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Policy, Economic, and Industry Repercussions of Current E-Business Diffusion Rate In European Food Industry

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Abstract

European policy is focussed on promoting the business techniques and new ways of working which will provide the economic and social foundation of the information society in Europe. To help policy makers define their programmes, and to monitor the effectiveness of these policies, it is essential to examine progress as well as identify areas requiring active support. This study examined the repercussions of e-business progress in the food sector based on the findings of a large quantitative survey that investigated the extent, scope, nature of and factors affecting the speed of e-business development in Europe for the Food, beverages and tobacco sector. For this purpose a pan European survey was conducted by EU market observatory called “European e-Business Market Watch” during the period February and March 2003. This study is based on the findings and reports of “European e-Business Market Watch” which can be accessed in the Internet (www.e-businesswatch.org).

This study discusses the economic implications for the individual enterprise, the industry structure as well as policy issues such as quality assurance, promotion of ICT education, training and “cultural” change. Regarding economic implications, e-business has played a indirect role because it has significantly involved only in Large Scale Enterprises which proportionally are a small percentage in food industry. For SMEs, the impact of e-business was mainly to the ICT facilities currently at their disposal: websites, the Internet, and e-mail. Regarding industry implications, e-business has not led to significant structural changes, but it has steamed up certain processes. E-business has armoured supply chain management with advanced but sophisticated network technologies. Regarding policy issues, an e-business solution capable of guaranteeing food safety to consumers and vertically integrating business operations across the supply chain would have a good chance of extraordinary diffusion in the food industry.

Key words: E-business, European Union, Policy, Food Industry

1 Introduction

Until recently, companies in the food and beverages industry have used e-business mainly to improve their internal processes and procedures. Applications most commonly used both by small and large enterprises are e-mail, websites and online banking. These basic tools are followed, with a considerable distance in terms of adoption rates, by EDI and ERP systems. However, the growing complexity of the industry is driving companies to adopt more effective solutions in response to new strategic challenges. Most important issues that are likely to have a big influence on ICT investment decisions in the future are food safety and the full digital integration of the value chain. Investments in supply chain integration (both internally and in B2B processes), including RFID (Radio Frequency Identification) technologies, are a focus of ICT adoption in the industry. Integration of internal processes, CRM and SCM are also likely to gain momentum.

The main opportunities companies hope to exploit through e-business are improvements in customer service, increased efficiency of internal processes, and sharing investments and risks. Main risks and

barriers for e-business adoption in SMEs are presently the inadequacy of the existing ICT infrastructure, the fragmentation of supply chains (especially in Southern Europe) and cultural barriers. This study reports and synthesises findings and reports of “European e-Business Market Watch” (www.ebusiness-watch.org)

1.1 The role and use of ICT technologies in food sector

The role and use of ICT technologies mirrors the structure of the industry: dominance by large multinationals, where the creation of industrial groups (tied to mergers and subsidiaries) has encouraged the installation of interconnected local networks. In the large multinationals, the role of ICTs is evolving from mere instrumentation for reducing production costs and it is becoming a growing support for strategic decisions and greater e-business interaction/models. Sophisticated technologies and applications are less pervasive than in other manufacturing sectors, focusing mainly on intra-organisational processes and procedures.

Core sector business areas are: supply, production, logistics, services, and marketing & sales (**Table 1.**) Other critical areas now being targeted for improvement are: packaging processes, the control of quality in Hazard Analysis and Control Critical Points (HACCP), the quality of the product, and the reverse supply chain management of returned products. In the production sector, verifying the quality of the raw material is becoming increasingly more important.

