

# The Skills Challenge for e-Business

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## Abstract

It is important for everyone living in the Information Society to benefit from all that technology has to offer, to do this we need to possess e-skills. These skills are defined at different levels. The EU defines them as follows: “The European e-Skills Forum, building on the activities of the Career Space initiative, has adopted a definition of the term "e-Skills" covering three main categories: ICT practitioner skills; ICT user skills and e-Business skills.” [1] These ICT user skills are required by everyone and have been defined in reports of the e-Skills Forum and many other European Commission documents; ICT practitioner skills have been defined in many papers and more recently by the European Committee for Standardization (CEN) in the e-Competence Framework<sup>1</sup>. This paper examines the third part of the skills definition, e-Business skills; these are the skills needed to exploit the business opportunities presented by ICT. The paper also examines the end-user skills which are required by all e-Business users and identifies the business knowledge and industry specific skills needed.

## 1. Introduction

In the Information Society of today, e-skills are vital for business, education and for normal daily living. The EU recognises this [2] and has defined e-skills in three areas - ICT practitioner skills, ICT end-user skills and e-Business skills [3]. ICT practitioner skills include the competencies required by ICT practitioners, working in all areas of the ICT business. The CEN (European Committee for Standardization) workshop on ICT skills has examined these needs and has defined a framework for ICT Professionals [4]. ICT end-user skills, often called “digital literacy”, are the skills required for everyday living in the Information Society and have been defined at different levels, including ECDL, Microsoft Digital Literacy and IC3. E-Business skills are those skills required to use ICT to identify and exploit business opportunities, to use ICT internally and externally in all business processes, and to improve business performance and competitiveness. In “ICT for competitiveness and Innovation” [5], the EU stresses the importance of e-skills for innovation and to help economic recovery.

A study done in 2007, funded by the European Commission, entitled “The Key to Employment and Inclusion in Europe” [6], found that:

- “Investments made in the last decade mean that the European workforce has a good level of basic ICT skills. Inclusion measures have built the baseline for competitiveness at the bottom of the pyramid, although the education system is seen as being better at preparing applicants for white-collar work with ICT skills rather than blue-collar workers.
- It is clear that ICT skills are becoming an important entry ticket to the job market — and crucial for people that want to move into better jobs. This is relevant across both blue- and white-collar positions.
- Future demand for skills goes beyond basic skills to advanced and e-Business skills, and will continue to grow as a majority of staff is expected to possess them.”

The definition of e-Business as described in Section 4 was used for this study, which surveyed over 600 employers in 10 European countries.

This paper examines the skills required for e-Business and suggests areas where further research regarding the development of “Innovation Skills” can be linked to the e-Business skills agenda.

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<sup>1</sup> [www.ecompetences.eu](http://www.ecompetences.eu)

## **2. What is e-Business?**

### **Definitions**

There are many definitions of e-Business. Some writers equate e-Business with e-commerce. Others define e-commerce as the use of ICT for external business processes and e-Business as the use of ICT for all business processes, internal and external. IBM defines e-commerce as “doing business online, including buying and selling online via the Internet, electronic funds transfer, business communications, and using computers to access business information resources” and defines e-Business as a broader concept incorporating all business processes – e-Business is “the transformation of key business processes using Internet technologies.”<sup>2</sup>

According to Li [7] “e-Business is about developing new ways of working by innovatively exploiting the new capabilities of ICTs in general and the Internet and related technologies in particular”

### **The Technologies**

The need for e-Business skills needs to be seen against the rapid development of ICT hardware. Gordon Moore’s 1965 predictions about the rapid advancements in hardware technology have come true [8] and this trend is forecast to continue until at least 2015. What does this mean for business? It means that business processes and applications which were out of reach because of expense and speed are becoming common place. The convergence of communications and information technology has unlocked an enormous potential for linking the customer to the supplier, the supplier to other suppliers and has created a new and very different marketplace for goods and services.

The emergence of devices such as iPhone 4 and similar provides a piece of hardware with extraordinary capability. Is it a phone or is it a computer? It does not matter, it is a piece of technology which successful businesses will embrace and will provide a platform for applications not yet conceived.

In step with the development of hardware and communication capabilities the development of software has expanded to make use of the technologies provided. These software developments have introduced us to new applications which are being used by many people and can be adapted to business purposes by innovative managers with appropriate e-Business skills.

