Report of E-Skills Summit - Final Version

1) Summary

There was much positive comment and goodwill but three generic issues emerged which need to be addressed for most of the recommendations to be effective. These were:

1) There are too many surveys, initiatives, programmes and organisations at every level but particularly with regard to the identification of employer needs. We are suffering from study and initiative overload. We need to do less but do it better. We also need to achieve economies of scale without compromising quality or losing local enthusiasm and personal tutorial support.

2) The result is a mix of ignorance and paralysis. Even organisations with large industry education teams (e.g. Microsoft with a team of 12) cannot respond to more than a fraction of the invitations and/or surveys they receive from government departments, universities, colleges, schools and industry bodies. Those who try to do more have no time to do their day jobs.

3) There are far too many funding agencies and programmes with complex rules, expensive bidding processes, slow decision processes. Too much is capital spend when the need is usually for a flexible mix of capital and revenue spend. This leads to waste of public funds in parallel with mounting frustration at lack of funds to exploit success.

This analysis leads to following generic recommendations:

1) Those wanting inputs from industry and employers on similar subjects should organise joint consultation exercises and meetings to enable a radical reduction in diary pressure and effort.

2) The E-envoy's Office, OGC, OST and other providers of public funding should agree, publicise and mandate common (and greatly simplified) funding rules and approval procedures for programmes involving public money. All are bound by EU and Treasury rules for procurement and it is difficult to see why so many "local variations" are needed).

3) Funding rules and hierarchies also need to be reviewed to achieve better value for money in meeting the needs of students and employers while fostering the organisational frameworks necessary to sustain quality of provision in a changing world. Issues include the way the UK funding drainpipes are said to discourage symbiotic cross-department and industry-academic relationships akin to those in, for example, the US and Germany.

Agreement to address these areas is needed rapidly if large employers and other potentially valuable contributors are not to walk away from the majority of existing DCMS, DETR, DfEE and DTI programmes. We risk “paralysis by initiative” unless we recognise the rapidly increasing resource and diary pressures faced by that minority of employers of ICT staff which recruits trainees and takes an active part in public sector education and training programmes. As was said during the last ICT recession (1991 - 3) by a senior member of the IT industry whose personal commitment to the development of skills went back many years - “It is all very well asking us to invest for the long term but if we don’t survive the next 18 months we won’t need any skilled staff.” Action to streamline existing programmes should have priority over new initiatives - particularly where employer participation and support are sought.

The follow up to the Summit is expected to begin with a workshop to discuss how rationalisation can be achieved while building on the best and harnessing enthusiasm. It is also suggested we seek to organise another summit in six months (for when the Learning and Skills Councils are becoming operational) to review progress and identify the actions necessary where progress is not being made.

A number of areas for specific action were also identified which appear to fall outside current programmes. One example was Security Skills (from basic procedures through e-crime prevention to what to do in the event of suspected abuse/crime, let alone hack-attack, to forensic and evidential processes, responsibilities and liabilities).

2) Background and Objectives

The Summit was organised by EURIM (the Parliament - Industry group concerned with the politics of the Information Society in UK, EU and International context) with the support of IMIS (the Institute for the Management of Information Systems), CPHC (The Conference of Professors and Heads of Computing) and Computer Weekly and was hosted by the University of Greenwich.

The objectives were to:

- improve clarity on the nature and scale of the e-skills issues and initiatives in the UK (demand, supply, initiatives, organisations) to enable participants to put their own activities into context.
- identify opportunities, problems, proposals and those seeking to organise/promote action and help participants to decide with whom they wished to work, to achieve what.
- identify possible recommendations with the potential for all party support and the role (if any) of EURIM in this area

The meeting was held under the EURIM variant of the Chatham House rule. Everything said was off-the-record save that participants could release their own comments to the press and say where they said them. The report of the proceedings summarises what was said but not who said what, save where participants wished to have their views on record.

