Sector Report No. 8/2006

ICT and e-Business in the

Tourism Industry

ICT adoption and e-business activity in 2006

e-business w@tch

European Commission

About *e-Business W@tch* and this report

The European Commission, Enterprise & Industry Directorate General, launched the *e-Business W@tch* to monitor the growing maturity of electronic business across different sectors of the economy in the enlarged European Union, EEA and Accession countries. Since January 2002, the *e-Business W@tch* has analysed e-business developments and impacts in manufacturing, construction, financial and service sectors. All results are available on the internet and can be accessed or ordered via the Europa server or directly at the *e-Business W@tch* website (http://ec.europa.eu/comm/enterprise/ict/policy/watch/index.htm, www.ebusiness-watch.org).

This document is a sector study by *e-Business W@tch*, focusing on the tourism industry. Its objective is to describe how companies in this industry use ICT for conducting business, to assess the impact of this development for firms and for the industry as a whole, and to indicate possible implications for policy. Analysis is based on literature, interviews, case studies and a survey among decision-makers in European enterprises from the tourism industry about the ICT use of their company.

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Table of Contents

Executive Summary 5

1 Introduction 9

1.1 About *e-Business W@tch* **9**

1.2 "e-Business" – the conceptual framework **13**

2 Context and Background 19

2.1 Sector definition – scope of the study **19**

2.2 Industry background **21**

2.3 Review of earlier sector studies **25**

3 Adoption of ICT and e-Business in 2006 28

3.1 Use of and Access to ICT Networks **29**

3.2 ICT Skills, Outsourcing and ICT Budgets **32**

3.2.1 Demand for ICT skills and skills development *32*

3.2.2 Outsourcing of ICT services and ICT investments *34*

3.3 Standards, Interoperability and ICT Security Issues **38**

3.3.1 Types of e-standards used *38*

3.3.2 Interoperability challenges *40*

3.3.3 Use of Open Source Software *41*

3.3.4 ICT security measures *43*

3.4 Internal and External e-Integration of Processes **45**

3.4.1 Use of software systems for planning and decision-making *45*

3.4.2 Use of ICT for cooperative and collaborative business processes *48*

3.4.3 Deployment of e-invoicing *49*

3.5 e-Procurement and Supply Chain Management **52**

3.5.1 B2B online trading: companies placing orders online *52*

3.5.2 SCM, financial e-processes and ICT links with suppliers *58*

3.6 e-Marketing and Sales **60**

3.6.1 Companies receiving orders from customers online *61*

3.6.2 e-Integration of marketing processes: CRM and ICT links with customers *65*

3.7 ICT and Innovation **67**

3.8 Drivers and Inhibitors for the Uptake of e-Business **69**

3.9 Summary of the quantitative analysis **73**

4 Current e-Business Trends and Implications 76

4.1 Dis-intermediation and re-intermediation in parallel 78

4.1.1 Introduction 78

4.1.2 Dis-intermediation 78

4.1.3 Re-intermediation 79

4.1.4 Growth, mergers and acquisitions and alliances in the intermediaries' markets . 81

4.1.5 Dis-intermediation and re-intermediation case studies 82

Case Study: Re-intermediation at the platform yourGreece - Travel services Ltd 83

Case Study: Successful Intermediation efforts in Lithuanian farm-stay tourism. 89

Case Study: Re-intermediation online and beyond the internet at adriatica.net, Croatia . 95

Case Study: Controlling the Costs of Web-based Distribution - AccorHotels 101

4.1.6 Summary of main points and conclusions 106

4.2 Dynamic Packaging 109

4.2.1 Introduction 109

4.2.2 State-of-the-art and market development 112

4.2.3 Case studies on dynamic packaging 116

Case Study: Implementing dynamic packaging technology 117

Case Study: Personalisation & Segmentation in Dynamic Packaging 122

4.2.4 Summary of main points and conclusions 128

4.3 ICT-related developments in the aviation industry 130

4.3.1 Introduction 130

4.3.2 Changes in the airline industry 130

4.3.3 e-Ticketing 132

4.3.4 Customer self-service 135

4.3.5 Bar-coded boarding passes 136

4.3.6 RFID for luggage handling 136

4.3.7 Case studies about ICT-related developments in the aviation industry 138

Case Study: ICT-deployment at the low-cost carrier Ryanair, Ireland 139

Case Study: e-Ticketing at SN Brussels Airlines, Belgium 143

4.3.8 Summary of main points and conclusions 148

5 Conclusions 150

5.1 Business impacts 150

5.2 Policy implications 164

References 169

Annex I: The e-Business Survey 2006 – Methodology Report 175

Annex II: Expanded Tables – Data by Country 185

Annex III: Glossary of Technical Terms 191

Executive Summary

Objectives and scope of the study

The tourism industry as defined for the quantitative survey of enterprises covers the following business activities: **Hotels** and **restaurants** (NACE Rev. 1.1 H 55.1 – 55.4), activities of **travel agencies and tour operators**, tourist assistance activities (I 63.3) as well as **recreational, cultural and sporting activities** (O 92.33, 92.52 and 92.53).[1] For the qualitative analysis of this study the sector definition has been extended to include those parts of the transport sector relevant for tourism, especially the aviation industry.

This document is a sector study by *e-Business W@tch*, focusing on the **tourism** industry. Its objective is to describe how companies in this industry use ICT for conducting business, to assess the impact of this development for firms and for the industry as a whole, and to indicate possible implications for policy. Analysis is based on literature, interviews, case studies and a survey among decision-makers in European enterprises from the tourism industry about the ICT use of their company.

e-Business activity

Underpinning the results from previous surveys, tourism is in the vanguard of ICT adoption and e-business in the area of **e-marketing and online sales**. In this area of customer-facing e-business activities **"e-tourism has taken off"**. Yet, in a ranking of the 10 sectors studied in 2006, the tourism industry only scores in the **middle field regarding the overall use of ICT and e-business**. Especially regarding the deployment of ICT infrastructure and the adoption of e-integrated business processes, tourism companies are still lagging behind their counterparts in other industries.

This finding is supported by several indicators: For example, the overall internet connectivity is still somewhat below the average of the 10 sectors surveyed, also the level of usage of ERP (enterprise resource planning) systems is low and e-procurement is significantly less developed than in other sectors.

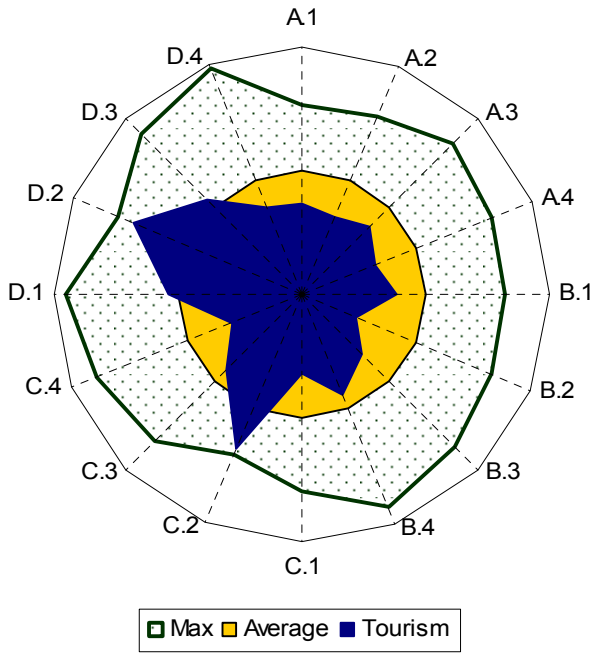
Overall, **customer expectations** and **market competition** are the main **drivers** of e-business in the tourism sector, while the **small size of most companies** and the considerable **costs** associated with acquiring technologies constitute the main **barriers** for a stronger uptake of e-business.

Considering ICT adoption and size of companies, the most outstanding result is that small tourism companies are more active users of e-business compared to their counterparts from other industries. The gap between big and small companies in using ICT and e-business applications may be relatively smaller than in other industries.

[1] NACE Rev. 1.1 is a 4-digit classification of business activities. It is a revision of the 'General Industrial Classification of Economic Activities within the European Communities', known by the acronym NACE and originally published by Eurostat in 1970.

Furthermore, results broken down by different sub-sectors of tourism show that **travel agencies and tour operators** seem to be the **strongest adopters of ICT and e-business**, followed by the **accommodation** sub-sector and – with much lower adoption rates – by the gastronomy sub-sector.

e-Business Scoreboard 2006 [2]



Component indicators
(based on data in % of firms)

A. ICT Networks
A.1 Internet connectivity (index)
A.2 LAN
A.3 W-LAN
A.4 Remote access to company network

B. e-Integrated Business Processes
B.1 Intranet
B.2 ERP systems
B.3 Online tracking of production time
B.4 e-Invoicing

C. e-Sourcing and Procurement
C.1 Firms placing orders online
C.2 Use of ICT systems for sourcing
C.3 ICT system linked with suppliers
C.4 Online inventory management

D. e-Marketing and Sales
D.1 CRM use
D.2 Firms accepting orders online
D.3 Use of ICT systems for marketing/sales
D.4 ICT system linked with customers

Current e-business trends and implications

Dis-intermediation and re-intermediation

e-Business processes have led to conflicting, parallel trends which have a profound impact on the role of intermediaries in the tourism market:

- **Dis-intermediation:** ICT enables tourism service providers to interact directly with consumers, which puts enormous pressure on traditional intermediaries (i.e. travel agencies and tour operators). The extent to which intermediaries are bypassed differs considerably between various sub-sectors: While, for example, the accommodation sector is only partially affected by dis-intermediation, the aviation industry tends to be much more affected by dis-intermediation – mainly by airlines selling tickets directly to consumers over the internet.
- **Re-intermediation:** Yet, ICT solutions may also provide new opportunities for traditional players and newly emerging online intermediaries. Many new entrants in the market, which operate exclusively online, successfully provide intermediary services, while some brick-and-mortar intermediaries have managed to secure their position in the market by offering value-added online services.

[2] See Methodology Annex for information about the structure and computation of the scoreboard.

- **Ongoing market consolidation:** There is an ongoing trend of market consolidation among intermediaries, driven by organic growth, mergers, acquisitions and strategic alliances. This, despite an increase in competitiveness on company level, might lead to reduced competition in the tourism market in the long run.

Dynamic packaging

Traditional packages offered by tour operators and travel agencies tend to be effective in bundling separate products, but only with limited flexibility. However, the increasing trend towards individualisation of tourism demand requires more flexible, dynamic packages. Despite the fact that technological and organisational barriers for truly dynamic packaging are considerable, a number of players have managed to develop feasible solutions for dynamic packaging.

ICT-related developments in the aviation industry

The aviation industry is one of the sub-sectors of tourism most affected by the development of ICT and the internet. In this context, no-frills airlines are the most striking feature of this market as they rely heavily on e-business solutions.

- **e-Ticketing**: The avoidance of classical paper-based tickets is one of the core elements of the low-cost business model. Yet, e-ticketing is not limited to no-frills airlines. The adoption of e-ticketing is also increasingly pursued by network carriers. The International Air Transport Association – IATA – intends to achieve a 100% penetration of e-ticketing among its members worldwide by the end of 2007.
- **Customer self-service**: Another measure for cost reduction and the acceleration of passenger flows at airports is to introduce customer self-service check-in solutions. This may be done on the spot by self-service kiosks or in the form of web based check-ins, which may even allow users to check-in from home or their office.
- **Bar-coded boarding passes** offer a natural link with e-ticketing and self-service check-in. Most recently, it is not only possible to print boarding passes at the passenger's home, but also to place bar codes on the passenger's cell phone which makes a paper document completely obsolete.
- **RFID for luggage handling** might replace classical baggage tags in the near future. It might simplify airline baggage management considerably, improve customer service in terms of reductions in mishandled baggage and provide new security requirements.

Business impact

The ongoing **market concentration** might lead to the formation of "oligopolies", where only a few companies dominate the market, and which will eventually lead to reduced competition. Yet, at the same time, competition pressure is expected to rise, as the anticipated growth in turnover in the next few years will be limited, and as ever more price-conscious consumers will put further pressure on tourism enterprises to reduce costs. The following business trends, some of which are contradictory, are expected to shape the market in the near future:

- Low barriers to **new market entrants**, which pose a threat for traditional players;
- Ongoing **ICT-based substitution of services** provided by traditional players;
- **Online distribution** channels strengthening the role of suppliers;
- Driven by ICT, **consumers are becoming more directly involved** in the production, compilation or innovation of products and services;
- **Growing competition** in the online market.

Policy implications

ICT have an influence on the further consolidation of intermediaries, and in particular the market concentration of online intermediaries. This could, in the long term, lead to the formation of strong oligopolies with negative effects on competition. In order to counteract such ICT induced market failure, it is recommended that policy should closely monitor the ongoing market concentration of tourism intermediaries and intervene, if necessary. Regarding policies to promote e-business and ICT adoption the following measures would seem most promising:

- **Initiatives to promote networking and cooperation**: As with previous e-Business W@tch studies, such policies are still highly encouraged;
- Encouraging the **adoption of e-business in micro and small companies**: Due to the dominance of micro and small enterprises in the sector, measures promoting these types of companies are necessary;
- Promoting **ICT infrastructure** and **e-integrated business processes**;
- Encouraging **innovation** and **research and development** in e-tourism.

1 Introduction

1.1 About *e-Business W@tch*

Policy background

The European Commission launched *e-Business W@tch* in late 2001 to monitor the adoption, development and impact of electronic business practices in different sectors of the economy in the European Union.

The initiative is rooted in the **eEurope Action Plans** of 2002 and 2005. The eEurope 2005 Action Plan defined the goal "*to promote take-up of e-business with the aim of increasing the competitiveness of European enterprises and raising productivity and growth through investment in information and communication technologies, human resources (notably e-skills) and new business models*".[3] *e-Business W@tch* has been an important instrument for the European Commission to assess the developments and progress in this field.

The **i2010** policy[4], a follow-up to eEurope, also stresses the critical role of ICT for productivity and innovation, stating that "*… the adoption and skilful application of ICT is one of the largest contributors to productivity and growth throughout the economy, leading to business innovations in key sectors*" (p. 6). The Communication anticipates "*a new era of e-business solutions*", based on integrated ICT systems and tools, which will lead to an increased business use of ICT. However, it also warns that businesses "*still face a lack of interoperability, reliability and security*", which could hamper the realisation of productivity gains (p. 7).

In 2005, in consideration of globalisation and intense international competition, the European Commission launched a **new industrial policy**[5] to create better framework conditions for manufacturing industries in the coming years. Some of the policy strands described have direct links to ICT and e-business developments. One of the new sector-specific initiatives covered by the policy is the taskforce on information and communication technologies (ICT) competitiveness. The taskforce with stakeholders representatives focuses on identifying and proposing measures to remove obstacles that inhibit ICT take-up among enterprises. Another initiative is to conduct a series of competitiveness studies, to include for ICT, food, and fashion and design industries, in order to analyse trends affecting the competitiveness of these industrial sectors.

These policy considerations constitute the background and raison d'être of *e-Business W@tch* as an observatory of related issues and a core theme for the analysis. Within this

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[3] "eEurope 2005: An information society for all". Communication from the Commission, COM(2002) 263 final, 28 May 2002, chapter 3.1.2

[4] "i2010 – A European Information Society for growth and employment." Communication from the Commission, COM(2005) 229 final.

[5] "Implementing the Community Lisbon Programme: A Policy Framework to Strengthen EU Manufacturing - towards a more integrated approach for Industrial Policy." Communication from the Commission, COM(2005) 474 final, 5.10.2005

broader policy context, two further important facets regarding the mission of the initiative are relevant. First, *e-Business W@tch* studies focus on **sectors** (and not on countries). Second, special emphasis is placed on developments and implications for small and medium-sized enterprises (**SMEs**).

e-Business W@tch is one of several policy instruments used by DG Enterprise and Industry in the field ICT industries and e-business. Other instruments include

- the e-Business Support Network (**eBSN** – a European network of e-business policy makers and business support organisations),
- the **eSkills Forum** (a task force established in 2003 to assess the demand and supply of ICT and e-business skills and to develop policy recommendations),
- the **ICT Task Force**, a group whose work is to draw together and integrate various activities aiming to strengthen Europe's ICT sector, and
- activities in the areas of **ICT standardisation**, as part of the general standardisation activities of the Commission.[6]

Focus and scope

Since its launch, *e-Business W@tch* has published e-Business Sector Studies on more than 20 sectors of the European economy, four comprehensive synthesis reports about the state-of-play in e-business in the European Union, statistical pocketbooks and various other resources, such as newsletters and special issue reports. All publications are available at www.ebusiness-watch.org ('resources').

e-Business W@tch presents a **'wide-angle' perspective** on the adoption and use of ICT in the sectors studied. The topic is not restricted to the measurement of e-commerce transactions (the volume of goods and services traded online), but also comprises an assessment of the degree to which business processes, including intra-firm processes, are electronically linked to each other and have become digitally integrated.

In essence, *e-Business W@tch* studies cover the whole field of what could be described as **collaborative commerce** (see following chapter). However, it becomes practically impossible to cover in detail all areas and facets of e-business in a single sector study. Therefore, each study focuses on a few specific issues, thus allowing the reader to zoom into these topics in more detail.

In addition to the analysis of e-business developments, the studies also provide some **background information** on the respective sectors. Readers, however, should not mistakenly consider this part of each report as the main topic of the analysis. An *e-Business W@tch* sector report is not a piece of economic research on the sector itself, but a study which focuses on the use of ICT and e-business in that particular sector. The introduction to the sector is neither intended, nor could it be a substitute for more detailed industrial analysis.

[6] The 2006 ICT Standardisation Work Programme complements the Commission's "Action Plan for European Standardisation" of 2005 by dealing more in detail with ICT matters.

Methodology

e-Business W@tch combines quantitative and qualitative research elements. The quantitative analysis of ICT and e-business adoption by firms is based to a large extent on representative **surveys** among decision-makers in European enterprises ("e-Business Survey"). Interviews are conducted by telephone, based on a standardised and computer supported questionnaire (CATI[7] method). In total, more than 25,000 enterprises were interviewed in the surveys of 2002, 2003 and 2005. The most recent survey (conducted in April/May 2006) covered more than 14,000 enterprises from 10 sectors in all EU Member States and most EEA and Candidate Countries.[8]

The *e-Business W@tch* Surveys have won recognition by the international research community as a useful instrument for **piloting** new e-business metrics. The experience gained from this piloting is used, for example, by Eurostat for planning and developing their own survey of ICT use by businesses.

e-Business W@tch complements the statistical picture by a more detailed presentation of concrete e-business activity in individual enterprises from the sectors covered, mainly in the form of brief **case studies**. About 75 case studies are conducted in 2006 adding to more than 100 case studies conducted in previous years. Evidence from the survey and case studies is backed up by **desk research** and **interviews** with industry representatives and e-business experts.

The importance of networking and debate

Since its first implementation in late 2001, *e-Business W@tch* has increasingly developed from a market observatory into a **think-tank and intermediary**, stimulating debate among stakeholders at an international level about the economic and policy implications of e-business. The positive feed-back and large uptake for the various publications and statistics provided by the *e-Business W@tch*, for example their exploitation by various research institutions, reflects the demand for sectoral e-business analysis and discussion on related issues.

e-Business W@tch uses several mechanisms for debate and networking with stake-holders. An important platform for this is the **website** (www.ebusiness-watch.org), where all reports and survey data are published. Furthermore, results are presented and discussed with industry at **workshops**, within and via the **Advisory Board**, and, lastly, through the participation of study team members in other events, such as conferences, workshops and working groups organised by third parties.

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[7] Computer Assisted Telephone Interviews, a widely used method in representative household or decision-maker surveys.

[8] The EEA (European Economic Area) includes, in addition to EU Member States, Iceland, Liechtenstein and Norway. Candidate Countries, which are candidates for accession into the EU, are (as of May 2006) Bulgaria, Croatia, Romania and Turkey.

*The **mission** of e-Business W@tch is to monitor, analyse and compare the development and impact of e-business in different sectors of the European economy – not the sectors themselves.*

*Its **objective** is to provide reliable results, based on commonly accepted methodologies, which are not readily available from other sources and will trigger the interest of policy-makers, researchers, and other e-business stakeholders for more in depth analyses or statistical surveys.*

*e-Business W@tch has adopted a "wide-angle" perspective in its **approach**. The necessary trade-offs are transparently depicted in each of its deliver-ables.*

The definition of sectors and the adequate level of aggregation

Economic sectors constitute the main level of analysis for *e-Business W@tch*. The 2006 studies cover sub-sets of **ten different sectors** whose configuration and definition are based on the NACE Rev. 1.1 classification of business activities.[9]

Over the years since its initial implementation in late 2001, *e-Business W@tch* followed a roll-out plan in the coverage of different sectors.[10] In each new period, some new sectors (not covered in previous years) were added.

The rather broad aggregation of various business activities into sectors in earlier implem-entation periods (2002-2004) made it possible to cover a broad spectrum of the economy, but also caused challenges for the analysis of e-business developments. In cases where rather heterogeneous sub-sectors were aggregated, it was sometimes difficult to make general observations or draw conclusions for "the sector" at stake. It also turned out that industry has a clear preference for comparatively narrow sector definitions.

The approach for selecting and defining sectors which was used in 2005 and 2006 reflects these concerns. Many of the sectors studied since 2005 are sub-sectors that had been part of larger aggregations in 2002-2004. A further argument for "**zooming in**" on former sub-sectors is that the broad picture for whole sectors is already available from earlier *e-Business W@tch* studies.

The **selection** of sectors in 2006 has been made on the basis of the following considerations:

- The **roll-out plan** of 2003.
- **Policy relevance** of the sector from the Commission's perspective.
- **Interest** articulated **by the industry** in previous years on studies of this type.
- The current **dynamics of e-business** in the sector and the impact of ICT and electronic business, as derived from earlier *e-Business W@tch* sector studies.

[9] NACE Rev. 1.1 is a 4-digit classification of business activities. It is a revision of the 'General Industrial Classification of Economic Activities within the European Communities', known by the acronym NACE and originally published by Eurostat in 1970.

[10] See website: "selection of sectors" (www.ebusiness-watch.org/about/sector_selection.htm)

The 10 sectors studied in 2006

The 10 sectors which are monitored and studied in 2006 include six manufacturing sectors, construction and three service sectors. The pulp and paper manufacturing industry is a 'new' sector, i.e. it had not been covered by the *e-Business W@tch* in any earlier period of implementation; the other nine sectors have been covered in previous years, mostly as parts of aggregated sectors (see Exhibit 1-1).

Exhibit 1-1: Sectors studied by e-Business W@tch in 2006

No.	NACE Rev. 1.1	Sector	Reference to earlier (most recent) coverage
1	DA 15 (selected groups)	**Food and beverages**	2005
2	DC 19.3	**Footwear**	2003/04 (as part of the textile and footwear industry)
3	DE 21	**Pulp, paper and paper products**	--
4	DL 30, 32.1+2	**ICT manufacturing**	2004 (as part of electrical machinery and electronics)
5	DL 32.3	**Consumer electronics**	2004 (as part of electrical machinery and electronics)
6	DM 35.11	**Shipbuilding and repair**	2004 (as part of transport equipment manufacturing)
7	F 45.2+3 (selected classes)	**Construction**	2005 (in a broader aggregation, including F 45 in total)
8	H 55.1/3, I 63.3, O 92.33/52	**Tourism**	2005
9	I 64.2	**Telecommunication services**	2004 (as part of ICT services)
10	N 85.11	**Hospital activities**	2004 (as part of health and social services)

1.2 "e-Business" – the conceptual framework

Fresh momentum after the 2001 odyssey

Although the 'new economy' revolution has not taken place as it seemed for a short moment in history it might, the **evolutionary development** of electronic business does not seem to have come to an end. On the contrary, the maturity of e-business has substantially increased across sectors and regions over the past five years. It has been a quiet revolution this time, but as a result, a **new picture of the digital economy** is beginning to emerge. ICT and e-business do matter in the global economy – probably even more than during the hype of the late 1990s.

The overall economic situation and market conditions for business innovation and investment have been difficult for European companies during the last few years. Nevertheless, e-business shows a dynamic development in the European Union. Drivers are new technological developments (wireless access technologies, for example) and the increasing **competitive pressure** on companies in a global economy. Firms are in

constant search for opportunities to cut costs. This has probably been the most important promise of electronic business: cutting costs by increasing the **efficiency of business processes**, internally and between trading partners in the value chain.

From e-Commerce to e-Business

As part of this maturing process, electronic business has progressed from a rather specific to a very broad topic over the past 10 years. Initially, however, particularly in the mid 1990s, the policy and research focus was very much on **e-Commerce**, which can be defined as online commercial transactions.

The term **'transactions'** refers to exchanges between a company and its suppliers or customers. These can be other companies ("B2B" – business-to-business), consumers ("B2C" – business-to-consumers), or governments ("B2G" – business-to-government). In the broad sense, transactions include commercial as well as other exchanges, such as sending tax return forms to the tax authorities. In the context of this study on e-business, transactions are predominantly commercial business transactions (see boxes for definitions).

Glossary

Definitions by standardisation groups (ISO, ebXML)

The term "business transaction" is a key concept underlying the development of e-standards for B2B exchanges. Therefore, definitions have been developed by the various standards communities as an underpinning for their practical work. Examples are:

- ***Business**: "a series of processes, each having a clearly understood purpose, involving more than one party, realized through the exchange of information and directed towards some mutually agreed upon goal, extending over a period of time [ISO/IEC 14662:2004]*
- ***Business transaction**: "a predefined set of activities and/or processes of parties which is initiated by a party to accomplish an explicitly shared business goal and terminated upon recognition of one of the agreed conclusions by all the involved parties even though some of the recognition may be implicit" [ISO/IEC 14662:2004]*
- ***e-Business transaction**: "a logical unit of business conducted by two or more parties that generates a computable success or failure state [ebXML Glossary]*

If transactions are conducted electronically ('**e-transactions**'), this constitutes e-Commerce. Transactions can be broken down into **different phases** and related **business processes**, each of which can be relevant for e-Commerce. The pre-sale (or pre-purchase) phase includes the presentation of (or request for) information about the offer, and the negotiation about the price. The sale / purchase phase covers the ordering, invoicing, payment and delivery processes. Finally, the after sale / purchase phase covers all processes after the product or service has been delivered to the buyer, such as after sales customer services (e.g. repair, updates).

Exhibit 1-2: Process components of transactions

Pre-sale / pre-purchase phase	Sale / purchase phase	After sale / purchase phase
Information about offer	Placing an order	Customer service
Price comparisons	Invoicing	Guarantee management
Negotiations between seller and buyer	Payment	Credit administration
	Delivery	Handling returns

Practically each step in a transaction can either be pursued electronically (online) or non-electronically (offline), and all combinations of electronic and non-electronic implementation are possible. It is therefore difficult to decide which components actually have to be conducted online in order to call a transaction (as a whole) 'electronic'.

In this context, during 2000 the OECD proposed broad and narrow definitions of electronic commerce both of which are still valid and useful:[11] While the narrow definition focuses on 'internet transactions' only, the broad definition defines e-Commerce as "*the sale or purchase of goods or services, whether between businesses, house-holds, individuals, governments, and other public or private organisations, conducted over* ***computer-mediated networks***. *The goods and services are ordered over those networks, but the payment and the ultimate delivery of the goods or service may be conducted on- or offline"* (OECD, 2001).

Glossary

Definition of key terms for this study

- ***e-Transactions****: Commercial exchanges between a company and its suppliers or customers which are conducted electronically. Participants can be other companies ("B2B" – business-to-business), consumers ("B2C"), or governments ("B2G"). This includes processes during the pre-sale or pre-purchase phase, the sale or purchase phase, and the after-sale / purchase phase.*
- ***e-Commerce****: Electronic Commerce. The sale or purchase of goods or services, whether between businesses, house-holds, individuals, governments, and other public or private organisations, conducted over computer-mediated networks. (OECD)*
- ***e-Business****: Electronic Business. Automated business processes (both intra- and inter-firm) over computer mediated networks. (OECD)*
- ***e-Interactions****: Electronic Interactions include the full range of e-Transactions, and in addition collaborative business processes (e.g. collaborative design) which are not directly transaction focused.*

The addendum regarding payment and delivery is an important part of the definition, but can be debated. The difficult question is which processes along the different transaction phases constitute e-Commerce and which do not (see Exhibit 1-2). The OECD definition

[11] In 1999, the OECD Working Party on Indicators for the Information Society (WPIIS) established an Expert Group on Defining and Measuring Electronic Commerce, in order to compile definitions of electronic commerce which are policy relevant and statistically feasible. By 2000, work of the Group had resulted in definitions for electronic commerce transactions.

excludes the pre-sale or purchase phase and focuses on a specific part of the sale / purchase phase, namely the ordering process. *e-Business W@tch* follows the OECD position on this issue.[12]

e-Commerce, defined in this way, is a key component of **e-business**, but not the only one. In recent years, it has been increasingly acknowledged among policy and research communities that the focus on e-commerce transactions may be too narrow to capture the full implications of e-business. A wider, business process oriented focus has been widely recognised. Reflecting this development, the OECD WPIIS[13] proposed a (broader) definition of 'e-business' as "*automated business processes (both intra-and inter-firm) over computer mediated networks*" (OECD, 2004, p. 6). In addition, the OECD proposed that e-business processes should integrate tasks and extend beyond a stand-alone or individual application.

This definition reflects an understanding of e-business that encompasses more than e-commerce transactions. The broad concept of e-business also includes the digitisation of **internal business processes**, as well as **cooperative** or **collaborative processes** between companies which are not necessarily transaction-focused. Collaborative e-design processes between business partners are a typical example from industrial engineering. The OECD definition implicitly indicates that the focus and main objective of electronic business is to be found in business process automation and integration, and the impacts thereof.

To bridge the gap between 'e-Commerce' and 'e-Business', it was proposed in earlier years (mainly around 2000) to use the term '**c-Commerce**' (collaborative commerce). Although this concept was rather abandoned when the new economy bubble burst, it has some value as it stresses the role of ICT for cooperation among enterprises. If web service and other emerging technologies (e.g. RFID, mobile applications) hold their promise, the digital integration of B2B trading processes could be taken to a new level, possibly with a considerable impact on industry structure. If so, it could be worth revisiting the former 'c-Commerce' concept.

e-Business and the company's value chain

Given the broad concept of e-Business applied for this study, which concentrates on business processes and a company's interactions with its environment, some further structuring and mapping of processes is necessary. Michael Porter's framework of the company value chain and value system between companies (Porter, 1985) is still valid and useful in this context, although dating back 20 years to the pre-e-business era.

A **value chain** logically presents the main functional areas ('value activities') of a company and differentiates between primary and support activities. However, these are "*not a collection of independent activities but a system of interdependent activities*", which are "*related by linkages within the value chain*" (p. 48). These linkages can lead to competitive advantage through optimisation and coordination. In fact, it is exactly here that ICT

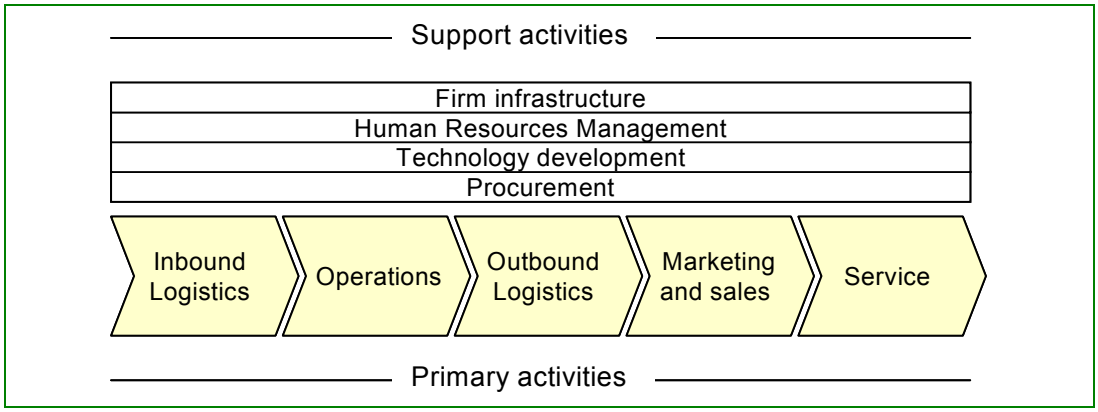
[12] This is reflected in the updated wording of the respective survey questions in 2006, when for "placing / accepting online orders" was asked instead for "purchasing / selling online".

[13] Working Party on Indicators for the Information Society

have a major impact, as they are a key instrument to **optimise linkages** and thus increase the efficiency of processes.

The **value system** expands this concept by extending the perspective beyond the single company. The firm's value chain is linked to the value chains of (upstream) suppliers and (downstream) buyers, resulting in a larger set of processes – the value system. e-Commerce, i.e. electronic transactions, occurs within this value system.

Exhibit 1-3: Value chain framework of a company by Michael Porter



Source: Adapted from M.E. Porter (1985) – simplified presentation

Key dimensions of this framework (notably inbound and outbound logistics, operations, and the value system) are reflected in the **Supply Chain Management** (SCM) concept. Here, the focus is on optimising the procurement-production-delivery processes, not only between a company and its direct suppliers and customers, but also aiming at a full vertical integration of the entire supply chain (Tier 1, Tier 2, Tier n suppliers). In this concept, each basic supply chain is a chain of sourcing, production, and delivery processes with the respective process interfaces within and between companies.[14] The analysis of the digital integration of supply chains in various industries has been an important theme in sectors studies previously prepared by *e-Business W@tch*.

e-Business and innovation

A very important aspect for *e-Business W@tch* studies is the link between ICT and innovation. The European Commission places great emphasis on the **critical role of innovation** for European businesses in order to stay competitive in the global economy.[15] On the other hand, a strong competitive pressure provides powerful incentives for companies to continuously engage in innovation and R&D. Thus, innovation, competition and competitiveness are closely intertwined.

ICT have been identified and widely recognised as a major **enabler of innovation**, in particular for **process innovation**. According to the *e-Business W@tch* survey 2006,

[14] cf. SCOR Supply-Chain Council: Supply-Chain Operations Reference-model. SCOR Version 7.0. Available at www.supply-chain.org (accessed in March 2006).

[15] See, for example, "An innovation-friendly, modern Europe". Communication from the Commission, COM(2006) 589, 12 October 2006.

75% of those companies that had introduced new business processes in 2005 reported that this innovation was directly related to or enabled by ICT.

In many cases, the implementation of **e-business processes** in a company will constitute a process innovation in itself. In **manufacturing** sectors, e-business has triggered significant innovation inside the companies, notably in supply chain and delivery processes, such as automatic stock replenishing and improved logistics. In **service** sectors such as tourism, the innovative element is more evident in the way that external transactions are accomplished. For example, if a company starts to sell its services online, this can imply innovation in the service delivery process and in customer communication.

In some sectors, particularly in ICT manufacturing, consumer electronics and telecommunications, ICT are also highly relevant for **product innovation**.

However, as more companies strive to exploit the innovation potential of ICT, it becomes more difficult for the individual company to directly gain competitive advantage from this technology. e-Business is becoming a necessity rather than a means to differentiate from competitors.[16] In addition, the introduction of innovation can cause **substantial costs** in the short and medium term, as it may take time before the investments pay off. This causes challenges in particular for small and medium-sized companies. It is one of the reasons why *e-Business W@tch* focuses on such challenges in its sector studies (see also 'Policy Background' in chapter 1.1).

[16] Cf. Carr, Nicholas (2003). "IT Doesn't Matter". In: Harvard Business Review, May 2003.

2 Context and Background

2.1 Sector definition – scope of the study

Tourism is most commonly understood as the provision of services for people travelling to and staying outside their usual environment for less than one consecutive year for leisure or for business purposes.

The operational definition of "tourism" for the official statistics record is ambiguous. If one defines tourism from the consumer's point of view, all products and services consumed by tourists should be taken into account. Yet, the standard NACE classification[17] does not always allow a clear distinction from other sectors: whereas accommodation establishments, travel agents and tour operators are incontestably an inherent part of the tourism sector, the question to what extent restaurants, cafes and bars, fair and amusement parks and transportation should be included cannot be clearly answered.

Official statistics do not allow us to determine whether a guest in a bar is a tourist or a local person, nor whether a restaurant or a bar is located in a tourist destination, and therefore most likely mainly be visited by tourists, or not. The role of the transport sector in the broader tourism economy is obvious, but on the basis of the NACE classification it cannot be evaluated properly because the extent to which its capacities are used by tourists and other passengers cannot be distinguished.[18] Thus, the quantitative survey conducted by *e-Business W@tch* covers the following sub-sectors of tourism:

Exhibit 2-1: Business activities covered by the tourism sector (NACE Rev. 1.1)

NACE Rev. 1.1		Business activities
Divisions	**Groups/ Classes**	
H 55		Hotels and restaurants
	55.1	Hotels
	55.2	Camping sites and other provision of short-stay accommodation
	55.3	Restaurants
	55.4	Bars
I 63		Supporting and auxiliary transport activities; activities of travel agencies
	63.3	Activities of travel agencies and tour operators; tourist assistance activities n.e.c.
O 92		Recreational, cultural and sporting activities
	92.33	Fair and amusement park activities
	92.52	Museums activities and preservation of historical sites and buildings
	92.53	Botanical and zoological gardens and nature reserves activities

[17] NACE Rev. 1.1 is a 4-digit classification of business activities. It is a revision of the 'General Industrial Classification of Economic Activities within the European Communities', known by the acronym NACE and originally published by Eurostat in 1970.

[18] For an elaborated examination of the difficulties with a definition of the tourism sector, see for example European Commission, DG Enterprise 2004.

The quantitative 'statistical' part of this report will primarily focus on accommodation, the gastronomy sector, travel agencies and tour operators. The inevitable over-estimation of the size of the tourism sector – due to the lack of differentiated statistics on the bars and restaurants sector – can be regarded as a corrective to the statistical under-estimation of the size of the tourism industry due to the non-inclusion of a large quantity of overnight stays in small accommodation facilities which are not registered by national statistics, as well as the whole transportation sector.

As land and sea transport (NACE I 60 and I 61) statistics have not been included in this report, considering that it is not possible to clearly distinguish between tourism and other reasons for transport activities, one might, on the contrary, argue for the inclusion of air transport statistics (NACE I 62). Air transport is not covered by the quantitative survey conducted by *e-Business W@tch*, but - with the focus on ICT-related developments in the aviation industry - it is part of the qualitative analysis.[19]

In the quantitative analysis of results from the *e-Business Survey 2006*, some indicators are broken down into three tourism sub-sectors. For this reason, the following sub-sectors were defined:

Exhibit 2-2: Break-down into three sub-sectors of the tourism industry

Sub-sector	NACE codes	Business activities
Accommodation	H 55.1	Hotels
	H 55.2	Camping sites and other provision of short-stay accommodation
Restaurants, bars and catering services	H 55.3	Restaurants
	H 55.4	Bars
Travel agencies & tour operators	I 63.3	Activities of travel agencies and tour operators; tourist assistance activities n.e.c.

Quantitative results for the whole tourism industry also contain data about NACE group O 92 'Recreational, cultural and sporting activities' (see Exhibit 2.1 above). Yet, this sub-sector is not presented separately in tables because case numbers for this single sub-sector are too low to provide representative results. In the results for the whole tourism industry, however, all four sub-sectors (1. Accommodation, 2. Gastronomy, 3. Travel agencies and tour operators, 4. Recreational, cultural and sporting activities) are included.

[19] See chapter 4.3 in this report below.

2.2 Industry background

Tourism as a whole is one of the fastest growing industries in Europe and worldwide. In recent years, growth rates in tourism have been higher than those of the overall world economy. This trend is unlikely to slow down in the near future. In the EU more than 1.4 million tourism enterprises employ about 8.1 million people and generate more than € 419 billion of production value (2001). Labour productivity differs considerably between different sub-sectors of tourism: In the hotels and restaurants sector it is rather low (reflected by fairly low salaries), while, for example, in the travel agencies and tour operators sector it is much higher.

The sector is dominated by micro-firms and SMEs (companies with 1 to 249 employees); in fact, 99% of all tourism companies are micro and small enterprises with fewer than 50 employees. In absolute numbers of production value, the United Kingdom, Italy, France, Germany and Spain generate the highest revenues in tourism, but the sector also contributes sizeable added value to national economies of smaller countries such as Austria, which is one of the countries most intensely engaged in tourism.

The new EU member and associated states in Central and Eastern Europe have also experienced enormous growth rates in tourism – both incoming as well as outgoing tourism. In fact, in terms of growth, they are currently the main winners in the European tourism market (cf. European Travel Commission 2005a). However, they are growing from a lower base.

2.2.1 Size of the EU tourism industry

Exhibit 2-3: European tourism: Facts and figures

GDP:	Tourism produces directly 5%, and indirectly 10% of European GDP
Revenues:	€ 262.3 billion in 2004 (+ 2.3% as compared to 2003), i.e. 6.6% of EU exports, 30% of external trade in services
Arrivals:	415.2 million in 2004 (+ 4.9% in comparison to 2003)
Market share:	Europe's share of global tourism arrivals: 54.4% (2004; 1990: 61.5%) Share of global tourism receipts: 52.4% (2004; 1990: 54.5%)
Top ten:	Six of the world's top ten tourism destinations by arrivals: France, Spain, Italy, UK, Germany, Austria; Seven of the world's top ten destinations by receipts: Spain, France, Italy, Germany, UK, Turkey, Austria;
Source countries of guests:	Europe 89.5%, Americas 5.4%, Asia-Pacific 3.4%, Africa and Middle East 1.0% (2003)
Average spending:	€ 630,- per arrival (2004)
Employment:	6.8 – 8 million jobs directly (indirectly about 20 million) 4.2 – 5% of total employment (2002)

Source: European Travel Commission (2005b)

From a global perspective, the European Union is still the most tourism intensive region worldwide. This assessment can be backed by numerous key figures, like contribution to regional GDP, global market share or employment effects. The compilation above, which

has been provided by the European Travel Commission, provides the key figures based on data from Eurostat, the European Travel & Tourism Action Group and the World Tourism Organization.

As already mentioned, the tourism industry in Europe is clearly characterised by an overwhelming share of micro firms and SMEs. Nearly 1.5 million enterprises directly related to tourism employ about 8 million persons (cf. Eurostat 2006). The table below illustrates the distribution of some key figures according to different company size classes.

Exhibit 2-4: Structure in the tourism sector in the EU-24* (2001)

	Total (EU-24)	1-9 employees	10-49 employees	50-249 employees	250+ employees
		in % of total EU-24			
No. of enterprises	1,467,969	91.9	7.4	0.6	0.1
Value added at factor cost	165,562	36.3	24.5	13.3	25.9
No. of persons employed	8,107,100	44.4	24.4	10.6	20.6
* EU-24 = EU-25 without Greece					

Source: Eurostat New Cronos / DIW Berlin 2005

About 92% of tourism enterprises are micro-enterprises with 1 to 9 employees. Only 0.1% of enterprises in tourism are big companies with more than 250 employees. Micro (1-9 employees) and small enterprises (10-49 employees) together constitute 99% of companies in the tourism sector. This results in a labour market where SMEs contribute about 79% of employment.

2.2.2 Trends and challenges

The economic importance of tourism and travel has increased tremendously in the last decades. This development is influenced by a number of factors, such as the growing prosperity in society, an increase in leisure time, new modes of communication and a growing population. Furthermore, globalisation and the emergence of new tourist destinations worldwide have created more competition. There is also a growing pressure on service providers in tourism and destinations to maintain their position in the market. Therefore, especially information and communication technologies (ICT), which allow access to essential knowledge and information, will continue to play an important role in tourism (cf. European Tourism Research Institute 2005).

From the economic point of view, tourism remains a booming sector, which brings new jobs and annual growth rates above the ones in other economic sectors. According to the UNWTO World Tourism Barometer, international tourist arrivals have beaten the expectations in 2005. Moreover, Europe is and will remain the world's most important tourist destination as well as tourism-generating region (cf. World Tourism Organisation 2006).

Demographic changes and consequences

The inverted age pyramid shows that the number of elderly people is increasing rapidly. It is evident that there will be more active seniors with a longer life expectancy than today's elderly people. They are increasingly making trips abroad, and are spending more money on travel than younger people. Therefore, criteria such as quality, convenience and security become more important in the tourism industry. Also, the spa, health and "keep-fit" tourism institutions are expected to benefit from this development, because of the high demand for more relaxing entertainment facilities (cf. European Travel Commission 2006).

Another demographic change which influences the tourism sector is the further decrease in the average number of persons per household. One-person households with higher disposable incomes are on the rise, which leads to an increasing demand for luxurious and special products in the tourism sector.

Individualisation as an ongoing trend

Sociologists claim a trend towards individualisation in today's societies: People want to decide themselves of how to spend their leisure time and their requirements have become increasingly personalised. This leads to products which conform to consumers' demand for quick information, pricing and travel options prior to, during and after travel.

To enable such repeating just-in-time purchases, sophisticated databases, recommender systems and semantic technologies will play a major role in future e-commerce travel solutions. Furthermore, rigidly packaged mass tours are in decline, while dynamic packaging, which meets the growing demand of personalised as well as up-to-date products, is on the rise. Moreover, social networking, such as community platforms for sharing information and experiences with peers and personalised websites (MyWebsites) with boomarking functionalities will become ever more popular. (cf. Buhalis, D. / Costa, C. 2006, PhoCusWright 2006).

Global catastrophes as facts of daily life

Global catastrophes such as the 2005/06 SARS epidemic, bomb attacks in Madrid or London, tsunamis or the bird flu have partially lead to a shift in consumer behaviour. Travellers are searching for destinations closer to home, but, at the same time, long-haul travel demand is growing again. Statistics of international travel arrivals confirm that tourists do not completely abandon travelling because of nature catastrophes or politically motivated attacks. Nevertheless, the desire for safe travelling becomes particularly important. Tourist destinations have to provide increased security and high safety standards because tourists will avoid destinations which are perceived as unsafe (cf. World Tourism Organization 2006).

Internet continues impact on tourism

The internet continues to be a tool of growing importance for the tourism industry. Nearly 60% of the European population regularly accesses the internet from home and business locations, and more than 76% of the population are estimated to use the web in 2009. Also the internet will continue to play an important role for purchasing tourism products and services. The increasing availability of in-depth tourist information on destinations and products enable users to view and compare a wider range of products and to instantly purchase them online. This possibility leads to an ongoing increase of transactions in online booking and has a strong influence on the competition in the tourism market (cf. European Information Technology Observatory 2006, European Travel Commission 2006).

Travel agents reinvent themselves

Electronic market places have gradually emerged and suppliers have developed internet interfaces to communicate with their clients and partners to sell their products directly. Intermediaries also try to take advantage of the capabilities of the internet. Tourists are expected to increasingly arrange their own package tours directly via the web through dynamic packaging. But despite the fact that the number of offline travel agents will decrease, they will not disappear. In the future, travel agents will have to provide both internet applications, as well as individual and qualified customer advice at physical information points (cf. Buhalis, D. / Costa, C. 2006).

Strong efforts in standardisation and interoperability

The standardisation efforts in tourism, for instance by the Open Travel Alliance (OTA) or the IFITT Reference Model Special Interest Group (RMSIG), demonstrate the increasing demand in standardised products. The virtualisation of the tourism value chain will continue to be more transparent and therefore comparable for the end customer. Especially the degree of interconnectivity and interoperability between tourism organisations will increase by using consistent standards and ontologies for tourism. As a consequence, the number of independent travellers putting together their own vacations by buying separate, well-defined modular tourism services on electronic market places will rise.

Always on

The booming of broadband access in the EU-15, Norway and Switzerland with over 50 million connections in 2005 and the launch of voice and video broadband services indicate the high demand in being “always connected” to services, applications and content (cf. European Information Technology Observatory 2006). Especially, mobile broadband services like UMTS are increasingly used in tourism, particularly for mobile tourist services like city, sport or museum guides. Corresponding to the trend that people tend to go on shorter trips and do not have time to prepare trips carefully, mobile services will increasingly support tourists during their trips with multimedia information and services, which are independent of location and time.

Increasing importance of mobile devices and geographic information systems

Mobile devices will become increasingly important and people will use them not only in business, but also in their leisure time, because they are ideal for receiving information on short notice. Different kinds of mobile devices can be merged into single devices, such as smart phones with significant computation power, storage and portability. Tourism has a high potential for using mobile devices, for example for delivering location based services.

Geocoding data and geographical information systems (GIS) are essential components of next-generation ultimate commerce (u-commerce) services in the travel and tourism industry. As interactive maps become ever more sophisticated and GPS-enabled mobile devices become the standard, mapping technology will increasingly play a major role in the travel industry – before, during and after the trip. Especially location-based services to receive location- and context-aware information while travelling will become more popular (cf. PhoCusWright 2006).

Integrated circuits enter tourism industry

Intelligent interfaces which are supported by computing and networking technologies will be part of the future everyday-life. Wearable computing, which allows the measuring of the heart-beat rate, blood pressure or step-length by using small chips integrated in the track suit could, for example, be one implementation field in the area of sports and health tourism. Moreover, tagging systems like Radio Frequency Identification (RFID) or Near Field Communication (NFC) for identifying objects of interest, locking hotel rooms or passing access systems in skiing areas will become increasingly commonplace in the tourism industry.

2.3 Review of earlier sector studies

Previous *e-Business W@tch* sector reports on e-business activities in the tourism industry covered a variety of topics (cf. *e-Business W@tch* / European Commission 2002, 2003, 2004a, 2004b and 2005).

In 2002, the main focus of *e-Business W@tch* was on the general role of ICT and e-business in the tourism sector as well as the diffusion of ICT and e-business applications (cf. *e-Business W@tch* / European Commission 2002). In 2003, *e-Business W@tch* analysed the major ICT innovation waves in the tourism industry, the tourism value chain as well as the specific role of ICT and e-business in selected tourism sub-sectors (cf. *e-Business W@tch* / European Commission 2003). The 2004 study investigated e-marketing and relationship development, e-business supporting CRM by revenue management, e-partnering and applications supporting communication (cf. *e-Business W@tch* / European Commission 2004a and 2004b). In 2005, the main focus was on ICT-supported destination management and operation of destination portals on the internet,

CRM in tourism destinations and mobile and location based services for tourists (cf. *e-Business W@tch* / European Commission 2005). Some of the main findings of these previous studies are summarised below.

The role of ICT and e-business in the tourism sector

Overall, the tourism sector has been a pioneer in adopting and developing ICT applications. The internet has become a key application in the tourism industry: Consumers, on the one hand, are able to interact directly with tourism providers, which allows them to identify and satisfy their constantly changing needs for tourism products. Suppliers, on the other hand, are able to deal more effectively with the increasing complexity and diversity of consumer requirements.

Tourism providers have been using the internet to communicate, distribute and market their products to potential customers worldwide in a cost- and time-efficient way. In fact, the individual company website had become the most important platform for e-commerce, followed by electronic marketplaces (cf. e-*Business W@tch* / European Commission 2004a).

The main focus of e-business processes in the tourism industry has been on customer-facing activities and services, i.e. primarily e-marketing and e-sales. Online booking and reservation services were widely accepted among consumers and business travellers already in 2005. Similarly, online purchasing had become a relatively well-used application in the tourism sector. On the other hand, the studies have shown that automation of internal business processes had been less crucial for a service sector such as tourism than it is for various manufacturing industries. As a result, the adoption of ICT solutions such as enterprise resource planning systems (ERP) had been significantly lower than in other economic sectors. This was also due to the fact that most of these solutions are cost-intensive and tailored for larger companies; as a result most of the SMEs in the tourism sector still maintained their internal operations manually (cf. *e-Business W@tch* / European Commission 2005).

Customer Relationship Management (CRM) in the tourism industry

In tourism, personal relations with customers and the customisation of products and services are vital for success. Therefore the introduction of customer relationship management (CRM) solutions had become increasingly important for tourism providers. For instance CRM solutions enable tourism providers to improve customer satisfaction. This can be accomplished by a better understanding of their customers which allows providers to sell the right product, at the right time, based on their personal purchasing patterns (cf. *e-Business W@tch* / European Commission 2003). As was shown in the *e-Business W@tch* 2005 study, mainly larger companies, such as airlines or hotel chains, were using CRM sophisticated solutions.

Need for stronger networking

A general trend towards enhanced network relations among tourism service providers, especially among the many SMEs was already identified in earlier *e-Business W@tch* studies on the tourism sector. According to these studies, to survive in an increasingly competitive and global environment, SMEs have to achieve economies of scale and scope in order to reduce transaction costs, increase productivity and gain market power. Networks and cooperation may help them to offer new products and services that increase the profitability and further develop the attractiveness and competitiveness of the destination and/or enterprise.

Dis-intermediation and re-intermediation

Traditionally, the role of intermediaries (travel agents and tour operators) in the tourism value chain was to take the role of bringing tourism suppliers and potential customers together and to enhance trade relations between them. ICT and e-business processes, however, had led to two conflicting parallel trends which had had a profound impact on the role of intermediaries: dis-intermediation and re-intermediation.

Dis-intermediation refers to the substantially reduced role of traditional intermediaries in the tourism distribution chain. Earlier *e-Business W@tch* studies identified that, to work against this development, traditional brick-and-mortar intermediaries had started to establish online portals and to offer value added intermediary services online. Some players had changed their business model completely by focusing exclusively on the internet. In addition, new online based intermediaries had entered the market (cf. *e-Business W@tch* / European Commission 2002, 2003).

ICT and e-business for destination management

ICT and e-business had fundamentally changed the daily operations of destination management organisations (DMOs). ICT had become particularly important for fostering internal coordination, e-marketing activities and online sales of services provided for specific destinations. DMOs had also started to operate destination portals on the internet to provide direct contacts between tourists and service providers - services that traditionally had been performed by intermediaries such as travel agencies (cf. *e-Business W@tch* / European Commission 2005).

Mobile and location based services for tourists

Mobile devices had become increasingly commonplace and people are using them not only in business, but also in their leisure time. Tourism has a high potential for using mobile devices, for instance by delivering location based services. However, in practice the quality of contents, the technological capabilities and the usability of existing mobile services varied considerably. Therefore, the market for mobile services was still immature and sustainable business models needed to be developed. Location-based services seemed to be promising, especially for supporting destination suppliers (cf. *e-Business W@tch* / European Commission 2005).

3 Adoption of ICT and e-Business in 2006

Background information about the e-Business Survey 2006

e-Business W@tch collects data on the use of ICT and e-business in European enterprises by means of representative telephone surveys. The e-Business Survey 2006 was the fourth survey after those of 2002, 2003 and 2005. It had a scope of **14,081 interviews** with decision-makers in enterprises from 29 European countries.[20]

Most of the tables in this report feature a breakdown of the population of enterprises based on the aggregate of 10 EU countries – **the "EU-10"**.[21] In these countries the survey covered all 10 sectors (at least to some extent) and therefore comparability of the sample across sectors is given. The EU-10 represent more than 80% of the total GDP and inhabitants of the EU-25 and are thus to a large extent representative for the whole EU.

The survey was carried out as an **enterprise survey**, i.e. focusing on the enterprise as a business organisation (legal unit) with one or more establishments. Similarly to 2005, the 2006 survey also included only **companies that use computers**. The configuration of the survey set-up (e.g. sampling) reflects the mandate of *e-Business W@tch* to **focus on sectors** and **SMEs**. As a result, comparisons should mainly be made between sectors and between size-bands of enterprises. Breakdowns by country are also possible, but should be treated cautiously, for several reasons (see Annex I).

In the **tourism industry** 2665 interviews were conducted; out of these, 725 with companies from the EU-10. Some of the data are broken down into the three main **sub-sectors** of tourism, i.e. NACE H 55.1 and 55.2 (accommodation sector), H 55.3 and 55.4 (gastronomy) as well as I 63.3 (travel agencies and tour operators).

More detailed information about the survey methodology, including information about sampling and the business directories used, the number of interviews conducted in each country and sector, data on non-response rates, as well as selected results by country are available in **Annex I** and on the *e-Business W@tch* website.

[20] The survey was conducted in March-April 2006 using computer-assisted telephone interview (CATI) technology. Field-work was co-ordinated by the German branch of Ipsos GmbH (www.ipsos.de) and conducted in co-operation with their local branches and partner organisations. The countries covered include EU Member States, Acceding and Candidate Countries, and countries of the European Economic Area (EEA).

[21] The EU-10 cover the Czech Republic, Germany, Spain, France, Italy, Hungary, the Netherlands, Poland, Finland and the UK.

3.1 Use of and Access to ICT Networks

Internet access

At first sight, basic **internet connectivity** of companies from the tourism sector appears to be fairly in line with the weighted average for the 10 sectors covered by the e-Business Survey 2006. About one out of ten companies that have computers is not yet connected to the internet; these are mostly micro companies. By share of employment, companies representing 93% of the sector's workforce are connected.

