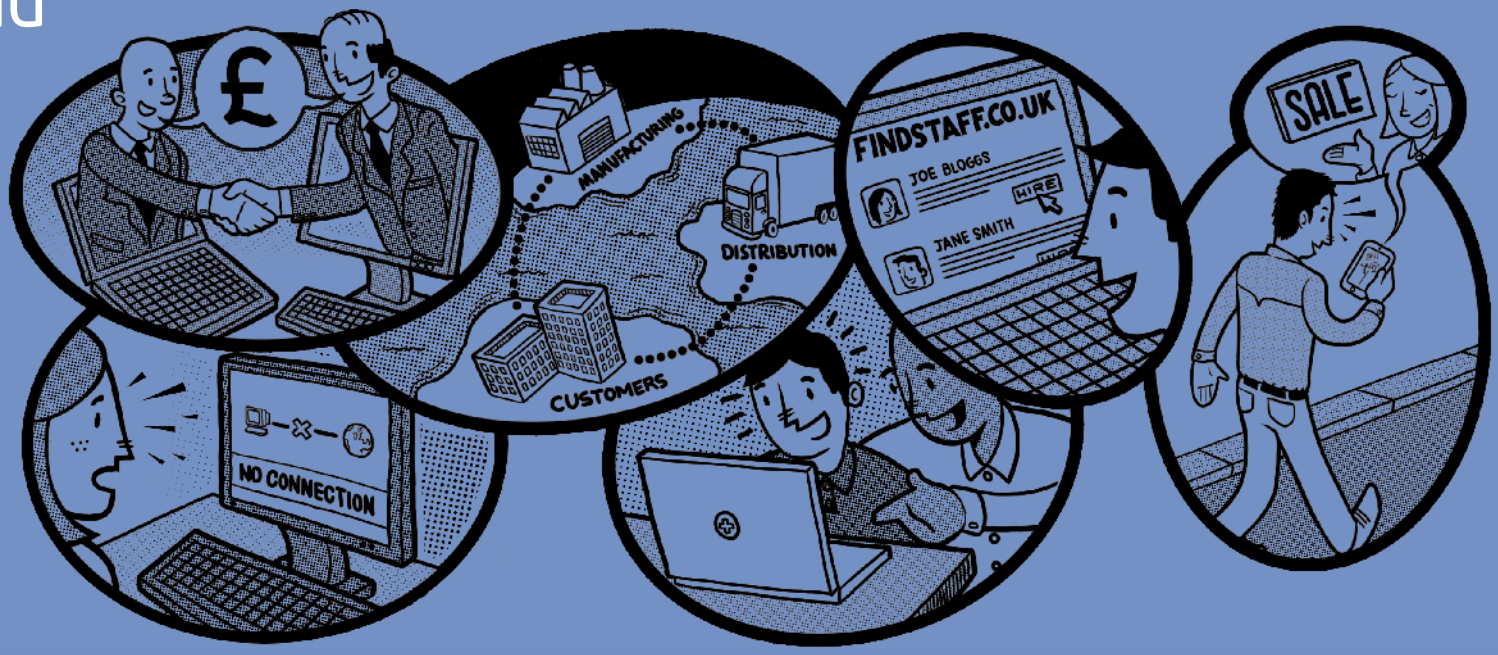
nominettrust ›

Employment and the internet



A STATE OF THE ART REVIEW written for Nominet Trust by Anne Green, Maria de Hoyos and Yuxin Li

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Foreword

Digital technology is seen as an important driver in the changing structure of employment - not only in the ways in which technology has been integrated into existing organisations and roles, but the ways in which the use of digital technologies have opened up new markets and types of employment, enabling new ways of organising, delivering and rewarding work. At the same time, the use of digital technologies have significantly changed the processes of engaging with the labour market for both traditional and 'new' jobs. These developments present a new set of opportunities, or indeed a new set of challenges for those involved in job seeking.

With over 2.5 million people currently unemployed in the UK, including about 20% of young people aged between 16 and 24, we need to find ways to take advantage of digital technologies to create new roles, opportunities and employment possibilities that support greater social and economic engagement. In doing so, we need to be mindful of the new skillsets required by employers and digital entrepreneurs, ensuring we support those most at risk of digital and economic exclusion.

This document provides a baseline of data around employment and digital technology. In doing so it maps emerging employment patterns that may provide opportunities to rethink how we address current levels of unemployment and underemployment. We're keen to hear how we can respond to the challenges set out in this report and look forward to your comments.

Dan Sutch
Head of Development Research
Nominet Trust - May 2012

About the series

Nominet Trust State of the Art Reviews are undertaken by leading academics to collate and analyse the latest research at the intersection of the internet and society. Drawing on national and international work, these reviews aim to share the latest research to inform the work of the Trust, those applying to the Trust and our wider partner organisations.

We value your comments and suggestions for how to act on the recommendations in these Reviews, and how we can build the series, so that it is more useful to us all as we explore how digital technology can be used to design radically new solutions to address specific social problems.

We look forward to your comments and suggestions at:

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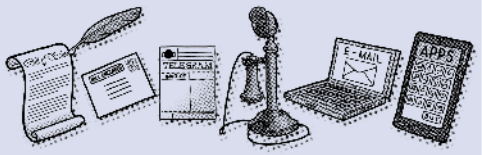

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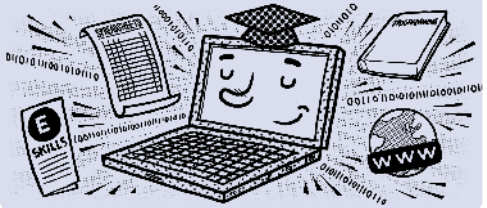

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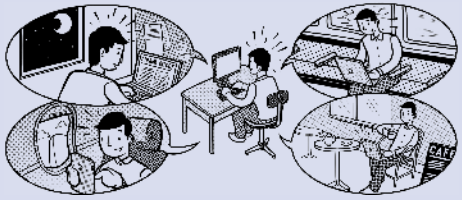

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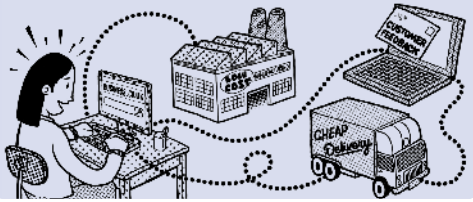

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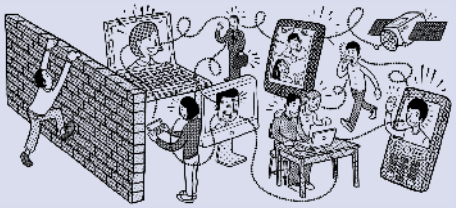

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Designed by **Ben Carruthers**

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This state of the art review details current understanding and emerging trends regarding employment and the internet. It draws on a review of literature and evidence on the potential of the internet to support access to employment and the development of new forms of employment, to alter how and where people work and the content and nature of what they do. The emphasis here is on 'employment' as a means of generating an income (as well as fulfilling other goals), rather than on 'work' in a more general sense.

Key Messages:

- Technological change is an important driver of the changing structure of employment, along with globalisation and economic restructuring. Alongside a growing 'internet industry' the ramifications of the internet are felt across most sectors and occupations.

- Since the 1990s the growth in access to and use of the internet has played an important role in increasing the availability and exchange of labour market information. The internet plays an increasingly important role in information, advice and guidance services for people seeking careers, education, training and employment advice. But with a growth in the amount of information available, it is important that users develop skills to assess the quality of information available and to distinguish between biased and unbiased sources so as to use information intelligently to guide decision-making.

- The public employment service in Great Britain is working towards delivering more of its services online. There is a danger that some disadvantaged people will be excluded further because of their lack of digital skills and/or of access to the internet. Digitally excluded individuals are themselves diverse and different support is needed for different groups to support them in moving towards access to digital services.

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- The internet is changing employers' recruitment and selection methods and the process of job search (i.e. searching for a job) by individuals. By posting vacancies on the internet employers can extend the reach of their search for employees in a convenient and cost effective way. They can also screen and select applicants using internet-based tools. While using the internet jobseekers can access more job vacancies in more places more quickly than by using traditional job search channels.

- By 2009 four in every five jobseekers were making use of the internet in their job search – often alongside other job search channels. Young people and those with higher level qualifications are most likely to use the internet for job search and older people and those with experience of manual occupations are least likely to do so. Benefit claimants are urged increasingly to use the internet to search for jobs and there are plans to monitor claimants' use of the internet in job search. This underlines the importance of access to, and skills in using, the internet.

- The internet opens up the possibility for individuals to take a more 'active' role in job search (as opposed to a 'passive' one of merely responding to vacancies) by uploading material about their skills and experiences. It is important that they take care not to post information on social networking sites that could damage their chances of gaining employment.

- The number of people seeing 'use of the internet' as an important part of their job is increasing. Basic ICT skills can be seen as a requisite for finding employment, but internet skills on their own are not sufficient for success, but they are a necessary baseline and a useful tool.

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- There is a lack of consensus about the term 'internet skills'. Distinctions have been made between having internet skills and being able to apply knowledge and experience to the employment context. One such distinction is that between 'medium-related internet skills' (relating to operating on the internet) and 'content-related internet skills' (relating to searching for information and using such information strategically). Ensuring that individuals have the ability to use **and** to make the most of the internet matters. Innovation and entrepreneurship are related to strategic internet skills and making the internet work for a specific purpose.

- The internet is a powerful enabler changing locations of work. Developments in information and communications technologies (ICTs) and the internet mean that individuals can work from different locations and on the move, as well as with colleagues in other parts of the world – so providing access to other working cultures. Together these developments challenge the idea of fixed 'workplaces'. It may be more appropriate to talk about 'work spaces'.

- A trend for some workers to spend less time in 'fixed workplaces' poses challenges for informal learning and for induction of new employees, since participative face-to-face learning is more difficult. Virtual learning may go only some way to filling this gap.

- Working via the internet from home may provide new opportunities for employment for some individuals and groups, who otherwise would not be able to take up paid employment. Individuals using the internet as an enabler to work from home – at least for some of the time – face the challenge of ensuring that work and home life do not invade one another to the detriment of either or both.

- The development of the Taobao Marketplace in China illustrates the job creation potential of internet-based developments, and how governments can target help towards encouraging business start-ups amongst specific population groups, such as young people.

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- The internet is a tool that gives access to resources that individuals can use to develop businesses with potential to grow to generate employment. It offers a means of accessing new business opportunities – through the development of new products, new services and new markets. Cloud computing enables small businesses to access ICT-related capabilities that were previously available only to businesses with the capacity to invest large sums on money in IT software and hardware, and hire the necessary staff to service and maintain it. It allows small businesses to rent network capacity, storage, computers and software over the internet from companies dedicated to investing in making these resources available.

- In spite of the potential benefits of cloud computing, there are a range of concerns around adopting this approach such as efficiency and security, and who controls the data (and where). The trade-off between risks and benefits varies from business to business, but for small enterprises the benefit of having access to computing equipment and services that would not be available to them otherwise might encourage them to deal with the risks.

- Action needs to be taken to address inequalities in internet access and to tailor interventions to the specific needs of internet non-users; there is a niche for third sector organisations here. It also needs to focus on developing skills in strategic use of the internet, including navigating the internet to find and interpret the information that individuals require. Cutbacks in public spending and the advance of the digitalisation agenda make the need for action more pressing, but also make it more difficult. There is a need to acknowledge that access to the internet is not uni-directional. Costs of access and upgrades to hardware/software may mean that people who formerly used the internet no longer do so.

1. Context

This chapter examines recent and projected changes in the structure of employment and highlights the importance of technological change for developments in the sectoral and occupational profile and content of jobs.

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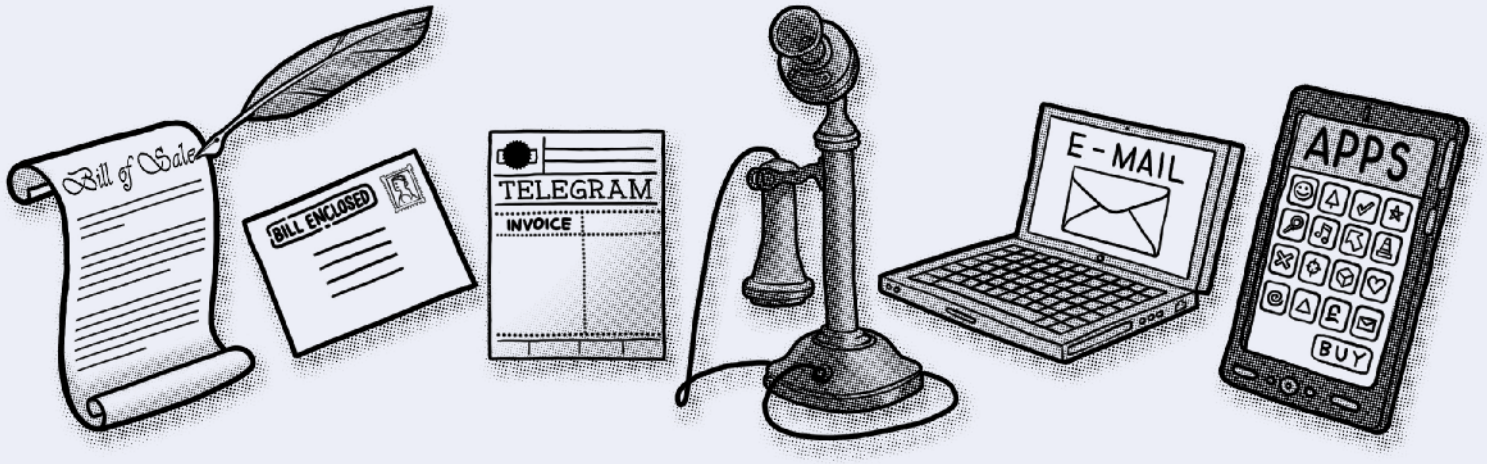

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The changing structure of employment

The profile of the employment structure in developed countries has changed dramatically over the last few decades. The drivers of the change have been diverse. They include:

- technological developments (discussed in more detail later in this section)
- globalisation
- economic restructuring.

In historical terms as economies develop the proportion of people working in primary sectors decreases and mechanisation leads to a rise in employment in manufacturing. Then, with further development the demand for services increases and shares of employment in service sectors rise.

The UK has a relatively small proportion of people working in primary industries (such as agriculture) and in manufacturing by international standards, and a relatively high proportion working in service sectors. Working Futures employment projections for the UK for the periods 2002-2012, 2004-2014 and 2007-2017 (Dickerson et al., 2006; Wilson et al., 2004, 2009) have consistently reported medium-term job losses in the Primary and Utilities sector and in Manufacturing, alongside employment growth in the Distribution and Transport sector (in particular distribution and retailing), Business and other services and Non-marketed services (such as education, health and social work). (See Table 1 for details of the composition of the six broad sectors referred to in this commentary.)

