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Management and e-Business



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The Wales Management Council is an employer-led body funded by the Welsh Assembly Government to promote the development of managers in the private, public and voluntary sectors in Wales.

The Wales Management Council aims to inspire, motivate and drive change in the perception, delivery, take-up and funding of management and leadership development in Wales.

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WALES MANAGEMENT COUNCIL

Management and e-Business

"e-business (EB) is e-commerce (EC) plus business intelligence (BI), customer relationship management (CRM), supply chain management (SCM) and enterprise planning (ERP)." ¹

"e-commerce can take a variety of forms including electronic data interchange (EDI), mobile telephone, direct link-ups with suppliers, Internet, intranet, extranet, electronic catalogue ordering, and e-mail." ²

"Examples of the benefits (of e-commerce) are cost savings resulting from reduced paper transactions; shorter order cycle time and the subsequent inventory reduction, resulting from the speedy transmission of purchase-order related information; and enhanced opportunities for the supplier/buyer partnership through the establishment of a web of business to business communication networks."

"Not every firm is ready to embrace e-commerce as a purchasing tool. Some serious hurdles to the successful implementation of e-commerce include a host of security, legal and financial problems, not least of which are unquantified business cases for its introduction."

"Those companies which have yet to establish electronic trading have fairly consistent reasons Lack of understanding about business opportunities presented by e-commerce, lack of understanding of how to implement e-commerce, lack of skills among the workforce, and the price of the technology."

"The 'gut feel' driver dominates and reinforces concerns that real business cases for e-commerce implementation are rare."

"Thinking strategically about e-commerce, its success is based on reach, affiliation and richness. Reach is access and connection; affiliation is about whose interests new business represents, e.g. existing or new customers; richness is about depth and detail of information."

"Effective e-commerce impacts on the all-important bottom line, both in the private and the public sectors. SMEs do not appear to recognise this and hence do not see a problem with their own e-commerce capability. e-commerce strategy is missing from SME business plans."

"SMEs contribute approximately 50 per cent to the UK gross domestic product and nearly 90 per cent to employment..... Developing SME e-commerce expertise is essential to sustaining (and in some cases achieving) competitive advantage.... The future belongs to those who can use new technology to make themselves more efficient and develop better products and services. The results may not be instant. Nevertheless, SMEs ignore e-commerce at their peril."

¹ Strauss J et al: *E-Marketing*, Prentice Hall, 2000 quoted in Lindgren *E-business in SMES in Northern Denmark*, 2002

² This and all quotations below are from Quayle: *E-commerce: the challenge for UK SMEs in the twenty-first century* in *International Journal of Operations and Production Management*, Vol.22 No.10, 2002.

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I. FOREWORD

Much advice and guidance in relation to e-business has focused on the technological aspects rather than the impact on

- organisational structure
- business processes
- relationships with suppliers and customers
- skills development

and the implications this has for managers now and will have in the future.

By talking to a small sample of managers across Wales we hoped to gain improved insight into the practical managerial implications of e-business, to complement the findings in our reports on e-commerce and future management practice which we published in 2002.

By identifying areas of good practice and understanding some of the pitfalls to avoid, we hope to be able to assist businesses in Wales with managing the introduction of e-business and taking full advantage of its benefits.

We also hope that the "Questions for managers" in the very last chapter will be a useful prompt for all managers to think further about the issues raised in this report.

We believe that exploring management development in relation to practical issues, such as e-business, is a key factor in achieving our mission to help managers in Wales lead and manage successfully.

Wales Management Council

September 2003

2. EXECUTIVE SUMMARY

This report complements and develops our two research reports published in 2002

- *The Managerial Implications of e-Commerce* : a quantitative study of e-commerce usage across a small sample of businesses in Wales.
- *Creating Future Good Management Practice*: a summary of the conclusions from symposium discussions about the skills managers will need to face the challenges of the future.

Our aim in this research is to obtain more qualitative information from practising managers about the impact of all aspects of e-business on their role, their organisations and their personal development.

e-Business usage across Wales is now well-established with connectivity (= use of website and/or email, and/or EDI) at 79% compared with a UK average of 86%, but the level of "e-adoption" is low, with a concentration of e-mail and website usage, and comparatively little on-line trading.

Managers in smaller businesses appear largely unaware of the potential impact of higher levels of "e-adoption" on themselves, their organisations and their customers.

Few managers in our sample had far-reaching business objectives. Most were taking e-business step-by-step, rather than looking for strategic advantages. A few were questioning whether e-business had any place in their industry or in their relations with their customers or suppliers.

The benefits of e-mail and websites in relation to faster communications and generation of orders are well-established, but some organisations found a mismatch between the speed of order receipt and order fulfilment.

We expected to find evidence of problems with e-mail volumes, constant accessibility for managers, volume and speed of information flow, and implementation. But it was heartening to find that in our small sample these hardly figured at all, a great encouragement for those who might be discouraged by stories of problems rather than benefits.

Our interviewees frequently said that they were not exploiting the full potential of e-business technology, and needed greater in-house or external support to enable them to do this.

Most companies had some plans to develop their e-business capability to a higher level, but faced issues of cost, time, staff and support.

The key recommendations for other SMEs were to have a clear strategy for what the company is trying to achieve, with a strong business case for e-business development, careful planning, understanding of customer needs, and a sharing of information with all involved.

Success comes from understanding that e-business is not just about selling to customers, but about harnessing the technology to interact more effectively up and down the supply chain, and internally, adapting to business processes to take full advantage of the opportunities this presents.

3. INTRODUCTION

Background

Early in 2002 the Wales Management Council published *The Managerial Implications of e-Commerce*. This report set out the results of a study to explore the impact of e-commerce on companies in Wales.

The report was based on the responses to a questionnaire sent to 750 companies to find out who was implementing e-commerce and to what degree, what was their motivation, and what impact had it had so far on their business.

The results of the research were both encouraging and disappointing. Encouraging in that over 90% of respondents had implemented some form of e-commerce, the majority being e-mail and a company website. Disappointing in that most claimed that little had changed for their business as a result.