Systems that cross business process boundaries and ultimately cross company boundaries provide the foundation for new systems. For example, it is now easy to integrate business processes using software which allow sharing of data and reduce the separation of corporate functions and the “silo” approach; software is available to connect and integrate the entire supply chain. These systems can also take advantage of the new mobile devices which are rapidly populating the world.

### **Social networking**

Social networking applications are being used by growing numbers of people. The most rapid uptake is with the younger population. These applications are being viewed now by the business community to see how such social interaction can be put to commercial value and many organisations advertise their presence on Twitter, Facebook, iTunes, YouTube and other networks. Using these networks, users create their own web content and communicate worldwide. This gives a huge marketplace to discuss a company’s products and services – good or bad; to recruit the right people; to find new customers and suppliers. Knowledge of how such systems work and how they can be used in business is vital, but what are such skills? They must include business, innovation, creativity and technical skills.

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<sup>2</sup> <http://www.ibm.com/investor/help/glossary.wss#E>

Social media allows a company to develop a much more intimate relationship with its customers, can encourage feedback and bring a wealth of innovative ideas from the people using its products and services. It gives the company an opportunity to keep in touch with its employees in a more immediate way and can be used to motivate staff and encourage innovation from within. Internally focussed social media can be used as a means to empower the workforce.

### **3. Why use e-Business?**

The normal business functions required to create a product or service include production and manufacturing, sales and marketing, financial management, accounting and human resource management. In the past companies were structured in this functional way. Business processes, the sets of tasks that define how specific business tasks are performed in a logical way, serve these functions. Some of these processes cross over functional areas and some are totally within the functional area. Nowadays many businesses are structured by business process.

Technology can be used to transform these business processes – that is “by doing things better” and it can be used for innovation – “doing new things”. E-Business can help an organisation gain competitive advantage, streamline business processes, enable collaboration and motivate employees. It is generally believed that investment in ICT brings worthwhile returns but it is not just a case of investing in technology, there must also be an understanding of innovation and the benefits of using new approaches to business. Successful companies actively cultivate new ideas, put those ideas to work quickly and efficiently, and harvest the business value benefits of successful innovations. The area of e-Business skills aims to ensure that the management of companies know how technology can be used to improve the business processes. The limitations of the technologies should also be assessed. It is just as important to avoid the use of unsuitable technologies as to select the appropriate technologies to meet the needs of the business.

According to Laudon [9], businesses invest in IT to achieve six important business objectives. Each of these is discussed below:

#### **1. Operational excellence**

Successful businesses are those which continually seek to improve the efficiency and effectiveness of their operations. It has been demonstrated that the return on investment in ICT systems can bring a significant return on investment. It is our contention that e-Business skills are required to improve operational excellence and that a combination of business skills, technological skills and innovation skills are an essential requirement to achieve this objective.

New computer applications have had an impact on human relations and recruitment policies. Many young people now use Facebook or other social media applications. Recruiters now have access to information about potential candidates which was unheard of before this revolution. The new technologies provide HR professionals with new weapons in their armoury to assist in the selection of suitable candidates for positions in their organisations. In another positive application, social media can be used effectively to empower employees by ensuring that they are kept up to date on an immediate basis and have the opportunity to make their contribution to the development of company policy.

#### **2. New products, services, and business models**

E-Business skills are required to make effective use of new technology to create new products and services as well as entirely new business models. Many businesses have moved from the traditional bricks and mortar model to a “clicks and mortar” model, providing products and services on-line.

### 3. Customer and supplier intimacy

Supply Chain Management Systems (SCM) help the business manage the relationship between itself and the suppliers. There is a need for innovation where the link between Customers and the Supply Chain needs to be shortened so that efficiencies can accrue. The ultimate aim is to get the right amount of goods to the right place at the right time. The development of SCM systems to tighten the relationship between supplier and customer requires business skills matched with technological skills. The development of the relationship which leads to greater efficiencies requires innovation and creativity skills to view the relationship in different ways. Accurate information throughout the supply chain is very important. A small change in demand in any part of the chain can lead to major distortion along the line. Integration of systems and quality of information can help to eliminate this “bullwhip effect” in the supply chain.