Exhibit 3-1: Internet access and remote access to company network

	Companies with internet access		Companies with broadband internet access		Average share of employees with internet access*		Companies with remote access to their network	
Weighting:	% of empl	% of firms	% of empl	% of firms	% of empl	% of firms	% of empl	% of firms
Tourism (EU-10)	**93**	**90**	**72**	**68**	**n.a.**	**53**	**38**	**13**
Micro (1-9 empl.)		90		65		57		13
Small (10-49 empl.)		98		82		33		19
Medium (50-249 empl.)		98		80		26		49
Large (250+ empl.)*		93		75		39		71
Tourism sub-sectors:								
Accommodation sector	100	98	76	80	n.a.	43	43	10
Gastronomy	84	80	68	54	n.a.	38	29	7
Travel agencies & tour operators	100	100	79	76	n.a.	95	45	32
All 10 sectors (EU-10)	**95**	**93**	**76**	**69**	**n.a.**	**43**	**35**	**16**
Micro (1-9 empl.)		89		62		51		12
Small (10-49 empl.)		98		75		29		22
Medium (50-249 empl.)		99		83		33		43
Large (250+ empl.)*		99		84		44		60
Food & beverages	95	88	72	64		25	35	14
Footwear	96	89	75	62		28	17	10
Pulp & paper	99	94	80	68		40	56	21
ICT manufacturing	100	99	84	79		74	69	35
Consumer electronics	98	97	87	74		80	51	32
Shipbuilding & repair	100	100	87	86		30	41	27
Construction	95	90	72	64		47	25	13
Tourism	93	90	72	68		53	38	13
Telecommunication	100	99	88	85		90	74	46
Hospitals activities	100	98	85	78		41	39	34
Base (100%)	firms with computers		firms with computers		firms with internet		firms with computers	
N (for sector, EU-10)	725		725		681		725	
Questionnaire reference	A1		A3		A2		A5	

* Read: "The average share of employees with internet access in a company from the tourism industry is 53%."

Source: *e-Business W@tch* (Survey 2006)

The deployment of **broadband access** is also very close to the average of the 10 sectors studied. Tourism companies representing 72% of the sector's employment said that they use an internet connection technology which can be classified as broadband (either DSL, cable, direct fibre connection or wireless broadband).

However, a close look at the figures reveals some outstanding results in ICT uptake even at this basic level. While connectivity on the company level is very close to average, significantly more **individual workers** in tourism companies seem to have access to the internet at their workplace than in other industries (on average 53% of employees in tourism companies compared to 43% across all 10 sectors studied this year by *e-Business W@tch*). Interestingly, especially the result for micro enterprises is significantly above the cross-sectoral average. 57% of employees in micro enterprises (with 1-9 employees) have internet access at their workplace. In contrast to this, a relatively low number of only 26% of employees in medium sized enterprises (50-249 employees) can access the internet at their workplace.

The adoption of **remote access** to a company's network is rather low in tourism. On average, only 13% of tourism enterprises indicated that they enable remote access to their computer network. This figure is the same as in the construction industry, and only the footwear sector reported an even lower figure with only 10%. Yet, the results vary enormously between different company size classes. While only 13% of micro enterprises in tourism said that they enable remote access to their network, 19% of small companies, 49% of medium sized companies and a remarkable 71% of large enterprises did so.

Use of internal computer networks

The tendency to connect computers to a company network (Local Area Networks – LAN, and Wireless LAN) increases with company size: While 63% of this sector's small firms said that they use **LAN**, 73% of medium sized tourism companies and almost all of the large enterprises reported having LAN (92%). **Wireless-LAN technology** is used by 15% of all tourism companies, which accords with the average of all 10 sectors surveyed. While only 13% of micro companies reported using W-LAN, twice as many small companies and even 58% of medium sized companies said that they have W-LAN. W-LAN usage of the large companies is 45%.

Exhibit 3-2: Networks and protocols used

	LAN		W-LAN		Use Voice-over-IP		Use VPN for remote access	
Weighting:	% of empl.	% of firms	% of empl.	% of firms	% of empl.	% of firms	% of empl.	% of firms
Tourism (EU-10)	**65**	**39**	**30**	**15**	**16**	**15**	**57**	**16**
Micro (1-9 empl.)		35		13		16		17
Small (10-49 empl.)		63		26		12		29
Medium (50-249 empl.)		73		58		15		40
Large (250+ empl.)		92		45		20		71
Tourism sub-sectors:								
Accommodation sector	74	45	32	22	13	14	59	3
Gastronomy	51	18	27	5	16	16	57	3
Travel agencies & tour operators	85	77	32	27	23	17	51	30
All 10 sectors (EU-10)	**65**	**46**	**32**	**16**	**16**	**13**	**57**	**26**
Micro (1-9 empl.)		35		12		14		20
Small (10-49 empl.)		59		21		11		32
Medium (50-249 empl.)		84		37		13		57
Large (250+ empl.)		96		47		22		79
Base (100%)	firms using computers		firms using computers		firms using computers		Firms enabling remote access	
N (for sector, EU-10)	725		725		725		221	
Questionnaire reference	A4a		A4b		A4c		A6d	

Source: *e-Business W@tch* (Survey 2006)

Voice-over-IP

The use of internet based telephony services by means of digitised voice transfer technology has gained momentum over the past few years. Established as well as new telecommunication service companies and internet service providers offer new services based on this technology which allow companies to save telephony costs.

These services are commonly referred to as "Voice-over-IP" (VoIP) services, as they use the Internet Protocol (IP) as the means to transfer voice calls. However, there are many ways for VoIP to be realised. For example, calls can be initiated and terminated via a computer or via a VoIP-enabled phone. The proliferation of VoIP is driven by increasing broadband penetration.

Private users typically encounter VoIP services as an internet-based peer-to-peer network service (e.g. Skype or Google Talk). Corporate users can generally follow **two paths** if they want to benefit from VoIP: **hybrid solutions** or pure **IP-based networks**.[22]

[22] See *e-Business W@tch* Sector Study on the Telecommunications Industry, 2006. Available at www.ebusiness-watch.org ('resources').

Voice-over-IP is already relatively widely used, even in a sector like tourism. In 2006, 15% of all companies from the sector (accounting for 16% of employment) said that they used Voice-over-IP services (see Exhibit 3-2). Differences in the extent of Voice-over-IP adoption per company size class in tourism are not as strong as in other sectors. With a diffusion rate of 16%, micro enterprises are only slightly behind the level of usage of large companies, where 20% reported using Voice-over-IP services. Voice-over-IP seems to be just as relevant for small tourism companies as it is for large enterprises in the sector. It can be expected that usage will increase rapidly over the next few years; eventually, as a common scenario predicts, all fixed network voice telephony might be converted to internet protocol. "Voice-over-IP" will then no longer be a viable option, but the standard technology for telephony.

In contrast to Voice-over-IP, Virtual Private Network (VPN) technology is predominantly used by larger tourism companies. While only 17% of micro enterprises and 29% of small companies use VPN technology for remote access to their computer network, 40% of medium sized enterprises and even 71% of large companies do so. This confirms the figures on companies which enable remote access to their computer network in Exhibit 3-1 above, where the adoption of remote access is much higher with large companies than with smaller ones.

3.2 ICT Skills, Outsourcing and ICT Budgets

3.2.1 Demand for ICT skills and skills development

Improving e-business skills, especially among SMEs, has been identified as an important **policy issue** in the sector study on the tourism industry of 2005: "*[…] training activities to enhance e-skills among employees could be supported. In particular, measures to ensure that curricula in tourism colleges and vocational training take into account the importance of ICT related developments. […] In particular, the managerial awareness and understanding of e-business opportunities should be promoted. […] Experience shows that many small companies without internet activities are reluctant to introduce e-business into their daily operations, because the owner of the firm refuses to personally use a computer or internet.*"[23]

[23] See *e-Business W@tch* Sector Study on the Tourism Industry, September 2005. Available at www.ebusiness-watch.org ('resources').

Exhibit 3-3: Demand for ICT skills and skills development

	Companies employing ICT practitioners		Regular ICT training of employees		Companies with hard-to-fill vacancies for ICT jobs		Companies using e-learning	
Weighting:	% of empl	% of firms	% of empl	% of firms	% of empl	% of firms	% of empl	% of firms
Tourism (EU-10)	**27**	**12**	**21**	**11**	**3**	**2**	**29**	**15**
Micro (1-9 empl.)		11		9		2		16
Small (10-49 empl.)		9		13		0		15
Medium (50-249 empl.)		20		24		0		22
Large (250+ empl.)		51		33		6		54
Tourism sub-sectors:								
Accommodation sector	30	12	25	19	6	0	28	11
Gastronomy	22	11	13	1	1	2	25	6
Travel agencies & tour operators	26	13	20	18	3	7	37	41
All 10 sectors (EU-10)	**27**	**14**	**22**	**13**	**2**	**1**	**21**	**11**
Micro (1-9 empl.)		12		9		2		12
Small (10-49 empl.)		15		16		0		11
Medium (50-249 empl.)		29		28		2		19
Large (250+ empl.)		59		41		6		35
Food & beverages	26	11	26	14	2	0	16	9
Footwear	20	13	14	6	1	0	7	5
Pulp & paper	35	16	29	12	3	1	21	13
ICT manufacturing	52	31	39	24	8	3	28	20
Consumer electronics	35	17	21	16	4	2	23	18
Shipbuilding & repair	36	33	29	20	4	0	14	15
Construction	22	14	18	12	2	1	12	8
Telecommunication	63	33	52	21	12	5	41	28
Hospitals activities	57	39	39	34	5	3	26	22
Base (100%)	firms with computers		firms with computers		firms with computers		firms with computers	
N (for sector, EU-10)	725		725		725		725	
Questionnaire reference	B1		B4		B2		B5	

Source: *e-Business W@tch* (Survey 2006)

The figures for the demand for ICT skills and skills development of the tourism industry do not vary considerably from other European industries. In total, about **12%** of the EU-10 firms from the tourism sector said that they **employ ICT practitioners** (see Exhibit 3-3), i.e. people with special skills and tasks related to the implementation and maintenance of ICT solutions in the company. These figures are similar to most other sectors with a large share of smaller companies, where ICT tasks are often performed by a single skilled employee, or even by the manager himself. About **11%** of tourism companies said that they provide **regular ICT training** for their employees, compared to 13% on average of all 10 sectors surveyed. Regular ICT training of employees is much more common in large firms than in smaller ones: 9% of micro enterprises, 13% of small companies, 24% of medium sized enterprises and 33% of large companies appear to provide regular ICT training courses for their employees.

Some of the other results on the demand for ICT skills have to be assessed on the basis of the relatively low overall employment of ICT practitioners. For example, **only about 2% of all tourism firms** report that they had **hard-to-fill vacancies** for ICT jobs in 2005 (of

these, mainly large companies (6%) with more than 250 employees had difficulties in finding ICT professionals, while smaller companies had less problems finding qualified personnel). This figure is surprisingly low, considering the attention which policy has been paying to the presumed ICT skills gap. Two explanations are possible: first, that the skills gap is commonly overestimated (indeed most of the sectors analysed report similarly small figures); second, in a more normative assessment, it can be argued that many companies are simply not aware that they should enhance their ICT skills base by hiring adequate personnel.

Furthermore, there seem to be considerable variations between different countries: In Greece, for example, 12%, and in Cyprus 8% of companies reported hard-to-fill vacancies for ICT jobs; in countries like Germany, Spain, Luxembourg, the Netherlands, Poland, Slovakia and Romania between 2% and 6%; in the other European countries surveyed hardly any companies reported hard-to-fill vacancies for ICT jobs at all (see Exhibit A5-11 in Annex III).

e-Learning, which means supporting training with learning material in electronic format - e.g. material that is available on the intranet or the internet - is used on average by 15% of tourism companies, which is a slightly higher figure than the average of the other sectors surveyed. However, medium and large enterprises in the tourism sector use e-learning for their employees' training much more often - with 22% and 54%, respectively – than micro (16%) and small companies (15%). e-Learning applications can be used for ICT-related training, but also for other sector-specific or even company-specific training measures.

3.2.2 Outsourcing of ICT services and ICT investments

Outsourcing

Firms were asked whether they had **outsourced** any of their ICT services, which had previously been conducted in-house, to external service providers in 2005. In the tourism industry, this seems to be the case for about 10% of companies, whereby larger companies generally tend to outsource more of their services than smaller ones.

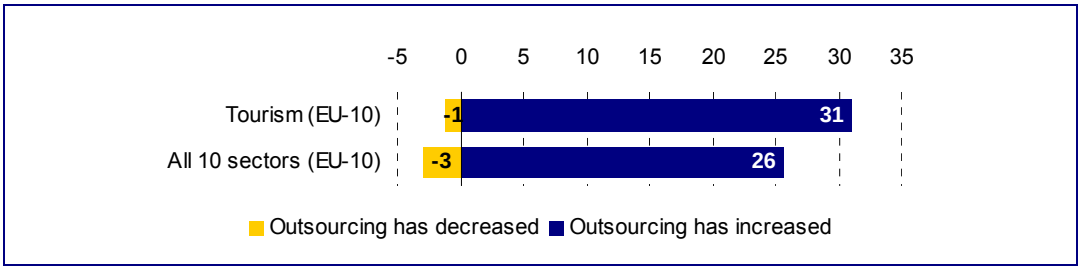
About a third of the surveyed tourism companies saidd that they outsourced more ICT services in 2005 than in the previous years, while only an insignificant number of companies said that they outsourced less (see Exhibit 3-5). This means that in tourism the trend towards outsourcing is somewhat stronger than in most other economic sectors surveyed this year by *e-Business W@tch*.

Exhibit 3-4: Outsourcing and spending on ICT

	Have outsourced ICT services in 2005		Share of ICT budget as % of total costs		Have made ICT investments in 2005		Difficulty to draw funds for investments	
Weighting:	% of empl	% of firms	% of empl	% of firms	% of empl	% of firms	% of empl	% of firms
Tourism (EU-10)	**21**	**10**	**7**	**7**	**63**	**45**	**14***	**74***
Micro (1-9 empl.)		8		7		40		99*
Small (10-49 empl.)		20		5		62		8*
Medium (50-249 empl.)		18		7		75		8*
Large (250+ empl.)		37		13		80		2*
Tourism sub-sectors:								
Accommodation sector	26	11	10	9	68	43	0	0
Gastronomy	17	8	5	3	50	32	6	67
Travel agencies & tour operators	26	13	10	12	79	79	52	86
All 10 sectors (EU-10)	**19**	**14**	**6**	**5**	**65**	**50**	**19**	**15**
Micro (1-9 empl.)		8		5		39		25
Small (10-49 empl.)		21		5		60		3
Medium (50-249 empl.)		21		6		78		6
Large (250+ empl.)		31		6		86		29
Base (100%)	firms using computers		all firms (excl. "don't know")		firms using computers		Firms with external funding sources for ICT investments	
N (for sector, EU-10)	725		431		725		33	
Questionnaire reference	B6		C1		C3		C5	
* Data only indicative due to low number of observations (N ~ 25-50).								

Source: *e-Business W@tch* (Survey 2006)

Exhibit 3-5: Outsourcing trend: percentage of companies that have increased / decreased their outsourcing activities in 2005



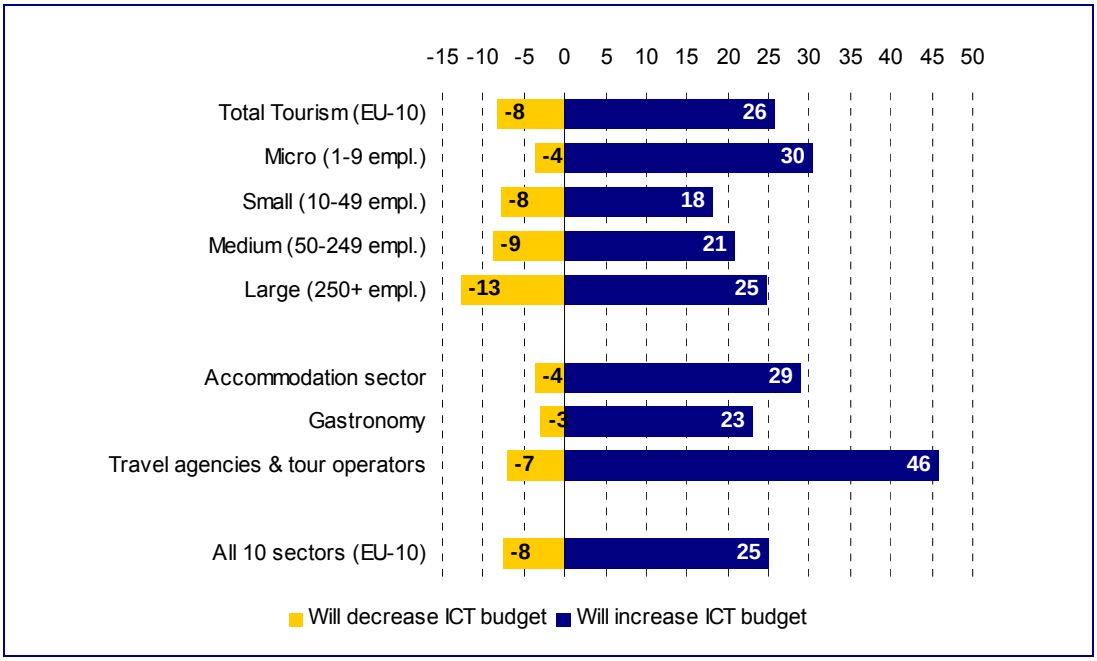
Base (100%): Companies that have outsourced ICT services. N (for sector, EU-10) = 113.
Weighting: in % of firms. Questionnaire reference: B7.

Source: *e-Business W@tch* (Survey 2006)

ICT expenditure and investments

According to the 2006 e-Business Survey results, the **average ICT budget** of a tourism company, which includes expenditures for hardware, software, services and personnel, corresponds to about 7% of total company costs (see Exhibit 3-4). About a quarter of all firms from the tourism industry reported plans to **increase their ICT budget** in 2006/07. With around 8% saying that they will decrease their ICT budget, a majority of about two thirds of surveyed companies said that they will maintain the current level of spending. Micro enterprises with up to 9 employees seem to be the ones with the highest probability for an increase of their ICT budget: 30% of these micro companies in tourism intend to increase their ICT budget, while only 4% plan to decrease this budget. In comparison, about 25% of large companies indicate a future increase in their ICT budget while, at the same time, 13% of large companies plan to downsize their ICT budget. This might be explained by the extreme pressure on keeping costs down, and possibly also some disappointment with the effects of earlier ICT investments. However, these results should not be over-emphasised, as the overall number of cases on which these figures are based is rather low. Overall, ICT budget trends in tourism are in line with respective developments in other economic sectors.

Exhibit 3-6: ICT budget trend: percentage of companies that plan to increase / decrease their ICT budgets in 2006/07



Base (100%): Companies using computers (excl. "don't know"). N (for sector, EU-10) = 683. Weighting: Totals (for the sector and for all 10 sectors) are weighted by employment and should be read as "enterprises comprising …% of employment in the sector(s)". Figures for size-bands and tourism sub-sectors are in % of enterprises from the size-band or sub-sector, respectively. Questionnaire reference: C2.

Source: *e-Business W@tch* (Survey 2006)

No figures are available on the absolute **size of investments**. Yet, the 2006 *e-Business W@tch Survey* included a question asking whether companies had made ICT investments in 2005. About **45%** of tourism companies (representing 63% of employment in this sector) said that they **made ICT investments** in 2005. This is a number only slightly below the cross-sectoral average. Furthermore, the data suggest that larger companies tend to invest more in ICT than smaller companies: twice as many large companies (80%) as micro enterprises (40%) made ICT investments in 2005.

In addition, *e-Business W@tch* asked companies about the **major source** from which they finance their ICT investments[24], and if they experienced any difficulties in receiving funds from this source (in case it was an external financing source). In any of the 10 sectors surveyed, **self-financing** (out of the cash-flow generated) is by far the dominant source of financing ICT investments. In the tourism industry, about 90% of firms say that this is their major source of finance. **Bank loans** are typically used for larger ICT investments; they are the major financing source for about 11% of medium-sized firms. Venture capital is insignificant compared to the other sources. Only a very low number of tourism companies (about 2%) use public funds for their investments.

Exhibit 3-7: Major source for investments in ICT

	Cash-flow financing		Bank loans		Venture capital		Public funds and other	
Weighting:	% of empl	% of firms	% of empl	% of firms	% of empl	% of firms	% of empl	% of firms
Tourism (EU-10)	**75**	**90**	**3**	**1**	**1**	**0**	**3**	**2**
Micro (1-9 empl.)		91		0		0		3
Small (10-49 empl.)		86		5		0		1
Medium (50-249 empl.)		62		11		0		1
Large (250+ empl.)		64		4		2		7
Tourism sub-sectors:								
Accommodation sector	71	92	5	1	0	0	4	0
Gastronomy	81	85	1	1	4	0	2	0
Travel agencies & tour operators	83	93	3	1	0	0	4	5
All 10 sectors (EU-10)	**74**	**82**	**5**	**7**	**1**	**1**	**9**	**7**
Micro (1-9 empl.)		82		8		1		2
Small (10-49 empl.)		81		6		1		2
Medium (50-249 empl.)		70		8		1		2
Large (250+ empl.)		67		2		1		8
Base (100%)	firms that have made investments in ICT							
N (for sector, EU-10)	453		453		453		453	
Questionnaire reference	C4		C4		C4		C4	

Source: *e-Business W@tch* (Survey 2006)

[24] Ideally, a question about the breakdown of investments into the different financing sources would be asked; however, only few interviewees would be in a position to spontaneously answer this question on the telephone; furthermore, such a question would be extremely time-consuming. Thus, the only feasible solution was to ask for the *major* source.

The figures in Exhibit 3-4 which show the percentage of companies facing difficulties to draw funds for investments are, because of the low number of companies surveyed (only 33 cases), only indicative. However it is noteworthy that 99% of micro enterprises in the tourism sector declared to have difficulties in drawing funds for investments. Therefore, concrete measures for the strengthening of the financial base of micro companies - which constitute the vast majority of enterprises in the tourism sector - are vital.[25]

3.3 Standards, Interoperability and ICT Security Issues

A "standard", used as a technical term, is *"a technical specification approved by a recognised standardisation body for repeated or continuous application, with which compliance is not compulsory"*.[26] There are national, European and international technical standards. The agreement on shared technical standards is used as an instrument for achieving interoperability between different systems. Without interoperability of ICT systems, which requires standards and compatibility between standards, advanced forms of e-business (such as the digital integration of systems in B2B exchanges) is hardly possible.

3.3.1 Types of e-standards used

On average, the use of different standards in the tourism sector is similar to other sectors of the European economy. Only 2% of tourism enterprises use EDI-based standards, 6% use XML-based standards and 10% use proprietary standards.

The size of a company has an enormous influence on the adoption of standards: The smaller the tourism company, the more unlikely it is that it adopts any of these standards; the larger the company, the more likely it is that it uses one of these standards. Only 2% of micro enterprises use EDI-based standards, while 14% of large companies do; only 7% of micro, but 28% of large enterprises use XML-based standards; and only 7% of micro, but 30% of large companies use proprietary standards in the tourism sector (see Exhibt-3-8). However, **proprietary standards** are more common than other standards: 10% of tourism firms overall and a higher share among companies with more than 10 employees said that they have agreed on proprietary standards with their business partners.

[25] The European Commission has already initiated various measures in this regard – e.g. the JEREMIE scheme. For further information please refer to chapter 5.2.2 – Policy Implications.

[26] Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998. See http://ec.europa.eu/enterprise/tris/98_34_ec/index_en.pdf

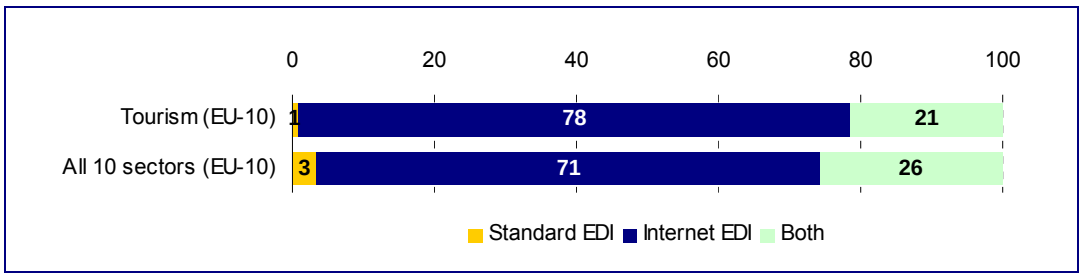
Exhibit 3-8: Use of e-standards

	EDI-based standards		XML-based standards		Proprietary standards		Other standards	
Weighting:	% of empl.	% of firms	% of empl.	% of firms	% of empl.	% of firms	% of empl.	% of firms
Tourism (EU-10)	**7**	**2**	**15**	**6**	**20**	**10**	**3**	**1**
Micro (1-9 empl.)		2		7		7		0
Small (10-49 empl.)		5		4		19		4
Medium (50-249 empl.)		7		13		26		5
Large (250+ empl.)		14		28		30		3
All 10 sectors (EU-10)	**9**	**3**	**11**	**5**	**19**	**12**	**4**	**2**
Micro (1-9 empl.)		2		6		10		
Small (10-49 empl.)		4		5		13		
Medium (50-249 empl.)		10		10		24		
Large (250+ empl.)		29		27		31		
Base (100%)	firms using computers		firms using computers		firms using computers		firms using computers	
N (for sector, EU-10)	725		725		725		725	
Questionnaire reference	G1a		G1b		G1c		G1d	

Source: *e-Business W@tch* (Survey 2006)

From those companies that use EDI in the tourism industry, the vast majority uses internet based EDI (about 78%) and only an insignificant number of firms uses standard EDI; about 21% said that they use both internet and standard EDI (see Exhibit 3-9). In other words: Internet EDI seems to be suitable for literally all tourism companies which are operating an EDI system.

Exhibit 3-9: Types of EDI used



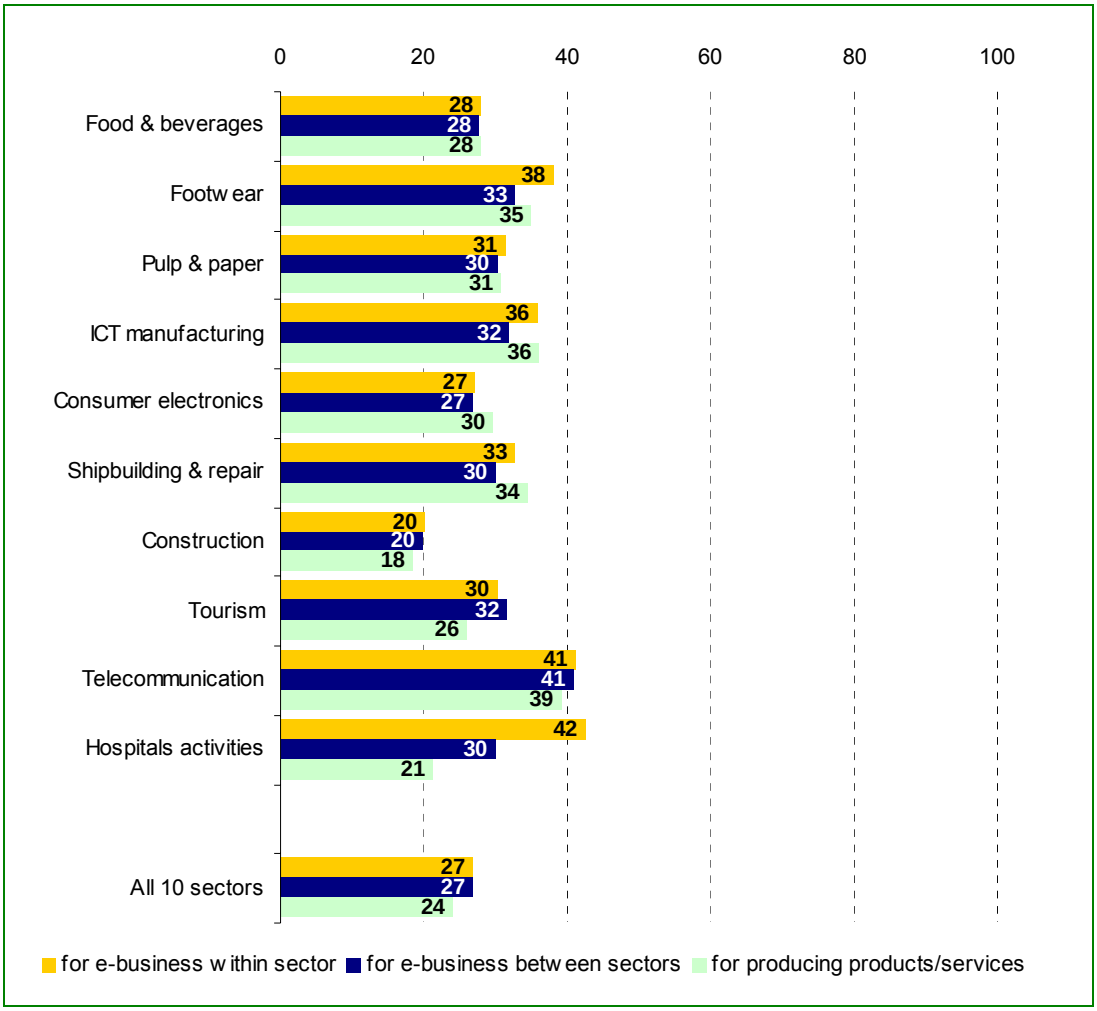
Base (100%): Companies using EDI. N (for sector, EU-10) = 39*.
* Data only indicative due to low number of observations.
Weighting: in % of firms. Questionnaire reference: G3.

Source: *e-Business W@tch* (Survey 2006)

3.3.2 Interoperability challenges

Interoperability refers to the *"ability of two or more systems to exchange data, and to mutually use the information that has been exchanged."*[27] *e-Business W@tch* asked companies whether they regard interoperability as critical for conducting e-business with companies from their own sector, from other sectors, and for producing their products or services. Results are fairly consistent with those obtained from the same question in 2005 and do not show any pronounced differences between sectors (see Exhibit 3-10), with the possible exception of the construction industry.

Exhibit 3-10: Perceived importance of interoperability: percentage of companies saying that interoperability is critical ...



Base (100%): Firms using computers. N (for sector, EU-10) = 725.
Weighting: in % of firms. Questionnaire reference: G5a-c.

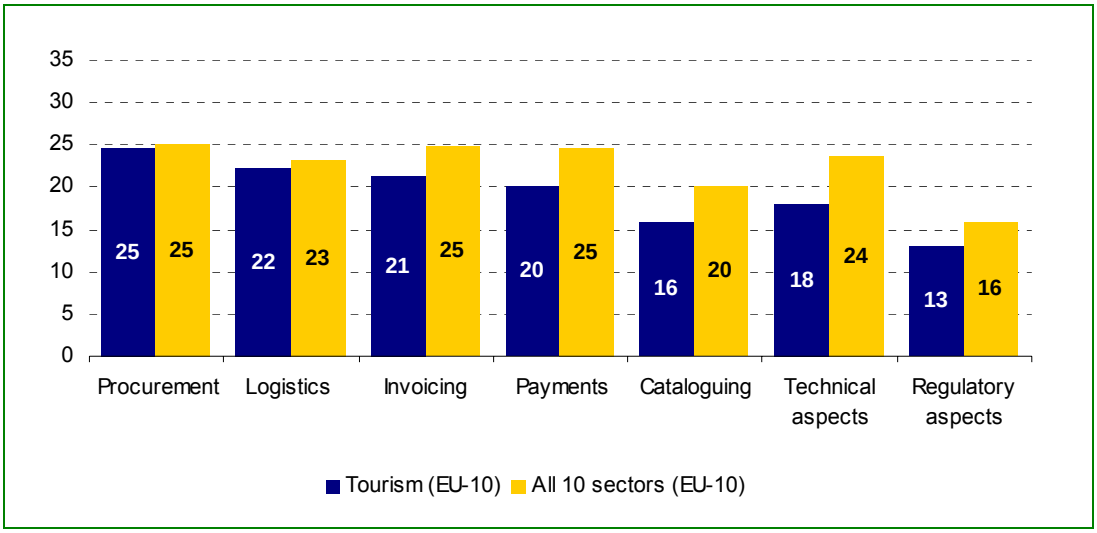
Source: *e-Business W@tch* (Survey 2006)

[27] Definition by IEEE and ISO, cf. *e-Business W@tch* Special Study on e-Business Interoperability and Standards, September 2005, p. 14. Available at www.ebusiness-watch.org ('resources').

In the tourism industry, about 30% of all companies see **interoperability as critical** in all three categories (e-business within sector, e-business between sectors and producing products/services). However, these figures must be put into perspective: about three quarters of all tourism firms say that e-business constitutes either a "significant" or "some part" of the way they operate. Thus, less than half of those companies which consider e-business as an essential element of their day-to-day routines are aware of the critical role of interoperability.

e-Business W@tch also asked companies whether they experienced any **difficulties** stemming from a **lack of interoperability**. Only those firms were asked which had said that interoperability was critical for e-business and/or producing the products; seven potential problem areas were suggested. Overall 13-25% of the firms reported difficulties stemming from a lack of interoperability. This is less than the average of the 10 sectors studied (see Exhibit 3-11). The area where most companies experience interoperability challenges is procurement. This indicates that in issues relevant for B2B transactions, like e-procurement, interoperability is considered as more critical than in B2C issues like payments or cataloguing where most transactions with consumers are processed over the internet and where interoperability appears to be less critical.

Exhibit 3-11: Problems due to a lack of interoperability: firms experiencing difficulties in …



Base (100%): Firms saying that interoperability is critical for their e-business. N (for sector, EU-10) = 308. Weighting: in % of firms. Questionnaire reference: G6

Source: *e-Business W@tch* (Survey 2006)

3.3.3 Use of Open Source Software

The open source model

Open source software (OSS) refers to computer software under an open source license. An open-source license is a copyright license for software that makes the source code publicly available and allows for modification and redistribution without having to pay the original author(s). In the past years, the public awareness of OSS has grown steadily, with the operating system Linux (an alternative to proprietary operating systems such as

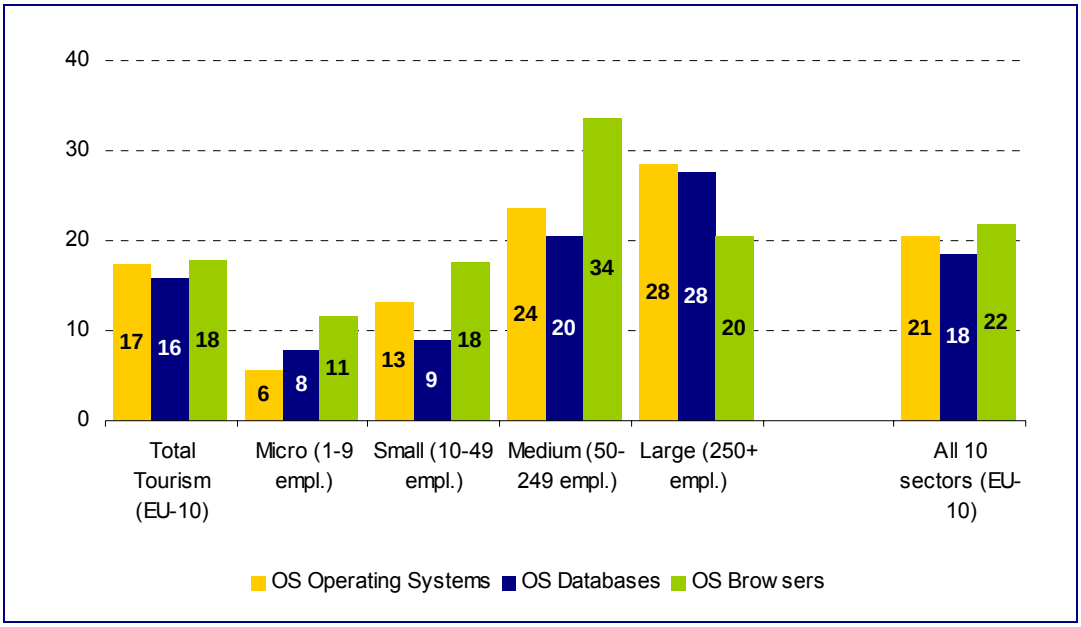
Windows) being the best-known project. Besides Linux, other OSS solutions such as the database mySQL or the internet browser Firefox (a spin-off of the Mozilla browser) have achieved significant market shares.

Decision makers are interested in monitoring OSS developments and the uptake among companies for several reasons. There is some debate about whether the use of OSS based operating systems could possibly reduce ICT costs for SMEs, at least in the long run. Another question is whether OSS systems may help to make companies less dependent on a few specific ICT service providers in the future.

Deployment of Open Source Software

Against this background, companies were asked whether they used OSS in operating systems, databases or browsers. Results for the tourism industry show that the **use of OSS** clearly **increases by firm size:** more large companies use OSS than small companies. In particular, **internet browsers** (including Mozilla and Firefox) based on OSS appear to be widely used by companies from the tourism industry. Among the medium sized firms, about 34% say that they use OSS browsers. Interestingly, large companies have more OS Operating Systems and OS Databases than OS Browsers. Overall, the adoption of OS software in the tourism sector is only slightly lagging behind other sectors.

Exhibit 3-12: Companies using Open Source Software



Base (100%): Companies using computers. N (for sector, EU-10) = 725. Weighting: Totals (for the sector and for all 10 sectors) are weighted by employment and should be read as "enterprises comprising …% of employment in the sector(s)". Figures for size-bands are in % of enterprises from the size-band. Questionnaire reference: G8

Source: *e-Business W@tch* (Survey 2006)

Hence, if decision makers intend to increase the uptake of OS Software in the tourism sector, awareness raising measures, especially regarding the advantages of OS Operating Systems and OS Databases, should be taken. Special emphasis should be put on the deployment of OS Software in micro and small enterprises which constitute the vast majority of tourism companies.

3.3.4 ICT security measures

e-Business W@tch analysed security mechanisms used by European enterprises to counter security threats in its survey of 2005. The results, which were presented in a special report,[28] indicated that basic components, such as firewalls and secure servers – for those enterprises which needed these – were already widely used. As a follow-up to this study, the e-Business Survey 2006 also included questions on specific security issues.

Secure Server Technology and Firewall

"**Secure server technology**" means that the data exchange between computers is based on certain technical standards or protocols, for example "Secure Sockets Layer" (SSL). SSL is a commonly-used protocol to enable the secure transmission of messages via internet. SSL has recently been succeeded by Transport Layer Security (TLS) - which is based on SSL - but SSL itself is still widely used.[29] In the tourism industry, about 17% of all firms said they use Secure Server Technology (see Exhibit 3-13). While the figures for SMEs in the tourism industry are comparable to the average figures for the 10 sectors studied this year, deployment of secure server technologies among large firms appears to be higher in tourism than in other sectors (77% in tourism compared to 64% on average across all 10 sectors).

Secure server technology is generally closely linked with **e-commerce**. Yet, the deployment figures for SMEs in tourism are lower than the respective number of companies that say that they receive orders from customers online (see Exhibit 3-13). This demonstrates the major importance of electronic marketplaces in the tourism sector. In contrast, the level of adoption of secure server technology by large tourism companies is much higher than their e-commerce activity. Obviously, these enterprises use secure servers for other purposes than to manage their online sales to a larger extent than smaller companies.

As can be expected, firewalls are widely used by companies from any of the 10 sectors studied. In the tourism sector, the adoption of this rather basic security measure is slightly higher than the cross-sectoral average. Interestingly, this holds true for all company size classes.

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[28] See *e-Business W@tch* Special Study on ICT Security, e-Invoicing and e-Payment Activities in European Enterprises, September 2005. Available at www.ebusiness-watch.org ('resources').

[29] Cf. Whatis.com (http://searchsecurity.techtarget.com)

Exhibit 3-13: Adoption of ICT security measures by enterprises

	Secure Server Technology		Digital Signature or Public Key Infrastructure		Firewall	
Weighting:	% of empl.	% of firms	% of empl.	% of firms	% of empl.	% of firms
Tourism (EU-10)	**42**	**17**	**18**	**16**	**81**	**64**
Micro (1-9 empl.)		13		17		61
Small (10-49 empl.)		29		13		78
Medium (50-249 empl.)		29		19		85
Large (250+ empl.)		77		22		98
Tourism sub-sectors:						
Accommodation sector	49	21	12	15	84	69
Gastronomy	32	7	21	13	74	52
Travel agencies & tour operators	42	37	33	28	85	81
All 10 sectors (EU-10)	**36**	**20**	**21**	**15**	**78**	**62**
Micro (1-9 empl.)		16		13		56
Small (10-49 empl.)		23		17		73
Medium (50-249 empl.)		36		25		84
Large (250+ empl.)		64		39		94
Base (100%)	firms using computers		firms using computers		firms using computers	
N (for sector, EU-10)	725		725		725	
Questionnaire reference	G9a		G9b		G9c	

Source: *e-Business W@tch* (Survey 2006)

Digital signature

An **e-signature** is an electronic information attached to or associated with a contract or message used as the legal equivalent to a written signature. Electronic signatures are often used to add a signature to a text via electronic means, or as a cryptographic means to add non-repudiation and message integrity features to a document. **Digital signature** usually refers specifically to a cryptographic signature, either with a document, or with a lower-level data structure. The rationale for measuring the adoption of digital signatures is that it is an important element for the integration of business processes between different enterprises, specifically for the legal recognition of documents sent electronically, as is the case of **invoices**.[30]

In 2005, e-*Business W@tch* had asked companies whether they had *"rules that specify the use of digital signature or Public Key Infrastructure"*, as part of a question on the use of ICT security measures. In total, about 11% of firms (accounting for 20% of employment) reported that they had such rules. Figures in 2006 appear to be slightly higher; specifically the adoption of e-invoicing may be a key driver. In the tourism industry, 16% of firms reported the use of digital signature / public key infrastructure (see Exhibit 3-13). Interestingly, the use is rather evenly spread over the different size classes of tourism companies.

[30] To this end, in 1999, the European Union issued the Electronic Signature Directive.

In general, the rather low level of deployment of digital signature / public key infrastructure could represent an obstacle to the development of interoperable solutions for many e-business processes, particularly those with strong contractual content such as the negotiation and booking of large contingents of services.

3.4 Internal and External e-Integration of Processes

The use of ICT and e-business to support and optimise intra-firm processes has become increasingly important for both the manufacturing as well as service sectors. By **digitising previously paper-based processes**, information and documents related to incoming or outgoing orders or bookings can be **seamlessly processed** along the company's value chain; reservations can be linked with capacity management, and the underlying software systems support controlling and management by enabling full transparency of all business processes. Furthermore, **collaborative** processes within and between companies are supported, such as information sharing among employees (for example by use of an intranet), planning and demand forecasting, organising and archiving documents, and human resources management. In general, in all different economic sectors ICT solutions for these purposes are predominantly used by large companies and, to a lesser degree, by medium-sized firms.

3.4.1 Use of software systems for planning and decision-making

Introduction

ICT are a powerful tool to support **management and controlling functions** in an enterprise, mainly by providing information faster, more flexibly and more concisely than it would be possible without the respective tool. ICT-based applications facilitate an integrated and **holistic view on the company** and are thus an indispensable management tool.

In larger enterprises, most of the regular **management reports** (e.g. from controlling) are critically depending on inputs (figures, calculations) from ICT systems. Therefore, these systems typically include specific reporting functions. Management reports can be generated automatically, based on pre-defined parameters. A key software application in this context are ERP (Enterprise Resource Planning) systems, which have even been named according to their function of supporting planning processes in enterprises.

Of course, all figures that are automatically generated from such systems need to be assessed, contextualised and explained in order to constitute a meaningful basis for decision-making. Thus, ICT cannot replace the **human factor** in management and decision-making, but they can greatly **support the process**. Any controller who has been in this profession for more than 20 years will confirm how his profession has changed due to ICT in this period. Previously, much effort had to be devoted in extracting data from various sources and preparing them for reporting. Today, due to ICT, data tend to be available in abundance. The key question is not to how to *get* the data, but how to *select* the meaningful data.

In a way, the impact of ICT on planning and decision-making is derived from two inherent characteristics of ICT: first, their capacity to **store any sort of data** and information in a **structured and linked** way, provided that clear standards for data entry have been defined beforehand; second, their capacity to **increase the transparency of information** and processes by enabling shared access to information in a distributed working environment.

Whereas the former is mainly provided by enterprise planning software (such as ERP) and specific databases (such as CRM – see chapter 3.6), the latter can be achieved by comparatively simple instruments such as an intranet. In this chapter, the diffusion of several applications in the tourism industry is discussed.

Applications used by tourism companies

Exhibit 3-14: Use of ICT systems for internal process integration

	Intranet		Accounting software		ERP system		Document Management system	
Weighting:	% of empl.	% of firms	% of empl.	% of firms	% of empl.	% of firms	% of empl.	% of firms
Tourism (EU-10)	**46**	**20**	**67**	**46**	**15**	**7**	**13**	**8**
Micro (1-9 empl.)		20		45		7		7
Small (10-49 empl.)		30		63		9		10
Medium (50-249 empl.)		36		79		8		10
Large (250+ empl.)		80		91		29		22
Tourism sub-sectors:								
Accommodation sector	51	20	70	40	21	13	15	15
Gastronomy	37	9	57	37	10	3	11	1
Travel agencies & tour operators	54	48	81	78	12	4	16	13
All 10 sectors (EU-10)	**42**	**23**	**70**	**57**	**19**	**11**	**19**	**13**
Micro (1-9 empl.)		19		50		7		11
Small (10-49 empl.)		28		70		16		13
Medium (50-249 empl.)		43		85		25		19
Large (250+ empl.)		76		88		45		42
Base (100%)	firms using computers		firms that do not use ERP systems		firms using computers		firms using computers	
N (for sector, EU-10)	725		622		725		725	
Questionnaire reference	D1a		D1e		D1d		D1c	

Source: *e-Business W@tch* (Survey 2006)

In the tourism industry, about every fifth company uses an **intranet**, which can be a useful platform for the secure exchange of information within a company and, possibly, the implementation of internal training programmes, but also for the distribution of planning data among employees. This result is similar to the average of the 10 sectors (see Exhibit 3-14). Generally, larger companies tend to make more use of the intranet than smaller ones: while only 20% of micro enterprises reported using an intranet, 80% of large tourism companies said that they use this tool. There are also significant variations

between different sub-sectors of the tourism industry: While only 9% of companies in gastronomy reported using an intranet, 20% in the accommodation sector and about 48% of travel agencies and tour operators did so.

Enterprise Resource Planning (ERP) systems are software solutions that help to integrate and cover all major business activities within a company, including product or service planning, purchasing of subsidiary services, inventory management, order tracking, human resources, projects management and finance. Ideally, they integrate business processes of different functionalities electronically to improve the efficiency in operating those processes. A prime example of ERP in tourism are capacity management systems in the hospitality sector (e.g. sector-specific software solutions from providers like Gastrodat[31], Fidelio[32] or Casa Blanca[33]). Ideally, these systems provide the back-office functionality behind the customer front end, e.g. if a guest calls a hotel by telephone, the receptionist may make the desired reservation of a room directly in the hotel's capacity management software.

In addition, ERP systems can play an important role for supporting the connectivity between enterprises. For companies in the accommodation sector, ERP systems may provide important interfaces in the cooperation with intermediaries, e.g. tour operators. This assumption is supported by data from the *e-Business W@tch Survey*, which shows that ERP systems are much more used by companies from the accommodation sector (13%) compared to other tourism sub-sectors.

In the 2006 survey, *e-Business W@tch* asked those companies that do not use an ERP system whether they used special **accounting software** (other than just spreadsheet calculation programmes, such as MS Excel) instead. In smaller companies, accounting software typically substitutes to some extent the functionality which ERP solutions have in larger firms, although on a much simpler level and with a lower potential for automating order related document flows. In tourism, the usage of accounting software increases significantly with company size: About 45% of micro enterprises use special accounting software, 63% of small, 79% of medium and 91% of large companies. Overall, about twice as many travel agencies and tour operators use accounting software as companies from the accommodation or gastronomy sector. This corresponds with the assessment that travel agencies and tour operators are the vanguards in the application of enterprise resource planning and decision-making solutions in the tourism industry.

Special software systems for **document management** are rarely used in the tourism industry, even less than in most of the other sectors. These software systems are typically used to archive and manage documents of any type in digital format; this is highly relevant, for example, in the insurance industry (management of insurance policies), but less important in a service sector like tourism.

[31] See www.gastrodat.com

[32] See www.micros-fidelio.de

[33] See www.casablanca.at

Within the tourism industry, document management systems are mostly relevant for the accommodation providers (15% of these companies use document management systems) as well as travel agencies and tour operators (13%), while they are nearly irrelevant for the gastronomy sub-sector. In this context, a good example for an application for the accommodation sector is the electronic registration of guests at the local municipality in countries which require such a registration of tourists staying overnight (in Germany and Austria the so-called “Elektronische Gästemeldung”).[34] Many suppliers of ERP systems for the hospitality industry provide the functionality of such a fully electronic document management system – within an individual tourism company as well as for the transaction of these guest registration documents to the municipality, e.g. the software providers Gastrodat or Vilicotel.[35] In this way, ERP systems may be directly connected to applications of e-government for the tourism industry.

3.4.2 Use of ICT for cooperative and collaborative business processes

The current level of deployment of tools for online cooperation and collaboration[36] in the value system is modest. About 8% of all tourism firms said that they use online tools for collaborative design ("**e-design**") processes with other companies. Unsurprisingly, this figure increases significantly with company size (see Exhibit 3-15). There is some doubt, however, whether collaborative e-design activities are really widely diffused in industries because it is difficult to clearly specify which software applications and practices are collaborative design solutions, and which are not.

Related figures should therefore be treated cautiously. Collaborative **forecasting of demand** is another example. There are quite sophisticated tools for calculating demand, determining the amount and the duration of production or service provision and thus the demand for supplies, or the reservation of capacity and other services. Figures on the adoption of related systems like **managing capacity** and inventory online in the tourism industry are similar to those for collaborative design.

[34] See www.datasystems.at/Presse/PRTexte/worddownload/PA%20JET%20WEB%20Touristik.doc

[35] See www.vilicotel.at

[36] "Cooperation" means splitting a common, centrally managed task into sub-tasks which are performed by different partners of the cooperation. "Collaboration" means that several partners work together on the same task at the same time.

Exhibit 3-15: Online cooperation and collaboration within the value system

	Share documents in collaborative work space		Manage capacity / inventory online		Collaborative design processes		Collaborative forecasting of demand	
Weighting:	% of empl	% of firms	% of empl	% of firms	% of empl	% of firms	% of empl	% of firms
Tourism (EU-10)	**26**	**12**	**25**	**8**	**21**	**8**	**30**	**15**
Micro (1-9 empl.)		11		7		6		15
Small (10-49 empl.)		19		16		8		13
Medium (50-249 empl.)		31		19		19		23
Large (250+ empl.)		47		51		47		58
All 10 sectors (EU-10)	**27**	**14**	**22**	**10**	**15**	**7**	**20**	**11**
Micro (1-9 empl.)		10		8		5		10
Small (10-49 empl.)		19		14		8		13
Medium (50-249 empl.)		31		21		13		19
Large (250+ empl.)		47		41		25		41
Base (100%)	firms with internet		firms with internet		firms with internet		firms with internet	
N (for sector, EU-10)	694		694		694		694	
Questionnaire reference	D5a		D5e		D5d		D5c	

Source: *e-Business W@tch* (Survey 2006)

3.4.3 Deployment of e-invoicing

Introduction

In the e-Business Survey 2006, special attention was paid to the issue of electronic invoicing (e-invoicing). **e-Invoicing** describes computer-mediated transactions between a seller / invoicing party and a buyer / payer (customer entity), which **replaces traditional paper-based invoicing processes**. In e-invoicing, the invoice is electronically generated and sent by the invoicing party, and electronically received, processed and archived by the payer. In practice, e-invoicing typically goes hand in hand with making payments electronically.[37]

It is widely recognised that the use of e-invoicing promises rather easy-to-achieve cost savings for both parties involved (invoicing entity and receiving entity), because the processing of invoices in a standardised, electronic format can be accomplished much faster than the often cumbersome handling of paper based invoices. The cost saving potential strongly depends on the number of invoices that have to be processed; companies and sectors differ widely in this respect: Some tourism sub-sectors appear to be making less use of e-invoicing (e.g. gastronomy), while some make more use of e-invoicing, e.g. travel agencies (see Exhibit 3-17).

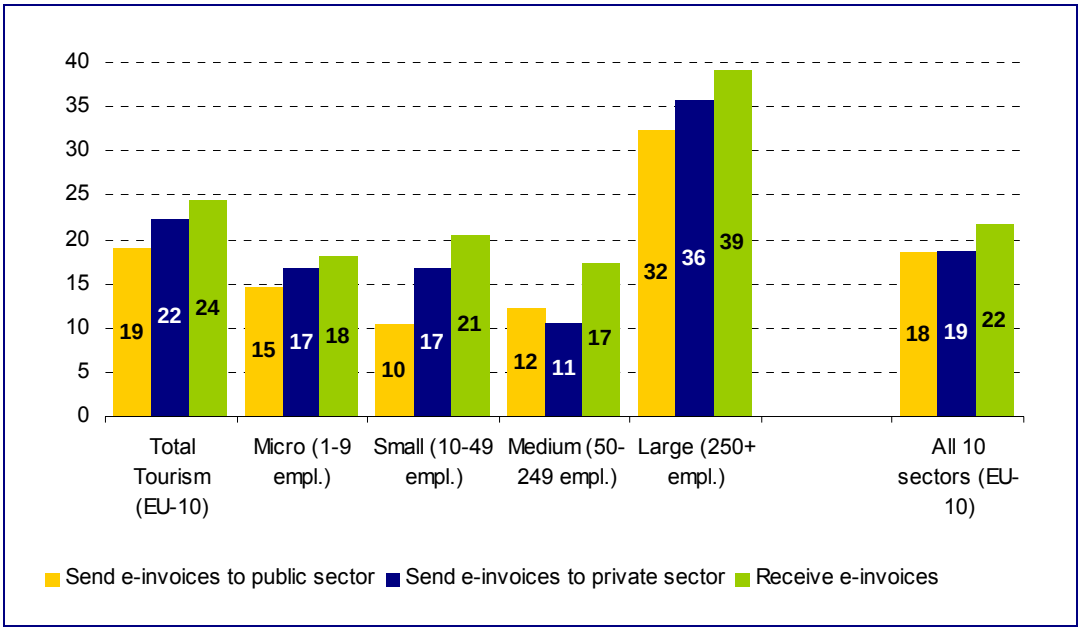
[37] For more background information on e-invoicing activities of enterprises, see *e-Business W@tch* Special Report "ICT Security, e-Invoicing and e-Payment Activities in European Enterprises" (September 2005). Available at www.ebusiness-watch.org ('resources').

Current state of adoption

e-Invoicing can either be accomplished in a **web based** environment, or processes can be integrated within a company's **ERP** system. ERP-based systems (which are used in B2B e-invoicing) promise the highest cost-saving potential for companies. However, the small number of ERP systems in the tourism industry could hamper the speedy adoption of e-invoicing.

In fact, evidence from the 2006 survey confirms this assumption – especially regarding the adoption of e-invoicing by SMEs. In the tourism industry, firms representing about 20% of employment in the sector reported sending e-invoices to customers (in the public sector and / or in the private sectors), while slightly more (about 24%) said that they receive e-invoices from suppliers (see Exhibit 3-16). These results are quite in line with the average of all 10 sectors surveyed. The uptake of e-invoicing is similarly low for micro, small and medium sized enterprises in the tourism sector. Only large tourism enterprises show a significantly higher uptake of e-invoicing than their SME counterparts.

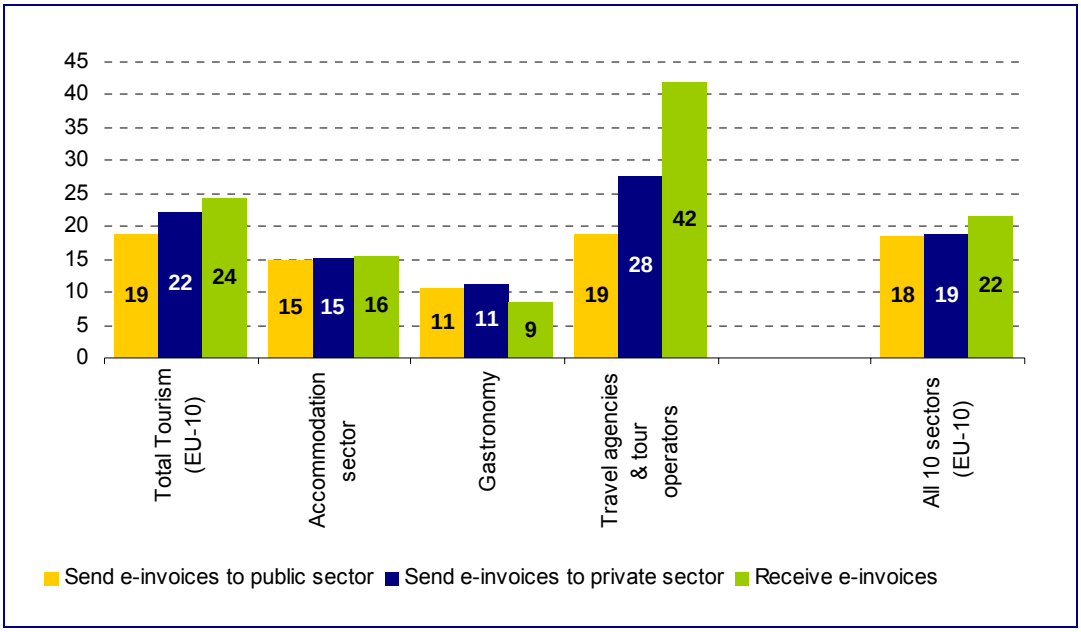
Exhibit 3-16: Adoption of e-invoicing: percentage of firms ... (by company size classes)



Base (100%): Companies with internet access. N (for sector, EU-10) = 694. Weighting: Totals (for the sector and for all 10 sectors) are weighted by employment and should be read as "enterprises comprising …% of employment in the sector(s)". Figures for size-bands are in % of enterprises from the size-band. Questionnaire reference: D5.