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Broad sector	Sectoral composition
Primary and utilities	Agriculture, forestry and fishing; mining and quarrying; energy and water industries.
Manufacturing	Engineering, all other parts of manufacturing
Construction	Construction and building
Distribution and transport etc.	Wholesale and retail trade; repair of motor vehicles and motor cycles; transportation and storage.
Business and other services	Accommodation and food service activities; information and communication; financial and insurance activities; real estate activities; professional, scientific and technical activities; administrative and support service activities.
Non-marketed services	Public administration and defence; compulsory social security; education and health; arts, entertainment and recreation; other service activities.

Table 1
Classification of the six broad sectors

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The Labour Force Survey from the Office for National Statistics (ONS) indicates that in the UK in the quarter April-June 2011 (the latest time period for which data are available at the time of writing), there were 29.27 million people in employment, representing an employment rate of 70.7%. The number of people unemployed was 2.49 million; representing an unemployment rate of 7.9%. 9.3 million people aged from 16 to 64 were economically inactive (ONS, 2011b).

Table 2 illustrates the distribution of workers in different sectors by gender and by employment status (i.e. whether an individual is an employee or self-employed). The majority of the working population (around four in five people) are engaged in service sectors. About 3% work in the primary and utilities sector, and around 10% in manufacturing. Men are more concentrated in the primary and utilities sectors, manufacturing, construction and distribution, transport, etc, than women. 46% of all women in employment are engaged in non-marketed services. Just over one in five men and women work in business and other services.

In the quarter April-June 2011 the number of people unemployed was 2.49 million; representing an unemployment rate of 7.9%. 9.3 million people aged from 16 to 64 were economically inactive

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Sectors	Total	Gender		Employment status	
		Men	Women	Employee	Self-employed
Primary and utilities	3.0	4.4	1.3	2.6	5.3
Manufacturing	9.8	13.9	5.1	10.7	4.4
Construction	7.6	12.4	1.9	5.4	21.1
Distribution, transport, etc.	27.5	30.2	24.4	28.1	23.7
Business and other services	21.6	22.0	21.3	19.9	32.8
Non-marketed services	30.5	17.1	46.0	33.4	12.9
Total	**100**	**100**	**100**	**100**	**100**

Table 2
Employment structure by sector, April-June 2011 (proportions, %)
Source: UK LFS April-June 2011

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Table 3 shows the occupational structure of employment in the UK, with disaggregations by gender and employment status. The single largest share of people in employment work in professional occupations (19%), followed by associate professional and technical occupations, and administrative and secretarial occupations. Relative to women, men are especially concentrated in managerial occupations, skilled trades occupations, and in process, plant and machine operative occupations. Women are more likely to work in administrative and secretarial occupations; caring, leisure and other service occupations; and sales and customer service occupations than men.

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Occupations	Total	Gender		Employment status	
		Men	Women	Employee	Self-employed
Managers, directors and senior officials	9.9	12.6	6.9	9.1	14.8
Professional occupations	19.4	18.8	20.1	20.0	16.5
Associate professional and technical occupations	13.5	14.3	12.6	13.3	15.0
Administrative and secretarial occupations	11.2	4.7	18.7	12.4	3.0
Skilled trades occupations	11.0	18.9	1.9	8.3	28.5
Caring, leisure and other service occupations	9.2	3.2	16.1	9.6	6.5
Sales and customer service occupation	8.2	5.6	11.2	9.1	2.2
Process, plant and machine operatives	6.4	10.6	1.5	6.2	8.0
Elementary occupations	11.2	11.3	11.0	12.0	5.6
Total	**100**	**100**	**100**	**100**	**100**

Table 3
Employment structure by occupation, April-June 2011 (proportions, %)
Source: UK LFS April-June 2011

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According to Working Futures projections for 2007-2017 (i.e. the most recent projections available at the time of writing, although projections for 2010-2020 are due to be published early in 2012), the number of jobs is projected to increase an annual rate of under ½% per annum. Technological change is expected to be a key driver of economic growth and sectoral change, and will continue to have significant impacts on supply and demand of skills (Wilson et. al., 2009).

Technological change is expected to be a key driver of economic growth and sectoral change, and will continue to have significant impacts on supply and demand of skills

Particular care should be taken when interpreting projected short-term changes in employment given the unprecedented financial crisis in 2008. The 2008 global financial crisis has affected the entire world economy and has led to jobs cuts across all sectors of the UK economy, starting in the financial sector and then subsequently impacting across the private sector and the public sector. The Working Futures 2007-2017 projections were undertaken before the economic crisis and are likely to underestimate the likely short-term downturn of the economy and the **level** of future growth. However, the sectoral and occupational **composition** of projected provide a plausible picture of future developments in employment structure (Wilson et. al., 2009).

Using the six broad sectors outlined in Table 1, the Working Futures 2007-2017 projections show a continuation of the long-term trend of decline in the number of people employed in the primary and utilities sectors, and in manufacturing, in the face of technological chance and international competition. Employment in 'Distribution, transport, etc', is projected to increase, especially in distribution, retailing, hotels and restaurants. Likewise 'Business and other services' are projected to experience an increase in employment, with computing services increasing the fastest.

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Occupational projections for 2007–2017 point to a continuation of medium-term trends (Wilson et. al., 2009). Significant increases in employment are projected for managers and senior officials, professional occupations, associate professional and technical occupations, personal service occupations and sales and customer service occupations. Conversely, significant decreases in jobs are projected for administrative, clerical and secretarial occupations, skilled trades occupations, and machine and transport operatives. Job losses are also expected in elementary occupations, but at a slower pace than was formerly the case.

The development of the internet and telecommunications technologies has contributed greatly to the globalisation of businesses and led to innovation in new products, services and processes

The technological context

Technological development is a key factor driving changes in employment structure. It affects the way work is organised and done – e.g. with the widespread use of ICT, many clerical and secretarial jobs have been replaced. The introduction of new technologies has led to increased productivity in manufacturing, so reducing demand for workers. On the other hand, the development of ICT has led to increasing demand for managerial, professional, associate professional and technical occupations. Furthermore, the growth of ICT is likely to increase the demand for higher skilled workers and decrease the demand for lower skilled workers across most sectors (as outlined in Chapter 3).

The widespread use of ICT has changed the world both in terms of business and personal lives, and has become a key feature of the information economy. The collapse of time and space as a result of the development of the internet and telecommunications technologies has contributed greatly to the globalisation of businesses and led to innovation in new products, services and processes.

The internet and related technologies have spread across most sectors and occupations. They have changed the structure of employment and the way work is done – e.g. with digitalisation, information which was previously stored on paper is now in digital form and a much larger amount can be saved and stored.

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The development of internet technology has reduced costs for many companies by removing many pre-existing barriers imposed by geography and time, and enabled companies and individuals to work across boundaries (Chesley, 2010; Wajcman et al., 2008). Furthermore, people have more mobile access to information wherever they go and can work together over internet or using video conferencing from different locations (Chesley 2005; Rubin and Brody 2005; DiMaggio and Bonikowski 2008); (see Chapter 4 for further details).

Communication also becomes much easier and quicker with the development of ICTs such as mobile phones, etc. In addition, computing power has been greatly improved with the invention of various software and internet-based applications. Globalisation has not only increased market opportunities but also raised market competition. Developed countries which have relatively higher labour cost compared to developing countries need to develop industries with higher value added and higher productivity in order to compete with economies with labour cost advantages. Those types of industries normally require more advanced technology which is more difficult to replicate than simpler technology. This has had major implications for employment structure. The main sectors that are expected to benefit from technological development are computing and business services, as well as some manufacturing of electronic products industries, while in other sectors there may be 'jobless growth' (i.e. a growth in output alongside losses in employment).

With the fast development of internet technology, the 'internet industry' has been established: the term refers to anything that provides the technologies, applications and services constituting the internet infrastructures and enabling the use of the internet (Fi3P, 2011). There are now two billion people connected to the internet worldwide and this number is growing by 200 million each year (du Rausas et. al., 2011, page v). In some developed markets about two-thirds of all businesses have a Web presence of some kind and one third of small and medium-sized businesses use Web technologies extensively (du Rausas et. al., 2011, page 1). The new e-commerce business models using the internet as the trading platform, mainly referring to B2C (Business-to-Consumer) and B2B (Business-to-Business) have made a dramatic

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contribution to the global economy. In 2011, almost $8 trillion of goods and services were exchanged through e-commerce - three times the annual output of the entire British economy (du Rausas et. al., 2011).

A study of the European internet sector revealed that in 2010 the 'internet economy' contributed 4.1% of EU27 Gross Domestic Product (GDP, i.e. the market value of all final goods and services produced in a given period). The total spending of end users on goods and services over the internet (B2C eCommerce) reached €323 billion and is predicted to further rise to €566 billion in 2014, representing an annual growth rate at 15%. B2B eCommerce is also projected to grow at an annual rate of 10% during this period (Fi3P, 2011). Focusing on 13 countries (the G8, South Korea, Sweden, Brazil, China and India[A]) which account for more than 70% of the global GDP, du Rausas et. al. (2011) provided, for the first time, a quantitative and comprehensive analysis of the economic impact of the internet. They examined a wide range of factors from different customers to enterprises and showed that the internet accounts for 3.4% of GDP (contributing more than other established industries such as agriculture, utilities, communication, education and mining), and is one of the biggest drivers of global economic growth and has considerable potential for further development. Their study also argued that the internet had not only created more jobs but had also increased productivity of established industries. In fact, 75% of the value added created by the internet is in traditional industries, indicating a necessity to encourage usage of internet technology across the economy.

A
South Korea and Sweden were included for their high internet penetration. Brazil, China and India were included for their large and high-growth economies.

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The European internet industry has developed dramatically and contributed significantly to the real growth of European economy. As reported in Fi3P (2011), by 2010, the EU had the largest world market for B2C followed by the USA and China, and it was the second largest world market for B2B with the USA having the largest market. However, the EU was only the third largest ICT market in the world taking a share of 26% of the global ICT market, and this share is predicted to decrease to 24% by 2014. The results from Fi3P (2011) also revealed that many relevant services sectors such as distribution, business services, health care and education in Europe have a low internet intensity relative to their potential and there is a need to encourage internet usage in these sectors.

2. Accessing the labour market

This chapter looks at the role of the internet in accessing the labour market, focusing on range of labour market information now available on the internet and the use of the internet in recruitment and selection processes.

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The internet and labour market information

Labour Market Information (LMI) encompasses data about all aspects of employment – including the number of jobs by sector and occupation that exist, qualifications needed for particular jobs, pay rates, progression routes and vacancies.

Since the 1990s increasing access to and use of the internet (see Vignette 1 for some figures on the recent growth and the profile of internet use) has played an important role in increasing the availability of LMI and in the exchange of LMI. In particular, the internet plays a crucial role in facilitating access to information for individuals looking for information, advice and guidance about education, training and employment opportunities. Likewise the internet is also increasingly widely used by employers searching for workers (see page 29-37 for discussion on the use of the internet in recruitment and selection) and by labour market intermediaries (such as the public employment service [i.e. Jobcentre Plus in Great Britain], private employment agencies, trainers, etc) who act as brokers facilitating 'matches' of jobseekers to employment opportunities. Importantly, the internet has the potential to enhance the efficiency and effectiveness of information search and exchange.

The internet plays a crucial role in facilitating access to information for individuals looking for information, advice and guidance about education, training and employment opportunities

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Vignette 1
Growth in and profile of internet use – selected statistics

- In 2011, 19 million households in Great Britain had access to the internet, representing 77% of households, up from 73% in 2010.
- The number of internet non-users decreased from 16.7 million adults in 2006 to 9.2 million in 2010 (ONS, 2010).
- In 2010:
  - 60% of those aged 65 years and over and 22% of those aged 55-64 years had never used the internet, compared with 1% of those aged 16-24 years).
  - 55% of those with no formal qualifications had never used the internet compared with 2% of those with a degree.
  - 33% of those in semi-routine and routine occupations had never used the internet vis-à-vis 9% in managerial and professional occupations.
  - 17% of those with an annual income of less than £20,700 had never used the internet compared with 2% of those with an annual income of greater than £41,600.
  - 29% of those in the North East region had never used the internet compared with 13% in London.

Source: ONS (2010) Internet Access 2010: Households and Individuals.

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Traditional routes for accessing LMI include social networks of family and friends, newspapers and notice boards. These routes still exist and remain important – arguably particularly so at a time of economic crisis when there are relatively fewer hard-to-fill and skill-shortage vacancies (see page 29-34). However, use of the internet enables individuals to identify a greater range of LMI and potentially a larger number of opportunities for education, training and employment over a larger geographical area at a lower cost and in a shorter time (Krueger, 2000). While use of the internet has obvious advantages in these respects, there is also a need to develop skills to deal with increased amounts of information and make effective use of it (Beauvallet et al., 2006). Labour market intermediaries (such as the Careers Service, Sector Skills Councils and the public employment service) can play an important role here in helping to interpret information and convert it into intelligence – for jobseekers and employers alike, but individuals who develop these skills themselves are at an advantage in the labour market (as discussed below).

The internet now lies at the heart of advice and guidance services, with the shift to internet-based guidance services being seemingly inexorable. It is used as a resource by Personal Advisers (PAs) who routinely visit specialist websites when giving guidance to customers – both young people and adults. In turn customers turn to the internet for information about entry requirements for courses, job opportunities, etc (Bimrose et al., 2010);[B] (see Vignette 2 for two examples of internet-based developments offering careers guidance information).

Use of the internet enables individuals to identify a larger number of opportunities for education, training and employment over a larger geographical area at a lower cost and in a shorter time

B
The research does not break this down into the types of information used – i.e. whether this is first point of contact, sole point of contact, a supplement to other resources, etc. However, 'best practice' guidance for users is that they should be using the internet alongside other sources.

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Vignette 2
Two examples of internet-based careers guidance services and information

Careersbox - www.careersbox.co.uk
A digital new media partner to the Institute of Careers Guidance, Careersbox aims to deliver information to careers advisers, students and jobseekers. It offers a free online library of careers-related films, news and information. Case study films on the website showcase 'real people' talking about 'real jobs'. These films are intended to give viewers insights into particular sectors. Careersbox also offers LMI about particular sectors and Web-based tools for individuals to makes assessments of their own skills. These skills can be matched automatically to 'suitable' job types.