3) Attendance

The attendees were:

Ruth Samuel, 4GreatJob.com
Nigel Cork, Best International
Mike Collett, BSI-DISC
Bob Lewis, CISCO
John Riley, Computer Weekly
Bill Goodwin, Computer Weekly
Garth Glynn, CPHC
Chris Hankin, CPHC
Gillian Lovegrove, CPHC
Colin Dingwall, Office of the E-Envoy
Lesley Giles, DfEE
Anne Russell, DfEE
Peter Owen, DTI
Roger Till, e-CentreUK
John Elmore, Elmore Associates
Matthew Dixon, Engineering Council
John O'Sullivan, e-Skills NTO
Lord Renwick, EURIM
Barbara Nielsen, EURIM
Philip Virgo, EURIM
Keith Duckitt, FE Funding Council
Valerie Barden, FI Group
Geoff Petherick, Gsoft Ltd
Chris Head, Henley Management Centre
Ron McLaren, ICL
Susan Ferguson, ICL
Jim Hillage, IES
Rachel Burnett, IMIS
Ian Rickwood, IMIS
Claire Perry, Microsoft
Colin Tully, Middlesex University
Peter Skyte, MSF
Christine Jack, NCC
John Eary, NCC
Amanda Lacey, Nortel Networks
Geoff Blackwell, Notts Business School, NTU
Patrick Craven, OCR
Vicki Ball, OCR
Mike Harris, Post Office
Helena Sturridge, Reed Business Information
Katie Miller, Research Machines
Bryan Lloyd, Spring.com
Colin Beveridge, TIF
Geoff McMullen, UKERNA
Liz Bacon, University of Greenwich
Chris Middleton, VNU Publications

4) Session 1 - The E-Skills Framework

4.1) Chairman's Introduction:

Much confusion is caused by statements about demand and supply for IT skills which fail to define what skills they mean. Much of governments spend over the past twenty years has, in consequence, been misdirected and wasted. But it is even sadder to consider how many individuals have spent thousands of pounds and/or months of effort on courses and cannot then get the job for which they have supposedly been trained. Most of those planning training provision lack access to timely and accurate information on demand and supply in the detail necessary to enable informed decisions. Macro statements of national or global shortfalls are of little help to Barchester TEC in planning local course provision. They, like most, need to know which skills are in local demand and who is willing to provide work experience in order for those they train to rapidly demonstrate the competence necessary to be placed into jobs.

There are too many national studies based on low (sometimes very low) response rates and statistical extrapolations and too many exercises to aggregate these with the views of "experts" as though this gives them more authority. The DfEE research budget is under £10 million. This includes not only funds for measuring the labour market and skills demand across all sectors (not just IT) but also for research into assessment methods and delivery technologies. Only two published studies over the past 30 years have had the sample size, response rates and methodology necessary for authoritative conclusions. Each blew apart the previous consensus.

The first was the NEDO Study published as "Computer Manpower in the '80s" This set the tone for debate in the 1980s and the methodology is still used today in the National Computing Centre Annual Survey of Salaries and Staff Conditions. The second was the study by West London TEC published in 1992 which set the tone for policy debate through the 1990s. This indicated that the numbers employed outside computer departments to support end-users were three times those employed within computer departments and that most support staff , let alone most end-users, had received no formal training. That report also indicated that over 20% of the UK workforce regularly used computers. Those findings are still being regurgitated today, nearly a decade on. But the unpublished part of that research included detail as to the hardware and software in use locally in which sectors - providing the "granularity" necessary for local action. More-over the world has moved on. Similar exercises are again needed, both nationally and locally, with annual updates, for decisions on publicly funded skills programmes (national and local) to be based on the current needs of employers (national and local).

No survey of expected demand more than 18 months into the future has yet been worth the paper on which it was printed. Even those with a reasonable response rate merely collect the budget plans of respondents for next year with a little aspirational dreaming. Only the IT Skills Trends reports (collating the assumptions behind the strategic plans of major players) have a track record of accuracy but these lack the detail to plan qualifications or curricula (as opposed to strategies and tactics for rapid response to market or technology changes as these occur).