Source: *e-Business W@tch* (Survey 2006)

Exhibit 3-17: Adoption of e-invoicing: percentage of firms ... (by tourism sub-sectors)

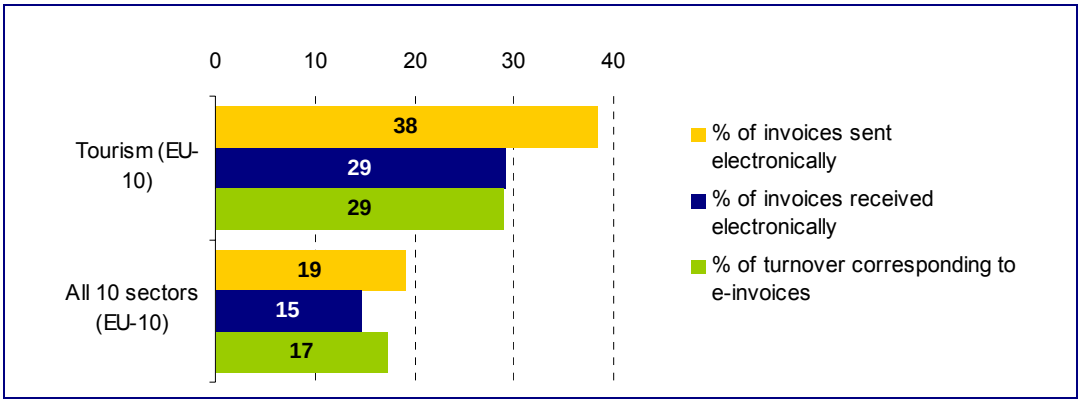


Base (100%): Companies with internet access. N (for sector, EU-10) = 694. Weighting: Totals (for the sector and for all 10 sectors) are weighted by employment and should be read as "enterprises comprising …% of employment in the sector(s)". Figures for tourism sub-sectors are in % of enterprises from the sub-sector. Questionnaire reference: D5.

Source: *e-Business W@tch* (Survey 2006)

Considering only those companies that actually use e-invoicing, the **average share of e-invoices** (measured as % of a company's total invoices sent or received) in tourism is significantly higher than the average figure for the total average of the 10 sectors. On average, companies in the tourism sector report that about 38% of invoices sent electronically are e-invoices, and about 29% of invoices received – compared to 19% and 15%, respectively, on average for all 10 sectors studied.

Exhibit 3-18: Share of e-invoices as % of total invoices



Base (100%): Companies sending/receiving e-invoices (without "don't know"). N (for sector, EU-10) = 104, 111, 84. Weighting: Totals (for the sector and for all 10 sectors) are weighted in % of enterprises. Questionnaire reference: D6, D7, D8.

Source: *e-Business W@tch* (Survey 2006)

The difference is plausible, as many of the smaller companies start with issuing and sending e-invoices; this can be done in a web based environment, often supported by their bank or other financial institutions, or by adding a module to the accounting software, similar to online banking. Adapting the software systems for receiving invoices electronically can be more complicated.

The e-Business Survey 2006 reveals that there are significant differences between individual sectors in the use of e-invoicing. Tourism and the ICT related sectors, as well as hospitals, reported the highest average share of invoices sent or received electronically among the ten sectors studied by *e-Business W@tch* in 2006.

3.5 e-Procurement and Supply Chain Management

Efficient management of procurement is a fundamental activity along a sector value chain which is as complex and fragmented like the tourism industry. Due to a relatively large number of transactions, even slight improvements in this domain can result in significant overall **cost savings**. Online procurement can be carried out without having to integrate one's system with suppliers, for instance by making bookings at a supplier's or partner's website. It is often the first step towards a more comprehensive and integrated use of ICT in business processes.

Similarly as in other service sectors, the **characteristics** and the quality control of these services are of utmost importance. Unlike other sectors in which goods or services are more standardised (e.g. in the telecommunications industry), this can be a **barrier** to the full deployment of e-procurement schemes unless commonly agreed standards for product or service quality have been introduced.

3.5.1 B2B online trading: companies placing orders online

Online orders and the average share of e-procurement

About 40% of all firms active in the tourism industry in the EU-10 countries said that they place orders to suppliers online, compared to a respective cross-sectoral average of 48%.[38] Frequency of online procurement increases with company size class – from 38% of micro enterprises up to 80% of large companies (see Exhibit 3-19). In terms of employment-weighted data, the results for the tourism industry are similar to those of the other sectors (with companies procuring online representing about 60% of employment in the sector). However, some significant differences can be observed between the three

[38] Note that the underlying question in the e-Business Survey 2006 was changed compared to previous years. In 2006, companies where asked whether they "use the internet or other computer-mediated networks *to place orders* for goods or services online". In previous surveys, the question was whether they "use the internet or other computer-mediated networks *to purchase* goods or services online". Thus, a direct comparison of figures, e.g. with those for tourism in 2005, is not recommended.

tourism sub-sectors covered in this study: 60% of travel agencies and tour operators, less than half of accommodation companies and about a quarter of enterprises in gastronomy reported practicing e-procurement.

The relatively high adoption rates of online purchasing / ordering of previous studies has to be seen as the **share of e-procurement** as percentage of the total procurement volume.[39] In the 2005 survey, a significant percentage of firms that purchased online stated that these purchases accounted for less than 5% of their total procurement. Obviously, many companies only occasionally ordered products or services from suppliers online (e.g. for office supplies), rather than practising e-procurement in a regular and systematic way.

Exhibit 3-19: Companies ordering supply goods online

	Place orders online		Place 1-25% of their orders online		Place more than 25% of orders online		Use specific ICT solutions for e-sourcing	
Weighting:	% of empl	% of firms	% of empl	% of firms	% of empl	% of firms	% of empl	% of firms
Tourism (EU-10)	**60**	**39**	**77**	**72**	**23**	**28**	**20**	**12**
Micro (1-9 empl.)		38		73		27		11
Small (10-49 empl.)		54		83		17		12
Medium (50-249 empl.)		61		75		25		16
Large (250+ empl.)		80		73		27		40
Tourism sub-sectors:								
Accommodation sector	68	47	84	79	16	21	25	9
Gastronomy	50	24	74	85	26	15	17	6
Travel agencies & TO	70	60	60	52	40	48	21	34
All 10 sectors (EU-10)	**57**	**48**	**74**	**75**	**26**	**25**	**16**	**9**
Micro (1-9 empl.)		44		73		27		7
Small (10-49 empl.)		54		80		20		10
Medium (50-249 empl.)		60		76		24		16
Large (250+ empl.)		68		75		25		29
Food & beverages	54	39	86	91	14	9	14	5
Footwear	35	29	83	87	17	13	9	5
Pulp & paper	59	49	81	75	19	25	14	8
ICT manufacturing	72	69	67	49	33	51	20	10
Consumer electronics	70	71	60	47	40	53	16	9
Shipbuilding & repair	62	53	78	69	22	31	18	12
Construction	53	51	74	72	26	28	12	6
Tourism	60	39	77	72	23	28	20	12
Telecommunication	78	77	54	49	46	51	26	12
Hospitals activities	67	67	71	73	29	27	19	12
Base (100%)	firms using computers		firms placing orders online		firms placing orders online		firms using computers	
N (for sector, EU-10)	725		418		418		725	
Questionnaire reference	E1		E3		E3		E7	

Source: *e-Business W@tch* (Survey 2006)

[39] Companies are asked to estimate how large a share of their total purchases (2003, 2005) / orders (2006) is conducted online.

About three quarters of those tourism companies which reported ordering online said that these orders account for up to 25% of their total procurement. In other sectors, the relative share of e-procurement is similar to the tourism results.

In the accommodation and gastronomy sub-sectors the vast majority of e-procurers seem to handle up to 25% of their orders online, while only a minority orders more than 25% online. In contrast, in the sub-sector of travel agencies and tour operators this relation between "modest" and "intensive" users of e-procurement appears quite balanced.

Overall, the 2006 e-Business Survey results indicate that travel agencies and tour operators are quite 'heavy' users of e-procurement compared to gastronomy and the accommodation sub-sector, as well as in relation to the average of other economic sectors studied this year by *e-Business W@tch*.

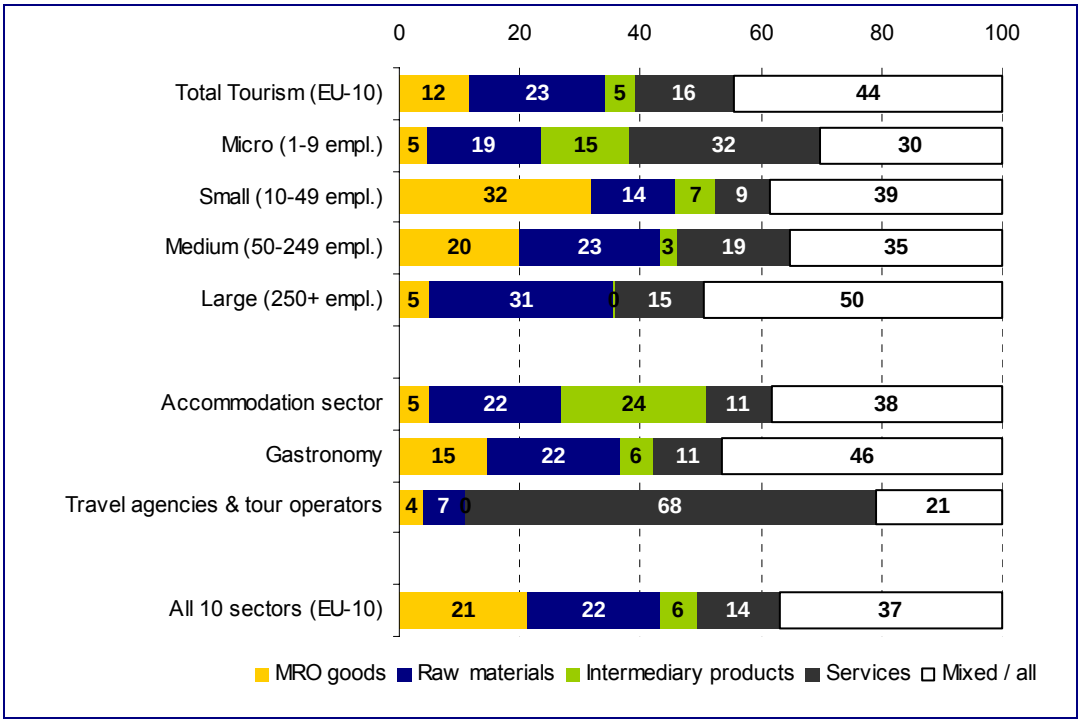
Main type of supply goods ordered online

Online sourcing and procurement can relate to different types of inputs. These include MRO goods,[40] raw materials, intermediary products and services. Unsurprisingly, the survey confirms that overall **raw materials** and **services** are most important for tourism companies in their e-procurement strategy. 23% of firms that place orders online stated that these orders are *mainly* for raw materials and 16% mainly for services. Yet, the picture differs considerably between different company size classes (see Exhibit 3-20) and even more between different sub-sectors of tourism.

e-Procurement of MRO goods is most important for gastronomy. The procurement of raw materials is likewise relevant for the accommodation sector as well as for gastronomy. In these sub-sectors, raw materials procured are mainly raw foodstuffs, beverages and articles provided for the personal hygiene of guests. Intermediary products are highly relevant for the accommodation sector (where about one quarter of companies e-procures from intermediaries). Unsurprisingly, travel agencies and tour operators do not e-procure intermediary services at all – as they provide intermediary services themselves. At the same time, e-procurement of services is, by far, the most important domain of travel agencies and tour operators, where about 68% of companies e-procure services compared to 11% of accommodation providers and gastronomy. This underlines the nature of the business of travel agencies and tour operators, which is a classical service industry intermediating between suppliers of tourism services or products and customers.

[40] MRO goods are maintenance, repair, and operating supplies. This category typically includes office supplies and diverse other items which are not materials or components directly used for the products or services which a company produces.

Exhibit 3-20: Main type of supply goods ordered online



Base (100%): Companies placing orders online (without "don't know"). N (for sector, EU-10) = 424. Weighting: Totals (for the sector and for all 10 sectors) are weighted by employment and should be read as "enterprises comprising …% of employment in the sector(s)". Figures for size-bands are in % of enterprises from the size-band. Figures for tourism sub-sectors are in % of enterprises from the respective sub-sector. Questionnaire reference: E4.

Source: *e-Business W@tch* (Survey 2006)

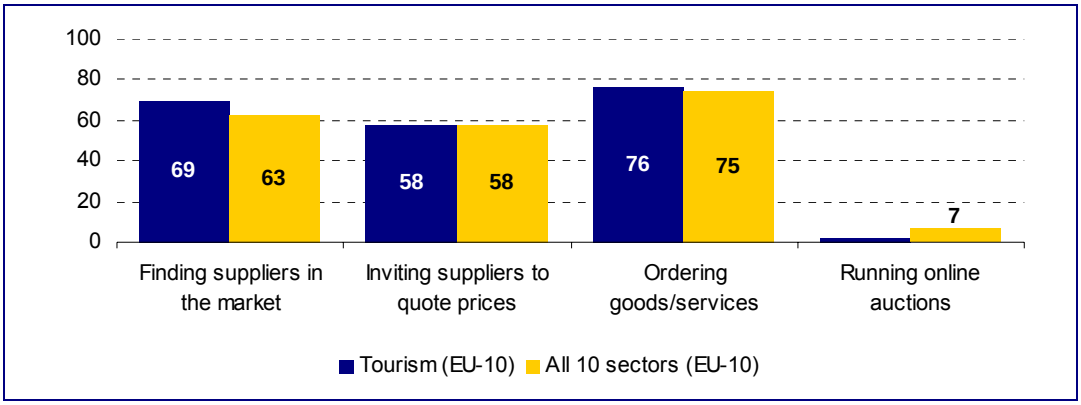
Use of ICT for e-procurement processes

As in 2005, *e-Business W@tch 2006* asked companies whether they "*support the selection of suppliers or procurement processes by specific ICT solutions*." The rationale for this question is to further test whether electronic procurement is in fact a systematic and **digitally integrated** process in a firm, or rather an occasional business activity without much significance for the overall business.

The average figures on the use of specific ICT solutions for e-sourcing in the tourism industry (12%) is similar to the average of all 10 sectors surveyed (9%). The application of such specific ICT solutions for e-procurement is clearly a domain of travel agencies and tour operators, while companies from the accommodation and gastronomy sectors are only minor users of such systems (see Exhibit 3-19).

Those companies which have procurement systems in place tend to use them for several functions, but mainly for finding suppliers in the market (69%), inviting suppliers to quote prices (58%) and placing orders (76%). These findings are comparable with the results in most other sectors (see Exhibit 3-21). Procurement via online auctions is practically negligible in tourism.

Exhibit 3-21: Sourcing and procurement processes supported by specific ICT solutions



Base (100%): Companies using specific ICT solutions for e-procurement. N (for sector, EU-10) = 89. Weighting: in % of firms. Questionnaire reference: E8.

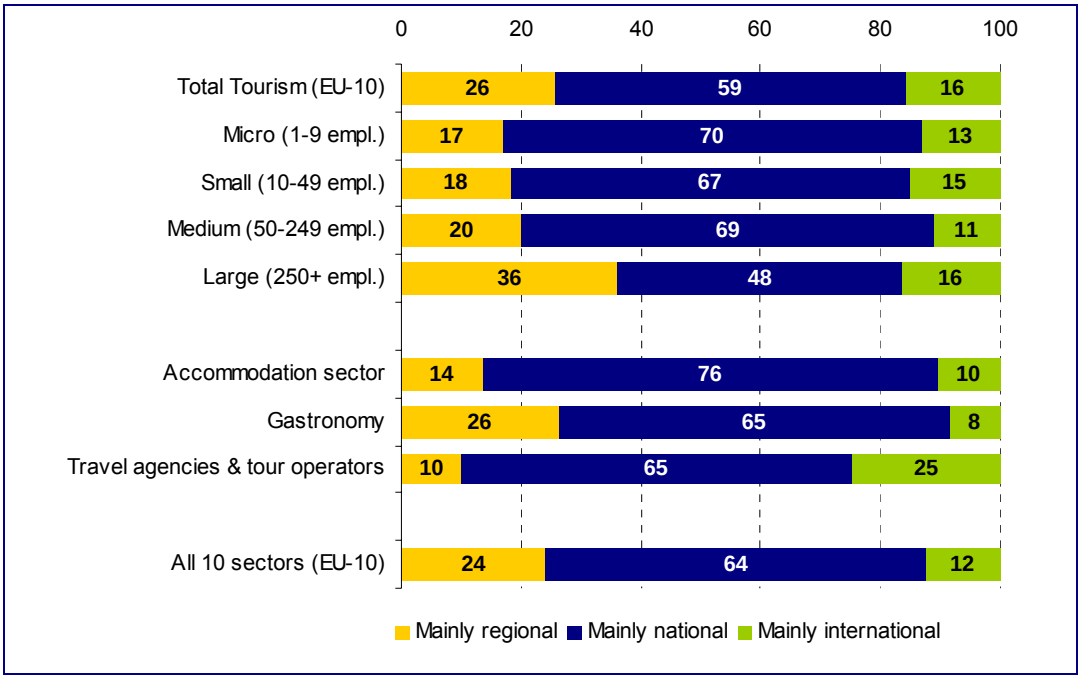
Source: *e-Business W@tch* (Survey 2006)

Main location of suppliers in e-procurement

Most tourism companies report that they order online mainly from suppliers in their own country, but with no special focus on their own region. About 59% of tourism companies that order online consider **national suppliers** as their main geographic market for procurement activities, compared to 26% and 16% which identified, respectively, regional and international suppliers (see Exhibit 3-22).

Overall, these results are comparable to the other sectors studied this year by *e-Business W@tch*. Again, there are significant variations between different tourism sub-sectors: e-procurement from regional suppliers is most important in gastronomy and from international suppliers it is most important for travel agencies and tour operators.

Exhibit 3-22: Main location of suppliers in e-procurement



Base (100%): Companies placing orders online (without "don't know"). N (for sector, EU-10) = 421. Weighting: Totals (for the sector and for all 10 sectors) are weighted by employment and should be read as "enterprises comprising …% of employment in the sector(s)". Figures for size-bands are in % of enterprises from the size-band. Figures for tourism sub-sectors are in % of enterprises from the respective sub-sector. Questionnaire reference: E5.

Source: *e-Business W@tch* (Survey 2006)

Impact of e-sourcing on supplier selection

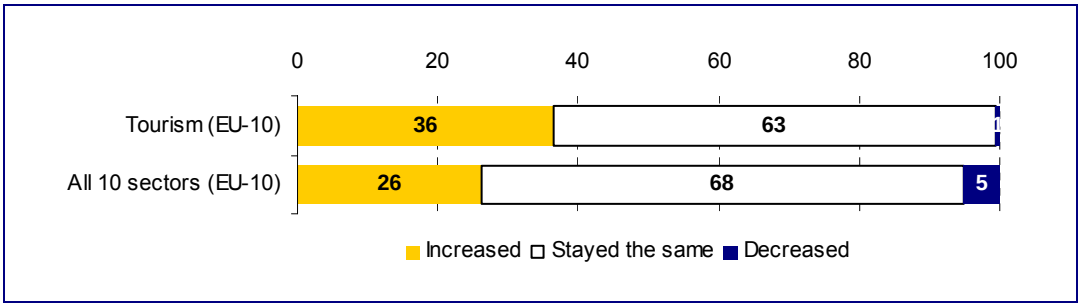
As in previous years, *e-Business W@tch* asked companies that use e-procurement whether this has had an impact on the selection of suppliers, i.e. whether the number of suppliers has rather increased or decreased due to their e-procurement activities, or whether this was without impact on the number of suppliers.

A majority of companies from the tourism industry (about 63%), as in most sectors studied this year, reported that e-procurement does **not have an effect on the number of suppliers**. However, 36% of tourism enterprises declared that the number has increased, which is higher than the respective all-sectors average of 26%. It appears that e-sourcing has helped companies finding new suppliers in the market; in other words, the market transparency in the tourism industry has increased. At the same time, the number of firms which say that they have consolidated their suppliers' base is negligible (less than 1%).

This finding is somewhat in conflict with the fact that many large firms which have established (or are establishing) sophisticated e-procurement schemes have the explicit objective to **streamline their supplier base**. ICT empowers them to bundle procurement activities of different establishments or even branches in order to exploit economies of scale. However, previous sector studies by *e-Business W@tch* have already shown that it is hardly possible to support this evidence by data from the e-Business Survey. The main

reason is that supplier consolidation is a strategy which is mainly used by the largest firms. As the *e-Business W@tch* surveys are focussing on SMEs, this study cannot provide conclusive data in this respect. However, e-sourcing activities clearly have an economic impact.

Exhibit 3-23: Impact of e-sourcing and e-procurement on the number of suppliers



Base (100%): Companies placing orders online (without "don't know"). N (for sector, EU-10) = 407. Weighting: in % of firms. Questionnaire reference: E9.

Source: *e-Business W@tch* (Survey 2006)

3.5.2 e-Integrated supply chains: SCM, financial e-processes and ICT links with suppliers

SCM – Supply chain management

Supply chain management (SCM) software can help tourism companies to match supply and demand through integrated and collaborative interaction tools. SCM allows companies to get an overview of its flows of products, information and finances. SCM coordinates and integrates these flows both within and among companies. One of the key objectives of any effective SCM system is to reduce inventory or over-capacities (under the assumption that products or services are available when needed).[41]

In the tourism industry, enterprises representing 16% of employment stated that they have a SCM system (see Exhibit 3-24). The use of SCM systems increases with company size: While only about 8% of small tourism firms said that they have adopted SCM, about 14% of medium-sized enterprises and 39% of large companies did so. The current deployment of SCM in the tourism industry is exactly in line with the average of the 10 sectors surveyed in 2006.

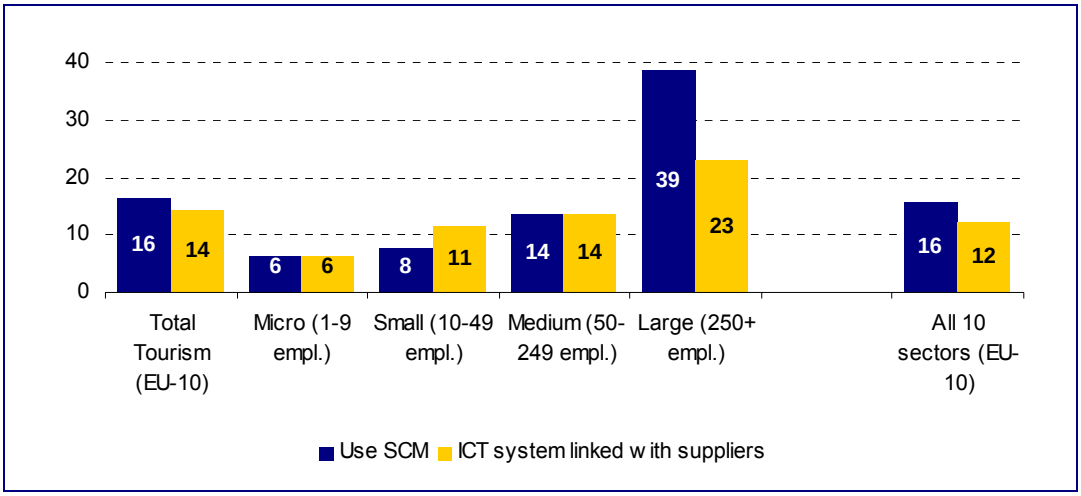
e-Business W@tch also asked companies whether their ICT system was linked to that of suppliers. Again, results for tourism are comparable to the cross-sectoral average (see Exhibit 3-24). Interestingly, the figures on the uptake of ICT systems linked with suppliers are similar to those with the general use of SCM in the field of SMEs, while they are much lower than the figures on the use of SCM by large companies.

This finding is somewhat contradictory to the general understanding of SCM which assumes some form of linkage of a company's ICT with its suppliers as a prerequisite. According to this understanding it could have been expected that the proportion of

[41] Cf. www.mariosalexandrou.com/definition/scm.asp: "Definition of Supply Chain Management"

companies which have their ICT systems linked with suppliers to be as high as the proportion of companies which use SCM systems. A possible explanation, however, might be that a great number of large companies have software for managing their inventory and supplies internally, without really integrating suppliers directly into their system. Thus, they use a form of SCM which is not interlinked with their suppliers; they automate the internal flows of materials and information, but they use other means to communicate their demands to suppliers.

Exhibit 3-24: Supply chain integration: use of SCM and ICT links with suppliers



Base (100%): Companies using computers. N (for sector, EU-10) = 725. Weighting: Totals (for the sector and for all 10 sectors) are weighted by employment and should be read as "enterprises comprising …% of employment in the sector(s)". Figures for size-bands are in % of enterprises from the size-band. Questionnaire reference: D1f, F13a.

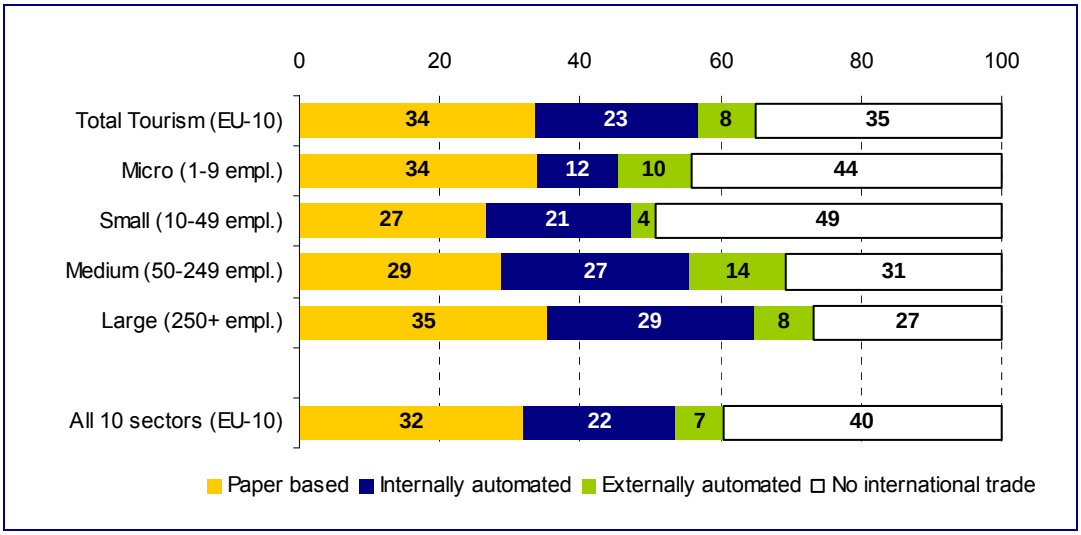
Source: *e-Business W@tch* (Survey 2006)

Integration of financial processes in international trade

A new question in 2006 was whether financial trading processes with international suppliers were mainly paper based, internally automated or externally automated. It is acknowledged that this question remains somewhat vague, as the difference between "internally automated" and "externally automated" is rather tentative, and because a telephone interview situation does not allow to go into a lengthy discussion on these issues. Even so, the results based on this question are able to give some basic understanding of the back-office integration of processes in international trade.

The results of the survey show that the relation between paper-based processes and automated processes (internally or externally) is quite balanced in the tourism industry. Automated processes are most relevant for medium sized and large companies, which indicate a much stronger uptake of international trade than their micro and small counterparts (see Exhibit 3-25). The different relations between internal and external automation in the various company size classes do not allow a clear interpretation.

Exhibit 3-25: Integration of financial processes in international e-trade



Base (100%): Companies placing orders online (without "don't know"). N (for sector, EU-10) = 400. Weighting: Totals (for the sector and for all 10 sectors) are weighted by employment and should be read as "enterprises comprising …% of employment in the sector(s)". Figures for size-bands are in % of enterprises from the size-band. Questionnaire reference: E6.

Source: *e-Business W@tch* (Survey 2006)

3.6 e-Marketing and Sales

ICT, and in particular the internet, can be used in various ways to support marketing activities, including the communication with customers, offering products or services for sale or developing new marketing strategies. In the tourism industry, a variety of services and products are sold via intermediaries, despite the fact that the internet enables service providers to sell directly to end consumers.[42] As many tourism companies recognise the potential of ICT for marketing and sales, the move towards web-based sales activities in tourism is much more advanced than in other economic sectors. Interestingly, although the tourism sector is one of the vanguards in the application of e-commerce, this does not hold true for all related applications. For example, the diffusion of ICT systems linked with customers is somewhat lower than in other sectors.

[42] For more information on this aspect, see the discussion in section 4.1 about dis-intermediation and re-intermediation in parallel.

3.6.1 Companies receiving orders from customers online

Online orders from customers

About **36%** of all firms active in the tourism industry in the EU-10 said that they **allow customers to order goods or book services online**; this figure is significantly higher than the cross-sectoral average of 25%. However, this average figure conceals some striking differences between tourism sub-sectors: While online orders and reservations from customers, unsurprisingly, play only a minor role in gastronomy, they are extremely important for travel agencies and tour operators (where 40% of companies accept online orders or reservations), and even more so for the accommodation sector where a sizeable 62% of accommodation providers said that they accept online reservations from customers (see Exhibit 3-26).

Exhibit 3-26: Companies receiving orders from customers online

	Accept orders from customers online		Receive 1-25% of orders online		Receive more than 25% of orders online		Use specific ICT solutions for e-selling	
Weighting:	% of empl.	% of firms	% of empl.	% of firms	% of empl.	% of firms	% of empl.	% of firms
Tourism (EU-10)	**49**	**36**	**68**	**72**	**32**	**28**	**28**	**11**
Micro (1-9 empl.)		35		74		26		8
Small (10-49 empl.)		46		69		31		20
Medium (50-249 empl.)		55		64		36		32
Large (250+ empl.)		61		65		35		50
Tourism sub-sectors:								
Accommodation sector	73	62	62	66	38	34	41	18
Gastronomy	24	16	72	83	28	17	15	3
Travel agencies & TO	53	40	74	78	26	22	26	20
All 10 sectors (EU-10)	**35**	**25**	**73**	**75**	**27**	**25**	**18**	**9**
Micro (1-9 empl.)		23		79		21		6
Small (10-49 empl.)		26		76		24		12
Medium (50-249 empl.)		29		75		25		16
Large (250+ empl.)		26		74		26		27
Base (100%)	firms using computers		firms accepting orders online		firms accepting orders online		firms using computers	
N (for sector, EU-10)	725		339		339		725	
Questionnaire reference	F4		F6		F6		F10	

Source: *e-Business W@tch* (Survey 2006)

This confirms earlier findings. However due to a change of the related survey question, the results of the surveys on online selling from 2005 and 2006 are not directly comparable. In 2006, companies where asked whether they would "allow customers *to order goods* or *book services* online from the website or through other computer-mediated networks". In previous surveys, the question was whether they would "use the internet or other computer-mediated networks *to sell* goods or services online". Thus, a

direct comparison of figures, e.g. with those for the tourism industry in 2005, must be treated with caution.

On first sight, it might seem that the growth in online sales in the tourism industry has ceased, as the percentage of companies which stated to make online sales in 2006 was exactly the same figure as in 2005 (36% each). However, this apparently zero growth may be the result of the different questioning in 2005 and 2006. It must be noted that in tourism there is a general debate about how to define "online bookings". For instance, some studies consider every reservation an online booking which was initiated via the internet (e.g. if a customer came across a hotel website on the internet, sent a request for booking a room manually by e-mail and the hotel replied manually by e-mail and made the reservation manually as well.)[43]

However, other studies define "online bookings" as fully automated: e.g. if a customer comes across a hotel website on the internet (maybe the individual site of the hotel or a platform of an online intermediary) with direct online booking functionality, where he can instantly check availability of rooms and make the booking, including the confirmation of the reservation within seconds – meaning that the whole workflow on the supply side is fully automated. The questioning in the 2006 survey within the framework of *e-Business W@tch* may be considered much closer to the second definition of "online booking". This might explain why the percentage figure did not rise from 2005 to 2006, as one would expect.

Furthermore, findings have to be put into perspective by the relative share of customer orders received online (as percentage of the total order volume).[44] In the tourism industry, a vast majority of about 72% of those companies that enable customers to order online say that online orders and reservations account for **up to 25% of their total orders** received (see Exhibit 3-26). In comparison, about 28% of companies receive more than a quarter of their orders online. These average figures are comparable to results of other sectors.

However, there are significant differences with different sub-sectors of the tourism industry: Only 17% of companies in gastronomy receive more than a quarter of their orders online, compared to respectable 34% in the accommodation sector. Overall, accommodation providers seem to be the strongest adopters of online bookings. If a company from the accommodation sector accepts orders from customers online, it tends to create considerable volumes of e-transactions. For instance, there are only 16% of accommodation providers which generate less than 5% of their orders online; in comparison 34% of accommodation providers generate more than 25% of their bookings online.

As in 2005, *e-Business W@tch* asked companies whether they "*support[ed] marketing and sales processes by specific ICT solutions*." The rationale for this question is to further test to what extent their e-commerce activities were **digitally integrated** processes, or

[43] To some extent, there is even a discussion whether a booking by telephone or fax, based on information found by the customer on the internet, should be considered an "online booking".

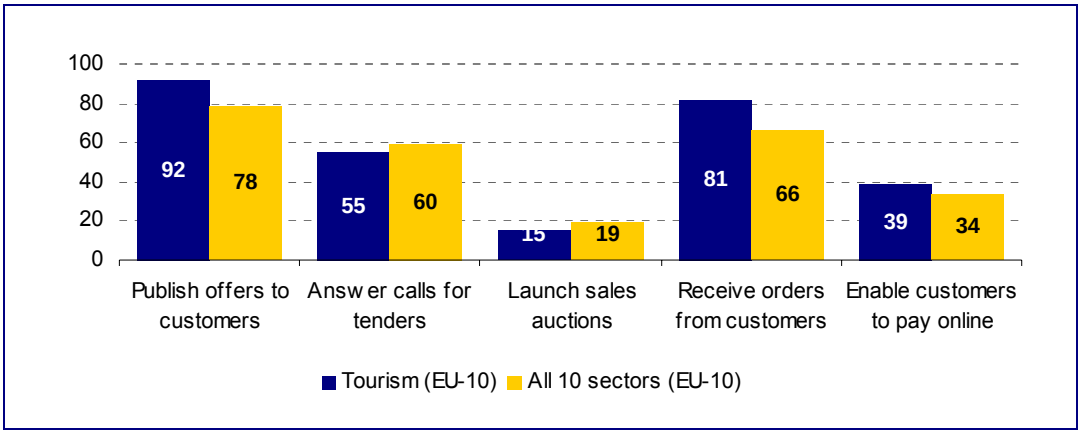
[44] Companies are asked to estimate how large a share of their total sales to customers (2003, 2005) / orders from customers (2006) is conducted online.

whether they used rather "simple" forms of e-commerce, such as receiving orders by e-mail without a system that integrates related information and document flows.

In the tourism industry, about **11% of firms** (representing about 28% of sector employment) reported the use of **specific software solutions** or internet-based services for their marketing and sales activities (see Exhibit 3-26). This shows that there is a considerable gap between the share of companies which receive orders and reservations online (36% of firms) and those that use special software for doing so (11%).

Those companies which use specific sales systems tend to use them mainly for **publishing offers** to customers (92%) and for enabling **customers to place orders** (81%; see Exhibit 3-27). Answering calls for tenders is less common (about 55%), and only 39% of companies with such systems also enable customers to actually pay for the goods or services online which they have ordered. The latter incidence shows how important it is to make a difference between the various phases in e-commerce transactions when analysing this topic. Enabling customers to place an online order in many cases does not mean that they can pay online. In these cases, payment is done in traditional ways, e.g. personally on the spot after having consumed the previously booked service.

Exhibit 3-27: Marketing and sales processes supported by specific ICT solutions



Base (100%): Companies using specific ICT solutions for marketing / sales. N (for sector, EU-10) = 133. Weighting: in % of firms. Questionnaire reference: F11.

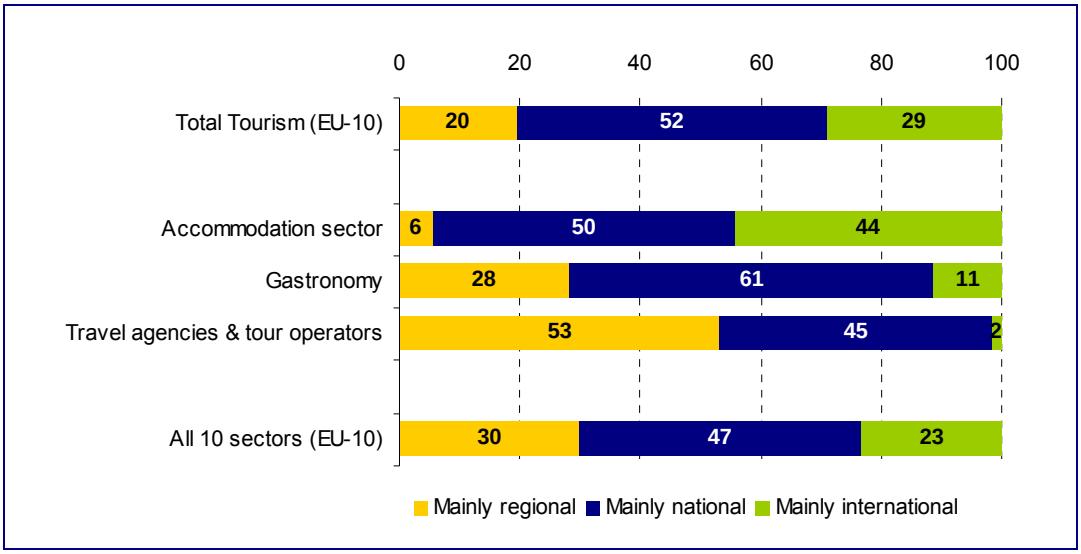
Source: *e-Business W@tch* (Survey 2006)

Location and type of customers placing online orders

Most tourism companies have stated that they receive online orders mainly from customers in their own country, while not necessarily from their own region. Compared to other economic sectors, the **geographic reach of e-commerce activities in tourism seems to be much broader**: Significantly more tourism companies which accept orders or reservations online say that their client base is mainly international (29% in tourism compared to 23% across all 10 sectors) or national (52% in tourism compared to 47% across all 10 sectors). Accordingly, only 20% of these companies have an online customer base which is mainly regional (compared to 30% across all 10 sectors).

The geographic distribution of customers that make orders or reservations online differs enormously between different tourism sub-sectors. International customers are extremely important for the accommodation sector while regional customers play a major role for travel agencies and tour operators. Obviously, this is due to the fact that accommodation providers serve an incoming market, while travel agencies and tour operators satisfy the demands of outgoing tourists.

Exhibit 3-28: Main location of customers that order online

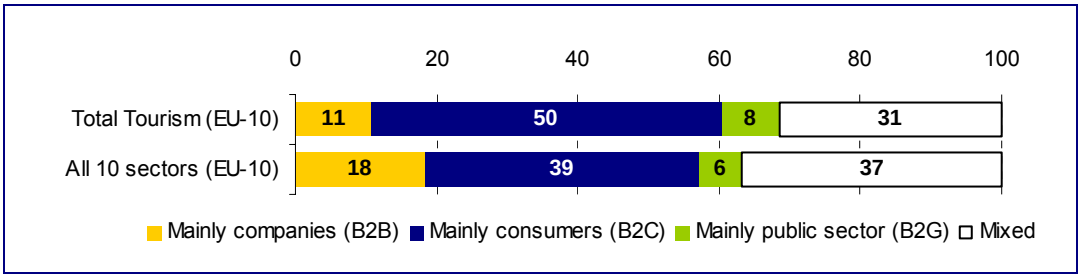


Base (100%): Companies accepting orders online (without "don't know"). N (for sector, EU-10) = 338. Weighting: in % of firms. Questionnaire reference: F7.

Source: *e-Business W@tch* (Survey 2006)

A large part of the **e-commerce activity** in tourism is either **focused on B2C** (in contrast to other economic sectors) or is mixed. 50% out of those companies which reported accepting online orders or reservations said that these are mainly from consumers. At the same time, slightly more than 10% said that bookings are mainly from other companies, which indicates that the internet is a very important sales channel which may allow companies to bypass intermediaries.[45]

Exhibit 3-29: Main type of customers that order online (B2B / B2C / B2G)



Base (100%): Companies accepting orders online (without "don't know").
N (for sector, EU-10) = 351. Weighting: in % of firms. Questionnaire reference: F8.

Source: *e-Business W@tch* (Survey 2006)

[45] For a more detailed discussion of the role of e-business in the market for intermediaries, see section 4.1 'dis-intermediation and re-intermediation' of this report.

3.6.2 e-Integration of marketing processes: CRM and ICT links with customers

One of the ICT applications that can help companies to improve the distribution of their products is **Customer Relationship Management** (CRM) for business intelligence purposes. CRM systems help the company to systematically increase the knowledge about customers and their profitability, and to build and adapt marketing strategies on the basis of this intelligence (see the chapter on CRM in the tourism industry in the previous *e-Business W@tch* Sector Study from 2005[46]).

CRM is a term that refers to a broad range of methodologies and software applications that help an enterprise to manage customer relationships in an organised way. Normally, CRM solutions are based on some kind of database with systematic information about customers and the business record the company has with them. Ideally, this information will support management, salespeople, staff providing services, and possibly the customers themselves in their tasks; for example by matching customer needs with product designs and offerings, and by specifying service requirements. Three levels of application of CRM are commonly distinguished:[47]

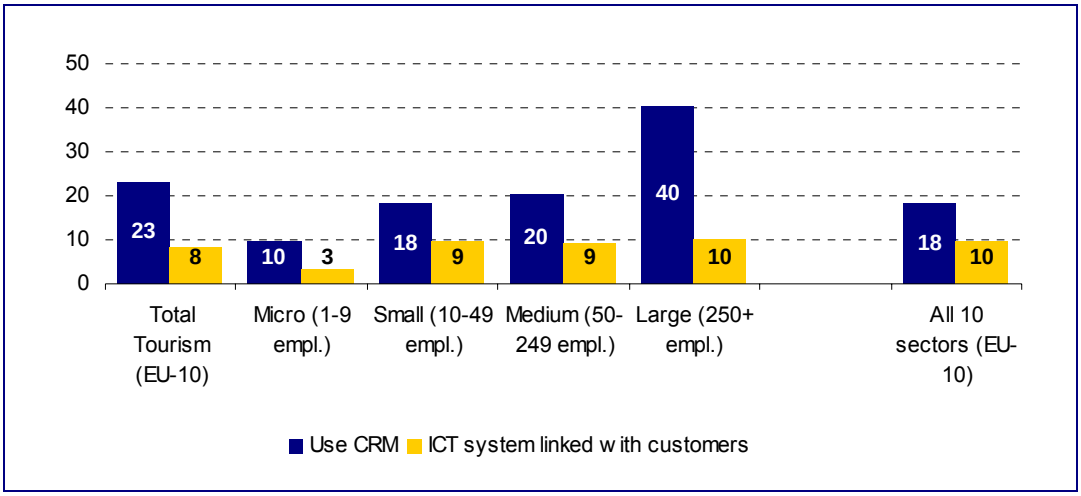
- **Operational CRM**: supporting front-office tasks by storing basic customer data (e.g. addresses, track records of contacts); the front-office enters new data as part of their work;
- **Analytical CRM**: analysis of data gathered through operational CRM in order to segment customers;
- **Collaborative CRM**: facilitates interactions with customers through all channels (personal, letter, web, e-mail) and supports coordination of company teams.

CRM applications appear to be more diffused in the tourism industry than in the average of the 10 sectors surveyed this year by *e-Business W@tch*. In 2006, enterprises representing about a quarter of this sector's employment reported using CRM (see Exhibit 3-30). However, the survey results indicate a gap between micro firms on the one hand, and large companies on the other: CRM is strongly used by tourism companies with more than 250 employees (40%). This should not come as a surprise: CRM software suites are quite expensive and require intensive organisational preparation to be effectively introduced in a company. Consequently, these could be major barriers for smaller firms to adopt CRM solutions.

[46] See *e-Business W@tch* Sector Report "ICT and Electronic Business in the Tourism Industry. ICT adoption and e-business activity in 2005" (September 2005). Available at www.ebusiness-watch.org ('resources').

[47] Cf. www.mariosalexandrou.com/definition/crm.asp: "CRM Definition"

Exhibit 3-30: Use of CRM and integration of ICT systems with customers



Base (100%): Companies using computers. N (for sector, EU-10) = 725. Weighting: Totals (for the sector and for all 10 sectors) are weighted by employment and should be read as "enterprises comprising …% of employment in the sector(s)". Figures for size-bands are in % of enterprises from the size-band. Questionnaire reference: F2, F13b.

Source: *e-Business W@tch* (Survey 2006)

e-Business W@tch also asked companies whether their ICT systems were linked to that of customers. The results are similar to the situation on the procurement side, where figures were quite different from those of SCM adoption. In a similar way, ICT links with customers are significantly lower than CRM deployment in tourism. Even in large companies, the adoption of ICT systems linked with customers lags behind CRM deployment (10% ICT systems linked compared to 40% using CRM). Interestingly, the respective figures for small, medium and large companies are quite similar: 9% of small and medium sized companies said that they have their ICT systems linked with customers and 10% of large enterprises did so. One explanation might be that this need not be directly related with collaborative CRM. It is also possible, that these links are part of an integrated e-commerce solution between companies, e.g. via dedicated EDI connections.

3.7 ICT and Innovation

To establish and utilise the **capability for innovation** is essential for European tourism companies in order to face global competition from international tourism destinations – in particular the emerging regions in Asia, the Pacific and America – and to retain their position in higher market segments. Product segments which are dominated by mass tourism and do not require a high level of know-how and innovation will continue to loose market shares to countries with lower wages. It is largely recognised that both product/service and process innovation (e.g. automation, flexible re-organisation) are key instruments for supporting this strategy. This can only be achieved by a large-scale deployment of leading-edge research results, a highly efficient process organisation and chain management, and a highly qualified work-force.

This competitive scenario pushes companies to use technologies for innovating products and for enhancing the quality and applicability of new services. **Process innovation** is centred on production/service processes, such as automated and computer-based booking systems, or processes aimed at providing both mass produced as well as customised services. In this context, *e-Business W@tch* asked companies whether they had launched any new or substantially improved products or services during the prior 12 months, and if they had introduced new or significantly improved internal processes. Companies that indicated that they had introduced innovations were then asked follow-up questions on the role of ICT for their innovation activity.[48]

Exhibit 3-31: ICT and Innovation activity

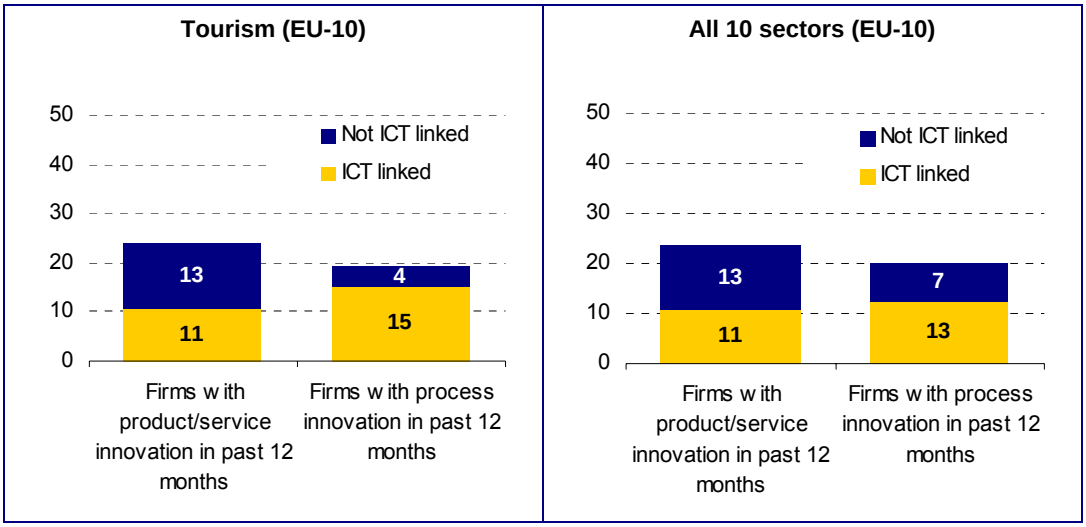
	Companies with new product innovation in 2005		Share of ICT-enabled product innovations		Companies with process innovation in 2005		Share of ICT-enabled process innovations	
Weighting:	% of empl	% of firms	% of empl	% of firms	% of empl	% of firms	% of empl	% of firms
Tourism (EU-10)	**32**	**24**	**53**	**44**	**35**	**19**	**76**	**78**
Micro (1-9 empl.)		23		37		18		77
Small (10-49 empl.)		34		50		29		58
Medium (50-249 empl.)		32		64		27		85
Large (250+ empl.)		43		66		57		83
All 10 sectors (EU-10)	**32**	**24**	**50**	**45**	**32**	**20**	**75**	**63**
Micro (1-9 empl.)		22		41		16		69
Small (10-49 empl.)		25		42		25		57
Medium (50-249 empl.)		33		45		38		71
Large (250+ empl.)		48		49		53		81
Base (100%)	firms using computers		firms with product innovation		firms using computers		firms with process innovation	
N (for sector, EU-10)	725		235		725		196	
Questionnaire reference	I1		I2		I3		I4	

Source: *e-Business W@tch* (Survey 2006)

[48] See also the special report about "the role of new companies in e-business innovation and diffusion", available at www.ebusiness-watch.org ('resources').

About a quarter of enterprises in the tourism industry stated that they had launched new (or improved) products or services in 2005. Almost half (44%) of these product or service innovations were related to or enabled by ICT (see Exhibit 3-31). Thus, the incidence of **product or service innovation** is exactly the same as the average figure for the 10 sectors. The role of ICT for this kind of innovation is similar to the other sectors surveyed this year by *e-Business W@tch*.

Exhibit 3-32: The role of ICT for product and process innovation



Base (100%): Companies using computers. N (for sector, EU-10) = 725.
Weighting: in % of firms. Questionnaire reference: I1 – I4.

Source: *e-Business W@tch* (Survey 2006)

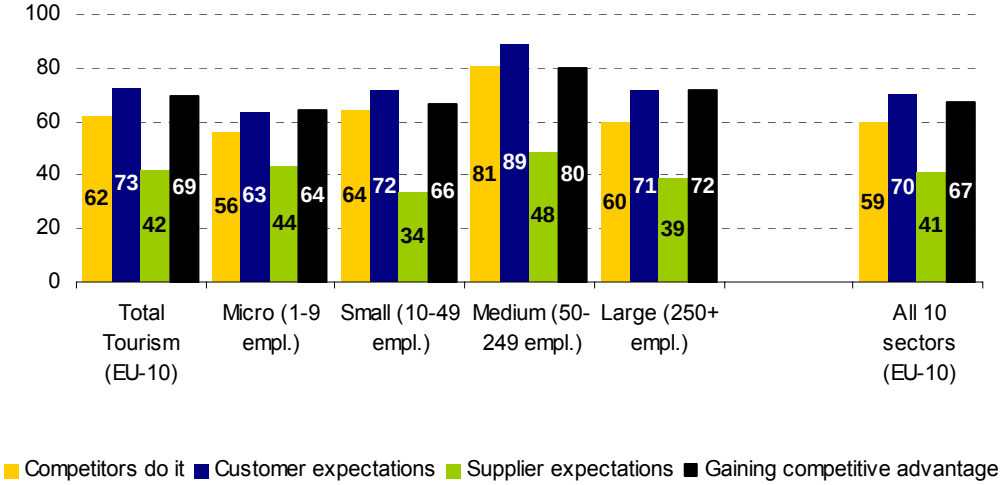
The area where ICT is considered most important is **process innovation**. This is also true for the tourism industry. In total, about 19% of tourism companies (representing 35% of sector employment) reported to have introduced new processes in 2005. 78% of these companies confirmed that these innovations were critically linked to ICT. Interestingly, the importance of ICT for process innovation does not vary considerably due to different company size classes: About 83% of large companies reporting process innovations in 2005 said that these innovations were ICT-enabled, while 77% of process innovations initiated by micro enterprises were ICT-enabled. Overall, in most sectors ICT-induced innovations were considered more important than other process innovations.

3.8 Drivers and Inhibitors for the Uptake of e-Business

3.8.1 Drivers of e-business adoption

Those companies that confirmed that e-business constituted "*a significant part*" or "*some part*" of the way they operate were then asked to indicate the rationale for starting their e-business activities. Four main reasons were suggested, in order to see whether it was simple imitation of competitors' activities, or a reaction to pressure from customers or suppliers, or whether companies saw an opportunity to gain a competitive advantage.

Exhibit 3-33: Drivers of e-business adoption: companies saying that … was an important reason for starting e-business (by company size classes)



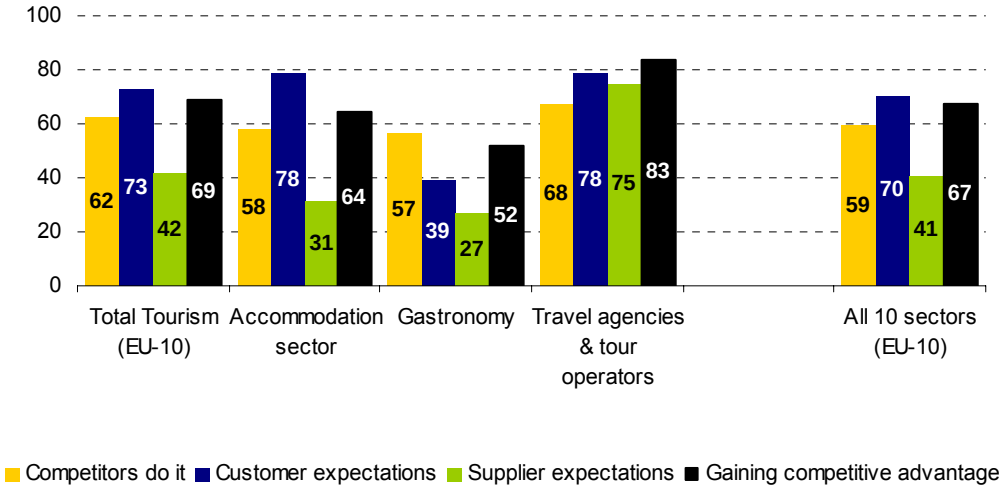
Base (100%): Companies saying that e-business is a part of their operations. N (for sector, EU-10) = 491. Weighting: Totals (for the sector and for all 10 sectors) are weighted by employment and should be read as "enterprises comprising …% of employment in the sector(s)". Figures for size-bands are in % of enterprises from the size-band. Questionnaire reference: H2.

Source: *e-Business W@tch* (Survey 2006)

Replies showed that all reasons were perceived as relevant, with **customers' expectations** and the opportunity to **gain a competitive advantage** as the most important reasons. Thus, the results for the tourism sector are in line with average results for all 10 sectors studied this year by *e-Business W@tch*. Suppliers were not considered as the main driving force, as was the case in other industries (mainly in the manufacturing sectors), which indicates that their influence in this regard is limited. Rather, pressure seems to be coming from customers. At the same time, the fulfilment of customer expectations also perfectly corresponds with efforts of tourism service providers to increasingly bypass intermediaries (see chapter 4.1 for a detailed discussion of the topic of dis-intermediation). Imitative behaviour ("*…because competitors do it…*") is also an important motive in the tourism industry – 62% of e-business practitioners stated that this was an important reason – but is considered as less relevant than the two main reasons mentioned above.

Interestingly, a break-down by company size classes does not give a clear picture. Reasons for introducing e-business processes for micro and small companies seem to be similar to the ones reported by medium and large enterprises (see Exhibit 3-33). The situation differs between sub-sectors, in particular concerning supplier expectations: these only play a minor role in the sub-sectors of accommodation and gastronomy, while they are of major importance for travel agencies and tour operators (see Exhibit 3-34). Customer expectations have exactly the same importance for the accommodation sector as for travel agencies and tour operators, while they are only about half as important for gastronomy. Overall, most drivers apply most for the sub-sector of travel agencies and tour operators.

Exhibit 3-34: Drivers of e-business adoption: companies saying that … was an important reason for starting e-business (by sub-sectors of tourism)



Base (100%): Companies saying that e-business is a part of their operations. N (for sector, EU-10) = 491. Weighting: Totals (for the sector and for all 10 sectors) are weighted by employment and should be read as "enterprises comprising …% of employment in the sector(s)". Figures for tourism sub-sectors are in % of enterprises from the respective sub-sector. Questionnaire reference: H2.