STEM Careers - http://www2.warwick.ac.uk/fac/soc/ier/ngrf/stem
It is widely agreed across government, industry and education sectors that the future prosperity of the UK is, to a large extent, dependent on young people choosing STEM (science, technology, engineering and maths) related subjects. STEM Careers has been designed to raise awareness of STEM courses and careers. It is aimed at teachers, guidance professionals, careers co-ordinators, tutors and mentors involved in careers education, information, advice and guidance. It brings together a wide range of resources as an online learning tool to provide high quality career guidance in STEM (Science, Technology, Engineering and Maths) teaching and methodology. It has three modules – 'STEM Basics', 'STEM Moving on', and 'STEM Digging deeper' – which provide successively more detailed information on STEM careers. The website contains self-assessments, LMI, teaching aids, downloadable resources and interactive materials.

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A key role for the PA is to coach customers in distinguishing between reliable and unreliable, and biased and non-biased sources of LMI. This is especially the case given the way that the internet is increasingly used not just for accessing information, but for communication purposes and for creating and sharing knowledge through self-generated blogs, wikis, multimedia sharing, podcasting, etc (Bimrose and Barnes, 2010). In relation to delivery of careers guidance services using such media, the generational distinction between those who have grown up with the digital language of computers, video games and the internet, and those who have had to adapt to the digital world, comes to the fore. Whereas the majority of young people are well versed in the use of digital media, most PAs and also adult users of information, advice and guidance services are likely to be less so. This broad division highlights a key need for PAs to keep abreast of developments in the ways of using the internet and of creating material for sharing on the internet.

The generational distinction between those who have grown up with the digital language of computers, video games and the internet, and those who have had to adapt to the digital world, comes to the fore

Increasing use and reliance on internet-based service delivery is also evident in the public employment service. One of the stated priorities for Jobcentre Plus is to work towards a digitalised Jobcentre Plus service in 2011/12. Jobcentre Plus aims to deliver more of its services online and in formats that enable customers to access them by a range of means, including electronically (Jobcentre Plus, 2010). Apart from the generic advantages of using the internet, such as the potential for improved effectiveness and efficiency of information exchange, it may also be argued that the promotion of online services to Jobcentre Plus customers could be in their long-term interest, since a working knowledge of the internet is an asset in many parts of the labour market. In addition, storing claimants' information online could reduce the cost and complexity of making new or additional claims (Hall and Pettigrew, 2007). Indeed, Jobcentre Plus customers are encouraged to register their application for benefits online. Full online application has the potential to reduce significantly the information exchange burden on both the customer and the public employment service (NAO, 2009).

Studies conducted by the Department for Work and Pensions on Jobcentre Plus online services found that people receiving Jobseekers Allowance (JSA) were much more likely to have used the Jobcentre Plus website than those in receipt of 'inactive

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benefits' (i.e. Income Support [IS], Incapacity Benefit [IB], Employment Support Allowance [ESA]) because people receiving JSA were more likely to be searching for work, and would be more likely to use the internet for this purpose. JSA claimants without internet access were less likely to move to online services (DWP, 2009).

There is a danger that with increased reliance of internet-based resources and services for information, advice and guidance, for job search (discussed in greater detail in page 35-37) and claiming of benefits that disadvantaged individuals will be increasingly excluded because of their lack of access to the internet and/or a lack of digital skills (e.g. see Whitfield et. al. [2010] in relation to the digitalisation of Jobcentre Plus services). These concerns are not new; over the last decade or so concerns have been voiced about the extent to which disadvantaged groups and/or those living in deprived areas are excluded from the economic and social benefits of ICTs (e.g. see Policy Action Team 15, 2000; Owen et al., 2003). However, as access to and use of the internet grows, those who are excluded are arguably more disadvantaged in labour market terms than was the case formerly.

Relevant support and training are key elements in the promotion of online services. Here it is salient that digitally excluded individuals are themselves diverse, and different support is needed for different groups. The distinction made by Adam et al. (2011) between digitally 'unaware', 'unready', 'uninterested' and 'unable' Jobcentre Plus claimants (see Vignette 3) illustrates this point.

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Vignette 3
Typology of digitally excluded Jobcentre Plus claimants

- **Unaware** - mainly recently unemployed JSA or ESA claimants, with some experience of using the internet – their key barrier was a lack of awareness.
- **Unready** - longer term unemployed, mainly in receipt of JSA or ESA and with little or no internet experience. Their key barriers were a lack of awareness, little or no internet access, minimal IT skills, and a lack of confidence. Access to the internet coupled with tailored computer and internet training and face-to-face support would enable this group to use digital services.
- **Uninterested** - long-term unemployed JSA claimants, those nearing State Pension age, and those with health problems. They generally had minimal internet experience, and no interest in learning. Persuasion or compulsion, coupled with training and support would be required.
- **Unable** - generally these are long-term unemployed claimants in receipt of IS, IB or ESA for whom work was a very distant goal. They had multiple barriers, including poor literacy and English language skills, and health problems limiting mobility. This group would need persuasion about the value of the internet, alongside long-term, personalised support.

Source: Adam et al. (2011)

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The internet and the changing nature of recruitment

Over the last ten years or so the internet has added to the suite of job search and recruitment methods. Use of the internet has potential benefits for both jobseekers and for employers. By searching on the internet jobseekers can gain access to a greater range of vacancies more quickly than by other means of job search. For example, the EURES internet portal (see Vignette 4) has been designed to advertise vacancies across the European Union, with the aim of facilitating international mobility.

Vignette 4
The EURES job mobility portal: scope and features

EURES (**http://ec.europa.eu/eures/home.jsp?lang=en**) is supported by the European Commission and links the public employment services (PES) across the European Economic Area (EEA). It is designed as a one-stop service to facilitate and promote free movement between Member States of the EEA by providing information, advice and recruitment/placement (job-matching) services for jobseekers and for employers. As such it helps jobseekers to find alternative work opportunities to those available locally or nationally, and likewise it helps employers who cannot find the right recruits for their jobs locally or nationally.

All vacancies from EU and EEA national public employment services are accessible on the EURES portal in 25 European languages. Via the EURES portal jobseekers can search electronically for vacancies in particular occupations or via job titles or skills. They can also post their CV online.

Employers can post vacancies on the EURES portal and can search the CVs of jobseekers. Via EURES they can also access personalised help (via EURES advisers) in accessing potential workers from elsewhere in Europe.

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In Great Britain vacancies notified to Jobcentre Plus are accessible via the Direct.gov jobs and skills search website at **http://jobseekers.direct.gov.uk** There are also numerous vacancy websites run by private sector providers, including Fish4jobs (**www.fish4.co.uk**), Monster (**www.monster.co.uk**) and Gumtree (**www.gumtree.com/jobs**). It is not clear how many jobs are posted on websites, or how many 'cross postings' of jobs between websites exist. The key issue for the current discussion is that by posting vacancies on the internet, employers can increase the volume of applicants by reaching a larger population of potential employees than through other means.

Importantly, the role of the internet in job search is multi-faceted and internet use has permeated much of the job search process over recent years. The internet (and other ICTs) can be used in combination with other job search methods. As the internet has become a more pervasive tool in job search and recruitment, so disentangling use of the internet from the use of other methods has become more difficult; arguably the boundaries between different job search methods have become more fuzzy and overlapping. Hence, a vacancy advertised in a shop window or a local newspaper may direct potential applicants to a company website for further information and details of how to apply; so an applicant would need to be able to use and access the internet in order to find such information and act upon it.

Multivariate analysis of Labour Force Survey data from Great Britain on use of the internet in job search over the period from 2006 to 2009 (Green et al. 2011) revealed no significant difference between men and women in the use of the internet for job search. However, it did point to a significant and consistent decreasing trend in the use of the internet to look for work as people age, with the youngest age groups (i.e. those aged 16-24 years) being most likely to use the internet in their search for work and the oldest age groups being least likely to do so, mirroring the profile of internet use outlined in Vignette 1. No particularly significant variations in the use of the internet for job search by ethnic groups were identified once other factors were controlled for. There was a very significant positive relationship between education and use of the internet in job search, with those individuals with degrees being most likely to use the internet in their job search. People living in London were more likely to use the internet

Multivariate analysis of Labour Force Survey data from Great Britain on use of the internet in job search over the period from 2006 to 2009 did point to a significant and consistent decreasing trend in the use of the internet to look for work as people age

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than people living in other parts of Great Britain, while jobseekers in the East Midlands and Wales had the lowest probability of using the internet for job search. JSA claimants had a higher propensity to use the internet for job search than non-JSA claimants within the sample. Holding all other factors constant, there was a significant and consistent increasing trend among jobseekers in internet use over time from 2006 to 2009. This emphasises the increasing importance of internet use in job search. In 2009 around four in five jobseekers in Great Britain were making use of the internet in job search, with its use being especially prevalent among younger jobseekers and the most highly qualified. Since 2009 this proportion is likely to have increased.

In 2009 around four in five jobseekers in Great Britain were making use of the internet in job search, with its use being especially prevalent among younger jobseekers and the most highly qualified. Since 2009 this proportion is likely to have increased.

Benefit claimants are being urged increasingly to use the internet to search for jobs, and there are plans to monitor use of the internet for job search by JSA claimants. On 6th October 2011 Lord Freud, Under-Secretary of State at the Department for Work and Pensions, made a statement that:

> "From spring 2012 we will introduce an IT system which will allow jobseekers to search and apply for jobs online and will help Jobcentre Plus staff to monitor their activities. In addition, later this year we will start a series of trials to assess the effectiveness of different methods of checking whether a claimant is fulfilling their job-search requirements. One of these trials will test the impact of requiring claimants to sign on every week rather than every two weeks"
>
> **http://www.publications.parliament.uk/pa/ld201011/ldhansrd/text/111006-wms0001.htm#11100650000011 [accessed 23/10/11].**

This raises important issues regarding access to and skills to use the internet, but also about what kinds of jobs are advertised on the internet. Some skilled craft jobs and some less skilled jobs are unlikely to be advertised on the internet. However, Brown et al. (2011) cite the example of a German website **online-jobs.de** where cleaning, clerical and catering jobs were offered by employers with a maximum price for the job; those looking for employment then underbid each other, and the winner was the person willing to work for the lowest wages (see also Dougherty, 2005). Launched in 2005,

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the founder Fabian Löw described it as the "eBay for the working world". He approached the development of the website from an employer's perspective and was explicit about his concerns regarding high wage levels in Germany, but set an absolute minimum wage of absolute minimum wage of €3 per hour – see **www.dw-world.de/dw/article/0,,1519405,00.html.** This illustrates how use of the internet may be used to 'drive down' the quality of employment, as well as open up more and better employment opportunities to jobseekers.

Using the internet to seek out information about jobs may be regarded as a relatively 'passive' use of the internet. Importantly, the internet allows jobseekers to play a more 'active' role in job search. For example, in late summer 2011 the professional networking site LinkedIn introduced a new plugin allowing applicants to send their LinkedIn profile direct to the websites of companies looking to recruit. For companies, this may help to streamline some of the processes that they are likely to be doing already, such as checking applicants' LinkedIn profiles to see how they use public networking sites, as well as using Google and social networking sites. In an article in the New York Times in 2009, Wortham (2009) reported that a survey by Career Builder of 2,667 managers in the USA[c] had found that 45% of managers and human resources staff used social networks to screen job applicants – and that this proportion had doubled over the course of a year. Facebook, LinkedIn and MySpace were the most common sites examined by employers. The downside is that the automated tool's ease-of-use may encourage more unsuitable applicants to apply for positions that they are not qualified or suitable for – meaning more work for employers' recruitment teams in sifting through larger volumes of applications (Shaw, 2011). What this emphasises is the need for individuals to manage and update their public profiles on the Web and remove any 'digital dirt' (Lehmann, 2010), given that the information they contain may be used in selection decisions, since, as argued by Jones et al. (2007), social networking sites on the internet have led to a blurring of the boundaries between private and public information. So whereas inappropriate photos, content about drinking, comments bad-mouthing or sharing confidential information from previous employers and lies about qualifications are harmful to job applicants, website content showing the positive aspects of the applicant are likely to be beneficial to them.

A survey by Career Builder of 2,667 managers in the USA had found that 45% of managers and human resources staff used social networks to screen job applicants

c
www.careerbuilder.com/share/aboutus/pressreleasesdetail.aspx?id=pr519&sd=8/19/2009&ed=12/31/2009&siteid=cbpr&sc_cmp1=cb_pr519_&cbRecursionCnt=1&cbsid=8412d5b32ef54ce6854a035cf3a59d12-303995843-x3-6

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For employers the advantages of using the internet for recruitment include: cost, content, convenience, and ease of communication, changes and cross-postings (see Vignette 5 and Hauer [undated] for further details).

VIGNETTE 5
Why use the internet for recruitment?

- **Cost** - this can be measured in two ways: (1) the amount paid for the recruitment advertisement and (2) the cost associated with the amount of time a recruiter spends identifying a potential candidate. In both cases the costs of using the internet are lower than for most conventional non-internet recruitment methods.
- **Content** - there is more space available for advertising on the internet than in newspaper adverts – this enables employers to say more about what they are looking for, so enabling candidates to have more information on which to base a decision to apply.
- **Convenience** - online postings are available 24/7.
- **Communication** - jobseekers can store CVs and cover letters online, and so can communicate more quickly and easily with potential employers.
- **Changes** - changes can be made to online adverts as soon as is necessary. A change to a newspaper advert would take much longer to make.
- **Cross-posting** - it is possible for an employer to cross-post a position on several 'job boards'; it would be more time-consuming and costly to submit a vacancy to several different (print) newspapers.

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Indeed, the Chartered Institute of Personnel and Development's CIPD Annual Survey Report 2009 on Recruitment, Retention and Turnover identified attracting candidates through the employing organisation's own website as the most commonly used method for attracting recruits in the UK (CIPD, 2009). However, just as jobseekers tend to use a variety of job search methods, so employers often use a range of recruitment methods (Coleman et al. 2007).

Not all employers will resort to the internet for recruitment. In austere economic circumstances one way to 'de-risk' recruitment is by relying on traditional (non socio-technological) 'families and friends' networks – i.e. advertising vacancies by word of mouth amongst current staff, on the basis that they will deliver applicants who have 'inside knowledge' of what the job involves and who may be beholden to the current employee who recommended them and so 'do a good job'. Of course, it is possible that current employees might make use of email to notify friends of such opportunities.

So while there is a trend towards increasing use of the internet in job search and recruitment, there is a possibility of information overload and of employers being inundated by too many unsuitable applicants if they advertise on external websites. Hence, some employers may choose not to use the internet and save costs by relying on traditional 'families and friends' networks as outlined above (Atfield et al. 2011). However, it seems likely that any such moves away from use of the internet for advertising vacancies may be related to the economic cycle, and come to be seen as blips in a longer-term trend towards greater use of the internet in recruitment and selection. Even if some employers decide not to advertise vacancies on external websites at times of high unemployment, they may still prefer or require applicants to make an application via the internet. But overall, a clear message emerging from this review is that the individuals who are least well placed are those (potential) jobseekers who lack access and skills to use the internet.

