

Careering Through The Web

The potential of Web 2.0 and 3.0 technologies for career development and career support services

June 2010

This work was funded by the UK Commission for Employment and Skills as part of a programme of activity to inform development of the proposals in 'Ambition 2020: skills, jobs growth'. The report was produced by iCeGs and authored by Tristram Hooley, Jo Hutchinson and A.G. Watts.

The views expressed are those of the authors and do not necessarily represent those of the UK Commission for Employment and Skills.

Contents

Executive summary	2
1. Introduction	5
2. Technology and career information, advice and guidance: a brief history	6
3. The potential of new technologies to support career development	8
3.1 Community	10
3.2 Collectivising knowledge	11
3.3 Individualisation	13
3.4 Recognising time and place	14
3.5 Located in the cloud	15
3.6 Free or almost free	16
3.7 Diverse and integrated	17
3.8 Games	18
4. Current applications of web technologies to support career development	19
4.1 The delivery of career information	20
4.2 Automated interaction with career resources	22
4.3 Communication	24
5. Policy issues	28
5.1 Growing digital literacy to support career management	29
5.2 Developing mechanisms for quality assurance and recommendation	30
5.3 Supporting the technical upskilling of careers professionals	30
References	32

Executive summary

This paper examines the environment that the web provides for career exploration. Career practitioners have long seen value in engaging in technology and the opportunities offered by the internet, and this interest continues. However, this paper suggests that the online environment for career exploration is far broader than that provided by public-sector careers services. In addition to these services, there is a wide range of other players including private-sector career consultants, employers, recruitment companies and learning providers who are all contributing to a potentially rich career exploration environment.

Access to online technologies has continued to grow. While it is still not possible to talk about ubiquitous access, the convergence between web and telephone technologies means that a very high percentage of the UK population can now access online services if they want. This is not to say that the digital divide has vanished altogether, but rather that the divide is now principally centred around issues of culture, education and skill rather than the capacity to access an internet-capable device. It is more helpful to conceive this as the development of digital literacies: skill-sets that are needed to effectively utilise online resources. The poorer, more socially-excluded and older members of society are likely to have lower digital literacy, though it is important not to over-generalise. Given the importance of the online environment to career exploration, it is vital that the development of digital literacy be given a high priority.

The paper explores a range of technological trends that are likely to have impact on the way this career exploration environment develops. Eight trends are identified:

1. **Community:** The internet is an important site for community interaction: technology has increasingly become a tool to facilitate a wide range of communication.
2. **Collectivising knowledge:** A feature of many Web 2.0 technologies is their ability to collectivise and aggregate the opinions of many.
3. **Individualisation:** Users are increasingly able to individualise and tailor their relationships with online content.
4. **Recognising time and place:** Technologies are now enabling us to interact with the web in ways that recognise and identify time and place. This is particularly important to career exploration.
5. **Located in the cloud:** The way in which both applications and data are stored and delivered to the end-user is changing and is increasingly located off-site and with third-party providers.
6. **Free or almost free:** The cost of publication and development has dropped, enabling a wide variety of resources to be delivered at a much lower cost than in the past.

7. **Diverse and integrated:** The internet is increasingly integrated into a range of technologies across our lives. In particular, the convergence between telephone and web technologies opens up new opportunities for career learning.
8. **Games:** Computer gaming is gaining increasing penetration across society. It is important that the potential of both commercially produced games and bespoke educational games are explored for the purpose of career learning.

Given the wide range of technological developments that have the potential to impact on career exploration processes, it is important to examine how these have been being incorporated into the practices of a range of organisations. This paper demonstrates that technology has generally been used to help meet client demand in one of three ways:

1. to deliver information;
2. to provide an automated interaction; or
3. to provide a channel for communication.

Where technology is used to deliver information, it serves a range of functions. It can, for instance, recreate the careers library by supplying information about jobs and courses. This can increase clients' access and remove the space limitations that plagued the conventional careers library. However, this kind of technology also provides an opportunity to improve the quality of information, to harness the linked nature of the web to draw in external resources (such as employers' sites) and to provide a more media-rich experience through the use of pictures, audio and video.

Where technology is used to develop an automated interaction, there are a range of opportunities. The use of technology can automate the initial exploration and diagnostic elements of the usual advice and guidance service: for example, it can facilitate psychometric, matching and reflective tools, and perform some initial diagnostic tests. Technology can also be used to support people to develop their career learning skills: for instance, through games and simulations that can be used to provide an interactive way of exploring the worlds of learning and work. These technologies therefore both promote user-control and self-reliance, but also can automate some of the more routine aspects of the guidance process, so allowing professionals to focus on offering higher-level support to clients.

Finally, there is a range of tools that facilitate communication and interaction between people, usually but not always at a distance. These technologies include the telephone and email as well as a range of technologies that enable telephone and email communications to be more effectively managed. Such technologies can make professional support to individuals more accessible, and are also being used to build communities of learning. These technologies can be further classified as those that facilitate the following types of communication:

1. one-to-one;
2. one-to-many and many-to-one; and
3. many-to-many.

Each of these different forms of communication offers new potential for both career exploration and the delivery of career IAG.

Given the range of activity and opportunities identified by this paper, it is difficult to make straightforward policy recommendations. This is particularly the case as the internet is notoriously difficult to regulate. However, if the online career exploration environment is conceived as a market, it is possible to draw on previous work relating to the development of a market in careers to suggest three roles for public policy:

1. Stimulating the market in order to build its capacity.
2. Regulating the market and assuring the quality of services, both to protect the public interest and to build consumer confidence.
3. Compensating for market failure where this is appropriate.

A fourth role might be added: supporting the growth of an educated consumer. In order to achieve this and to maximise the value that individuals can draw from the online market, it may be useful to consider policy recommendations in three areas:

- supporting the growth of digital literacy to support career management;
- developing mechanisms for quality assurance and recommendation of career-related online resources;
- supporting the technical upskilling of careers professionals.

1. Introduction

Towards Ambition 2020 (UKCES, 2009) outlines a vision for the UK economy that foregrounds the development of skills in general and high-level skills in particular. As Sir Mike Rake writes in the foreword: “I believe our aspiration should be to ‘live in human capital times’.” In other words, the development of high-quality people is essential to the continued wealth of the UK and to the nation’s social fabric. However, as the report also argues, government funding is unlikely to increase and is likely to remain focused around the development of basic employability skills.

Given this picture, government’s role becomes that of encouraging individuals and employers to drive the development of skills. Career IAG has a central role in this process, helping individuals to recognise the importance of developing their skills and then supporting them in developing strategies to access learning and make progressive career decisions in a well-informed and well-thought-through way. Viewed from this perspective, the effectiveness of the government’s skills strategy is significantly dependent on the quality of the career decisions made by individuals, which in turn is dependent at least in part of the quality of the support available to them.

However, for the providers of career IAG to have this kind of societal impact, there is a need to increase the reach and quality of such services. It is anticipated that new technologies are likely to be a key part of reconceptualising career IAG around a different paradigm, with a much wider social reach. At the same time, the new technologies pose issues about the quality of delivery, with potential both to improve such quality but also to make it much more difficult to assure.

The publication of new policies related to career IAG both for young people (DCSF, 2009) and for adults (DIUS, 2008; DBIS, 2010) create a significant policy space within which new thinking on the role of technology in IAG can take place. Some of the thinking about how IAG can deliver a wider social impact has been undertaken as part of the preparatory work for setting up the adult advancement and careers service in England. There has also been considerable development of ideas about the remodelling of career IAG services in Skills Development Scotland, in Careers Wales and in higher education. This paper will draw together some of these lessons and explore how maximum advantage can be extracted from 21st-century technologies in delivering a lifelong service aimed at a wide range of social, learning and employment contexts.