Source: *e-Business W@tch* (Survey 2006)

3.8.2 Barriers to e-business adoption

Those companies that claimed that e-business "does not at all constitute a significant part of the way the company operates" were then asked to indicate important reasons for not initiating e-business activities. Seven main reasons were suggested, in order to identify the main barriers:

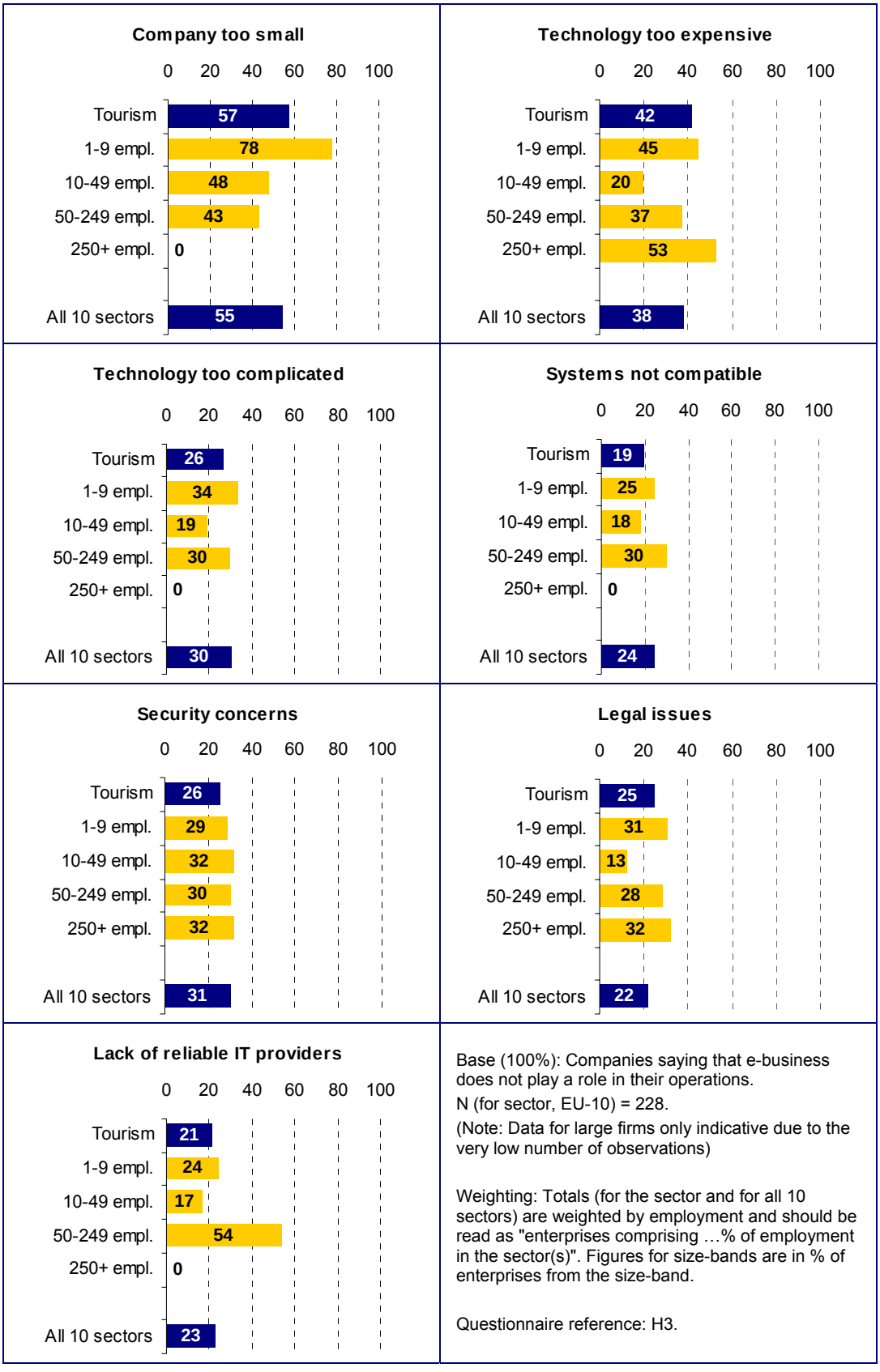
- the small size of the company,
- costs of e-business technologies,
- complexity of e-business technologies,
- lacking compatibility of technologies,
- security risks and concerns about privacy issues,
- perceived unsolved legal issues or
- the difficulty to find reliable IT suppliers.

Overall, the perceived barriers to e-business adoption in tourism seem to be very similar to the ones of the other economic sectors. The most prominent barrier seems to be that companies consider themselves to be **too small to benefit** from any e-business activities (see Exhibit 3-35). Unsurprisingly, especially micro enterprises expressed this argument. This is in line with the findings from other industries – with the important difference that there are many more micro enterprises in tourism than in the other sectors.[49]

The perception that e-business **technology is too expensive** is stated as the second most important argument (by enterprises constituting about 42% of employment in the sector). About one quarter of companies (weighted by employment) state that e-business technology is too complicated, raise security concerns or perceive important legal issues to be unsolved. About every fifth company (weighted by employment) stated that their systems were not compatible with those of suppliers or customers, or claimed not to have sufficiently reliable IT suppliers. Overall, these results show that the barriers to e-business adoption in tourism are very similar to the ones in other industries. Hence, tourism policies targeting these barriers may be similar to e-business initiatives in the overall economy – primarily focusing on measures strengthening technology adoption by SMEs.

[49] About 92% of tourism companies are micro-enterprises – see Chapter 2.2 'industry background'.

Exhibit 3-35: Barriers to e-business adoption as perceived by companies



Source: *e-Business W@tch* (Survey 2006)

3.9 Summary of the quantitative analysis

Main findings

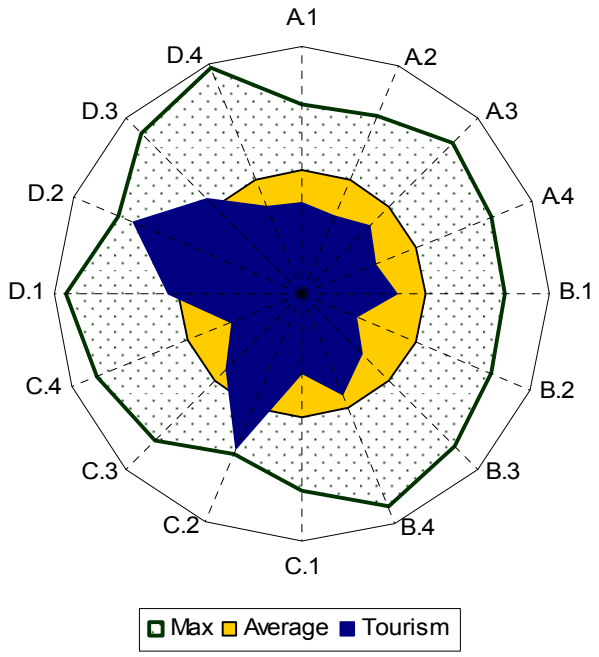
In a ranking of the 10 sectors studied by *e-Business W@tch* in 2006, the tourism industry scores in the **middle field regarding its overall use of ICT and e-business**. The tourism sector is lagging behind vanguard industries like the telecommunications sector or ICT manufacturing, but apparently performing better in ICT and e-business adoption than construction, the food sector or the footwear industry (see "e-Business Index 2006", following page).

Similar to findings from previous surveys, **marketing and sales** oriented objectives dominate electronic business in tourism (see “e-Business Scoreboard 2006”, following page). In three out of four component indicators in the field of e-marketing and sales (i.e. D.1 ‘CRM use’, D.2 ‘Firms accepting orders online’ and D.3 ‘Use of ICT systems for marketing/sales’) tourism shows results above the average of all 10 sectors surveyed. The only other component indicator scoring above the cross-sectoral average is an indicator in the field of e-sourcing and procurement (i.e. C2 ‘Use of ICT systems for sourcing’). In all other areas, the deployment of ICT and e-business in tourism is below the average of the 10 sectors. In particular, there are shortfalls regarding the infrastructure for ICT networks and the uptake of e-integrated business processes.

In terms of ICT adoption in regard to different size classes of companies, the most striking result is that smaller tourism companies appear as relatively more active users of e-business, compared to their counterparts from other industries (see e.g. the results in Exhibit 3-26). Although the gap between large and small players in making use of ICT and e-business applications certainly exists in this sector as well, it may be relatively smaller than in other sectors studied by the *e-Business W@tch* in 2006.

e-Business Index and Scoreboard 2006 [50]

e-Business Scoreboard 2006



Component indicators
(based on data in % of firms)

A. ICT Networks
A.1 Internet connectivity (index)
A.2 LAN
A.3 W-LAN
A.4 Remote access to company network

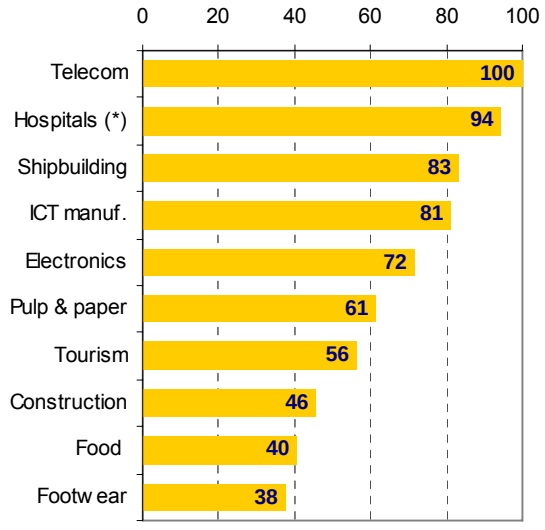
B. e-Integrated Business Processes
B.1 Intranet
B.2 ERP systems
B.3 Online tracking of production time
B.4 e-Invoicing

C. e-Sourcing and Procurement
C.1 Firms placing orders online
C.2 Use of ICT systems for sourcing
C.3 ICT system linked with suppliers
C.4 Online inventory management

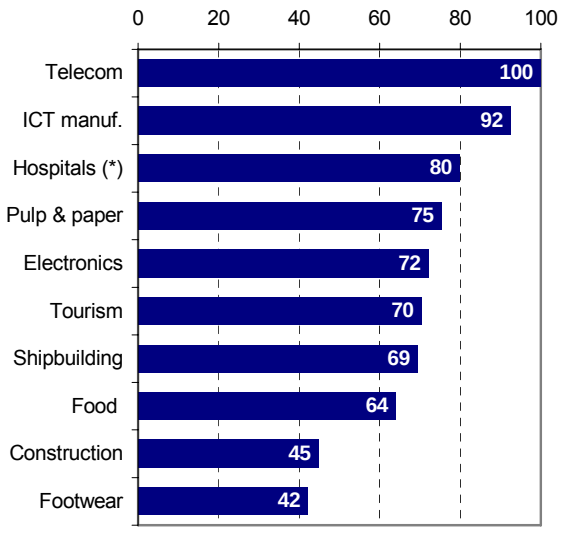
D. e-Marketing and Sales
D.1 CRM use
D.2 Firms accepting orders online
D.3 Use of ICT systems for marketing/sales
D.4 ICT system linked with customers

e-Business Index 2006
(based on 16 component indicators of the Scoreboard)

based on data in % of firms
(emphasizes activity in smaller companies)



based on employment-weighted data
(places a higher weight on activity in larger firms)



(*) The index for the hospital sector is not fully comparable to the other industries, as there are only few micro and small organisations in this sector. Thus, the apparently more intensive use of ICT is largely an artefact of the specific structure of this sector. When comparing only the large enterprises and organisations, hospitals would not be within the top rank.

Source: *e-Business W@tch* (Survey 2006)

[50] See Methodology Annex for information about the structure and computation of the scoreboard.

In 2006, results for some indicators were broken down by different **sub-sectors** of tourism. Findings show that the picture for the three sub-sectors studied (accommodation providers, gastronomy, travel agencies and tour operators) is very complex, with enormous variations for individual indicators (see e.g. Exhibits 3-1, 3-6, 3-13, 3-17, 3-20, 3-26 or 3-28). Overall, travel agencies and tour operators seem to be the strongest adopters of ICT and e-business, followed by the accommodation sector. For most indicators, gastronomy is scoring below these two other sub-sectors, although the results for many indicators are not as low as would have been expected.

- **Companies with broadband internet access**: The uptake of broadband internet connections in tourism companies is similar to the average in the 10 sectors surveyed. On average, micro enterprises in tourism show a stronger penetration with broadband than their counterparts from other economic sectors. Yet, the overall internet connectivity in the sector is somewhat below the average of the 10 sectors, i.e. there is still a considerable number of "internet deniers".
- **Small base of ERP systems:** The overall uptake of ERP (enterprise resource planning) systems - an important backbone for B2B integration and cooperation - is low in the sector; only large tourism enterprises show a higher uptake of ERP systems.
- **Online procurement** activity is significantly less developed than in other sectors studied. Yet, the results differ considerably between sub-sectors: Travel agencies and tour operators are rather strong adopters of e-procurement and the accommodation sector is very close to the average of other economic sectors, while in gastronomy online procurement activities are poorly developed.
- **Online marketing and sales** are the applications responsible for the common perception that "e-tourism has taken off". This is true especially for the area of B2C, and with major empirical evidence for the accommodation sector as well as for customer-facing e-business activities of travel agencies and tour operators.
- **Customer expectations and gaining competitive advantages – the main drivers:** The comparatively high relevance of e-business activities in the area of B2C corresponds with the companies' perceived major influence of customer expectations. Furthermore, gaining competitive advantages is still one of the most important drivers of e-business adoption. Interestingly, this holds true for the whole spectrum of company size classes.
- **Size and cost – the main barriers**: Companies that do not practice e-business see two main barriers that prevent them from doing so: they feel that their company is "too small" for doing e-business, and that they cannot afford the required technologies. Other barriers (e.g. security concerns, lacking compatibility of technologies) are perceived as less relevant.

4 Current e-Business Trends and Implications

Topics in focus

This chapter provides an insight into current ICT use and e-business activities which are specific to the tourism sector. The chapter does not claim to provide a comprehensive overview, as this would exceed the limits of this report. Also, it would be difficult to give a conclusive picture as ICT and e-business are relevant for nearly all core business areas of the tourism industry. Therefore, the issues analysed, as well as the case studies presented, should rather be understood as representative examples of current practices and related opportunities and challenges. The following issues have been selected in consultation with industry federations[51] and in coordination and agreement with DG Enterprise and Industry as particularly relevant and topical:

- **Dis-intermediation and re-intermediation in parallel:** On the one hand, ICT enables service providers in tourism to interact directly with consumers, which puts enormous pressure on traditional intermediaries (e.g. travel agencies). On the other hand, new players are entering the market (e.g. travel intermediaries operating exclusively online). At the same time, public tourism organisations tend to change their operations from pure providers of information to offering booking functionalities – which also generates new competition for traditional travel agencies. The study assesses how these developments shape the market of travel agencies and tour operators.
- **Dynamic Packaging:** Traditional packages provided by tour operators or travel agencies cover the task of bundling separate products quite well, but with limited flexibility. The trend towards individualisation of tourism demand requires more flexible, dynamic packages. Most tourists would prefer to book dynamic packages created according to their specific wishes and personal profiles instead of the cumbersome search for and individual booking of separate products offered by single service providers. Yet, back office solutions for service providers are extremely heterogeneous and even current tourist platforms work with different technologies (lacking standards and interoperability). Hence, technological and organisational barriers for truly dynamic packaging are considerable, but a number of players are working heavily on feasible solutions for dynamic packaging. Most experts in the field consider dynamic packaging as one of the most important technological trends in tourism. The study assesses the market impact of e-business solutions for dynamic packaging.
- **ICT-related developments in the aviation industry:** No-frills airlines are the most visible invention in the market of the transport for tourists. Their low-cost strategy relies on ICT for different purposes: The internet as the main sales channel, the

[51] E.g. ETOA – the European Tour Operators Association, HOTREC – Hotels, Restaurants & Cafés in Europe and ECTAA – Group of National Travel Agents' and Tour Operators' Associations within the EU. Among others, representatives from these organisations attended the *e-Business W@tch* kick-off meeting in Brussels on January 24th, 2006, and discussed the topics in focus with the authors of this study.

abandonment of paper tickets and complex systems of yield management not feasible without ICT. In recent years, most incumbent airlines followed the example of low-cost carriers often resulting in a reduction or cancellation of commissions for bookings by travel agencies (which may lead to dis-intermediation to some extent). Other innovations, apart from e-ticketing, are self-service check-in kiosks, the possibility to check-in at the passenger's home or office via the internet, bar-coded boarding passes and the possible introduction of RFID technology for luggage handling. The study discusses how these developments influence, or even transform, the aviation industry for tourism.

The case studies and business examples (summarised in Exhibit 4-1), together with analyses of secondary literature as well as the results of the e-Business Survey 2006, build the basis for identifying conclusions and implications for policy in chapter 5 of this report.

Exhibit 4-1: Case studies and business examples presented in this report

Chapter	Company / project	Country	Topic(s)
4.1	Case study: *YourGreece.com*	Greece	Example of a new online intermediary which promotes and mediates a network of 80 small and unique hotels and guesthouses in Greece.
4.1	Case study: *Lithuanian countryside tourism association*	Lithuania	Example of a non-governmental organisation engaged in intermediation, promotion, training and lobbying on behalf of Lithuania's countryside farm-stay owners.
4.1	Case study: *Adriatica.net*	Croatia	Re-intermediation online and beyond the internet at the largest Croatian online travel agency and tour operator.
4.1	Case study: *Accor Hotels*	France	Dis-intermediation by the strategy of Accor Hotels to control the costs of web-based distribution primarily by pushing its own website as distribution channel.[52]
4.2	Case study: *CSI Media*	United Kingdom	Example of a technology provider whose dynamic packaging solution powers numerous major travel sites.
4.2	Case study: *Lastminute.com*	United Kingdom	Personalisation and segmentation in dynamic packaging applied by one of the biggest online travel intermediaries.
4.2	Business example: *Touropa.com*	Germany	Business example of a small tour operator providing dynamic packaging services to its customers.
4.3	Case study: *Ryanair*	Ireland	The use of ICT for online booking, e-ticketing, internal communications, improvements in cost containment, operating efficiencies, route system and scheduling at Europe's largest low cost airline.
4.3	Case study: *SN Brussels*	Belgium	e-Ticketing and dis-intermediation at a full-service airline.

Source: *e-Business W@tch* (2006)

[52] This case study is a re-visit of an earlier case study on Accor Hotels, which was presented in the *e-Business W@tch* Sector Report on the Tourism Industry from August 2004. The previous case study focused on revenue management applications. See www.ebusiness-watch.org 'resources'.

4.1 Dis-intermediation and re-intermediation in parallel

4.1.1 Introduction

"Dis-intermediation" and "re-intermediation" are terms commonly used to describe the changing roles of intermediaries in the tourism value chain as a result of the increasing use of advanced IT solutions and e-business processes.

Dis-intermediation is usually associated with the substantially reduced role of traditional intermediaries (travel agencies and tour operators) in the tourism value chain - a development which is particularly triggered by the introduction of electronic means that enable consumers to transact directly with suppliers (cf. Buhalis / Ujma 2006, Carson / Sharma 2004). As demonstrated in Section 3.6.1, the internet is a very important sales channel in the tourism industry; it allows companies to bypass intermediaries.

Re-intermediation, on the other hand, describes a development converse to dis-intermediation, and refers to a process where traditional or new intermediaries use electronic means to provide added value tourism products and services to customers (cf. Klein / Werthner 1999). In practice, Buhalis and Ujma argue, these are two conflicting but parallel trends which have a profound impact on the role of intermediaries in the tourism market (cf. Buhalis / Ujma 2006).

Since the linkages between tourism suppliers and their potential customers in the tourism market are imperfect, intermediaries take the role of bringing tourism suppliers and potential customers together and to optimise trade relations between them (cf. Buhalis / Ujma 2006). Such intermediaries are traditionally travel agencies and tour operators: the function of tour operators is to put together tourism packages and to offer them to customers, either directly or through a retailer; travel agencies, on the other hand, act as booking agents for travels as well as a source of additional information and advice (cf. Buhalis 2003).

4.1.2 Dis-intermediation

With the ever increasing importance of information and communication technologies (ICT) and the introduction of e-business processes, initially research suggested that the producers of tourism products and services would increasingly be able to circumvent traditional intermediaries, and thus initiating a process that might eventually lead to the gradual elimination of intermediaries from the tourism value chain altogether. In fact, there appear to be strong economic incentives for both producers and consumers to omit intermediaries from the tourism value chain: intermediaries are generally associated with adding significant costs to tourism products, thus suppressing profit margins of producers of tourism products on the hand, while at the same time creating higher prices for consumers.

Dis-intermediation, however, the argument goes, will benefit both producers and consumers: producers because they get immediate access to consumers and whose profit margins are boosted, and which eventually allows them to pass a part of their

savings to the consumers; consumers, on the other hand, because they are able to enjoy lower prices and increased market transparency (cf. Giaglis / Klein / O'Keefe 1999, Klein / Werthner 1999, Daniele / Frew 2004).

Another argument brought forward in favour of dis-intermediation is that it can be difficult for established tourist providers to build up and preserve their distinctive brand. Richard Lewis from the Preferred Hotel Group, for example, argued at his presentation at the eTourism Futures Forum at the University of Surrey in March 2006 that *"...intermediaries do not help hotels to build up brand integrity and - even more important - rate integrity! For this purpose the Preferred Hotel Group intends to be and is an intermediary itself." (Richard Lewis 2006)*

As presented in chapter 3.6.1. of this report, *e-Business W@tch* survey results show that e-commerce activity in tourism is strongly focused on B2C (in contrast to other economic sectors) while B2B commerce is much less important, which indicates that the internet is a very important sales channel which may allow companies to bypass intermediaries (cf. chapter 3.6.1 'Companies receiving orders from customers online').

Some tourism related sectors have indeed been strongly affected by dis-intermediation. According to the 2004 Travel Weekly survey, the airline industry has been particularly successful at driving consumers to their own company websites. In the Travel Weekly Industry Survey of 2004, Travel Weekly suggested that airlines in the U.S. were expected to increase their reliance on their company websites heavily, which, in effect, has considerably reduced the role of established intermediaries. Other sectors, however, are much less affected by dis-intermediation: in the U.S. cruise line industry, for example, only 3% of sales were made directly over company websites in 2003 (cf. Travel Weekly 2004).

Also, the dis-intermediation argument focuses primarily on the costs of intermediation, but often does not consider the added value provided by intermediaries. Intermediaries, in fact, may provide many value-adding functions that cannot be easily replaced with direct producer-customer interaction (cf. Giaglis / Klein / O'Keefe 1999).

4.1.3 Re-intermediation

If, however, as the "re-intermediation" argument goes, intermediaries manage to provide value-added products and services, intermediaries may well continue to play a significant role in tourism value chain. Instead of disappearing intermediaries may in fact gain considerable significance in the market (cf. Giaglis / Klein / O'Keefe 1999). Travel agencies, indeed, are fighting back, mostly by offering value-added services, such as assembling complex itineraries or offering personal advice (cf. Buhalis / Ujma 2006, Klein / Werthner 1999). Similarly, tour operators have been trying to strengthen their position in the market by developing user-friendly computer systems and interfaces, cleverly packaging tourism products and by using the new media to promote their products more efficiently (cf. Buhalis / Ujma 2006).

Indeed, many intermediaries saw their online bookings soar in the recent years. While growth in the traditional brick-and-mortar business had been modest at best for years, languishing in single digits, the introduction of internet booking platforms boosted their

overall booking figures. Internet bookings in 2002 went from 5% (in 2001) to 20% at Travizon, from 8% to 20% at Travel, Inc. and from 30% to 45% at World Wide Travel (cf. Travel Weekly 2003).

The re-intermediation process has also lead to a new phenomenon - the emergence and the proliferation of online travel intermediaries. Some of these operators have achieved considerable growth rates in the recent years and have managed to challenge some of established traditional intermediaries (cf. Daniele / Frew 2004). At the end of 2002, in terms of gross sales, Expedia, for example, was already the 4th largest travel agency in the US, with gross sales of over $5.3 billion. A year earlier, Expedia had ranked only number eight of the leading travel agencies. Travelocity, another major online intermediary, ranked number 7, with gross sales of $3.5 billion. In its first full year, Orbitz moved instantly into the top 10 (ranking as number 9) (cf. Travel Weekly 2003). Only one year later, at the end of 2004, Travelocity already ranked number 5 of the top U.S. travel agencies, with gross sales of $4.9 billion; Expedia, which was part of IAC/InterActiveCorp until August 2005[53], still remained number 3, just behind the industry leaders American Express Business Travel and Carlson Wagonlit Travel (cf. Travel Weekly 2005).

Exhibit 4-2: Top 10 Online Agencies in the US
(by market share of travel agency category for April 2005)

Name	Domain	Market share (rounded)
Expedia	www.expedia.com	21%
Travelocity	www.travelocity.com	16%
Orbitz	www.orbitz.com	10%
Cheap Tickets	www.cheaptickets.com	8%
Yahoo! Travel	www.travelyahoo.com	7%
Hotwire	www.hotwire.com	6%
American Express Travel	www.itn.net	3%
Priceline	www.priceline.com	2%
Vacations to Go	www.vacationstogo.com	2%
AMXTravel	www.amxtravel.com	2%

Source: Travel Weekly's Power List

The newly emerged online intermediaries have mainly utilised two business strategies: dynamic packaging, which is covered in detail in chapter 4.2, and the merchant model (cf. Buhalis / Ujma 2006). In the merchant model, the intermediary receives an inventory of products and services from suppliers at negotiated rates. The online intermediary then determines the price of the final product/service by raising the negotiated rates to make up for its own costs and to account for a profit (cf. Daniele / Frew 2004).

[53] For further information on the spin-off, please see at the Expedia website. Online available at: http://press.expedia.com/index.php?s=press_releases&item=253 (18th April 2006).

4.1.4 Growth, mergers and acquisitions and strategic alliances in the intermediaries' markets

Overall, three broad groups of online intermediaries have emerged in the last few years: global players, regional players and local players.

- **Global players** (e.g. Travelocity, Expedia or Priceline) are mostly situated in North America, Europe and Asia.
- **Regional players** are mostly European, and to a lesser extent, Asian-Pacific companies. These companies have mostly grown through acquisitions of and joint ventures with other players.
- **Local players** are mostly intermediaries that have been unable or unwilling to move beyond their local markets. As a result, local players have often been the target for take-overs of players which were trying to build a local presence through acquisition (cf. Daniele / Frew 2004).

The substantial growth has been achieved essentially through a mix of market growth, mergers and acquisitions or through strategic alliances. However, while US based intermediaries have pursued growth strategies largely based on growth or joint ventures, their European counterparts have often tried to grow via acquiring other companies. According to Daniele and Frew this could be due to the nature of the European market: The European market, unlike the US one, is very fragmented and culturally diverse. Therefore acquisitions, they argue, have allowed these companies to acquire a local and cultural market presence. The current wave of acquisitions is likely to continue as many global and regional players are trying to increase their market position in the global market. In this development, US based companies, Daniele and Frew conclude, however, are best placed to expand their position due to their substantially higher capital resources (cf. Daniele / Frew 2004).

Besides acquisitions and mergers, strategic alliances also play a key role in the development and growth of intermediaries (cf. Daniele / Frew 2004). Expedia Inc., the world's leading online travel company, for example, has established partnerships with, among many others, the hotel chains Hyatt Hotels & Resorts, Kimpton Hotels or Hilton International, with BedandBreakfast.com – the leading online bed and breakfast internet directory and reservation network – or with MSN, Microsoft Corp.'s network of internet services (cf. www.expedia.com).

However, Daniele and Frew argue that the ongoing consolidation in the market could, in the long run, lead to the formation of oligopolies which could, as a result, reduce the level competition and, subsequently, result in higher prices and less choice for consumers (Daniele / Frew 2004).

The European Commission is aware of this development and has been closely monitoring the ongoing consolidation in the travel agency market - and in particular the online travel agency market. In 2001, for example, the Commission had launched an in-depth investigation on the plan of TUI and Neckermann to market leisure travel services jointly online via T-Online.

The Commission's assessment concentrated primarily on the risk that the new company might dominate the online travel market and the possibility of market foreclosure for other online suppliers. The joint venture could have had privileged access via its parent companies TUI and Neckermann, Germany's leading tour operators, to package-holiday products and via T-Online – the leading German telecoms provider – to a very large potential customer base.

Other online travel companies which were heavily dependent on the products supplied by TUI and Neckermann feared that the new company could dominate the online marker segment and that they would be discriminated in the case of agency contracts. In addition, the Commission examined whether the joint venture might also lead to the creation of a dominant position on the overall travel-agency market (comprising online and traditional travel agents). As a result of the Commission's investigation, the plans for a joint venture of were withdrawn and the Commission ceased its investigation (cf. European Commission 2001).

4.1.5 Dis-intermediation and re-intermediation case studies

In the following pages, four case studies on dis-intermediation and re-intermediation will be presented. The first three case studies, about re-intermediation at the platform *yourGreece* (Greece), successful intermediation efforts in *Lithuanian Countryside Tourism Association* and re-intermediation online and beyond the internet at *Adriatica.net* (Croatia) are examples of successful **re-intermediation** efforts. The fourth case study, about controlling the costs of web-based distribution by *Accor Hotels* (France) is an example which illustrates **dis-intermediation** efforts in the tourism industry.

CASE STUDY: RE-INTERMEDIATION AT THE PLATFORM YOURGREECE - TRAVEL SERVICES LTD

Abstract

yourGreece *is a small and independent online intermediary in Athens, Greece, which promotes and mediates a network of 80 small and unique hotels and guesthouses in Greece* worldwide via the website www.yourgreece.com. yourGreece *uses two simple, but effective e-business applications: an online payment system and a booking request system. The booking request system is a semi-automatic internet based application that allows the company to automatically process customer requests while at the same time addressing each customer/request personally and manually. Central to the business model of* yourGreece *is that it uses automation technologies merely to assist human interaction: The interaction with the customers is still done by an employee of* yourGreece*; automation mainly speeds up the manual processes of communication, identification of tailor-made accommodation packages and eventually booking.*

Case study fact sheet

Full name of the company:	*yourGreece – Travel Services Ltd.*
Location (HQ / main branches):	*Athens*
Sector (main business activity):	*Tourism*
Year of foundation:	*2005*
Number of employees:	*2*
Turnover in last financial year:	*Less than € 200,000*
Primary customers:	*Travellers and hotels*
Most significant market area:	*United States/Canada (ca. 20%), United Kingdom (ca. 20%), rest of Europe (ca. 40%)*
Focus of case study:	*Semi-automatic booking system*
Key words:	*Re-intermediation, tailor-made accommodation packages*

Background and objectives

yourGreece is a young, small and independent Greek company located in Athens. It was founded in 2005, has three shareholders - Jacoline Vinke, who wrote the books *Great Small Hotels in Greece* and its follow-up, *Around Greece in 80 Stays*; Philip Nielsen, an entrepreneur and e-marketing expert; and Aris Ikkos, a tourism consultant - and currently a staff of two employees. *yourGreece* is an online intermediary which offers personalised internet-based tourism services to bring together tourists and providers of accommodations. It represents a network of currently 80 small Greek hotels and guest houses which it promotes and mediates worldwide to travellers via the internet.

The main market of *yourGreece* is the mediating and booking of selected small hotels and guesthouses to travellers. While all the hotels which *yourGreece* represents are located in Greece, its customer base is mainly international: Most of its customers are travellers from Canada and the United States of America (over 20%), the United Kingdom

(ca. 20%) and other European countries (ca. 40%); the remaining share of customers are from countries all over the world, e.g. South Africa, Israel or Singapore.

yourGreece, by its own definition, does not target the mass tourism market of low-cost travellers, backpackers or package deal tourists - tourists that are mainly looking for the cheapest price - but rather travellers who are looking for high-quality tourism solutions and accommodation. Their customers are mainly highly-educated people, people who are familiar with using new technologies, families and off-peak season travellers (which is particularly important for hotels in a country like Greece, which has traditionally difficulties in attracting visitors in the off-peak season) or travellers who are trying to avoid mass tourism.

As the tourism market has become a global market, competition - both globally and in Greece - has steadily become fiercer in the last few years: As a result, an increasing number of companies offer similar, specialised services targeting small scale quality accommodation as *yourGreece*. This development was particularly sparked by the internet which allowed smaller companies to start services that were able to reach and attract customers all over world, without having to run expensive advertisement campaigns. Furthermore, established players like travel agencies have been entering the internet-based market to address the non-mass, customised market. Even the very big players like TUI are buying smaller companies or setting up services to address this market segment.

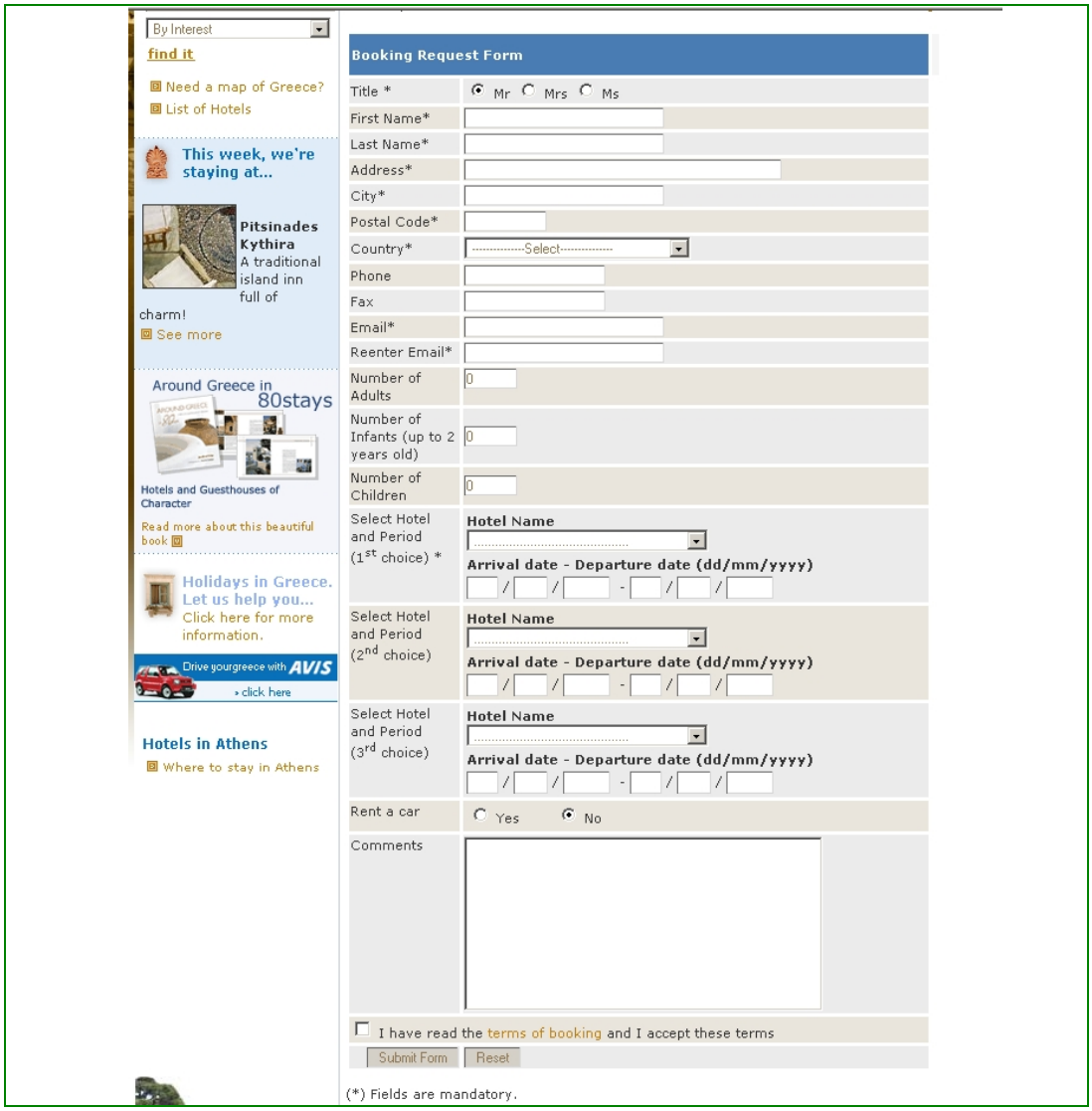
Although *yourGreece* is a very young company, it quickly managed to establish itself as the market leader in the specialised (targeting small scale quality accommodation), internet-based hotel booking market in Greece. In order to succeed in this highly competitive market, *yourGreece* selected an approach which combines the use of new technologies with a maximum of personal contact with the customer:

The initial idea came from a book, *Great Small Hotels in Greece,* which was written by one of the partners. Based on the research and experience from writing this book, the plan for establishing a platform to promote small scale hotels was developed by the three shareholders. They came to the conclusion that the many small Greek hotels would have difficulties to succeed in the global market against mass tourism organised by big players if they would not group together.

e-Business activities

yourGreece uses two simple, but effective e-business applications: an online payment system and a booking request system. The booking request system is a semi-automatic internet based application that allows the company to automatically process customer requests while at the same time addressing each customer/request manually/personally. These applications are built upon a custom software Windows environment, Osmium, which has been developed by the Greek company Creative Marketing S.A.

Exhibit 4-3: The booking request form of yourGreece



Source: www.yourgreece.com

Planning and implementation

The planning phase for establishing *yourGreece* was very short and took between three to four months. Following the set up of the *yourGreece* web platform, the portal was tested for about six months in a pilot phase. The implementation of the web platform was rather smooth and quick, mainly because the three founders knew exactly what they wanted, and also because they were able to learn on a daily basis.

The costs for purchasing and implementing the necessary e-business infrastructure (e-billing system, software, computer hardware) were less than 50,000 Euro.

The e-business model of *yourGreece*

The basic idea of *yourGreece* is that it serves as an intermediary, which promotes and mediates worldwide a network of small and unique hotels and guesthouses in Greece via the website www.yourgreece.com.

In addition to promoting hotels, *yourGreece* has identified companies and providers that offer various additional services and activities related to these hotels that can also be booked via the *yourGreece* website. For example, it offers potential customers tailored activities (e.g. photography classes, Greek cooking courses, outdoor activities) or assists customers in designing their own personalised trips. Furthermore, *yourGreece* helps organising the transport of its customers to the hotels (e.g. by hiring cars and leaving them at the airport). These services are offered complementary to the accommodation and their price is included in the overall package price which can be paid online. *yourGreece* only offers additional services if these have been tested and evaluated thoroughly. The services are identified and established in cooperation with the individual hotels.

The web platform hosts a wealth of information on each of the network's small hotels, as well as an online payment and a booking request system, whereby the latter one is at the centre of the business model. These systems combine two elements: automation and a high degree of human interaction. Automation is only used to assist human interaction. The interaction with the customers (travellers, tourists) is still done by an employee of *yourGreece*; automation mainly speeds up the process of communication, identification of tailor-made accommodation packages, booking and eventually payment between *yourGreece* and its customers. Without automation, the staff might easily get lost in dealing with high quantities of individual requests and thus delay customer response time. The automated booking request system tells the *yourGreece* staff what a particular customer has requested. From here on, however, most processes are carried out at a personal level: The company employees identify a product which will meet the customers' requirements and then communicate adequate offers via email to each customer. Response to customer requests normally happens within 24 hours.

E-mail communication is a vital element of the communication process with customers. The main advantage of e-mail communication is that it is personal and that it allows the staff to address all requests individually. Unlike mass booking services where most communication processes are fully automated with very little human interaction, e-mails at *yourGreece* are actually written by persons. In addition to internet based services, the company's multilingual staff (English, French, Italian, Dutch and Danish) provides additional support via telephone to answer any further queries. Even during their stay, the customers can contact *yourGreece* (by e-mail or telephone) to solve eventual problems. This system ensures that every service offered to each customer is tailor-made. What *yourGreece* has tried to achieve with this business model is to find the perfect balance between technology and personalised (manual) services.

In exchange for these services, the member hotels have to pay an annual membership fee to *yourGreece*. Membership fees range from 300 to 1,200 Euro. The amount of membership fees for each hotel is calculated according to its categorisation, whereby the key criterion is the exceptional value a specific hotel has: the higher the value, the higher the fees. In addition, *yourGreece* also keeps a commission on each individual booking (10 percent). In terms of overall revenues, there is a healthy balance between revenue from membership fees and revenues from bookings.

The hotels promoted and mediated via the *yourGreece* website are selected by the company's personnel on very specific quality criteria, such as: unique **location** (they are

situated in attractive and reasonably quiet spots), unique **design**, unique **service**, **size** (they generally have no more than 20 rooms; typically, they have between 8 and 12 rooms), **character and charm** (their architecture is appealing, most are historical buildings, and inside they are tastefully furnished and decorated), atmosphere and **facilities** (they offer a good level of comfort and service and a reasonable value-for-money ratio). These criteria are periodically checked by the staff of *yourGreece*. Furthermore, the quality of its services and its member hotels are evaluated by asking each individual guest for feedback.

After only one and a half years of operation, *yourGreece* has already a significant number of recurring guests, and positive recommendations by previous customers.

Planned amendments and future expansion

For the near future it is mainly planned to expand the booking request system. This is connected with the intention to automate the network's hotel booking systems (many of them are still paper based) and to integrate them with the booking system of *yourGreece*. This will allow *yourGreece* to rapidly speed up the checking of the availability of rooms in the various member hotels. Currently this is still done manually - a process which can be very time and resource intensive, as *yourGreece* has to contact each hotel individually by phone.

However, this is a complicated process because most of these hotels are very small units and many of them regard information technologies with suspicion. Consequently they hesitate to invest in IT infrastructure and many of them do not have the ability for major investments. Therefore *yourGreece's* strategy to convince them to acquire relevant hardware and software, is to bring them additional business: the more business they get through *yourGreece*, the more receptive they will be to new ideas and investments.

In addition, *yourGreece* plans to develop a whole series of customised tours, e.g. wine-tasting tours, olive oil tours or tours in remote, rural and unknown areas which will also be offered via the website. These new tours should attract a wider range of potential customers. It is also planned to enlarge the customer base by offering its services in more languages. At the moment the web platform is available only in English. However, *yourGreece* does not plan to simply offer translations of its existing services but, in fact, to provide language and culturally specific services for the German and French speaking countries, the Scandinavian countries, The Netherlands and Italy.

Eventually, *yourGreece* intends to enhance its promotion and advertisement activities over the web and to strengthen the cooperation with Google and Yahoo in order to increase the visibility of its website and services via the most important search engines.

Impact

Overall, in 2005 about 150 bookings were made over the web platform; in comparison, only in the first quarter of 2006, already 85 bookings have been made via the platform. Based on the turnover figures of the first quarter of 2006, and assumed that the growth rate will continue throughout the year, it is expected that the overall turnover of *yourGreece* for 2006 will be at least three times as much as in 2005 (its first year of operation). Since early 2006, the number of bookings has substantially increased: For

some hotels the number of bookings has increased by 100%, for some even by 200% in comparison to the figures of 2005.

Generally the hotels have benefited from the services offered by *yourGreece*, although it is difficult to generalise: some hotels have benefited more than others. Hotels, for instance, which have not been well-known before joining *yourGreece* have really taken off; others which were already well known and popular, have had smaller increases in terms of bookings. Therefore, it is difficult to compare them directly or to provide average figures. The location of the hotels appears to be the most determinant factor for the level of benefit: hotels in remote or little known areas have definitely had less benefit – a lot of work remains to be done to promote these regions more.

In terms of reorganisation of processes, the most important impact has been that the member hotels have started to cooperate with each other, instead of working on their own. The hotels have realised that, in order to be successful in the market, they have better chances if they work together. Indeed, many of the hotels promoted via *yourGreece* were cautious of the idea at the beginning because they were sceptical of the new technologies and the internet. Moreover, some of the hotels were afraid of cooperating with hotels which they regarded as direct competitors.

Lessons learned

One of the lessons learned was that the company had not realised from the start how much time and resources were needed to communicate the idea of *yourGreece* to each of the 80 hotels (with 80 different personalities representing them) and to convince them to participate. Also, the company did not realise how much time it would take for *yourGreece* to establish a "name" and visibility.

Another lesson learned was that each customer needs a lot of time to serve. Thus, the service proved to be much more time and cost-intensive as previously assumed. However, in the end it seems to pay back: *yourGreece* has a 98% satisfaction rate with its services, based on the evaluation results of its customers, and the comments are overwhelming positive.

> *"As a final lesson learned"*, Mr Nielsen argues, *"I would say, it is very, very hard work to please your customers nowadays, but if you can do it, you will have wonderful customers; they bring you business. They are your best advertising."*

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CASE STUDY: SUCCESSFUL INTERMEDIATION EFFORTS IN LITHUANIAN FARM-STAY TOURISM / COUNTRYSIDE TOURISM ASSOCIATION OF LITHUANIA

Abstract

*The non-governmental organisation (NGO) **Lithuanian Countryside Tourism Association** (from now on LCTA) unites over 1,000 businesses in Lithuania providing countryside (farm-stay) tourism services. The NGO is active in promotion, training and lobbying on behalf of Lithuania's countryside farm-stay owners. In 2003 LCTA has implemented an innovative e-business online tool – a special search engine allowing users to browse through the Lithuanian farm-stays and craftsmen activities within a 50 km radius according to their preferences. The implementation of this tool has resulted in a significant increase of (especially foreign) farm-stay travellers visiting Lithuania. Since the implementation of the web search tool almost 100% of surveyed foreigners and 60% of local visitors in farm-stays have found their accommodation via this engine.*

Case study fact sheet

Full name of the company:	*Countryside Tourism Association of Lithuania*
Location (HQ / main branches):	*K. Donelaičio st. 2-201, LT-44213 Kaunas Lithuania*
Sector (main business activity):	*Farm-stay tourism*
Year of foundation:	*1997*
Number of employees:	*2 (full-time)*
Turnover in last financial year:	*Approx. 150,000 Euros*
Primary customers:	*Farm stay owners in Lithuania*
Most significant market area:	*Uniting and representing local farm-stay tourism actors*
Focus of case study:	*Online search engine*
Key words:	*Re-intermediation, accommodation sector, countryside / farm-stay tourism*

Background and objectives

The farm-stay or countryside tourism in Lithuania has developed due to economic and social pressure in the provincial regions of the country in the 1990s. Traditionally, poorer provinces were encouraged to change their main function from agriculture to more productive and sustainable activities like tourism. In addition, in the late 1990s, Lithuania was trying hard to open negotiations for the EU accession which also meant that reforms had to be prepared for the local agricultural sector.

After the negotiations with the EU had started in 2000, PHARE accession funds were made available to facilitate the growth of the farm-stay business. After a number of countryside tourism businesses were established, it became obvious that there was a need for the coordination of the promotion, training and lobbying of farm-stay owners. Hence the LCTA was founded in 1997. It was an initiative of the Ministry of Agriculture, the tourism department and the local farm-stay owners who were experiencing great

economic difficulties at the time due to the regional economic recession in the period of 1997-1999.

The LCTA is a non-governmental organisation (NGO) representing farm-stay tourism in Lithuania. In April 2006 the NGO had 1,015 members (in 1997 only 17), which not only included farm-stay owners, but also training institutes (i.e. universities), local municipalities and individual experts working in the field of rural tourism. However, the organisation does not include all the farm stay owners in the country (approximately 350 out of 500 in 2006).

Among its services the NGO offers farm stay certificates, farm-stay branding with patented quality labels, farm-stay inclusion in the search engine, training schemes and other benefits in return of the sign-up for membership (145 euros) and a yearly membership fee (from 17 euros to 86 euros). The LCTA is financed from membership fees, public funds, online advertisements and, occasionally, from various EU funds. The latter, however, are more difficult to acquire since Lithuania's EU accession in 2004. The main barrier to participate is the requirement for co-financing of structural funds projects.

Strategically the LCTA hopes that farm-stay tourism in Lithuania will benefit from south-north (Germany, Holland to Baltic States) and north-south (Scandinavia to Baltic States) tourism flows. Since 2001 tourist arrivals in the sector have tripled. Naturally the biggest competition is seen from farm-stays in Latvia, Estonia (600 farm-stays) and Poland.

Exhibit 4-4: Farm-stay tourist arrivals in Lithuania

Year	Farm-stay arrivals (in thousands)	% of foreigners
2001	72	-
2002	120	3%
2003	164	10%
2004	167	12%
2005	215	18%

Sources: Interviews with Regina Sirusienė, April 11th, 2006, Brussels-Kaunas and with Valentina Duškina (UAB "Rodiklis"), April 19th, 2006, Brussels; Articles from: Verslo Banga (online business portal; 2005-12-10), Takas (online business portal; 2006-04-08), Lithuania in the World (online magazine about Lithuania; vol. 11, nr. 3, 2003)

e-Business tool

According to Klaus Ehrlich (President of the European Federation of Farm and Village Tourism) most rural tourists in Europe ranked the possibilities of online reservation, security and an impressive nature as the most desirable options in farm-stay vacations (UNWTO Conference on: *"Impact of the European Union Enlargement on tourism development in Europe",* Vilnius, Lithuania, 1-2 March 2006).

In 2003 LTCA launched an online search engine system on its own website (www.countryside.lt). The search options allow users to choose farm-stay accommodation according to various options, quality labels and to-do activities within 50km radius. The database is constantly updated with new information on prices, promotions and new farm-stays. The main expectation is that the search system will allow

rural tourism to flourish and become more competitive in terms of attracting local and foreign visitors to Lithuanian farm-stays.

e-Business activities

Creation of the search engine

The creation of the online farms-stay search tool on www.countryside.lt was an initiative from the LCTA. The NGO saw a need to re-intermediate among the more than a thousand business owners in Lithuania and potential tourists by providing them with a *one-stop-shop* to choose their farm-stays according to the uniform search criteria. In addition there was a need to improve the quality of Lithuanian farm-stay business via integration, standardisation and labelling of businesses.

The first year of operation in 2002 was financed by the Ministry of Agriculture. Approximately 35,000 euros were provided for the development of the search engine since the LCTA did not have enough resources and could not persuade its members to pay for this development. Initially six full-time employees worked on the tool but now, as the search tool is fully functional, two people maintain the database and implement changes.

Exhibit 4-5: The search engine at the platform of LCTA

How it works

The website www.countryside.lt offers clients five search options:

1. Instant search for farmsteads (option for returning customers likely since a farm number is required);
2. Search for places to visit where one can chose between ten sites (i.e. churches, castles);
3. Search by (ethnographic) crafts (14 types; within 50km of a chosen location);
4. Search the whole website;
5. Extended search for farmsteads (see next page).

Source: www.countryside.lt

Facts

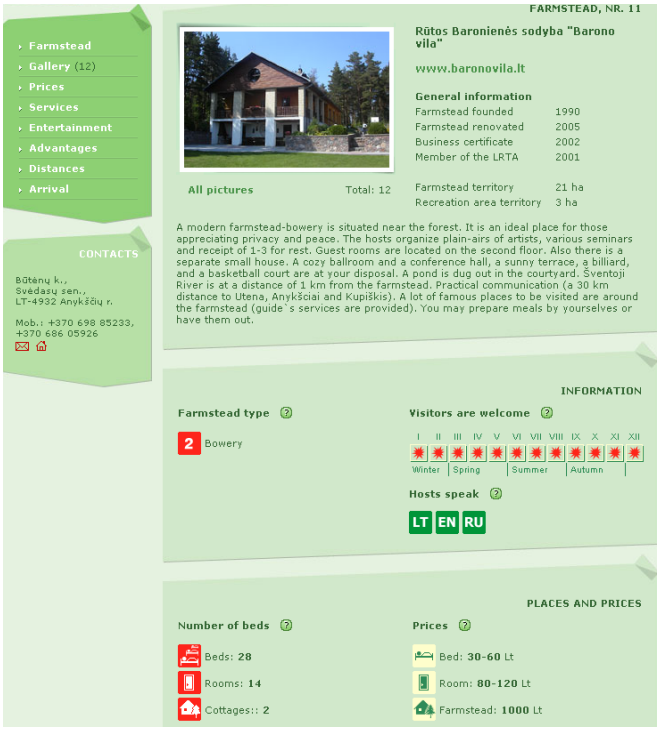
- The website receives on average 1,000 unique visitors per working-day and 600 on a weekend-day;
- Updates are made daily;
- Almost 100% of the foreign and 60% of the local farm tourists have found their farm stay via this website.

Extended Farmstead Search

In addition, the website offers extended farmstead search possibilities, which allows users to choose their accommodation by stay category, price, host language and a selection of services. To highlight the quality of the services offered, the site uses the patented quality label of the LCRA - a stork: the more storks the higher service quality of the farm. To be registered as a farmstead the owner has to have at least a sauna, water sport infrastructure and a fireplace installed.

Farm-stay business in Lithuania is defined (registered) not only in terms of accommodation services but also linked to ethnographic foods and activities. The database is updated daily by a subcontractor – UAB Rodiklis (Lithuania) – the company that also created the search engine platform. The updates to the database are submitted by farmstead owners themselves to UAB Rodiklis. From 2003 on, all expenses of the database are borne by farmstead owners themselves (paying directly for UAB Rodiklis for updates and maintenance). A typical result from a database query is shown below:

Exhibit 4-6: Search results at the platform of LCTA



- Every LCTA-certified farm is numbered, has a short description in four languages and lists of dates when reservations can be made and a list of services and prices. In addition, an address is provided of how the hosts can be contacted;
- In exceptional circum-stances the LCTA will mediate between clients and farm-stay owners;
- *There is no opportunity to do a reservation/payment online yet.* This service is practically ready; however, due to technical barriers it will be made available after September 2006.

Source: www.countryside.lt

The most important requirement for the implementation of such a search tool was the ability of the LCTA to get initial finance for kick-starting the venture, certification of the farmsteads according to a uniform system and the persuasion of business owners to participate in the project.

- LCTA was very successful in lobbying for government financial support for initial stages of the project;
- It took almost two years to create a thorough database and certify all owners of Lithuanian farmsteads. In addition the NGO held a number training sessions for the business owners to teach them how to use the tool and benefit from it. According to LCTA, however, there is still a significant lack of 'business mentality' among farmstead owners in Lithuania;
- After only one year of operation of the online search tool, farmstead owners were convinced of the benefits of the tool and were ready to "foot the bill" of the project themselves;
- The main technological problem hindering further adoption of the tool is the lack of internet access by the Lithuanian farm owners. In 2006, only about 30% of farm-stay owners had access to the web (no statistics on broadband or dial-up). However the situation has improved significantly in comparison to the previous years.

Impact

According to LCTA there was a significant impact on the rural tourism market in Lithuania after the online search tool had been implemented in 2003. The impact can be seen in terms of effects on arrivals, work organisation and business relations in farm-stay business in the country. Although it is difficult to assess exactly the increase in tourist arrivals due to the search tool, it has been noted that:

- The 2004-2005 period saw a 28% increase in rural tourist arrivals; it was suggested that up to 10% of this increase can be attributed to the search tool;
- Foreigners constitute a growing share of farm-stay tourism in Lithuania. In 2005, their share increased to 18% of total stays from 12% in 2004; the increase in foreign arrivals can be directly attributed to the availability of the online search engine because since 2004 almost all foreign visitors found their accommodations via this site;
- In 2005, 60% of domestic (Lithuanian) farm-stay visitors found their accommodation via this site.

As to internal work organisation, the rural farms-stay owners have now centralised their booking processes, which in effect helped to increase their occupancy rates faster. Most reservations for the summer season (June-August) are already made two months in advance.

The success of the online tool has encouraged farm-stay owners and the LCTA to lobby harder for internet access in rural Lithuanian regions. Lithuania is (unfortunately only) one of three countries in the EU-25 supporting wide-scale WIMAX implementation (Intel based wide range (up to 10km) wireless internet) adoption, which would benefit rural tourism significantly. The wireless solution is a good option for Lithuania because there is a lack of fixed telephone lines to scarcely located farms in the province which could provide standard modem dial-up or ADLS connections.

The tool also fostered regional leadership and increased the competitiveness of Lithuania in the rural regional tourism market. There are similar tools in Latvia and Estonia; however, the Lithuanian website offers more search option choices. On the other hand there is visible cooperation (i.e. advertising on each others websites) among the Baltic farm-stay associations as well.

Lessons learned

The LCTA is satisfied with the implementation of the online search tool and the impetus it gave to the Lithuanian farm-stay market. The LCTA has stressed that further development of this e-business tool will be taking place (i.e. online booking capability adoption) in the near future.

Further advancements are, however, dependant on the general lack of internet infrastructure in the rural regions of the country. Currently the LCTA is negotiating with a number of private (infrastructure) companies trying to improve this regional digital divide problem. If more farms would have internet access the relevance and use of the online search tool could be greatly enhanced. This would also ease the implementation of the planned online booking system which is now delayed because of coordination and internet access problems.

The LCTA also noted that due to a general initial relationship of "mistrust" between the agency and farm-stay owners it was difficult to kick-start the venture. The general lack of business and IT skills among owners is still a significant barrier improving business competitiveness of Lithuanian rural tourism.

The LCTA is also very keen to promote Lithuanian farm-stay opportunities abroad and their decision to equip their website with the search tool was a significant step forward in their marketing work.