While there is a trend towards increasing use of the internet in job search and recruitment, there is a possibility of information overload and of employers being inundated by too many unsuitable applicants if they advertise on external websites

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The internet and selection processes

The internet enables employers to be very prescriptive in the way in which they ask candidates to provide information. For example, through an internet-based multiple choice questionnaire (i.e. use of 'closed questions'), often designed to gather personality information to assess the applicant's 'fit' with the position applied for and with the employer more generally, candidates may be scored as they proceed through the questionnaire. Those who do not meet the required threshold may, in some instances, not be routed to proceed to 'open questions' inviting candidates to provide examples of their work experience and skills relevant to the job for which they are applying. In this way, the volume of candidates invited to complete the full application process is reduced and only those applicants with the highest scores may then be invited for interview.

Hence through electronic screening questionnaires accessed via the internet, virtual work simulations (which attempt to identify attributes that are difficult to assess from CVs) and automated scoring systems (see Anders, 2011 and also Vignette 5), employers can screen and select applicants much more quickly than by adopting more traditional 'good practice' methods where selection panel members may score applications manually against 'person specification' criteria and then meet to compare scores and draw up a short list of candidates for interview. The rationale for using such automated software for large companies is often one of 'cost saving' – for example, with an automated recruitment system, supermarket chain Asda cut the number of interviews conducted: "Where as previously the company had relied on interviews and CVs to assess applicant suitability, with the new system this work is already done. Now, the company is seeing the top 20% of candidates at interview rather than the top 50% as before" (psychologist quoted in Fuller, 2006).

An example of how the internet has been used to automate large parts of recruitment and selection processes is provided by text on recruitment from the Rolls-Royce (see Vignette 6).

Through electronic screening questionnaires accessed via the internet, virtual work simulations and automated scoring systems employers can screen and select applicants much more quickly

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Vignette 6
Information on the Rolls-Royce recruitment process

You are welcome to apply for any vacancy you consider that you are qualified for. The automated recruitment process simplifies the application and selection process for you and our Human Resources department.

You will find all vacancies listed by clicking on "Search Vacancies". Choose a position, read through the job description and apply. If you are visiting the Rolls-Royce Career site for the first time, you may register and provide Rolls-Royce with your personal information.

After applying, your background and details will be reviewed. Should your skills, qualifications, experience and other requirements match the criteria for the position, you may be invited to attend an interview and/or assessment.

You will be informed regularly via email of the progress of your application, as the entire recruitment process is automated. You can view the progress of your application by logging on to Candidate Home page on the Rolls-Royce Motor Cars career site at any time.

Source:
www.rolls-roycemotorcars.com/the_company/careers/recruitment_process/

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There are no definitive statistics on how many employers use automated recruitment and selection software, or for what positions. However, the use of such systems is likely to be greater for large employers than for smaller ones, given the set up costs and the volume of vacancies they are dealing with. What is clear is that individuals unable to use or access the internet will be excluded from the recruitment and selection process of some employers who rely on such internet-based systems. They will have a smaller pool of jobs available to them, so, all other factors being equal, diminishing their chances of accessing employment.

Individuals unable to use or access the internet will be excluded from the recruitment and selection process of some employers who rely on such internet-based systems

3. The internet and skills for employment

This chapter is concerned with skills and competences needed for use of the internet, and focuses in particular on defining different types of internet skills and on internet skills to enhance employability.

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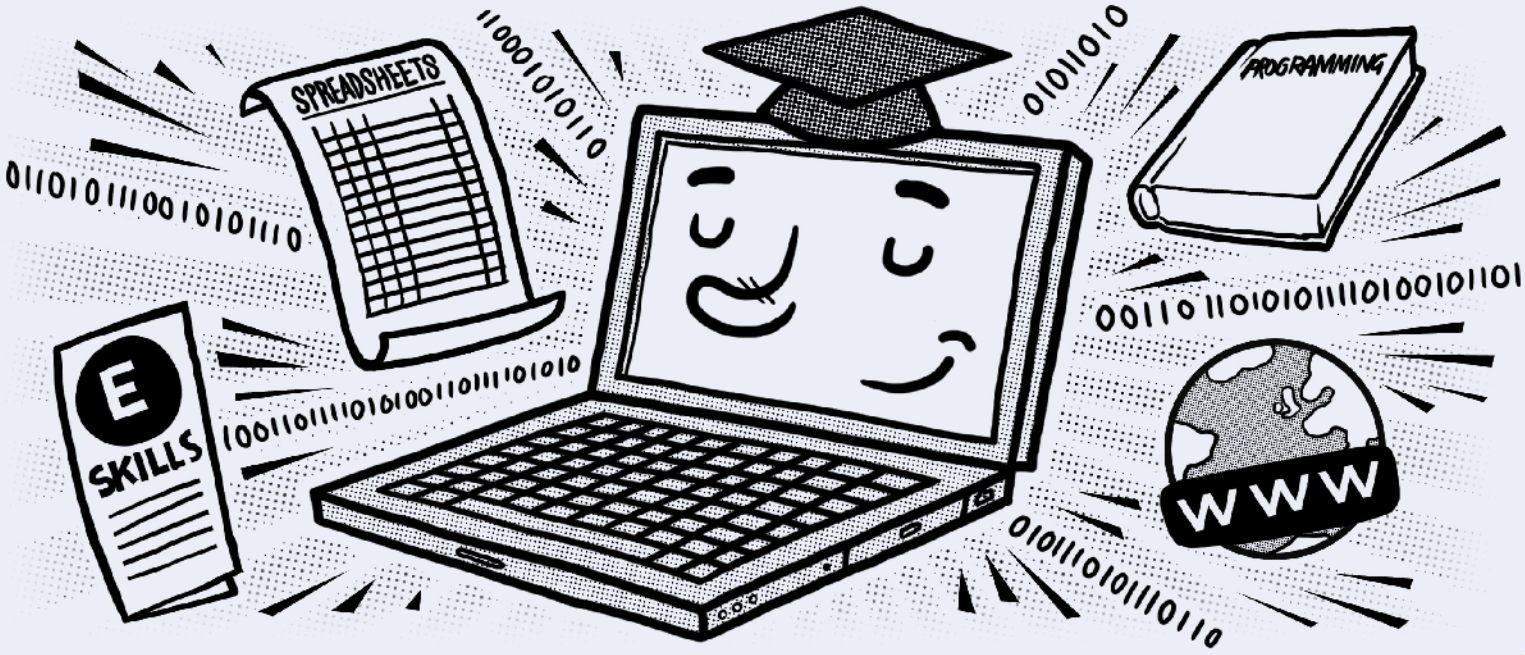

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ICT SKILLS AND COMPETENCES

A discussion of internet skills required for employability should consider the definition of both skills and competences. Skills can be seen as the knowledge and experience necessary to perform a particular task; competencies are defined as the ability to apply this knowledge in different situations. Although different authors and sources provide varying definitions of these concepts, the definitions provided by CEDEFOP (2009) are useful for the purpose of this report since they suggest a distinction between having internet skills and being able to apply knowledge and experience to the employment context.

It is possible to distinguish between **end-user** and **practitioner** ICT skills. While the former refers to the ability to apply ICT systems or devices effectively for whatever purpose, ICT practitioner skills refers to the ability to – among other related activities – develop, plan, market, produce, install and maintain these systems (CEPIS, 2005). In addition to this, **e-business** skills can be seen as a third category comprising the skills needed to "exploit the strategic opportunities provided by ICT (in particular the internet) for specific industry or societal sectors" (CEPRIS, 2005: 50). Of direct relevance to this report are e-business skills, which overlap with end-user skills and other job-related skills such as teamwork, problem solving, and the ability to perceive business opportunities and pursue them.

In relation to competences, the OECD (2005) differentiates between three types of users and how they employ their ICT skills: specialist, advanced and basic. Specialist users use their ICT skills as the main part of their job to develop, install and maintain ICT tools for others. Advanced users use sector-specific tools as part of their jobs, but these are not the main part of their job. As for basic users, they may use generic ICT tools such as the internet, word processors, spreadsheets and email at work, but also for general purposes in their personal lives. It can be noted that given the generality and need for the internet in the information society, specialist and advanced users also make use of basic tools and often play the role of basic users. Given that the main interest here is the use of the internet in the employment context, the focus will be

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placed on basic and advanced users and their ability to use their internet skills as a tool to do their job or perform it more efficiently.

In the context of the UK, the National Occupational Standards (NOS) indicate that improving productivity using IT consists of the "ability to plan, evaluate and improve procedures involving the use of IT tools and systems to improve the productivity and efficiency of tasks and activities" (e-Skills UK, 2009: p 9). This requires that three areas of competence are mastered: 1) the use of IT systems; 2) the use of IT to find or exchange information; and 3) the use of software applications (see Executive Summary). Using the internet does not necessarily require the use of other software applications per se but involves accessing, browsing, downloading and sharing information, as well as understanding about connectivity and security issues.

Thus, the focus of this chapter is on e-business skills in relation to the use of the internet and their application and relevance to the world of work. Thus includes skills that range from basic ICT skills to the use of the internet "to explore possibilities for new ways of conducting business, to enhance the efficiency of various types or organisations, and perhaps to establish businesses" (OECD, 2005: 6). The next section looks into the internet skills and how they can be defined.

Defining internet skills

Discourse on the digital divide has led to the view that it is not only whether a person has access to the internet or not that matters, but it is also important to consider individuals' motivations and online skills (Department for Communities and Local Government, 2008; Hargittai, 2002). It can be said that with internet access being extended in the UK, areas of concern now include other factors leading to digital exclusion. According to the Office for National Statistics (2011a), internet access in British households increased from 61% to 77% between 2007 and 2011, and 93% of all households in Great Britain now use broadband connections. However, ONS also reported that 28% of British adults aged 45-54 years who access the internet do not

Discourse on the digital divide has led to the view that it is not only whether a person has access to the internet or not that matters, but it is also important to consider individuals' motivations and online skills

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think their internet skills are sufficient to protect their personal data, and 21% of them said this in relation to protecting their computer from viruses. Among households in Great Britain with no online connection, the second most common reason cited for not having internet access (after "I don't need the internet") was lack of skills.

This suggests there is now a need to concentrate on a 'second level' digital divide in which it is not only access that matters but the ability to make the most of the internet. Hargittai (2002) defined internet skills as the "ability to efficiently and effectively find information on the Web" (Hargittai, 2002: 2). From this perspective, she conducted an experiment with internet users in the US. She found that older people are less skilled in finding information on the Web and that this skill is positively associated to the amount of time spent online. Hargittai's definition of skill, however, may be limited since it focuses on the use of internet in isolation and this raises questions about people's ability to use the internet as a tool to achieve a particular goal. In his analysis of international trends to promote the development of e-competencies, Cobo Romani (2009) highlighted that "non-expert ICT users have been oversimplified as evidenced by mentioning only capability to interact with generic ICT tools" (Cobo Romani, 2009: 19). The author added that there is a need to provide a more complex characterisation of these users as this category may include individuals with the technical and cognitive skills to generate added value. Furthermore, he suggested the term **e-competent** to describe an ICT user that is able to combine the use of specific technologies with other knowledge and skills.

Van Deursen et al. (2011) suggest that there is a lack of consensus about the term 'internet skills' and its measurable dimensions. In a series of papers, they propose a more in-depth definition of internet skills that incorporates medium- and content-related skills (van Deursen and van Dijk 2009, 2010, van Deursen et al., 2011). Medium-related skills are basic skills related to using the internet technology (so called 'button knowledge') and understanding of the hypermedia structure on which the internet is built. Content-related skills are skills related to using the internet to achieve specific goals that range from finding specific information to using the internet as an aid to "reaching the particular goal of improving one's position in society" (van Deursen

There is now a need to concentrate on a 'second level' digital divide in which it is not only access that matters but the ability to make the most of the internet

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et al., 2011: 3). Moreover, medium-related skills can be classified as i) operational and ii) formal; content-related skills are classified as i) information and ii) strategic internet skills. This gives four types of internet skills which are described in detail in Figure 1.

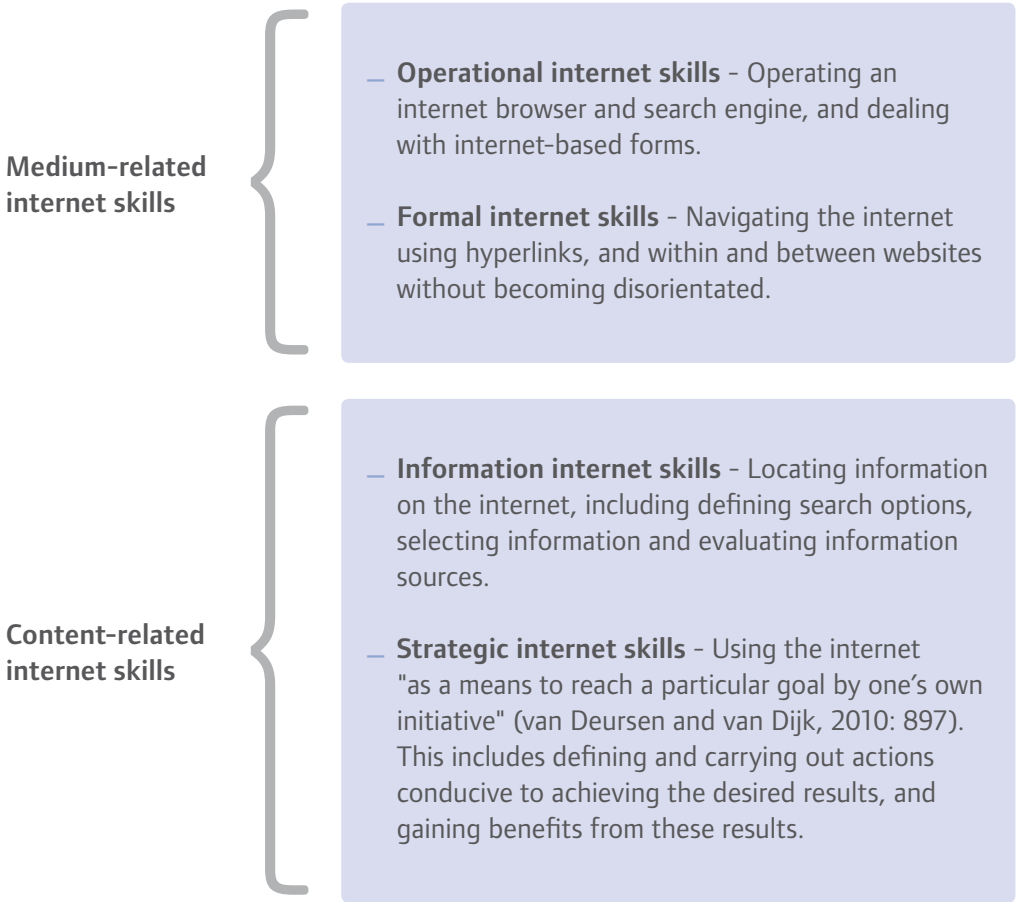

Fig 1
Adapted from van Deursen et al. (2011), with permission from Elsevier

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Through a series of experiments conducted with adult Dutch internet users, van Deursen et al. (2011) measured the relationship between medium- and content-related internet skills and variables such as gender, age and education. The authors found no relationship between gender and any of the internet skills tested but there were associations with age. As they expected "the elderly perform more poorly than the younger generations with regard to medium-related skills" (van Deursen et al., 2011: 11). However, they also found that older individuals perform better with regard to content-related skills. Another important finding is that educational attainment has an influence on all types of skills. On the other hand, years of internet use or number of hours of internet use per week have a weak relation with the level of internet skills, suggesting it is education rather than heavy use that helps people improve the extent to which they benefit from this tool.