Table 1 Applications of E-business tools to Food & Agribusiness Management

Business Functions	E-business tools	Applications
Marketing	B2B e-commerce, Internet ordering, Corporate Websites, mobile commerce	Product promotion, new sales channels, direct savings, reduced cycle time, customer services
Purchasing	EDI, Internet-purchasing, EFT	Ordering, fund transfer, supplier selection
Production	B2B e-commerce, MRP, ERP, GIS	Production planning and control, scheduling, inventory management, quality control
Sales and distribution	Electronic funds transfer, On-line TPS, Bar-coding system, ERP, WWW integrated inventory management, Internet delivery of products and services, RF-ID	Internet sales, selection of distribution channels, transportation, scheduling, third party logistics
Warehousing	EDI, EFT, web-based integrated inventory management	Inventory management, forecasting, scheduling of work force
Supplier development	WWW assisted supplier selection, communication using Internet (e-mails), research on suppliers and products with WWW and intelligent agents	Partnership, supplier development

Source: Mangina & Vlachos, 2004.

2 Methodology

The data used in this study are derived from the European e-Business Survey 2003. In total, 3515 telephone interviews with decision makers in European enterprises in 5 EU Member States (Germany, Spain, France, Italy, UK) were conducted between 24th February and 20th March 2003. A follow-up study is on-going involving 5,000 enterprises (2005) from 10 different sectors across 7 EU member states.

The field work was carried using computer-aided telephone interview (CATI) technology. The decision maker in the enterprise targeted by the survey was normally the person responsible for ICT within the company, typically the IT manager. Alternatively, particularly in small enterprises which may not have a separate IT unit, the managing director or owner was interviewed.

3 Analysis

The role of ICT in the sector is still rather controversial. Despite the fact that, based on the results of the survey, 71% of the interviewed enterprises feel that e-business does not play a significant role yet for the company, it must be noted that for approximately 50% of larger enterprises and over 20% of small enterprises, e-business already represents a rather significant part (see Figure 1).

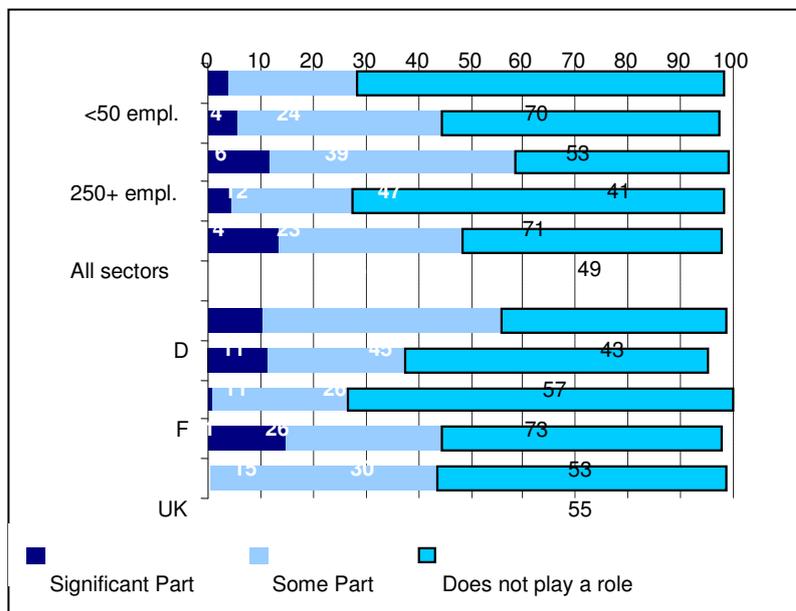


Figure 1 Importance of e-business in 2003 as perceived by companies

Source: E-Business-Watch Observatory

3.1 Online selling

Figure 2 shows the status of online selling in the food, beverage and tobacco sector. In particular, it indicates that only 5% of companies use online selling. This percentage is slightly higher in the case of medium-sized enterprises (9%) and large enterprises (8%). Nevertheless, it must be emphasised that in the food industry, online selling is less developed in comparison to the average of other sectors, in which there is a 16% rate of online selling. Spain and the United Kingdom are the countries that use this sales method the most, respectively with 10% and 9% of companies that sell online. Instead, France is the least oriented to online selling (only 2% of companies). The countries revealing the highest percentage of companies that are planning to introduce online selling within the next twelve months are Spain (11%) and the United Kingdom (13%).