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CASE STUDY: RE-INTERMEDIATION ONLINE AND BEYOND THE INTERNET AT ADRIATICA.NET, CROATIA

Abstract

adriatica.net *is the largest Croatian online travel agency and tour operator based in Zagreb. Established in February 2000, it employs more that 100 employees and has subsidiaries in Prague, Warsaw, Trieste, Ljubljana, Bratislava and Vienna. Its web portal comprises over 150,000 pages that have been translated into 11 languages.*

The company aims at enabling their customers to search, plan and book travel arrangements by means of web based search and booking functionalities. For this reason, adriatica.net *has developed its own booking technology. The business development of* adriatica.net *reveals strong re-intermediating tendencies in online and traditional fields.*

Case study fact sheet

Full name of the company:	*adriatica.net*
Location (HQ / main branches):	*Zagreb*
Main business activity:	*Selling Croatian tourism products via internet*
Year of foundation:	*2000*
Number of employees:	*110 full-time and 20-40 part-time*
Turnover in last financial year:	*€ 9.3 Million*
Primary customers:	*Business and individual travellers*
Most significant geographic market:	*Hungary (14%), France (12%), Italy (12%), Germany (10%), Croatia (7%), Poland (6%), Czech Republic (5%), Slovenia (4%), United Kingdom (3%), Switzerland (3%), Austria (3%)*
Focus of case study:	*Reservation and booking technology*
Key words:	*Re-intermediation, online and traditional intermediary, online booking platform*

Background and objectives

Founded in 2000, adriatica.net is a travel agency and tour operator operating primarily online in the business to consumer sector. 25% of its turnover accounts for traditional channels like paper catalogues and travel agencies (business-to-business). On its website, the company provides access to almost 10,000 accommodation units, comprising hotels, private apartments, sail and charter boats, lighthouses, villas and car rentals in over 250 destinations throughout the entire Croatian coast and islands. Currently adriatica.net's workforce consists of 110 full-time and 20 part-time employees.

Rationale and business objectives for implementing adriatica.net

Adriatica.net started as a project within the Emporion Company for investment and informatics, founded in the beginning of the 1990s. The most significant of Emporion's business assignments was the setup and implementation of payment software systems and database solutions. The following points summarise the emergence of *adriatica.net*.

1. Emporion realised early on that there was a great potential for ICT based solutions in tourism, which constitutes one of Croatia's strongest economic sectors;
2. Emporion's internal research on the state-of-the-art of online tourism in Croatia revealed that there was no (appropriate) presentation of private accommodation offerings on the internet in terms of *"what you see [accommodations] is what you get"*.
3. As a result, a business model for the presentation and booking of private accommodations was developed, implemented and tested in the framework of a project. The first online reservation via the *adriatica.net* website was made in 2000, one month after the website went online.
4. Within its first year, the model had already proved to be economically feasible and viable. This reinforced the intention to further develop adriatica.net. In May 2002, *adriatica.net* dissociated itself from Emporion and started to work as an autonomous company with technical personnel from Emporion.

The initial business steps of adriatica.net can be summarised as follows:

- Selection of accommodation providers across the whole Croatian coast;[54]
- Convincing the accommodation providers to participate in *adriatica.net*;
- Collecting the data on every single accommodation unit for the online data base;
- Setup of the website and presentation of the data;
- Starting of (online and traditional) marketing activities to promote *adriatica.net*;
- Booking and reservation activities.

Business activity and the market

adriatica.net started as an online company, but has since increasingly extended its business activities into "traditional" business fields by acquiring high street tour operators and travel agencies.[55]

In the year 2005, 75,000 tourists visited Croatia via *adriatica.net* and 282,000 via the services of the *adriatica.net* group. In 2005, the *adriatica.net* group registered a turnover of € 85.2 million, which is a 15% growth compared to the previous year. At the same time, for the year 2006 a 30% growth is expected, equating a turnover of € 100 million.

In contrast to the predominantly national supply structure, its customer base is to a large extent international. No source market holds a share bigger than 14%, however. Most customers in 2006 came from countries Hungary (14%), France (12%), Italy (12%), Germany (10%), Croatia (7%), Poland (6%), Czech Republic (5%) and Slovenia (4%).

adriatica.net has a market share of about 0.75% (75,000 incoming tourists) of the total Croatian tourism market and in the context of its wider *adriatica.net* group a market share

[54] The selection process is based on a point system reflecting the following five quality criteria: contents and furniture (kitchen equipment), surrounding area (garden, entrance), interior (general atmosphere and installations), cleanliness and (the relationship of) hirer/owner (to the guests). In order to maintain and increase the quality of the offer, each year the selected accommodations are re-evaluated and 10% of the units with poorer quality are excluded from the offer and/or replaced by accommodations with higher evaluation marks.

[55] E.g. Riva Tours (Germany), Odisej (Slovenia), Ilirika Turizem (regional chain of tourist agencies in Slovenia, Croatia, Italy, Serbia and Montenegro) and Atlas Airtours (Croatia).

of about 2.2%. Its main competitors are international companies like Interhome (www.interhome.com) and Novasol (www.novasol.dk).

e-Business activities

Business model

In case of successful intermediation, *adriatica.net* demands a commission of 15-25% of the initial price. Compared to the traditional intermediaries, which charge up to 50%, this is a significantly lower commission rate. No reimbursement has to be made in case that no intermediation takes place, which makes *adriatica.net* an interesting distribution and marketing channel for accommodation providers. Provision of such low commission rates is feasible through the fact that up to three traditional intermediaries become obsolete by using the online channel. Furthermore, *adriatica.net* is able to accelerate the payments for the accommodation providers significantly in relation to traditional travel agencies.

adriatica.net does not make bulk purchases (of rooms or similar services) and offers its services free from obligations to make any sale (e.g. for the providers of rooms, lighthouses, car rentals). To increase their visibility and sales on the *adriatica.net* website, it is the responsibility of the accommodation providers to distinguish themselves from their competitors by competitive prices and the quality of services.

Business strategy: From online to traditional channels

Adriatica.net has been continuously expanding its business activities in terms of supply categories and geographical distribution. Furthermore, besides web-based business-to-consumer sales, *adriatica.net* also cooperates with several hundred travel agencies from 25 European countries.

The company focuses increasingly also on international markets, where it operates as a tour operator by offering travel arrangements, especially skiing packages in neighbouring countries like Italy, Slovenia and Austria. Not being dependent on summer and homegrown tourists, the company can efficiently bridge the summer season gap in the period from September to December. The expansion to other products and markets is, according to Tihomir Brzica, the managing director of *adriatica.net*, necessary to ensure the stability of the company in a relatively small Croatian tourism market and to be able to successfully compete with large international players.

adriatica.net connects to Amadeus GDS

Currently, the adriatica.net *develops an interface for the Amadeus Global Distribution System (GDS) and for the Travia (part of the Travco Group) system. Through a GDS channel, travel agencies cannot only book 95% of the worlds scheduled airline seats, but the system also provides access to numerous hotels, car rental companies, and to other providers such as rail, cruise and insurance companies as well as tour operators.*

The goal of adriatica.net *is to support and facilitate the travel agencies when they distribute the company's travel arrangements, by providing agencies with a familiar system similar to the one they have been using previously. Therefore, not the agencies have to switch and adapt to the existing system of* adriatica.net*, but* adriatica.net *will adapt its system to theirs.*

The main selling channel of *adriatica.net* is the internet, which makes up 75% of the total sales, with approx. 56,000 guests (from 75,000 guests in total). The other 25% are sold through traditional channels, i.e. partner travel agencies. Tihomir Brzica expects this ratio to equate in the following years. A quite different picture emerges in the context of the whole *adriatica.net* group: The share of the online channel has been rapidly growing and is expected to gradually surpass its traditional brick-and-mortar business.

The *adriatica.net* group comprises both business-to-business (B2B) and business-to-consumer (B2C) selling modes both of which comprise online and traditional channels. The following exhibit represents the share of B2B and B2C selling channels for the single companies within the *adriatica.net* group.

Exhibit 4-7: Relation between B2B and B2C selling modes within adriatica.net group

	B2B selling via partner agencies, tour operators and external online reservation systems	**B2C selling** via acquired partner agencies and internal online reservation systems
adriatica.net	**19,000**	**56,000** (online + tel.)
Riva Tours	65,000	20,000 (catalogues, internet + tel.)
Odisej	10,000	5,000
Atlas Airtours	48,000	
Ilirika Turizam		50,000 (in Ilirika's agencies)
Adriagate		9,000 (online + tel.)
adriatica.net group	**142,000**	**140,000**

Source: Interview with Tihomir Brzica

Operating system

No significant technological problems have been encountered. The system has been progressively developed and has been maintained exclusively by the internal IT-department of *adriatica.net*, in response to rapidly increasing customer numbers. Currently, the system has to cope with 280,000 customers; anticipating 1.5 million customers within the next few years, further technological developments already take place, including parallel systems and a new IBM-solution. In the medium-term the in-house development of a dynamic packaging solution is planed.

The online reservation and booking system runs on the "Windows" operating system and is based on the "Java servlets" server and the "Sybase" database technology. Instead of one large-scale server, the system operates 15 small-scale interconnected servers, which ensures more flexibility and security. For online real-time transactions, *adriatica.net* uses the "Setefi's" internet protocol payment gateway solution which allows the authorisation, settlement and management of credit card payments. However, due to the lack of capacity caused by a rapid increase *of adriatica.net's* e-business the move to a more powerful payment system has been considered, i.e. an advanced online payment scheme.

Enhancing real-time vacancy availability

The web based system is equipped with search and real-time booking functionalities. Real-time availability of vacancies, however, is provided for only 50% of the accommodation units, while the other half must be contacted via phone by the customer service centre. Currently, the company is enhancing its real-time vacancy-check functionality in order to decrease the workload for the customer service personnel. For this purpose three parallel updating options for the vacancy database have been identified:

1. The **manual** update via traditional communication channels (call centre). The accommodation providers which are not acquainted with the internet can regularly contact the service centre and report vacancies or occupancies which are then manually fed into the database by the company personnel.
2. The **semi-automated** updates: Accommodation providers can autonomously update the vacancies on the partner secure space of the *adriatica.net* website. This service has been set up just recently. It can be assumed, however, that, for the time being, many accommodation providers will prefer to communicate via traditional channels.
3. The **fully-automated** updates by means of interconnected vacancy IT-systems between *adriatica.net* and the accommodation providers, which currently consist mostly of hotels from one large hotel (chain) with its own IT-solution. The *adriatica.net* IT-department is currently developing an XML-based solution to connect data-bases and integrate heterogeneous data. According to Brzica a fully-automated online database updating system with major Croatian hotel chains will be established in the near future.

Demanding cost categories and problems

The biggest expenses are not of technological nature but account for online marketing activities and personnel costs. As Brzica puts it, "*the more we invest in marketing, the more we benefit from our selling activities*."

Currently, the most urgent problem is the efficient training of customer service support operators. Customer service is available in 12 languages. It is responsible for providing information on accommodation as well travelling in Croatia. The problem of skilled staff becomes especially acute in the summer season months, when up to 50 additional part-time workers must be employed. According to Brzica, it takes 2-3 months to effectively train the employees, which represents a significant investment, given the seasonal character of this kind of employment.

Impact

Since the introduction of *adriatica.net* in 2000, there has been a substantial increase in online sales (from 1,500 reservations in 2000 to 75,000 in 2005) and website visitors (from 100,000 website visits in 2000 to 7.5 Mio. in 2005). Its annual growth rate is 50%.

Tihomir Brzica mentioned a positive impact of ICT and e-business solutions on the optimisation of business processes of the *adritaica.net* group, especially in the context of streamlining its business processes, its main IT infrastructure and its marketing activities. Based on the example of the *adriatica.net*, Brzica cannot claim, however, that e-tourism would necessarily be associated with lower expenditures and higher revenues. Rather it is linked with shifted cost categories: "*What for traditional tour operators is a catalogue production, this is for adriatica.net the investment in a web and IT development, call-centre personnel and especially marketing activities, which, compared to traditional travel agencies, must be much more aggressive.*"

Lessons learned

The major lesson of *adriatica.net* was that the effects of ICT-based, automated customer relationship were overestimated while, at the same time, the relevance of personal customer interaction was underestimated.

Originally, the realisation of the first online travel scheme of *adriatica.net* was considered to be almost exclusively a technological undertaking. The initial assumption was that the system would run without considerable personal communication with the customer. Experience showed, however, that only about half of the customers searched and booked accommodations via the internet on their own, while the other half of customers preferred to have personal customer service. Despite using fully automated internet services, it was still necessary to offer personnel-intensive services like telephone or email services. Learning this lesson, according to Tihomir Brzica, caused "*one of the biggest deviations from the initial business model*", leading to a massive expansion of the customer service.

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CASE STUDY: CONTROLLING THE COSTS OF WEB-BASED DISTRIBUTION / ACCORHOTELS, FRANCE (WORLDWIDE)

Abstract

The use of new, web-based distribution channels in the accommodation sector did not necessarily reduce the costs for distribution. Despite original expectations, in fact, it has rather increased them, due to a rising number of intermediaries operating between guest and hotel. Accor Hotels understood by analysing the patterns of distribution costs that only a fundamental change of the reimbursement system for online distribution would solve this problem.

Case study fact sheet

Full name of the company:	*AccorHotels*
Location (HQ / main branches):	*Paris (France), worldwide*
Sector (main business activity):	*Tourism – Hospitality services*
Year of foundation:	*1967*
Turnover in last financial year:	*€ 7,622 Million (2005)*
Primary customers:	*Business and private hotel customers*
Most significant market area:	*Europe (Marketleader), worldwide*
Focus of case study:	*Web-based distribution system and CRM*
Key words:	*Dis-intermediation, online selling*

Background and objectives

This case study is a re-visit of the case study on Accor Hotels conducted in 2004 by *e-Business W@tch*. The focus of the case study from 2004 was on the implementation of electronic revenue management systems and computer reservation systems. The 2006 re-visit builds upon these findings and focuses specifically on the usage and revenue/cost dimensions, as well as on further strategic developments, such as the optimisation of (online) distribution costs. Both case studies are based on interviews conducted with the same person, Mr. Nicolas Besse, Web Distribution Director Accor Group.

The Accor Group is one of the big players in the worldwide tourism industry. It offers products in three areas: Hotels, services (e.g. Clean Way, Childcare Vouchers) and related areas like travel agencies (e.g. Accor Vacances, Club Med, Carlson Wagonlit Travel).

AccorHotels

AccorHotels has become an important player in the hospitality business, managing, owning or franchising 4,065 hotels with more than 475,000 rooms in more than 140 countries (figures from 2005) and 120,917 employees (in 2004). AccorHotels' worldwide activities can be characterised as follows: 68% of the group's total revenues of 7,622 million euros are realised in Europe, 17% in North America and 15% in the rest of the world. The offer of AccorHotels ranges from low priced, economy class hotels such as IBIS, ETAP, Formule 1, Red Roof Inn, Motel 6, and Studio 6, to middle class hotels such

as Mercure and Novotel, and with the Sofitel brands it also incorporates a luxury class hotel chain.

The rising costs of operation and fierce competition have made it increasingly important for hotel operators to register and identify market developments and customer demand to optimise their dynamic pricing operations. Accor has made optimal pricing at each location for the individual customer a key operational element of their business activities. This has been achieved in the past by means of establishing an electronic revenue management system as well as a Central Reservation System (CRS) linking each individual hotel with the group.

Owing to this strategic choice, Accor managed to boost its online sales, which in 2004 amounted to more than 431 million euros, or 8% of total sales revenue. This represented an increase of more than 44% of total online sales vis-à-vis 2003, when online sales only represented 5.6% of its total sales volume. About 81% of the reservations made in 2004 have been directly carried out on the internet pages of the different Accor hotel groups.

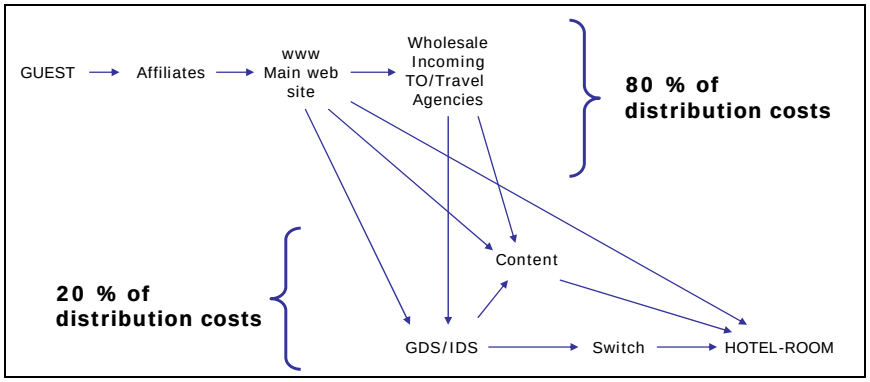
Though still quite small in comparison to the overall revenues of the group, the strong increase in online-sales prompted the group to reconsider its overall strategic approaches to web-based distributions and sales, and web-based Customer Relationship Management (CRM).

e-Business activities

Controlling distribution costs in the hospitality industry

The World Wide Web was considered to revolutionise the distribution of hotel-rooms by enabling the customer to compare prices and to book online, while reducing the costs for companies offering their services. Using web-based solutions, new, supplementary types of distribution intermediaries such as search engines (e.g. Google or Yahoo!), affiliates (e.g. kelkoo; fare.net), travel agencies, tour operators (TO), incoming, wholesalers, and Global Distribution Systems (GDS) (e.g. Pegasus; Amadeus) emerged. Accor witnessed a steadily increasing number of intermediaries; in some cases more than five intermediaries operating between the guest and the hotel room. As a consequence, distribution became very complex and costly. Exhibit 4-8 distinguishes between the distribution costs for actual distributors, which represent about 80%, and distribution costs for so-called technical (electronic) intermediaries, which account for about 20% of the overall distribution costs.

Exhibit 4-8: Repartition of costs for online distribution

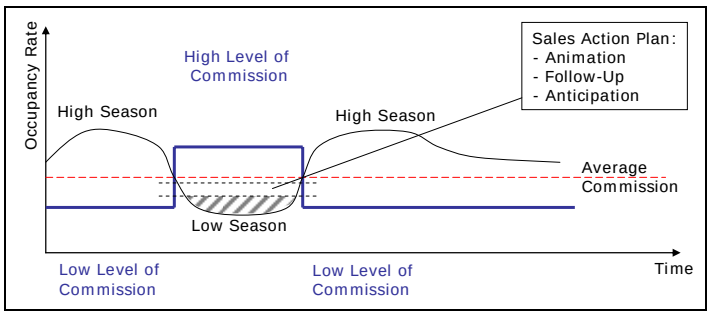


Source: Accor 2006

Instead of reducing costs for distribution, the use of new, web-based distribution channels turned out to be more expensive for the company than the traditional distribution channels. Moreover, Accor realised that, within the framework of the existing distribution system, some intermediaries were able to offer hotel rooms at cheaper rates than the group itself.

For these reasons, Accor recognised the necessity to alter its online distribution approach. Ideally, the guest would reserve Accor rooms only via the group's own web pages. This would allow them to save expensive commissions, which would otherwise have to be paid to external intermediaries. To achieve this, more targeted, direct marketing activities, such as CRM (as outlined below) were envisaged. However, the group also realised that a full-scale dis-intermediation approach would not be an option, since external intermediaries were especially important for the distribution of hotel rooms in the low-season. Therefore, the group conceptualised a seasonal approach to control distribution costs.

Exhibit 4-9: Seasonality: The "magic wave"



Source: Accor 2006

"The key was the average commission paid to the intermediaries".[56] According to the group, it was no longer adequate to pay an average commission to intermediaries for their distribution services, because this approach did not take into account the occupancy rates of the individual hotel (black curve) in high and low-seasons. For the future the group decided to dynamically adjust the commission rate in an anti-cyclic way, based on the occupation rate of an individual hotel instead of paying an average commission. In high season, when occupancy is high and the need for distribution low, the commission would also be lower. In contrast, in low season, when occupancy is low and the need for distribution high, the commission paid to the intermediaries would be higher.

In general, the distribution costs depend on the type of intermediary: they are lowest when affiliation services are used; they tend to be higher when the services of travel agents are sought; and they are highest when wholesalers and tour operators are involved. This reflects the fact that the higher the number of direct bookings, the lower the costs for distribution for Accor. For this reason, the group is interested to make use of indirect bookings in low season and direct bookings in high season.

[56] Statement by Nicolas Besse, Web Distribution Director Accor Group.

Exhibit 4-10: Controlling distribution costs

Source: Accor 2006

In practice, the approach would have the following implications: Each individual hotel's manager will be responsible for entering the hotel's low and high season into the group's Common Reservation Systems (CRS). This determines the height of the commission paid to intermediaries for each hotel room sold. Thus, via the group's integrated IT systems, the decentralised management activities are reflected in the CRS.

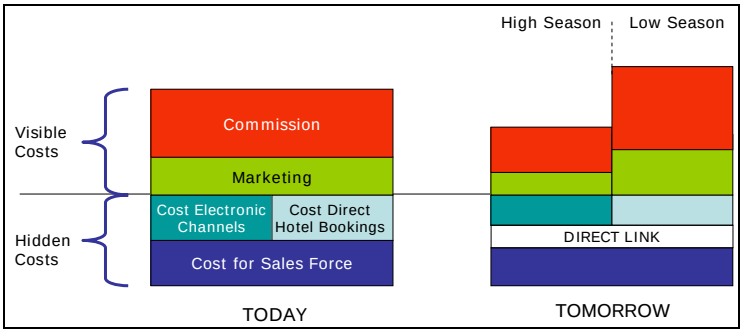
Customer Relationship Management (CRM)

Given the significant growth of Accor's direct distribution channels via online sales, the group aimed at increasing customer retention and loyalty to the Accor group by means of CRM. The group intends to better understand the purchasing behaviour of its clientele. Accor collects information on the clients, especially information on who they are and the way they are behaving. In this way, it intends to optimise its marketing approach by addressing existing customers in a more targeted way and thus personalise relations with clients. This direct marketing approach will largely be realised via online solutions.

Impact

This system is expected to affect the costs of distribution as illustrated below:

Exhibit 4-11: Cost structure – today and tomorrow



Source: Accor 2006

Whereas today, the visible costs of distribution – commissions and costs for marketing – are constant throughout the year, in the future, the height of both (commissions and marketing costs) will be based on the aspect of seasonality. In terms of hidden costs, the potential for future cost reduction is more complex.

- **Cost of electronic channels**: In the future Accor intends to realise more direct bookings via its own online-booking sites. Increased web-based direct marketing efforts shall bolster this effort. More direct internet bookings additionally imply fewer costs for external electronic channels, such as the various GDS solutions that Accor is using.
- **Cost of direct bookings**: These costs basically reflect the activity-based costs for direct bookings in a hotel, e.g. the costs for picking up the phone and manually executing a room reservation.[57] Accor intends to reduce costs of this kind by means of emphasising the use of direct, web-based links for hotel reservations.
- **Costs for sales forces**: In the past, the rates of intermediaries were based on their brand name, their history and thus their negotiation position. For the future, Accor envisages a performance-driven kind of reimbursement. Determining factors will be neither the name nor the history of the intermediary but, exclusively, the number of bookings that it provides to the group. The negotiation of reimbursement agreements should be conducted centrally, addressing all Accor hotels at the same time and not, as is the case today, for the group's different sub-divisions. This is considered to significantly decrease the sales costs.

Lessons learned

This case study illustrates a number of lessons learned:

1. The introduction of e-business solutions does **not necessarily decrease** the costs for a company. On the contrary, for Accor the costs of online distribution turned out to be higher than those of classic distribution channels due to a steadily increasing number of intermediaries.
2. E-business solutions allow the **automatic collection of information** which can be used for controlling purposes. In this way, Accor was able to thoroughly analyse the structure of its distribution costs.
3. The introduction of e-business solutions may finally have **repercussions on the strategic choices** of companies in various fields of their business. In the accommodation sector, e-business solutions may change distribution strategies fundamentally, impact negotiations for commissions paid to intermediaries or even alter the structure of distribution channels.
4. Regarding **CRM**, the introduction of e-business solutions allows for **more targeted, direct marketing** activities. Though the impacts of Accor's CRM activities are not yet visible, these activities may reinforce the group's negotiation power vis-à-vis intermediaries active on the market, both traditional and web-based.

[57] In this context, especially so-called off-line websites provoke many telephone reservations, which trigger additional activity based costs for individual hotels.

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  - www.hotelmarketing.com

4.1.6 Summary of main points and conclusions

The IT revolution and the introduction of e-commerce processes have led to two conflicting, parallel trends which have a profound impact on the role of intermediaries in the tourism market: dis-intermediation and re-intermediation. While, on the one hand, IT and e-commerce represent a challenge and a threat to the role of intermediaries in the tourism value chain, they also provide new opportunities and chances for traditional and newly emerging online intermediaries. The case studies presented in this section exemplify this situation:

The case study on *Accor* supports to some extent the dis-intermediation argument: By introducing an electronic revenue management system as well as a central reservation system (CRS) which links each individual hotel with the group, *Accor* has managed to boost its direct sales via its own hotel network, thereby bypassing traditional intermediaries. This allowed *Accor* to save commission costs which it otherwise would have had to pay to intermediaries if it would not have offered these services itself.

However, Accor also realised that completely circumventing the use of intermediaries would not be an option since these intermediaries proved to be particularly effective and valuable for the promotion of hotel rooms in the low seasons. Therefore, *Accor* adopted an anti-cyclic intermediary strategy: Instead of paying an average commission to intermediaries for each hotel room booked, it adopted a system in which in an individual hotel's high season, when the level of occupancy is high – and hence the need for intermediary services low – the commission would be lower; in contrast, in a hotel's low season, when the level of occupancy is low – and hence the need for intermediary services is high – the commission for intermediary services would also be high. In this

way *Accor* adopted a two-tier strategy: on the one hand to benefit from the cost-saving effects of dis-intermediation while at the same time creating incentives for traditional intermediaries to promote its services, especially in low seasons.

On the other hand, the case studies on *yourGreece*, *Lithuanian Farm-Stay Tourism* and *Adriatica.net* represent examples of successful re-intermediation ventures. While *yourGreece* and *Lithuanian Farm-Stay Tourism* are online ventures, *Adriatica.net* represents both an online as well as a brick-and-mortar business intermediary. *Adriatica.net* initially started as a mere online intermediary but has since established a strong presence in the brick-and-mortar intermediary business by acquiring several established traditional travel agencies. Having only started in 2000, it already presents the biggest online intermediary business in Croatia which has taken away business form established travel agencies.

The *yourGreece* and *Lithuanian Farm-Stay Tourism* case studies have demonstrated the benefit of co-operation between several smaller players in using intermediaries to promote and market their services collectively. In the case of *yourGreece*, the member hotels of *yourGreece* have realised that cooperating with each other under the *yourGreece* umbrella was more beneficial than working on their own. Initially some of the hotels were afraid of cooperating with hotels which they regarded as direct competitors. However, they quickly realised that in an increasingly competitive market, they have better chances if they work together. Similarly, in the case of the *Lithuanian Farm-Stay Tourism*, Lithuanian farm-stay owners benefited from cooperating under the umbrella of the Lithuanian Countryside Tourism Association (LCTA) to jointly promote their services via the *Lithuanian Farm-Stay Tourism* website.

However, cooperation under the umbrella of an intermediary can also be problematic, as was shown in the *yourGreece* and *Lithuanian Farm-Stay Tourism* case studies: In both cases, the lack of ICT skills and IT infrastructure proved to be hazardous in the set-up of both platforms. The LCTA, for example, tried to tackle these problems by offering several training sessions to its members - the Lithuanian farmsteads it represents. In the case of *yourGreece*, one of the lessons learned was also that the company had not realised from the start how much time and resources were needed to communicate the idea of *yourGreece* to each of the member hotels and to convince them to participate.

But, as some of the case studies have shown, technology and fully automated systems are often not sufficient for running a successful online intermediary. Both *yourGreece* and *Adriatica.net* have realised that personal interaction is vital for operating an online venture. This is especially true for *yourGreece* where technology is only used to support personal interaction between provider and supplier. The actual interaction with customers is still handled by an employee of *yourGreece*; automation merely speeds up the process of communication between customer and provider, supports the identification of tailor-made tourism packages and enhances booking and payment procedures. *Adriatica.net* made a similar experience: Originally, *Adriatica.net* was designed as an almost exclusively technological undertaking, without considerable personal communication schemes between *Adriatica.net* and its customers. Yet, about half of its customer base preferred to have personal customer services supporting their search and booking activities. *Adriatica.net* therefore had to expand its personal customer services to meet these demands.

Overall, these case studies have shown that the degree of intermediaries' success largely depends on the businesses themselves, as Buhalis and Ujma have also pointed out:

> *"The key factors for success in the future for intermediaries will be flexibility and innovation in providing added value to tourism products and services. ICT should be used to develop and distribute these offerings globally, through user-friendly interfaces and interoperable systems. Successful intermediaries will emerge as customer-centric value creators." (Buhalis / Ujma 2006)*

Fact-Box: Core results of the analysis regarding dis- and re-intermediation in parallel

- **Dis-intermediation / re-intermediation:** ICT and e-business have led to a parallel trend of dis-intermediation and re-intermediation;
- **Dis-intermediation:** Some tourism-related sectors, for example the hotel sector, (e.g. *Accor*) are increasingly able to offer their products and services directly to consumers, thereby partly bypassing traditional intermediaries;
- **Re-intermediation:** Re-emergence of intermediaries is observed, in particular newly emerged online intermediaries (e.g. *yourGreece*, *Lithuanian Farm-Stay Tourism*);
- **Need for cooperation among smaller players:** Co-operation of smaller players, for example under the umbrella of an intermediary, or by organising in clusters, may be more beneficial than competing against each other (e.g. *yourGreece*, *Lithuanian Farm-Stay Tourism*);
- **Partly lack of ICT skills and infrastructure:** Many smaller players (e.g. the hotels of *yourGreece* or the farmsteads of the *Lithuanian Farm-Stay Tourism* web platforms) lack relevant ICT skills and infrastructure to be integrated within the services of online intermediaries;
- **Ongoing market consolidation:** Market consolidation is on-going, driven by growth, mergers, acquisitions and strategic alliances. This might lead in the long term to oligopolies and, thus, reduced competition in the tourism sector.

4.2 Dynamic Packaging

4.2.1 Introduction

Dynamic packaging (DP) is the travel industry jargon for a user centred, cheaper and more flexible way of assembling and booking a personalised holiday, using the web and associated application of technology. The phrase is rarely seen in the public literature on a travel web site. Instead marketers have adopted more straightforward descriptions of the technology: Book Together and Save, Build Your Own, or Flight + Hotel, etc. From the end customer / consumer view, DP is an online real-time service which mimics the experience of visiting a travel agent and negotiating a deal exactly as the consumer wishes. From the travel service provider view, DP automatically combines offerings from more than one data source on demand and according to customer preferences. Using pre-determined packaging rules, which are set and controlled by the service provider, and hiding price transparency on the individual components, a combined price is determined for the chosen package. The booking can then be confirmed in a single user purchasing transaction. Depending on the contracts and "hidden" discounts in place with the inventory providers (such as global distribution systems, insurance, or travel suppliers such as airlines, hotels, car rental companies, tours, activities) an attractive price and assurance of a complete travel service can be offered for the entire package.

Dynamic packaging (DP) has been heavily discussed in the tourism sector as a new "Wundermittel" ("miracle cure", Fettner 2006) which offers both the supply and demand side substantial advantages. DP can be considered as a key issue in e-tourism and maybe even as a next logical step in e-tourism development, empowering the customer not only to search and book single components, but also to assemble and book whole travel arrangements in real-time by means of web-based technology (configurators).[58]

As such, DP favours the process of dis-intermediation of traditional travel agencies by partially outsourcing their assembling-activities directly to customers. On the other hand, DP also enables re-intermediation, as there are new online intermediaries such Expedia or Orbitz that dominate the field of DP (cf. Travel Weekley's Power List).

Definition and distinction

Among many similar DP definitions (cf. Fitzgerald 2004, Rogl 2003), the one from Kabbaj is rather concise and comprises several relevant elements: "*DP means dynamically (i.e., in real-time) putting together – and pricing – a package of several major travel components, e.g., air flight legs, hotel nights, car rental days, etc., from heterogeneous suppliers and heterogeneous information sources or back-end reservation services, even as those provide frequently changing availability or prices*" (Kabbaj 2003).

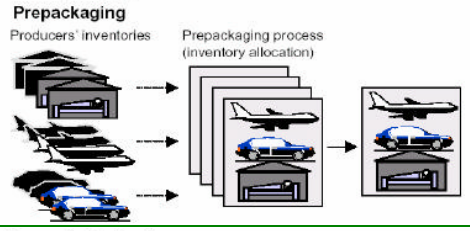
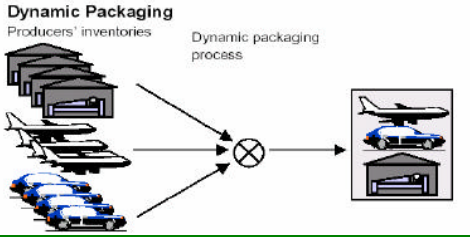
This definition should be complemented by the following elements, however. Different

[58] An extensive analysis of DP markets, technologies, players and potentials for tourism destinations is provided by the Salzburg Research study about "Dynamische Produktbündelung in Salzburger Tourismusdestinationen. Eine Analyse von Potenzialen, Herausforderungen und Umsetzungsschritten" (Markus 2006).

travel components are bundled at the *single contact point of sale* and in *dynamic response* of the customer or tour operator, i.e. "*each selection made by the consumer shapes the response of the packaging system, the behaviour of the component products, and the final price and component set of the package*" (TravelTechnology Consulting Inc.). The management of the dynamic packaging and pricing process is enabled by the appliance of *business rules* which determine the price (discounts) and combination options of assembled travel components. Finally, the service provider assumes the *legal responsibilities*, i.e. the guarantees for the package. As Hans-Josef Vogel from the Travel, Tourism and Hospitality Law Committee puts it: "*The dynamic packager becomes responsible for defects in the air travel, the hotel, or other services contained in the package. While the traditional tour operator will often have some recourse against the provider of the service, this will not be the case for the dynamic packager*" (Vogel 2005).

As a real-time or instant packaging service, DP should not be mistaken with non-instant and non-automated packaging services that are assembled by traditional tour operators in a timely shifted response to the customers' requirements. Also, DP should not be mixed with pre-packaged, in advance bundled travel arrangements, which are not dynamically interrelated and therefore allow only the selection of different fixed packages, but not a real time bundling of single components on basis of distributed resources. The following figure (Gartner 2001) illustrates the distinction between traditional component selling, pre-packaged travel arrangements and DP.

Exhibit 4-12: Dynamic Packaging in relation to traditional pre-packaged travel services

	**Traditional pre-packaged travel services** Pre-packaged arrangements by tour operators Inflexible dates and prices; multiple choices but limited customisation ability In advance quotas by tour operators
	**Dynamic packaging: real-time packaging** Packaging is executed by the customer in real-time on basis of distributed resources Enhanced customisation ability of the customer No in advance quotas; real-time availability assessment and real-time booking

Source: *Gartner research 2001*

Based on this definition, it is obvious that DP is a complex issue that is linked with significant challenges in several dimensions:

- **The technological dimension**, which is especially concerned with (*i*) the establishment of appropriate infrastructure requiring "a shift from old mini-computer-based systems to open distributed technology" (TravelTechnology Consulting), (*ii*) the seamless internal processes and (*iii*) the integration of heterogeneous data.
- **The organisational dimension**, which is concerned with (*i*) the harmonisation of supply-side activities and with (*ii*) the intensification of collaboration and communication between single service providers.

- **The legal dimension**, which is concerned with creating an appropriate legislative framework.

Expectations and Drivers: Why DP?

In the past few years the significance of DP as a new form of customisable tourism arrangements has been continuously growing. Great expectations have been associated with the adoption of DP, which sometimes is regarded as "*the killer application for the leisure travel industry*" (Rose 2004). The following important expectations and drivers of DP can be identified:

- DP is a technology-based instrument for tackling the problem of over-capacities (cf. Fischer 2005).
- DP enables the customisation of travel components towards cost-competitive travel packages (cf. Poon 2003).
- DP avoids direct price competition and *"introduces the ability to obtain hidden discounts, enhanced marketing and merchandising to communicate consumer benefit of purchasing in this new way."* (CSI Media 2005; Travel Mole 2005)[59]
- DP enables the re-establishment of the tour operators' brand (cf. CSI Media 2005).
- DP disburdens and enables the individualisation of travel packages by booking agents and customers, who do not need to visit multiple websites to plan their trips, to make multiple registrations and payments as well as to wait for a response or confirmation (cf. Edeman 2005).

There is, however, no (available) empirical evidence providing sufficient support for these claims yet. There is also a lack of comprehensive and systematic research on dynamic packaging. In fact, a comprehensive web survey revealed that only few books provide a comprehensive coverage of the topic (cf. Rose 2004, Stengel 2004).[60] The majority of information sources accounts for announcements, short journal and paper articles or case studies, presentations and company-based information material which often lack a systematic approach and an all-embracing analysis. Despite a large quantity of fragmentary information resources, the issue of DP is thus still encircled by a certain "hype aura", as there is a lack of empirical evidence on DP benefits and risks.

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[59] In many cases hidden single prices and discounts seem to suggest the notion of DP, by presenting customers an all-round price with, apparently, (substantial) cost reductions in comparison to booking single components separately. This should enable suppliers to increase revenues by obtaining better prices (i.e. over the limit of the established market) for some components by selling them in a context of a package. Yet, it is arguable whether current DP services, based on two or three basic travel components, provide a sufficient price-hideout and, if they do, whether these non-transparent prices would be accepted by customers who have been increasingly used to compare prices. In addition, the new emerging travel search engines could further complicate company's attempts of DP based price-hide-outs. In this context, Patrick Urso, Managing Director and Chief Product Officer of Tazzoo.com, stated at the ITB Berlin 2006: *"We are going to provide possibilities of comparing and assembling packages on different platforms, i.e. dynamic packaging."*

[60] The analyst and consultant Norman Rose (2004) covers the technological dimension and Nico Stengel the implications of dynamic packaging for the tourism value chain, especially with regard to dis-intermediation and re-intermediation.

4.2.2 State-of-the-art and market development

DP Technology and their providers in Europe

The level of adoption of DP is increasing and will continue to rise. One important indication for this is the growing number of DP technology providers and users. Michelle McDonald estimates that the development in Europe lags behind the situation in the United States (cf. McDonald 2005). The first wave of DP enabling technologies stem from the Neat Group (in April 2003 bought by Cendant), Site59.com (acquired by Travelocity.com) and Classic Custom Vacations (bought by Expedia in 2002).

Meanwhile, there are several companies in Europe offering ready-to-use DP technologies/suites[61], as the following exhibit indicates. The technological dominance of the United Kingdom does not surprise given the fact that almost 80% of all DP sales in Europe are from the United Kingdom (cf. Travel Mole 2006).

Exhibit 4-13: Dynamic Packaging Technology/Solution Providers in Europe (Selection)

DP Solution Providers	Country	Customers[62]
Accovia www.accovia.com	France	Disneyland Resort Paris, Exit.ca, Expedia.ca, Union Nationale des Centers Sportifs de Plein
CSI-Media www.dynamicpackaging.net	United Kingdom	Lastminute.com, Expedia.com, Holiday Booker, hostelworld.com
GoCuo www.traveldynamicpackaging.com	United Kingdom	Aeroplanedealc.com, flymecheap.co.uk, Holiday Express, Rex Air Limited
Inovasoft AG www.inovasoft.de	Germany	LMX Touristik, McFlight Flugvermittlung, Touristik Service Schürmann, Travelpoint, D.A. Ferntouristik, 7tur, ReiseEcke, EMTS Reisen, Hit Reiseclub/ GUV Touristik, Viva Tours, HST Touristik
IT-Score www.it-score.de	Germany	n.a.
Multicom www.multicom.co.uk	United Kingdom	Thomas Cook, MyTravel, Telewest
Online Travel Corp www.onlinetravelcorporation.com	United Kingdom	Cheaptickets.co.uk, Priceline.co.uk, Thomas Cook, TUI, UKs Lunn Poly
OpenJawTechnologies www.openjawtech.com	Ireland	Opodo, Aeroplan, Budget Travel (World of TUI), Openjet
RWA Travel Technology Solutions www.rwa-net.co.uk, www.sell-it-suite.com	United Kingdom	British Airways Holidays, Cosmos, Crystal Holidays, Frosh Touristik FTI, MyTravel

Source: *Compiled by Salzburg Research.*

As a general rule, DP solutions are XML-based, which is the leading standard for the aggregation and integration of heterogeneous data. DP has been identified as a likely area of an early industry-wide strategic impact for semantic web[63] technologies.

[61] There is no particular dynamic packaging technology; rather it is a bundle of diverse technological components and functionalities.

[62] Not all of these customers provide online DP solutions.

[63] Semantic Web is an established technological term in various contexts of ICT-/internet-based society. Replacing it with another one could result in confusion. According to Palmer, "the Semantic Web is a mesh of information linked up in such a way as to be easily processable by

No such solutions can be found in the market yet, however. According to Kabbaj, the semantic web technologies based DP solutions can be expected to be deployed in five to eight years (cf. Kabbaj 2003).

Scope and focus of DP services

The following Exhibit provides a selection of the tour operators and online travel agencies in Europe offering DP services. These providers can be regarded as real DP providers as their modules are dynamically (in chronological order and with regard to places, destinations and prices) interrelated and because they provide real-time availability-check and instant booking/transaction functionalities.

Exhibit 4-14: Selection of Dynamic Packaging Online Providers in Europe[64]

Dynamic Packaging Providers	Based in	Number and kinds of travel components	
ebookers.de, *www.ebookers.de*	Germany	2	Flight, Transfer/Rent-a-car (+Insurance)
eDreams *www.edreams.it*	Italy	2	Hotel, Flight (+ Insurance)
Expedia.co.uk *www.expedia.co.uk*	United Kingdom	4	Hotel, Flight, Rent-a-car, Events (e.g. Musical, Theatre) (+Insurance)
Flexible Trips *www.flexibletrips.com*	United Kingdom	2	Hotel, Flight (+ Insurance)
Lastminute *www.lastminute.com*	United Kingdom	3	Hotel, Flight, Transfer/Rent-a-car (+ Insurance)
Odysa *www.odysia.fr*	France	2	Hotel, Flight (+Insurance)
Rejsefeber www.rejsefeber.dk/	Denmark	3	Hotel, Flight, Rent-a-car (+ Insurance)
Resfeber.se *resfeber.se/*	Sweden	3	Hotel, Flight, Rent-a-car (+ Insurance)
Rumbo *www.rumbo.es*	Spain	2	Hotel, Flight (+ Insurance)
Sterling *http://package.sterling.dk*	Denmark	2	Hotel, Flight (+ Insurance)
Thomas Cook *www8.thomascook.de*	Germany	4	Hotel, Flight, Transfer/Rent-a-car, Events (+ Insurance)
Travelprice.fr *www.travelprice.fr www.fr.lastminute.com*	France	3	Hotel, Flight, Transfer/Rent-a-car (+ Insurance)
Viajar.com *http://viajar.com*	Spain	3	Hotel, Flight, Transfer/Rent-a-car (+ Insurance)

Source: *Compiled by Salzburg Research.*

machines, on a global scale. You can think of it as being an efficient way of representing data on the World Wide Web, or as a globally linked database" (2001).

64 Although many travel/tourism websites (e.g. Ryanair, Accor) provide multiple travel components beyond their core services, they cannot be regarded as dynamic packaging websites as there is no dynamic packaging functionality that enables consumer to simultaneously search and book multiple travel components, to one travel package, on one single website, and to obtain one total package-price respectively.

This brief analysis reveals that current DP services focus on the composition of elementary travel components (Hotel + Flight + Transfer). A more detailed (or in-depth) pre-trip holiday customisation, consisting of e.g. a particular hotel room (with a view to the sea), a window seat in a plane or certain sport activities, still requires the professional *and* manual "hand" of traditional tour operators. The primary focus of DP services is therefore not so much the comprehensive personalisation of services but price-efficiency in combination with flexibility and convenience for the customers, emphasising savings of self-packaged arrangements: "Tailor-make and save!" (Expedia.co.uk)

Although "the value of the tour operator's 'hand holding' for customers is falling fast" (McDonald 2005), the access to computer reservation (CRS) and global distribution systems (GDS) provides the operators and traditional agencies still with more specific and destination-related information. Given the rapid development of web-based automated travel services, it can assumed however, that in the medium and long term this information and personalisation advantage might be gradually diminished, as more detailed and cost effective services will be provided by means of ICT, especially via the internet.

Is DP a domain of large enterprises?

So far, DP was predominantly implemented by large tour operators and online travel agencies that operate a large network (1,000+) of service providers (accommodation, flight, transport, transfer, and events). These providers are able to seamlessly aggregate and process large quantities of heterogeneous data, as well as to offer real-time transaction capabilities and legal guarantees.

The exhibits on DP-technology provider and users provide evidence that technology does not pose an insuperable obstacle for the adoption of DP, at least not for large companies that dominate the actual DP market. For many small providers of tourist services that do not share interoperable computing systems, however, the adoption of DP might pose a significant technological (and organisational) challenge: "*The travel industry has always been plagued by disparate, closed systems and networks that do not communicate and share information. This lack of connectivity leads to 'one-off' integration solutions that simply upload and download information between systems in a batch mode*" (Travel Tech Consulting).

The *e-Business W@tch* report of 2005 re-emphasised the fact that there are significant "deficits in adequate ICT solutions, especially suitable for SMEs" (September 2005), which would enhance the connectivity and enable seamless and automated working processes among single service providers. Defining a common ICT language and infrastructure therefore seem to be the major preconditions (and challenges) for the realisation of a small-scale DP solution in the framework of a region or a destination.

DP Market

All market observers and major DP providers report a significant growth in DP sales. The ability to customise travel packages is obviously accepted by an ever growing share of customers. According to PhoCusWright, 24% of online tourists used DP services in 2003; in 2004 already 33% (cf. Edeman 2005). GfK Germany reports that almost 70% of customers prefer to package their travel arrangements on their own. (Büchsel 2005) And a survey by Gartner/G2 shows that "*80% of UK customers cited the ability to choose the precise combination of travel components as an important reason for building their own package, and 40% cited it as the most important*." (McDonald 2005)

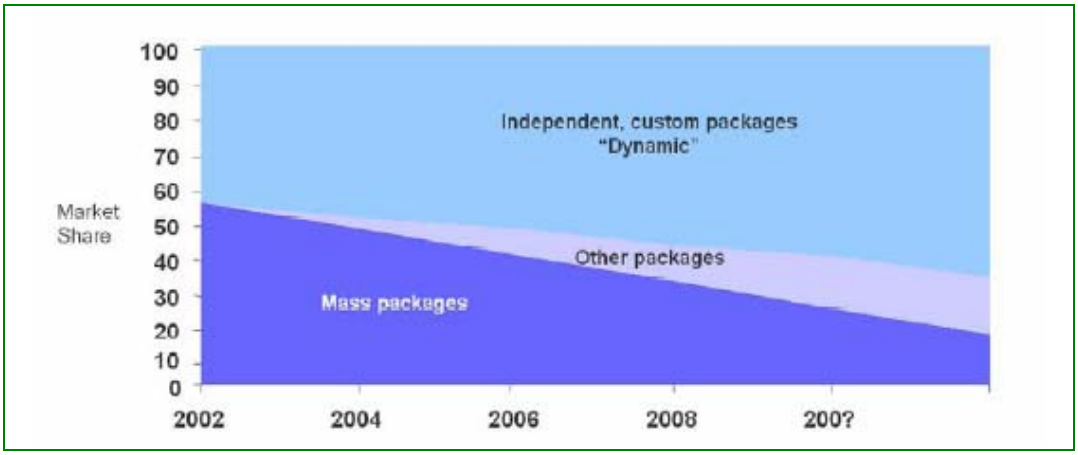
According to recent Opodo research findings, the level of deployment of DP in Europe is much smaller than in the United States. The exception in Europe is the United Kingdom, where DP sales reached more that £ 4.3 billion in 2005. In proportion to DP sales in Europe, even "*76% of all European dynamic package sales are from the UK. However, other European markets are evolving at a slower pace with Germany only accounting for 11% and France for only 3% of total European dynamic sales, according to the research conducted with Euromonitor International*" (Travel Mole 2006)

As regards future market development, a Multicom survey from 2005 forecasted that DP would account for nearly 35% of the United Kingdom travel market by 2007, with total revenues of £ 2.4bn. (cf. Travel Industry Wire 2006). The Gartner Group assumes that, on the basis of a 2004 survey, by 2008 20% of all travel bookings in the United Kingdom will be based on DP (cf. McDonald 2005).

Will DP replace traditional pre-packaged deals and travel agencies?

The following Exhibit indicates that the acceptance of self-packaged arrangements is growing, while the interest in pre-packaged or mass tourism products is simultaneously decreasing (cf. Schuppener 2004).

Exhibit 4-15: Increase of DP and decrease of pre-packaged travel arrangements



Source: *Kabbaj 2003, 21*

However, according to market analysts, DP will not replace, but complement the traditional pre-packaged deals and travel agencies that still offer clear customer benefits such

as convenience, trust, counselling and support to conveniently find the best offer (cf. Touristik Report 2004; Schuppener 2004). A clear advantage of travel agencies exists furthermore in the provision of real customisation. Also, DP service providers encounter the difficulty to provide an extensive inventory of services during high season. Furthermore, for many tourists, planning and assembling an individual travel is a time consuming task which poses a considerable challenge that should not be underestimated.

Nevertheless, the adoption of DP will have a profound impact on pre-packaged arrangements: In order to compete with customised *and* low price dynamic packages (cf. Anite Travel Systems 2003) pre-packaged arrangements will have to offer lower charges (cf. Reise & Preise online 2004). According to Gordon Wilson from Cendant Travel Distribution Services, "*the average savings on a [dynamic] package for two people or more is over $200 per trip and this is a major feature of the advertising for package sales*" (Wilson 2005). On the other hand, critical comparisons on savings between dynamic packaging and traditional package deals come to the clear conclusion "*that it still pays to use a real live travel agent*" (Sullivan 2003a; 2003b; Kabbaj 2003). Thus, there seems to be some evidence to the claim that DP will not replace, but complement and, as a result, make the situation for traditional packages and travel agencies more difficult.

4.2.3 Case studies on dynamic packaging

In the following, two case studies and one business example on DP will be elaborated. These cases were selected in order to illustrate the essential elements of the DP e-business value chain: back-end technology, front-end customer relations and business models with service suppliers.

The first case study on the DP technology provider *CSI Media* focuses on technological back-end issues, implementation obstacles and business lessons gained from the implementation of DP solutions. The second case study on the DP service provider *lastminute.com* focuses primarily on the customer front-end and DP strategy issues. Furthermore, it outlines the main success factors and ongoing lessons gained from the provision of DP services. The third case is a business example of a rather small (21 employees) DP service provider, *touropa.com*, which recently implemented a DP solution based on a business model enabling service suppliers to autonomously adapt their prices to current demand.

CASE STUDY: IMPLEMENTING DYNAMIC PACKAGING TECHNOLOGY- CSI MEDIA MAKING THE WEB WORK

Abstract

CSI Media is a web services company whose Travelberry dynamic packaging solution powers numerous major travel sites. This case study describes the functional capabilities and flexible, tailored solutions which have been developed to meet individual client needs. It outlines the business and technology lessons gained from the wide range of implementations to date, including the impact and challenge of off-the-shelf vs. bespoke travel systems. The role and importance of a complete enterprise resource planning system coupled with good analytic data on web site performance is highlighted and reference made to emerging best practices.

Case study fact sheet

Full name of the company:	*CSI Media*
Location (HQ / main branches):	*Crewe, Cheshire (UK)*
Sector (main business activity):	*Travel and Tourism*
Year of foundation:	*1998*
No. of employees:	*23*
Turnover in last financial year:	*8 million Euro*
Primary customers:	*Tourism Service Suppliers and Content Providers*
Most significant market area:	*Europe, Asia*
Focus of case study:	*Technological solution for dynamic packaging*
Key words:	*Dynamic packaging, online distribution*

Background and objectives

CSI Media was founded in 1998. Initially offering services based around IT training, it developed into an internet and database technology provider for small and medium sized enterprises (SMEs) focusing on a range of markets including the travel, leisure, B2B, B2C and finance sectors. CSI Media is now a major player in the travel technology industry, building and maintaining numerous major web sites each year. The flagship of their bespoke internet booking engine and software development is the Travelberry suite. This is a dynamic packaging product which is based on XML and web services technology.

This case study focuses on the approach, services and technology provided by CSI Media for use by travel service providers who wish to add dynamic packaging to their online services and the automatic feeds for use by content partners who wish to expand their potential customer reach.

e-Business activity

Travelberry

Richard Nash, Business Development Director of CSI Media, describes Travelberry's capabilities in terms that any existing or prospective travel service provider can

understand: "*You choose the suppliers, let us provide the dynamic packaging technology and then empower your customers to package their own holidays*".

When online consumers visit a website powered by Travelberry, they can find travel stock such as flights, hotels, car hire, tours, transfers, ferries, cruises, travel extras and more, all from a variety of operators and suppliers. Based on customers' searches, the results are returned and displayed with packaged prices, without showing the individual product prices. This allows mark-ups for specific items to be concealed by the travel agent. This feature, along with the additional opportunities for other related purchases prompted by but not an integral part of the main transaction, provides the basis for increasing margins across sales.

In terms of their customer's website expansion and growth, Travelberry can incorporate additional new data sources quickly, by adding new inventory data suppliers providing resort information, holiday activity information, etc. This allows travel companies to utilise product feeds more readily and release new products to market more quickly while avoiding costly downtime of their travel website. As soon as new products are ready, the customer can start buying them straight away. Travelberry will integrate with most back-office systems and provide total flexibility with regards to customer facing web page layouts. Without the DP services, each travel product source would have to be contacted independently by the web site, which is cumbersome, slow and inefficient.

Tour operators and other suppliers can use the Travelberry system to package their own products and re-distribute via their own XML feed. Suppliers wishing to provide their content for DP but do not already have an XML feed, can avail of other CSI Media services to generate such feeds, thereby opening their products to a much wider customer base.

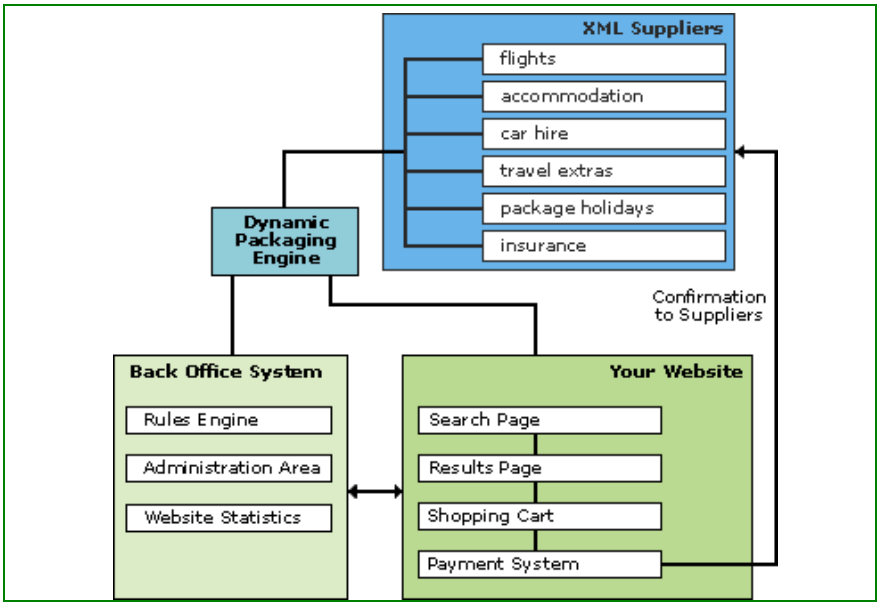
Travelberry Lite

Travelberry Lite is based on established templates and provides a complete low-cost entry level online travel system for small to medium companies. It integrates access to a variety of XML based travel data sources (e.g. charter flights, low cost flights, accommodation) into consumer facing websites and includes an easy to use payment system together with email forms for consumer product enquiries. It is designed to be easily expanded to the full Travelberry functionality or parts thereof.

Technology Building Blocks

Exhibit 4-16 shows the main building blocks of the system: website, XML suppliers, DP Engine and Back Office System. The **DP Engine**'s integration process is based around the ability to search feeds from various multiple travel data sources such as XML Feeds, Application Programming Interfaces (APIs) and Web Services. Travelberry returns combined results for multiple travel products (e.g. flights/hotels) at a single price and in a common format on a consumer facing travel website. A service provider can control their web site by selecting as many or as few data feeds as they wish. They may also add features such as price discount / mark-up, special offers and more to the Rules Engine.

Exhibit 4-16: Technology building blocks



Source: CSI Media (2006)

No travel web site would be complete without a comprehensive **back-office** system. This allows the content of the site to be managed effectively and also enable easy integration with the financial management and reporting systems. CSI Media's bespoke back-office systems utilise latest security technologies, and each back-office system is designed specifically to a client's individual needs, such as easy control of costs, pricing, offers, and invoicing. General features include facilities to keep the website data and information up-to-date, properly targeted (e.g. seasonal offers) and accessible so that new products can be introduced at any time, and existing offers manipulated to ensure maximum sales. Functionality is customised to the user requirements, and access / security controls ensure that only the areas which are meant to be updated by the user are available for editing. In addition, comprehensive usage analysis tools and reports on important metrics are provided.