The research was entirely quantitative, and the conclusions in the report clearly needed further investigation.

Soon after the publication of this e-commerce report, the Wales Management Council published *Creating Future Good Management Practice*. This report explored the future challenges facing all managers in Wales and laid great emphasis on

- developing technology and the skills managers would need to take full advantage of this
- the importance of managing and using information
- issues relating to managing distant relationships with staff, suppliers and customers

which are explored more fully in the next chapter.

Since the publication of the first e-commerce report the Wales Management Council has considered what form the next research phase should take, mindful that there were related issues in *Creating Future Good Management Practice* that deserved further exploration.

Aims and objectives

We decided that personal contact with SME managers was essential to explore in more depth a number of key questions and assumptions, but available resources dictated that the number to be contacted would have to be modest.

Key questions related to

- current levels of e-adoption
- perceived benefits of e-commerce
- operational and implementation difficulties
- skill difficulties and support required
- plans for the future.

Unlike the first research, these questions were to be the starting point for more in-depth, qualitative exploration on the telephone of the who, what, why, and how of e-commerce.

Preliminary questions

A key part of the preparatory work was a discussion to establish:

- *what does "e-commerce" mean to most people?*

We reached an early conclusion that "e-business" was a more helpful term than e-commerce, as this embraced a wider range of business activities.

- *in e-business terms, where does Wales stand in relation to the rest of UK?*

We wanted to put our findings in meaningful context of other parts of the UK, so that we did not applaud or blame ourselves inappropriately.

- *is there any substance in assumptions that technology was making us, for example, slaves of e-mails, electronically available 24/7, and unable to cope with the unlimited information available to us on the internet?*

We wanted to ensure that our personal and anecdotal experience of e-business informed the questioning, but did not colour the results.

Research

We put the research out to tender and retained the services of Strategic Marketing in Cardiff to design a telephone questionnaire, conduct the interviews, and draft a report on their findings.

This first phase of work consisted of 50 semi structured telephone interviews (see Appendix 2) with directors and senior managers in manufacturing and business-service sectors in Wales. The industrial structure of these interviews was similar to that of our previous research. There is however no attempt to suggest that this is a representative sample of all businesses in Wales.

A discussion group selected from the telephone respondents was used to drill down further into many of the issues.

Some desk research into the adoption of online technologies was also undertaken to provide additional perspective in terms of its adoption in Wales and the issues confronting companies across the UK and other parts of Europe.

Advice and guidance

The final part of the research brief was to provide positive recommendations for SMEs across Wales who might be on the first rungs of the e-adoption ladder, but needed further encouragement to take them higher.

4. MANAGEMENT CHALLENGES

In March 2002 we published a report on *Creating Future Good Management Practice* which highlighted the many different challenges managers in Wales will face as we transform ourselves into a knowledge driven economy that competes with the best nations in the world.

The report laid particular emphasis on the fact that "new technology will need to be harnessed efficiently and effectively to understand and respond to the changing needs of increasingly sophisticated customers."

Some of the challenges from new technology are summarised below as a starting point for the consideration of the impact of e-business on the development of management skills in Wales.

Current and future managers will need to be able to:

- understand the potential use of the technology in their organisation and the rate at which the technology is developing
- understand the impact of the developing technology on markets and market opportunities
- understand the probable future developments in technology which could affect their organisation as a threat and as an opportunity
- understand how developing technology can be used for external communication to gain knowledge for external sources, and communicate with suppliers and customers
- ensure that the business drives the technology and not allow the technology to drive the business
- be an effective user of the technology, as a car driver rather than a specialist mechanic, in order to provide a role model within the organisation
- be able to set out the required outcomes from technology systems in order to be able to prepare a brief for design specialists
- be able to understand technological solutions being put forward by more technology literate staff
- use the technology to establish the customers' current real need and anticipate their future need
- use the technology to explore the activities and performance of competitors

-
- use the technology to provide information to empower staff to take decisions quickly
 - deal with problems of isolation resulting from over-reliance on e-mail communication within the organisation and from working at home or in the field
 - deal with the implications, threats and opportunities of 365/24/7 availability made possible by mobile communications
 - develop personal skills in relation to time management and the implications of isolation in dealing with a remote workforce and remote colleagues.

As a part of this current research in relation to e-business we wanted to explore whether these issues were a reality for the managers to whom we spoke.

In the final chapter of this report we suggest a number of questions that managers need to ask to focus on these issues.

5. E-BUSINESS IN WALES

Overview

In the last two years two reports have provided a comprehensive overview of e-business in Wales.

In 2002, as part of the DTI International Benchmarking Study, the Welsh Assembly Government and Welsh Development Agency commissioned HI Europe to provide a detailed view of how businesses in Wales were performing in terms of their adoption and usage of online technologies. The study compared Wales with the UK and individual UK regions.¹

In this study "online technologies" refers to at least one of the following:

- access to the Internet
- internal or external e-mail
- a website
- EDI
- Intranet and Extranet,
- Local Area Network
- Wide Area Network
- interactive (automated) telephony.

In 2003, Opportunity Wales, the E-Commerce Information Centre (ECIC) and Cardiff University Business School, published *eCommerce in Welsh SMEs: the State of the Nation Report 2002/2003*.² This is the most comprehensive report to date on the extent of e-commerce usage among SMEs in Wales, both nationally, and by region and industry.

The comments below reflect highlights from the findings of both reports.

The ownership of online technologies in Wales has increased in recent years and is in the main substantial and not radically different from other UK regions. On the majority of measurements used to benchmark each UK region's online capability, businesses in Wales have improved to such an extent that Wales can no longer be considered to be the least advanced region. However, it is the use of this technology that could be more advanced.

The table below summarises the position of Wales in relation to the average for the UK in terms of company ownership of online technologies.³ The following paragraphs describe in more detail the way that the technology is being applied.

¹ Copies of the reports are available on www.ukonlineforbusiness.gov.uk (UK) and www.wda.co.uk (Wales)

² Copies of this report are available on www.opportunitywales.co.uk.