One of the innovative areas being pursued by many businesses is the use of social media for marketing and customer relationship management (CRM). This approach is particularly suitable for SMEs and can reap rich rewards when implemented successfully. In order to use social media successfully a company must understand its own needs, the product range it provides, the services it offers and the market segment which it addresses. Clear business objectives to be achieved by the introduction of social media technologies should be defined and a strategy for the introduction of social media should be developed. The Forrester report of 2007 suggests a method for successful implementation of social media technologies. “First, examine the Social Technographics Profile of your customers. Second, choose your objective: listening to, talking with, energizing, supporting, or embracing your customers and their ideas. Third, build a strategy around changing your relationship with your customers. Finally, pick the appropriate technologies to implement. Companies that take these four steps in order and then put success metrics in place are the most likely to succeed.” [10]

### 4. Improved decision making

Huge quantities of data are collected and stored in computer systems. With the analytical tools now available to sort, correlate and look for trends in this data, decision making can be greatly enhanced. Up to date, accurate data can be made available to decision makers in real time, in readable form and on many of the new devices.

### 5. Competitive advantage

ICT can be leveraged to gain a competitive advantage. The company which takes up new technologies can gain “first mover” advantage. If the culture of an organization is more conservative then the requisite e-Business skills will be required to decide when is the appropriate time to move into new technologies so as to not to risk early moving but not be too late so that opportunities and markets are lost.

### 6. Survival

Sometimes companies need to use technology to meet new legislative requirements and also to match the offerings of their competitors. In such situations the e-Business skills are needed to identify the strategy required to meet new needs in the business environment and to develop a strategy for survival.

#### 4. What e-Business skills are needed?

ICT has changed the way we live, work and communicate today. We buy on-line, collaborate on-line, and communicate on-line from anywhere, at anytime. We expect services to be available at all times and at the touch of a button. In the work environment we expect to have technology available as part of our standard business processes. We are living in a world in which we expect services to be provided using ICT. We expect e-Business. But how do we make the best use of ICT in providing these services and in using these services? We need new and different skills.

The key business skills have been well defined and are included in curricula in universities, colleges and business schools. These include:

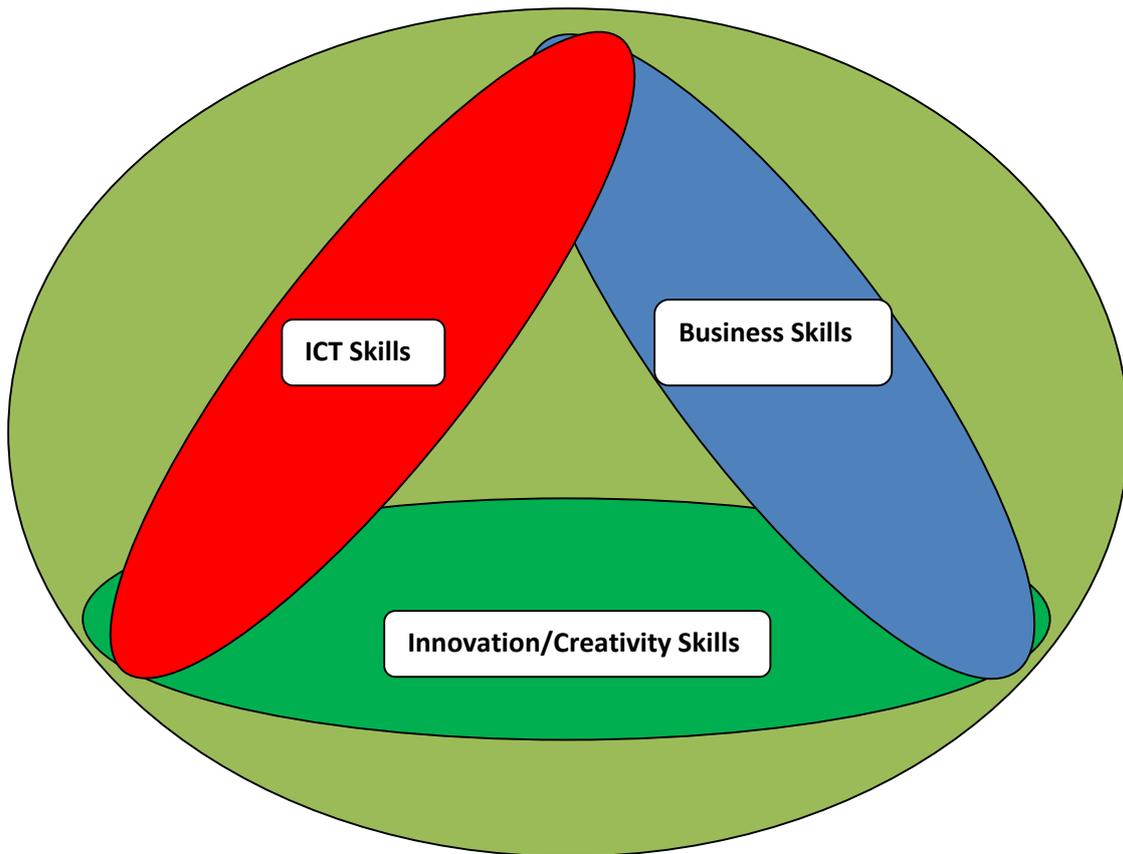
- General business skills, product knowledge and sales and marketing;
- Communication, written and spoken;
- Strategic planning, financial planning and control;
- Risk management;
- Leadership, People skills;
- Creativity and Problem Solving;
- Technology;
- Change management.