Impact

Third party travel sites which use the Travelberry DP suite can and do have their own unique selling points, defined by their product focus and individuality. The range is extensive and among others includes (in alphabetical order): Allstar-online.co.uk, Beatthebrochure.com, Getabed.com, Flydeals.co.uk, Skybargains.co.uk, Travelshoponline.co.uk and Yourholidays.com

Increased sales opportunities are driven by faster and more efficient search capabilities against all relevant feeds, better margin control and varied choice of product feed. These include seamless XML feeds, and automated links via Application Programming Interfaces (APIs) to established Global Distribution Systems (GDS). Attention was drawn by CSI Media to two immediate challenges whose resolution would require action outside their current control and which related mainly to standards challenges:

- Lack of consistency in geographic (GEO) and location codes across different GDS and other systems.
- Flexibility to change start and/or end dates of proposed travel trips and calculate "what ifs" without the need to restart the search process and re-enter other information i.e. achieve interoperability as seen from the customer across the different XML feed systems.

Another challenge, which is almost but not yet fully resolved by CSI Media, is to complete the links to the travel service provider's back-office systems. SMEs, in particular, require automatic feeds from transactions to their business accounting records and software in order to avoid overheads necessitated by otherwise duplicated data entry mechanisms.

Lessons learned

The optimisation of natural search ranking though inclusion of advanced metadata and extensive search engine optimisation techniques is an ideal way to ensure that customers can easily locate a site and be encouraged to stay and complete their transactions. In addition the competitive edge provided by DP needs to be continually sharpened by careful analysis and reasoned action based on the measurement, collection, analysis and reporting of internet data for the purposes of understanding and optimising Web usage[65].

Richard Nash summarised the pre-requisites from both customer and DP travel provider viewpoints, *"Prospective travellers must be able to automatically conduct simultaneous searches of all relevant feeds, and travel service providers must make informed adjustments to their booking engine rules based on a solid analysis of structured real-time information on bookings derived from flexible data management services customised to their needs".*

One of the other significant lessons derived from the CSI Media success with application of DP in travel is the realisation that DP technology is a set of web services that can in principle be used by consumers in any industry to assemble "a la carte" combinations of services offered by independent service providers. The business case depends significantly on the DP system's ability to sell time-limited inventory at a discount without damaging the associated brands or other marketing channels. The methodologies developed and used in the travel industry will be applicable to any "a la carte" service offerings, compiled on demand from several different sources. Clearly then, the underlying technology can and must be quite generic in design and tailored only where required to enable the business models that are particularly relevant within each industry.

It is expected that the lessons gained from successful applications in the travel industry will eventually be applied in other sectors, where the same personalised service and concepts of users demanding sets of separate services together into one package applies.

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[65] CSI Media analysis methodology includes use of URCHIN, now also known as Google Analytics (www.google.com/analytics). This suite of web usage and analysis tools provides business-ready graphics and reports enabling clients of the methodology tools to more easily maximise yield management from their dynamically packaged travel, accommodation and other services.

References

Research for this case study was conducted by Henry J. F. Ryan, Lios Geal Consultants, on behalf of the e-Business W@tch. Sources and references used:

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- *Desk based literature research, and information available from the CSI Media web sites www.csimedia.net, www.dynamicpackaging.net, http://support.csiadmin.co.uk/*

CASE STUDY: PERSONALISATION & SEGMENTATION IN DYNAMIC PACKAGING AT LASTMINUTE.COM

Abstract

This case study on the dynamic packaging strategy and experience of lastminute.com, a Sabre Holdings / Travelocity brand, outlines the main success factors and ongoing lessons from Europe's leading independent online travel and leisure group. It demonstrates the critical importance of scale, customer focus, knowledge management and permanent product innovation. In addition to outlining impacts of the multiple-brand business segmentation and technical architecture developments, the study presents the end-customer personalisation aspects and customer feedback mechanisms. Policy considerations related to the lastminute.com "open basket" concept are also raised.

Case study fact sheet

Full name of the company:	*lastminute.com*
Location (HQ / main branches):	*London (UK)*
Sector (main business activity):	*Travel and Tourism*
Year of foundation:	*1998*
No. of employees:	*c.2000*
Total Transaction Value (TTV) in last financial year:	*1.2 Billion US dollars*[66]
Primary customers:	*Leisure and business travellers; Tourism and travel service suppliers*
Most significant market area:	*Europe*
Main e-business applications studied:	*Dynamic Packaging*
Key words:	*Dynamic Packaging strategy; customer experience*

Background and objectives

Based on the simple idea of matching supply and demand, lastminute.com is Europe's largest online travel system and one of the most widely known branded providers of dynamically packaged (DP) travel and leisure solutions. Founded in 1998, at the height of the dot.com boom, lastminute.com survived the "burst of the bubble" and over the period 2000-2004 has established itself as the European market leader through its DP capabilities, and a series of 14 acquisitions. The company's growth in sales value from just over £500m in 2003 to almost three times that in 2005 ultimately led to its acquisition by Sabre Holdings /Travelocity in July 2005.

Operating across multiple markets, lastminute.com has over 17 thousand supplier relationships and has around 10 million subscribers to its weekly newsletter. The 2004 addition of OTC (Online Travel Corporation), the company that created online self-packaged holidays, resulted in a stable of two leading platform technologies, namely, the lastminute.com Breakbuilder and OTC's Build Your Own. Both of these platforms

[66] Sabre data for Travelocity Europe in 2005. Includes Q3 and Q4 data for lastminute.com.

continue to operate, as they each use different Global Distribution Systems (GDS) and maintain a range of own brand and "white label"[67] hosted sites.

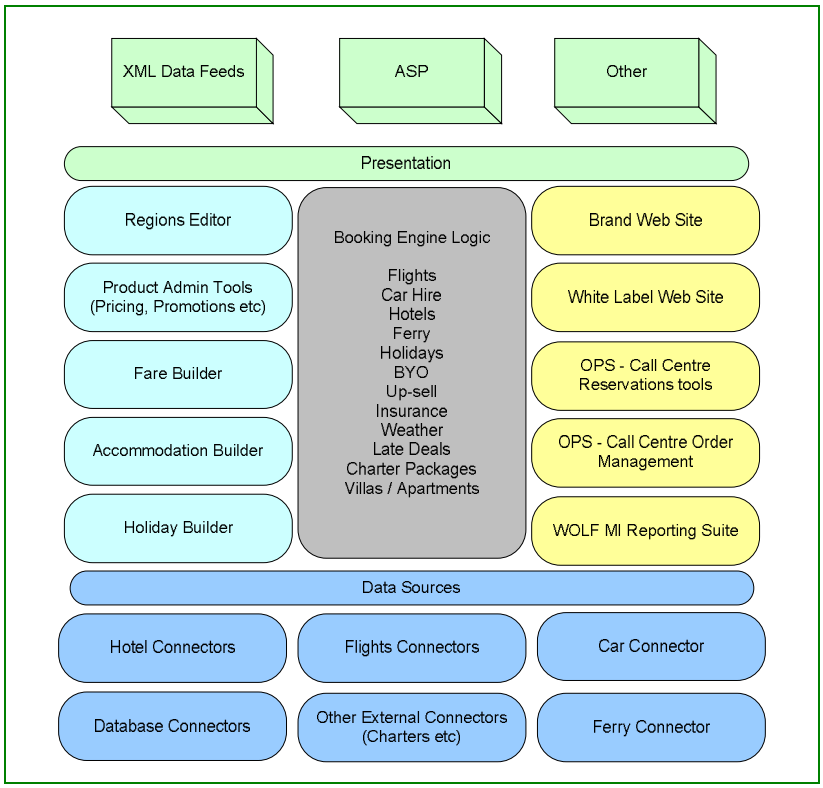
This case study outlines the impacts of practical multiple-brand business segmentation and web service based technical architecture developments. It also presents the emerging end-customer personalisation, visualisation and online social networking enhancements. Policy considerations related to the lastminute.com "open basket" concept are also raised.

e-Business activity

Since 2001, dynamic packaging at lastminute.com has delivered total component flexibility to customers and agents i.e. any combination of components presented can be booked and paid for in a single transaction. This development, enabling travellers to build tailor-made holidays online by combining flights and hotels, was also spearheaded at the time by OTC.

Exhibit 4-17 represents a high-level system architecture of the type of data and components that are fed into the central booking engine.

Exhibit 4-17: lastminute.com high level logical architecture



Source: lastminute.com (2005)

"White label" customers of lastminute.com DP technology are seeking to keep more control of the "look and feel" of their own front-end interface to their customers. Technology also needs to be developed to service new channels (mobile, PDA, other).

[67] i.e. services for third parties without visibility of the 'lastminute.com' label.

To meet these functionality enhancements, and ensure easier management of multi-language content though separation of the content from the web booking process, lastminute.com is increasingly adopting web service based solutions.

The first two systems have already been rolled out. However, the lack of industry standards in this area is a drawback, which is expected to cause some problems in the future as more and more DP systems get interlinked or taken over. Nevertheless, speed of delivery is critical in the tourism business and these concerns for the future are not impacting current development and roll-outs. The e-business goals are straightforward and immediate, focusing on continuous, customer-centred innovation. As summarised by Vic Darvey, Group Trade Director, lastminute.com: "*We ensure and maintain differentiated ways of building, presenting and delivering product to our customers. The business rationale for customer flexibility is paramount. Maximum choice delivered through an easy interface will win*".

Impacts

The success of DP, as measured by customer uptake and total transaction value (TTV), is indisputable. Vic Darvey outlined the current status and potential for continued growth: "*Dynamic packaging typically generates 40% of our TTV, with margins of around 12%. Our combination of global reach, wide range of travel and travel related products enables lastminute.com to further personalise European customers' choice of DIY (do-it-yourself) travel packages and increase our market share*".

Lessons learned and current status

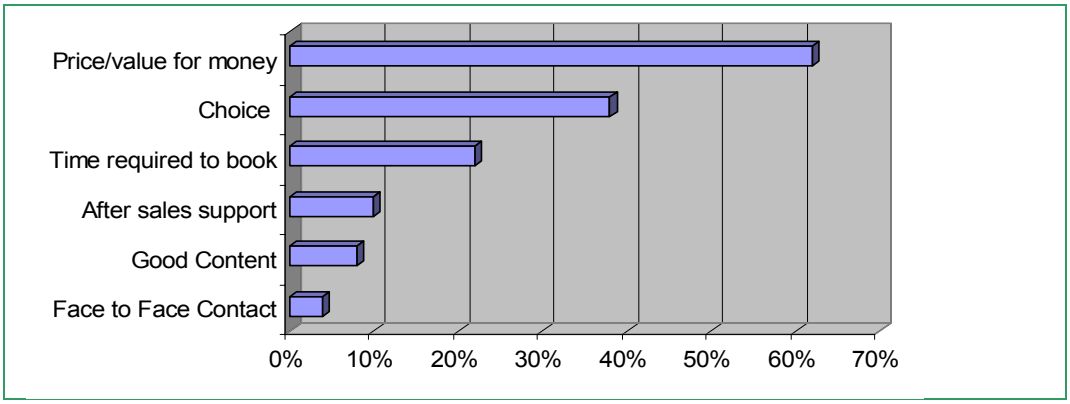
Business Complexity

The biggest lesson to date is that DP is not an easy business. The underlying business model means that the dynamic rules for packaging and pricing products and combinations of products is complex and needs a lot of time to get right. It also requires continuous investment to maintain and adjust in keeping with demand, changing tastes and traveller expectations. For example within the limited window of the online screen (which in the future may be a PDA or mobile phone screen) it is important to show the most suitable offers – from the customer perspective – not just the cheapest ones.

Demand for increased personalisation

DP was originally expected to become the main way of meeting tourist needs. Early expectations were high, but the reality was that the customer reactions were mixed. On the one hand, the type of duration booked did not alter much as Vic Darvey has observed "*analysis of dynamically packaged bookings conducted in 2005 indicated that people mainly continued to book the industry standard duration of seven, 10 and 14-nights*". This is not surprising as traditional holiday slots available to all family members are likely to be unchanged. On the other hand, the original concept of enabling simultaneous booking of a combined hotel and flight in one transaction had underestimated the customer need for flexibility and choice. The same analysis (see *Exhibit 4-18: Customer drivers for dynamic packaging)* indicated that the main driver of customer satisfaction after value for money was "choice".

Exhibit 4-18: Customer drivers for dynamic packaging



Source: lastminute.com (OTC Survey, 2005)

Travellers clearly want much more flexibility e.g. departure from local airports, access to low cost airlines, and greater freedom to include different service providers in the same basket. To meet the first two of these needs, lastminute.com has expanded its content to include low cost carriers and regional flights. To meet the third need, lastminute.com has developed its "open basket" concept whereby it is possible to include complex multi-supplier itineraries for (un)related journeys and other travel and lifestyle-related items in the same purchase.

Issues arise regarding the legal status of such a diverse package. Is it a split contract within the ATOL[68] and CAA[69] understanding? How can and should the individual components be bonded? This is an area which urgently requires industry-wide clarification and agreement. It is also an area in which regulatory and policy-making authorities at the European and national levels could usefully help to broker a resolution that respects the rights of individuals and is in keeping with the overall aims of the package holiday directive[70].

Content

Broadband is driving provision and access over the internet to richer content via customer-centric opportunities such as virtual tours, 360º views and better more-up-to-date information on destination location and surroundings. The latter aspects can be decisive factors in most bookings. For example, GEO codes, widely used to locate and display hotel properties on maps for the convenience of customers, are inadequate in some instances, such as busy seafront beach properties. In this case lastminute.com is leveraging the increased broadband availability to also display various elevation graphics and pictures with the aid of Google Earth and Microsoft Virtual functionalities. Customers can, thus, actually experience the views, pinpoint local attractions and see the precise location and surroundings of any hotel or other accommodation on offer before making their final decision.

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[68] Air Travel Organiser's Licence. ATOL is a consumer protection scheme for flights and air holidays, managed by the Civil Aviation Authority (CAA). Most firms who sell air travel in the UK are required by law to hold an ATOL.

[69] Civil Aviation Authority is the UK's specialist aviation regulator http://www.caa.co.uk/

[70] Package Holiday Directive 90/314/EEC (OJ 1990 L 158/59)

Customer Experience Management

One of the company's guiding principles is to keep its customers pleased and happy and if this is not achieved, lastminute.com needs to know about it very quickly. To this end, all lastminute.com websites use ResponseTek:CEM, a customer-initiated mechanism to convey feedback on their experiences. It enables customers to contact centre staff in their language and get a direct response. Their feedback is stored; aggregate information from all customer feedback sessions is then used to drive enhancements to company processes and achieve an improved experience for all customers. The solution enables lastminute.com to evaluate overall customer experience across each of its brands and countries. As a result, the company can identify why one of its brands is performing better in a particular country and then apply that knowledge to improve other brand and product performance.

Social networking

As shown by the explosion in blogs, one of the currently biggest changes in Europe is the increasing emergence and importance of online user communities and social networking. This will have a big impact on travel and purchasing behaviour. lastminute.com is establishing facilities to enable customers and staff to provide and widely share information and feedback on services and properties. This interactivity is seen as one of the ways by which potential purchasers and travellers can ensure that their planned arrangements will be a positive experience. This approach is also seen as an important differentiator in the market and one which will help foster long-term growth and customer loyalty.

Conclusions

DP has shown that it can maintain margins, and even increase customer satisfaction in a period of downward pressures caused by rising costs in both leisure and business travel. lastminute.com is comfortable in going head to head in competition with the traditional tour operators and other DP companies. Two years ago the tour operators and DP companies were operating in different markets. This is no longer the case. Dynamic content now includes a huge capacity of accommodation and related travel services at many beach hotels and other popular destinations worldwide, and has extended its access to low cost carriers, charters and regular flights. At the same time, DP operators face less risk exposure than, for instance, the traditional tour operators. Unlike the traditional tour operator they have no expensive brochures to print and distribute, there is no prior commitment to a specific allocation of hotel beds, and due to the huge scale factors that now exist for easy inclusion of additional accommodation and other leisure offerings there are essentially no concerns regarding capacity limits.

How complex can a dynamic package be? Vic Darvey envisages inclusion of more pre-packaged options from third-party tour operators and is confident in the emergence of a greater number of leisure and other service providers offering XML feeds that can be incorporated into the DP Engines "*There is a ceiling to how complex a dynamically-packaged booking can get, but we have not reached it yet. By developing our multiple brands based on customer feedback and innovation, lastminute.com is perfectly positioned to understand the market segments and more easily tailor and target individual offers directly to the most appropriate potential customers*".

References

Research for this case study was conducted by Henry J. F. Ryan, Lios Geal Consultants, on behalf of the e-Business W@tch. Sources and references used:

- *Interviews with Mr. Vic Darvey, Group Trade Director, lastminute.com and Ms. Claire Williams, Head of Corporate Communications, September 2006*
- *Desk based literature research, and information available from the Sabre Holdings, Travelocity, lastminute.com, and affiliated websites: e.g. www.sabre-holdings.com, www.travelocity.com, and www.lastminute.com*

Business example:

Touropa.com – *a dynamic packaging (DP) service provider*

Touropa.com is a German dynamic packaging service provider situated in Taufkirchen near Munich. Founded in 2004 (DP since March 2005), Touropa.com is a virtual tour operator which provides tourists "easy-to-assemble" travel packages, from different components, by means of a web-based travel configurator or via a requirements-based recommendation solution. Customers pay one price and obtain a guarantee for the whole package. All services can be booked separately, too.

Touropa.com is 60% owned by Georg Eisenreich (former Kreuzer, TUI and FTI manager) and 40% by TUI AG. Although the company has only 21 employees, due to this ownership structure, it cannot be considered a typical "small company".

Packages include accommodation, flight, car rental, transfer and additional services such as events or theatre tickets. In terms of quantity, its line of services offered is moderate in relation to other DP service providers on the market. It includes 300 hotels, 15 destinations (mostly Mediterranean), four airlines and one car-rental company. According to Eisenreich, a four-digit number of service providers will be reached soon. Accommodation provision descends to a large extent -most probably- from TUI.

Touropa.com does not acquire in-advance quotas, but enables real-time packaging from separate data repositories of different service providers. Service providers can adapt their prices according to their own capacities via a web interface. This functionality provides service providers with enhanced revenue- and capacity-management options. In contrast to in-advance fixed prices that can only be reduced during phases of weak business activity, Touropa.com's service providers are also able to increase prices during phases of high demand (e.g. on weekends). Two optional business models are provided:

- *the agency model (gross prices plus a negotiated commission rate) and*
- *the merchant model (a fixed net price plus a margin determined by Touropa.com), which is preferred by most accommodation providers.*

Touropa.com follows a multi-distribution channel strategy, i.e. sales via internet and other channels, such as traditional brick-and-mortar intermediaries, travel TV-channels and call centres. Additionally, it offers "white-label" services, i.e. services for third parties without visibility of the

label 'touropa.com'. According to Eisenreich, Touropa.com's e-business strategy generates profit margins of 3-5%, which are higher than those of traditional tour operators.

The development of a DP solution took approximately 18 months. Responsible for implementation was the German company ISO (www.isogmbh.de) which adapted its tour operator software "Ocean" to the DP requirements of Touropa.com. The most demanding task was to establish an interoperable technological connection with service providers that allows the mutual "understanding" of systems using different data formats.

Sources:

- *Website touropa.com*
- *Hildebrandt, K. (2005). Eisenreich startet auf allen Kanälen. In: FVW, März 2005.*
- *Jegminat, G. (2005). Eisenreichs virtuelle Vision. In: FVW, März 2005.*

4.2.4 Summary of main points and conclusions

Dynamic packaging (DP) depicts probably the most sophisticated and challenging e-business format in tourism (in both B2B and B2C) in terms of **technological requirements** (connectivity / interoperability of heterogeneous data) and **organisational demands** (management of enormous number of external suppliers). For this reason, large enterprises – the leading adopters of ICT in tourism – have, almost exclusively, been implementing / offering DP services so far.

The *CSI Media* case study focuses on the business and technology lessons gained from the wide range of DP solutions implemented to date. DP is a generic e-business solution on web-service basis which supports customisation and the integration of separate products and services into a single package for customers. The company offers its Travelberry solutions to travel-service providers who wish to add DP functionality to their online services. The case study illustrated that the implementation of DP solutions is a challenging but not an insuperable problem and that, in fact, there are already several DP service providers using the Travelberry technology. Two kinds of technological interoperability problems that have yet to be solved were highlighted in this case study: The first is the **lack of standards in geographic and location codes** across different GDS and other systems, which makes it very difficult to integrate different data sets. The second refers to the **seamless customer search** across different repositories. To reap all the advantages of DP, such as measurement and analysis of customer data for improved yield management or the optimisation of internal work-flows, the DP solution should be fully integrated with back-office solutions. Therefore, the next technological development step of *CSI Media* is about fully integrating the DP customer front-end with back-office or ERP systems of travel service providers.

The *lastminute.com* case study focuses on DP strategy and customer experience. The company utilises DP as a tool for matching supply and demand, based on a large scale of supplier relations (17,000). Also, DP has been used for "a multi-brand approach", i.e. to enable "differentiated ways of building, presenting and delivering products" to customers. Currently, DP accounts for 40% of total transaction value in *lastminute.com* and a further

customer uptake is expected. But, *lastminute.com* also points to a great complexity of DP-based e-business in terms of technological requirements (web services) and business models (dynamic rules for packaging and pricing products). The main driver for customer satisfaction after value for money was the ability to assemble packages including diverse (un)related journeys and other travel and lifestyle products in the same basket. Issues arise around simple and user-friendly presentation of content with sufficient information on destination location and surroundings. By means of customer experience management, *lastminute.com* identifies which brand is performing better and adapts its DP strategy accordingly. The main challenges and potential obstacles are a lack of technology standards for product descriptions and legal regulations concerning packages that include diverse products.

The *touropa.com* business example shows that even a "small" enterprise can develop and implement a DP solution. Obviously, however, this undertaking was only possible with the support of the travel giant TUI AG, which owns 40% of the company's shares. This business example also demonstrates that, although the development and implementation of DP solutions is a difficult task, it can be achieved. *Touropa.com* did not develop a new DP solution, but – for reasons of financial and technological stability – it adapted an existing tour operator's software to its own requirements. In fact, *touropa.com*'s business practice is focusing on enabling service suppliers to autonomously adapt their prices to current demand and, thus, to increase their revenue and capacity management opportunities. *Touropa.com* also offers different pricing models (agency and merchant model) for suppliers to choose from.

Fact-Box: Core results of the analysis regarding dynamic packaging

- **Drivers** of dynamic packaging (DP) are **over-capacities** of service providers, the possibility of cost-competitive **customisation** of travel components, the **avoidance of direct price competition** and the prospect to re-establish the tour operators' brand. At the customer side, DP perfectly meets the current trend towards **individualisation** of tourism demand.
- The main barrier for DP is its **complexity** in three dimensions – the **technological** dimension (e.g. requirements for distributed technology, seamless internal processes and the integration of heterogeneous data), the **organisational** dimension (e.g. the harmonisation of supply-side activities and the intensification of collaboration and communication between single service providers) and the **legal** dimension (i.e. mainly questions of service guarantee and reliability).
- **DP will not fully substitute pre-packaged deals**. Instead, it will complement the traditional pre-packaged offerings of travel agencies that still provide clear customer benefits such as convenience, trust, counselling and support to conveniently find the best offer. Yet, DP might force pre-packaged arrangements to offer even lower charges.
- **DP is still a domain of large enterprises**, as tour operators and travel agencies with a large network of service providers are best positioned to implement DP. Furthermore, most DP sales in Europe are from companies in the UK.

4.3 ICT-related developments in the aviation industry

4.3.1 Introduction

The transport sector is indispensable for a prospering tourism industry, as tourists require adequate means of transportation to get from A to B. Yet, not the entire transport sector is part of the tourism industry. Especially the transport of freight, but also a major part of passenger transport, is conducted outside the tourism sector. For this reason, the transport sector was not included in the quantitative survey of *e-Business W@tch*. Yet, the qualitative section of the study shall analyse developments in those branches of the transport sector which are relevant for tourism – especially airline passenger transport, with the focus on e-ticketing and other ICT-enabled processes in the aviation industry. Werthner and Klein (1999) provide a thorough assessment of the importance of ICT for transport in tourism, especially airlines:

> *Airlines represent the economically strongest players, using the most sophisticated IT applications and marketing methods. In pricing their product they use advanced yield management methods, which are usually not known in the other supply fields [of tourism …]. Airlines were among the first companies creating worldwide electronic networks, not only for the means of selling and distribution, but also for internal management and operations purposes. Also the other types of transport suppliers, car rentals as well as railways or the maritime industry fall into this category, they are technologically advanced." (Werthner / Klein 1999)*

4.3.2 Changes in the airline industry

In recent decades, the most important change in the airline industry has been the trend towards privatisation and enhanced competition – most prominently resulting in the emergence of the no-frills, low-cost carriers (LCC). The trend towards air transport deregulation started in the US domestic market in 1978. Many other markets have subsequently been liberalised or deregulated. In the EU, deregulation has been achieved with a multilateral policy approach that evolved over a couple of years through the introduction of three deregulation packages. Since 1997, any airline based in the EU can operate any route between two countries with virtually no controls on pricing or capacity (cf. Doganis 2006, Sterzenbach / Conrady 2003, ELFAA 2004).

Low-cost carriers offer a basic product with high seating density, minimal in-flight service and tend to use cheaper airports. LCCs achieve high utilisation as they offer high-frequency, scheduled, point-to-point short-haul services, using a single aircraft type with times for turn-round of 30 minutes or less. Another important characteristic is that they mostly sell directly – primarily through the internet (cf. Lumsdon / Page 2004, Klein 2006). The origins of the LCC sector lie within the US airline Southwest; now there are many other LCCs operating in North America. In Europe, Ryanair (see case study below) and easyJet were the first LCCs. They were established in the late 1990s and primarily operated routes out of the UK and Ireland. Subsequently, there have been many new start-ups in Europe; the competition was particularly strong in Germany with new airlines

such as Germanwings, Hapag-Lloyd Express or Air Berlin. The EU enlargement in 2004 has encouraged a number of new Eastern European start-ups, like Wizz and SkyEurope (cf. Creaton 2005, Calder 2003).

While the traditional flag airlines have faced an unprecedented economic crisis since 2001, the established LCCs such as Southwest, Ryanair and easyJet have managed to maintain high levels of profitability. Despite the apparent success of LCCs, there have also been many failures, and it is very unlikely that many of the new start-up carriers will survive because of the increasingly competitive climate. Competition evolves both amongst the LCCs, but also against the more traditional sector, where an increasing number of airlines, e.g. Aer Lingus and British Airways, have changed their short-haul strategy in order to compete more effectively. Other flag carriers have set up their own low-cost subsidiaries such as Ted (which was set up by United), snowflake (SAS) or Qantas (JetStar). Similarly, many charter airlines felt threatened and also moved into the LCC business, such as myTravelLite or Hapag-Lloyd Express. As a result, the distinction between traditional flag carriers, LCCs and charter airlines is becoming increasingly blurred (cf. Graham 2006, Doganis 2006, Groß / Schröder 2005). Overall, the emergence of low cost airlines was quite successful in recent years. An analysis of the European market concludes that the larger LCCs have shown that they can attract a totally new market while "eating into" the market share of legacy airlines (cf. Hunt / Richardson 2006).

Another advantage of LCCs is that they can apply revenue management more easily than the conventional carriers since - with rare exceptions - they sell only point-to-point, single-sector tickets. As a result, they do not face yield assessment problems arising from multi-sector tickets and from tickets sold in a wide range of diverse currencies and different values. Instead of having 12 to 24 different booking classes like flag carriers, LCCs only use four to six classes which reflect the separate fares they may offer on any individual route. In general, only one ticket price is available at any specific time for each flight. This makes effective yield management easier and cheaper to implement (cf. Doganis 2006).

LCCs, flag carriers and charter airlines alike heavily rely on information technology for their current daily business – and prospects for future developments, too (cf. Buhalis 2003).

> *"I believe technology is changing the face of the airlines. In this IT is fundamental and it is frontline."* (Paul Coby, Chief Information Officer, British Airways, 2004, quoted in Doganis 2006)

Rigas Doganis (2006) provides a good overview of key issues for airlines in regard to information technology, as presented in the box below. These key issues refer to LCCs and flag carriers alike. Some of the issues raised are discussed in the following sub-chapters.

Fact-Box:

Key issues for airlines in regard to information technology

Strategic issues

1. Developing a unified architecture or internet protocol (IP)
2. Developing an alliance IT hub (for global alliances)
3. How much to outsource

Business to customer

4. Implementing effective distribution strategies
   - online selling
   - use of joint airline portals or online travel agents
   - role of traditional travel agents
5. Effective customer relations management
6. Simplifying passenger travel
   - emphasis on self-service
   - electronic ticketing and/or ticketless travel
   - automatic check-in, including baggage
   - common use of self-service check-in kiosks
   - streamlining repetitive checks
   - radio frequency identification baggage tags (RFID)
7. Use of biometric technology for security
   - pre-screening passengers
   - effective biometric security

Business to business

8. Implementing e-business in
   - maintenance planning and control
   - supply chain management
   - procurement and supplier relationship (i.e. B2B)

Source: Doganis 2006.

4.3.3 e-Ticketing

One of the most important trends in the tourism sub-sectors of transport (as well as recreational, cultural and sporting activities) has been, and is likely to remain, e-ticketing. Airlines are the vanguards of this development. Especially no-frills carriers work exclusively with e-tickets; the avoidance of classical paper-based tickets is one of the core elements of their business model, as it considerably saves costs. Traditional incumbent airlines also take measures to promote e-tickets and roll back paper tickets. This conforms to the development towards dis-intermediation, as the issuing of paper tickets is a duty of classical intermediaries.

Intermediaries in ticket sales

Traditionally the majority of air travel tickets have been sold through travel agents, whereas for other modes of transport many tickets have been sold directly by the transport operator – especially in surface transport, where many passengers just 'turn up and go'. Since the late 1990s there has been a strong pressure on airlines to reduce their commission costs and this, coupled with the development of the internet as a viable alternative sales channel, has meant that more and more airline tickets were sold directly. Meanwhile many airlines in the USA pay no commission at all, and in Europe a number of airlines have decided to do the same. An important factor in the attempts of airlines to reduce their distribution costs has been the development towards e-ticketing (cf. Graham 2006, Doganis 2006).

The implementation of e-ticketing

The International Air Transport Association – IATA – has established a working group on electronic ticketing which addresses airline data interchange, interline revenue accounting, passenger handling, fraud prevention, security, as well as legal and facilitation issues. IATA has issued an 'Electronic Ticketing Implementation Guide' and set up the aim to achieve a 100% penetration of e-ticketing worldwide by the end of 2007, i.e. from the 1st of January 2008, only e-tickets shall be issued by the world's airlines.[71]

Other public means of transport have also decided to switch to e-tickets, including railways and coach operators. Operators of cultural and sporting facilities are promoting e-ticketing as well.[72] E-ticketing may be a win-win situation: customers may obtain tickets more conveniently and service providers may automate sales processes for tickets – clearly a feasible measure to save costs. Apart from these core benefits, e-ticketing also has other advantages: If tickets are sold over the internet, customers may need to register themselves. In this way, sellers of tickets can identify their customers who might otherwise remain anonymous in a classical ticket sale at the cashier's desk. This may deliver valuable data about the clientele – one of the basic requirements for the application of customer relationship management (CRM).

IATA summarises the **advantages** of e-ticketing for the airline business as follows:

- "*For the customer this means stress-free ticketing, no tickets to lose and no last minute queues for tickets on departure, together with greater opportunities for using self-service kiosks.*
- *For the travel agent, electronic ticketing will allow them greater opportunities to manage the corporate travel experience by being able to make changes to the actual ticket whilst the customer is on the telephone. […]*
- *For airlines, it is estimated that approximately 9 US dollars in savings could be made when an electronic ticket is issued instead of a paper ticket.*" (www.iata.org)

[71] Cf. www.iata.org/workgroups/etwg.htm

[72] Other examples of e-ticketing were analysed in the case studies about the London Eye (2004) and about Ski amadé (2005) in previous reports of the *e-Business W@tch* (cf. *e-Business W@tch* / European Commission 2004 and 2005).

Currently, IATA members process about 300 million paper tickets each year. Based on these figures, it is estimated that the 100% e-ticketing will save the industry up to 3 billion US dollars per year. e-Ticketing cost savings will derive from the elimination of printing, postage, shipping, storage and accounting costs; costs for collateral materials like envelopes and ticket jackets, increased efficiency in revenue accounting; and last but not least, a reduction in space necessary for airport counters by increasing the use of self-service check-in (cf. www.iata.org).

North American airlines as forerunners – European airlines following suit

North American airlines are forerunners in the application of e-ticketing as well as online sales of tickets in general, i.e. European airlines are very likely to emphasise further efforts to push e-ticketing even more vigorously. The following table gives an overview of the share in tickets sold on the airlines' own websites, tickets sold via all online channels (including sales on airlines' own sites) and the percentage of e-tickets issued. The figures are based on responses from 112 airlines, including low cost carriers.

Exhibit 4-19: Impact of online sales and e-ticketing in 2004

	Proportion of all tickets sold		
	Airlines' own websites (%)	**All online channels (%)**	**e-tickets issued (%)**
North American airlines	29.5	37.1	41.4
European airlines	15.2	16.0	20.7
Asia/Pacific airlines	7.6	10.2	16.5
World-weighted average	14.9	20.7	33.8

Source: *Airline Business and SITA (2004), quoted in Doganis 2006.*

Current data on online sales of airline tickets, as presented by Hannes Werthner at the EU tourism ministers' conference in Vienna in March 2006, indicate that nearly 50% of all sales and reservations of airline tickets world-wide were conducted entirely online in the second half of 2005 (cf. Werthner 2006).

The issue of e-ticketing is not necessarily directly connected to selling online, but in any case e-ticketing facilitates online sales. Here, sales via internet platforms bear enormous cost savings for airlines compared to traditional channels via travel agencies, which usually run over GDS. From this perspective, the direct sale of tickets via the internet by airlines constitutes another form of dis-intermediation.[73] The statements of two senior executives from Lufthansa and Star Alliance made in presentations at the ITB Berlin 2006 (the International Tourism Convention) clearly speak for themselves:

> *"Star Alliance member carriers currently spend an average of 12 US dollars per ticket in GDS fees. GNEs[74] such as G2 SwitchWorks, ITA and Farelogix have indicated to the group that they could offer the same product for 2-3 US dollars per*

[73] See chapter 4.1 of this report for a more detailed discussion on the issue of dis- and re-intermediation.

[74] GNE = Global New Entrant.

ticket." (Matthias van Leeuwen, Vice President Sales, EMEA, Lufthansa Systems Group, ITB Berlin 2006)

"These are credible companies. They can create all of the GDS offerings at a much lower cost because of internet technology. The low-cost carrier concept is about to arrive in the GDS world." (Graham Atkinson, United's Senior Vice President of Sales Chairman of the STAR Alliance Management Board, ITB Berlin 2006)

4.3.4 Customer self-service

Self-service kiosks for check-in allow passengers to enjoy the same convenience they have with banks' cash machines. Furthermore, these kiosks can be deployed at locations beyond the traditional check-in areas of airports, e.g. rail or bus stations, car hire plazas or hotel lobbies. From a provider's perspective an important advantage – among others – is the smaller space needed compared to traditional check-in desks. British Airways, for example, intends to conduct 80% of its customer operations in self-service (and 95% in e-ticketing) in Heathrow Terminal 5, which is to be opened in March 2008 (cf. Doran 2006). The biggest single constraint in Heathrow is terminal capacity; it is the world's busiest international airport, but occupying a very small space. Therefore, check-in kiosks in Terminal 5 will outnumber traditional check-in desks by far, which will save terminal space and is expected to increase the throughput of travellers considerably. At the 5th eTourism Futures Forum at the University of Surrey in March 2006, Nick Doran from British Airways concluded his presentation "The customer-enabled airline and the contribution to competitiveness" with the following final statement:

"In future, most customers will only have two direct contact points with BA – online and onboard…" (Doran 2006)

IATA established the **CUSS** (Common Use Self-Service) standard, which allows airlines to share self-service kiosks. For over ten years, self-service kiosks have been deployed at airports for passenger check-in. Initially, these systems were proprietary; they were developed on behalf of individual airlines in order to give them a competitive advantage and targeted at frequent flyers and business travellers. In the meantime, the industry has realised that many variants of essentially the same tool were too expensive and the service offered was taken too quickly as granted by passengers. Therefore, IATA members decided to create and adopt a common standard to ensure a more cost competitive service offering to their customers.

The CUSS standard allows airlines to share the self-service kiosk infrastructure whilst providing a vehicle for the airline to retain its branded kiosk application. Furthermore, as the kiosks are shared, there is a smaller number required for any given airport, thus CUSS kiosks use up less space in congested airport check-in areas in comparison to employing individual airline kiosks. The cost of the operation is significantly lower while the throughput is significantly higher (cf. www.iata.org). Thomas Frankl from SITA calculates average industry savings of 2.50 US-Dollar per check-in at a self-service kiosk. He also forecasts that common-use kiosks will become the choice for airlines in shared terminals (cf. Frankl 2006).

4.3.5 Bar-coded boarding passes

Another initiative of IATA was the development of a standards regime for bar codes of boarding passes. The aim was to reduce queues at airports and airline costs associated with check-in processes. IATA describes the advantages as follows:

- *"Customers will be empowered to print their own boarding pass at home or at the office and thus avoid queues for check-in. […]*
- *Airlines will have more options for providing boarding passes using different technologies. The use of bar codes for boarding passes will also facilitate the use of e-ticketing."* (www.iata.org)

The use of bar coded documents rather than traditional boarding passes enables cost savings, greater reliability and fewer mechanical problems that may arise with the magnetic strip readers at the gate. Bar coded documents provide the option to place an entire itinerary on one boarding document. This offers a natural link with e-ticketing. Most recently, it has become possible not only to print boarding passes at the passenger's home, but also to place bar codes on the passenger's cell phone[75] which makes a paper document completely unnecessary (cf. www.iata.org, Bruyère 2006[76]). As bar coding technology allows the printing of a boarding pass at home or in the office, off-airport check-in will become commonplace in the future, particularly for business travellers who only travel with cabin luggage. Furthermore, biometrics might even facilitate self-boarding of aircraft in the future. Yet, developments regarding biometrics are not shaped independently by the airline industry, as it is an issue for public security in many fields and therefore accompanied by a lot of political debate[77].

Overall, the European airline industry is lagging behind its U.S. counterparts, as self-service technologies are being pioneered in the U.S. There, air travel has already largely migrated online; about 56% of flight check-ins are conducted at kiosks and bar-coded boarding passes have become mainstream (cf. Frankl 2006).

4.3.6 RFID for luggage handling

In the near future, the use of Radio Frequency Identification (RFID) technology might simplify airline baggage management considerably. It might improve customer service in

[75] For example, the German airline DBA provides a mobile check-in service to its customers where passengers can check-in via their mobile phone and receive bar-coded boarding pass in form of a MMS (Multimedia Message Service) on the display of their mobile phone. Currently, this is provided in the form of a pilot project on a single domestic route within Germany, but DBA plans to extend this service to further routes (cf. www.flydba.com; August 2006).

[76] Information based on statements by Philippe Bruyère, Programme Director, Simplifying the Business – IATA, presented in a panel discussion at the ITB Aviation Day on the occasion of the ITB Berlin 2006, the International Tourism Convention in Berlin in March 2006.

[77] The deployment of biometrics is expected to be discussed heavily in the future. Yet, this discussion is clearly beyond the focus of this report and shall not be expanded here. For EU legislation regarding the integration of biometrics in passports and travel documents see e.g. http://europa.eu/scadplus/leg/en/lvb/l14154.htm For a discussion regarding the impacts of the deployment of biometrics on society see e.g. http://ec.europa.eu/justice_home/doc_centre/freetravel/doc/biometrics_eur21585_en.pdf

terms of a considerable reduction in mishandled baggage and provide new security requirements; increase baggage handling; reduce interline baggage tag read errors as RFID technology does not require contact or direct line-of-sight, as is the case with current optical read technology; allow the identification of bags in a baggage container that cannot be scanned by an optical scanner; and reduce the costs of manual encoding of interline baggage tags as the result of tags that failed to be scanned automatically by the system.

Currently, IATA is conducting a pilot project with key airlines and airports worldwide. The goal of this project is to measure and validate the interoperability of the technology, the processes associated with RFID, as well as all costs and benefits associated with the new technology. Back in 2004, IATA undertook a study to determine how to best implement RFID technology industry-wide. The key findings of this study were:

> *"RFID technology is a catalyst for change and a good focus for baggage handling performance improvements. RFID technology is to run parallel to the existing bar code technology for the foreseeable future. An RFID pilot is essential prior to an industry-wide rollout. Although there are strong arguments for RFID for baggage management, today here is insufficient data on costs and hard benefits currently available to support robust business cases either for individual airlines implementations or at the overall industry level. Ad hoc, individual attempts to introduce RFID will not lead to a solid, integrated industry-wide solution. The current perception is that tag costs are too high (0.20 US dollars) and will have to drop well below this level for adoption." (www.iata.org)*

Other developments regarding luggage handling may be quite unexpected, or innovative in a way that nobody would have foreseen. Peter M. Burns describes this latest innovation by Ryanair:

> *"Low Cost Airline 'Bans' Hold Luggage: Ryanair is one of the leading innovators in air transport through its policies of cheap fares with a 'no frills' business model. The latest attempt at innovation and creative thinking (July 2004) is a proposal to charge passengers 5 British Pounds fee for handling checked-in baggage. The idea is that Ryanair could negotiate lower ground handling fees at airports if there was no hold-baggage to handle. The business model would be to allow passengers a reasonably large bag that fits into the overhead locker along with electronic purchase of tickets and check in." (Burns 2006)*

As described in detail in the case study on *Ryanair*, the low cost carrier put this plan into practice in March 2006.

4.3.7 Case studies about ICT-related developments in the aviation industry

ICT and e-business solutions tend to differ in their application by no-frills carriers on the one hand and traditional flag airlines, on the other. Therefore, in order to gain insights in these different approaches, *e-Business W@tch* conducted two contrasting case studies about

- **Ryanair**, as a prominent European example of a low cost carrier,
- **SN Brussels**, as an example of a newly established network carrier (succeeding the old flag airline SABENA).

On the following pages, these two case studies are presented in detail.

CASE STUDY: ICT-DEPLOYMENT AT THE LOW-COST CARRIER RYANAIR, IRELAND

Abstract

The innovative use of information technology for online booking, e-ticketing and internal communications coupled with relentless improvements in cost containment, operating efficiencies, route system expansion and scheduling enables Ryanair to achieve increased passenger traffic and report the best customer service performance in its peer group class. The stated goal of doubling revenue targets and traffic volumes to 70 million, by 2012 depends on continued growth in ancillary revenues and technology adoption in line with the other business strategies to be adopted over the period.

Case study fact sheet

Full name of the company:	*Ryanair*
Location (HQ / main branches):	*Dublin, Ireland, with operations in most of Europe*
Sector (main business activity):	*Low cost air travel*
Year of foundation:	*1985*
Number of employees:	*about 2,700*
Turnover in last financial year:	*€1.3 billion*
Primary customers:	*Business and Leisure Travellers*
Most significant geographic market:	*Europe*
Focus of case study:	*e-Ticketing*
Key words:	*e-Ticketing, online booking, web check-in, low cost airline*

Background and objectives

Ryanair is Europe's first and largest low fares airline. It operates scheduled passenger services on 346 short-haul, point-to-point air-routes across 22 European countries. Originally established in 1985 by Dr Tony Ryan, founder of Guinness Peat Aviation, an aircraft leasing company, Ryanair first introduced its low-fares operations under a new management team in 1995 by copying the Southwest Airlines (www.southwest.com) model of favouring secondary airports, direct booking, no frills, low fares, and a single aircraft type for the entire fleet.

Ryanair has achieved annual increases in passenger traffic each year since 1995. Projections are for 35 million passengers in 2006, increasing to an estimated 42 million in 2007. Ryanair's objective is to double passenger volumes and revenue by 2012. It currently (July 2006) operates a fleet of 107 Boeing 737-800's and will buy 142 more of these aircraft over the next 6 years. The 2012 scheduled fleet complement of 269 aircraft is geared to provide the seat capacity to reach the 70 million passengers target.

Given the large number of low cost airlines now operating in Europe, Ryanair's goals are very aggressive and effectively assume that Europe is still in the early stages of low fare development. Ryanair recognises the potential for cost containment and operating efficiencies to be derived from appropriate investments in technology-enabled smart e-business activities. This study outlines the currently evolving e-business capabilities in place to address these growth areas and achieve the sought for doubling targets.

e-Business activities

Online booking

Online booking via the internet commenced in earnest after the launch of the www.Ryanair.com website in 2000. Over 98% of the 27.5 million passenger[78] seats in 2005 were sold via the internet. This percentage figure is consistent year on year, and is expected to continue at this high level. The remaining 2% is also important as it includes "walk-up" passengers who generally pay higher fares than average. Ryanair discounted fares are "capacity controlled" in that a specific number of seats are allocated on each flight to each fare category leading up to flight time. Therefore Ryanair does not overbook flights and generally tends to reserve a certain capacity of flights for such walk-up passengers.

The online booking system gives Ryanair the capability to introduce innovative practices to ensure that the individual customer has greater control over their fare costs. A recent such example relates to baggage charges. Passengers with checked in luggage must pay €3.50 (£2.50) per bag, per one way flight if pre-booked on website at the time of reservation or via a Ryanair call centre up to 4 hours prior to scheduled flight departure. They pay €7.00 (£5.00) per one way flight per bag presented un-booked at the airport. As a result of these changes, it is asserted that the 25% of Ryanair's passengers who presently travel with just hand luggage effectively no longer cross subsidise passengers travelling with checked-in luggage.

e-Ticketing Check'N'Go

Officially launched on the Dublin-Cork commuter run prior to the 2006 St Patrick's Day (17th March) holiday weekend, and since extended to all routes from Shannon and Cork Airports and on all European routes from Dublin, Ryanair's e-Ticketing Check'N'Go service enables passengers to check-in online within three days prior to the proposed flight and up to 4 hours before take-off. The procedure has been approved by the air-travel security authorities. Using a pre-printed e-boarding card from their home or office computers, passengers can avoid the airport check-in desk and go directly to the security gates with a maximum of one piece of hand baggage. There, security staff scan a bar code printed on the ticket - to eliminate possibility of duplication and multiple uses of the ticket - before passengers can proceed to the various departure gates where they can also avail of priority boarding.

[78] Represents the number of initial earned seat sales sold via the Ryanair website as a percentage of total initial seat sales. Initial seat sales exclude changed and amended seat sales. Earned seats include seats that are flown whether or not the passenger turns up. This is because once a flight has departed a no-show customer is not entitled to change flights or seek a refund.

Encouraging passengers to travel with less checked-in luggage, also means faster queues for those who check-in at the airport desk. Ryanair estimates that between 40 to 50% of its passengers will ultimately use online check-in. This will enable them to reduce the number of check-in desks and other airport handling facilities. The savings in handling cost are being used to offset other additional costs. The current process is not yet completely streamlined from the passenger perspective. easyJet for instance allows passengers to print off their boarding passes at the time of booking[79]. Ryanair passengers have to log-in again a short time before travel.

Internal communications

As Ryanair expanded across Europe, documentation and internal communications overheads increased. In particular, managing operational information became more complex. Therefore, in addition to their well known customer facing web pages, Ryanair has implemented a web-based internal communications system used by flight crews, maintenance and ground staff. This supports critical back office systems and internal quality management. For instance, a record is kept of the various components in each aircraft and a tickler schedule for their maintenance and/or replacement. Likewise training records, scheduled courses and assurance of the awareness of changes (record of individual access to the files) in critical operational information is logged. These mandatory recording features can also be used to generate exception reports for attention of the staff and managers concerned. The intranet system has also saved on tangible costs, including paper and printing costs.

Dynamic packaging and other ancillary revenue sources

Ryanair drives more sales and increased revenue via the dynamic packaging of flights with discounted hotel rooms and bottom of the range car rentals. In addition after selecting their flights, all travellers are strongly encouraged via the online payment process to take out travel insurance. Another option provided via Ryanair's homepage at present is to click through to another supplier's web site such as activitybreaks.com to buy their products.

Conclusions and lessons learned

The Ryanair approach can be characterised by spartan simplicity and a micro-focus on the cost base. The adoption of e-ticketing and internal e-business systems has enabled this low cost carrier to keep operational running costs well in-check, and will remain an essential element of their operations and strategies.

Achieving the revenue, and hence profit targets, will depend on additional income from increasing the number of passengers (airfares, onboard purchases) and, more importantly, through parallel service bundling with related insurance brokerages and tourism principals at destinations such as car rental companies and hotels. This is already an important contributor to risk management and revenue respectively. Such revenues continue to grow at a faster rate than passenger volumes. For the financial year ended March 31, 2005 their share accounted for 16% of total revenues, compared to

[79] Easyjet set to roll-out internet check-in for its UK passengers. www.m-travel.com/news/2006/02/easyjet_set_to_.html

15% for the previous year. Other ancillary sales include onboard catering. This, however, currently averages little more than €1.30 per passenger. At present, scratch cards are sold so it is possible that, at some future stage, online gambling would be introduced. It is likely that any increased revenue from gambling would be achieved by players being drawn to facilities which would be made available via the well known Ryanair website.

The customer service quality facts are clear: the US Department of Transportation ranks airlines on three criteria, on-time arrivals, baggage handling, and customer complaints. Ryanair is consistently the European leader on all three measures. In addition due to the minimal in-house administration costs afforded by the public online booking systems, Ryanair's low-cost-flights business marketing model includes frequent "give-away" flights as well: 23% of its tickets were given away in 2005, and half of all flights are slated to be "free" (i.e. not including taxes and landing charges) within the next four years. As spokesman Peter Sherrard stated, "*When demand is low, we give away empty seats and find that passengers are buying our on-board food and drinks products, rent cars through us and purchase hotel accommodation. It's much better for us to have people feeding into the revenue that way, even though they are travelling for free*".

References

Research for this case study was conducted by Henry J F Ryan, Lios Geal Consultants, on behalf of e-Business W@tch. Sources and references used:

- Information provided by Peter Sherrard and Lorna Farran, Ryanair Communications in April 2006.
- Desk research, company website www.Ryanair.com, annual reports and press clippings.

CASE STUDY: E-TICKETING AT SN BRUSSELS AIRLINES, BELGIUM

Abstract

The benefits of e-ticketing have long been recognised. However, many European carriers are lagging behind in terms of e-ticket adoption. The IATA commitment to discontinue the distribution and processing of paper tickets by December 2007 has been supported by most major carriers, which have also decided to discontinue interline and alliance partnerships with any carrier that cannot support interline e-ticketing. SN Brussels decided to focus on e-ticketing in order to cut operating costs and generate extra convenience to passengers. Apart from lower cost and increased operation efficiency, e-ticketing allowed the airline to strengthen its market position by a more intensive use of alliances and reduced dependency on intermediaries.

Case study fact sheet

Full name of the company:	*SN Brussels Airlines*
Location (HQ / main branches):	*Brussels, Belgium*
Main activity:	*Transport of passengers - 3.6 millions of passengers transported in 2005*
Year of foundation:	*2002*
Number of employees:	*2170*
Turnover in last financial year:	*946 Million Euro (for the group)*
Area of business:	*Passenger airline*
Main e-business applications studied:	*e-ticketing*
Key words:	*Online platform, e-ticketing*

Background and objectives

SN Brussels Airlines is a full-service Belgian airline company founded in 2002 by a group of Belgian investors who acquired some assets of the bankrupt Sabena airline. The airline operates daily flights to various destinations in Europe, Africa and the USA with 285 flights per day and 3.5 million passengers carried per year. SN Brussels Airlines is the only full service airline that operates from Brussels and is the market leader at Zaventem/Brussels Airport. The company has over two thousand employees in Belgium and abroad.

From the start, SN Brussels Airlines has developed an interesting business concept of offering fully serviced flights, as offered traditionally by the established airlines, with the lowest possible fare to compete with the low cost carriers. The airline aims to attract both the demanding business travellers with tight schedules but expecting value for money and economy travellers who are sensitive to prices. This strategy has lead to steadily increased numbers of passengers and better aircraft occupancy resulting in a seat load factor of 63% for 2005. As a result, the airline announced net profits in the last three years despite of the unfavourable conditions for the sector in general. Consequently, SN Brussels Airlines stands as a good example of reinventing its business operations to increase revenue and sustainability at a time when European airlines have been facing many challenges.

SN Brussels Airlines' approach is underpinned by two key drivers of ICT investments:

- First, SN Brussels Airlines expands its ICT use due to customer expectations regarding **a self-service based model** which gives travellers more convenience and control from the booking stage to the in-flight service. Here the internet plays an important role - purchase of air tickets constitutes 56% of European online travel market transactions[80]. The internet also gave rise to a widespread adoption of other passenger-liberating technologies, in particular e-ticketing, online check-in and self-service kiosks at the airports. Investment in automating passenger touch-points with transformational technologies, such as e-ticketing and self-service kiosks, are playing a part in the relentless campaign to reduce costs and narrow the gap between SN Brussels Airlines and the fiercely competitive discount Low Cost Carriers (LCC).
- Second, ICT developments like e-ticketing and own website/booking engine enable the airline to **strengthen its brand awareness**, get direct access to its customers and, consequently, reduce the dependency on Central Reservation Systems (CRS) and Global Distribution Systems (GDS).

In the business of travel distribution GDS act as intermediaries between airlines and travel agents. GDS have significant market power over airlines because each controls a large proportion of travel agents in the market. On this saturated market, GDS compete for the business of travel agents by offering increasingly high 'cash-back' payments. However, these costs are effectively passed back to airlines in increased booking fees which, according to the AEA (European Airlines Association), have been rising by around 5% annually in the last five years. As a result, for as long as the airlines are unable to exit from the upstream GDS market, they have no choice but to pay these higher booking fees. From the airlines' perspective, GDS are not readily substitutable for one another, as each GDS controls access to an important share of passengers through its member travel agents. Consequently, most airlines would not afford to cease participating in any of the four major GDS, i.e. Amadeus, Galileo, Worldspan and Sabre.

Thus in order to meet new requirements of travellers and reduce the dependency on intermediaries, SN Brussels Airlines decided to invest in its own internet platform supporting the e-ticketing system. The declining costs of modern server infrastructure and the introduction of pricing, shopping, and booking off-the-shelf software, have allowed the airline to shift significant buying volume to its own website, thereby avoiding CRS/GDS distribution fees of $4 or more per flight sector.

[80] See http://www.crt.dk/UK/staff/chm/trends.htm

e-Business activities

SN Brussels' **internet site** (www.flySN.com) is a major part of the company's e-ticketing infrastructure. Serving as a customer interface, it had to be user-friendly and allow for an easy search and compilation of travel offers. However, the first SN Brussels web site was not appropriate for the e-travel era. Based on a home-grown **content management system** (CMS) with an obsolete architecture and navigation structure, it was never well thought out and its updating became cumbersome. SN Brussels Airlines needed to improve and upgrade their CMS, thus allowing customers to search and find reliable information about the company. The web site also had to offer the most practical way of booking online with a clear and user-friendly way of helping customers navigate the site.

The first priority was to implement a future-proof technological platform to ensure the needs of SN Brussels Airlines' customers. The wish to adjust the site to the needs of customers and create content layers in various currencies, languages and countries resulted in a challenging content management package. The company wanted a well-known CMS to avoid the dependency of a partner or agency, which had been tried and trusted elsewhere. This CMS should also be able to handle all their web site requirements including multilingual and multi-country branding issues. For these reasons, SN Brussels Airlines chose Tridion.[81] Bruno Brusselmans, head of the e-business department at SN Brussels Airlines, explains the decision process: *"Without a robust infrastructure you cannot react flexibly to market demands and you cannot take commercial decisions adequately. Layout, navigation structure and the overall part of the content is centrally controlled at the headquarters in Brussels. The local offices control their own promotions and contact information. The maintenance and management costs of the new Web site are minimal, whilst each week substantial changes including translations are implemented."*

The new web site was launched in August 2004. It was equipped with a significantly upgraded, user-friendly **booking engine**. In its new format it presents the entire range of flights and price availability for any chosen route in one single page. In 2004[82], 280,000 bookings were made on www.flySN.com which represented an increase by 100% compared with the previous year. Also, with the steady growth of sales, the percentage of tickets sold by the airline's own channels without intermediaries has grown up to 30% in 2005 while in 2004 about 83% of European sales emanate from travel agencies.

Among the SABENA's assets which were taken over by SN Brussels was the IT infrastructure, including the e-ticketing system which was developed back in 1999. Similar to a paper ticket, an e-ticket performs two functions: it confirms to airline staff that the passenger has paid for travel and it is also a method of documenting sales and managing inventory. Unlike paper, the e-ticket uses a database to track the sale and use of tickets. All subsequent ticket transactions, including refunds, exchanges, check-in, void and settlement, involve this holding database. E-tickets are now available through the SN Brussels Airlines' web site and call centre on all routes in the network, offering a more

[81] See www.tridion.com

[82] Since the owner of SN Brussels Airlines, the SN Airholding Group, has acquired ownership of another airline, Virgin Express, in 2005, the results of each individual airline are no longer published.

convenient and environmentally friendly alternative to paper tickets. The airline also offers e-ticketing through global distribution systems (GDS) used by travel agents.