³ The survey results are weighted to reflect employee distribution. This means that a data reference to, for example, '30% of businesses' should be understood to mean 'businesses accounting for 30% of all employment in that region or country, with the exception that for performance against the connectivity and trading online targets a simple headcount of businesses has been used.

Wales v UK Average		
Ownership of Technology	Wales	UK
External e-mail	87%	88%
Internal e-mail	68%	76%
Website	73%	80%
LAN	71%	76%
WAN	40%	51%
Intranet	38%	49%
Extranet	16%	20%

Connectivity

A business is counted as 'connected' if it

- has a website, and/or
- has 25% or more of employees making daily use of e-mail, and/or
- uses EDI.

Connectivity amongst businesses in Wales, as measured by the DTI's Connectivity Indicator, ranks slightly below most other UK regions at 79% against the UK average of 86%.

The majority of Welsh businesses within each size band are now 'connected'. It is micro and small businesses in Wales, as across the rest of the UK, that have some way to go before reaching high connectivity levels.

Welsh businesses that are connected by size	
Business size	Connectivity level
Micro (1 - 10 people)	59%
Small (11 - 49 people)	70%
Medium (50 - 249 people)	81%
Large (250 + people)	91%

The Opportunity Wales report states that 88% of the workforce in small to medium SMEs (excluding micro businesses) in Wales is employed in a business where one employee or more regularly uses a computer.

Internet access

57% of Welsh SMEs have an internet connection.

Internet access varies by company size from 55% of micros and 76% of small businesses, to 95% in medium sized companies.

Website and e-mail

According to the DTI (weighted) figures approaching threequarters of businesses in Wales have a website compared to a UK average of 80%.

87% of businesses in Wales have external e-mail, as opposed to 68% with internal e-mail.

External e-mail capability in Wales is close to the UK average, while internal e-mail is eight percentage points behind the UK average.

The Opportunity Wales report states that 55% of SMEs have a company website.

Trading online

The DTI considers a business to be 'trading online' if it both:

- Orders on line or allows customers to do so
- Makes payments online or allows customers to do so.

Just over a fifth of businesses in Wales trade online compared to an average of 26% for the UK, but Wales is ahead of many regions of the UK. The UK however has lost its lead position to Australia (39%), Sweden (35%), Germany (30%), and Ireland (28%).

Opportunity Wales reflects these figures. Although only 6% of Welsh SMEs accept payments on-line, 21% make on-line payments.

Working with customers

The proportion of Welsh businesses using online technology to enable customers to order goods and services online is 30%. This compares well with a UK average of 32%.

However businesses across the UK show considerably lower adoption of facilities that enable customers to pay online. In Wales only 10% of businesses allow customers to pay online compared to a UK average of 14%.

Working with suppliers

The proportion of businesses in Wales placing orders online has risen to 44%. This is close to the UK average of 50% and Wales is a middle region of the UK.

The proportion of Welsh businesses that make online payments to suppliers is much lower but close to the UK average of 19%.

Business Culture

Wales tops all other UK regions with the highest proportion of businesses with a business plan (76%) compared to a UK average of 71%. However Wales is below average in considering ICT to some extent as an integral part of their business planning.

Approximately half of Welsh businesses either frequently or sometimes measure the total cost of technology to their business. This places Wales in a middling position when compared to other UK regions. A much lower proportion of businesses across all regions measure or evaluate the benefits of technology. Across the UK, the average is 40% and in Wales it is 32%.

Welsh businesses have a similar profile to the UK average in their willingness to adapt to new technology.

Drivers and Barriers

The main driver for adoption of technology across all regions of the UK was the need to "reduce costs/increase efficiency and profit".

Micro and small Welsh businesses were more likely to cite "keeping up with progress". Medium and large Welsh businesses were more likely to cite "reducing costs/increasing efficiency/profits as well as improving communications with staff. This is also true of UK businesses as a whole.

The main barrier across all regions was set up cost. Running costs and lack of time and resources were the other two top barriers.

The Opportunity Wales report cites the top five expected benefits of e-commerce in Wales as

- increased turnover
- new business opportunities
- increased profit
- increased profit and efficient marketing

and the key barriers for all SMEs in Wales

- not enough skilled staff
- high cost
- not understanding the issues.

Advice and support

Opportunity Wales makes the key observation that "take up of e-commerce advice by Welsh SMEs remains low, despite indications that a lack of understanding of the issues involved in implementing and exploiting e-commerce constitute a key barrier for the majority of businesses."

The workshop discussions which formed the final part of our own research suggested that low take-up did not reflect any lack of desire for such support. Two of the key recommendations from our workshop participants were



- the establishment of a network of high quality ICT mentors, with good business acumen, who would establish long-term (12-18 months) relationships with businesses, focusing on implementation issues.
- A publicly available list of quality approved independent consultants.

We hope that the sharing of experience that forms the main part of this report will be an additional source of e-business support and encouragement for SME managers in Wales.

6. MANAGEMENT AND e-BUSINESS

In this and our previous research we have taken a broad view of e-business which ranges from the simple use of email and the internet, to using an interactive website or electronic supply chain management.

This aligns with the approach taken by the DTI in its International Benchmarking Study (IBS) which has five levels of "e-adoption" as shown below ⁴, with the greatest business benefits being achieved when businesses start to make more sophisticated use of e-technologies to transform their processes and business relationships. ⁴

Business benefits	e-adoption	Impact	Extent of organisational change
	transformed organisation	Open systems of information for customers, suppliers, and partners. New business models based on interworking between organisations and individuals.	
	e-business	Integrate supply chain so manufacture and delivery become seamless. Minimise waste at every stage of supply chain.	
	e-commerce	Order and pay online reducing transaction costs. Maximise accessibility and speed.	
	website	Place in worldwide market. Window on worldwide suppliers.	
	e-mail	Efficient internal and external communication.	

From a management perspective, which is the main focus of this report, the higher the level of e-adoption, the greater the extent of organisational change. As a result managers must develop their skills both to handle a changing business environment, and to obtain maximum benefit from the technology, and from the new opportunities this provides in relation to business development, staff, and customers.