Years of internet use or number of hours of internet use per week have a weak relation with the level of internet skills, suggesting it is education rather than heavy use that helps people improve the extent to which they benefit from this tool

It may be said that it is content-related internet skills that have potential to improve a person's employability, although these skills build on medium-related skills, as was shown in van Deursen et al.'s (2011) experiment. For instance, use of internet skills for job search requires the development of a plan to achieve a particular goal and to taking and number of actions and decisions to reach this goal. In this case, the internet plays an important role as a tool for helping the individual become employable, and it may be added that medium-related skills may not be sufficient to reach this goal. Moreover, this logic can also be applied to other employment-related tasks that go beyond searching for a job.

These considerations are important since, as Felstead et al. (2007) indicate in their analysis of the 2006 UK Skills Survey, the number of people who saw the use of the internet as 'essential' to their jobs doubled between 2001 and 2006. This increase has been faster for women than men, although there is a marked difference between the importance full-time and part-time women attribute to the use of the internet in their job, with the latter reporting the internet as less important. Felstead et al. also note that, unsurprisingly, there are differences in the use of the internet by occupation. While around 70% of those in 'professional occupations' saw the internet as essential or very important for their job in 2006, less than 20% of those in occupations such as

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skill trades, machine operators and elementary occupations saw the use of the internet as of major importance to their job. The authors also found that the self-employed, together with those in higher occupational groups, tend to report more complex uses of the internet. The next section considers the internet skills that are required for employability.

Internet skills for employability

In the context of work and employment, internet skills have been classified as generic hard skills, i.e. as "technical and job-specific abilities, which are applicable in most companies, occupations and sectors", and thus described as highly transferable (RPIC-ViP, 2011, p 276). Email and internet skills are among the most widely-spread IT user skills in the UK population and a high proportion of employees are familiar with IT user skills. According to the UK Sectors Skills Council for Business and IT (e-Skills, 2010), 95% of employers in the UK consider that the email/internet skills for applicants to their non-IT and telecoms positions are up to the level required or above this level. This is in contrast to other IT user skills such as spreadsheet skills. In this case, 21% of employers were of the opinion that applicants' skills in this area were below the level required. What this suggests is a picture where, using van Deursen's terms (2009, 2010, 2011) most employees possess medium-related skills and at least some content-related skills.

Research has identified three different roles that basic ICT skills can play for employability (Guest editors ITID, 2009). Basic ICT skills can be seen as a basic requisite for finding employment; as skills that, together with other skills, enhance a person's employability; or as skills that can be further developed and lead the individual into a career in the IT and telecoms sector. These roles in relation to ICT can be summarised as follows:

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- **Gateway skills** - skills that open the possibility of employment and without which individuals would stand no chance of finding employment.
- **One among necessary skills** - skills that combine with other aspects of the individual to form an employable profile and which may 'tip the balance' toward finding employment.
- **Catalyst for key skill development** - skills that introduce the person to the IT and telecoms sector but that are further developed, leading into a career in this area.

In relation to gateway skills, there is a particular concern about providing these ICT skills for marginalised groups in Europe and around the world. Evidence indicates that those who are socially disadvantaged are less likely to be engaged with the internet and that lower ICT competences are associated with social exclusion (Kluzer and Rissola, 2009). Therefore countries have developed programmes to support disadvantaged groups such as migrants and older people to develop basic ICT skills and give them a footstep into employment. In the UK, for example, 'Online basics' is a basic internet skills programme aimed to help individuals who are not familiar in using this tool (see Vignette 7 for a description of the programme).

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Vignette 7
What is Online basics?

Online basics is a free, easy to use course that will help you get started using computers and the internet. [Potentially leading to an Entry Level 3 Award, the course is a "collaboration between e-skills UK, and partners including the Department for Business, Innovation and Skills, and UK Online".]

Online basics includes five short modules. They show you how to use a mouse and keyboard, how to email, and how to search for information and stay safe online. With Online basics you can learn and practice your new skills and start enjoying all the fantastic things the internet has to offer. You should register now, or find a local centre where staff can help you get started.

Source: **www.e-skills.com/using-it/individuals/online-basics;**
see also: **http://onlinebasics.co.uk/**

Once a person possesses basic ICT or internet skills, these will be utilised – together with other skills – to various degrees. In other words, job roles vary widely and the internet skills required for the job vary as well. As suggested by the McKinsey Global Institute (quoted in Bishop, 2011: 7) work in the labour market can be seen as **transformational**, **transactional** and **interactional**. Transformational work involves physical activity, and physical work in construction is a typical example. Transactional work is work in, e.g., banks or call centres that can be automated but it is still done by people. As for interactional work, it relies on collaboration with others and use of knowledge and expertise, and can be seen in activities such as management consultancy or business creation and innovation. Internet skills are directly relevant to transactional and interactional work and it may be said that e-business skills which allow the individual to exploit the opportunities that the internet provides are particularly relevant to the latter.

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Transactional work requires the use of internet skills but it may be said that medium-related internet skills involving operational and more formal skills may suffice in many cases. Interactional work, on the other hand, requires content-related skills including the skills to devise a plan of how to use the internet as tool to reach a given goal and to carry out this plan. As Johnson et al. (2005) point out, the demand for people with the skills to coordinate and manage the exchange of goods and services, or to analyse information and solve problems, has increased considerably more than the demand for people to do transactional jobs (e.g., clerical jobs). As Beardsley et al. (2005) put it:

> "Companies in many sectors are hiring additional employees for more complex interactions and fewer employees for less complex ones. For instance, frontline managers and nurses – who must exercise high levels of judgment and often draw on what economists call tacit knowledge, or experience – are in great demand. Workers who perform more routine interactions, such as clerical tasks, are less sought after. In fact, companies have been automating and outsourcing jobs that involve many of these transactional interactions" (Beardsley et al., 2005: 1)

The implications of this are that there is a need for internet skills at work and also that internet skills can only be seen as a tool that in itself does not provide a competitive advantage. The reason for the latter is that internet skills are relatively pervasive in the developed world population. It is **the ability to combine internet skills with other skills** that makes the internet a valuable tool for professional development. This points again to the relevance of the term e-business skills which are about individuals using the internet to innovate and develop opportunities in industry or society.

A term that comes to mind when talking about e-business skills is self-employment. Besides providing a useful technological tool for traditional businesses, the internet has made it easier for individuals to start a business online (see page 61). Moreover, it has been suggested that SMEs have more to gain from the use of the internet than larger companies. Social media, if appropriately and creatively used, allows smaller businesses to advertise and communicate with customers in ways that were previously reserved to larger enterprises. Nonetheless, like any successful businesses, a successful e-business

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requires not only internet-related skills but also talent in other areas such as creativity, motivation, networking (virtually and in person), time management, and administration skills. This provides a further argument to the idea that **internet skills on their own are not sufficient for success but they are a necessary baseline and a useful tool**.

Using the internet is about connecting with others virtually and in that way opportunities are created. However, individuals' ability to participate and use their knowledge capital shapes the nature of these opportunities. For example, where some can see an opportunity for accessing information, others can see the possibility of making a living using the internet. Innovation and entrepreneurship are related to strategic internet skills and making the internet – and technology in general – work for a specific purpose (see Vignette 9). Besides being a skill that can help individuals create a job for themselves, it can also foster the creation of jobs for others. Thus, although it is important that individuals possess and develop basic computing skills, it is important to recognise that these on their own are a starting point and that individuals can be encouraged to make the most of these tools for the benefit of their employment situation.

Innovation and entrepreneurship are related to strategic internet skills and making the internet – and technology in general – work for a specific purpose

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Vignette 8
Learning basic computing skills: the 'Hole in the Wall' project

While it is accepted that younger generations are more acquainted with computers, the idea that children without any prior computer experience can acquire internet skills on their own seems more debatable. This is precisely what Dr Sugata Mitra, Chief scientist at NIIT, proposed: that children can develop basic computer skills on their own if they are provided with access to the internet, motivating and encouraging content and some minimal human guidance. To test his idea that computer skills can be learned incidentally and without supervision, he devised the very first 'Hole in the Wall' experiment in Kalkaji, a slum in New Delhi. The experiment consisted of making a computer freely accessible by carving a hole in one of the walls of the NIIT premises. This setting provided access to the computer to children and other dwellers on one side and from the other researchers were able to observe users' reactions.

Results of this first experiment supported Dr Mitra's initial hypotheses and led to extending the experiments to other similar settings. What the team observed was that what appeared as initial chaos would then lead to children from all backgrounds to start taking turns and organising themselves. This would eventually lead to learning to use applications (basic Windows functions, browsing, painting, chatting and email, games and educational material, music downloads, playing video) and even to developing the language to communicate in this context. The findings suggested that children were able to learn computer skills on their own and led to defining Minimally Invasive Education as a new way of learning.

The question that this raises is to what extent this learning can incorporate strategic skills associated with the use of the internet. In other words, to what extent will these children learn or be able to use computers in their everyday lives and to use it to achieve a better life. Teaching children to use their skills is a first step of continuous support that goes beyond the learning of basic computer skills.

Source: Hole in the Wall webpage: **www.hole-in-the-wall.com/Beginnings.html**; Mitra (2007); Simmons (2005).

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Vignette 9
Entrepreneurship and the internet

Digital entrepreneurship can be seen as harnessing of the opportunities that the internet and other ICTs make available to individuals wishing to start or change a business or organisation. Some examples of how these opportunities have been exploited are dot.com businesses; the exchange of commercial goods and services using electronic auction infrastructures such as that provided by eBay and Taobao Marketplace in China; new business models and initiatives that make use of 'Web 2.0'; and the use of weblogs to advertise and disseminate company information.

The digital economy provides entrepreneurs with the tools to make their processes and activities digital, and with the ability to transfer information freely and instantly. However, digital entrepreneurship is a multi-faceted endeavour in which the business concept, its accumulated knowledge and institutional practices interact and become intertwined within the new technology. The matchmaking website **eHarmony.com** can be seen as an illustrative example of this. The business model consists of a dating services site where clients complete a lengthy online questionnaire of their traits and attributes which is used to search for potentially compatible partners. Key to the business is the knowledge and experience of the founder of the firm (a marriage counsellor with a PhD in psychology and a background in 'relationship science' research) and the operation of its eHarmony Labs to investigate the factors affecting long-lasting and successful relationships.

Thus, although new technologies make it possible to innovate and create new business models, a successful business requires more than the mere adoption of new technology. Successful businesses also depend on the interaction of other elements such as the business idea, the knowledge available, the market demand, and the pace at which new technologies are adopted. Entrepreneurs' skills to identify and take advantage of opportunities are indispensable in this respect.

Source: Davidson and Vaast (2010)

4. The changing nature of the workplace and working practices

Today, staying connected is a near-ubiquitous possibility. For certain occupations, this means people can now work from different locations and on the move. This challenges the idea of 'workplaces' and it may now be more accurate to talk about 'work spaces' instead. While this brings new opportunities there are also implications associated with the extension of work to people's personal lives.

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From 'workplaces' to 'work spaces'

Sociologists and geographers have become increasingly interested in where work is undertaken. One of the leading writers on this topic is Alan Felstead from the University of Cardiff, and this section draws heavily on his research on this topic (Felstead, 2010, 2012 in press; see also Felstead et al., 2005).

As outlined by Felstead (2010), 'work can be thought of as an 'activity' (a person might say 'I'm working') or as a 'place' (as in 'I'm going to work'). For many years these notions have been unified – with activities being carried out in a place of work – the 'workplace'; note that this is a 'singular' word that is not hyphenated.

But this singularity is increasingly being challenged by the internet and related technologies. The internet and related technologies have potentially untethered **some** activities from the workplace, as indicated by the notion of teleworking. Teleworking means that it is possible to work in a different way – and in a variety of places and at a variety of times. It is possible to:

- work without travelling,
- work while travelling between places,
- work in places and times previously regarded as being beyond the boundaries of work.

The growth in mobile internet use via laptop, tablet or other portable technologies and the spread of wireless (wi-fi) hotpots has facilitated such mobile working. Evidence suggests that there has been a growth in the use of wireless hotspots from 0.7 million people in 2007 to 4.9 million in 2011 (ONS, 2011b); (hotspot use is not necessarily for employment purposes, but the key point is that hotspot can be, and are used, for work purposes).

The growth in mobile internet use via laptop, tablet or other portable technologies and the spread of wireless (wi-fi) hotpots has facilitated such mobile working

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As work 'spills over' into non-work life, so the divisions between 'work' and 'nonwork' that have been apparent conventionally are being challenged by the internet and related technologies. As a result people may have work spaces 'at home', 'at work' and at 'other places' in between. Some workers may have less 'dead time' – and people are 'never off' work. However, this may not be an inexorable trend: there are signs of 'resistance' to pervasiveness of mobile ways of working, with 'mobile free' areas in buildings and on trains.

People may have work spaces 'at home', 'at work' and at 'other places' in between. Some workers may have less 'dead time' – and people are 'never off' work

There is a great deal of hype about the internet and work, with the internet being heralded as changing the nature of the workplace. There is a danger of the hype transcending the reality. In part, this is understandable, given the limited nature of data sources on work location in the UK. The most up-to-date source is LFS; other less frequently conducted surveys (such as Skills Surveys, Future of Work Surveys and the Workplace Employment Relations Survey also contain some information).