For the individual, the development of the internet has already delivered a massive increase in access to career information and advice. People increasingly use the internet to mediate their relationship to the labour market. For example, a recent study by GradFutures, 2010) found that graduates spend 80% of their job-searching time online (GradFutures, 2010). While we might expect graduates to be particularly digitally literate, there is evidence that online job searching is becoming increasingly prevalent amongst all sectors of society; although it is also important to note that there remain noticeable differences based on demographics, employment status and levels of educational attainment (Martey, 2008; Stevenson, 2008). Recruiters are more and more aware of the migration of job seekers online and are reformatting their recruitment processes accordingly (CIPD, 2009; Hansen, 2008). The internet provides information about particular jobs, labour market trends, learning opportunities and job opportunities; careers service websites have recognised this and have responded by presenting their materials in similar formats.

2. Technology and career information, advice and guidance: a brief history

The recommendation by the UKCES that the sector should create a range of IAG services which utilise 21st century technologies is timely. The technologies often referred to as Web 2.0 (social networking, user-generated content, segmentable and repurposable data etc) offer substantial possibilities for changing the way people work, communicate and learn. Much thinking has already been done on the ways in which learning contexts are changed by Web 2.0 (e.g. Higher Education Academy, 2009; Redecker *et al*, 2008). There has also been considerable discussion on the impact of these technologies in a variety of fields such as business (Tredinnick, 2006), social organisation (Shirky, 2008), medicine (Giustini, 2006) and the democratisation of information (Weinberger, 2008).

Career IAG professionals and researchers have long paid considerable attention to the implications of technological change for service delivery. There is a substantial body of research looking at the relationship between ICT and guidance (e.g. Watts, 1996; 2002; Bosley, Krechowicka & Moon, 2005; Sampson, 2006a; Watts & Offer, 2006). This literature has also examined key issues such as the role of the internet in IAG (Evangelista, 2004; Offer, Sampson & Watts, 2001), e-guidance (Madahar & Offer, 2004) and developing the IAG workforce to make use of ICT (Cogoi, 2005; Barnes, 2008; Bimrose, Barnes & Atwell, 2010).

The rapid expansion of the internet and Web 2.0 applications has meant that this literature can date quite quickly. However, many of the overriding principles and issues from earlier study are still relevant to current practice. Watts (2002) identifies four phases in the development of ICT in guidance: the mainframe phase (1960 to late 1970s), the microcomputer phase (1980s to mid-1990s), the web phase (1990s to early 2000s) and the digital phase (current). He also identifies three trends that can be seen across the four phases: increased accessibility; increased interactivity; and more diffused origination (the trend towards more diverse creators and providers of career IAG). He notes that the role of ICT in guidance can be seen as a tool, as an alternative, or as an agent of change. While policy-makers have sometimes tended to view it in the first two guises, the main policy challenge is now its potential as an agent of change.

It is important that these web developments are seen in the context of wider technological changes that have the potential to impact on guidance. The development of telephone-based guidance services has been increasingly assimilated into the mainstream practice of guidance professionals and has been seen to deliver high levels both of customer satisfaction and of expert-rated quality (Page *et al*, 2007). It is noteworthy that in England the number of telephone interventions has declined somewhat in relation to web-based interventions, but that the telephone is increasingly being used for in-depth guidance rather than information and advice (Watts & Dent, 2008). These trends are best seen in the light of the diversification of communication modes used by careers services and the increasing integration between web and telephone technologies. Thus the Careers Advice Service (<http://careersadvice.direct.gov.uk>) has now augmented its telephone guidance service to include text messaging and email, discussion forums, and blog-based services.

Another important strand of technologies that are used in guidance is ICT-based career guidance systems such as the various products produced by Cascaid (www.cascaid.co.uk) and the Kuder Career Planning System (www.kuder.com). These systems typically use a mixture of interest and skills assessments to provide targeted occupational information and advice. The Association of Computer-based Systems for Career Information (ACSCI) (www.acsci.org) exists to represent these systems and has developed some useful standards for their development. There is an extensive literature that examines the appropriate use and effectiveness of these systems (see e.g. Betz & Borgen, 2009; Sampson *et al*, 2009). Many of them evolved iteratively through Watts's four phases (mainframe, microcomputer, web, digital). How these systems are interacting with the Web 2.0 world will be discussed further in section 4.2.

Cogoi (2005) explored the range of technologies that were being used to support guidance work and concluded that there was a distinction between two types of uses:

- As a *medium* for the interaction between a guidance worker and a client. This group of technologies included the telephone, email, chatrooms, newsgroups, SMS (text messaging) and video conferencing.
- As resources to provide information and support client decision making.

This remains a useful distinction. However, it will be argued in Sections 3 and 4 that there is a need for a more complex typology to take account both of the enhanced opportunities offered by new technologies and of the developing practice of careers practitioners.

In this paper the focus is to explore the potential of new technologies, and the potential that new developments create for enhanced access to information, to communication and to social interaction. Its purpose is to explore the ways in which these might be adapted by careers services or used by people to support their career learning, decision-making and progression. It uses examples from current practice to illustrate particular points or to identify areas where technologies exist but their application in a careers context does not. It is not a comprehensive audit of technological innovations within the guidance sector; neither is it a critique of current uses or services. Rather it uses current practice to explore the potential for future career service development in an increasingly digital world.

3. The potential of new technologies to support career development

Key to conceptualising the impact of new technologies on individuals' career development processes is a consideration of the demographics of web use. In 2009, 70% of UK households had internet access, and 76% of adults had accessed the internet in the previous three months (Office for National Statistics, 2009a). Amongst young people (16-24) surveyed in 2008, 93% had accessed the internet in the previous three months, and 77% accessed the internet every day or almost every day (Office for National Statistics, 2009b). All of these figures are trending upwards, as are figures for use of social media, mobile phones and figures relating to the use of the internet by children (Office for National Statistics, 2009c).

While the amount and the ways that people use the internet clearly have a relationship to age, this relationship is not always as straightforward as is often perceived. Ofcom (2008) found that the use of social networking sites was well distributed across the age ranges. Thus, for example, 49% of members of social networking sites were over 35, and 24% were over 50 (ibid, p.17).

As the internet becomes increasingly ubiquitous, it is easy to ignore the dwindling group who are not connected or engaged. Digital exclusion is not simply about the inability to find an internet connection, but rather relates to broader issues of culture and skill. It is argued that there is a particular combination of skills, attitudes and knowledge that can be characterised as digital literacy (Livingstone & Helsper, 2007; Pietrass, 2007). There is an exponential and positive relationship between an individual's digital literacy and the value that they can extract from the internet. But it is clear that while internet use might be increasingly widespread, digital literacy is not equally distributed throughout society. Those who are at greater risk of digital exclusion may include those from working-class backgrounds (Tien & Fu, 2008), the elderly (Helsper, 2009) and the socially excluded – for example, the rural poor (Warren, 2007).

However, digital exclusion cannot simply be assumed to be a function of someone's age, geographical location or place in society, as Roberson & Nardi's (2010) work on the use of digital technologies by homeless people in Los Angeles shows. Roberson & Nardi demonstrate that some homeless people are digitally literate and able to gain access to the web via devices provided by support services or using their own mobile phones or laptops; where the homeless were digitally included, it enabled them to use these skills to support their survival needs and to increase their social capital and social inclusion.

It is possible to take this discussion beyond simply identifying those who use the web and those who do so less or not at all. The question of who uses the web is necessarily followed by a discussion of how they use the web. The BBC is currently conducting an experiment with Ian Rowlands of University College London into online behaviour. Rowlands (2010) argues that "we know alarmingly little about how people really interact with the web" and poses a series of questions that are likely to differentiate different types of web user:

- How able are we to filter the enormous amount of information delivered to us by search engines?
- How confident are we in our ability to find the "right answer" when looking for information on the web?