⁴ Adapted from Cisco and Information Age study on e-commerce in small business

⁵ A more detailed six stage e-Commerce Route Map can be found on the Opportunity Wales website www.opportunitywales.co.uk and in their recent report eCommerce in *Welsh SMEs: The State of the Nation Report 2002/2003*.

7. RESEARCH SAMPLE

Our sample was small, but our intention was to obtain information that would be of practical use to other SMEs, not to produce data that had statistical validity.

Three quarters of the companies interviewed manufacturers, with the balance involved in business-to-business services.

Approximately two thirds of the companies interviewed employed between 20 and 50 people, with a further third employing more than 50 people. This is typical of the majority of SMEs in Wales. ⁶

The various aspects of e-business that our interviewees had adopted reflected the national trends

<i>e-Business</i>	<i>Frequency</i>	<i>Percentage (%)</i>
e-mail - internal	39	82%
e-mail - external	48	98%
Website	43	90%
On-line sales	6	12%
On-line purchasing	7	14%
EDI	3	6%
Intranet	3	6%
Extranet	1	2%

The majority used the Internet only to send emails, transfer files or documents, or gather information. Most companies we interviewed had not attempted more ambitious projects than this, although some are now planning/developing upgrades.

The majority of companies interviewed, that have a website, use it as an online brochure and/or to provide a description of the company. Some sites also provide access to data sheets and supply frequently asked questions etc. This is seen as both a service to customers and a cost saving to the company. For those companies serving overseas markets this is particularly beneficial due to language and time zone issues.

Only a few (12%) organisations had more sophisticated websites that allow online ordering by customers. These were all manufacturers and all but one were small/medium sized independent companies. Only one of these companies supplied direct to consumers; the others were business-to-business. These companies supplied a variety of products covering building materials, printed stationery, decorative giftware and engineering products. One of the engineering companies had only recently set up their website which was not yet generating enquiries/sales and they were questioning whether e-commerce was appropriate in their particular industry.

Three companies were interviewed that operated EDI. These businesses were as diverse as engineering design and manufacture, gift-wrap for retailers, and farm supplies. These are clearly the most sophisticated companies in our sample and have had e-business at the heart of their business strategy and systems for five or more years.

A further seven companies were involved in online purchasing, although in most cases this was not integrated with production.

⁶ See Appendix I for more details of the companies interviewed.

8. IS e-BUSINESS FOR EVERYONE?

Perceptions

We wanted to explore at first hand whether the companies in our sample felt that e-business was "for them" and would provide real benefits.

Recent research undertaken by the European Commission identified that the most important factor impeding SMEs of all sizes from extending their use of e-business is the belief that online trading was not applicable to their type of products or services and the lack of perceived commercial benefit.

Although e-business can potentially provide access to global markets, companies still require the fundamentals of distribution networks and direct markets to be successful.

Only a handful of companies in our research commented that online technologies were inappropriate for their industry or their business. These comments generally related to the use of email or simple brochure-content websites rather than the more sophisticated concept of online trading.

Typical negative comments included "our industry still uses paper/faxes", "our customers know where we are" and there is no possibility of business being transacted through websites or email "while people are on building sites".

There will be those who will identify with these comments, but they beg the following questions about

- vision
- strategic thinking
- complacency
- status quo
- industry norms

and the narrow view of e-business being solely about desk-bound computers, and not about mobile phones and PDAs.

The majority of companies we interviewed were convinced that online technologies were beneficial in their industries, but only a few were planning developments that would encompass online ordering or purchasing.

Objectives

With a few notable exceptions, the majority of companies did not have clear or far-reaching e-business objectives. A 'step-by-step' approach is the norm for most companies; adopting a 'me-too' approach rather than looking for strategic advantage with their e-business applications.

With the benefit of some online experience behind them, a number of companies are now thinking about, or are developing, improvements to their ICT systems including more sophisticated online applications, but few of these improvements encompass e-commerce or e-business as set out in the model in chapter 6.

Where companies mentioned an e-business objective, it was most frequently to do with a website and increasing sales enquiries.

Several companies reported that they use the technology to control costs and help them to do their work, and as such they are not looking for breakthrough strategies. They apply online technology when they believe it is robust enough to achieve their immediate objectives.

9. BENEFITS

General

Several companies mentioned that the benefits of e-business are not really seen until the technology has been installed and people get to use it. Then people start to see other opportunities for improvement in the way some business processes are undertaken. A few companies commented that you have to get started, to see where the technology can take you.

This raises key management questions of

- strategic leadership
- managing expectations
- seizing opportunities
- training and development.

Specific comments on the e-business in its various forms were:

e-mail

Most companies report very positively on the benefits of e-mail in terms of speed, improved external communication with customers and suppliers, and improved working relationships with business partners.

Typical comments were:

- "Improved and faster communications with customers, particularly those overseas"
- "Extra time over the traditional postal system for tenders and other time critical tasks"
- "We can exchange information quickly and now send drawings electronically"
- "Most people prefer to deal by e-mail now, it is more convenient"
- "e-mail makes work so much easier"
- "It is immediate and informal. It is more likely to gain a faster response than a formal letter because the person it is addressed to will probably answer it"
- "e-mail now replaces the phone to an extent"

Websites

Success in achieving tangible benefits from websites has been mixed. The most common objective for websites was to generate sales enquiries. Companies that reported good levels of enquiries tended to have thought through their marketing approach.

Those companies that are disappointed with their website, tended not to have given much thought to what it was meant to do for them. They developed a site because they "saw competitors with one", or because they "thought they should have one".

A number of companies set up websites to provide information services for customers and prospects rather than to generate enquiries. Their objectives were customer service and cost saving. Online information has resulted in freeing up management time from "frequently asked questions" and being able to provide information 24/7, sometimes in several languages for export customers.

Several companies reported getting the wrong sort of enquiries e.g. consumer enquiries when they were trade only. This highlights the need to think though the marketing implications and website content in a structured way as a key part of marketing strategy and planning.