LFS data suggest that working at home and on the move has become more prevalent in the UK (Felstead, 2012 in press). A distinction may be made between those mainly working 'at home' and those who work 'from home' (i.e. using home as a base while working in a number of different places, including the home). The percentage of workers working mainly at home increased from 1.5% in 1981 to 2.9% in 2010, while the percentage of workers working mainly in different places but using home as a base increased from 2.8% in 1981 to 8.4% in 2010; (in 2010 nearly 820 thousand people worked mainly in their own home, whereas around 2.39 million worked mainly in different places using home as a base). These figures illustrate that the main change has taken place in the share of people using home as base, rather than the number working mainly at home. It is also apparent that in absolute terms the numbers working using home as a base far exceed the numbers working at home. Note that not all of these people will be making use of the internet.

It is clear that technology - including the internet – has been and is one important driver of these changes in the location of work, but so are environmental considerations and employers' concerns to save on office rental and running costs.

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LFS data compiled by Felstead (2012 in press) indicates that:

- The numbers and proportion working at least one day a week at or from home increased from 2,987,000 (11.3%) in 1997, to 3,566,000 (13.4%) in 2001, to 4,201,000 (14.9%) in 2006 and 4,384,000 (15.3%) in 2010.

Of these people, the proportion indicating reliance on the telephone and computer to work at or from home for at least part of the week rose from 33.1% in 1997, to 47.0% in 2001, to 52.1% in 2006 and 58.7% in 2010. This indicates that the internet and related technologies have a role in changing 'work spaces', but not all of those people working at or from home depend on them to fulfil their employment role.

In terms of who has been most affected by these trends it is evident from LFS data that up to two-thirds of the rise in the use of the home as a workplace comes from office workers. This highlights that it is non-manual workers that have been in the lead on this trend. Data from an ESRC Future of Work Survey covering 128 large organisations in the UK shows that Senior Managers and Professionals, followed by Associate Professional, Administrative and Sales staff, are the largest proportion of users of 'devices to untether work from inside the office'.

Data from other surveys also points to the demise of the 'fixed workplace'. For instance, data from Skills Surveys on changing patterns of work between 2001 and 2006 indicates a statistically significant decline in those who are 'mainly office, factory or shop-based' from 74.5% in 2001 to 71.9% in 2006, and a statistically significant rise in the 'use of other places for work' from 35.9% in 2001 to 37.8% in 2006 (Felstead, 2010).

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These changes have wider implications for the separation of 'home' and 'work', for social interaction and learning in employment and for planning policy:

- Growing use of 'hot desks' (bookable shared office space) and 'touchdown desks' in offices means in a more intensive use of office space and allow employers to save on office costs.

- For individual workers there are implications in terms of balancing physical distance from colleagues and clients with physical closeness to family and friends. Workers need to manage the twin pressures of isolation from colleagues with the need to avoid interruptions from family and friends when 'work' and 'home' are brought into close proximity (Felstead, 2012 in press); (as discussed later in this section).

- Those workers who need to travel to a fixed workplace only once or twice a week may choose to live further away from their workplace than they would do so otherwise, so raising issues for travel and transport policy (Wheatley et al., 2008). For example, they might choose to live in accessible rural areas and/or close to motorway junctions or mainline rail stations (Green, 1997). This in turn has implications for settlement patterns, and the greater dispersal that such patterns imply make it more difficult to sustain provision of public transport networks.

- Induction of new colleagues is more difficult to achieve outside a fixed workplace (Jewson, 2008). Some informal learning conventionally associated with being 'on site' at workplaces (for example sitting next to a colleague and watching and learning specific tasks/ procedures) has to be done in other ways (perhaps virtually, or by workers coming together for fixed periods in a more formalised manner), since participative learning is more difficult. Likewise everyday serendipitous contacts that are the norm in a fixed workplace environment are lost.

In conclusion, some work is being untethered from the workplace, albeit gradually in a process facilitated by the internet and related technologies. It is office workers and the relatively privileged that are benefiting most from these trends. Individuals involved in

Workers need to manage the twin pressures of isolation from colleagues with the need to avoid interruptions from family and friends when 'work' and 'home' are brought into close proximity

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a range of different working arrangements need to find out what works best, where and how, and for organisations, as well as the individuals concerned, the fact that it is difficult to learn from others given spatial separation needs to be addressed. In part this is a learning process on both sides.

Individuals involved in a range of different working arrangements need to find out what works best, where and how, and for organisations

Opportunities and implications for working practices

The internet and new ICTs have changed the working practices of a large proportion of the working population, although it is true that some types of jobs have been more affected than others. Knowledge and information workers are among those who come to mind when thinking about who can do their job from different locations aided by the use of technology. Nonetheless, although less-skilled jobs might not be as portable, the use of the internet means that these jobs have still been affected. For example, people in all types of jobs can remain connected with the world of work during situations such as career breaks and maternity or paternity leave, meaning that they do not have to become disconnected from the workplace. Also, being able to work from home using the internet may mean people have opportunities to stay in employment or take up employment when they might not otherwise have been able to (e.g. some disabled people, people with small children), but there is no detailed quantifiable evidence to indicate how many people have been supported in this way.

Collaboration with people based in different places is now possible thanks to ICTs as well. Mobile and smart phones put individuals within reach from practically any location; teleconference facilities allow groups of people across the globe to meet virtually; and documents and information can be securely exchanged. This requires the adoption of new sets of paradigms and working protocols to deal with the complexities of talking to people who are not physically present. This also suggests a vision of a virtual world of work where employees could be available from different parts of the world 24 hours a day, seven days a week. The idea is not new, with the Sloan Management Review publishing and article on the potential and adoption of the virtual office by companies more than a decade ago (Davenport and Pearlson, 1998).

Mobile and smart phones put individuals within reach from practically any location; teleconference facilities allow groups of people across the globe to meet virtually; and documents and information can be securely exchanged

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However, according to Messer (2010), the idea that companies could operate completely virtually if they chose to do so has not totally unfolded (see Vignette 10). The reason for this, the author suggests, is that organisations have not yet been able to create and transmit their business culture merely online and they still depend on face-to-face interaction. Still, the author points out the open source software movement[D] as an example of a culture that has developed virtually over the internet and suggests that organisations will also be able to create and transmit their culture to their employees in a virtual way.

D
Advocates and participants of the development of computer software with source code open to the public, which can be changed, improved and distributed by users. See **www.opensource.org**

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Vignette 10
Can the internet allow us to overcome time and space constraints?

Although the idea of the virtual office has been around for at least a decade thanks to the advances in ICTs, it has been suggested that the prospect of an organisation operating virtually is not without difficulties. According to Messer (2010) the following scenario has not crystallised yet for many businesses.

> "[A] financial analyst employed by an investment bank in New York, can live and work in Vancouver without having to relocate. The benefits to both parties are quite obvious, including a lower cost of living, cheaper wages because of differences in foreign exchange and no office space requirements. These cost saving can amount to 70% of the average annual remuneration for a financial analyst. In addition there is the benefit of having a wide range of workers from which to choose when searching for expertise. These knowledge workers will be unfettered by time constraints (quitting time in New York is early afternoon in Vancouver) and space constraints (New York and Vancouver both look the same to the internet)" (Messer, 2010: 102).

The economic recession is one of the reasons businesses are turning to encouraging their employees to work from home. So what was once seen as a perk is now in some cases a business necessity and an opportunity to save money on real estate costs (Businessweek, 2009). This, together with the opportunities provided by new ICTs, has potential to accelerate the adoption of the virtual office. Nonetheless, it is still agreed that the "office will remain the primary spot for meetings, collaboration, and, of course, gossip" (Businessweek, 2009: 2).

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The opportunities that ICTs open in relation to the way work is done have implications as well, particularly on the distinction that people make between working time and personal time. Although the idea of a clear-cut boundary between family and work life is contentious, it may be accepted that work is "what people do in an employed capacity, while 'family' remains an idealised realm or non-work or leisure that takes place alongside household work" (Currie and Eveline, 2011: 534). As these authors discuss in their work of e-technology and work/life balance for academics with young children, ICTs can contribute to both the **extensification** and **intensification** of work. While extensification refers to spatial dimensions and taking work physically into the home using ICTs, it can also be interpreted from a temporal perspective, meaning that work also extends to otherwise family time.

As for intensification, although globalisation and economic factors have also contributed to increased demands in relation to the amount of work that is expected from employees, new technologies seem to play a role as well, at least in individuals' minds. According to Chesley's study (2010; using a USA sample) people seem to agree with the idea that the use of ICTs such as computers and mobile phones makes them more effective, but also that their use leads to an increased workload and accelerated pace of life. In a previous study, Madden and Jones (2008; also using a USA sample) found that while 80% of the workers that took part in their study believed that technology made them more effective, 46% believed that it increased their work demands, and 49% said that they found it harder to disconnect when they were at home and over the weekends, thus making being connected a 'mixed blessing'. Southerton (2007) explained the relationship between people's perceptions of the effect of technology on their pace of life by arguing that technologies make "the coordination and personal allocation of practices both more 'pressing' and 'unavoidable'", therefore contributing to a feeling of 'harriedness' (p.126), which was observed in women more than men.

The extensification of work thanks to ICTs is sometimes seen as an invasion into private life, and responsible for the creation of a work culture in which employers expect workers to use technology to work more and longer hours (Stephens et al., 2007).

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This would suggest that technologies are working against and not in support of employers achieving a better work/life balance. Other studies also highlight the fact that the so called 'work extending technologies' (WET, or items of technology that allow work to be done remotely) have positive and negative implications. Towers et al. (2005) cite increased flexibility in terms of when and where the job can be done, and better productivity due to a more client oriented approach as positive effects of WET. On the negative side, they mention that flexibility can also be perceived as a negative effect since it increases expectations about the amount of work that should be done and of people being constantly on call. However, it has also been suggested that people have better control when it comes to the intrusion of work into family life with some technologies, such as the mobile phone (Wajcman et al., 2008).

Thus, there are positive and negative implications of the use of the internet and other ICTs on the extension of work to the sphere of family life, and an individual may experience both the benefits and drawbacks of the effect of WET at different times. To this, other benefits of the use of the internet for work purposes can be added, such as the global connections that are made possible and the access that this gives to other working cultures (see Murphy, 2011).

Thus, there are positive and negative implications of the use of the internet and other ICTs on the extension of work to the sphere of family life, and an individual may experience both the benefits and drawbacks of the effect of WET at different times

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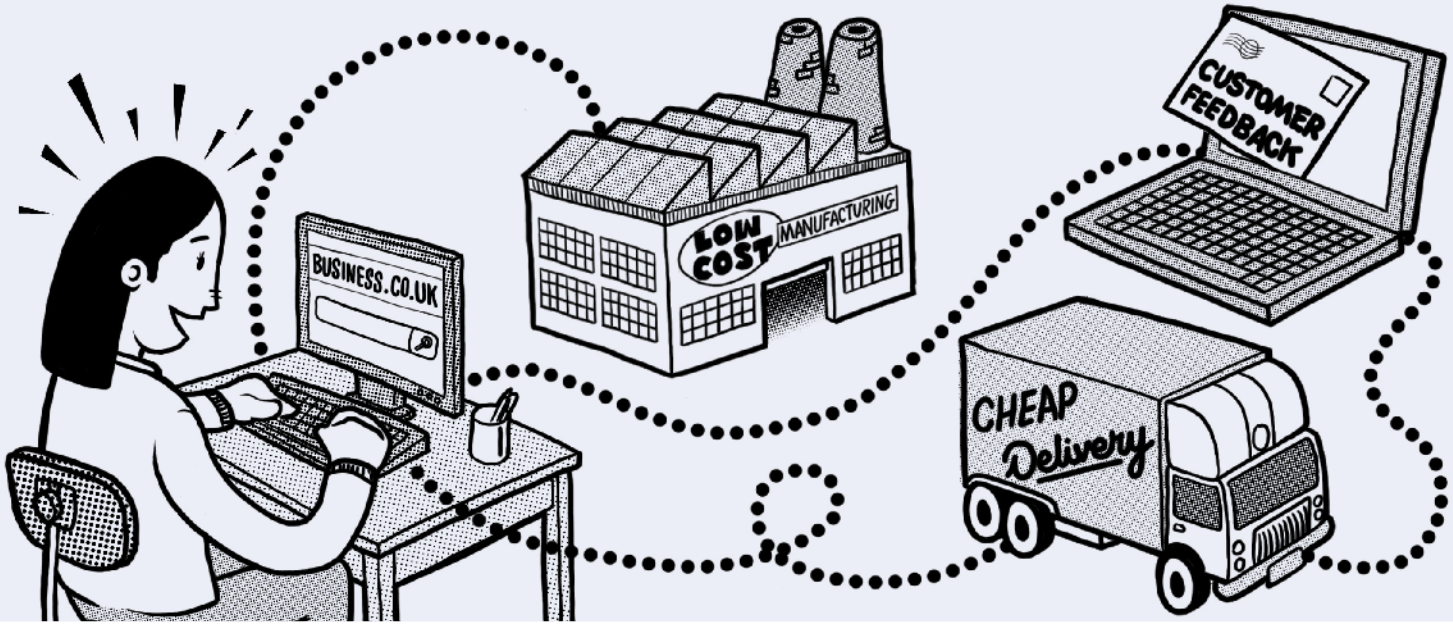
As well as existing businesses, the internet facilitates new opportunities for entrepreneurship (including social entrepreneurs) through lowering costs of entry (e.g. through selling on eBay). This chapter explores some of these opportunities.



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As outlined in previous chapters, the internet has evolved from a mere information dispensing vehicle into a robust transaction-facilitating environment. For businesses the internet has the potential to offer improved customers service (on a 24/7/365 basis through Web-based applications), lower operating costs (procurement costs, selling costs, just-in-time supplies, financial management, data processing, etc), and potential for producing better products (on the basis of customer feedback). Whether these business benefits are achieved in practice, and their implications for employment, is another matter.

Small businesses and the internet

The internet has changed the way businesses operate, but it particularly has potential to transform small business enterprises' (SMEs) operations. While until a few decades ago doing business all over the world was reserved mainly to larger transnational companies, the internet has made it possible for small businesses to exchange information with customers and providers located in other parts of the globe. This has been made possible through internet tools such as social media, online sales and cloud computing.

Social media (e.g., YouTube, Facebook, Google+, Twitter) allow businesses to communicate with customers and the wider community. As BCS (2006) pointed out, "since anyone can be a member, including businesses, social networking sites offer SMEs an excellent opportunity to tailor campaigns and messaging aimed at community members". Making social media work for small businesses poses many advantages but requires dedication and careful attention to the messages that are sent, both intentionally and otherwise. Their use is not without risks, however, and getting it wrong would impact negatively on a business's image.

