Education and Culture DG

Lifelong Learning Programme

Thematic Network Project

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Round Table Meetings

Internet-related Jobs

"Needs of the Internet Industry Making Offer and Demand meet in Training and Education"

Country:	**United Kingdom**
Venue:	**The Forum, Norwich**
Date:	**7 April 2011**
Author:	**Philippe Wacker**
Partner:	**EMF**

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Description/General Information

The Roundtable meeting took place at The Forum in Norwich (www.theforumnorwich.co.uk) on 7 April 2011 from 9.00 to 13.00 hrs.

It was attended by:

☑	Richard Burley	City College Norwich - www.ccn.ac.uk
☑	Frances Downey	Shaping Norfolk's Future - www.shapingnorfolksfuture.org.uk
☑	John Smith	The Forum Trust - www.theforumnorwich.co.uk
☑	Philippe Wacker	EMF – The Forum of e-Excellence – www.emfs.eu
☑	Andrew Wheeler	Trainagain - www.trainagain.co.uk
☑	Anne Williamson	Entreprise Partnerships - www.enterprisepartnerships.co.uk

Main Topics discussed

The Roundtable started by a presentation of the PIN project and e-Jobs Observatory (www.e-jobs-observatory.eu) by Philippe Wacker. This was followed by a discussion of:

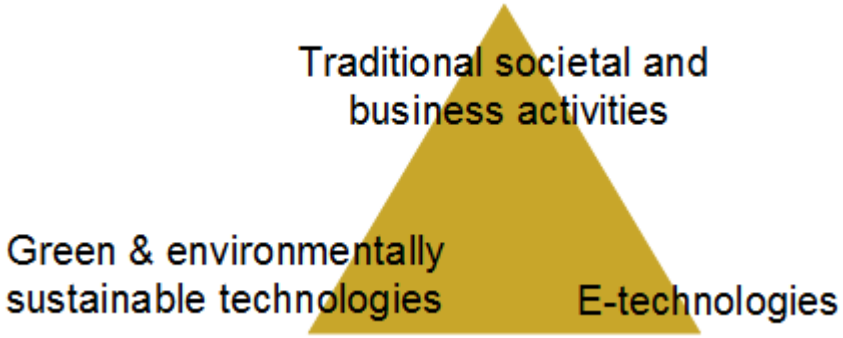
1. Definition of the "internet industry"
2. Current and prospective needs regarding e-Jobs in the UK
3. Problems faced in the UK
4. e-jobs and internet-related job profiles / eCF, EQF, ECVET
5. Labelisation, certification, normalisation
6. The e-Jobs Observatory

The Roundtable was concluded by a sandwich lunch.

Definition of the "Internet Industry"

The definition proposed by the PIN project was considered as adequate overall, but participants stressed that the Internet was an enabling media/technology that currently "revolutionises" all segments of the economy and society at large (news, entertainment, tourism, health, government, finance, manufacturing, trade, transport, even agriculture & fisheries). The impact of the internet is therefore to be measured not as a standalone industry (deploying ICT technologies), but as an enabling (and sometimes disturbing) factor affecting society and the economy in general. The prospects for generating new employment opportunities through the pervasive deployment of the internet were considered as very high, while certain professions/activities would undoubtedly be challenged and perhaps radically put into question. The most exciting prospects for new job creation were perceived in combining traditional skills and competences with internet-based skills and competences, i.e. through the emergence of new "hybrid" jobs. For example, there is presumably a large market for semi-technical skilled content managers who can manage and develop good CMS systems and creative content.

A "golden" triangle of opportunities was identified at the cross-roads of:



Current/prospective needs and job requirements related to e-jobs in the UK, considering the point of view of the IT sector and VET institutions.

In most organisations, the internet is often still seen as part of the "back office". Managers in large and small organisations still need to become fully aware of the opportunities in using/implementing the internet in their relevant businesses/organisational processes. This in itself constitutes a training challenge.

Instead of advertising for jobs in the traditional way, the most dynamic fringe of industry in the UK has started collaborating with certain training institutions to organise 1-day-activities comprising e.g. a 1-hour class in which the organisers can observe the behaviour of applicants followed by

a site visit with practical quizzes and exercises which, again, allow organisers to monitor and assess the participants.

Skills gaps (in existing staff) tend to get addressed over time if they are business critical skills, otherwise the gap tends to become a long term issue which may never get addressed (e.g. language skills in the UK).

What is the most important/current problem faced by the sector regarding e-jobs?

Certain skills are currently not at all available in parts of the country. They can be found only in London. There is also a lack of high quality trainers. The best trainers work for the industry, earning high wages and/or work in the capital. Trainees have to travel to the capital to have access to them. This phenomenon comes close to a brain-drain (and therefore cash-drain) for the provinces.