What is the difference between “business skills” and “e-Business skills”? The EU’s definition of e-Business skills includes “e-leadership” skills [11] and notes that “These (skills) correspond to the capabilities needed to exploit opportunities provided by ICT, notably the Internet; to ensure more efficient and effective performance of different types of organisations; to explore possibilities for new ways of conducting business/administrative and organisational processes; and/or to establish new businesses.” It is clear that a vital skill is the ability to identify new opportunities, to re-engineer business processes, to discover new ways of working; in short - to be innovative by using technology. Reynolds [12] states that “ICT as a major driver of economic growth” and that it leads to the development of new products and services and productivity improvement in existing tasks and processes. However he notes that there is concern at all levels of government (in the UK) about the levels of e-skills with a shortage of qualified people. He believes that e-Business skills are “Strategic in nature” and that they are the “skills needed to exploit business opportunities”.

The ICT Skills Monitoring Group identifies a great need for ICT skills in “the growing importance of Internet technology, telecommunications devices and infrastructure and the increasing use of these technologies (ICT tools) to re-engineer business processes and to raise productivity.” [13] A project examining the needs for a framework for End-User Skills has recently been completed by the CEN Workshop on ICT Skills<sup>3</sup>. This project defined skills relating to “generic software tools” and “sector specific tools”. The skill sets in using these tools overlapped, showing that there are some skills which are common to all in the workforce and some which are required for specific tasks and roles. E-Business skills are those skills required to enhance business processes, collaborate with business partners and identify and take advantage of opportunities presented by new technology. They are a combination of business skills, ICT skills and innovation/creativity skills (see Figure 1).

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<sup>3</sup> <http://www.starbus.org/NL/index.htm>



**Figure 1 A combination of Business, ICT and Innovation/Creativity Skills**

It may not be possible to have all these skills in one person. In reality it may be that a multi-disciplinary team would be the best way to see the achievement of the benefits from e-Business. While general business programmes are well provided for in universities and business schools, e-Business is quite a new discipline. For the future it will be necessary to see graduates with a combination of business and ICT skills, together with innovation and creativity skills. There are many opinions as to whether one can teach creativity. It is possible that problem solving can be a useful step along the way to creativity. Another vital part is the confidence to research new ideas and to put forward innovative plans; this is really only possible with the knowledge, education and skills.

## **5. The Scope of e-Business skills**

At managerial level a manager needs the requisite e-Business skills to ensure that he/she has an appreciation as to the benefits of potential technological applications, how they would fit in with the business strategy, what is realistic and what is just a fashion statement without substance.

The ICT practitioner needs to have the technological skills to define, design, create, test and implement the e-Business solutions which are felt to be suitable in the context of the overall business strategy. The ICT practitioner also has a role to play in bringing to the attention of management those technologies which may be useful for the business. The role of ICT management is vital in guiding the innovations. The Chief Information Officer (CIO), who must understand the business and not just the technology, is becoming more accepted at a senior level within organisations. The 2009 survey by IBM, "The New Voice of the CIO" [14] finds that the CIO must be:

- "An Insightful Visionary and an Able Pragmatist
- A Savvy Value Creator and a Relentless Cost Cutter

- A Collaborative Business Leader and an Inspiring IT Manager.”