- How much do we concentrate when we are using the web, even when we are using it to make potentially life-changing decisions?
- What is the role of memory in shaping what we do on the web? (How much of today's online journey do you actually remember?)
- How influential are "super brands" in defining the choices we make online?
- How do we decide on the reliability or "authority" of information provided by others online?

While it is unlikely to be possible for the providers of careers information and guidance to be able to optimise their sites for a wide variety of web learning styles, it is worth noting that there are likely to be significant differences in how individuals interact with web-based content. These may have a complex series of relationships to factors like age, educational level, digital literacy and personality.

The complexity of issues around the digital divide can make it difficult to formulate policy in this area. It would be easier if we could comfortably say that everyone had access to the internet or that certain groups were fully excluded. While there is some truth in the idea that those experiencing social exclusion are less likely to be digitally literate and included, this is by no means a rule. So far, careers services working with high-skill, socially-included individuals, for example in higher education, have been most able to grasp the potential of new technologies in careers work. However, some members of socially excluded groups such as NEETs (Marschalek & Unterfrauner, 2009) and the long-term unemployed are internet or web users. Marschalek & Unterfrauner's work on socially excluded young people suggests that many of the benefits of internet access are available to this group through mobile technologies.

Furthermore, there is a growing body of work looking at the potential of the internet to re-engage the socially excluded in the labour market. Kuhn & Skuterud (2004) found that while unemployed workers who used the internet for job search were more likely to be successful than those who did not, this was no longer true when they controlled for other variables. McQuaid, Lindsay & Greig (2003) concluded that while use of ICT for job-seeking was growing amongst unemployed workers, it was still at a relatively low level; they also found a tendency for the rural unemployed to be more engaged with internet and telephone technologies for job-searching. However, both of these studies are now more than five years old, and it is possible that Marschalek & Unterfrauner's findings might now be more widely generalisable, given the increasing level of convergence between web and telephone technologies.

As can be seen, technology is developing rapidly, so it can be difficult to evaluate comprehensively what might be useful for career development work. This section will now go on to outline a series of technological trends that seem to raise important opportunities or issues for careers work. These trends are based on the authors' experience, discussion with career practitioners and a review of literature relating to recent technological trends (e.g. Redecker *et al*, 2008; Weinberger, 2008; Shirky, 2008; O'Reilly & Battelle, 2009).

3.1 Community

In *Bowling Alone*, Putnam (2000) argues that the key issue in assessing the impact of the internet is whether people use it more like the television (alienating, individualised, based around consumption) or more like the telephone (connecting, social, producing). It now seems clear that the internet has become a super-charged telephone at least as much as it has become a multi-channelled television. A large number of the opportunities associated with new technologies are about finding new ways for people to talk to each other, whether one-to-one (chatrooms, videoconferencing etc), one-to-many (blogs and video-sharing sites) or in groups and communities (social networking and community communication sites).

This myriad of new ways in which people can communicate is driving social and political change (Shirky, 2008) but is also increasingly challenging the way in which people use the web and discover information. To a growing extent, individuals are discovering internet resources via peer recommendation. It has been observed that this is starting to challenge search engines as the main way in which resources are discovered (Long, 2010). Search engines can only provide the answer to a question that you already have, while social networks have the capacity to provide new and surprising questions. This ability to provide challenging and new information offers huge potential for career exploration, as it has the potential to provide options and ideas for exploration that may not previously have occurred to the individual.

In exploring the value of technology for career IAG, it is therefore important to engage with these increased opportunities for human interaction. Careers websites have tended to see the web largely as a broadcast (one-to-many) medium through which information can be communicated from the professional to the client. Where communicative technologies were used, they were similarly conceived as an extension of the existing one-to-one practice of career IAG (Offer, 2004). The technologies associated with the social web challenge this by increasingly utilising many-to-many forms of communication. This requires a new kind of guidance pedagogy that recognises and utilises the socially situatedness of communications, perhaps by seeking ways of engaging peers, mentors and employers more strongly in the guidance and career decision-making process.

While there are a myriad of ways in which the ideas of community can be harnessed to support career exploration, the Twitter Advice Project (TAP) provides a functioning example that combines professional guidance with peer support. TAP is a service offered by the CareerRealism blog (<http://www.careerealism.com/category/twitter>). People with a question are invited to email twitter@careerrealism.com with a career-related question. The question gets posted on the TAP blog and a range of career experts answer it, using the microblogging site Twitter. This has the potential to spark further conversations and interactions between the experts and the wider community, and also leads to the development of an online archive of questions, answers and discussions that currently (31st March 2010) comprises 464 questions.

What TAP has done is to move a one-to-one interaction into a social context. It is not attempting to replace the traditional guidance interaction: indeed, experts contribute in order to raise their profile and engage clients in more conventional career consulting. However, TAP has managed to socialise both the questioning and advice-giving and to be a medium for interaction, while simultaneously creating a resource for exploration.

3.2 Collectivising knowledge

Current technologies allow us to harness collective intelligence in ways that radically alter the way we understand the role of expertise and the production of information. O'Reilly (2005) contrasts the approach which underlies Amazon's search with that which underlies its competitor Barnes and Noble (barnesandnoble.com). Amazon's listings always favour the "most popular", aggregating the choices of its customers, whereas (at the time of O'Reilly's article) Barnes and Noble used their website to push their own products and priorities. However, the idea of harnessing and collectivising knowledge goes beyond this kind of plebiscite democracy by creating ever more sophisticated mechanisms for aggregating the opinions of the many. A system like Wikipedia enables its users to engage in the creation of a negotiated understanding of truth, one which has been found to deliver more reliable content than its rival the expert-produced *Encyclopaedia Britannica* (Giles, 2005). This is not to say that there is no value in expertise. But, as Surowiecki (2005) argues in *The Wisdom of Crowds*, if you can find a way to aggregate the opinions and knowledge of the crowd, this can often outperform conventional expertise.

If Wikipedia socialises the creation of data, services like Flickr (www.flickr.com) and Delicious (delicious.com) socialise the creation of metadata. In a world where there are no real limits on who can publish or the amount they can publish, the organisation and categorisation of information becomes even more important than the information itself. Conventionally, this was done through the creation of an expert taxonomy: an example in the careers field was the Connexions Resource Centre Index (Connexions, 2008). Web 2.0 technologies enable these conventional expert-designed taxonomies to be replaced with folksonomies.

A folksonomy is an organisational structure defined by users rather than by experts or designers. It allows multiple personal structures to be created, as well as offering the capacity to aggregate these subjective individual structures together into a collective metadata structure. So, for example, a search for “career” on the social bookmarking site Delicious lists 310,246 sites relating to career (2nd April 2010). Users can use this list to find out the sites that have been tagged as relating to career most often by others, and to access a series of related terms. So we can see that over 17,000 people see the business networking site LinkedIn as having relevance to career, and that 2,306 people have tagged a post on Bhuvana Sundaramoorthy’s Blog entitled 50 Common Interview Q&A. It also demonstrates that the terms “job”, “jobs”, “business” and “resumé” are commonly seen as related to the term “career.”

These new ways of aggregating knowledge support the development of a public sphere within which ideas can be shared, debated and synthesised, and reinforce the trend towards community discussed in Section 3.1. Surowiecki (2005) has theorised the challenge that markets and other aggregators of information can pose to conventional ideas of expertise. He argues that, given the right conditions and a functional system for aggregation, a crowd is likely to make better decisions and to possess more knowledge than an expert. Surowiecki’s conditions are that the crowd needs to be diverse, that its members reach decisions independently, and that they work on the problem in a decentralised way. While it is possible to dispute Surowiecki’s thesis (Tammet, 2009), it is difficult to challenge the idea that the internet offers a wide range of tools to aggregate the views of the crowd and that these aggregations are becoming increasingly influential. The generation of huge amounts of user content and its mediation through equally large amounts of user metadata mean that services which are based heavily on the possession of information, or on experts’ ability to organise and locate this information, may need urgently to rethink their unique selling points.