The 1996 IT Skills Trends Report chapter on "The Current IT Skills Base" began as follows

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4.1 *Fewer professionals, many more and, more diverse, end-users*

4.1.1 *What is IT*

There are many definitions of IT:

- "just a posh term for word processing" (a secretary)
- "the metatechnology behind the Global Information Society" (a guru)
- "Data Processing with delusions of grandeur" (a user director)

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For the purposes of that report "professional IT skills" were defined to include those necessary to

develop and to support the application and use of the broad range of products and services that might be the responsibility of the "Head of IT" in a major user. “Thus an electronic marketing operation might embrace satellite data broadcast to radio modems to update point-of-sale smartcard readers, as well as radio or cable based local and wide area networks to collect data from both fixed and mobile locations”. Even then most of the network would have been outsourced and was beginning to use an evolving mix of Internet and EDI protocols

The main sets of definitions used in the industry appear to be those developed/maintained by:

- Computer Economics - these have evolved since 1968 and are currently used by somewhere over 500 medium to large employers in the UK to set and compare salaries by location and industry as well as by job function. They are also used by an unknown number of companies in the EU and US who subscribe to the surveys run by Computer Economics’ overseas partners. Titles and descriptions range from “Help Desk Assistant” or “Junior Technical Analyst” to “User Support Manager” or “Technical Services Manager”. The definitions are reviewed regularly as participants needs evolve. The same group runs similar surveys covering Accounting, Marketing, Personnel, Engineering etc.

- Salary Services Publications (now owned by Reed-Elsevier) - these have evolved since 1987 and are used to classify recruitment advertisements (including on the web as well as in the main Trade, National and Regional publications). There is also a parallel survey of salaries for those in post to enable comparison with peers and outside salaries. The main difference to Computer Economics is that advertised jobs are classified by any technology skills required (e.g. systems architect, IBM mid-range experience, Windows NT and TCP/IP) as well as by industry and location. The definitions evolve as new roles are advertised and over a year of trend data is now available for webmasters, senior web-designers, web designers and web authors/editors. SSP also analyses recruitment in other industries: e.g. Engineering, Hotel and Catering, Medical etc.

- British Computer Society Industry Structure Model (also adopted by the ITNTO, now part of E-Skills NTO, as the basis for SFIA). This was developed and maintained to help the hundred or so employers using the BCS Professional Development Scheme as the basis of their in-house training and career development programmes. Over 1,000 copies of the “model” were sold and it is not known how many currently use the model, whether or not they are registered as part of the programme.

- Career*Space is a European consortium (participants include companies like BT, CISCO, IBM, Intel, Microsoft, Nokia, Nortel, Philips, Seimens, Telefonica and Thales) which aims to broaden and deepen ICT skills profiles working with Universities and Technical institutes on curriculum guidelines, career materials and image improvement. As well as traditional IS/IT job titles its definitions include titles such as Data (Mobile) Net Designer.

How different are the sets of definition? How can they be brought together and if so on which dimensions? How can we make better use of the millions being spend by the private sector on market research. It is possible for this to be shared with those in public sector on an equitable basis - given also the differences in timescale and motivation? Who should pay for the consultation/research necessary to dovetail local provision and programmes with local needs?

4.2) Points made in the course of discussion:

Many of the issues were not new – skills and training issues were the principal cause of computer systems failures 30 years ago.

Many problems derive from the different priorities, cultures and perspectives of the organisations involved – industry, government and educators, as well as a fundamental confusion over the definition of IT skills.

The plethora of initiatives is confusing to employers. More focus is needed. Skills shortages must be distinguished from skills gaps. We need to map skills needs and initiatives along a number of dimensions. These include not only level (supervised trainee to professional) and type (e.g. user-support or systems programming), but also type of application area and type of employer (e.g. financial services user or software integrator), product lifecycle (from research to delivery) and geographic location.

There is a need to put first entry training into perspective. The ICT practitioner workforce loses and gains mature staff to other sectors as well as being joined by newly trained staff join but the movement of staff within the sector dwarfs all other movements. Retraining within the industry, as individuals move between employers with different needs (technology, application etc.), is a much bigger issue.