The time-lag between the emergence of new market requirements in terms of skills and competences and the availability of trainings responding to these is a crucial problem. Based on current procedures, the full cycle between the emergence of new needs, their specification and training institutions responding with government approved and funded programmes takes 4-5 years.

Relevance remains an issue. Despite all efforts, some training courses will propose wrong or ill-adapted content.

Difficult training subjects (e.g. language training) have a tendency to disappear because their failure rate is too high, which makes them commercially unviable.

What can/should be done to improve the situation on the job market for e-jobs?

Clearly, first and foremost, an intensified collaboration between training institutions and prospective employers. This should be facilitated by government at local, national and European level. In this regard, initiatives like PIN are most welcome. There appears to be considerable potential in facilitating and accelerating "learning-from-each-other" processes, i.e. identifying best practices and spreading them.

There is overall agreement that soft skills or behavioural skills are key competitive differentiators or advantages for job seekers intent to succeed. However, a proper investigation into what is exactly meant by "soft skills" still needs to be carried out and a detailed nomenclature ought to be elaborated. For example, what is meant by "can lead a team"?

Confidence to empower and delegate; preparedness to take calculated risks; ability to learn from mistakes?… these are some elements that should be analysed and specified in order to further clarify the generic descriptor.

Who of the target groups should do what to improve the situation?

Employers call for highly specialist and modular trainings. Training institutions should follow this call. Governments should facilitate the process with light rather than heavy-handed intervention.

www.e-Jobs-observatory.eu

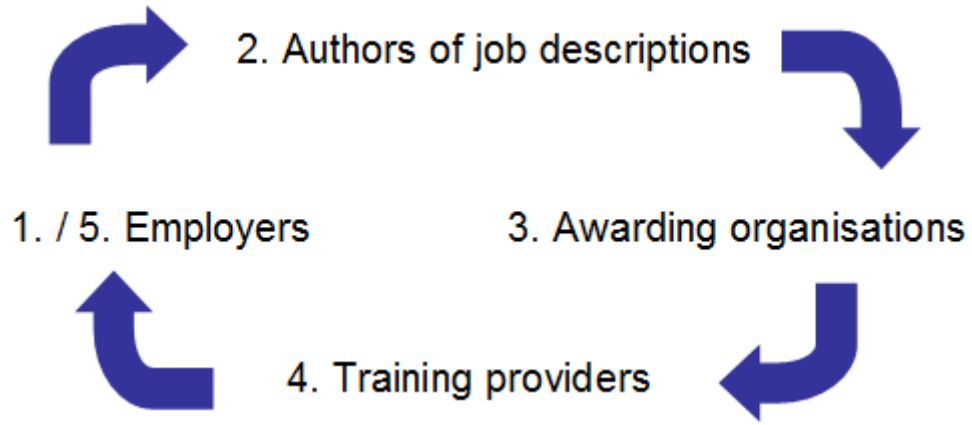
The idea of an information exchange platform at European level is valuable, particularly for institutions that have already "channels" to "Europe". Others (with a local focus) may have difficulties relating to it. Individual companies may not see its immediate benefits. However, the effort is to be lauded and should be sustained in the long-term, particularly as a best/good practice transfer mechanism and a means to provide comparability of approaches, methods, frameworks and outcomes at European level.

Labelisation, certification and normalization in the field of e-jobs

The internet-related job profiles elaborated by PIN (and its predecessor projects) are very valuable tools in terms of bridging the gap between enterprises and training institutions. However, making them "useful" for both parties will be a challenge. Particularly businesses are likely to consider this sort of tool as too remote from their daily needs and requirements.

Attempts to develop a labelisation, certification and normalization activity at European level must be envisaged over the long-term and must secure the buy-in of national labelisation, certification and normalization processes. In the UK, for example, it would be crucial to obtain the recognition and buy-in from "awarding organisations" such as Edexcel (www.edexcel.com).

The process should be based on an ongoing interaction between:



Job profiles such as those generated by PIN must be relevant and able to plug into e.g. the Edexcel National Specification in Information Technology Units (see for example "Unit 28: Website Production" appended).

Collaboration with e-Skills UK (www.e-skills.com) and the STEM Centre in York (www.nationalstemcentre.org.uk) is also seen as crucial.

Other comments

Another big challenge is the emerging gap between older entrepreneurs retiring (and their businesses disappearing since not all will be able to sell out) and the new generations not taking over, due to their lack of entrepreneurial spirit. How should the educational/training system react to that?