The ability to use technology to aggregate the knowledge of individuals offers a range of exciting possibilities for career exploration. Wikijob (www.wikijob.co.uk) provides one example of this. It offers stakeholders a career learning resource which is developed and written by users of the site, on the same basis as Wikipedia. The fact that contributors include career learners, career professionals and employers has the potential to strengthen the site. The successful generation of a community of editors expands its scope to develop and respond to change beyond what would be possible within a single organisation. However, the challenge to develop a sufficiently large community of authors and editors (as has been done with Wikipedia and possibly with Wikijob) remains the key challenge.

3.3 Individualisation

The ability for a user to control their own interface with web content is another important theme. Previously, organisations have seen their websites as the centre of their online communications with their users. Effort was expended to make sites “sticky”, so that once you entered you would not want to leave. However, the increasing powers of search mean that users have much more capacity to dive straight into the content that they want. This has the potential to re-conceive how interactions happen on the web. Whereas energy has hitherto been expended on the creation and organisation of the interaction space (the website), it is increasingly the case that the interaction space is the internet as a whole. In this case it may be that the traditional website becomes less important as users engage with granulated content through a range of platforms.

Aggregation is an important user strategy to manage interactions with a wide variety of web content. It includes a variety of services that allow users to bring together material which interests them, to help them to assimilate it, and to build relationships between different entities. The development of portals (applications that co-locate data or functionality from two or more external services), aggregators (applications that create a single datastream from multiple sources) and mashups (applications that combine data or functionality from two or more external sources to create a new service) all enable the user to individualise their interactions with individuals, organisations and information.

Individualisation provides a powerful way for individuals to manage information overload, but its potential goes beyond merely filtering out information. The ability to create a personalised interaction with online information paves the way for the creation of what has been described as a personal learning environment (PLE) (Attwell, 2007). The PLE is not a piece of technology but rather a type of interaction that can utilise a range of technologies. Johnson & Liber (2008) argue that the development of user-driven PLEs necessitates a new pedagogy which recognises this changed dynamic between individuals, professionals and institutions.

For careers organisations, the main issue is to provide content in ways that support the creation of individual’s learning and information pathways through their content. The use of push technologies like RSS which are designed to syndicate content to users are likely to be an important component of this. Careers adviser Elizabeth Wilkinson has used Netvibes to draw together a range of resources for her clients (postgraduates at the University of Manchester) on her Resources for Postgraduate Careers page (www.netvibes.com/postgradcareers#The_Careers_Service). This serves the dual purpose of providing an aggregated point of access to a range of services, and amplifying an approach to information management that clients can use. In order for individuals to access fully the opportunities offered by individualisation, they will need to increase their ability to manage and interrogate information. This will be discussed further in Section 5.1.

3.4 Recognising time and place

Traditionally the internet has been poor at recognising time and place. Google's main search tool provides results in a way that tends to favour established sites and does not take account of geographical location beyond the national context. There are obviously huge difficulties in processing this kind of information. Asking a computer to identify what is recent is difficult, but asking it to identify what is current is more difficult still. Similarly, identifying where something originated, where it relates to, and how broad a geographical area it will still be relevant to, are complex issues. This is highly problematic for career exploration processes where time (now) and place (near here) are generally important.

The difficulty of using the web in ways that enable the identification of appropriate information in relation to the time and place of the searcher is being tackled through a number of different approaches. The concept of a semantic web in which data is described through some kind of common metadata has strong support from the World Wide Web Consortium (W3C) which is the international body that develops standards to ensure the long-term growth of the Web (W3C, 2010). The development of metadata standards can be combined with the increasing power of search to extract and extrapolate metadata in order to create services which are better at recognising time and place. This has already resulted in services like Google's New and Blog searches which favour recently-posted information.

An alternative approach to the creations of semantic web metadata is the approach inherent in social media. Many social media services facilitate real-time or near-real-time communication. Information is generally served to users in ways that emphasise recent activity. Furthermore, people's use of social media is based on the development of networks of people who share a characteristic or interest. Geographical location remains a powerful characteristic that commonly drives the creation of links in social networks. The experience of using social media is therefore one of being in real-time communication with people, many of whom are geographically proximate to you. While the full functionality of the semantic web remains as an aspiration, people are increasingly accessing time- and space-relevant web content through the use of social media services.

The value of time- and place-specific web content has been identified by recruiters, who have been engaging job-searchers through using services that develop existing technology for recruitment purposes. Hansen (2010) argues that real-time job search changes the nature of online job-searching activity, and it is certainly true that this trend is likely to favour those who possess a greater degree of digital literacy. TwitJobSearch (www.twitjobsearch.com) brings together the elements of time and place by extracting all vacancy information that is posted on Twitter and providing tools to search and filter it. One of these tools, for example, combines vacancy information from Twitter with map data to map the location of the vacancies. This kind of tool is obviously enormously valuable to job-seekers, but it also provides a useful tool for career exploration by enabling people to visualise and explore the current distribution of jobs across a range of variables (geography, sector, salary etc).

3.5 Located in the cloud

The cloud is a metaphor that is used to describe the intangible and distant nature of the internet. Whereas information that is stored on your computer sits in a black box next to your screen, information that is stored on the internet has a cloud-like existence, at once observable and present but also intangible and distant. It represents a paradigm shift in computing, from a situation where most of your data and applications were located on your computer, to a situation where most data and applications are delivered via the internet. So we see a move from desk-based applications like the Microsoft Office suite to cloud-based applications like Google docs, which provides a range of office-based applications and the capacity to store your data online. For programmers and developers, cloud computing goes beyond providing a way to store data or access applications, and opens up a new scalable environment within which development can take place.

For organisations, cloud computing has big implications for the management of technical infrastructure. The locus of infrastructure moves away from a single organisation towards the internet. However, cloud services do not really live in the cloud, but are usually supported by a third-party supplier with a huge data centre who can provide infrastructure, applications and/or space in a similar way to the way a utility is provided. From a business perspective, the key advantage therefore lies in the ability to scale a range of technical resources up and down to fit with demand.

For individuals, cloud computing opens up some possibilities that are likely to have implications for career. The ability to create online spaces which can serve as repositories for data, to move data easily between learning and work environments, and to be able to share these resources with others, has the potential to mainstream the idea of the e-portfolio. This builds on the discussion of PLEs in section 3.3 by enabling individuals not only to engage with a range of personalised learning content but also to respond to it and share it with both professionals and their peers. E-portfolio tools are now being used strategically by a range of careers services to facilitate career learning (Watts, 2010), so it is interesting to investigate ways in which use of reflective career learning processes can be extended beyond the formal educational contexts within which e-portfolios are usually introduced. The ability to create, organise and share materials can support and smooth transitions and can provide ways to record and market individual and collective achievement. E-portfolios within careers-service websites provide one way to achieve these benefits, but it is increasingly possible to “portfolio-ise” your learning and experience using tools such as LinkedIn (to provide CV-type material, qualifications and references), blogs (to provide textual examples of your work and thinking) and Flickr or YouTube (to provide visual and multi-media content). The cloud simply describes the location of these materials; the ability to use this location to selectively retain and broadcast key life, learning and work information across the course of a life journey has huge potential implications for career development.