There is no lack of information on skills, skills were always being surveyed, but the parameters (e.g. country, skill types, sectors) are inconsistently applied. This makes it all but impossible to compare figures from different sources. There are a variety of Industry bodies which could provide a focus. The Alliance for Information Systems Skills (AISS) has the relevant trade associations and professional bodies in membership. The e-skills NTO has published a strategic list of 8 objectives covering public policy actions for the next few years. The final version would be available shortly. The Real Time Club is involved in a mapping initiative listing all known IT skills initiatives to try an obtain an overall picture. IMIS collates and interprets information on recruitment patterns and employment profiles.

The ICT trade press collates information from recruiters and job-seekers on a routine basis for both editorial and commercial reasons. The top priority for employers of IT professionals is relevant work experience, not qualifications. There is a tendency for recruitment advertisements to specify several years experience in a specific discipline using a particular technology. Experience in related fields or older technologies which would enable an individual to rapidly acquire the precise skill needed (without the need for major re-training) tends to be discounted. This discourages those with legacy skills or related professions from making the transition and exacerbates any potential mis-match between emerging job profiles and already available skills.

Projects fail due to lack of engineering discipline, which is still an absolute requirement. It is difficult to recruit experienced people. Large software and service employers do try to retrain people when it was just a case of technical knowledge, because they already have experience and the fundamental skills required. But they face two problems: attracting enough people into the industry and retaining those they have attracted. This is because they need a large number of people with basic IT skills to do moderately repetitive jobs in areas of technology that are not exciting or innovative. Some have addressed this problem by setting up "professional communities" to create skills frameworks, including working with government through modern apprenticeship schemes and other means to optimise their training potential.

Another problem is finding "rounded" graduates – technical skills were available but presentation, communication and literacy were poor.

We need to distinguish between the IT skills needs for those not going on to further education (basic level user skills for the majority of the workforce) and those for graduates expected to work within the ICT supply side, in formally trained sub groups with specific skills.

We also need to move away from the traditional curriculum solution and assessment system that frequently favours knowledge over skills. This is not a reason to change the curriculum but an

opportunity to look at additional forms of qualification. There is no common approach to IT skills in the education system, but there are many and varied examples to copy or learn from.

From the large user perspective, the project management skills supposedly in such short supply are the same in transaction processes, whether IT or non- IT related and are therefore transferable. By and large the most important skills area already held within companies. However, the difference with e-business is that many processes which were previously behind the scenes are now transparent to people on the browser. The biggest problem is ensuring the end-to-end transaction integrity necessary to build customer confidence.

Long term sustainability is vital. IT should be promoted as "the career of choice". Retraining of employees and opening up opportunities to excluded groups should be priorities. Some form of cross sectoral re-skilling scheme is desirable. A talent bank in the form of an electronic clearing house would help match jobs to skills.

Two-way flexibility is needed better to serve the needs of both employer and employee – women are often discouraged from returning to work after maternity leave because terms are too inflexible.

Universities are already providing some of the technical and key skills said to be in demand, as well as a technical education, which is their first priority. Although Courses take 18 months to implement., they are actively focused on the needs of current professionals, and postgraduate courses are tailored accordingly. Universities are also increasing their provision of short courses. Universities believe that companies would employ more of their graduates were t hey available. Graduates are now choosing their employers so that they get what they want. The job market enables them to be employed. We need to produce more of the same.

HE and FE establishments were anxious to keep courses relevant and welcomed industry accreditation (e.g. from the BCS, IEE). Industry input was difficult to get, even with access to industry advisors. Courses increasingly had industry placements of 9 – 12 months around year three to maintain relevance and practical applicability. A principal problem was the traditional education cycle, which forced institutions to prepare prospectuses by November 2001 for students wanting to start in September 2003. With these constraints in mind HE institutions would welcome help to increase the numbers of graduates and the relevance of courses.

