at the enterprise level, since this is where the detailed knowledge about products is located.
- **Product related services.** Combinations of machinery and services are increasingly important for competitiveness. Implementation and assembling of machines, the training of employees, online maintenance and repair as well as leasing, insurance, financing and recycling services are offered by machinery manufacturers. ‘Operator models’ in which the machine is operated by the manufacturers throughout its life time are frequently adopted.

- **Small and medium-sized enterprises** have developed e-business models which are suitable for their needs. Case studies have shown that by taking advantage of the specific features of 'being small' e-business projects can be successful. Problems exist in implementation and planning, since limited personnel resources do not allow to delegate employees to the implementation of the projects.

An interesting approach to addressing the problems of e-business diffusion can be observed in the French mechanical engineering industries. The Industry Federation has developed a program which concentrates on 'consistency', 'concentration' and 'certainty' as the fundamental prerequisites of successful projects. A thorough assessment of costs and awareness of the challenges of e-business projects are key concerns. The 'e-business club' of the Federation monitors the progress of application, aims at understanding the prerequisites and rationale of success, and fosters dialogue among users. When introducing e-business to potential users it has to be pointed out that short-term effects are to be distinguished from the long-term ones: in the short run, methods to be adopted in new projects seem tough and the necessary re-adjustments burdensome; in the long term, however, strategic benefits can be reaped as the economic effects of time-saving and cost-cutting begin to emerge.

3 Conclusions

E-business remains an important element of corporate strategy in the automotive, the pharmaceutical, and the machinery and equipment industry. The ability of firms to gain competitive advantage crucially depends on whether and how investments into e-business technologies are transferred into innovative activities.

Due to different business dynamics and environments among industrial sectors, there is no generic e-business strategy that would guarantee success. Instead, firms need to find individual solutions that help them to either become more efficient in what they are doing, or to improve their products and services. The workshop provided up-to-date evidence and examples of how various e-business technologies remain an important enabler of such improvements in the manufacturing industries.

4 Further information:

Workshop proceedings (agenda, presentations, list of participants) are available for download at the *e-Business W@tch* website (www.ebusiness-watch.org). For further information, questions and input you are welcome to address:

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