It would be good to explore how the Hotsource network (www.hotsourcenorwich.co.uk) could help with future plans. This could provide a useful SME pool for project feedback.

Conclusions

1. The most exciting prospects for new job creation are in combining traditional skills and competences with internet-based skills and competences.
2. Managers in large and small organisations still need to become fully aware of the opportunities in using/implementing the internet in their relevant businesses/organisational processes.
3. Intensified collaboration between training institutions and prospective employers is necessary and should be facilitated by government.
4. A proper investigation into what is exactly meant by "soft skills" needs to be carried out.

5. Employers call for highly specialist and modular trainings. Training institutions should follow this call. Governments should facilitate the process with light rather than heavy-handed intervention.
6. An information exchange platform at European level as a best/good practice transfer mechanism and a means to provide comparability of approaches, methods, frameworks and outcomes is useful.
7. Attempts to develop a labelisation, certification and normalization activity at European level must be envisaged over the long-term and must secure the buy-in of national labelisation, certification and normalization processes.
8. Collaboration with e-Skills UK, the STEM Centre and the Hotsource network should be explored.

Appendix

Edexcel National Specification in Information Technology - Unit 28: Website Production (N.B. there are more such "Units" relevant to PIN's domain of interest available on Edexcel's website (www.edexcel.com).

Unit 28: Website Production

Unit code: Y/601/6623

QCF Level 3: BTEC Nationals

Credit value: 10

Guided learning hours: 60

Aim and purpose

The aim of this unit is to enable a learner to understand web architecture and the factors that affect its performance and to be able to design and create interactive websites.

Unit introduction

The number of websites on the worldwide web has increased dramatically and competition is very high. This means that designers must use increasingly sophisticated techniques to capture interest, as well as ensuring that an appropriate company image is presented. Usability issues, such as navigation methods, must be considered carefully. A poorly-designed structure could result in users becoming confused or frustrated and navigating away from the website.

The need for good web designers and developers continues to grow as more and more companies realise they must develop a web presence and keep it maintained and updated. This unit starts by exploring web architecture and the factors that influence website performance. Learners investigate the web development process from identification of need, design, build, and test through to review.

Learning outcomes

On completion of this unit a learner should:

1 Understand web architecture and components

2 Understand the factors that influence website performance

3 Be able to design websites

4 Be able to create websites.

Unit content

1 Understand web architecture and components

Web architecture: Internet Service Providers (ISP); web hosting services; domain structure; domain name registrars; worldwide web

Components: hardware eg web, mail and proxy servers; routers; software eg browser, email; *Protocols:* transport and addressing eg TCP/IP; application layer eg HTTP, HTTPS, SMTP

Web functionality: Web 2.0; blogs; online applications; cloud computing

2 Understand the factors that influence website performance

User side factors: download speed; PC performance factors eg browser, cache memory, processor speed

Server side factors: web server capacity eg available bandwidth, executions to be performed before page load, number of hits; file types eg bitmap, vector, jpg, gif, wav, mp3; avi, swf

Security: risks eg hacking, viruses, identity theft

Security protection mechanisms: firewalls; Secure Socket Layers (SSL); adherence to standards eg strong passwords

3 Be able to design websites

Identification of need: nature of interactivity eg online transactions, static versus dynamic; client needs and user needs eg image, level of security, development timescales, support, maintenance contracts, costs, visibility on search engines; end user need eg appropriateness of graphics, complexity of site, delivery of content

Design tools: concept designing eg mood boards, storyboarding; layout techniques eg frames, tables, block level containers (DIV), inline containers (SPAN); templates; colour schemes; screen designs; other eg outline of content

Software: markup languages eg HTML; client side scripting languages eg JavaScript, VBScript; features and advantages of software languages; software development environments

4 Be able to create websites

Structure: layout of pages; navigation; format of content and cascading style sheets (CSS); interactive features eg catalogue of products, shopping cart; images; animation

Content: proofed, correct and appropriate; information source; structured for purpose eg prose, bullets, tables

Tools and techniques: navigation diagram eg linear, hierarchy, matrix; building interactivity tools eg pseudo-code for client-server scripting; animation; audio/visual elements; ensuring compliance with W3C; meta-tagging; cascading style sheets

Review: functionality testing eg user environments, links, navigation; content; check against user requirements; user acceptance; audit trail of changes

Assessment and grading criteria

In order to pass this unit, the evidence that learners presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	**To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:**	**To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:**
P1 outline the web architecture and components which enable internet and web functionality	**M1** explain the role of web architecture in website communications	**D1** explain the role of the TCP/IP protocol and how it links to application layer protocols
P2 explain the user side and server side factors that influence the performance of a website		
P3 explain the security risks and protection mechanisms involved in website performance [EP1]		
P4 using appropriate design tools, design an interactive website to meet a client need [CT1]	**M2** explain the tools and techniques used in the creation of an interactive website	**D2** discuss the techniques that can be used on web pages to aid user access to information
P5 create an interactive website to meet a client need. [CT1, SM2]	**M3** improve the effectiveness of a website on the basis of a client review. [IE4, CT6, EP4]	**D3** demonstrate that a created website meets the defined requirements and achieves the defined purpose.