As for online sales, small businesses can take advantage of the internet to sell their products and deal with some or all of their providers. Examples of this are the use of eBay and Taobao's Marketplace in China (see page 69). According to the Office for

Making social media work for small businesses poses many advantages but requires dedication and careful attention to the messages that are sent, both intentionally and otherwise. Their use is not without risks, however, and getting it wrong would impact negatively on a business's image

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National Statistics (ONS, 2011c) internet sales in Great Britain represented approximately 9.6% of total retail sales in August 2011, an increase from 7.1% in 2010, and 3.0% in 2006. Moreover, it is estimated that around 66% of all adults in Great Britain (32 million people) purchased goods or services over the internet in 2011 (ONS, 2011b). This suggests the growing importance of the internet for small businesses, as it allows them to offer better prices and convenience for customers.

Cloud computing

Another important resource made available through the internet that already benefits small businesses in particular is the possibility of hiring 'Software as a Service' (SaaS), or cloud computing (see Vignette 11). Cloud computing makes software and hardware accessible anywhere in the world via the internet and, most importantly, allows users to pay for this service as required (Sharif, 2010). This has important implications for SMEs since rather than investing in buying desktop-delivered applications and hardware (e.g., servers), and having the necessary staff to operate and maintain their IT systems, they can pay for computing services over the internet on a more flexible basis.

Cloud computing makes software and hardware accessible anywhere in the world via the internet and, most importantly, allows users to pay for this service as required

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Vignette 11
Cloud computing and Software as a Service (SaaS)

Although the terms are related and used sometimes indistinctly, cloud computing can be seen as a broader term incorporating SaaS. The following definitions of these terms can help clarify these concepts:

"SaaS means lending the software rather than selling it. SaaS is the distribution of software to end users remotely through the internet. SaaS is software developed to be offered and "consumed" like a service. In SaaS, there is no installation on the users' computers, the application runs at a remote location, typically the supplier's, the users being able to access it whenever they want or need it, thus the term of "on-demand" software. Also, it is payable on a monthly fee, as opposed to the traditional "on premises" model."

Cloud computing can be defined as a "model for offering on-demand computing resources over the internet. The cloud is in fact the internet, so the term cloud computing could be 'translated' as 'computing over the internet', as opposed to classical computing on the users own physical computer". The three major components of cloud computing are:

- **Software as a Service (SaaS)** – giving access to software over the internet,
- **Platform as a Service (PaaS)** – allowing users to "deploy content using the instruments of the cloud provider",
- **Infrastructure as a Service (IaaS)** – allowing users to "exploit computing resources for any type of application".

Source: Bajenaru (2010, Section 3.1)

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A useful way of understanding cloud computing is comparing the traditional business model of Microsoft against that of Google (Newton, 2010). On the one side, Microsoft can be seen as the epitome of the 'client-server' model where businesses buy servers and workstations; purchase the software licences for file sharing, wordprocessing, email services, etc.; and hire IT staff to maintain the system. On the other hand, Google allows its customers to use their products (e.g., Gmail, Google Docs) through a Web browser, eliminating the need for "hosting email and file servers on-premise, running database servers, and purchasing myriad software licences" (Newton, 2010: 28). Although this comparison helps explain cloud computing, it is worth highlighting that Microsoft is also aware of the benefits and business potential of cloud computing, and "already offers its ubiquitous Microsoft Office applications as a service, hosted in the cloud" (Clark, 2009: 19).

Among the business benefits of this technology [Cloud Computing] are the fact that it is dynamically scalable and that rather than investing in capital, businesses can purchase IT resources using their operational budgets

Cloud computing can give SMEs access to IT services and resources that until recently have only been accessible to larger companies (Clark, 2009). According to Smith (2009) among the business benefits of this technology are the fact that it is dynamically scalable (services contracted can be increased or decreased with demand) and that rather than investing in capital, businesses can purchase IT resources using their operational budgets. These are two advantages that can make considerable economic differences for SMEs, and can make the difference between a company being able to survive or going bust during an economic downturn. In other words, cloud computing gives SMEs "the opportunity to innovate by providing fast access to enterprise-level technology at the same time as reducing capital expenditure" (Ashford, 2008).

Despite the fact that cloud computing can be seen as a current IT hype there are concerns around it, contributing to businesses being cautious about adopting this new technological development. Some of these concerns are:

- **Security** - companies "are hesitant to host their internal data on a computer that is external to their own company and that is company-hosted with another company's applications" (Smith, 2009: 67). Security measures can be taken, however, this also raises concerns in relation to how these measures are defined, applied and monitored.

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- **Design flaws** - users have to trust that the design of the system – possibly created by third party suppliers developing code anywhere in the world – is up to the task and will stand browser-based weaknesses, for example (Mansfield-Devine, 2008).

- **Location of the data** - laws of the country where data is physically located apply to the data and this may also be a cause for concern. For instance, data physically stored in the U.S. "fall under the jurisdiction of the U.S. Patriot Act, allowing the U.S. government to access that data very easily" (Smith, 2009: 67).

- **Limited resources** - it may seem that the cloud is limitless, however, the net can become extremely difficult to navigate and offer poor performance at certain times due to the severe 'traffic' caused by the use of thousand of applications being used (Smith, 2009).

In addition to these there are other more technical concerns which are beyond the purpose of this report. Another threat to the credibility of cloud computing are the cases where the system fails. For example, in February 2009 users could not access Google Docs for three hours due to Google's Web servers being down (Clark, 2009); and more recently, in the first half of 2011, Amazon's EC2 cloud service collapsed and Sony's online gaming sites were hacked (Weber, 2011). These cases make potential users feel that they cannot be too cautious when it comes to signing up to cloud computing. Nonetheless, cost and efficiency justify the use of cloud computing and SMEs are encouraged to explore this option, possibly starting with data that is less critical to the business (Smith, 2009). Mansfield-Devine (2008) warns that there are no security standards specific to cloud computing but suggests users should require transparency of information from the provider and an open discussion on the measures adopted in relation to this (e.g., what testing is being done and by whom). After all, it has been suggested that SMEs can benefit most from the cloud, and with companies like Microsoft showing enthusiasm in this respect, cloud computing is a technology that may be worth considering.

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In sum, the three internet elements discussed here (social media, sales infrastructure and cloud computing) highlight the fact that small and also medium-sized businesses have a lot to gain from new technologies and in particular the internet. The latter, however, can be seen as a salient opportunity for SMEs, and in this way for the creation of employment. As mentioned in the chapter on 'The internet and employment', it is up to individuals to use their skills and creativity to innovate and create new products and services. Cloud computing, sales infrastructure and social media provide entrepreneurs and business owners with the right tools for the job (see Vignette 12 for the case of Animoto). Internet skills are indispensable to achieve this aim, but these will have to be used strategically and in conjunction with other skills and competences.

Small and also medium-sized businesses have a lot to gain from new technologies and in particular the internet

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Vignette 12
Animoto: The 'poster child' of cloud computing

Animoto is a Web application that allows users to turn photos, video clips, and music into "stunning video masterpieces to share with everyone" and which promises to be easy to use, fast and free (**Animoto.com**). Its features can be used by individual users but also by businesses as a marketing tool, helping them save money. Using Animoto, businesses can create professional 30-second-videos to advertise their products over the internet (e.g., on YouTube or through their own website) with minimal investment on marketing.

The application was launched in August 2007 with funding from the founders' friends and family and Amazon.com. Thanks to the use of cloud computing, the business is itself free of infrastructure and instead takes advantage of Amazon Web Services to operate. This means that server processing, computing equipment, bandwith and data storage are handled in the 'cloud' and paid for on demand. This has allowed them to grow in accordance to client uptake, which rocketed from 25,000 to 250,000 in a three-day period as a result of a positive posting on the popular website Slash.dot.

Cloud computing allowed Animoto the possibility to grow "without purchasing millions of dollars worth of computing equipment, hiring an IT department, or selling majority ownership to venture capitalists" (Smith, 2009: 65). This points out the benefits of cloud computing for the IT industry, and provides an interesting case of an application that, in turn, can be used to support SMEs in general.

Source: Smith (2009); Wilson (2008); **www.animoto.com**

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The example of Taobao Marketplace – China's primary consumer-to-consumer online shopping website

Launched in 2003, Taobao Marketplace (**www.taobao.com**), which is a member of the Alibaba Group, has become the largest and leading consumer-to-consumer (C2C) online marketplace in China. It aims to foster a comprehensive e-commerce ecosystem that provides partners and consumers with the best user experience. With more than 800 million product listings and more than 370 million registered users currently, Taobao Marketplace is the primary online shopping website for the largest online population in the world. Taobao Marketplace receives more than 60 million visitors daily and sells about 48 thousand items every minute. It has now become one of the world's top 20 most visited websites.

China's online shopping market reached 170.2 billion yuan (approximately $26.5 billion) in the second quarter of 2011, up nearly 77% compared with the previous year. Among C2C websites, Taobao is still the dominant player with 90.3% market share, followed by Tencent's Paipai with 9% market share. eBay's EachNet has a tiny share of 0.7%. Taobao is targeting $159 billion in transactions in 2012.

Taobao has thrived, according to internet analysts, because people do not need much capital to start online stores; it was even free to open a shop on Taobao in the first few years. The most recent job index released by Taobao shows that by the 31st December 2010, Taobao had created more than 1.823 million direct jobs, indicating that nearly 1.823 million people had set up their own shops on Taobao. According to estimates of the global consultancy firm IDC, each direct job on Taobao can bring 2.85 indirect jobs on average; thus by the end of 2010, Taobao had created in total more than 5 million jobs, both directly and indirectly. Over 60% of those are aged between 20 and 32 years, and it has become very popular for university graduates to get employed by opening shops on Taobao.

The fast development of China's online retail business has not only provided customers with new shopping choices but also provided a new platform for a growing number of

Each direct job on Taobao can bring 2.85 indirect jobs on average; thus by the end of 2010, Taobao had created in total more than 5 million jobs, both directly and indirectly

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entrepreneurs. The growth of online-shopping transactions in 2009 stimulated people to open online shops. By the end of 2010, Taobao shop owners had covered all of the provinces and municipalities in China. Taobao launched a series of practical policies, such as training opportunities and reduced costs, to help and attract new entrants. In February 2011, Taobao announced an investment of 400 million yuan (about $62 million) to support the small and medium sized sellers by providing them with free services and free shops. From 2009 onwards Taobao also strengthened the seller's preferential policies towards students. It established a training institution - Taobao University - and set up a three-dimensional teaching model by combining online training, onsite training and training certification. Hundreds of existing senior shop owners give lectures, and specific programmes have been designed to support relevant professional groups. The Taobao training network has spread over thirty cities across China and cooperated with more than a hundred colleges and universities.

The positive results from students' online shops have also contributed to the introduction of government policies to support them. For example, in June 2009, Zhejiang Provincial Education Department introduced the 'New Deal' stating that a student online shop with good credit is considered as 'employment' and is able to enjoy preferential policies for aimed at people establishing own businesses.

Shops on Taobao can help solve problems of finding employment for a large number of vulnerable groups, but also small shops have led to the development of a series of industries - such as delivery, billing, advertising, image design, online marketing and credit rating services. Basically, each transaction link can drive the development of an industry. In addition, the online shops have also overcome geographical restrictions that traditional shops face, and thus have greatly stimulated domestic demand. Following the positive effects of online business on employment and the economy, the Chinese government has determined to provide further support to online businesses, including: lowering the tax threshold for online business; ensuring more flexible, safe and secure online transactions; providing a more flexible management policy and providing consultancy and training services.

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In summary, the success of China's online business Taobao is attributable to the following factors. In the early years after Taobao was established, incentives for people to open a shop online included free opening costs, no tax, and free services and specific training tailored to shop owners. When Taobao developed onto a much larger scale, it continued to provide quality training and support policies for online shop owners, and the government also started to launch supporting policies for online business development.

Launched in 2003, Taobao quickly overtook eBay, which had been the largest Chinese online auction company in China. So what factors have led to the success of Taobao and how they might be relevant to the UK and other countries? There may be potential for Taobao-like services to help solve unemployment problems amongst young people. The widespread of the use of internet and relatively easy access to it, as well as the popularity of home computers has made the online shop a possible employment choice. A comparison between eBay and Taobao highlights the following conditions as key to online the success of online businesses:

1. **Price** - Taobao used a free-service strategy to enter the market and decided to keep transactions free of charge for the first five years since its launch (from 2003 to 2008), while there has been always a charge for listings on eBay (Chen et. al. 2007).

2. **Target** - eBay targets its mainstream users as those who are well-educated, familiar with the internet, earning a monthly income in excess of 3000RMB and between 20 and 40 years old. However, after a four-month analysis of China's C2C market, Taobao decided to target people aged 20 to 30 years, especially those who live in less developed cities. It also added older people to its target user base in 2005 (Chen, et. al. 2007; ChinaBusiness, 2006c; Sohu.com, 2005).

3. **Promotion** - eBay spent a huge amount of money advertising on mainstream and formal media, and national channels, while Taobao mainly advertises on informal channels, small or personal websites and traditional media.

The widespread of the use of internet and relatively easy access to it, as well as the popularity of home computers has made the online shop a possible employment choice

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4. **Design** - Taobao has a user-friendly and vibrant interface design, and it encourages users to make product and service designs, which are not advocated by eBay.

5. **Customer service** - Taobao has set up customer service centres to help its users and it has a more proactive service than eBay in terms of top management executives in Taobao chatting with users through forums and online tools.

6. **Loyalty programmes** - Both eBay and Taobao provide discounts and coupons. In addition to a discount policy similar to that offered by eBay, Taobao also gives buyers membership cards to record their transactions. When a certain level of repetitive purchasing has been made, the membership will be levelled-up to enjoy further discounts.

7. **Community building** - Both Taobao and eBay emphasise the importance of community building. While eBay actively organises community activities, Taobao encourages their users to organise activities themselves and it also encourages users to share knowledge, personal experience and feelings.

In summary, compared to eBay, Taobao provides more targeted, flexible and localised services to its users and tailors its service to individual interests. It has a wider customer base than eBay and gives help to more disadvantaged groups, and to young people in particular. It offers flexible discount systems and also has a localised negotiation policy, allowing buyers to negotiate prices with sellers. This is not allowed on eBay. Special communication and payment tools have also been designed to facilitate communication and transactions between buyers and sellers. It is the wider customer base, highly localised and flexible service, easy entry policy and active supporting activities (such as training) that have together contributed to Taobao's success.

Taobao gives help to more disadvantaged groups, and to young people in particular

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While Taobao in China was set up by a private company, the government might also be able to act as the owner of such a forum, targeted at helping provide employment opportunities for specific groups, such as young people or disabled people. It is in terms of targeting disadvantaged groups, and an emphasis on flexibility and localised services, that the UK (and other countries) might have most to learn from the Taobao experience.