Information searching

A few companies mentioned the advantages they had gained by being able to search out better/cheaper suppliers.

Several companies also mentioned the ability to monitor competitors.

Supply chain management

The key benefits from electronic supply chain management were reductions in internal and external transaction costs and to a lesser extent, reductions in purchase prices.

10. PROBLEMS

We have strong anecdotal evidence of problems with

- the relentless volume of e-mails
- management availability 24/7
- the speed and availability of information
- implementation

and we wanted to explore these with our sample.

e-mail volume

We wanted to explore whether the often quoted "tyranny of e-mails" was a reality for our sample companies. None of the respondents however reported this as a problem.

Many companies appear to receive only modest numbers of emails. Is this a characteristic of smaller organisations and within manufacturing? Evidence from outside our research suggests it is more likely to be dependent on the relationship with the market place, and whether the company is independent or part of a group.

Storing e-mails was not seen as a problem either. Several respondents kept them as part of their audit trails.

A few companies reported problems with SPAM.

Management availability

e-mail, laptops, and mobile telephones potentially allow managers to be contacted by their staff, customers and suppliers at any hour of the day or night. Was this a problem? Our sample said no. A number of managers interviewed said they operated within office/factory opening hours only. Does this indicate a striking example of work/life balance, or of the fact that the available technology is not being used to its full potential?

Speed of information flow

The most advanced companies are clearly taking advantage of the speed of information flows and are developing and using integrated online systems to advance their competitive position through automated/integrated processes.

Most companies did not appear to have problems with the speed at which information is required. However a small number of companies commented that they needed to educate customers to be realistic in their expectations. For these companies a fast enquiry process cannot be matched with fast production. This mismatch is a frequent problem for companies when business processes are not planned in an integrated way.

Implementation

The majority of respondents did not experience any major problems with implementation. A number had teething problems only.

For some SMEs to drive change outside of their organizations is difficult unless they select supply chain partners who think the way they do. This solution has a real advantage as it encourages companies to look hard at the lifetime value of each of the stakeholders in their existing supply chain.

For those few companies trying to introduce more advanced systems, there have been issues of getting suppliers and customers to work together on supply chain solutions. One such company had issues getting each of their stakeholders to utilise the same technology. They are moving towards this goal steadily now, and as a result the buying power of the group has increased. The lower cost of online software compared with EDI makes working together in a collaborative way much easier to achieve.

Several companies commented about the problems they were having obtaining access to broadband and the reliability of telecommunications equipment.

II. PEOPLE

The key issues we wanted to explore were:

- management knowledge
- workforce skills
- in-house resources
- external advisors

Management knowledge and understanding of e-business

One of the drivers for this research was a belief that a lack of management understanding of the business opportunities presented by e-business could be impeding the development of companies.

Our research identified only a handful of companies where managers were prepared to acknowledge that their understanding of the potential of online technology could be better. This needs to be put in the context of the relatively straightforward online ambitions of most of the respondents. A typical comment was "I don't think we are exploiting the full potential of the technology". However few companies were able to provide any more detailed argument or explanation.

Workforce skills

More companies expressed concerns about the level of in-house technology skills. This ranged from relatively basic IT operating skills, to the more sophisticated skills required by ICT staff. Most of these comments related to exploiting the technology further to obtain its full potential. A number of companies reported that their workforce is still gaining experience, as systems are relatively new.

In-house resources

Several of the larger respondents in our survey stressed the importance of having a competent in-house ICT manager. Several commented that since recruiting this type of person their vision and enthusiasm of what was possible with ICT had expanded, as had their ability to implement new systems.

Small companies generally have more difficulty than medium or large companies in developing ICT skills and systems because they cannot justify an in-house ICT resource. This is certain to impact detrimentally on these companies, a fact that was recognised by the larger organisations.

Having so called "in-house techies" who are steeped in the latest trends has enabled some companies to be more pro-active in their online developments rather than reactive. These companies believe that it is critical to put the right people in place with the skills to manipulate the technology, although keeping up with advances in technology is still a challenge as is the high staff churn rate in the ICT industry.

Recent work by PFA Research has identified a trend towards the use of external ICT advisers and web designers as an initial source of information, followed by companies completing the work in house. Their research also identified that companies without in house ICT skills were the most likely to have "unprofitable" websites.

A caution expressed by several respondents about ICT specialists is their lack of appreciation of the bigger commercial picture. Whether they are in-house or external consultants, they must be managed so that developments support business strategy and not vice versa. e-business needs a champion at board level, but this does not have to be the ICT specialist.

External advisors

More than half the companies covered in the research use, or have used, external advisors or support particularly for web design, to fill other skills gaps and for general advice.

Most companies were pleased with the service they had from external advisors, but there were a significant number of companies that had experienced problems. Issues of cost and good practical advice were the main problems with external advisors.

One of the difficulties with using external advisors is bridging the potential gap between an ICT specialist's knowledge and the need to understand the clients business before developing a strategy. This is a particular problem for organisations (frequently the smaller ones) that do not have a clear business strategy or e-business vision and many of the online "failures" can be traced to the lack of a coherent business strategy.

12. FUTURE PLANS

Developments planned

More than three-quarters of the companies interviewed are planning to upgrade their systems in the foreseeable future.

- Several companies are now exploring on-line ordering, but others will wait until there is pressure from major customers
- Several of the more advanced companies are continuing developments into extranets and online tracking of progress
- Several companies are exploring on-line purchasing
- Several companies are expanding their websites, but fundamentally these will still be online brochures.

Problems anticipated

The potential problems anticipated by respondents were varied and specific to their individual circumstances. A few themes were:

- Finding the resources and time
- Cost
- Market acceptance / suitability
- Availability of advice and support.

On-line trading

Only a small proportion of SMEs trade, or are planning to trade, online, reflecting a number of barriers, identified in other research studies and reinforced by this project:

- A lack of awareness of the potential of online technologies
- Lack of online technologies skills base
- Security and privacy issues
- Lack of staff to implement technology.