3.6 Free or almost free

The internet has always provided a low-cost publishing opportunity. Until recently, however, moderate technical skills and the ability to serve information to the web provided barriers for many. The development of Web 2.0 applications such as Facebook (www.facebook.com), Wordpress (wordpress.org/) and YouTube (www.youtube.com) have changed that, by making the user interface simple enough that almost anyone can now post content on the web. Allied to this, the move to cloud computing (as discussed in Section 3.5) has reduced the need for technical infrastructure. However, perhaps most important to the massive growth in user-generated content has been the falling costs of web publication.

The cost of publication falls dramatically once there is no longer a need to produce a physical object. It also falls when you remove editorial and selection processes and just allow everyone to publish everything. This is not to sidestep the difficult issue of how to make much Web 2.0 activity sustainable if there is no profit in it. Many Web 2.0 services make no money; others work through selling advertising or charging for premium services. However, the experience for the ordinary user is generally that they can now get a lot of functionality via the web without paying for it.

This movement to free or nearly free services has a number of implications. Perhaps most importantly, it creates a culture of “publish and then filter” rather than “filter and then publish”. When publication costs money, a lot of energy needs to go into sorting out what is worth publishing. But when publication is free or nearly free, there is no need to do this. This has the effect of transferring the process of filtering to the reader, which in turn requires a digitally literate reader with command of some of the technologies discussed in Section 3.3.

The ability to publish freely also provides an opportunity for individuals to market themselves, their ideas and their skills more easily to employers and investors. The idea that successful individuals need to create an online brand has become an important part of the language of careers. Dan Schwabel’s Personal Branding Blog (<http://www.personalbrandingblog.com>) provides career advice centred around the idea that creating a substantial digital footprint is essential to progressing a career. Hansen (2009) also argues that conventional job listings are being replaced by a more dynamic and two-way conversation between recruiter and potential recruit. If this is correct, and if online brand is going to play an increasing role in the management of recruitment and career, this creates a need to support individuals in developing the skills to manage their online profiles and build relationships with employers.

The lowering cost of publication has certainly allowed a new generation of private-sector careers consultants (such as Hansen and Schwabel) to develop their brands. The profile of the private-sector careers consultant/expert/blogger has been increased by the possibility of low-cost publication. To give an idea of the scale of this trend, it is worth looking at the RiseSmart Career 100 (<http://www.risesmart.com/risesmart/blog/career100/>) ranking of career blogs, which currently lists 333 English-language careers blogs. Many of these sites offer high-quality careers advice offered by experienced careers practitioners. However, from a public-policy perspective, the ability of the discerning consumer to sort through the plurality of resources and to contextualise advice within the context of their own life is key to ensuring the usefulness of these resources.

3.7 Diverse and integrated

The internet is no longer constrained by conventional desktop computing. The growth in internet-focused peripatetic devices has been enormous and looks set to continue (ITU-D, 2010). The ways that people are accessing online services are becoming both more diverse and more integrated. Users can pull content off the web to their telephone or TV, just as they can integrate their Sat Nav or fridge into their computer (O'Hara and Shadbolt, 2008, p.15). In particular, this means that through the red button on digital TV remotes and the high levels of mobile phone ownership, the web is penetrating into social and economic groups that desktop computing has not penetrated.

As discussed in Section 2, the Careers Advice Service has been providing careers information and advice using text messages. There are also a growing number of applications for the iPhone that support job searching and professional networking (Schwable, 2009). These include mobile-optimised versions of services like LinkedIn (www.linkedin.com), as well as new services such as Job Compass (<http://itunes.apple.com/app/jobcompass-want-to-find-a-job/id297264903?mt=8>) which uses the iPhone's locator feature to hone in on your position on a map and gives you the ability to search for a job within a 5- to 100-mile radius.

There is also a rich pedagogic literature that examine the use of mobile technologies in supporting learning (Naismith *et al*, 2004). Particularly relevant to career learning is the way in which mobile technologies can facilitate situated learning in a variety of authentic contexts. This raises a range of possibilities, such as using mobile learning approaches to support and facilitate learning during work experience for example.

3.8 Games

Gaming has gradually grown as a mainstream pastime. It has enormous penetration with young people, but has also increasingly moved into mainstream (adult) culture. Purpose-built games have been utilised in education for a number of years. However, there is a growing discussion about the learning that takes place through mainstream computer games (Royle, 2009). Games-based learning can take place within the context of a formal curriculum, but is more likely to take place outside it. How careers work can utilise computer games is worthy of investigation. Careers educators have certainly been using face-to-face games and simulations for years to enable people to experiment safely and to explore decisions and transitions (Jamieson, Miller & Watts, 1988).

The possibilities offered by game -and simulation- based learning are already being used to support career exploration. On the one hand, purpose-built career-learning games such as the Real Game (www.realgame.co.uk) provide opportunities for young people to explore career and related issues through an engaging and interactive educational game. On the other hand, mainstream games like the forthcoming The Sims 3 Ambitions (http://news.ea.com/portal/site/ea/index.jsp?ndmViewId=news_view&ndmConfigId=1012492&newsId=20100304005459&newsLang=en) seem worthy of further investigation for their utility in career learning.

4. Current applications of web technologies to support career development

Technological change has the potential to alter radically the ways in which individuals engage in career exploration processes. As discussed in Section 3, new technologies are changing the ways that individuals interact with information, with each other and with the labour market. This section will go on to explore the ways in which organisations are responding to these trends within the context of supporting career development. Much of the practice discussed here is emergent and is included to give a flavour of the kinds of innovations that are currently being explored.

In a discussion of how organisations are supporting career development activities, it is important to recognise that public-sector careers services are not the only providers of relevant web content and services. As discussed in Section 3.6, the environment provided by the web has served to lower the costs for individuals and organisations seeking to publish career-related material. It has also blurred the distinctions between, on the one hand, the trained, public-sector, impartial careers advice, and on the other, services offered by a host of private-sector organisations. It is possible to see this proliferation of career-related information as a threat to the integrity and viability of career IAG. However, it is perhaps more fruitful to see the burgeoning market in online careers information, advice and guidance as an opportunity. In order to make the most of this opportunity, traditional careers services will need to think carefully about their role in this increasingly crowded marketplace. Policy-makers will also have to think about how far the market can be shaped and managed, as will be discussed in Section 5.

Organisations, services and individuals have harnessed the opportunities generated by technological advances to repackage their services, refine and develop their offer, and respond to their markets. Technology has generally been used to help meet client demand in one of three ways:

1. to deliver information;
2. to provide an automated interaction; or
3. to provide a channel for communication.

Where technology is used to deliver information, it serves a range of functions. It can, for instance, recreate the careers library by supplying information about jobs and courses. This can increase clients' access and remove the space limitations that plagued the conventional careers library. However, this kind of technology also provides an opportunity to improve the quality of information, to harness the linked nature of the web to draw in external resources (such as employers' sites) and to provide a more media-rich experience through the use of pictures, audio and video.

Where technology is used to develop an automated interaction, there are a range of opportunities. The use of technology can automate the initial exploration and diagnostic elements of the usual advice and guidance service: for example, it can facilitate psychometric, matching and reflective tools, and perform some initial diagnostic tests. Technology can also be used to support people to develop their career learning skills: for example, through games and simulations that can be used to provide an interactive way of exploring the worlds of learning and work. These technologies therefore both promote user-control and self-reliance, but also can automate some of the more routine aspects of the guidance process, so allowing professionals to focus on offering higher-level support to clients.

Finally, there is a range of tools that facilitate communication and interaction between people, usually but not always at a distance. These technologies include the telephone and email as well as a range of technologies that enable telephone and email communications to be more effectively managed. Such technologies can make professional support to individuals more accessible, and are also being used to build communities of learning.