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills applicable in the pass criteria. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

The outline learning plan (OLP) which follows this section gives an indication of how time can be allocated between various topics in the unit content. It is designed only as a guide and tutors will use knowledge of their learners to adjust the allocation of time and order of delivery accordingly.

Learners must have access to facilities which give them the opportunity to fully evidence all of the criteria. If this cannot be guaranteed then centres should not attempt to deliver this unit.

The suggested delivery pattern follows the logical order of the learning outcomes in the unit specification. This is not the only order that can be used and it is perfectly acceptable for tutors to follow their own preference.

For learning outcome 1, learners should be given an overview of web architecture and components based on the elements specified in the content.

Learning outcome 2 deals with website performance and constraints. This tends to be purely theoretical and is delivered using whole-class teaching examples of image files, sound files and animation files. Tutors should back up the information with handouts and reinforce it with electronic quizzes or gapped handouts.

The other area of website performance looks at user side and server side factors. This can be introduced by using groups of learners looking at different aspects using research and directed study on the internet. Groups can feed back their particular topics to the whole class where tutor and peer comments will refine information, and the class as a whole can end up with composite lists, one for client side and one for server side. Following website performance are a number of topics relating to constraints, starting with security. Learners are given directed research to undertake on the internet and gapped handouts, which may be electronic, to reinforce the knowledge.

At this point learners can attempt Assignment 1 which targets criteria P1, P2, P3, M1 and D1.

Learning outcome 3 starts with various aspects of identification of need as stated in the unit content. A good method of delivering this is to use case studies (actual or synthesised) from which learners can observe how the various aspects of need are identified. Once the tutor has demonstrated this, learners could work in groups to practise the skills needed.

Learning outcome 4 concerns creating interactive websites, the first element of which deals with structure.

The tutor should demonstrate aspects of structure as per the unit content. This is followed by exercises in simple structure, creating their own and recognising structures in existing websites. Since items such as CSS are dealt with in great detail in another unit, it is the straightforward use of CSS which is required in this unit.

Learners must next consider the content of the website. Introducing this through discussion groups is useful, perhaps different groups assembling ideas on different facets of the unit content and feeding these back to the class as a whole for comment and criticism. This is followed by examining and criticising several examples of content.

The next area of delivery concerns tools and techniques and is carried out by tutor demonstration of the techniques followed by learner examples of the same techniques. If this is done item by item it helps to reinforce each technique in isolation. Ultimately, there will be an exercise which combines all the techniques together.

This leads to Assignment 2 which targets criteria P4, P5, M2, M3, D2 and D3.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan demonstrates one way in planning the delivery and assessment of this unit.

Topic and suggested assignments/activities and/assessment
Introduction to the unit
Overview of web architecture – tutor presentation
Understand constraints: • whole-class exercise – tutor presentation on security risks • whole-class exercise – tutor presentation on protection mechanisms • whole-class exercise – tutor presentation on laws and guidelines • individual exercise – understanding user perceptions.
Factor on performance: • individual exercise – learn the different file types used on websites • directed research – understand user side factors • whole-class exercise – server side performance factors.
Assignment 1 – Issues in Website Design
Designing an interactive website: • whole-class exercise – discussion of web architecture • whole-class exercise – how to identify the need for a website • whole-class exercise – introduction to web design tools • individual exercise – basics of web design programming.
Creating an interactive website: • whole-class exercise – how are websites structured? • whole-class exercise – how to create content • individual exercise – learn the different techniques for website creation.
Assignment 2 – Creating a Website
Creating an interactive website – review: • individual exercise – reviewing a website • individual exercise – upload a website to the internet.

Assessment

For P1, learners should compose a brief outline of the web architecture and components which allow the internet and websites to function. Learners could represent this in a short report or flow diagram detailing the various stages and processes that information must pass through to get from server to screen.

For P2, learners will need to focus on the user and server side factors which affect website performance. A report which considers the benefits of particular server side capabilities for a company website would be appropriate, although learners should also consider the limitations of the equipment and software customers may be using to browse the website.