3.2 Impact of online selling on companies

Figure 3 illustrates the impact of online selling on companies in this sector. In particular, online selling has proven to have a positive impact above all in terms of the number of customers (an aspect cited by 64% of the companies that sell online). Moreover, although with a slightly lower percentage, its impact on the quality of customer service (58%) and on the efficiency of internal processes (57%) has been indicated as positive. There is also a significant percentage of companies that gave a positive opinion about the impact of online selling on their sales turnover, a factor that 12% of the companies even considered a “very positive impact”. The impact that online selling on logistics costs and stock management is less positive. For this factor, over 65% of the companies stated that online selling has neither a positive nor a negative impact.

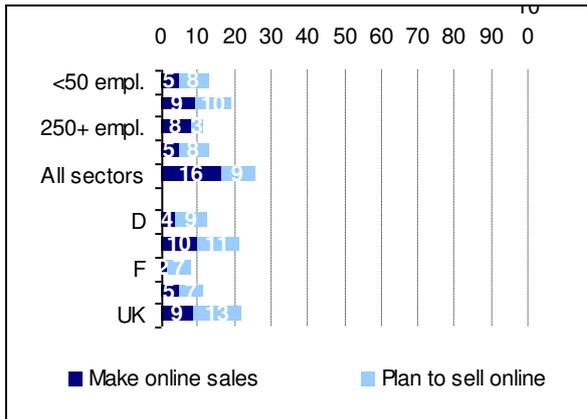


Figure 2 Companies selling online / Source: E-Business-Watch Observatory

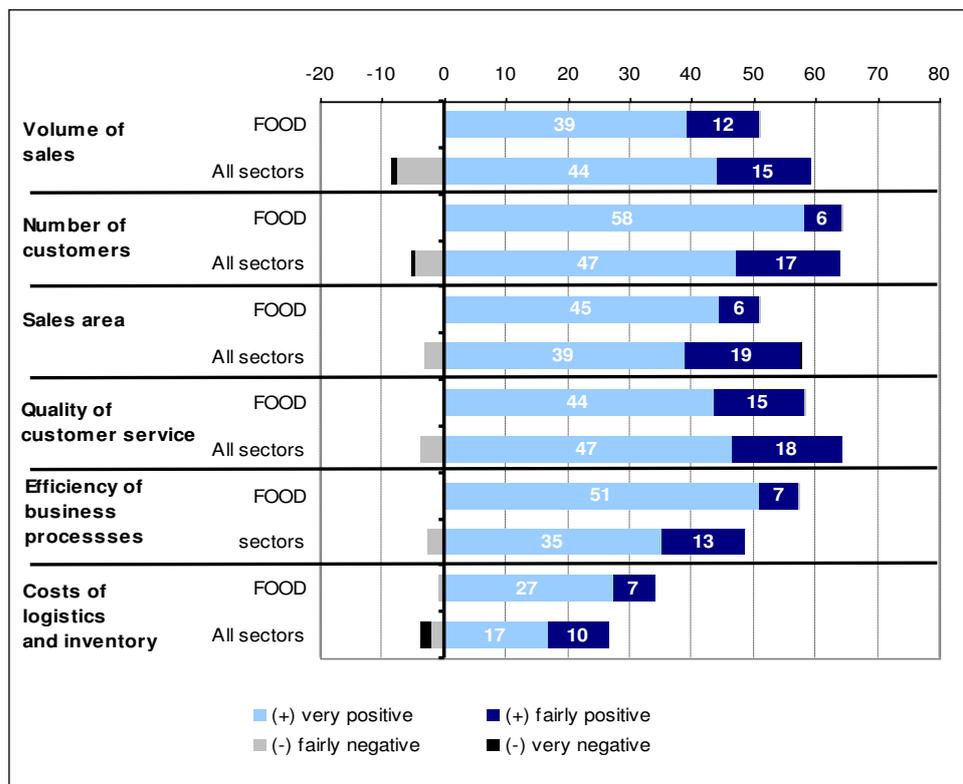


Figure 3 Impact of selling online / Source: E-Business-Watch Observatory

3.3 E-Procurement