There are two sides to Industry – academia co-operation. Industry advisors are too often ignored or their input underrated. Universities wanting help from industry need to be more conscious of the value of that information and the cost to industry to provide it.

A critical shortage is technical architecture level skills. There is no shortage of jobs for the right graduates, and room for more if they were there. Some employers have resorted to taking graduates in unrelated fields and cross training them. It would be helpful if more generic IT skills were incorporated into all courses

There is a need to take advantage of the environmental benefits and flexibility offered by telework - for example by using the Internet to advertise teleworking opportunities.

Flexible, part time and home working present problems to project-oriented employers. Projects are dynamic and part time employees cannot contribute as effectively if they are not on-site when needed. Employers tend to offer flexible working at the professional level to existing employees, whose aptitudes and attitudes they know, rather than take the cost/risk of assessing and employing new recruits.

However, many customer service jobs do not require professional level skills or presence on-site and offer more opportunities for recruiting flexi/tele-workers from outside. Call centres, in particular could

major area for part time working and the implementation of more flexible working practices could help reduce their high attrition rates.

Some providers have good track records in placing trainees into full time paid employment with SMEs (who do not have time to train/supervise their own staff) after relatively short and inexpensive re-training. However, employees want vendor specific training and current funding from government does not permit this. Government has also reduced the Vocational Training Relief (VTR) from 23% off IT courses to ILA which has a ceiling of £150,

LINX (the London Internet Exchange) is currently developing specifications for the Internet-related skills needed by its members (Internet service providers of all types). It is interested in co-operation with others to expand the provision of such training but not at the expense of confusion or delay.

Graduate recruitment programmes can problems with dissatisfied trainees who are technically able but have unrealistic expectations and are poorly equipped to put their abilities into immediate practice. This is partly because line ICT managers often lack people-skills and partly because of a mismatch between technical skills and practical experience. One solution is pre-recruitment placements to give the graduates prior work experience and "de-risk" the recruitment process. Understanding is a two–way process.

Re-training existing staff with new skills is the preferred for many large ICT suppliers. Outside recruitment is not undertaken lightly. The criteria have invariably been carefully considered, and very specific qualifications are required so that the new employee can hit the ground running.

There are far too meetings: industry-academic, curriculum and careers advisory etc.. The problem is apparent when you do a sizing exercise and count how many universities, colleges, skills councils, curriculum bodies funding agencies, professional bodies and trade associations are all organising such meetings. Few (including major software and service companies] now have more than 2 - 3 staff available for such meetings - and most of these have "day jobs". But such employers may face requests to attend hundreds of parallel events/meetings on apparently the same subject. We need a "system rethink". The likely solution involves wholesale rationalisation and the use of bypass routines (e.g. feed-back direct from former graduates to their former supervisors not through head-office, HR, recruiter, curriculum planning and funding bottlenecks)

4.3 Summary of key points from first session:

- Data rich, information poor
- There are too many surveys:- Different definitions, audiences, methodologies:- pull them together, but recognise dimensions of Industry, application and geography
- We need an exercise to pull the definitions together, adding the best features of CEL, SSP and Career*Space to the SFIA
- We need to differentiate between information handling skills for all and ICT skills for professionals and technicians
- The flows within the industry, part development, part churn, dwarf the flows from education to industry – we need to focus more on retraining those within the industry
- A course is not enough, until you have the work experience placement, it could well be a waste of money
- Supervised work experience can be more expensive than the course

4.4 Possible Recommendations

- DfEE/DTI should fund the E-Skills NTO to develop, update and promote the SFIA in return for its uncharged availability for use in any publicly-funded ICT skills survey.

- Any publicly funded survey which does not propose to use the SFIA (or a compatible derivative) should be required to justify that decision as part of the proposal.

- Any proposal for a new publicly funded programme/course should include evidence of the willingness of employers within the relevant travel to study/work areas to provide work experience placement and/or recruit from that programme

- Major ICT employees should "encourage" AISS/E-Skills NTO/CPHC/DTI/DfEE/Skills Councils et all to organise a joint events programme so that those wishing inputs from the same employers should hold their meetings in the same room, at the same time, with the same chairman.