Initially, the new site was designed according to customer needs. The traveller had to be able to decide at any moment in time where and when he wanted to book: via the web site, via the call-centre, at the airport or via the travel agency. In 2005, the focus shifted from user-friendliness to "price advantage" of the sales channel. In this way SN Brussels Airlines positively influences passengers to purchase an e-ticket via its own website. With 22 web sites SN Brussels Airlines is still working on the development of their self check-in (via kiosks & website) possibilities, added hotel bookings, insurance and rent-a-car services online.

The e-ticketing system is integrated with other functions such as reservations[83] and departure control services. All e-tickets are stored in a single database that interacts with other airline functions. Such an integrated design provides e-ticket details in sales reports and financial data, ground handling capabilities and revenue accounting reports. Mr Tony Capiau, the airline's representative, estimates that - in the most pessimistic calculation - issuing an e-ticket saves one Euro in comparison to issuing a paper ticket: *''Although IATA states that an electronic ticket is about 7 US dollars cheaper than a paper ticket, I was only able to demonstrate, for SN Brussels Airlines, a cost saving of about 1 EUR per e-ticket. But even if an e-ticket is only 1 EUR cheaper than a paper ticket, the savings are still evident considering the over 3.5 million tickets issued yearly''.*

Impacts

The airline's own web site enabled SN Brussels Airlines to create an efficient customer interface and a cost effective distribution channel of e-tickets. In 2005, flySN.com was chosen by the CMS-Awards committee as the best Belgian web site powered by a CMS.[84] According to Mr. Brusselmans, *"Our web site has proven to be a great success with customers, thanks to the consistent structure, layout and tight integration of content and flight data across all of the 16 languages we offer. We're now taking over 25,000 online bookings per month, which represents a massive increase compared with the old site."*

One of the key advantages of the technology, according to Brusselmans, is its *blue printing* capability, which makes it very easy for the company to update its web sites or launch new ones. *"The ongoing maintenance costs of the site are minimal, even though we make major changes to the content almost every week with new offers and pricing. Best of all, however, we can now launch a new site in just a few hours – we literally only have to write the content and translate it, as there is no need to do any programming."*

Since the web site revamp, SN Brussels Airlines experienced a steady growth in **online booking**, which proved to be an efficient channel for the distribution of e-tickets. Whereas in May 2002 only 38% tickets were sold online, in September 2006, 63% of own sales were conducted via its own booking engine. This result was facilitated by the

[83] Depending on the fare, it is possible to make a reservation without buying the ticket immediately. The lowest fares require immediate payment and ticket issuance and more expensive fares are more flexible. Even after the ticket has been issued, changes are possible; either free of charge or at a cost, depending on the chosen fare.

[84] See www.cms-awards.be

implementation of a dedicated **search strategy** which lead to a 420% increase in bookings from Google and the other major search engine's paid and natural listings.

The benefits of e-ticketing have long been recognised and, according to Mr. Capiau, e-ticketing delivered SN Brussels Airlines the following **direct benefits**:

- Reduced document distribution costs,
- Access to all sales channels,
- Eliminated paper-ticket fraud,
- Enhanced passenger check-in options,
- Increased revenue through the automation of check-in and ticket change control,
- Eliminated lost / stolen tickets,
- Enhanced self-service possibilities by using kiosks and via online check-in.

In addition to these direct gains, SN Brussels Airlines has also achieved other less obvious benefits from e-ticketing. Firstly, the code-share flights marketed by SN Brussels Airlines are not eligible for SN Brussels Airlines electronic ticketing when the operating carrier does not have an interline e-ticketing agreement with the airline. Using an e-ticketing system developed to meet the International Air Transport Association (IATA) industry standards, allows SN Brussels Airlines to fully participate in interline and alliance partnerships that require e-ticketing. Thus, having the e-ticketing technology at place the airline has a clear advantage over LCC using e-ticketing solutions not applicable for interlining. Hence, SN Brussels Airlines' e-ticketing solution allows for seamless **link up with external partners** by forming alliances and developing the so-called "interlining" system that allows passengers to have one ticket for a complete travel itinerary with different travel segments from several airlines. Passengers have then only one set of tickets for a multi-operator trip and benefit from having their luggage checked right through to their destination. In contrast, LCCs' point-to-point services enable low operating costs but do not allow interconnectivity of the airline networks.

Secondly, the introduction of the e-ticketing system together with the consequent development of the company's online identity, allows SN Brussels Airlines to **overcome intermediaries** and directly access customers. Furthermore, the e-ticketing system allows the airline to conduct interline e-ticketing transactions with airline partners and travel agents. Given that GDS and interline channels often represent around 70% of an airline's sales, SN Brussels Airlines benefits from the cost savings of e-tickets across all channels.

Lessons learned

This case study illustrated the use of e-ticketing at SN Brussels Airlines. The e-ticketing system did not only enable the airline to reduce operation costs and increase efficiency, but also helped to achieve strategic advantages which have further strengthened its market position. In particular, the applied e-ticketing technology facilitates the creation of alliances with other airlines. This, in turn, allows for a more efficient utilisation of transportation capacities and access to a larger number of customers. Furthermore, e-ticketing combined with the development of direct online sales channels reduces the dependency on intermediaries and decreases the payments to CRS/GDS.

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- *Websites:*
  - *Company website: www.flysn.com (Sept 2006).*
  - *www.crt.dk/UK/staff/chm/trends.htm (Sept 2006)*
  - *AEA website: www.aea.be (Sept 2006)*
  - *IATA website: www.iata.org (Sept 2006)*

4.3.8 Summary of main points and conclusions

The aviation industry is one of the sub-sectors of tourism most affected by the development of ICT and the internet. In this context, no-frills airlines are the most striking feature of this market as they rely heavily on e-business solutions. Yet, currently the whole airline industry – including traditional flag carriers – is being transformed by ICT and e-business. Most of these developments concern customer-facing activities and are therefore directly recognisable for flight passengers, e.g. e-ticketing, online sales of tickets, customer self-service check-in or bar-coded boarding passes. Yet, e-business also heavily shapes the internal workflow of airlines and the co-operation with suppliers and intermediaries. This is particularly exemplified by the gradual substitution of traditional Global Distribution Systems (GDS) through services provided by new entrants operating with internet technology or through airlines' own websites. Ideally – from an airline's perspective – the majority, if not all bookings of tickets should be made directly over the airline's website. This would imply that all sorts of intermediaries would be omitted. Not only low cost airlines pursue this business strategy; classical network carriers are following suit.

The case study about *Ryanair* demonstrates how the adoption of e-ticketing and internal e-business systems has enabled an airline to keep its operating costs down. A sophisticated yield management system which allows flexibility in dynamic pricing of tickets has successfully been in operation for years. In the near future, *Ryanair* will further boost self-service check-in processes accompanied by new strategies, such as separate pricing of hold luggage.[85] Furthermore, *Ryanair* intends to increase ancillary revenue sources, e.g. by packaging flights with hotel rooms, car rentals and travel insurances. These ancillary business areas are expected to become even more important in the future.

[85] However, it remains to be seen how recently aggravated security measures regarding allowances for cabin luggage by many airports will thwart Ryanair's strategy to reduce the transportation of hold luggage at the expense of increased volumes of cabin luggage.

The case study about *SN Brussels Airlines* shows how a traditional network carrier benefits from the deployment of e-ticketing and dis-intermediation. The main difference to the adoption of e-ticketing by Low Cost Carriers (LCC) is that it applies e-ticketing also for interlining flights. In this way, e-ticketing also supports the formation of alliances and cooperation between different airlines. Another difference to the LCC e-ticketing model is the sale of more flexible e-tickets, e.g. it is possible to book a ticket but not buy it immediately. The flexibility in issuing the ticket depends on its price class. In this way, the network carrier may serve business travellers, who are less price-sensitive, but require more flexibility for the date and time of their travel, and leisure travellers alike, who tend to be more flexible but are more price conscious.

While LCCs like Ryanair sell tickets exclusively over their website, network carriers tend to push bookings through their own website alike, yet without completely abandoning travel agents as the traditional sales channel for flight tickets. Similarly, LCCs operate exclusively with e-tickets (completely abandoning paper tickets), while most network carriers still issue paper tickets along e-tickets. Yet, also traditional airlines are pushing e-ticketing. In any case, e-ticketing is a measure of cost containment – although the calculated amount of savings differs according to different sources (e.g. IATA claims savings of 7 US dollars per ticket, while SN Brussels Airlines only calculates a cost saving of 1 EUR per ticket issued electronically instead of a paper ticket).

Fact-Box: Core results regarding ICT-related developments in the aviation industry

- **e-Ticketing**: The elimination of traditional paper-based tickets is one of the core elements of the low-cost business model. Yet, e-ticketing is not limited to the so called “no-frills” airlines. The adoption of e-ticketing is increasingly pursued also by network carriers. The International Air Transport Association (IATA) intends to achieve a 100% penetration of e-ticketing among its members by the end of 2007.
- **Customer self-service**: Another measure for cost reduction and the acceleration of passenger flows at airports is to introduce customer self-service check-in solutions. This may be done on the spot by self-service kiosks or in the form of web based check-ins, which may even allow users to check-in from home or their office.
- **Bar-coded boarding passes** offer a natural link with e-ticketing and self-service check-in. Most recently, it has become possible not only to print boarding passes at the passenger’s home, but also to place bar codes on the passenger’s cell phone, thus making paper documents obsolete.
- **RFID for luggage handling** might replace classical baggage tags in the near future. It might simplify airline luggage management considerably, improve customer service in terms of reductions in mishandled luggage, and provide new security mechanisms.

5 Conclusions

5.1 Business impacts

5.1.1 Implications for enterprises

In the following section, the impact of ICT and e-business for individual enterprises in the tourism industry will be assessed. This assessment will be based on the combined findings from the e-Business Survey 2006 presented in chapter 3 and the case studies and the discussion of current e-business trends presented in chapter 4 of this study. Relevant impacts on competition in the tourism industry are also analysed.[86]

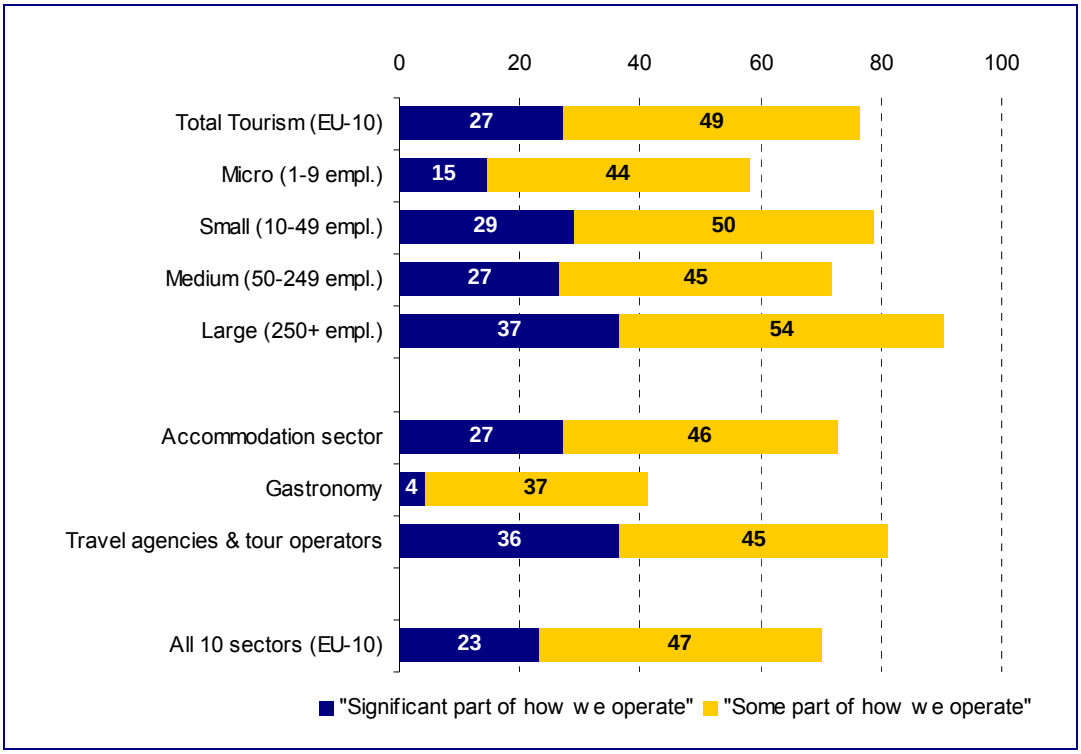
Perceived importance of e-business in tourism is above all-sectors average, but not for micro companies

As shown in Exhibit 5-1, the figures on the importance of e-business for company operations in the tourism industry are **slightly above the all-sectors average** for the 10 industry sectors covered by the e-Business Survey in 2006. For 76% of tourism companies (10 sectors average: 70%) e-business constitutes either a "*significant part*" or "*some part*" of their daily business operations. The importance of e-business is particularly stressed in large tourism enterprises: 37% of the large companies consider it a "*significant part*" of their operations and 57% consider e-business at least partly important for them. Overall, more than 90% of large tourism enterprises ascribe e-business a more or less significant role in their business operations. The perception of the importance of e-business is in line with the all-sectors average. Only the figures for tourism micro enterprises are below the overall average.

As regards the different **sub-sectors** of the tourism industry, as defined for the purposes of this study, e-business has the highest importance for those players which are "in the front line" of e-marketing and online booking: travel agencies, tour operators and accommodation providers. The figures for these tourism sub-sectors are higher than the average figures across the 10 sectors analysed this year by *e-Business W@tch.* This is a clear indication of the **travel agencies' and tour operators'** role as **e-business forerunners** not only in tourism, but also **in relation to other industries** studied.

[86] A special report on "ICT impact on competitiveness and productivity" is available at the website www.ebusiness-watch.org 'resources'.

Exhibit 5-1: Perceived overall importance of e-business for company operations



Base (100%): Companies using computers (excl. "don't know"). N (for sector, EU-10) = 719. Weighting: Totals (for the sector and for all 10 sectors) are weighted by employment and should be read as "enterprises comprising …% of employment in the sector(s)". Figures for size-bands are in % of enterprises from the size-band. Figures for tourism sub-sectors (accommodation sector, gastronomy, travel agencies & tour operators) are in % of enterprises from the sub-sector. Questionnaire reference: H1.

Source: *e-Business W@tch* (Survey 2006)

High impact of ICT on the organisational structure of large enterprises

The high impact of ICT on the organisational structure of large enterprises indicates a stronger level of integration of ICT in their business operations and thus an additional competitive advantage of large companies compared to SMEs. The e-Business Survey 2006 has examined the ICT influence on organisational structures of tourism companies in terms of job descriptions, employee training and outsourcing decisions (see Exhibit 5-2). The results indicate that ICT influence is clearly **linked to firm-size**: it is perceived to be considerably more influential in large companies than in SMEs. General results are in line with most of the other economic sectors surveyed.[87]

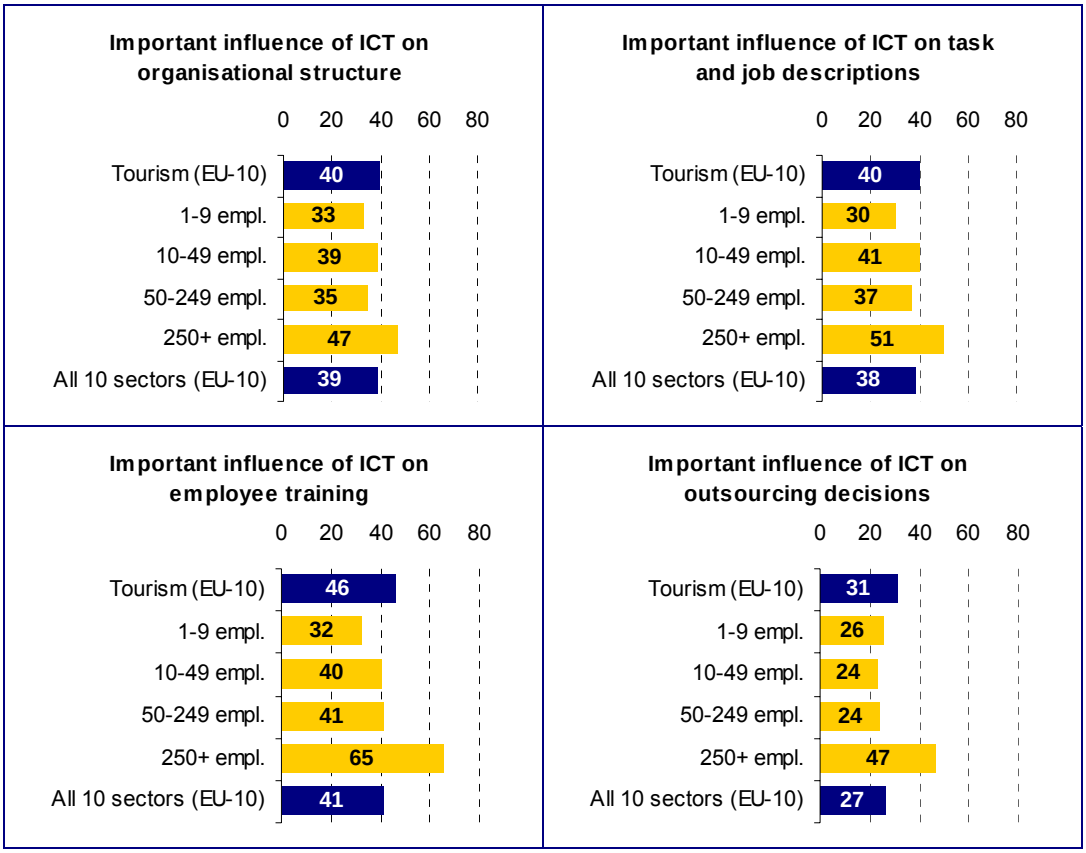
In terms of the influence of ICT on organisational structures, the **training of employees** has been perceived as most important. Especially large companies see the necessity to provide ICT training for their employees much more than SMEs: only 9% of micro and 33% of large companies said that they provide ICT training for their employees (see

[87] See also e-Business W@tch Special Study on the "Impact of ICT on corporate performance, productivity and employment dynamics" (2006), available at www.ebusiness-watch.org ('resources').

Exhibit 3-3 in chapter 3). On the other hand, in small or micro companies ICT tasks might be sufficiently covered by one employee, mostly by the manager himself, and ICT training of additional staff might not be considered necessary (cf. chapter 3.2.1 'Demand for ICT skills and skills development').

Yet, the influence of employment training on organisational structure should not be overestimated, as only 11% of tourism companies provide regular ICT training for their employees. This figure is low, but in line with the all-sectors average, i.e. of all 10 sectors surveyed (13%). Furthermore, the indicator "hard-to-fill vacancies for ICT jobs" clearly shows that **ICT skills and skills development are not considered to be a "burning issue" in the tourism industry**. Only about 2% of all firms in this sector reported having hard-to-fill vacancies for ICT jobs in 2005 (see Exhibit 3-3 in chapter 3). Given the growing importance of e-tourism, a critical question must be posed whether tourism companies simply do not need more ICT skills or whether they are not aware of the need to invest in ICT skills, or the need to upgrade these skills, respectively. However, with respect to this question, there is also a significant difference between SMEs and large companies claiming that ICT is having significant influence on their employees' training (Exhibit 5-2). The most probable reason for this is that business processes in large companies are to a larger extent ICT-based than in their smaller counterparts.

Exhibit 5-2: Perceived influence of ICT on organisational structure:



Base (100%): Companies using computers. N (for sector, EU-10) = 725. Weighting: Totals (for the sector and for all 10 sectors) are weighted by employment and should be read as "enterprises comprising …% of employment in the sector(s)". Figures for size-bands are in % of enterprises from the size-band. Questionnaire reference: H7.

Source: *e-Business W@tch* (Survey 2006)

The influence of **outsourcing** on organisational structure is likewise low, as only 10% of companies – especially the large ones – have outsourced their ICT services to external service providers. However, outsourcing proves to have a high potential impact on organisational structure, as there is a strong trend towards outsourcing in tourism industries. In 2005, about 31% of tourism companies outsourced more ICT services than in the previous year, while only an insignificant number of companies said that they outsourced less (cf. chapter 3.2.2 'Outsourcing of ICT services and ICT investments').

Generally, ICT is more deeply ingrained in business operations of large tourism players. This again might have an impact on competition. In-depth ICT integration contributes to work-flow and business processes optimisation / acceleration in large enterprises where business operations are already to a large extent ICT-based and automated. Hence, the **competitive advantage of large enterprises might even increase** in the future.

The overall statistical picture provides sufficient evidence for the claim that large enterprises drive ICT development and are clear e-business vanguards in the tourism industry. Hence, SMEs, and especially micro enterprises, should be more decisive in making use of e-business and investing in ICT respectively. In 2005, about twice as many large companies (80%) have made ICT investments as micro enterprises (40%). On the other hand, the e-Business Survey 2006 revealed micro enterprises as those companies with the highest disposition to increase their ICT budgets in the future. Policy initiatives with the aim to strengthen micro companies in tourism - which constitute the vast majority of enterprises in this sector - should have a closer look at this issue.

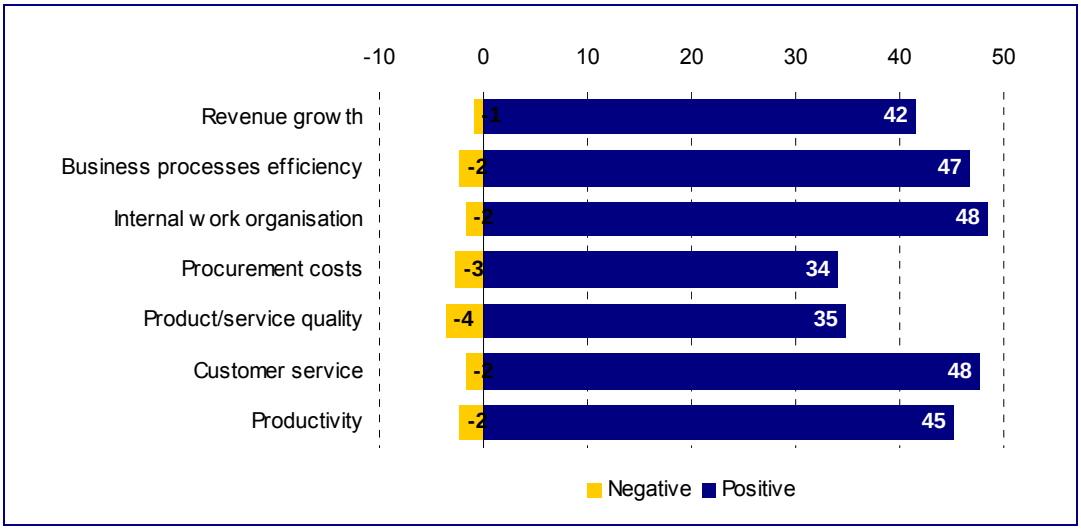
High ICT impact on customer services and internal work organisation

ICT influence on companies' business is to a large extent considered positive, while negative influences of ICT are perceived to be very low. As could be expected, strong **ICT influence is perceived particularly in the front-end area**, i.e. in the customer service domain, which is probably a result of well established online booking and e-marketing activities – similar to findings from previous *e-Business W@tch* surveys. Customer-facing e-business activities are the only domain that substantially outstrips the average figures of other industries (cf. chapter 3.9 'Summary of the quantitative analysis').

Interestingly, however, the influence of ICT on the back-end area – internal work organisation, business process efficiency, productivity and revenue growth – has been perceived (almost) **equally strong** as well. This could be explained by a growing reliance of companies on digital business environments (e.g. for e-invoicing or e-procurement) and, to a smaller extent, by the trend to integrate customer-facing operations with back-office systems. Given the moderate adoption of software systems for internal process integration (intranet, ERP system, document management system, supply chain management, ICT system linked with customers) and for collaborative B2B processes, there is substantial future development potential, especially since paper-based processes still dominate financial (and probably other) work flows among tourism companies (cf. chapters 3.4.2 'Use of ICT for cooperative and collaborative business processes' and 3.4.1 'Use of software systems for internal process integration').

ICT influence is perceived as fairly low in terms of the quality of products or services. An explanation could be that tourism services (and, certainly, products) are not directly associated with ICT. On the other hand, the fact that ICT-based search, booking and real-time packaging functionalities have been revolutionising tourism services is only to a low extent reflected in the perception of ICT influence on service quality. On the contrary, ICT influence has been perceived most negatively in this respect. One of the main reasons for this might be the understanding of tourism as a service sector, in the sense of human service, where full automation of services (mostly based on ICT) may be considered the 'antipole' to high-quality manual service.

Exhibit 5-3: Perceived ICT influence on the company's business



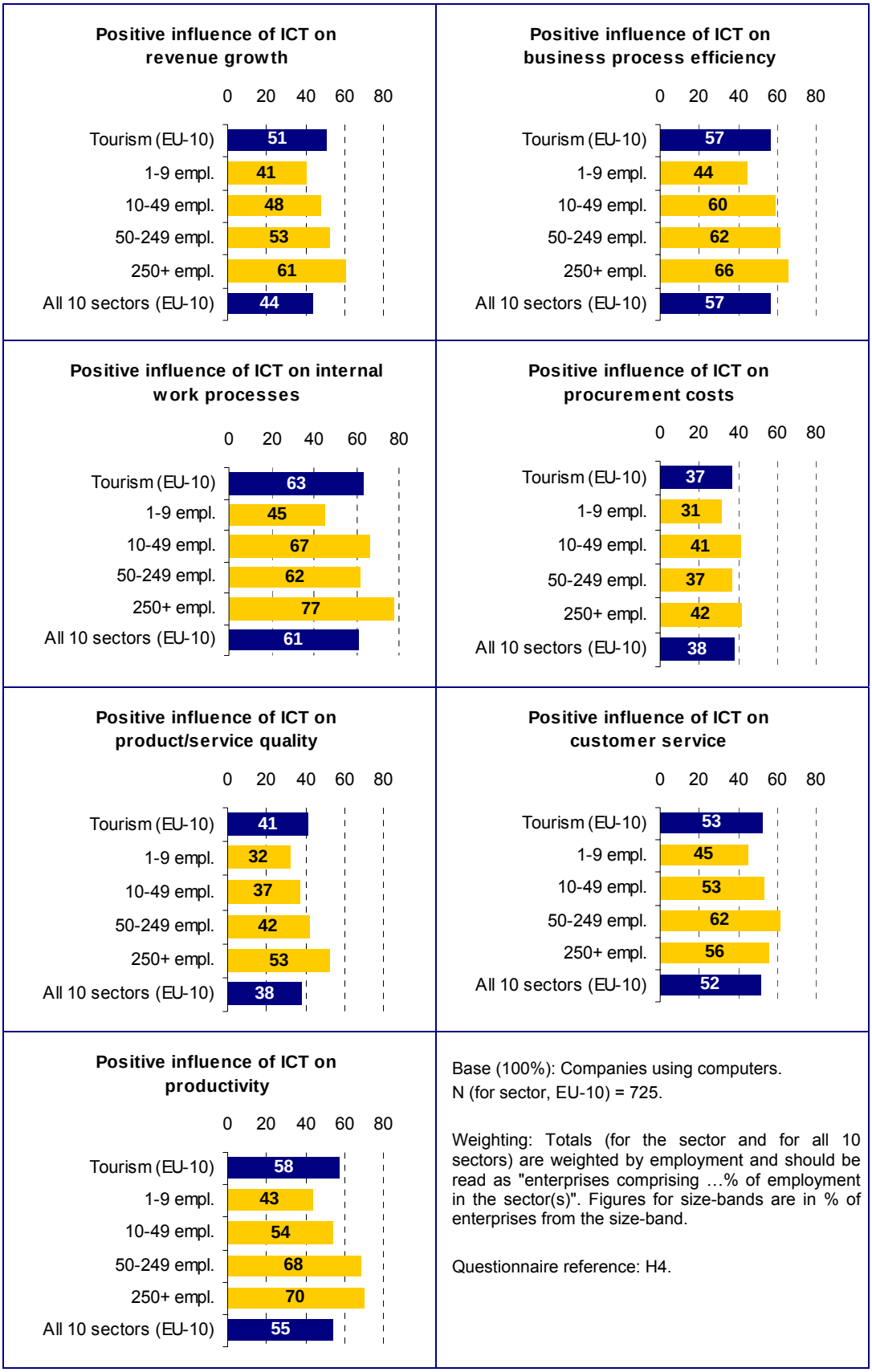
Base (100%): Companies using computers. N (for sector, EU-10) = 725.
Weighting: in % of firms. Questionnaire reference: H4.

Source: *e-Business W@tch* (Survey 2006)

The results of the e-Business Survey 2006 provide some evidence for a **high ICT impact on the organisation of internal work operations, services and supplies**. It is interesting that the influence of ICT in these areas has been assessed as even higher than in the area of customer-facing activities, which is often considered a traditional e-business "flagship" in the tourism industry. The reason for this perception might be seen in increasing ICT-based value chain integration in tourism in terms of both, internal and external companies' operations. The results for tourism are consistent with the other sectors of the European economy. Remarkable differences can be observed only with respect to a positive influence of ICT on revenue growth, which in tourism is about 7% higher that in the other sectors surveyed.

Overall, the perception of a positive influence of ICT on tourism companies is mostly **dependent on firm-size**. This is especially true for revenue growth, business process efficiency, product and service quality and productivity - and, with a slight deviance, for internal work processes and procurement costs.

Exhibit 5-4: Companies observing a positive influence of ICT on …



Base (100%): Companies using computers.
N (for sector, EU-10) = 725.

Weighting: Totals (for the sector and for all 10 sectors) are weighted by employment and should be read as "enterprises comprising …% of employment in the sector(s)". Figures for size-bands are in % of enterprises from the size-band.

Questionnaire reference: H4.

Source: *e-Business W@tch* (Survey 2006)

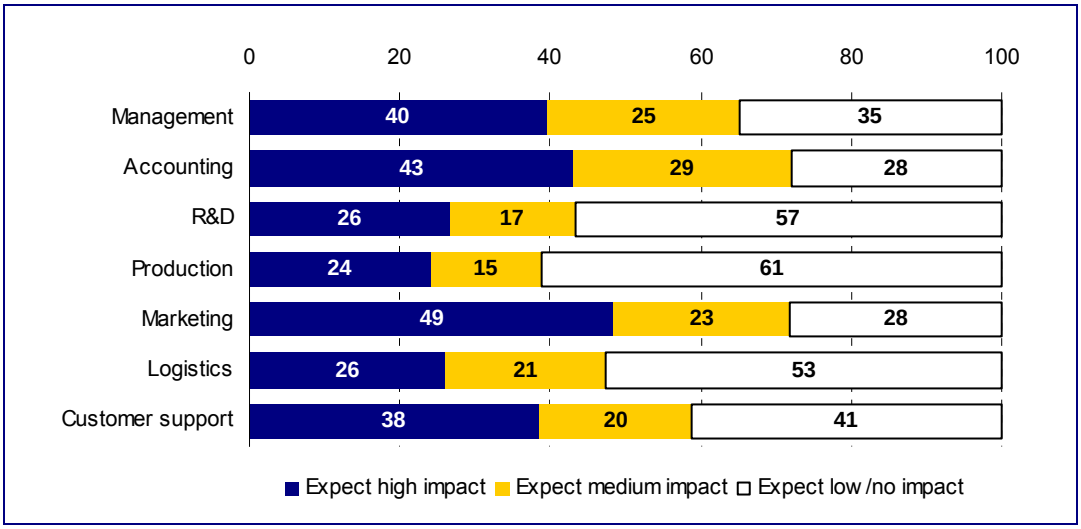
The **lowest** influence of ICT was observed with respect to **procurement costs**, which indicates that sourcing operations are to a large extent still carried out manually and do not produce significant savings (e.g. of transaction costs). Again, savings are feasible in fully automated and interoperable technological environments that integrate all relevant stakeholders. Indeed, procurement seems to be the business area most often associated with interoperability problems in tourism. However, the average **awareness of interoperability problems is low**, and significantly below the cross-sectoral average.

Only less than half of those companies for which e-business constitutes a relevant part in their daily business are aware of the critical role of interoperability (cf. chapter 3.3.3 'Interoperability challenges'). In order to raise awareness of and overcome interoperability barriers, there is a need to elaborate and stress the benefits of technologically interoperable environments, especially for micro companies.

Marketing and accounting with the largest future ICT impact

Tourism companies themselves anticipate the biggest future impact of ICT in two diverse business fields: front-end marketing and back-end accounting. 72% of companies said that they expect high or medium impacts of ICT usage in marketing and accounting, while only 28% expect low or no impacts in these fields. These results, together with a high ICT-related impact on internal work-flow efficiency and productivity (see previous paragraph), might point to a trend towards an integration of the entire e-business value chain in tourism, bridging the front and back-end of e-business.

Exhibit 5-5: Anticipated future impact of ICT



Base (100%): Companies using computers. N (for sector, EU-10) = 725. Weighting: by employment, i.e. figures should be read as "enterprises comprising …% of employment in the sector". Questionnaire reference: H8.

Source: *e-Business W@tch* (Survey 2006)

These expectations for the future are consistent with the currently perceived influence of ICT on marketing and accounting activities. About 36% of all companies in the tourism industry (40% of travel agencies and tour operators and 62% of accommodation providers) said that they enable customers to order products or services online. These

figures are considerably above the respective all-sectors average of 25%.[88] However, the adoption of sophisticated software solutions for e-marketing is still low.

As regards accounting, almost half of all tourism companies (46%) that do not use a sophisticated ERP system said that they use some kind of accounting software. The discrepancy within the industry is substantial, as about twice as many travel agencies and tour operators reported using accounting software compared to companies from the accommodation or gastronomy sector. There is also a significant gap to other sectors studied this year where, on average, 57% of companies said that they use some kind of accounting software.

The level of impact is also expected to be high in the management area, indicating expectations with regard to a further ICT-based optimisation of internal work processes. Furthermore, a high ICT impact is anticipated for customer support processes. In contrast to the currently perceived high influence of ICT on logistics, there are rather low expectations for the future impact of ICT on this area of business activity.

Pronounced role of ICT for process innovations

Compared to other sectors studied by *e-Business W@tch* in 2006, there are no exceptionally intensive innovation activities in tourism, neither in the product nor in the process dimension. But, the role of ICT for process innovation (e.g. automation, flexible re-organisation) in tourism is remarkably pronounced: almost 80% of companies which reported process innovations in the year 2005 (19%) said that these innovations were essentially ICT-based (see Exhibit 3-31 in chapter 3). The case studies conducted by *e-Business W@tch* highlight the role of ICT as driver for process innovations in the context of dis- and re-intermediation (see the case studies about *YourGreece*, *Lithuanian Countryside Tourism Association*, *adriatica.net*, *Accor Hotels* in section 4.1), as well as in the context of dynamic packaging (case studies about *CSI Media*, *lastminute.com* and *touropa.com* presented in section 4.2).

Concluding assessment

Exhibit 5-6 recapitulates the assessment of the ICT and e-business impact on the business areas presented in this sector report. The scores are not to be understood as 'exact' results of a quantitative computation, based on some model; they are tentative, reflecting the impression that the study team gained from analysing findings from the survey, the interviews, case studies and the literature review conducted fro this report. This exhibit should be, therefore, regarded more as a means to trigger further debate.

[88] This finding is consistent with other e-tourism studies. According to the most recent investigation on “Trends in European Internet Distribution”, this development of online tourism will continue to rise (cf. Marcussen 2006).

Exhibit 5-6: Impacts of ICT and e-business on competition in the tourism sector

	Business areas where ICT and e-business can have an impact	Observed impacts in large firms *low < > high*	Observed impacts in SMEs *low < > high*
1	Organisational structure		
2	Work-flows / operational organisation		
3	Sourcing and procurement		
4	Production / service provision		
5	Logistics		
6	Marketing / sales		
7	Customer support		
8	Research & development		
9	Product & service innovation		
10	Process innovation		
11	Skills requirements		
12	Outsourcing		
13	Employment		

Maximum: 3 points (or).

Source: *e-Business W@tch* (2006)

All evidence suggests that the powerful ICT systems and e-business solutions of large companies currently allow more advanced practices, which turn into greater achievements in term of cost savings and efficiency. Therefore, while the areas of e-business activity are similar between large and small firms, the impact is probably more pronounced for large firms.

5.1.2 Implications for industry structure

This chapter assesses the implications of ICT and e-business adoption on the structure of the respective industry. As in 2005, *e-Business W@tch* uses the 'five-forces-model' developed by Michael E. Porter (1980), to discuss and assess e-business implications on the industry's structure.

Background information:

Michael E. Porter's Five-Forces Model

The 'Five Competitive Forces' model was developed by Michael E. Porter in his book „Competitive Strategy: Techniques for Analysing Industries and Competitors" in 1980. Since that time it has become an important tool for analysing industrial structure, competition and strategic options of players. Porter's model is based on the insight that a corporate strategy should meet the opportunities and threats in the organisation's external environment.

Porter has identified five competitive forces that shape every industry and every market. These forces determine the intensity of competition and, hence, the profitability and attractiveness of an industry. The objective of corporate strategy should be to modify these competitive forces in a way that improves the position of the organisation. Porter's model helps to identify the main driving forces in an industry. Based on the information derived from the Five Forces Analysis, companies can decide how to influence or to exploit particular characteristics of their industry.

The instrument has been applied by e-Business W@tch since 2004/05 to assess the influence of ICT and e-business on competition in a sector.

Michael E. Porter is the Bishop William Lawrence University Professor at Harvard Business School.

The following statements are an assessment based on both the quantitative results of the e-Business Survey 2006 and the qualitative analysis presented in this study.

Exhibit 5-7: Impact of ICT and e-business on competition in the tourism sector

	Competitive forces	General importance in the sector (currently) *low < > high*	Impacts of ICT and e-business *low < > high*
1	Threat of new entrants*		
2	Substitution of products / services		
3	Bargaining power of suppliers		
4	Bargaining power of customers		
5	Rivalry in the market		

Maximum: 3 points (or).

* "New entrants" in the sense of new companies being founded. "New entrants" in the sense of companies from a different geographic area entering the European market are considered under "rivalry in the market".

Source: *e-Business W@tch* (2006), developed from Michael E. Porter.

An estimation of the ICT impact on competition and industry structure in the tourism sector must consider the fact that the overall volume of the online travel market (and therewith to a large extent also of e-business) in tourism is at approximately 10% of the travel market as a whole (cf. Marcussen 2006). 90% of the travel market still consists of traditional booking and sales channels, which are not necessarily linked to e-business. The interpretation of the impact should therefore not be overestimated. On the other hand, it must also be acknowledged that the share of the online travel market (and e-business) is

rising continuously (cf. Marcusen 2006) which again implies growing impacts on competition and industry structure.

Threat of new entrants

Low barriers enable new market entrants, posing a threat for traditional players

Current online market developments will make the future business especially difficult for traditional micro, small and medium-sized travel agencies and tour operators. This is especially true given that barriers to enter the market (e.g. technological solutions and products in place) are low and online travel agencies carry no stock inventory. As more traditional and large companies turn to the online channel and more new companies enter the online market, the pressure for traditional players to re-invent themselves will rise further on.

adriatica.net, for instance, entered the Croatian tourism market in 2000 as one of the first online travel agencies and as a small company with no tourism expertise at all. Within only 6 years, *adriatica.net* became the most important online player and, in the context of the adriatica.net group, the largest company on the Croatian tourism market, with a total market share of approximately 2%. As such, *adriatica.net* poses a severe competition for traditional large and small players. Relying on the online channel, the company operates with significantly lower commissions by making up to three travel agencies and tour operators from the traditional tourism value chain obsolete (dis-intermediation).

Given relatively strong concentration activities (see the analysis below and the case study on adriatica.net), it might be assumed that barriers for new entrants will rise again, making successful market entries increasingly difficult.

Substitution of products / services

Ongoing ICT-based substitution of services, provided by traditional players

New technologies and web functionalities like dynamic packaging (will) lead to an additional substitution of products and services originally provided by traditional service providers like travel agencies and tour operators. In the past few years, online tourism players progressively substituted the services of traditional travel agencies. First, a direct web-based access to an abundance of travel information was provided, thus allowing the independent planning of travels. Subsequently, real-time transaction functionalities were added, enabling customers to book their journey independently. Most recently, dynamic packaging solutions have enabled tourists to independently assemble travel arrangements of multiple components in real-time.

Bargaining power of suppliers

Online distribution channels can strengthen the role of suppliers, but…

ICT and particularly the availability of online distribution channels can strengthen the role of suppliers. Given the possibility to use an online channel for presenting and distributing services and products directly to the customer, accommodation providers (e.g. hotels and pensions) are increasingly less dependent on traditional intermediaries. Furthermore, the

mere availability of multiple distribution channels on the market stresses the role of suppliers by providing them with a much better bargaining position (e.g. lower agency commissions) to achieve better contractual conditions and to place their products on the market in a more competitive way. However, service suppliers will continue to work with (online) intermediaries and their concentration activities on the market might lead to dependencies and less choice for suppliers (cf. Leidner 2004).

Generally, the results of the *e-Business W@tch* Survey 2006 show that supplier expectations (in contrast to "customers' expectations" and "gaining a competitive advantage") have been considered as a less important e-business driving force, indicating a fairly low influence of suppliers with respect to the take-up of e-business processes (and also a fairly low ICT connectivity level among players in the tourism industry). Yet, supplier expectations as a reason for starting e-business play a minor role only in the accommodation and gastronomy sectors, but they are of major importance from the perspective of travel agencies and tour operators. In general, travel agencies and tour operators are heavily driving e-business adoption in the tourism industry. Overall, e-business has the biggest impacts for industry structure in this sub-sector of travel intermediaries and tour operators (cf. chapter 3.8.1 'Drivers of e-business adoption').

Bargaining power of customers

Ongoing ICT-based switch from consumers to "prosumers"[89]

The online selling channel increasingly empowers customers to perform an increasing number of tasks themselves. Customers can autonomously inform themselves, compare prices, select, plan, book – and, more recently, even package their travel arrangements. The bargaining power of customers is herewith increasing. Moreover, the notion of a customer transforms gradually from a passive consumer, being served by travel agencies, to a self-serviced selector and, eventually, towards a self-made "prosumer", who more or less actively designs or configures his/her own arrangements. Yet, "prosumers" will not replace classical consumers; some researchers, however, suggest that these active customers will play an ever bigger role in future relations between companies and customers in tourism, linking their roles ever more closely (cf. Werthner/Klein 1999). Further on, customer expectations will be a significant driver of e-business adoption. This interpretation corresponds with the results of the e-Business Survey 2006. The companies in which e-business constitutes "*a significant part*" or "*some part*" of the way they operate see **customers' expectations** as the most important driver for e-business adoption (see Exhibit 3-33 in chapter 3.8.1 'Drivers of e-business adoption').

[89] The term "prosumer" is composed of "PROducer" and "conSUMER", to describe a consumer who is actively participating e.g. in the design, composition and/or packaging of products and services in the tourism industry (cf. Toffler 1981).

Rivalry in the market

Growing competition in the online market

Competition in the online market is increasing, as ever more online service providers offer ever more types of services, leading to the development of all-embracing travel websites or online one-stop-shops. The low-cost carrier *Ryanair*, for instance, provides not only flights, but also accommodation bookings via its website. Numerous online service providers are branching out from their traditional markets offering additional products, entering foreign markets therewith. Furthermore, as a result of low entry barriers, non-tourism players are entering the sector and start to provide tourism services and thus increase competition even further. It can be assumed, however, that in parallel to increasing competition also the level of cooperation among service providers will increase, especially in cooperation intensive fields like dynamic packaging. As the Travolution magazine puts it:

> *"But there will be co-operation because you cannot do everything yourself. It takes longer and costs far more money to develop the technology and build the inventory."* (Travolution 2006)

Growing competition due to increasing popularity of international destinations

It could also be assumed that the competition in the tourism industry will be additionally reinforced due to growing popularity of international destinations (e.g. Asia, Africa, the Pacific and the Middle East). According to recent data from the United Nations World Tourism Organisation, Europe currently represents 54.6% of all international arrivals worldwide (cf. UNWTO 2006), while this percentage is expected to decrease to 46% by 2020 (cf. UNWTO 2005):

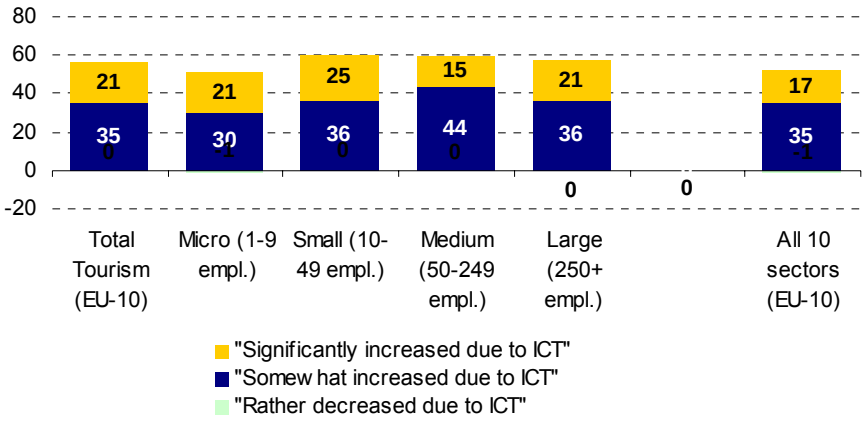
> *"East Asia and the Pacific, South Asia, the Middle East and Africa are forecasted to record growth at rates of over 5 percent per year, compared to the world average of 4.1 per cent. The more mature regions Europe and Americas are anticipated to show lower than average growth rates. Europe will maintain the highest share of world arrivals, although there will be a decline from 60 per cent in 1995 to 46 per cent in 2020."* (UNWTO 2005)

Other experts, however, point out that, even if the UNWTO forecast becomes true, the growing demand outside Europe will not disadvantage the whole tourism industry in Europe, but "*mainly the HORECA [hotels, restaurants and cafes] sector, whereas travel organisers might benefit from the growing number of Europeans visiting these destinations*" (Leidner, e-mail correspondence). A comparison of the UNWTO forecast with the actual developments of international arrivals reveals that, in recent years, the performance of global international arrivals followed UNWTO's forecast, whereas international arrivals in Europe are above the predicted trend (cf. Cabrini[90] 2006).

[90] Luigi Cabrini is UNWTO Regional Representative for Europe.

ICT impact on competition

Exhibit 5-8: Perceived impact of ICT on competition in the industry



Base (100%): Companies using computers. N (for sector, EU-10) = 725. Weighting: Totals (for the sector and for all 10 sectors) are weighted by employment and should be read as "enterprises comprising …% of employment in the sector(s)". Figures for size-bands are in % of enterprises from the size-band. Questionnaire reference: H6.

Source: *e-Business W@tch* (Survey 2006)

According to the e-Business Survey 2006, the tourism industry perceives that ICT increases competition somewhat stronger than perceived in the other sectors studied by the *e-Business W@tch*. Indeed, enterprises comprising 56% of employment in the tourism sector said that competition has “significantly” or “somewhat” increased due to the adoption of ICT (see Exhibit 5-8). Especially affected appear to be the sector’s small enterprises: about a quarter of these companies reported a significantly increased competition due to ICT. However, variation to other enterprises is not significant; companies from all size-bands have the impression that ICT increases competition.

On the other hand, for micro and small companies, ICT provides an enormous potential to (re-)establish and re-invent themselves on the market, and even to gain substantial new market shares. For example, the case study on *adriatica.net* illustrates an ICT empowered micro company which has not only successfully entered the market, but, in fact, has evolved into a major competitor for traditional and well established intermediaries within a very short period of time.

Impact of concentration activities on competition

As pointed out in Chapter 4.1, an ongoing concentration of the market might eventually lead to the **formation of oligopolies**, especially in the field of online travel agencies and organisers (cf. Mercer Management Consulting 2003). In turn, these oligopolies could lead to **reduced competition** and, subsequently, to higher prices and less choice for consumers (cf. Daniele / Frew 2004). Moreover, by reducing the bargaining power of small service suppliers (hotels, restaurants and cafes, which constitute more than 90% of firms in this sector), this development could lead to price cuts against the suppliers and worse contractual conditions for them. At the same time, strong concentration activities in

the field of (online) travel agencies might lead to increased dependencies of service suppliers on large intermediaries. For this reason, the European Commission has been monitoring concentration in this market already since 2001, especially with regard to foreclosure for other online suppliers (cf. European Commission 2001).

However, despite concentration activities, the **competition pressure will continue to rise** for the following reasons: For the period between 2002 and 2010, a turnover growth of less than 3% annually is estimated for the tourism sector, implying a stronger competition between single players. Furthermore, the tourism sector is increasingly characterised by price-conscious customers who will put pressure on all enterprises to reduce costs of their services (cf. Leidner 2004).

5.2 Policy implications

General remarks

E-business developments can have implications for several policy areas. Relevant considerations made in this context can be grouped around two overall objectives which are paradoxically, to some extent, antagonistic:

- **Counteract ICT induced market failure**: Policy must to consider intervention if e-business activity causes undesirable effects on the macro level, i.e. market failure.
- **Promote ICT adoption**: Policy may have an interest in accelerating the adoption of ICT and e-business activity among companies, particularly among SMEs. This is based on the assumption that ICT is a driver of productivity and competitiveness.

Exhibit 5-9: Policy implications arising from e-business activity in the tourism industry

	Policy issues	Possible initiators	Policy leverage *low < > high*
1	Measures against the increasing market concentration of travel agencies – threat of formation of oligopolies / reduced competition	European Commission; National Governments	
2	Encourage initiatives for networking and cooperation of SMEs	Industry federations Business support networks	
3	Encourage the adoption of e-business in micro and small companies	European Commission National Governments Industry federations Business support networks	
4	Promote ICT infrastructure and e-integrated business processes	European Commission National Governments Industry federations Business support networks	
5	Foster competitiveness through innovation and R&D	European Commission National governments	

Maximum: 3 points (or).

Source: *e-Business W@tch* (2006)

5.2.1 Policies to counteract ICT induced market failure

Ongoing market concentration among tourism intermediaries

The ongoing consolidation of intermediaries and, in particular, the market concentration of online intermediaries could, in the long term, lead to the formation of oligopolies (see Chapter 4.1). This could, in effect, lead to reduced competition and, subsequently, to higher prices and less choice for consumers. In the U.S., for example, the three main companies in the online travel market - Expedia, Travelocity and Orbitz - already make up nearly 50% of the online travel market.

Well aware of this situation the European Union has adopted the following measures to ensure open competition and prevent the formation of oligopolies:

- The European Commission, in particular DG Competition, closely monitors the travel agency and tour operator market (in particular the market of online travel intermediaries) and market consolidation processes (i.e. mergers and acquisitions).[91]
- As many travel agencies are non-European companies and/or operating internationally, the European Commission cooperates and coordinates its activities with international competition bodies, including the US Bureau of Competition, the International Competition Network, the WTO or the OECD.

Therefore the European Union should foster its policy of closely monitoring the market for online tourism intermediaries and, if necessary, adopt counter measures to prevent the formation of oligopolies.

5.2.2 Policies to promote e-business and ICT adoption by tourism firms

While there are no specific EU programmes to promote e-business and ICT adoption specifically in tourism, the EU's recent strategy document '*A renewed EU Tourism Policy: Towards a stronger partnership for European Tourism'* (2006) refers to several existing instruments that can be utilised: To foster the establishment of business networks, develop infrastructure, promote ICT and encourage innovation in SMEs, for instance, the document refers to the European Regional Development Fund programmes (ERDF), while the EU's proposed Competitiveness and Innovation Framework Programme and the 7th EU Framework Programme for Research, Technological Development and Innovation are cited as instruments to encourage R&D activities for tourism companies (cf. European Commission 2006b).

In addition to these schemes, the European Union has launched a new European travel portal, visiteurope.com, at the European Tourism Ministers' Conference in Vienna, 21 March 2006, to foster the marketing of Europe as a destination. The portal includes

[91] In 2001, for example, the EU Commission launched an in-depth investigation on the plan of TUI and Neckermann to market leisure travel services jointly online via T-Online. The Commission's examination market focussed on the risk that the new company might dominate the online travel market and the possibility of market foreclosure for other online suppliers – more information at: http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/01/803&format=HTML&aged=0&language=EN&guiLanguage=en (April 2006).

practical information about Europe, travel services, such as a travel planner and travel recommendations, as well as links to the websites of national tourism organisations. The portal is hosted by the European Travel Commission (cf. European Commission press release, 21 March 2006).

Encouraging initiatives for networking and cooperation

As was shown in chapter 3.4.2 and in table 3-14, currently only a minority of companies (8% of all tourism companies) use online collaboration tools (cf. chapter 3.4.2). In addition, for many smaller providers of tourist services, which do not have the resources to acquire complex and interoperable computing systems, the adoption of advanced collaborative e-business solutions such as DP might pose a significant technological and organisational challenge (cf. chapter 4.2).

However, as was shown in the case studies about *yourGreece* and the *Lithuanian Countryside Tourism Association* (cf. Chapter 4.1), if smaller tourism providers and operators cooperate and combine their efforts and resources, they indeed are able to successfully operate in an increasingly competitive market. But very often small tourism providers are reluctant to abandon traditional business cultures or to cooperate with other small stakeholders that might be perceived primarily as competitors.

Therefore it is important to encourage (in particular by industry federations and business support networks) SMEs to **form networks** with other players and to **share resources** in order to satisfy the needs of diverse and ever faster changing customer requirements. This, in turn, could increase the competitiveness of the whole network, as well as of each participating SME. The beneficial role of partnerships and cooperation in tourism is also highlighted in the EU's strategy document '*A renewed EU Tourism Policy: Towards a stronger partnership for European Tourism'.* Considering that tourism involves a variety of stakeholders and policy measures, the document specifically encourages the cooperation not only among tourism providers, but with relevant tourism stakeholders and policy actors as a whole (cf. European Commission 2006b).

Encouraging the adoption of e-business in micro and small companies

As was shown in chapter 2, the vast majority of enterprises in the tourism sector are SMEs. But only competitive businesses will be able to grow and create additional employment. As was shown in the study, ICT and e-business are major drivers to growth and competitiveness. However, although smaller tourism companies are relatively active users of e-business solutions compared to their counterparts from other industry sectors, many companies still consider themselves as "too small" for doing e-business, or they cannot afford the necessary investments. To improve this situation, concrete measures for promoting the adoption of ICT and e-business solutions by tourism SMEs, and in particular micro and small companies, should be envisaged. Furthermore, policy could consider the promotion of ICT-enabled clustering at the local or regional level.

As was shown in chapter 3.2.2 and exhibit 3-7, access to finance for ICT investments poses a particular problem for many tourism companies, especially micro companies. For 90% of all tourism companies self-financing is the major source for financing ICT investments. Only a minority of companies uses other forms of financing, such as bank

loans, venture capital or public funds (cf. chapter 3.2.2). However, a specific element of promoting the adoption of ICT by SMEs, as was outlined by the EU's Lisbon agenda, is to improve access to finance and risk capital for SMEs. In this context, the European Commission, the European Investment Bank and the European Investment Fund launched, in May 2006 the *Joint European Resources for Micro to Medium Enterprises (JEREMIE)* initiative, which allows European Member States and Regions to use a part of their structural funds to obtain a set of financial instruments that are specifically designed to financially support micro, small and medium enterprises. The JEREMIE initiative (http://www.eif.org/jeremie/) foresees the following main financial instruments:

- Equity and venture capital, focusing on start-ups and technology transfer;
- Loans;
- Provision of guarantees (both for micro-credit loans and SME loans).

From 2007 on, the Member States and regions supported by the European Structural Funds will be able to implement the JEREMIE initiative which will allow them to launch relevant measures to address these needs (cf. European Commission 2006a). The scheme could provide micro firms and SMEs in the tourism sector additional financial means and incentives to invest in ICT and e-business.

Promoting ICT infrastructure and e-integrated business processes

As shown in chapter 3 of this study, while the use of ICT and e-business technologies and applications in the tourism sector is strong in the areas of marketing and sales and, to a lesser extent, in e-sourcing and procurement, the tourism sector is clearly lagging behind in terms of deployment of ICT infrastructure and the adoption of e-integrated business processes.

The EU has initiated various schemes to enhance ICT infrastructure and encourage the adoption of e-business processes. While there is no specific EU tourism initiative to tackle this issue, the EU's recent "*i2010 – A European Information Society for growth and employment*" initiative has outlined a strategic policy framework calling for increased ICT adoption and integrated ICT business solutions, especially for SMEs (European Commission 2005b).

In addition, the EU's Communication "*A renewed EU Tourism Policy: Towards a stronger partnership for European Tourism*" refers to ERDF measures as financial instruments for promoting the introduction of ICT and the European Social Fund and the Leonardo da Vinci programme for funding training measures to improve the skills basis of companies (cf. European Commission 2006b).

Encouraging innovation and R&D in e-tourism

As was stated by the renewed EU's Lisbon strategy *'Implementing the Community Lisbon Programme: Modern SME Policy for Growth and Employment'*, research and innovation (R&D) constitute vital elements for strengthening the competitiveness of the European companies, especially against the background of increasing globalisation and international competition (European Commission 2005a).