In contrast to online selling which is used by 5% of the interviewed companies, online procuring (as in other sectors) has been developed more rapidly, playing a more important role in the sector. In fact, as demonstrated by Figure 4, 19% of the sample companies use online procuring, although this percentage is lower compared to the average for other sectors, where the use of online procuring amounts to 33%. Large companies are the ones that mainly adopt online procuring (54% of the sample), but there is also a rather significant percentage of small companies that handle their purchasing online (19%). On a geographic level, online procuring is more widespread on the average in countries like Germany (40%) and the United Kingdom (30%). Inversely, French companies are the least oriented towards e-procurement (only 6%). For 70% of the companies (out of the total number of companies that use e-procurement), online purchases represent less than 5% of total purchases. This leaves a wide window for future online purchases.

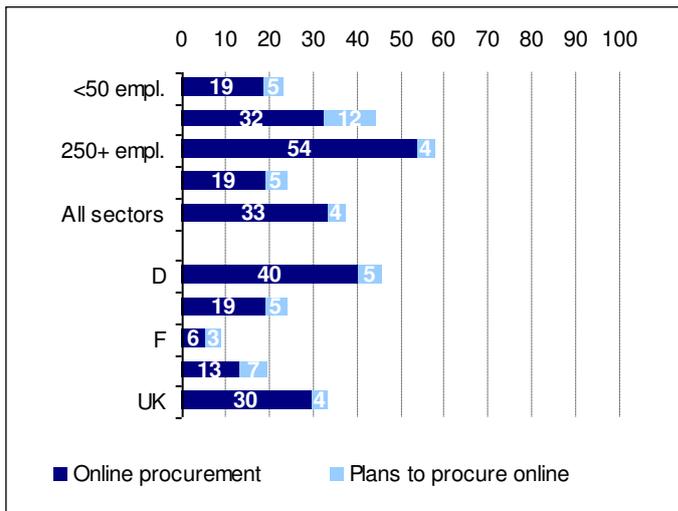


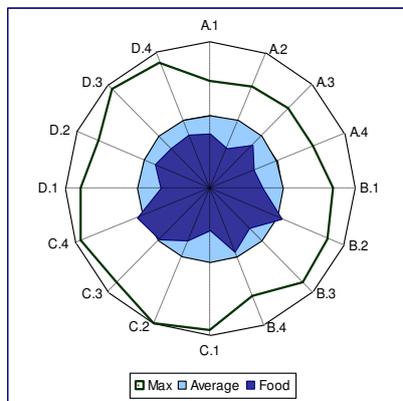
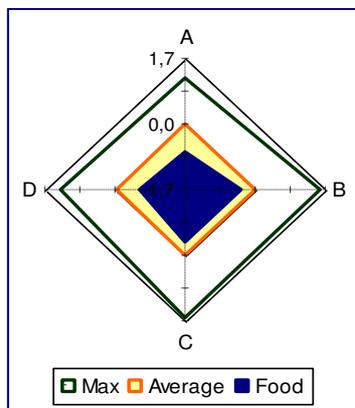
Figure 4 Enterprises procuring online / Source: E-Business-Watch Observatory

3.4. Sector scoreboard

Companies in the F&B industry use e-business mainly for their internal processes and procedures.