13. ADVICE FOR SMEs

The findings of our research reflect the comments in the 2002 DTI ICT Benchmarking Study for the UK that

"Businesses are now taking time to develop a more strategic approach to their ICT use considering how they can integrate these new applications into their business processes to meet their overall business objectives"

The recent CBI report *Reality Bites* confirms that

"Businesses now have a more pragmatic approach to e-commerce and its implementation."

There are several themes to the advice given by respondents to our survey reflected in the quotations below:

- **Strategy**

"Have a clear strategy or idea of what the company is looking to achieve before implementing anything and provide full managerial support for ICT projects."

- **Business Case**

"Make the business case, with clear goals and benefits expected before embarking on projects, do not just follow what other companies are doing."

- **Business processes**

"Look at your business processes and then the benefits that e-business can bring. e-business must integrate with other business processes and be right for your market place before you go down this route. This is where the real value of trading online comes."

- **Planning**

"Introducing online technologies should be planned and project managed as thoroughly as any other project and must be driven from the top."

- **Share information**

"You must be prepared to share information internally and externally to get real benefits from online technologies. This is a real culture change for everybody in the business."

- **Long term vision**

"Recognise that it is for the long term, not a quick fix, so stick to your plan."

- **Customers**

"Understand what your customers want, and see whether working online will give you advantages over competitors."

- **Stakeholders**

"Identify the stakeholders in any particular project and give them a voice."

- **Staff**

"Ensure that staff have confidence in ICT, an understanding of the vision and not have it imposed on them before they are ready."

- **Cross-functional issues**

"Make sure that each functional area is represented in decisions so that systems take account of cross-functional issues."

- **Advice**

"Find some good advisors, but make sure you remain in control and that they understand your business strategy."

- **External support**

"New software in particular is likely to have problems and requires support. If support is externally sourced ensure that it will be provided when needed."

- **The unexpected**

"Be aware that there may be benefits and pitfalls that you had not anticipated."

14. CONCLUSIONS

The decision to 'step onto' any stage of the e-adoption ladder is a business decision.

It is not just an IT issue as it has wider implications for the business, both internally and externally.

As with any decision in an enterprise that involves investment of capital, a business case must be presented.

Look around your own industry and see what your competitors are doing: not just in Wales but internationally.

Gaining an understanding of just what e-business can achieve should be on all managers' strategic agendas. Having this appreciation will enable them to make an informed decision on whether or not it is right for their business.

This understanding will also highlight that online technology is not just about selling to customers, but also about harnessing the technology to interact more effectively up and down the supply chain and internally.

The decision to go online should not be taken in isolation. To make a genuine difference to the business, taking your suppliers and buyers online at the same time will enable you to create a demand for your products and services.

There is strong evidence that if the decision to go online is taken as a result of pressure from the customer, then the chances of success are far higher than they are for e-business implementation decided upon without asking customers if they want it.

If there is a market need, driven by the customer or supplier, then an e-initiative has a good chance of succeeding. If the company is trying to implement e-initiatives with buyers/suppliers without collaboration or consultation then they are in danger of having the equivalent of a shop with no customers.

"Some companies appear not to have realised that supply chains are about the flow of information as well as material" (Quayle 2002). Transparency is key between different elements of the supply chain. If each stakeholder has a higher degree of openness with their buyers and suppliers, they will be closer to operating as an integrated entity.

The companies who review and substantially change their business processes and then adopt appropriate ICT for their needs will see the most benefits.

15. QUESTIONS FOR MANAGERS

Do you understand potential use of e-business technology in your organisation and the rate at which technology is developing?

- where are you on the "e-adoption" ladder?
- what are you using e-business technology for?
- what do you plan to use it for in future?
- what difference has it made?
- where/how has it failed to live up to expectations?
- what are you doing to remedy this?
- what are the gaps in your own knowledge and understanding?

What are the probable future developments of e-business which could affect your market, suppliers and customers?

- how has e-business had an impact on your market?
- Is this an opportunity or a threat for you?
- how will you maximise the opportunities?
- how will you minimise the threats?
- is the situation going to get worse or better in future?
- what developments do you need to adopt in future to stay ahead of the competition?
- have you discussed your e-business development plans with your customers and suppliers?
- how could you use technology more effectively to develop new marketing opportunities?
- is your website doing the job its is supposed to do? Could it do more?

What are the probable future developments in e-business which could affect your staff and systems?

- what are the future developments which could affect you?
- are these an opportunity or a threat for you?
- how will you maximise the opportunity?
- how will you minimise the threat?
- could you use e-business technology more effectively to:
 - gain knowledge from external sources?
 - communicate with suppliers?
 - communicate with customers?
 - communicate internally
- if you did this, what impact would it have on your organisation?

Are you an effective user of e-business technology, and a role model within your organisation?

- are you an efficient and effective user of e-mail and internet?
- if not, why not?
- how do you intend to make yourself more effective?
- how will you help to make others in your organisation more effective?
- what are the main barriers/difficulties?

Can you set out the required outcomes from e-business technology systems in order to propose a brief for design specialists?

- do you drive the technology or does the technology drive you?
- what are your short/medium/long term e-business objectives?
- how and where will you find the specialists to help you achieve them?
- how will you know if the specialists are any good?
- is e-business a key part of your overall business strategy and planning?

Can you understand technological solutions being put forward by more technology literate staff?

- are you the technological dinosaur in your organisation?
- how do you manage/get the best out of staff who are more expert than you are?
- how do you assess the competence of staff who are more expert than you are?
- are your staff becoming more technologically literate/expert or less? How do you know?

Do you think your management skills and style need to change in relation to developments in e-business?

- how do you cope with the mass of information that is now available to you via the internet?
- how do you cope with being potentially available (via internet and mobile phones) 365/24/7?
- how do you manage staff who are remote and in e-contact rather than personal contact with you?
- what do you need to do to "raise your game" in relation to e-business?

APPENDICES

APPENDIX I

Profile of Companies Interviewed

The following tables summarise the characteristics of the research sample.

Type of Company

Three quarters of the companies interviewed were manufacturers. The balance of interviews was with business-to-business service organisations.