Therefore, R&D and innovation activities should be fostered – again with a particular emphasis on SMEs. The European Commission has taken an active role in this respect. While there are no tourism specific programmes in this regard the most recent Commission strategy document *'A renewed EU Tourism Policy: Towards a stronger partnership for European Tourism'* (cf. European Commission 2006b) refers to two programmes which will be of particular importance in this respect in the coming years: the proposed '*Competitiveness and Innovation Framework Programme'* and the '*7th EU Framework Programme for Research Technological Development and Demonstration'*.[92]

The proposed '*Competitiveness and Innovation Framework Programme'* foresees a budget of more than € 4 billion for the period 2007-2013. The programme will specifically aim at strengthening the competitiveness of EU enterprises and SMEs. The programme has three main foci: Entrepreneurship and Innovation; ICT Policy Support; and Intelligent Energy Programme (cf. European Commission 2005c).

Furthermore, research and development activities will be supported under the proposed *7th EU Framework Programme for Research, Technological Development and Demonstration*. Along with more generic research foci, the programme seeks to fund tourism specific R&D activities – for instance application oriented intelligent service solutions for tourism, and ICT supporting businesses and industry (i.e. new forms of dynamically networked co-operative business processes and optimised, distributed work organisation and collaborative work environments such as knowledge sharing and interactive services; a sector that has been highlighted specifically in this context is tourism) (cf. European Commission 2006c).

Activities under the Framework Programme may result in benefits for the tourism industry through, amongst others, research and development on ICT or satellite applications (cf. European Commission 2006b).

[92] For more information, see http://ec.europa.eu/enterprise/enterprise_policy/cip/index_en.htm and http://cordis.europa.eu/fp7/home.html, respectively.

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Annex I: The e-Business Survey 2006 – Methodology Report

Background and scope

e-Business W@tch collects data relating to the use of ICT and e-business in European enterprises by means of representative surveys. The e-Business Survey 2006, which was the fourth survey after those of 2002, 2003 and 2005, had a scope of 14,081 telephone interviews with decision-makers in enterprises from 29 countries, including the 25 EU Member States, EEA and Acceding / Candidate Countries.[93] Interviews were carried out in March and April 2006, using computer-aided telephone interview (CATI) technology.

Questionnaire

The questionnaire is similar to those used in the previous surveys from 2002 to 2005 in order to ensure a basic continuity of the research approach. The module on ICT impact was substantially extended compared to 2005, in response to current policy interest, in exchange for some questions from other modules.

Some questions which were also used in previous surveys were slightly modified. The most important change in this context concerns questions on e-commerce: up to 2005, companies were asked whether they "purchase / sell online"; in 2006, companies were asked whether they "place / accept orders online". This is a more precise question, since the terms "purchasing" and "selling" leave it open whether ordered goods also have to be paid online in order to qualify for "online purchasing / selling".

Some specific topics were added or expanded in the questionnaire in order to reflect the latest e-business developments; examples are the new questions on the use of RFID and Voice-over-IP.

The questionnaires of all four surveys (2002, 2003, 2005, 2006) can be downloaded from the *e-Business W@tch* website (www.ebusiness-watch.org/about/methodology.htm).

Population

As in 2005, the survey considered only **companies that used computers**. Thus, the highest level of the population was the set of all computer-using enterprises which were active within the national territory of one of the 29 countries covered, and which had their primary business activity in one of the 10 sectors specified on the basis of NACE Rev.1.1.

Evidence from previous surveys shows that computer use can be expected to be 99% or more in all sectors among medium-sized and large firms. Differences are more relevant, however, for micro and small enterprises, in particular in the food and beverages industry, the textile and footwear industries, construction and tourism. In these four sectors, 10-30% of micro enterprises and 4-15% of small firms (depending on the country and sector)

[93] The EEA (European Economic Area) includes, in addition to EU Member States, Iceland, Liechtenstein and Norway. Acceding Countries with whom an Accession Treaty has been signed are Bulgaria and Romania; Candidate Countries, which are candidates for accession into the EU, are (as of September 2006) Croatia, the former Yugoslav Republic of Macedonia, and Turkey. In most of these countries, interviews and/or case studies were conducted.

do not use a computer.[94] This should be considered when comparing figures over the years, as figures either represent a percentage of "all companies" (as in 2002 and 2003) or a percentage of "companies using computers" (as in 2005 and 2006). Differences are minimal, though, when figures have been weighted by employment.

The 10 sectors which were selected for the 2006 survey are extremely heterogeneous in terms of their size. Construction and tourism are by far the largest with about 1.5 million enterprises in each of the EU-25.[95] At the other end of the range is the consumer electronics industry with about 5,400 enterprises; this is a factor of about 280 between the largest and smallest sector. This imbalance has inevitably a substantial impact on weighting and thus on aggregate results, which are dominated by figures from construction and tourism.

Table 1: Population coverage of the e-Business Survey 2006

No.	NACE Rev. 1.1	Sectors covered	No. of enterprises in EU-25 *	No. of interviews conducted
1	DA 15 (most groups)	Food and beverages	282,000	1,709
2	DC 19.3	Footwear	13,700	980
3	DE 21	Pulp, paper and paper products	18,400	1,158
4	DL 30, 32.1+2	ICT manufacturing	31,800	1,687
5	DL 32.3	Consumer electronics	5,400	665
6	DM 35.11	Shipbuilding and repair	7,200	150
7	F 45.2+3 (selected classes)	Construction	1,546,000	2,655
8	H 55.1/3, I 63.3, O 92.33/52	Tourism	1,500,000	2,663
9	I 64.2	Telecommunication services	12,900	1,580
10	N 85.11	Hospital activities	(e) 13,000	834

* mostly based on Eurostat SBS, latest available figures
(e) = estimated on the basis of figures for the former EU-15 (no figures available for EU-25)

Sampling frame and method

No cut-off was made in terms of minimum size of firms. The sample drawn was a random sample of companies from the respective sector population in each of the countries, with the objective of fulfilling minimum strata with respect to company size class per country-sector cell. Strata were to include a 10% share of large companies (250+ employees), 30% of medium sized enterprises (50-249 employees), 25% of small enterprises (10-49 employees) and up to 35% of micro enterprises with less than 10 employees.

Samples were drawn locally by fieldwork organisations based on official statistical records and widely recognised business directories such as Dun & Bradstreet or Heins und Partner Business Pool (both used in several countries).

The survey was carried out as an enterprise survey: data collection and reporting focus on the enterprise, defined as a business organisation (legal unit) with one or more establishments.

Due to the rather small population of enterprises in some of the sectors, target quota, particularly in the larger enterprise size-bands, could not be accomplished in each of the countries. In these cases, interviews were shifted to the next largest size-band (from large to medium-sized, from medium-sized to small), or to other sectors.

[94] Non-computer users include typically small craft firms (textile, construction), bars, restaurants or pensions (in tourism), and small food producing companies.

[95] Construction (NACE Rev. 1.1 F 45) in total has about 2.3 million enterprises. The sub-sectors covered in 2006 (see Table 1) account for about 1.5 million out of these.

Fieldwork

Fieldwork was coordinated by the German branch of Ipsos GmbH (www.ipsos.de) and conducted in cooperation with its local partner organisations (see Table 2) on behalf of *e-Business W@tch*.[96]

The survey had a scope of 14,081 interviews, spread across the 29 countries and 10 industries covered. In 10 countries ("EU-10"), all 10 sectors were covered; in the other countries, selected industries were surveyed. In most countries, between 400 and 750 interviews were conducted. Pilot interviews prior to the regular fieldwork were conducted with 23 companies in Germany in February 2006, in order to test the questionnaire (structure, comprehensibility of questions).

Table 2: Institutes that conducted the fieldwork of the e-Business Survey 2006 and no. of interviews per country (#)

	Institute	# Int.		Institute	# Int.
BE	Ipsos Belgium, 1050 Brussels	400	MT	Misco International Ltd., Valetta VLT 04	101
CZ	Ipsos Czech Republic, Skolska 32/694, 110 00 Praha 1	750	NL	Ipsos Belgium, 1050 Brussels	400
DK	Vilstrup Research AS, 1360 Copenhagen	403	AT	Spectra Marktforschungs-gesellschaft m.b.H., 4020 Linz	400
DE	Ipsos GmbH, 23879 Mölln	800	PL	Ipsos Poland, 02-508 Warszawa	752
EE	Marketing and Public Opinion Research Centre SKDS, Riga LV-1010	314	PT	Ipsos Portugal, 1070-15 Lisbon	400
EL	Synovate Hellas, 15451 Athens	407	SI	GfK Gral-Iteo trazne raziskave d.o.o., 1000 Ljubljana	400
ES	Ipsos Eco Consulting, 28036 Madrid	754	SK	GfK Slovakia Ltd., 813 41 Bratislava 1	400
FR	Ipsos France, 75739 Paris	751	FI	Taloustutkimus Oy, 00510 Helsinki	752
IE	Landsdowne Market Research, Dublin 1	400	SE	GfK Sverige AB, 22100 Lund	400
IT	Demoskopea S.p.A., 00199 Roma	756	UK	Continental Research, London EC1V 7DY	750
CY	Synovate Cyprus, 2107 Nicosia	209		EEA and Acceding/Candidate countries	
LV	Marketing and Public Opinion Research Centre SKDS, Riga LV-1010	432	NO	Norstat Norway, 0159 Oslo	401
LT		404	BG	TNS BBSS Gallup Interbational, 1164 Sofia	400
LU	Ipsos GmbH, 23879 Mölln/20097 Hamburg	117	RO	Field Insights, Bucharest 2	440
HU	Szonda Ipsos, 1096 Budapest	772	TR	Bilesim International Research & Consultancy Inc. Turkey, 34676 Istanbul	400

[96] The survey was carried out under two different contracts. The survey in the six largest EU countries (DE, ES, FR, IT, PL, UK) was carried out as part of the e-Business W@tch contract between the European Commission and empirica GmbH; the survey in the other countries was carried out in parallel, but under a different contract (following an open call for tender for the "extended e-Business W@tch survey", issued in 2005).

Non response: In a voluntary telephone survey, in order to achieve the targeted interview totals, it is always necessary to contact more companies than just the number equal to the target. In addition to refusals, or eligible respondents being unavailable, any sample contains a proportion of "wrong" businesses (e.g., from another sector), and wrong and/or unobtainable telephone numbers. Table 3 shows the completion rate by country (completed interviews as percentage of contacts made) and reasons for non-completion of interviews. Higher refusal rates in some countries, sectors or size bands (especially among large businesses) inevitably raises questions about a possible refusal bias. That is, the possibility that respondents differ in their characteristics from those that refuse to participate. However, this effect cannot be avoided in any voluntary survey (be it telephone- or paper-based).

Table 3: Interview contact protocols: completion rates and non-response reasons (2006, examples)

		CZ	DE	ES	FR	HU	IT	NL	PL	FI	UK
1	**Sample (gross)**	5595	7763	7730	8686	21540	8533	4576	11054	3016	11821
1.1	Telephone number does not exist	283	1055	0	186	5545	717	349	2282	139	2663
1.2	Not a company (e.g. private household)	79	80	356	66	2076	89	219	681	34	324
1.3	Fax machine / modem	56	48	0	79	1120	61	28	53	4	130
1.4	Quota completed -> address not used	43	124	660	1939	1665	2154	1002	877	66	158
1.5	No target person in company	17	359	730	142	9	178	232	959	319	736
1.6	Language problems	9	18	0	25	0	1	36	0	41	20
1.7	No answer on no. of employees	2	1	10	13	6	8	1	19	1	0
1.8	Company does not use computers	48	47	158	250	279	314	235	460	28	51
1.9	Company does not qualify	134	330	103	156	0	113	47	813	49	215
	Sum 1.1 – 1.9	671	2062	2017	2856	10700	3635	2149	6144	681	4297
2	**Sample (net)**	4924	5701	5713	5830	10840	4898	2427	4910	2335	7524
2.1	Nobody picks up phone	1071	582	1645	6	1023	647	82	513	22	1898
2.2	Line busy, engaged	83	122	57	46	89	0	3	73	1	1
2.3	Answering machine	143	145	121	1315	1200	0	9	127	1	145
2.4	Contact person refuses	2080	1125	2553	131	2011	729	1653	2009	578	2523
2.5	Target person refuses	450	1865	202	1475	2776	642	113	280	405	1618
2.6	No appointment during fieldwork period	3	11	70	182	2571	384	112	150	50	376
2.7	Open appointment	295	953	35	1896	258	1041	21	763	459	51
2.8	Target person is ill / unavailable	2	31	0	0	0	13	0	29	2	32
2.9	Interview abandoned	43	67	271	29	108	686	34	176	15	130
2.10	Interview error, cannot be used	4	0	5	5	32	0	0	38	50	0
	Sum 2.1 – 2.10	4174	4901	4959	5085	10068	4142	2027	4158	1583	6774
3	**Successful interviews**	750	800	754	751	772	756	400	752	752	750
	Completion rate (= [3] / [2])	15%	14%	13%	13%	7,12%	15%	16,48%	15%	32%	10%
	Average interview time (min:sec)	19:19	18:46	17:29	19:39	17:14	16:43	19:00	23:44	20:19	20:16

Feedback from interviewers

No major problems were reported from the fieldwork with respect to interviewing (comprehensibility of the questionnaire, logical structure). The overall feedback from the survey organisations was that fieldwork ran smoothly and that the questionnaire was well understood by most respondents. The main challenge was the fulfilment of the quotas, which was difficult or impossible in some of the sectors, in particular among the larger size-bands. Some of the more specific remarks from fieldwork organisations, which point at difficulties encountered in the local situation, are summarised in Table 4.

Table 4: Comments by national fieldwork companies on their experience (2006, examples)

Country	Comments
Belgium	• The questionnaire was very clear. • Business-to-business (B2B) research (i.e. surveys on behalf of companies or authorities amongst companies) is often difficult when the questionnaire length is longer than 15 minutes; target persons often complained that they have no time for an interview during their normal work. • Positive reaction from respondents that the results can be found on the website.
Bulgaria	• Many companies (especially within the tourism sector) have outsourced their ICT operations. Therefore, it was sometimes difficult for respondents to understand the questions.
Czech Republic	• It was difficult to fulfil quotas in several sectors which are mainly represented by very small companies, often by one-person-companies (self-employed), many of which are not willing to do a relatively long interview. There was a high percentage of refusals among micro-companies.
Denmark	• Some technical terms (such as internet protocol, LAN, W-LAN, VPN, RFID, and EDI) were hard for interviewers and respondents to understand.
Finland	• The questionnaire was quite long and that is why there were more refusals than normal. • Smaller companies often refused to answer or interrupted the interview because they thought that they did not know enough about e-business. Respondents in the pulp and paper sector were especially not interested in this topic due to comparably low ICT usage.
Germany	• As with previous e-Business surveys carried out, fieldwork ran relative smoothly overall and the questionnaire was easy to understand and interesting for most of respondents. • Respondents from small companies often had difficulty when answering questions related to specific technical terms and applications. • Respondents reacted positively to the fact that the survey was carried out on behalf of the European Commission.
Greece	• There were several cases where companies have outsourced the IT support and thus there was no person to interview. • Respondents who were not IT specialists found some of the IT terminology difficult to understand.
Spain	• Fieldwork did not run as smoothly as expected due to several bank holidays occurring during the period, therefore it was difficult to reach the target persons. • IT professionals in large companies were the most available.
France	• In general, the fieldwork went without any problems and the questionnaire was understood by the respondents. • For some sectors, the lack of contact addresses was a serious problem. • For future surveys, the case concerning new companies which cannot answer the financial questions should be considered.
Hungary	• The cooperation level in this survey was similar to other telephone surveys among companies; but a problem was that many small companies use only one computer, and only for basic functions.
Ireland	• The B2B sector (not general population or household surveys) is very over researched in Ireland; hence there was a high level of refusals. • In Ireland more than 90% of businesses employ less than 9 employees so many companies do not have the need nor use for ICT.

Italy	• Many refusals among the smallest and/or family owned business, where only one PC is available and used more for personal reasons than for business. • Respondents often lost their patience because considering the low use of the PC in their business, they had to spend time on the phone always giving the same answers ("no, do not use …").
Latvia	• The main problem was the length of the questionnaire. Although the average interview length was 16 minutes and thus the shortest of all participating countries, surveys among companies with interviews lasting more than 15 minutes are generally not recommended in Latvia. • It was rather hard for IT managers to answer about budget, market shares and so on.
The Netherlands	• The questionnaire was very clear, so positive. • Business-to-business surveys are often difficult when the questionnaire length is longer than 15 minutes. • Secretaries/receptionists in the Netherlands are very well trained in refusing the transferring of a call.
Norway	• Interviewers experienced that many respondents / businesses did not wish to participate due to the topic of the survey. Main reason was that they did not feel competent, although they qualified from the results of the screening.
Poland	• There were some difficulties in getting an interview with computer/IT specialists. In many big companies they refuse to take time for an interview. • Many small companies did not understand some of the more technical terms.
Sweden	• The questionnaire was understood by most of the respondents.
UK	• Although some of the questions do appear to be quite technical, this did not prove a particular problem for respondents. • There was a very low universe of companies in certain quota cells. Given the limited sample available in some sectors, and the need to target a high proportion of large companies, a longer field period would probably have helped to maximize the number of complete interviews. • It is becoming increasingly difficult to secure interviews with IT/DP professionals, and we suspect that this situation will only worsen in the future.

Weighting schemes

Due to stratified sampling, the sample size in each size-band is not proportional to the population numbers. If proportional allocation had been used, the sample sizes in the 250+ size-band would have been extremely small, not allowing any reasonable presentation of results. Thus, weighting is required so that results adequately reflect the structure and distribution of enterprises in the population of the respective sector or geographic area. *e-Business W@tch* applies two different weighting schemes: weighting by employment and by the number of enterprises.[97]

- Weighting by employment: Values that are reported as employment-weighted figures should be read as "enterprises comprising x% of employees" (in the respective sector or country). The reason for using employment weighting is that there are many more micro-enterprises than any other firms. If the weights did not take into account the economic importance of businesses of different sizes in some way, the results would be dominated by the percentages observed in the micro size-band.
- Weighting by the number of enterprises: Values that are reported as "x% of enterprises" show the share of firms irrespective of their size, i.e. a micro-company with a few employees and a large company with thousands of employees both count equally.

[97] In the tables of this report, data are normally presented in both ways, except for data by size-bands. These are shown in % of firms within a size-band, where employment-weighting is implicit.

The use of filter questions in interviews

In the interviews, not all questions were asked to all companies. The use of filter questions is a common method in standardised questionnaire surveys to make the interview more efficient. For example, questions on the type of internet access used were only asked to those companies that had replied to have internet access. Thus, the question whether a company has Internet access or not serves as a filter for follow-up questions.

The results for filtered questions can be computed on the base of only those enterprises that were actually asked the question (e.g. "in % of enterprises with internet access"), but can also be computed on the base of "all companies". In this report, both methods are used, depending on the indicator. The base (as specified in footnotes of tables and charts) is therefore not necessarily identical to the set of companies that were actually asked the underlying question.

Statistical accuracy of the survey: confidence intervals

Statistics vary in their accuracy, depending on the kind of data and sources. A 'confidence interval' is a measure that helps to assess the accuracy that can be expected from data. The confidence interval is the estimated range of values on a certain level of significance. Confidence intervals for estimates of a population fraction (percentages) depend on the sample size, the probability of error, and the survey result (value of the percentage) itself. Further to this, variance of the weighting factors has negative effects on confidence intervals.

Table 7 gives some indication about the level of accuracy that can be expected for industry totals for the EU-10[98] (based on all respondents) depending on the weighting scheme applied. For totals of all-sectors (in the EU-10), an accuracy of about +/- 3 percentage points can be expected for most values that are expressed as "% of firms", and of about +/- 2 percentage points for values that are weighted by employment.

The confidence intervals for industry totals (EU-10) differ considerably depending on the industry and the respective value; on average, it is about +/- 5 percentage points (in both weighting schemes). Confidence intervals are highest for the shipbuilding and repair industry, due to the small number of observations, and because this sector is more sensitive to weights due to its structure (i.e. the dominance of large firms in a comparatively small population). Data for this industry are therefore indicative and cannot claim to have statistical accuracy.

The calculation of confidence intervals is based on the assumption of (quasi-) infinite population universes. In practice, however, in some industries and in some countries the complete population of businesses consists of only several hundred or even a few dozen enterprises. In some cases, literally each and every enterprise within a country-industry and size-band cell was contacted and asked to participate in the survey. This means that it is practically impossible to achieve a higher confidence interval through representative enterprise surveys in which participation is not obligatory. This should be borne in mind when comparing the confidence intervals of *e-Business W@tch* surveys to those commonly found in general population surveys.

[98] The EU-10 are composed of those countries in which all 10 sectors were covered by the survey. To ensure data comparability, only interviews from these countries are included in the aggregated "total" values. The EU-10 are: CZ, DE, ES, FR, IT, HU, NL, PL, FI, UK. These 10 countries represent more than 80% of the population and GDP of the EU.

Table5: Confidence intervals for all-sector and sector totals (EU-10)

		Confidence interval								
	Survey result	Weighted as "% of firms"			Weighted by employment			Unweighted		
All sectors (aggregate), EU-10	**10%**	**8.1%**	**-**	**12.3%**	**8.7%**	**-**	**11.5%**	**9.4%**	**-**	**10.6%**
Food and beverages	10%	**6.6%**	-	**14.8%**	**7.3%**	-	**13.6%**	**8.4%**	-	**11.9%**
Footwear	10%	**7.5%**	-	**13.2%**	**7.6%**	-	**13.1%**	**8.4%**	-	**11.9%**
Pulp and paper	10%	**7.8%**	-	**12.7%**	**7.5%**	-	**13.3%**	**8.5%**	-	**11.7%**
ICT manufacturing	10%	**7.9%**	-	**12.6%**	**7.6%**	-	**13.0%**	**8.7%**	-	**11.5%**
Consumer electronics	10%	**7.4%**	-	**13.4%**	**6.0%**	-	**16.2%**	**8.0%**	-	**12.4%**
Shipbuilding and repair	10%	**4.8%**	-	**19.7%**	**4.6%**	-	**20.4%**	**6.0%**	-	**16.1%**
Construction	10%	**6.9%**	-	**14.3%**	**7.6%**	-	**13.1%**	**8.3%**	-	**11.9%**
Tourism	10%	**6.6%**	-	**14.8%**	**6.8%**	-	**14.4%**	**8.3%**	-	**12.0%**
Telecommunication services	10%	**7.6%**	-	**13.1%**	**6.6%**	-	**14.8%**	**8.4%**	-	**11.9%**
Hospital activities	10%	**7.2%**	-	**13.7%**	**7.2%**	-	**13.8%**	**8.1%**	-	**12.3%**
All sectors (aggregate), EU-10	**30%**	**26.8%**	**-**	**33.4%**	**27.9%**	**-**	**32.2%**	**29.1%**	**-**	**30.9%**
Food and beverages	30%	**24.2%**	-	**36.6%**	**25.4%**	-	**35.0%**	**27.4%**	-	**32.8%**
Footwear	30%	**25.9%**	-	**34.5%**	**26.0%**	-	**34.3%**	**27.3%**	-	**32.8%**
Pulp and paper	30%	**26.4%**	-	**33.9%**	**25.8%**	-	**34.6%**	**27.6%**	-	**32.5%**
ICT manufacturing	30%	**26.5%**	-	**33.8%**	**26.1%**	-	**34.2%**	**27.9%**	-	**32.2%**
Consumer electronics	30%	**25.6%**	-	**34.8%**	**22.9%**	-	**38.1%**	**26.8%**	-	**33.5%**
Shipbuilding and repair	30%	**20.2%**	-	**42.0%**	**19.7%**	-	**42.8%**	**23.0%**	-	**38.1%**
Construction	30%	**24.7%**	-	**35.9%**	**25.9%**	-	**34.4%**	**27.3%**	-	**32.8%**
Tourism	30%	**24.2%**	-	**36.5%**	**24.6%**	-	**36.1%**	**27.3%**	-	**32.9%**
Telecommunication services	30%	**25.9%**	-	**34.4%**	**24.2%**	-	**36.5%**	**27.4%**	-	**32.7%**
Hospital activities	30%	**25.3%**	-	**35.2%**	**25.3%**	-	**35.2%**	**26.9%**	-	**33.4%**
All sectors (aggregate), EU-10	**50%**	**46.4%**	**-**	**53.6%**	**47.6%**	**-**	**52.4%**	**49.0%**	**-**	**51.0%**
Food and beverages	50%	**43.2%**	-	**56.8%**	**44.7%**	-	**55.3%**	**47.0%**	-	**53.0%**
Footwear	50%	**45.3%**	-	**54.7%**	**45.5%**	-	**54.5%**	**47.0%**	-	**53.0%**
Pulp and paper	50%	**45.9%**	-	**54.1%**	**45.2%**	-	**54.8%**	**47.3%**	-	**52.7%**
ICT manufacturing	50%	**46.0%**	-	**54.0%**	**45.5%**	-	**54.5%**	**47.7%**	-	**52.3%**
Consumer electronics	50%	**45.0%**	-	**55.0%**	**41.7%**	-	**58.3%**	**46.3%**	-	**53.7%**
Shipbuilding and repair	50%	**38.2%**	-	**61.8%**	**37.5%**	-	**62.5%**	**41.8%**	-	**58.2%**
Construction	50%	**43.9%**	-	**56.1%**	**45.4%**	-	**54.6%**	**47.0%**	-	**53.0%**
Tourism	50%	**43.3%**	-	**56.7%**	**43.7%**	-	**56.3%**	**46.9%**	-	**53.1%**
Telecommunication services	50%	**45.4%**	-	**54.6%**	**43.3%**	-	**56.7%**	**47.1%**	-	**52.9%**
Hospital activities	50%	**44.6%**	-	**55.4%**	**44.6%**	-	**55.4%**	**46.5%**	-	**53.5%**
All sectors (aggregate), EU-7	**70%**	**66.6%**	**-**	**73.2%**	**67.8%**	**-**	**72.1%**	**69.1%**	**-**	**70.9%**
Food and beverages	70%	**63.4%**	-	**75.8%**	**65.0%**	-	**74.6%**	**67.2%**	-	**72.6%**
Footwear	70%	**65.5%**	-	**74.1%**	**65.7%**	-	**74.0%**	**67.2%**	-	**72.7%**
Pulp and paper	70%	**66.1%**	-	**73.6%**	**65.4%**	-	**74.2%**	**67.5%**	-	**72.4%**
ICT manufacturing	70%	**66.2%**	-	**73.5%**	**65.8%**	-	**73.9%**	**67.8%**	-	**72.1%**
Consumer electronics	70%	**65.2%**	-	**74.4%**	**61.9%**	-	**77.1%**	**66.5%**	-	**73.2%**
Shipbuilding and repair	70%	**58.0%**	-	**79.8%**	**57.2%**	-	**80.3%**	**61.9%**	-	**77.0%**
Construction	70%	**64.1%**	-	**75.3%**	**65.6%**	-	**74.1%**	**67.2%**	-	**72.7%**
Tourism	70%	**63.5%**	-	**75.8%**	**63.9%**	-	**75.4%**	**67.1%**	-	**72.7%**
Telecommunication services	70%	**65.6%**	-	**74.1%**	**63.5%**	-	**75.8%**	**67.3%**	-	**72.6%**
Hospital activities	70%	**64.8%**	-	**74.7%**	**64.8%**	-	**74.7%**	**66.6%**	-	**73.1%**
All sectors (aggregate), EU-7	**90%**	**87.7%**	**-**	**91.9%**	**88.5%**	**-**	**91.3%**	**89.4%**	**-**	**90.6%**
Food and beverages	90%	**85.2%**	-	**93.4%**	**86.4%**	-	**92.7%**	**88.1%**	-	**91.6%**
Footwear	90%	**86.8%**	-	**92.5%**	**86.9%**	-	**92.4%**	**88.1%**	-	**91.6%**
Pulp and paper	90%	**87.3%**	-	**92.2%**	**86.7%**	-	**92.5%**	**88.3%**	-	**91.5%**
ICT manufacturing	90%	**87.4%**	-	**92.1%**	**87.0%**	-	**92.4%**	**88.5%**	-	**91.3%**
Consumer electronics	90%	**86.6%**	-	**92.6%**	**83.8%**	-	**94.0%**	**87.6%**	-	**92.0%**
Shipbuilding and repair	90%	**80.3%**	-	**95.2%**	**79.6%**	-	**95.4%**	**83.9%**	-	**94.0%**
Construction	90%	**85.7%**	-	**93.1%**	**86.9%**	-	**92.4%**	**88.1%**	-	**91.7%**
Tourism	90%	**85.2%**	-	**93.4%**	**85.6%**	-	**93.2%**	**88.0%**	-	**91.7%**
Telecommunication services	90%	**86.9%**	-	**92.4%**	**85.2%**	-	**93.4%**	**88.1%**	-	**91.6%**
Hospital activities	90%	**86.3%**	-	**92.8%**	**86.2%**	-	**92.8%**	**87.7%**	-	**91.9%**

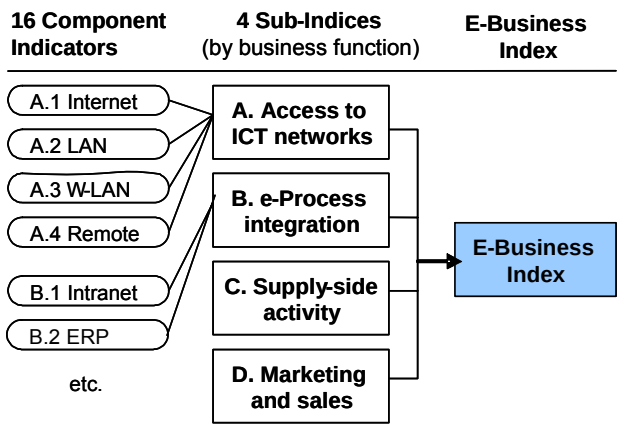
confidence intervals at α=.90

The e-Business Scoreboard 2006

The e-Business Scoreboard approach was developed by *e-Business W@tch* in 2004. It is a compound index that condenses data on ICT adoption and e-business activity, enabling comparisons across different sectors, countries or size-bands.

Conceptually, the e-Business Scoreboard owes a debt to the Balanced Scorecard (BSC) approach, which suggests that an organisation should be viewed from four perspectives, and that metrics (and targets) are to be defined for each perspective. Similarly, the e-Business Scoreboard looks at ICT use by enterprises from four (inter-related) perspectives. The Scoreboard consists of **16 component indicators** (see next page), which represent the metrics for these perspectives. Component indicators (CI) can be aggregated on several levels.

- First, CI can be aggregated into the 4 main **sub-indices** (with 4 CI each) that represent major application areas of e-business.
- Second, the four sub-indices can be further aggregated into 2 dimensions and, finally, into the overall "**e-Business Index**".



The e-Business Scoreboard takes into account the percentages (diffusion rates) from all sectors (size-bands, …) and show how a specific sector (size-band, …) differs from the all-sector-average. An index value is based on mean values and standard deviations. Thus, index values express the multiple of the standard deviation (1 or (-1)) for a specific sector and the selected indicator. 0 equals the mean value for all sectors (size-bands, …).

Indexes simplify multi-dimensional concepts. To correctly assess the validity and shortcomings of the Scoreboard and its overall index, the following notes should be taken into account:

- **Weighting**: Results are influenced by the selection of the underlying weighting scheme for component indicators. If employment-weighted figures are used, e-business activity in large firms is emphasized. If indicators are weighted by the number of enterprises (irrespective of their size), the situation in smaller firms is emphasized.
- **Component indicators**: The selection of component indicators may have a bias towards manufacturing activities, as some indicators can be more relevant for manufacturing than for service sectors (e.g. ERP use).
- **Relative comparison**: The Scoreboard results do not represent absolute measures of e-business activity, but depend on the respective set of sectors (or countries, ...) that are compared to each other, because figures express standard deviations from the *average* of the respective set.

Component indicators of the e-Business Scoreboard 2006

(Definitions for indicators weighted by employment)

A. ICT infrastructure and basic connectivity		
A.1	**Internet** connectivity	= the percentage of employees working in enterprises that are connected to the internet, with a supplementary indicator for the type of internet connection in terms of bandwidth. Enterprises that are connected with broadband (via DSL, cable, direct fibre or wireless broadband) are computed with a factor of 1.0, enterprises connected via analogue dial-up modem or ISDN with a factor of 0.5. The maximum value of 100 would be returned if all employees work in enterprises with broadband connections.
A.2	Use of **LAN**	= the percentage of employees from a sector working in enterprises that have connected computers with a Local Area Network (LAN).
A.3	Use of a **Wireless LAN**	= the percentage of employees working in enterprises which use a Wireless LAN.
A.4	**Remote access** to the company's computer network	= the percentage of employees from a sector working in enterprises where it is possible to access data from the company's computer system from a remote location.
B. Internal business process automation		
B.1	Use of an **intranet**	= the percentage of employees working in enterprises that use an intranet.
B.2	Use of an **ERP** system	= the percentage of employees working in enterprises that have implemented an ERP (enterprise resource planning) system.
B.3	Use of online technology to **track** working hours and/or production time	= the percentage of employees working in enterprises that use online technologies (other than e-mail) to track working hours and/or production times.
B.4	Companies sending or receiving **e-invoices**	= the percentage of employees working in enterprises that send and/or receive e-invoices.
C. Procurement and supply chain integration		
C.1	Companies placing >5% of their **orders to suppliers online**	= the percentage of employees working in enterprises saying that they place orders to suppliers online on the web or via other computer-mediated networks, for example via EDI based connections to their suppliers, and that these online orders account for at least 5% of their total orders.
C.2	Use of **specific ICT** solutions for e-procurement	= the percentage of employees working in enterprises that use specific IT solutions to support the selection of their suppliers and/or procurement processes.
C.3	Companies **linking their ICT system with suppliers**	= the percentage of employees that work in enterprises whose ICT system is linked with those of suppliers.
C.4	Companies managing **capacity and inventory online**	= the percentage of employees working in enterprises that that use technologies to manage capacity and inventory online.
D. Marketing and sales processes		
D.1	Use of **CRM** software systems	= the percentage of employees working in enterprises that use a CRM (customer relationship management) software to organise data about their customers electronically.
D.2	Companies receiving >5% of **orders from customers online**	= the percentage of employees working in enterprises saying that they accept orders from customers online on the web or via other computer-mediated networks, and that these online orders account for at least 5% of their total orders received.
D.3	Use of **specific ICT** solutions to support marketing and sales processes	= the percentage of employees working in enterprises that uses specific IT solutions to support marketing and sales processes.
D.4	Companies **linking their ICT system with customers**	= the percentage of employees that work in enterprises whose ICT system is linked with those of customers.

Annex II: Expanded Tables – Data by Country

General remarks on country data break-downs

The studies of *e-Business W@tch* have a sectoral perspective and focus, within sectors, on small and medium-sized enterprises; the analysis of geographic differences is not in the foreground. This decision on the study focus recognises that the e-business activities of a company are mainly determined by its business activity, the configuration of its value system and its size, rather than by the location of a firm.

For several reasons, country data on e-business adoption must be taken with a pinch of salt. They can reflect, at least to some extent, the structure of the economy rather than the overall e-maturity of firms. In Italy, for example, sectors dominated by small firms are much more prevalent than in other countries. Since large firms are more advanced in electronic business, aggregated data may point at a lower level of e-business activity in Italy. In contrast to Italy, the relative performance of French and Dutch companies is significantly better if the emphasis is on larger firms. These benchmarking results suggest that the digital divide between small and large firms could be quite pronounced in these countries.

It should also be considered that the average size of the companies interviewed in a sector can differ by country, depending on industry structure and the available business directories used for sampling. It cannot be excluded that some directories may have a bias towards smaller / larger firms. Although this effect is counteracted by weighting the answers (according to the representation of various company sizes in the population), it cannot be excluded that structural differences in the sample have an impact on results. Ideally, comparisons between different countries should only be made within the same size-band of firms, rather than on the aggregate level. However, at least within a given sector, the number of observations available does not allow a break-down by country *and* size-band.

Exhibit A2-1: Internet access and remote access to company network

	Companies with internet access		Companies with broadband internet access		Average share of employees with internet access*		Companies with remote access to their network	
Weighting:	% of empl.	% of firms	% of empl.	% of firms	% of empl.	% of firms	% of empl.	% of firms
Tourism (EU-10)	**93**	**90**	**72**	**68**	**n.a.**	**53**	**38**	**13**
Micro (1-9 empl.)		90		65		57		13
Small (10-49 empl.)		98		82		33		19
Medium (50-249 empl.)		98		80		26		49
Large (250+ empl.)*		93		75		39		71
Tourism sub-sectors:								
Accommodation sector	100	98	76	80	n.a.	43	43	10
Gastronomy	84	80	68	54	n.a.	38	29	7
Travel agencies & tour operators	100	100	79	76	n.a.	95	45	32
Czech Republic	98	96	68	43		85	19	15
Denmark	98	98	85	78		72	59	34
Germany	96	89	79	53		58	42	10
Estonia	98	96	89	89		67	54	40
Greece	99	100	60	45		51	47	27
Spain	92	85	84	75		53	45	27
France	88	76	82	76		49	33	1
Ireland	97	97	63	56		48	33	15
Italy	100	100	72	54		49	31	11
Cyprus	91	82	54	48		44	44	36
Latvia	98	93	63	59		61	25	13
Luxembourg	86	72	69	57		61	21	20
Hungary	96	92	72	61		68	33	18
Malta	98	96	77	72		73	46	27
Netherlands	96	94	81	68		60	46	8
Austria	97	96	66	39		45	38	15
Poland	100	100	87	71		79	30	41
Portugal	88	82	80	76		25	22	14
Slovenia	98	91	70	55		62	38	27
Slovakia	94	82	63	48		51	17	10
Finland	98	96	87	69		63	56	13
Sweden	98	95	88	80		71	41	16
United Kingdom	91	99	57	80		40	38	2
Bulgaria	78	64	53	40		36	22	13
Romania	94	84	63	56		44	35	15
Norway	100	100	89	78		79	59	33
All 10 sectors (EU-10)	**95**	**93**	**76**	**69**	**n.a.**	**43**	**35**	**16**
Micro (1-9 empl.)		89		62		51		12
Small (10-49 empl.)		98		75		29		22
Medium (50-249 empl.)		99		83		33		43
Large (250+ empl.)*		99		84		44		60
Base (100%)	firms with computers		firms with computers		firms with internet		firms with computers	
N (for sector, EU-10)	725		725		681		725	
Questionnaire reference	A1		A3		A2		A5	

* Read: "The average share of employees with internet access in a company from the tourism industry is 53%."

Source: *e-Business W@tch* (Survey 2006)

Exhibit A2-2: Demand for ICT skills and skills development

	Companies employing ICT practitioners		Regular ICT training of employees		Companies with hard-to-fill vacancies for ICT jobs		Companies using e-learning	
Weighting:	% of empl.	% of firms	% of empl.	% of firms	% of empl.	% of firms	% of empl.	% of firms
Tourism (EU-10)	**27**	**12**	**21**	**11**	**3**	**2**	**29**	**15**
Micro (1-9 empl.)		11		9		2		16
Small (10-49 empl.)		9		13		0		15
Medium (50-249 empl.)		20		24		0		22
Large (250+ empl.)		51		33		6		54
Tourism sub-sectors:								
Accommodation sector	30	12	25	19	6	0	28	11
Gastronomy	22	11	13	1	1	2	25	6
Travel agencies & tour operators	26	13	20	18	3	7	37	41
Czech Republic	11	0	21	12	0	0	20	4
Denmark	47	35	33	17	5	0	25	10
Germany	14	1	5	2	2	6	23	14
Estonia	25	4	16	5	0	0	20	17
Greece	51	32	38	22	10	12	17	12
Spain	19	16	19	21	3	5	34	26
France	22	5	23	1	0	0	25	5
Ireland	23	8	22	12	9	0	22	14
Italy	33	18	26	13	0	0	31	23
Cyprus	32	16	43	26	6	8	14	15
Latvia	34	13	20	5	10	0	8	10
Luxembourg	28	19	22	14	2	5	9	6
Hungary	19	10	14	8	0	0	15	12
Malta	29	21	19	16	0	0	28	29
Netherlands	39	5	9	1	2	5	14	11
Austria	24	4	27	8	3	0	26	12
Poland	31	23	15	12	11	6	7	12
Portugal	17	0	22	3	0	0	17	2
Slovenia	10	2	16	5	2	0	31	21
Slovakia	34	8	19	9	9	4	16	11
Finland	38	5	34	11	2	0	20	7
Sweden	49	22	21	1	1	0	10	7
United Kingdom	22	16	27	1	8	0	38	11
Bulgaria	32	12	14	7	7	0	16	5
Romania	6	8	40	24	1	2	33	36
Norway	53	32	16	4	0	0	42	14
All 10 sectors (EU-10)	**27**	**14**	**22**	**13**	**2**	**1**	**21**	**11**
Micro (1-9 empl.)		12		9		2		12
Small (10-49 empl.)		15		16		0		11
Medium (50-249 empl.)		29		28		2		19
Large (250+ empl.)		59		41		6		35
Base (100%)	firms with computers		firms with computers		firms with computers		firms with computers	
N (for sector, EU-10)	725		725		725		725	
Questionnaire reference	B1		B4		B2		B5	

Source: *e-Business W@tch* (Survey 2006)

Exhibit A2-3: Companies ordering supply goods online

	Place orders online		Place 1-25% of their orders online		Place more than 25% of orders online		Use specific ICT solutions for e-sourcing	
Weighting:	% of empl	% of firms	% of empl	% of firms	% of empl	% of firms	% of empl	% of firms
Tourism (EU-10)	**60**	**39**	**77**	**72**	**23**	**28**	**20**	**12**
Micro (1-9 empl.)		38		73		27		11
Small (10-49 empl.)		54		83		17		12
Medium (50-249 empl.)		61		75		25		16
Large (250+ empl.) *		80		73		27		40
Tourism sub-sectors:								
Accommodation sector	68	47	84	79	16	21	25	9
Gastronomy	50	24	74	85	26	15	17	6
Travel agencies & TO	70	60	60	52	40	48	21	34
Czech Republic	49	54	70	58	30	42	5	8
Denmark	77	67	57	60	43	40	18	7
Germany	70	50	84	77	16	23	12	12
Estonia	73	54	58	46	42	54	11	1
Greece	45	46	81	77	19	23	20	13
Spain	39	27	45	42	55	58	37	26
France	73	40	78	98	22	2	17	9
Ireland	55	51	77	82	23	18	10	6
Italy	50	41	96	99	4	1	9	1
Cyprus	52	52	85	73	15	27	24	22
Latvia	35	34	73	74	27	26	13	9
Luxembourg	57	47	84	88	16	12	8	5
Hungary	51	51	84	83	16	17	11	4
Malta	53	46	74	74	26	26	22	24
Netherlands	64	47	45	32	55	68	1	1
Austria	72	54	66	75	34	25	18	8
Poland	82	60	70	51	30	49	4	6
Portugal	29	24	74	82	26	18	6	2
Slovenia	43	49	82	78	18	22	9	8
Slovakia	36	37	81	65	19	35	11	5
Finland	83	55	46	52	54	48	26	3
Sweden	81	66	56	77	44	23	3	3
United Kingdom	56	23	75	56	25	44	27	9
Bulgaria	21	14	72	84	28	16	7	2
Romania	51	41	79	78	21	22	15	9
Norway	85	76	36	45	64	55	24	12
All 10 sectors (EU-10)	**57**	**48**	**74**	**75**	**26**	**25**	**16**	**9**
Micro (1-9 empl.)		44		73		27		7
Small (10-49 empl.)		54		80		20		10
Medium (50-249 empl.)		60		76		24		16
Large (250+ empl.)		68		75		25		29
Base (100%)	firms using computers		firms placing orders online		firms placing orders online		firms using computers	
N (for sector, EU-10)	725		418		418		725	
Questionnaire reference	E1		E3		E3		E7	

Source: *e-Business W@tch* (Survey 2006)

Exhibit A2-4: Companies receiving orders from customers online

	Accept orders from customers online		Receive 1-25% of orders online		Receive more than 25% of orders online		Use specific ICT solutions for e-selling	
Weighting:	% of empl	% of firms	% of empl	% of firms	% of empl	% of firms	% of empl	% of firms
Tourism (EU-10)	**49**	**36**	**68**	**72**	**32**	**28**	**28**	**11**
Micro (1-9 empl.)		35		74		26		8
Small (10-49 empl.)		46		69		31		20
Medium (50-249 empl.)		55		64		36		32
Large (250+ empl.)		61		65		35		50
Tourism sub-sectors:								
Accommodation sector	73	62	62	66	38	34	41	18
Gastronomy	24	16	72	83	28	17	15	3
Travel agencies & TO	53	40	74	78	26	22	26	20
Czech Republic	34	38	68	56	32	44	2	0
Denmark	57	47	77	71	23	29	24	10
Germany	43	19	86	86	14	14	31	15
Estonia	69	68	53	54	47	46	12	7
Greece	35	29	78	60	22	40	14	7
Spain	33	31	65	82	35	18	20	6
France	63	54	53	54	47	46	31	21
Ireland	47	39	56	28	44	72	20	9
Italy	46	41	96	99	4	1	22	1
Cyprus	41	27	78	39	22	61	27	19
Latvia	33	21	71	88	29	12	20	8
Luxembourg	65	56	89	88	11	12	23	15
Hungary	47	25	64	60	36	40	14	6
Malta	61	44	79	88	21	12	24	14
Netherlands	44	18	84	65	16	35	13	0
Austria	65	51	68	63	32	37	28	15
Poland	76	71	65	58	35	42	24	6
Portugal	35	38	94	89	6	11	7	6
Slovenia	52	48	79	75	21	25	16	16
Slovakia	36	37	77	64	23	36	9	4
Finland	68	39	73	65	27	35	35	13
Sweden	44	40	76	76	24	24	19	3
United Kingdom	48	17	74	85	26	15	29	10
Bulgaria	28	14	96	100	4	0	25	7
Romania	53	39	44	74	56	26	30	23
Norway	62	46	70	76	30	24	37	14
All 10 sectors (EU-10)	**35**	**25**	**73**	**75**	**27**	**25**	**18**	**9**
Micro (1-9 empl.)		23		79		21		6
Small (10-49 empl.)		26		76		24		12
Medium (50-249 empl.)		29		75		25		16
Large (250+ empl.)		26		74		26		27
Base (100%)	firms using computers		firms accepting orders online		firms accepting orders online		firms using computers	
N (for sector, EU-10)	725		339		339		725	
Questionnaire reference	F4		F6		F6		F10	

Source: *e-Business W@tch* (Survey 2006)

Annex III: Glossary of Technical Terms

Term	Definition[99]
Access	The ability to retrieve information and to communicate online through the use of digital information and communication technologies.
B2B	Business to Business. Electronic transactions between companies.
B2B e-marketplace	Electronic trading platforms on the internet where companies can sell and/or buy goods or services to/from other companies. They can be operated by a single buyer or seller or by a third party. Many marketplaces are industry-specific. Some marketplaces require registration and membership fees from companies that want to conduct trade on them.
B2C	Business to Consumer. Electronic transactions, between companies and consumers.
Bandwidth	The physical characteristic of a telecommunications system that indicates the speed at which information can be transferred. In analogue systems, it is measured in cycles per second (Hertz), and in digital systems in binary bits per second. (Bit/s).
Broadband	High bandwidth internet access. In *e-Business W@tch* reports, broadband is defined as the capacity to transfer data at rates of 2 Mbit/s (megabits per second) or greater.
Channel	In communications, a physical or logical path allowing the transmission of information; the path connecting a data source and a receiver.
CRM	Customer Relationship Management. Software systems that promise the ability to synthesize data on customers' behaviour and needs and thus to provide a universal view of the customer.
Dial-up	The process of establishing a temporary connection (to the internet) via the switched telephone network.
Digital signature	An electronic signature that can be used to authenticate the identity of the sender of a message or the signer of a document, and to ensure that the original content of the message or document that has been sent is unchanged. Digital signature usually refers specifically to a cryptographic signature, either on a document, or on a lower-level data structure.
DRM	Digital rights management. DRM is a system of IT components and services, along with corresponding law, policies and business models, which strive to distribute and control intellectual property and its rights. Product authenticity, user charges, terms-of-use and expiration of rights are typical concerns of DRM.
DSL	Digital Subscriber Line. A family of technologies generically referred to as DSL, or xDSL, capable of transforming ordinary phone lines (also known as "twisted copper pairs") into high-speed digital lines, capable of supporting advanced services. ADSL (Asymmetric Digital Subscriber Line), HDSL (High data rate Digital Subscriber Line) and VDSL (Very high data rate Digital Subscriber Line) are all variants of xDSL
e-Business	Electronic business. The *e-Business W@tch* uses the term "e-business" in the broad sense, relating both to external and to company internal processes. This includes external communication and transaction functions, but also ICT supported flows of information within the company, for example, between departments and subsidiaries.
ebXML	Electronic business using XML. A proven framework and unified set of internationally agreed upon technical specifications and common XML semantics designed to facilitate global trade.
e-Commerce	Electronic commerce. As distinct from the broader concept of e-business, e-commerce refers to external transactions in goods and services between companies (B2B), between companies and consumers (B2C), or between companies and governments (B2G) and may therefore be seen as a subgroup or component of e-business activities.
EDI	Electronic Data Interchange. A way for unaffiliated companies to use networks to link their businesses by using a common technical standard for exchanging business data. While electronic mail between companies is common, electronic data interchange passes bigger bundles that replace large paper documents such as bills and contracts.

[99] Some of the definitions in this glossary are derived from or based on definitions suggested by Whatis?com, a leading online ICT encyclopaedia and learning centre. See http://whatis.techtarget.com.

Term	Definition[99]
EDM	Electronic Document Management. The management of different kinds of documents in an enterprise using computer programmes and storage devices. An EDM system allows an enterprise and its users to create a document or capture a hard copy in electronic form, store, edit, print, process, and otherwise manage documents.
e-Invoicing	Electronic invoicing. A business-to-business transaction in which invoices are generated, delivered (and normally paid) electronically, replacing the equivalent traditional paper-based invoicing processes.
e-Learning	e-Learning means supporting training with learning material in electronic format, for example material that is available on the intranet or the internet. e-Learning applications can be used for ICT-related training, but also for sector-specific or even company-specific training content.
ERP	Enterprise Resource Planning. A software system that helps to integrate and cover all major business activities within a company, including product planning, parts purchasing, inventory management, order tracking, human resources and finance.
Extranet	A network using internet protocols that allows external organisations (for example customers or suppliers) access to selected internal data. Essentially it is an Intranet which gives external users restricted access (often password protected) to information through the firewall.
Firewall	A firewall is a set of related programmes that protects the resources of a private network from users from other networks. The term also refers to the security policy that is used with the programmes.
ICT	Information and communication technology. ICT includes networks, computers, other data processing and transmitting equipment, and software. The application of ICT in business processes leads to e-business.
Information security	Measures taken to protect information systems against unauthorised use and attacks
Internet	The world's largest computer communication system, with an estimated 700 million users worldwide.[100] The internet is a loose confederation of principally academic and research computer networks. It is not a network but rather the interconnection of thousands of separate networks using a common language.
Interoperability	The technical features of a group of interconnected systems (includes equipment owned and operated by the customer which is attached to the public telecommunication network) which ensure end-to-end provision of a given service in a consistent and predictable way.
Intranet	An internal internet, that is an internal network running using TCP/IP, which makes information available within the company. Most Intranets are connected to the internet, and use firewalls to prevent unauthorised access.
ISDN	Integrated Services Digital Network. An international telecommunications standard for transmission of voice and data over dial-up lines running at 64 Kbit/s (kilobits per second). It allows sharing of multiple devices on a single line (for example, phone, computer, fax).
IT	Information technology. IT includes hardware (computers, other data processing and transmitting equipment) and software.
KM	Knowledge Management. ICT solutions that support enterprises in systematically gathering, organising, sharing, and analysing their knowledge in terms of resources, documents, and people skills. Knowledge management software typically involves data mining and some method of operation to push information to users.
LAN	Local Area Network. The most common way of connecting computers in a small area (typically inside a building or organisation) for sharing databases and communication facilities. The two most common versions are Ethernet and Token Ring. Implementation is based on coaxial cables or plain wires. Speed achieved ranges from 10 Mbps to 100 Mbps.
Leased line	A private communication channel leased from the common carrier. It is usually a dedicated fixed-route link (e.g. point-to-point frame relay).
m-Commerce	Mobile commerce. E-commerce that takes place using mobile connection devices and through data transmission via technical standards for mobile communication.
Micro enterprise	A company with fewer than 10 employees.

[100] Cf. Global Internet Statistics by Global Reach, www.glreach.com

Term	Definition[99]
Modem	Modulator/Demodulator. A device that modulates outgoing digital signals from a computer or other digital device to analogue signals suitable to be transmitted through a conventional telephone line (copper twisted pair telephone). The reverse procedure takes place for incoming signals.
MRO goods	Maintenance, repair and operating goods. Supplies which companies need to maintain their operations, for example office supplies, in contrast to "direct production goods" which are components of the goods and services the company produces.
OOS	Open source software refers to computer software under an open source license. An open-source license is a copyright license for software that makes the source code available and allows for modification and redistribution without having to pay the original author.
Processes	Business processes are operations that transform the state of an object or a person. This can, for example, be an order placed via the internet. Ordering an object or a service creates a liability for the supplier to deliver, and initiates the transfer of property rights from one entity to another. The electronic handling of processes is likely to speed them up and to introduce new processes in the realisation of the same transaction.
PLM	Product lifecycle management. The process of managing the entire lifecycle of a product from its conception, through design and manufacture, to service and disposal. PLM software helps companies effectively and efficiently innovate, for example by managing descriptions and properties of a product starting from conception and development.
Remote access	The ability of a company computer network's transmission points to gain access to a computer at a different location.
RFID	Radio Frequency Identification. A wireless technology which is used to uniquely identify an object, animal, or person. RFID is coming into increasing use in industry as an alternative to the bar code. The advantage of RFID is that it does not require direct contact or line-of-sight scanning.
SCM	Supply Chain Management. Software that helps businesses to match supply and demand through integrated and collaborative planning tools.
Sector	Sectors of the economy with comparable business activities. These constitute the main research unit of the *e-Business W@tch*. Aggregated information at the industry level is used to document the diffusion of activities within the industries as well as the overall importance of the observed phenomena for changes in the economy as a whole. The definition of sectors follows NACE Rev.1.1 classifications.
Secure server technology	Secure server technology means that data exchange between computers is based on certain technical standards or protocols, for example "Secure Sockets Layer" (SSL).
SME	Small and medium-sized enterprises with 0-249 employees. To be classified as an SME, an enterprise has to satisfy the criteria for the number of employees and one of the two financial criteria, i.e. either the turnover total or the balance sheet total. In addition, it must be independent, which means less than 25% owned by one enterprise (or jointly by several enterprises) falling outside the definition of an SME or a micro-enterprise, whichever may apply. The thresholds for the turnover and the balance sheet total will be adjusted regularly, to take account of changing economic circumstances in Europe.
SSL	Secure Sockets Layer. A commonly-used protocol for managing the security of a message transmission on the internet. SSL has recently been succeeded by Transport Layer Security (TLS), which is based on SSL.
Standard	A standard is a technical specification approved by a recognised standardisation body for repeated or continuous application, with which compliance is not compulsory.
Transaction	Electronic transactions can be subdivided into several steps, each of which initiates a process. There are pre-sale (or pre-purchase) phases, sale and after-sale phases. Typically a transaction starts with information gathering, price and quality comparisons and possibly pre-sale negotiations. During the sale phase contracting and delivery are the core processes, and payment is the final stage of this phase. After-purchase transaction stages comprise customer service, the administration of credit payments and the handling of returns as well as marketing activities preparing for the next purchase.
UMTS	Universal Mobile Telecommunications Service. A third-generation (3G) digital standard for mobile communication, enabling packet-based transmission of voice, text and video at data rates up to 2 megabits per second (Mbps).
Value added	Gross output minus intermediate inputs. It is valued at producers' prices and includes all indirect taxes, but excludes VAT and subsidies.

Term	Definition[99]
VoIP	Voice over Internet Protocol (IP). The use of telephony services over internet networks, by means of digitised voice transfer technology.
VPN	Virtual Private Network. A way to use a public telecommunication infrastructure, such as the internet, to provide remote offices or individual users with secure access to their organisation's network.
WAN	Wide Area Network. A network allowing the interconnection and intercommunication of a group of computers over a long distance.
WAP	Wireless Application Protocol. A communication protocol for delivering data over mobile telephone systems, allowing cellular phone sets and other mobile hand-set systems to access WWW pages and other wireless services.
Website	A related collection of World Wide Web files that includes a beginning file called a home page.
Wi-Fi	Wireless fidelity. A popular term for a high-frequency wireless local area network (W-LAN). Wi-Fi technology is rapidly gaining acceptance as an alternative or complementary infrastructure to a wired LAN.
W-LAN	Wireless Local Area Network. An implementation of a LAN with no physical wires, using wireless transmitters and receivers. It allows a mobile user to connect to a LAN or WAN through a wireless (radio) connection. A standard, IEEE 802.11, specifies the technologies for wireless LANs.
WWW	World Wide Web. The collection of pages in HTML format which reside on web-servers. Although WWW and the internet are different, the terms are increasingly becoming interchangeably used.
XML	Extensible Mark-up Language. A standard to describe the contents of a page or file. XML is a way to create common information formats and share both the format and the data on the World Wide Web, intranets, and elsewhere.

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