6. Conclusions: Challenges, opportunities and influences

This chapter concludes this report by providing an overview and setting out some of the main challenges and opportunities pertaining to the internet and implications for current and future employment.

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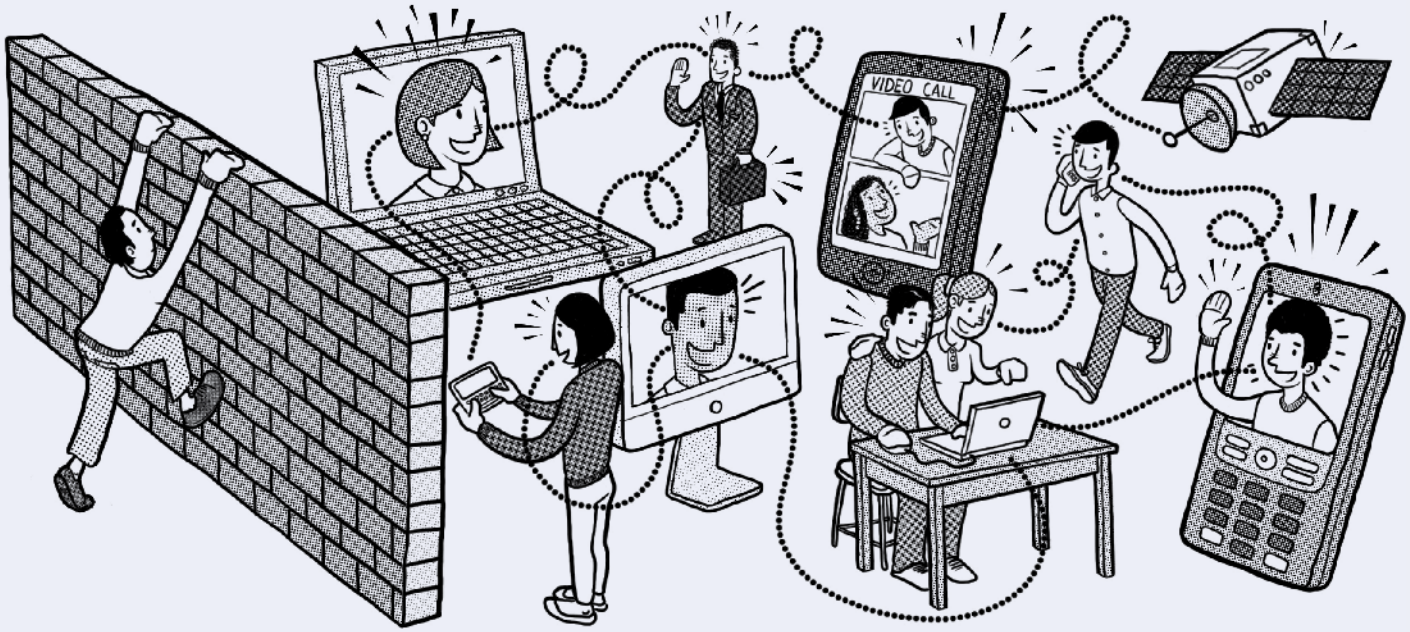

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Overview

According to the most recent statistics on internet access released by the Office of National Statistics, there were over 41 million adult internet users in the UK by the second quarter of 2011 (ONS, 2011d). These 41 million adults potentially benefit from the massive amount of information and communication possibilities provided over the internet.

However, at this time there were still about 9 million adults in the UK with no access to the internet. Of these 9 million, 4 million were from disadvantaged groups – including older people, disabled people, people from minority ethnic groups and those from lower socio-economic groups. These people are least likely to get online without intervention or support (BIS, 2010) and are most likely to 'lose out' in terms of accessing employment opportunities (and other services) via the internet. There are various initiatives to help digitally excluded people, such as the Race Online 2012 campaign, Age UK/AbilityNet, Get Digital and training courses provided by public libraries. Public spending cutbacks – including the closure of some libraries and community centres and reduced opening hours of others – may thwart progress.

While the UK Government has an ambition of getting most people online, so 'driving' greater citizen use of the internet, it is faced with many challenges. For example, the Government will need to ensure the wide availability of networks across the UK so that everyone has the option to get online at a reasonable internet speed. To date rural areas lag behind in this respect. In addition, actions need to be taken to tackle socio-economic inequalities in internet access, and also in costs of access. For example, work amongst digitally excluded Jobcentre Plus customers (Adam et al., 2011) highlighted that some unemployed people who had access to the internet from their home at the start of their benefit claim, could no longer afford such costs as their duration of non-employment increased. This illustrates how access to the internet is not 'uni-directional' (i.e. it is not a case of everyone who currently has access to the internet being able to maintain such access all the time). The costs of upgrading hardware and software may also be prohibitive to people on low incomes.

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With the internet pervading most aspects of life, there is a risk that people who do not have access to, or the skills to use, internet-based services become more vulnerable to further disadvantage and exclusion. With the digitalisation of government services, the voices of the digitally excluded people may not be heard. Consequently, the support or services specifically designed for the digitally excluded may not be effective due to the lack of information from them, which will then reinforce and deepen the digital exclusion of the most disadvantaged people (Whitfield et al., 2010).

Chapter 3 outlined the range of skills required for successful use of the internet. Given the vast volume of information available on the internet, and the increasing emphasis on 'self-help' advice and guidance (as outlined in Chapter 2), as well as technical skills to operate a PC, smart phone, etc, some internet users may also require help in **navigating** their way through the information available to them and assessing **the quality and relevance of such information**, especially so with increased volumes of user-generated material on careers, jobs, help with CVs, etc. Internet users also need to be aware that prospective employers may be able to find out a great deal about them through material they post on the internet; hence users need to exercise caution in what material they include in their internet profiles.

Other challenges of using the internet include security and privacy. Threats of online fraud and computer viruses and risk of exposing important personal information over the internet mean that users need to exercise caution when using the internet. Despite the challenges noted here, it remains the case that the positive changes and new opportunities related to the development of the internet outweigh the drawbacks.

The internet as a new means of spreading information has provided individuals and companies dramatic benefits and removed barriers of traditional commercial practices, such as geographical distance and high transaction and engagement costs. E-business and online shopping have contributed greatly to the global economy and created many new jobs. Over the past five years, the internet contributed 21% of the GDP growth in mature economies. While large businesses have significantly increased their performance, it is individual consumers and small, startup entrepreneurs that have

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grown more quickly and are exporting more widely (du Rausas et al., 2011). In addition, the internet has become a key driver of business transformation and economic modernisation. The global Small and Medium Enterprise (SME) survey conducted by Manyika and Roxburgh (2011) discovered that 75% of the economic impact of the internet comes from traditional companies that have benefited from higher productivity resulting from the use of the internet.

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While the use of the internet has contributed greatly to the economy of developed countries already, there is still room for further expansion. Recent developments in internet technology include cloud computing which delivers computing as a service and represents a different way to design and remotely manage computing resources (Winans and Brown, 2009). As noted in Chapter 5, it is able to process "big data" through computer networks instead of on individual computers, and to improve the efficiency and effectiveness of the way companies collaborate and share information through shared virtual workspaces and social networks (Manyika and Roxburgh, 2011). There is scope for companies to further reduce their management costs and expand existing IT infrastructures by outsourcing computing services.

In less developed countries, there are also great opportunities for the further development of internet technology. However, the path to an effective internet economy may vary across countries. Policymakers who look to encourage positive impacts of the internet on the economy and employment may, as suggested in Manyika and Roxburgh (2011), consider the need to foster competition, encourage innovation, develop human capital, and build infrastructure.

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Challenges and opportunities for current and future employment

The nature of employment has changed markedly as a result of the internet and this poses challenges but also opens up new opportunities. New ways of working have created differences between the generations that have grown up with the internet and those who have had to 'migrate' to it as their working life unfolds. This leads to

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challenges that range from older or less computer 'savvy' individuals needing to adapt to the new requirements of employment, to the need for managers to better understand how the values and behaviours of those from the so-called 'net generation' are affected by technology (Barzilai-Nahon and Mason, 2010; Hargittai, 2010).

Another important challenge in relation to the intensified adoption of the internet and related technologies by governments and society as a whole is dealing with digital exclusion. From an employment perspective, this exclusion can be seen from the time when an individual is looking for work, as most of those who do not want to use the internet or cannot do so are already at a disadvantage at this stage. Besides being crucial in the job search process, internet skills can be seen as a basic requirement to be considered as a suitable applicant for many jobs. Moreover, there is evidence to suggest that individuals with higher levels of education have a greater tendency to use the internet to fulfil their goals and to make their voices heard (Van Deursen et al., 2011; Schradie, 2011) and this has important implications for employment.

Together with these challenges, the internet also opens up new opportunities. Using the internet for recruitment offers a number of benefits including reduced costs associated with advertising (for employers) and efficiency and convenience in relation to searching for and applying for jobs (for jobseekers). In the UK, helping individuals to search for jobs using the internet is among the Government's priorities when it comes to encouraging and supporting people to adopt its digital services (Adam et al., 2011). This type of support offers benefits that may spill to other areas, since learning to search for jobs online can mark the beginning of learning to use the internet in other areas, including in employment itself.

Individuals possessing internet skills have access to information on the Web and are able to interact with a wider network of contacts virtually. This has implications for employment, but its effect depends on the type of job and, most importantly, on **how** the internet is used. In other words, being able to use the internet to improve 'one's position in life' (van Deursen et al., 2011) depends not only on skills related to how to operate and navigate the internet, but also on being able to use the internet

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strategically to achieve an aim. Thus, the benefit of using the internet can be seen at its greatest when individuals combine their internet skills with other skills such as problem solving and networking to innovate and start a business. The internet can, from this perspective, be seen as a tool that gives access to resources that individuals can use to develop businesses with potential to grow to, in turn, generate employment.

Some countries have seen growth potential in supporting the creation and expansion of small businesses using the internet, particularly by encouraging the use of cloud computing. For instance, the Malaysian Industry Development budget for 2011 contained measures to stimulate ICT adoption in the country and listed cloud computing among its top-ten priorities regarding strategic technology (Business Monitor International, 2011). Also in India, the government plans to invest in subsidies for SMEs to help them modernise by using cloud computing and to improve performance (CIOL News, 2011). The development of the cloud computing sector in these countries goes in hand with investments from businesses such as Microsoft and IBM as they seek to develop new markets.

In the UK, there is evidence of cloud computing's gaining importance. For example, e-Skills, the Sector Skills Council for Business and Information Technology, provides advice for businesses in relation to introducing cloud computing to their businesses. In relation to investment, Sunderland City Council announced plans to invest in cloud computing and to move most of its applications to a cloud server, which will be planned, designed and implemented by IBM (Say, 2011). The government body stated that the city-wide cloud infrastructure will provide better and quicker online services for residents, and that it will benefit businesses "through the ability to increase capacity and capabilities without investing in new infrastructure, training new personnel or licensing new software" (Parnell, 2011).

Thus, there seems to be support for businesses willing to consider cloud computing given the benefits, but further support is needed. As an example, there is still a need for free and reliable information to help SMEs in their decisions as to whether to adopt cloud computing. This includes a need for statistics in relation to the take up of these

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services and their impact on the business; and for further guidelines as to how to approach the risks posed by cloud computing would also be useful. Internet skills are necessary to take advantage of the positive impacts of the internet, but these are not sufficient. It is also important that individuals develop a critical understanding of the internet and see it as a tool to improve their employment situation. For instance, the internet can give flexibility to individuals in relation to where they work, but care should be taken to maintain a satisfactory work-life balance.

Third sector bodies already help individuals become familiar with the internet, but there may a niche for this type of organisations to provide more sophisticated support. For instance, Adam et al. (2011) highlight how charities such as UK Online and the Citizen Advice Bureau can support jobseekers by providing support in relation to accessing Jobcentre Plus services.

At one level this is about developing generic skills in using computers and the internet, and raising awareness of security issues associated with use of computers and the internet, but it would be helpful for such skills to be developed in the context of job search. Hence, examples and practice in using the internet could be developed in using sites where vacancies or training courses are advertised, etc, and where advice and guidance information can be accessed. Over and above developing skills in using computers and the internet, there is a more specialist role to be developed in terms of interpreting information on the internet and assessing its quality. It is important that third sector organisations work alongside Jobcentre Plus and Work Programme providers here. Internet users also need to be aware that prospective employers may be able to find out a great deal about them through material they post on the internet; hence users need to exercise caution in what material they include in their internet profiles.

Another way in which third sector organisations can help individuals become more at ease with the internet and related technologies is by using it more themselves to communicate with clients and deliver their services. In a McKinsey Global Institute report, du Rausas, et al. (2011) indicate that the "government's own usage [of the

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internet] encourages citizen use" (p. 33). Taking this into account, it can be argued that charities' own usage of the internet may have a similar effect on their clients. Of course, this effect goes beyond the use of the internet for employment purposes, but it also encompasses it. After all, internet use is a transferable skill and incentives to use in one area can yield benefits in other areas of life.

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The internet enables us all to think radically differently, to stimulate new forms of collaboration and to mobilise new communities of interest to take action for social good. It offers us phenomenal opportunities to inspire the creativity and compassion of millions of users in addressing social needs.

At Nominet Trust, we harness new possibilities presented by the internet to seek out, galvanise and nurture the untapped potential of social action that empowers people to change the world and their own lives in beneficial ways.

As a UK-based social investor and catalyst, we bring together, thoughtfully invest in and support people who use the internet to make society better.

All of our social investments are informed by research into current thinking and best practice. These investments are, in turn, evaluated to identify good practice. This good practice also feeds into further research on how to advance the internet as a tool to mobilise positive social change, which subsequently informs new investments.

To find out more about our work or how you can apply for funding, please visit:

www.nominettrust.org.uk

Visit Nominet Trust's website

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About our work

There are many ways in which the internet can bring about change. To make sure we achieve the greatest impact, our focus is on supporting projects and organisations that use digital technology to improve lives of the disadvantaged and vulnerable and to strengthen communities.

It is important to remain open to new ideas that offer a fresh perspective. Our aim is to seek out, galvanise and support innovative, early-stage projects that use digital technology to address big social challenges.

We also invest in a number of programmes that address a specific social group or issue, such as young people, local communities or health and well-being. By clustering our investment in this way we hope to increase our social impact. We regularly review the groups of people and issues we support so please check our website to find out our current focus.

Do you need support for your idea?
If you have an idea for a new initiative or would like support for an existing project then please get in touch.

We are particularly interested in projects that develop tools or models that can be replicated or scaled-up to benefit others.

To find out more about how you can apply for funding, visit us at:

www.nominettrust.org.uk

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