4.1 The delivery of career information

As with information in many other fields, it is increasingly easy to find a wide range of information to support career development online. Information that might traditionally have required a special trip to the careers adviser or the careers section of the public library is now readily available to anyone with a web connection, and increasingly to anyone with a mobile phone.

This move to provide information freely via the internet reflects wider trends in information provision, but has also been explicitly driven by government in order to support widening access to learning and employment opportunities. For example, the Action Plan for the 14-19 Prospectus and the Common Application Process (DCSF, 2009) has required all areas to develop an electronic prospectus to collate and present complex information about opportunities in learning and training in a format which, they argue, appeals to young people. In some areas, complementary sites have been developed that bring together a wider range of learning opportunities for both young people and adults. In the East Midlands, for example, the Your Future East Midlands website (www.yourfuture-eastmidlands.co.uk) links career destination with current level of learning in order to plot progression pathways and course availability.

Information about different occupations can also be found on a number of sites, including the Prospects graduate careers database (www.prospects.ac.uk), the Careers Advice Service's Advice Resources (www.advice-resources.co.uk/) and the Connexions Direct service (www.connexions-direct.com/jobs4u/). Currently these present largely text-based information, although there are some moves to develop more dynamic and multi-media content.

The sites of public-sector careers services provide authoritative and impartial resources. They often link to the sites of employers and recruitment organisations, which also provide a rich source of occupational information that can support career exploration. For example, the PricewaterhouseCoopers recruitment site (<http://www.pwc.com/uk/en/careers/index.jhtml>) contains pictures of current employees, a blog written by recent recruits, and up-to-date information about salary, training and vacancies, alongside tips about careers and employability.

Recruitment sites such as Monster (<http://www.monster.co.uk/>) also contribute to the rich information environment that is available for career exploration. These sites are somewhat more “objective” than employer sites, but because they are commercially based, they are still not fully impartial or comprehensive in the way that a public-sector careers service can aim to be.

The limitations of text-based resources have resulted in the generation of media-rich forms of information dissemination. Thus, for example, iCould (icould.com) offers hundreds of short films describing the career journeys of a cross-section of individuals. Careersbox (www.careersbox.co.uk) offers a similar service, but providing job profiles rather than career journeys. U-Explore (<http://www.u-xplore.com/>) brings several of these elements together with its development of job profiles, with fact sheets about salary, entry requirements and so forth, alongside video clips, and 360° representations of a typical workspace.

Alongside information about course and occupational opportunities, there is information about the labour market. This includes trend information giving a strategic overview developed by the respective Sector Skills Councils, accessible via a portal managed by the University of Warwick (www.guidance-research.org/future-trends).

Individuals engaged in career exploration are also likely to engage with existing vacancy information. This is available in a myriad of places including individual employers (most of whom have a “Vacancies” space on their web-sites), recruitment agencies and newspapers. In the public sector, job opportunities are available via JobCentre Plus (www.jobcentreplus.gov.uk), while the National Apprenticeship Service has a national Vacancy Matching Service (www.apprenticeships.org.uk/).

The individual has the possibility of accessing a rich range of information for career exploration on the web. Where this information is provided in ways that make it easy to aggregate, to comment upon and to organise through the creation of folkonomies, the pluralism of the web is likely to add substantial benefit. The use of RSS by the researcher careers organisation Vitae (www.vitae.ac.uk) enables the organisation to provide dynamic content (news, events, blogs, etc) in the form of feeds that can be picked up and utilised by users in whatever context they want (email updates, via a portal such as Netvibes or via an aggregator like Google Reader). The organisation creates content and identifies the content of others, but users are not required to come to the organisation’s website to access this content. Similarly, the Manchester University Careers Service uses Twitter as a push technology updating subscribers to changes in the website and providing vacancy information. The use of services such as Twitter allows user to access this information easily through mobile technologies.

Careers information, too, is widely available on the web, and organisations have successfully created a range of ways to disseminate it successfully to users. If they are able to find ways to embrace ideas like community, collectivising knowledge and supporting users who wish to aggregate information, it is possible that this can become increasingly effective. In order to do this, however, organisations are likely to have to give up some control over their content and to need to facilitate individuals to access their information in a variety of new ways. These moves are likely to blur the distinction between what is information (that does not require the intervention of another human) and what is communication.

The main challenge for the user in negotiating this information is the difficulty of organising and evaluating the vast range of information sources. The ability to analyse the bias, subjectivity and partiality of a range of information sources is crucial to successfully navigating online career information. Engagement with technologies and practices such as aggregation, engaging with social networks and the social creation of folkonomies can support individuals in their interrogation of career information. The ability to critically analyse information sources, harness networks of expertise and use a range of technological tools will be explored more fully in Section 5.1, which deals with the idea of digital literacy as a key career management skill.

4.2 Automated interaction with career resources

Resources have been developed that take the provision of information further, to offer ways to encourage career learning and career literacy for anyone who chooses to engage with the technology. These are self-managed, self-directed resources that facilitate enhanced self-awareness, and knowledge of occupations and career choices, but which do not require the involvement of a guidance professional.

The ability to take an automated test to increase your self-awareness and make suggestions about your appropriate fit into the labour market is appealing to many individuals. These kinds of tests have been used by both careers services and recruiters in a face-to-face context but are increasingly available via the internet. Some are well-known (such as the Myers Briggs test). Others are less well-known but nevertheless based on academic research: these include the BBC Personality Test (www.bbc.co.uk/science/humanbody/mind/surveys/personality/index.shtml) which is a personality test based on the OCEAN five-factor model for classifying personality traits. A more directly career-based test is offered by the Self-Directed Search (SDS) (www.self-directed-search.com) which provides support for career decision-making based on the theories of John Holland. Interestingly, the SDS is based on a pay-per-test model and marketed towards individuals looking for support in career changing as well as towards young people choosing a career path.

For the non-specialist, it can be difficult to evaluate the validity of the large number of psychometric, matching and guidance tools that are available online. Some are embedded in social networking sites such as Facebook and are traded virally between users: for example, the What Careers Suit Your Personality Type application on Facebook. As with the information sources, the ability to evaluate the provenance and authority of an online tool is likely to be essential. The development of digital literacy and critical information skills will be discussed further in Section 5.

Some companies are building increasingly sophisticated resources that link databases of job types with outcomes from career exploration tests, and relate these to qualification requirements and then to learning providers. Prefinio (www.prefinio.co.uk) developed by Morrisby (who developed the widely-used Fast Tomato) have established what they describe as: “A fully integrated careers education and guidance system that helps individuals of all ages find their ideal career, as well as showing them the routes they could take to achieve their goals. Suggestions are based on an accurate assessment of a person’s qualities; their aspirations, expectations, skills and preferences. These attributes are carefully analysed and linked to a comprehensive database of careers, courses, colleges and universities.”

Diagnostic tools have been developed to support career learning in other contexts. For example, CXL Ltd have developed C-Xtra EU (<http://www.c-xtra.eu/>) – an on-line diagnostic tool that allows learners to reflect on their learning needs and prompts them to seek support from their tutors if necessary.

Games represent another form of automated interaction, which enable individuals to explore different careers and occupations through simulations. Some of these are developed by career companies to encourage career-related learning in an engaging manner. In formal education, the Real Game (www.realgame.co.uk) has been one of the most successful role-play games devised for an educational setting. The Real Game is now available via the internet and is designed to be played in a classroom setting. Students learn about a range of occupations, the qualifications needed and how occupational choice impacts upon lifestyle, as well as some broader learning related to adult roles and responsibilities. A similar resource is The Drive of Your Life (www.driveofyourlife.org) which encourages career exploration through a driving-based game.