Size of Company

<i>Number of Employees</i>	<i>Frequency</i>	<i>Percentage (%)</i>
5 - 9	1	2%
10 - 19	1	2%
20 - 50	31	63%
Over 50	16	33%
	Sample = 49	

<i>Company Turnover</i>	<i>Frequency</i>	<i>Percentage (%)</i>
Less than £500K	-	-
>£500K and <£1m	2	5%
>£1m and <£5m	29	75%
>£5m and <£10m	1	3%
Over£10m	7	18%
	Sample = 39	

Age of Company

<i>Time Trading</i>	<i>Frequency</i>	<i>Percentage (%)</i>
Less than 5 years	1	2%
>5 years and < 10 years	3	6%
>10 years and < 20 years	12	24%
>20 years and <50 years	25	51%
Over 50 years	8	16%
	Sample = 49	

Ownership

<i>Company Status</i>	<i>Frequency</i>	<i>Percentage (%)</i>
Independent	38	78%
Part of a group	11	22%
	Sample = 49	

Geography

<i>Location</i>	<i>Frequency</i>	<i>Percentage (%)</i>
North Wales	12	25%
Mid Wales	5	10%
South East Wales	21	43%
South West Wales	11	22%
	Sample = 49	

Names, location and type

A cross section of the respondents who took part in our research:

<i>Company Name</i>	<i>Location</i>	<i>Type Manufacturing (M) Service (S)</i>
2 Travel Group Plc	Cwmbran	S
Abtest Ltd	Mountain Ash	S
Agrisense BCS Ltd	Pontypridd	M
Aircraft Maintenance Support Services	Pyle	M
Beaver Designs Ltd	Monmouth	M
Bevan & Buckland Chartered Accountants	Swansea	S
Bob Francis Crane Hire	Rhyl	S
Bruce, Edwards, Jones & Co Insurance Brokers	Caernarfon	S
Buckley Foundry (Chester) Ltd	Buckley	M
Cellpath Plc	Newtown	M
Clifford Jones Fencing Supplies	Ruthin	M
CR Clarke & Co (UK) Ltd.	Ammanford	M
Cwmbach Engineering Co. Ltd.	Aberdare	M
Daniels Fans Ltd.	Llanelli	M
Darrell Olive & Co, Chartered Accountants	Abergavenny	S
Dulas Ltd	Machynlleth	M/S
Fire Appliance Components Ltd.	Ystrad Mynach	M
Griffin Interiors Ltd	Hawarden	M
Gwent Cables	Cwmbran	M
Histon Overalls, Neath	Neath Abbey	M
HOFA Railway Group Ltd	Port Talbot	S
Illustrated Stationery Ltd.	Taffs Well	M
Insteg Process Automation Ltd.	Taffs Well	M/S
Kysor Europe Ltd	Hengoed	M
Mangor International Ltd	Presteigne	M
Martyn Powel Solicitors	Cardiff	S

Modplan Ltd	Abercam	M
Pineology Ltd	Wrexham	M
Plan Stairways	Mountain Ash	M
Polyroof Products Ltd	Flint	M
Record Industrial Brushes Ltd	Llandoverly	M
Ribbons Ltd	Treorchy	M
Rockfield Software	Swansea	S
Scandinavian Design	Hengoed	M
Silver Scenes (2000) Ltd	Welshpool	M
Simbec Research	Merthyr Tydfil	S
Spencer Davies Engineering, South Wales	Burry Port	M
Sterile Services International (SSI) Cardiff	Cardiff	S
Streetmaster Products	Ystradgynlais	M
Synthite Ltd	Mold	M
Textile Shapes and Assemblies Ltd.	Ebbw Vale	M
The Westdale Press Ltd	Cardiff	M
Veeboard Ltd	Deeside	M
Waterton Technology Centre & Control 2000	Bridgend	S
Watts Gregory Chartered Accountants	Cardiff	S
Welsh Farm Supplies	Aberystwyth	S
Wirral Fospray Ltd	Hawarden	M
Withersdale Plastics	Wrexham	M

APPENDIX 2

Interview Topic Guide

1. e- adoption

Which of the following e-technologies do you currently use?

- e-mail - internal
- e-mail - external
- Website
- Intranet
- Extranet
- On-line ordering
- Electronic data exchange (EDI)
- Other (please specify)

Can people order products from your website?

What else have these technologies enabled the company to do?

When did you start introducing these electronic communications tools?

2. Perceived benefits of e-commerce

What were the benefits you expected from e-mail/website facilities etc?

To what extent have these benefits been realised?

To what extent is your "e-commerce" plan aligned to your business strategy?

3. Operational difficulties

How do you cope with being available 365/24/7 via internet and mobile phone?

How do you cope with the speed at which information is now available?

How do you cope with the volume of electronic information such as emails?

4. Implementation difficulties

What were the main implementation difficulties you faced?

How did you overcome them?

5. Skills difficulties

What gaps do you think there are in your management team's knowledge and understanding of e-commerce technology and its application?

How does this impact on your development?

What use do you make of external advisors/support?

To what extent do you think that your workforce is able to take full advantage of the potential benefits of e-commerce?

What is the most important piece of advice that you would give to other companies about e-commerce based on your experiences?

6. The Future

What are your likely next uses of electronic commerce?

What difficulties do you think you will need to overcome?

7. Discussion group topics

- How do you integrate ICT into your business strategy?
- How do you get a management team to think strategically about ICT?
- How do you integrate e-technologies with other business processes?
- How do you integrate e-marketing and conventional marketing?
- Are there industries where e-commerce is not appropriate?
- How do you set about anticipating customer needs and competitor activities from an e-commerce perspective?
- How do you manage external consultants?

APPENDIX 3

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www.thetimes.co.uk

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APPENDIX 4

Glossary

ADSL

Asymmetric Digital Subscriber Line - the specific technology for making broadband transmissions on the existing telephone network (the main alternative for broadband transmissions is cable technology). Potentially 40 times faster than a 56k modem but most customers are likely to sign up to a retail version up to ten times faster.