Most common applications are:

- online management of capacity / inventory
- online technology to track working hours and/or production time
- SCM systems
- ERP systems



A: connectivity of enterprises
 B: Internal business process autom.
 C: Procurement and supply chain
 D: Marketing and sales
 Max: maximum indexed values for one of the 10 sector bench.
 Average: value for all 10 sectors

Figure 5 Food Sector Scoreboard / Source: E-Business-Watch Observatory

4 Results & Discussion

E-business applications can be classified into three categories, according to the purpose they serve:

1. **Informative.** The purpose of informative e-business application is to provide technical, professional or business information such as in the case of a corporate web site. In this case, the content is typically unstructured and dynamic. Typical informative transactions include the corporate web site, business communication transactions, and e-promotions using e-newsletters and e-mail.
2. **Transaction.** The purpose of e-business transactions is to facilitate current or future transactions with business partners and customers. In this case, electronic transactions should be codified in advance. The majority of e-marketplaces are also characterized by codified business transactions.
3. **Growth.** Chandler in his seminal work pointed out that the purpose of a firm, particular of a large and/or innovative one, is more than to reduce transaction costs: firms actually define new markets and resource uses (Chandler, 1990). E-business can be used as an instrument to open up new markets, leverage new product development, and engineer innovative business processes.

4.1 Policy implications

1. **Informative.**

The majority of food companies have built a web site, thus making the first 'big step' into digital world. A corporate web site is the cornerstone of **market transparency** which allows consumers to track all the relevant information about the food they eat. Market transparency raises consumer confidence and trust in the integrated supply chain. A web-site is required but not sufficient condition to achieve full market transparency. Food traceability is also necessary but this requires e-business applications to enhance transactions.

2. **Transaction.**

Food tracking and tracing requires to a large extent supply chain integration. **Food traceability** is hard to be implemented without the help of modern technology and e-business applications. Food traceability is more hard to achieve when supply chain is fragmented, a typical case in Southern Europe. **Fragmentation** creates both supply inefficiencies, inhibits market transparency, creates information asymmetries, and prohibits food quality and safety. Policy measures should address supply fragmentation i.e. by supporting participation to e-marketplaces, creating clusters of SMEs, virtual chains, etc.

3. **Growth.**

E-business is a new market to itself for food companies, thus creating growth dynamics for SMEs. For example, e-business opens us access to new markets, or opportunities for re-engineering existing business models. Access to new markets and business partners should also be supported. For example, disseminating best practices for food SMEs can remove barriers to change and unfold growth potential. Growth dynamics is equally important for SMEs and LSEs.

4.2 Economic implications

1. **Informative**

E-business are a standard communication means for efficient and cost-effective dissemination of corporate information. E-mail is commonplace even for small food SMEs across EU.

2. **Transaction.**

Transaction-type e-business are the most popular in food sector, such as online management of capacity / inventory, online technology to track working hours and/or production time, SCM and ERP systems. A lot of development is also anticipated to take place in the near future, particularly as regards as online sales / procurement and traceability systems.

3. **Growth**

The first-mover advantage is well documented in the literature and evidenced in the EU food sector when referring to large retailers and smaller suppliers. It is typical in the adoption process that followers have the advantage of lowering the risk of investing in an 'uncertain' e-business which trade-off with the opportunity of reaping higher benefits if the investment is successful. However, the pace of growth that e-business is not always certain as proven by the e-tailing case in food sector. Thus, it is anticipated that there would be no significant change in the growth of food sector unless an array of best practices of food SMEs paves the way for rest SMEs.

4.3 Industry implications

The diffusion of e-business tools and applications in the food & beverage sector, even at a lower pace than other industries, lowers the transactions costs within business-to-business and business-to-consumer transactions. The players that seem to ripe the fruits of this cost reduction are large companies. To this extend, we can anticipate that e-business can contribute to the creation of new agreements or strategic alliances, as well as acquisitions and mergers. As a consequence, many food companies and particularly SMEs would face the dilemma of either collaborate or compete with existing business partners and competitors.

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