Games companies also develop products that, intentionally or otherwise, facilitate career learning. Board games such as The Game of Life which was published in its original form in 1960 has been repackaged as a CD-Rom version since 1998. More recently, the latest edition of Sims 3: Ambitions provides players with the opportunities to explore a variety of careers (firefighter, architect, investigator, ghost-hunter, stylist or doctor) in a simulated world.

Different in aim and tone to games are computer-assisted simulations. Typically these create a full-automated environment for an individual to explore. An example might be a medical simulation in Second Life, generated primarily for training purposes (see for example the video demonstration at <http://www.youtube.com/watch?v=TkuLAOzL0zU>), but also offering the potential to enable people to explore the working life in a particular occupation.

Some sites have developed very sophisticated means of bringing together simulations or gaming environments with career information and recruitment. An American Army game (<http://www.americasarmy.com/>) brings an online gaming environment which includes profiles of roles and YouTube video clips of real soldiers, alongside the army recruitment site [goarmy.com](http://www.goarmy.com) which itself has a wide range of multi-media information, chat forums and links to recruiters.

Increasingly, games provide a mix of automated interaction and communication with other people. The Sims example discussed above not merely offers interaction with computer-generated characters, but provides a role-playing environment where individuals can interact with each other. As with the discussion of information giving, the development of new technologies is increasingly blurring the boundaries between automated interactions and communication. Some games like The Sims offer a mix of the two, but others such as Second Life (<http://secondlife.com/>) and other Multi-User Domains (MUDs) offer simulated environments populated exclusively by avatars controlled by real people. This has the potential to provide further opportunities for career learning. For example, TMP worldwide have held a virtual recruitment fair (www.tmpw.co.uk>Showcases/Second-Life/) featuring Microsoft as one of the exhibitors (<http://microsoftjobsblog.com/blog/microsoft-in-second-life/>). This linked the opportunity for virtual exploration with real-time, real-job opportunities.

The applications described here bring together some of the aspects of new technologies, such as the aggregation of diagnostic results with items drawn from occupational type datasets, and also games that blend high-quality simulated environments with the potential for both automated and virtual interactions to support career learning.

4.3 Communication

As argued in Section 3, new technologies continue to develop new ways to interact with other people. There are a wide range of technologies that provide opportunities to transfer existing career guidance practices online in ways that can overcome barriers of distance or access through the use of email, text chat, video conference or simulated environments. However, it is also important to note that many new technologies are changing the way that people communicate, by extending social networks and facilitating interaction across space and in a time frame that hitherto has been both un-imagined and un-achievable. Career guidance has the opportunity to engage with the complex array of new ways to communicate in order to define new practices and paradigms for the delivery of guidance.

It is possible to classify the range of different communication tools into three main categories: those that facilitate one-to-one, one-to-many and many-to-many forms of communication.

4.3.1 One-to-one

The interaction of professional adviser to client via a face-to-face interview remains an important tenet of practice amongst career guidance practitioners. However, that practice can be effectively translated to communication over the telephone (Page *et al*, 2007) and via the internet as “an opportunity to give more guidance to more people, more often, at a distance” (Offer, 2004). Offer examined a range of channels that could be used to do this, such as web chat, email, on-line discussion fora and message boards. Six years later, the range of communication channels has increased further, but the nature of one-to-one e-guidance remains broadly similar.

One example of how a careers service has innovated with the use of one-to-one communications can be found in the virtual Connexions service in Milton Keynes (www.mysaymk.com) which encourages access to the service via an appealing virtual website. In the HE sector, personalised advice is being delivered through a range of communication media including for example both audio and visual feedback on interview technique (<http://intervisual.brunel.ac.uk/intervisual>), and using real-time chat facilities to give e-guidance (www.careers.manchester.ac.uk/students/services/interactive).

Within the field of career guidance there has been some theorisation of online or e-guidance practice (see Sampson, 2006b). There has also been considerable interest in developing a theory of online practice amongst the mainstream counselling and psychotherapy community (for an introduction into this literature, see Anthony & Merz Nagel, 2009). As the career guidance field continues to develop its approaches to online guidance, it may have valuable lessons to learn from practice in the counselling and psychotherapy world.

One-to-one communication does not necessarily have to be with a careers professional to support career learning. Horsemouth (www.horsemouth.co.uk) provides a system to support the development of informal mentoring relationships to aid career exploration. It is also possible to use existing professional networking tools like LinkedIn to identify and manage one-to-one communications with recruiters or potential mentors. Finally, it is likely that much peer-to-peer career support is now conducted via a range of technologies.

A particularly specialised form of one-to-one communication is offered through the e-portfolio. E-portfolios are tools through which the outputs of learning and experience can be retained to aid reflection and communication. E-portfolios therefore provide a communication tool between an individual and a range of other parties (e.g. learning tutors, peers, mentors/mentees and potential employers). E-portfolios have been found to support learner reflection (Zubizarreta, 2009), the development of competencies (Wade, Abrami & Sclater, 2005) and career learning (Watts, 2010; Lorenzo & Ittelson, 2005), but existing e-portfolios have tended to be linked to a particular

organisational context. When the learner moves on, access to the e-portfolio has been lost. In principle, access to all-age careers services could enable access to be maintained (Watts, 2010). There is also considerable effort going into exploring inter-operability between various e-portfolio tools (JISC, 2009). However, Cohn & Hibbitts (2004) argue that institutionally based e-portfolios need to be replaced with what they call Lifetime Personal Web Space (LPWS). There is potential for this vision to be realised through a range of web tools discussed in Sections 3.5 and 3.6. Given the opportunities presented by these new tools for career learning, the question moves from being a technical one to a pedagogic one, with teachers and career practitioners now needing to find ways to encourage the adoption and sustainable use of this wide range of tools.

4.3.2 One-to-many: many-to-one

One-to-many communications are conventionally conceived of as broadcasts. One person (probably the professional) has something to say and the role of the many is simply to listen. However, technologies like blogs and video-sharing sites provide one-to-many communication channels with additional opportunities for the many to respond. This can create a blurring between activities that are primarily about information giving and those that include more interactive advice or guidance.

Blogs, as an example of one-to-many career IAG, are used by both the public and private sectors to provoke thought and raise questions for discussion, as well as for offering more basic forms of information and advice. Private-sector careers professionals tend to use the blog as a means of establishing credibility as part of their marketing strategy. An example here is www.careerealism.com, which blends the blog with video clips offering advice, twitter and an invitation to a career counselling service. Similarly, www.herecomestheboss.com offers careers advice and insight into getting a job and working in a range of sectors but with most of the content as video clips.

Public-sector careers services use blogging and Twitter to share information about particular learning or job opportunities, or to share ideas on how to think about career and career learning. Again, higher education professionals have adopted these technologies in advance of others (e.g. <http://uclcareersservice.wordpress.com>), perhaps because they have been able to assume higher levels of digital access and literacy for longer. Blogs allow their authors to share ideas, and also give them some power to manage and edit the discussions that follow from their initial posts.

As with one-to-one communications, one-to-many communications can take place between a wide range of different career stakeholders. Accenture provides the Accenture Recruiters Blog (www.accenture.com/Global/Accenture_Blogs/Recruiters_Blog) which as well as broadcasting a range of information to potential recruits also provides an opportunity for job-seekers to engage with recruiters. Similarly, the higher education jobs board jobs.ac.uk provides a range of blogs including the Just Highered blog (www.jobs.ac.uk/blogs/just-higher-ed) which traces the fortunes of a recently appointed academic.

In addition to its use by careers professionals, employers and recruiters, blogging is also used as a strategy by job-seekers themselves. A Job Hunter's Blog (<http://ajobhuntersblog.wordpress.com/>) is subtitled a "blog tracking the progress of one job hunter amongst many" and details the trials and tribulations of going to interviews, receiving rejections and claiming benefits. This kind of blog is clearly designed to raise the blogger's profile, but it also serves as a space for reflection and encourages the evaluation of job-seeking strategies. Finally, it provides a point around which peers can group, engage into discussion and trade strategies.