This survey of 2,500 Chief Information Officers worldwide believed that the CIO need to “make innovation real”, “raise the return on investment of ICT” and “expand the business impact of ICT”.

The user of ICT in many ways has the most important role to play in the assessment of the potential of e-Business solutions. An ICT literate user will be able to appreciate what tools are needed to make his/her tasks more efficient and more effective. Many people believe that innovation from the bottom up is one of the most relevant types of innovation. An ICT literate user will not only be able to identify potential application areas but will also be very helpful in specifying requirements so that the ICT Practitioner can implement the desired result more easily.

While generic e-skills are needed by everyone for personal and work use, e-Business skills include the ability to combine the traditional relevant business skills and knowledge of the opportunities offered by use of technology. “E-Skills should encompass a broad set of skills necessary in the modern workplace. Successful innovation in ICT services requires cross-disciplinary, cognitive and problem-solving skills as well as an understanding of the fundamentals of business and communication skills, including competence in foreign languages. They should also be seen in the wider context of a core set of competences equipping all European citizens for the knowledge-based economy and society.”<sup>4</sup>

Research into the requirements for education and training in e-Business was published in 2000 by Forfas in Ireland. This report identified that the key opportunities for e-Business in Ireland were in transforming business processes, thus increasing productivity; in producing new products by introducing e-Business enabling products and by creating new e-Business support services. The report finds that “e-Business skills requirements are broad, encompassing management and creative skills as well as IT technical skills and IT literacy.”<sup>5</sup>

The skills required for successful use of e-Business include:

- General business skills
- Skills specific to an industry
- Basic skills in using computers and productivity tools
- Skills in using e-mail and other collaboration tools
- IT technical skills

This must be coupled with changes in the culture in business and in industry to create an environment where possibilities are considered, where staff are encouraged to suggest improvements and where organisations are willing to innovate.

As discussed earlier, the EU has defined e-skills in three areas - ICT practitioner skills, ICT end-user skills and e-Business skills. The CEN Workshop on ICT Skills has worked since 2003 in defining ICT Skills and implementing realistic frameworks within which ICT Skills can be structured and mapped to other frameworks including the European Qualification Framework (EQF). Through the CEN Workshop on ICT Skills, the ICT practitioner area has been defined in the e-Competence Framework. This framework was published and is being refined; version 2 will be issued in the coming months. In addition, work has just been completed on establishing the need for an End User e-Skills Framework and a report submitted to the European Commission was approved in the September 2010. Having established the need, a new project is planned to develop an End User e-Skills Framework and this project should commence in early 2011. E-business skills, the third leg of the e-Skills definition, are vital to the future success of business and industry. While some aspects of e-Business skills are already defined in the eCompetence Framework, the additional skills related to business functions, creativity and innovation need to be further considered.

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<sup>4</sup> [http://ec.europa.eu/enterprise/sectors/ict/e-skills/extended/index\\_en.htm](http://ec.europa.eu/enterprise/sectors/ict/e-skills/extended/index_en.htm)

<sup>5</sup> [http://www.forfas.ie/media/egfsn000801\\_ebusiness\\_skills.pdf](http://www.forfas.ie/media/egfsn000801_ebusiness_skills.pdf)

## 6. Conclusions

There is continuous and rapid change in technologies. Skills need to be acquired, updated and renewed on an on-going basis. This makes it difficult to define the skills needs at any given moment. However, it is necessary to understand the basics of technology in general and the technologies relevant to specific business areas so that opportunities can be identified to exploit the advances in technology.

In order for an organisation to take full benefit of e-Business opportunities, there must be collaboration between business managers, ICT managers and professionals and the user.

In order to meet the demands of an ever changing technological landscape it is important that the education system evolves to produce graduates with the skills necessary to meet the new reality. This means that all graduates should be ICT literate and have been given a good grounding in problem solving. ICT graduates should be business-aware. Somehow graduates must be taught the essence of creativity so that they can embrace innovation. The current silo approach to education, with only a few links between the different disciplines, must be restructured so that we in Europe can keep our leading position in the technological and innovation arena. The work of the CEN Workshop on ICT Skills now needs to turn to e-Business skills and this area is the subject of ongoing discussion.

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