Bandwidth

Bandwidth (in an internet context) is the measurement of the maximum amount of data that can be carried at any given time by an internet connection. It is expressed as data speed in bits per second. An ISP (see below) can increase its bandwidth to accommodate more traffic and/or to increase the speed of its traffic.

Broadband

Broadband is the method of sending and receiving data over high speed networks. It is most commonly associated with a far faster way of connecting your computer to the internet than is possible via a conventional dial-up method, enabling significantly quicker loading of web pages, transfer of files and email. It is 'always on', flat-rate and dedicated (i.e does not tie up the telephone line).

Cable modem

A cable modem transmits data at very high speeds. Whereas a typical telephone modem may connect at 56 kilobytes per second a cable modem will typically connect at between 1 and 3 Megabytes per second (with much higher rates technically feasible). A cable modem can be added to a set-top box that provides a TV set with channels for Internet access.

Electronic Data Interchange (EDI)

Electronic Data Interchange (EDI) is a standard electronic format that facilitates computer-to-computer exchange of business documents.

Electronic Mail - e-mail

e-mail, short for electronic mail, is one of the most popular uses of the Internet today. e-mail allows any person with internet access to send written messages, files, and pictures to any other person with Internet access, anywhere in the world, almost instantaneously.

e-marketplace

Business communities are beginning to form e-marketplaces, enabling them to automate and leverage transactions with one another as a community. By bringing together large numbers of buyers and sellers, e-marketplaces give sellers access to new customers, expand the choices available to buyers and reduce transaction costs.

e-marketplaces/exchanges

Online virtual markets that enable buyers and sellers to share information and order/pay online. For example, builders, contractors, distributors, wholesalers and manufacturers in the homebuilding industry buy materials and labour online using an e-marketplace.

e-procurement

The acquisition of direct and indirect products and services using the Internet and new technologies to facilitate a seamless, end-to-end stream of strategic procurement activities by connecting buyers with suppliers. Typically includes tools and business intelligence systems that enable improved responsiveness and analysis within the procurement organization.

Extranet

An extranet is a mechanism based on Internet and Web technology for communicating both privately and selectively with your customers and business partners. An extranet can be viewed as part of a company's intranet that is extended to users outside the business.

Firewall

A software and/or hardware system that isolates a company's computer network from outsiders.

ICT

Information and Communication Technology.

Interactive (automated) Telephone System

This is a telephone facility that manages incoming calls and handles them based on the number called and associated handling instructions. Many businesses offering sales and service support use an automated telephone system to validate callers, make outgoing responses or calls, forward calls to the right party, allow callers to record messages, gather usage statistics, balance the use of phone lines, and provide other services.

Internet

The Internet, sometimes called simply 'the Net', is a worldwide system of computer networks - a network of networks in which users at any one computer can, if they have permission, get information from any other computer (and sometimes talk directly to users at other computers). Technically, what distinguishes the Internet is its use of a set of protocols called TCP/IP (Transmission Control Protocol/Internet Protocol).

Intranet

An intranet is a network *within* an organisation that uses Internet technologies to enable users to find, use, and share documents and Web pages. Corporations use intranets to communicate with employees. A firewall (see below) is used to isolate the network.

ISP

An ISP (Internet Service Provider) is a company which provides internet access to other companies or individuals. An ISP maintains connections to other networks and ISPs, acting as a router for internet traffic between a customer's computer and any other machine also connected to the internet. The internet connections are typically ADSL, cable and dial-up.

ISDN

Integrated Services Digital Network - provides digital data service over traditional analogue telephone lines (as does ADSL - see above). It allows users to send and receive data at rates up to 128Kbps (Kilobytes per second) and carries both voice and data transmission on the same line. As broadband is rolled out, ISDN use is almost certain to decline.

Kilobyte

A measurement of capacity. For illustrative purposes, 15 kilobytes (k) is equivalent to approximately one side of A4 text.

Local Area Network (LAN)

A LAN, or local area network, is a group of computers, printers or other hardware that are all connected in a reasonably small geographic location like an office or home. A LAN makes it possible for the connected users to share files and applications that usually reside on a server or some type of shared computer.

Megabyte

A measurement of capacity. For illustrative purposes, 1 megabyte (M) is equivalent to an average paperback novel, and 5 megabytes is equivalent to the complete works of Shakespeare.

Online

Online is the condition of being connected to a network of computers or other devices. The term is frequently used to describe someone who is currently connected to the Internet.

Outsourcing

A company chooses a consultant or application service provider to manage components of its internal IT structure, staff, processes and applications. This allows the organization to remain focused on its business goals.

Reach

The fraction of a market that is exposed to an advertisement. High reach at low cost is every advertiser's dream.

Server

A server is a program on a computer that literally serves up information or applications that are requested by clients-other programs on connected computers. A Web server delivers Web pages to web browsers.

SME

Small to Medium-sized Enterprise.

Spam

Unsolicited junk email. Often used for selling products and services and seen as a major problem not only for its annoying or often offensive nature but because it takes up precious bandwidth (see above).

url

Uniform Resource Locator - a reference (an address) to a resource on the Internet. e.g <http://www.bbc.co.uk>

VPN

Virtual Private Network - In a truly private network a company owns the wires all the way from point A to point B, and nobody else can use them. In a VPN, some part of the path from A to B is a public network such as the Internet or the public telephone system. The VPN provider (through judicious use of software) builds a "tunnel" through that public system for your private data traffic. Secure encryption is vital to protect the data from prying eyes.

Website

A website is a related collection of World Wide Web (www) files with a unique address (or url)

Wide Area Network (WAN)

A Wide Area Network (WAN) is a geographically dispersed telecommunications network. The term distinguishes a broader telecommunication structure from a Local Area Network. A Wide Area Network may be privately owned or rented, but the term usually connotes the inclusion of public (shared user) networks.

XML

Extensible Markup Language is relative of HTML which is promoted as supporting the next generation of the web, namely web services. XML allows applications to communicate with each other without the need for browser interaction.