4.3.3 Many-to-many

Social networking sites facilitate many-to-many communication. It is undoubtedly the case that the peer communities facilitated by social networking sites provide their members with a range of support including peer support. However, this kind of many-to-many communication can be difficult to control and challenging for professionals to intervene in. With most social networking sites, it is relatively easy to create a group to discuss a single theme. Current career-related groups include The Job Seekers Network on Facebook, and the Job and Career Network on LinkedIn. Groups can be spontaneously created by anyone, and frequently fail to reach critical mass.

Many-to-many communication through social networks generally bind together communities of people who share particular characteristics. This is useful for peer support and may lead to connections being made with potential mentors and even employers. However, interventions in such networks by professionals are difficult to manage. The metaphor of the "creepy treehouse" (Stein, 2008) is useful in conceptualising why this is likely to be the case. The creepy treehouse is a space that looks like a fun place to spend time. When kids enter the creepy treehouse, they expect to find other kids like themselves. But if they discover that it is inhabited by teachers trying to force them to learn, it immediately becomes less appealing or even creepy. This is not to say that intervention by professionals in social networks is impossible: just that it needs to be carefully managed, and access carefully negotiated.

Social networks are not the only form of many-to-many communications. Wikijob (www.wikijob.co.uk) provides an alternative conception. It is a resource developed primarily from user-generated content by a community of graduate job-seekers and recruiters. The site is generated through a large number of communications and interactions between its users. It might be possible to view social tagging sites like Delicious (delicious.com) as offering a similar form of social communication and collaboration to Wikijob. It would be worth exploring how these kinds of online projects can be used to support career exploration and resource sharing.

5. Policy issues

The growth of a range of new technologies has clearly changed the context within which job exploration takes place. In the last 10 to 15 years, the majority of the UK population have moved towards using the internet and mobile technologies as an integral part of their lives. This trend has impacted on a wide range of aspects of people's lives and has inevitably included career and learning exploration and job searching. A wide range of online services have grown up to meet this demand, some of which have been driven by public-sector careers services, but much of which has been developed by a range of other organisations and businesses. The challenge for the consumer is how to find, navigate, prioritise and evaluate this material.

The internet is a notoriously difficult field in which to develop viable public policies. So much activity happens beyond national borders and so much new activity takes place every day that monitoring it is extremely difficult. Policy-makers therefore need to proceed with caution and to have realistic expectations as to what can be achieved.

The range of technological services and environments that support career exploration can perhaps most usefully be seen as a kind of market. Policy-makers therefore need to consider how and when they can influence the shape of this market. Previous discussions around the management of a market in careers work (OECD, 2004; Watts, Hughes & Wood, 2005) have concluded that governments could fulfil three main roles:

1. Stimulating the market in order to build its capacity.
2. Regulating the market and assuring the quality of services, both to protect the public interest and to build consumer confidence.
3. Compensating for market failure where this is appropriate.

This framework is a useful starting point in the consideration of how to relate to the online market in careers. However, it might be useful to add a fourth role for policy makers, which would be to support the growth of an educated consumer. In order to achieve this and to maximise the value that individuals can draw from this online market, it may be useful to consider policy recommendations in three areas:

- Growing digital literacy to support career management.
- Developing mechanisms for quality assurance and recommendation.
- Supporting the technical upskilling of careers professionals.

5.1 Growing digital literacy to support career management

There is a strong recognition that digital technologies are of increasing importance to the UK economy. *Digital Britain* (DCMS & DBIS, 2009) states that economic growth is dependent on digital communications and argues for the generation of high-quality public-service content. The report states that currently Digital Britain sectors account for nearly £1 in every £10 that the whole economy produces each year.

Sector Skills Councils have picked up this agenda to argue for the need to create the appropriate skill base for the digital economy (e-Skills UK & Skillset, 2009). However, it is possible to move beyond this conception of “digital skills for digital jobs” to a wider understanding of how digital literacy is necessary in order to successfully pursue a career in a wide range of fields. An extensive discussion has been taking place on the relationship between digital access and the access to social and economic opportunities (e.g. DiMaggio & Hargratti, 2001; Hargratti, 2002; Livingstone & Helsper, 2007). This discussion was originally described as relating to a “digital divide” of computer haves and have-nots. However, as discussed in Section 3, the growth of access to computers and the internet has led to the discussion being reconceived as being about skills or digital literacy (Pietrass, 2007). Digital literacy is a skill set that enables those who possess it to gain personal value from digital information sources.

Digital literacy clearly has a key role to play within an individual’s pursuit of work and career. The ability to identify opportunities, gather labour market information and harness social networks are key to individual career success. Within this context, it is possible to conceive digital literacy as part of a wider set of career management skills. Career management skills are those skills which equip an individual to pursue a career in a flexible and dynamic labour market (e.g. Kidd & Killeen, 1992; Collin & Watts, 1996; Arnold, 1997).

If the idea that digital literacy is an important career management skill is accepted, then the ability to develop these skills becomes a key aim of careers work. Careers services have a role to support and develop the digital literacy of their clients. Developing digital literacy in the context of career development is essential in equipping people to interact with the worlds of learning and work and therefore needs to be a stated outcome for careers services. Furthermore, it could be suggested that an exploration of the worlds of work and learning provides an ideal curriculum through which to develop digital literacy in more general terms. There would be value in beginning this process as part of a school career management skills curriculum; however, it is also important that the development of career management skills and digital literacy is supported as part of lifelong learning. If careers services are to be able to achieve this aim, they will need to ensure that staff are suitably digitally literate themselves and that they have the appropriate skills to support its development in others.

5.2 Developing mechanisms for quality assurance and recommendation

While the ideal would be to have a highly digitally literate population, this is challenging to achieve. There is therefore a clear role for evaluation of resources and the provision of guidance around their use. It is possible to consider their role in a number of different ways. The first would be the development of some kind of official kitemark that recognises quality careers information. However, this could be difficult to implement, as the information on the web is constantly expanding and changing: any official quality procedure is likely to lag behind. Furthermore, it is open to question how far the general population would be engaged or influenced by a standard of this kind.

An alternative approach would be to more actively recommend good sites and to publicise the creation of a range of portals or aggregators that would serve as quality-assured signposts. This seems an ideal role for existing public-sector careers services to adopt, and their sites are already doing this to some extent. They also have the expertise, interest and regular contact with the end-user that would enable their recommendations to be informed and useful.

An additional or supplementary approach would be to encourage the widespread use of social bookmarking and other social media services by careers professionals. If all careers professionals were utilising social media to publish their insights and publicly identify the resources that they found useful, there would be an enormous critical mass of new content and metadata that would balance existing content (much of which is produced by the private sector and is highly US-centric).

5.3 Supporting the technical upskilling of careers professionals

Finally, it is important to acknowledge that the picture of technological change that is painted throughout this paper is a complex one. There are technical, social and cultural elements to understanding the ways that new technology can support career exploration. As Bimrose, Barnes & Attwell (2010) concluded in their recent study of Connexions Personal Advisers, if careers professionals are to maximise the opportunities offered by technology, they will need training and support.

However, it is also important to recognise that there is a wide range of innovative practice in this area that has already emerged from the profession. Much could be achieved by further sharing this emergent practice and by providing opportunities for practitioners to disseminate their practices further. Careers professionals do not have sole responsibility for all career learning or for the development of all online career exploration. They do however have an important role in supporting the development of career-related digital literacy, in quality-assuring career learning materials and in developing a strong understanding about the inter-relationship between technological development and the pursuit of career.

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978-1-906597-55-9

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