For P3, as well as discussing the general security risks which threaten the integrity of data, learners should define the laws and guidelines that a particular website has to adhere to. This could include, for instance, a website that stores users' details, it will be legally required to comply with the Data Protection Act (DPA). Learners should write a short report, with the use of screen grabs, to evidence their understanding.

For P4, learners need to carry out the planning work for a multi-page, two-way interactive website. Particular attention should be paid to making sure learners define the requirements and purpose of the site clearly and realistically, as this is extended into D3. The plan should take the form of annotated drawings as it would in a normal web design process.

For P5, learners need to build a multi-page website. Any method of creation can be used, the unit is non-specific on software or techniques. The website should feature two-way interactivity as well as being multi-age. Prime evidence for this is the website itself in electronic form. However, annotated prints of the website and a tutor statement of authenticity will also suffice.

In order to achieve a merit grade for the unit, learners must complete all of the pass and merit criteria.

For M1, learners should go into more detail regarding the way websites move information for communication. Learners should discuss current methods of information sharing and movements such as Web 2.0.

For M2, learners need to be able to explain the tools and techniques that can be used to make a website. This will work best alongside P4 or P5, as learners will have the chance to talk about what they have done to meet the pass criteria. Learners must show a strong, accurate understanding of the tools they have used, and be able to articulate clearly the techniques they have employed. This criterion should be evidenced by a short presentation or an extension to the website.

M3 can work best as an extension of P5. Learners must show that they have adapted and improved the website that they worked on for P4, in a measurable ways.

In order to achieve a distinction grade, learners must complete all of the pass, merit and distinction criteria.

For D1, learners should give a technical explanation of application layer protocols in relation to the TCP/IP protocol.

For D2, learners should consider design and functionality to suggest ways of improving accessibility and ease-of-use on the defined website.

For D3, learners must demonstrate they have created a website which meets the defined requirements and purpose. This can be evidenced through a series of annotated screen grabs.

Programme of suggested assignments

The table below shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the assessment and grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Edexcel assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, P5, M1, D1	Issues in Website Design	You are working for a web production company, which has asked you to look at the security, legal and performance issues involved in one of its websites.	Short report Screen grabs
P3, P4, P5, M2, M3, D2, D3	Creating a Website	The company has asked you to create a new website.	Annotated drawings Web pages

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC in IT sector suite. This unit has particular links with the following unit titles in the IT suite:

Level 1	Level 2	Level 3
	Unit 17: Website Development	

Essential resources

Learners need access to systems and software with which they can create, test, amend and upload web pages to a web server. Without access to all of these facilities the centre should not attempt to deliver this unit.

Employer engagement and vocational contexts

Any potential contact with commercial organisations working in this field will be very helpful to learners.

There is a range of organisations that may be able to help to centres engage and involve local employers in the delivery of this unit, for example:

- Learning and Skills Network – www.vocationallearning.org.uk
- Local, regional business links – www.businesslink.gov.uk
- National Education and Business Partnership Network – www.nebpn.org
- Network for Science, Technology, Engineering and Maths Network Ambassadors Scheme – www.stemnet.org.uk
- Work-based learning guidance – www.aimhighersw.ac.uk/wbl.htm
- Work Experience/Workplace learning frameworks – Centre for Education and Industry (CEI University of Warwick) – www.warwick.ac.uk/wie/cei.

Indicative reading for learners

Textbooks

Towers J – *Macromedia Dreamweaver MX 2004 for Windows and Macintosh* (Peachpit Press, 2004) ISBN 0321213394

Veer E, Lowe D, Ray E, Ray D, Dean D, McCue C, Weadock E, Nielsen J, Aviram M, Lockwood S and Siddalingaiah M – *Creating Web Pages All-in-one Desk Reference for Dummies, 2nd Edition* (John Wiley and Sons Ltd, 2004) ISBN 0764543458

Websites

www.ico.gov.uk	Information Commissioner's Office
www.w3.org	World Wide Web Consortium

Delivery of personal, learning and thinking skills

The table below identifies the opportunities for personal, learning and thinking skills (PLTS) that have been included within the pass assessment criteria of this unit.

Skill	When learners are ...
Creative thinkers	generating ideas and exploring the possibilities for a functional multi-page, two-way interactive website
Self-managers	working towards goals, showing initiative, commitment and perseverance when creating an interactive website to meet a client need
Effective participators	discussing issues of security concern and protection mechanisms involved in a website.

Although PLTS are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are ...
Independent enquirers	analysing and evaluating website designs, suggesting improvements, judging its relevance and value
Creative thinkers	adapting ideas as circumstances change.
Effective participators	identifying improvements the effectiveness of a website on the basis of a formal review.