5 Learning Delivery Networks and Infrastructures

Learning delivery networks and infrastructure are crucial. There are over 4 million students in Further Education in England. Information skills and technical skills need to be differentiated. The aim is to embed information skills into every aspect of the curriculum in every college in the country so that in 2 years time, they are part of the qualification criteria Most of the FE funding would go into learning development and staff development – such as tutoring skills to help students access information source and use them effectively to meet their learning needs.

We need to guard against spending too much energy on analysis and not enough on action. A backward view may be helpful "what are the skills needed for this job, how do we design a course to meet these" but if there is a three year delay between the agreement to create that course and the production of qualified individuals the demand might have gone.

Even if we could agree on perfect course and even if we could implement it instantly the first "graduates" will be at least 3 years away. We need to address the issues of flexibility.

Companies need recruits with project management skills and IT skills, often in a specific package. Funding is not available for training in individual packages. This slows the cycle.

The infrastructure is on the cusp of significant change regarding technology. Although in schools IT spend is 1.5 % of the annual budget in industry it is 4-5%. Barriers included security issues and understanding and accepting responsibilities with regard to access to school networks. From a pedagogical perspective there is an inadequate understanding of what we are trying to achieve by putting technology into the classroom. Information handling skills and ICT technical skills must be differentiated.

The Government's intentions were good but 46 or so initiatives is too many. In consequence the prospects of success are poor. Rather than fragment budgets for Internet and Communications access and learning materials across multiple funding routes and programmes these should be brought together to enable economies of scale in provisions.

[A week after the summit a case study was used by the E-envoy's office at the launch the launch of the Broadband Stakeholders' Group to illustrate how a Regional Development Agency had been able to pool the various funding pots and provide 2 megs to every primary school and 20 megs to every secondary school, community centre et al in its area.]

Government initiatives fail to track progress adequately. Monitoring is essential to identify problems as they come up.

The UK is falling behind on the communications infrastructure needed for learning. A recent OECD survey shows the number of DSL lines and cable modem lines per head of population in the UK compared to other countries. The UK was 22nd, behind Portugal. Access and funding rules and lack of infrastructure meant that it is often harder to arrange co-operation between Universities and Colleges within the UK than with other countries.

There are long-standing networking skills shortages , particularly with regard to running internet based services. These need to be addressed to enable ICT to be used more effectively as a tool to deliver skills development in all areas. More information is needed on the nature of these shortages in order to take appropriate action.

Support for important initiatives is being withdrawn - e.g. conversion masters courses . for non-numerate graduates who were very successful both at the course and in subsequent employment, because they had more rounded skills. Student grants had been withdrawn and HE establishments will

be withdrawing those courses. The calibre of graduates from such courses was not just a factor of the quality of the courses – it was also determined to a large extent by the characteristics of the people going in at the start.

Many people got into IT by accident. The concept that ICT courses are vocational was off-putting. It suggests that a decision has to be made at an early age and that transition from other career paths might be difficult. The reverse is the actually case and of those in senior posts in the ICT industries transferred in from other careers .

Computer Science as a name was not appropriate as a title or " brand name" for the subject area. It is too closely associated with spotty nerds in the minds of adolescents who might otherwise take on the subject, and attracts the wrong kind of applicants. It is really an engineering discipline but calling it engineering is an even bigger turn-off. The e********** word is never used in recruitment. "Information Technology" is not much better. The marketing of the subject area is a sector wide problem across schools and universities. "Computing" may be the best term.

Courses are not attracting as wide a range of people as is desirable and the number of women was also declining again although the ways of reversing that decline were identified during the successful Women into IT Campaign from 1988 - 92 (when HMG funding ended). One university raised the proportion of women on computing courses to 30% and reduced drop out levels dramatically by re-defining the traditional hierarchical staff-student relationship to that staff worked as project managers and students as project team workers. This management technique not only attracted the girls, but they proved to be extremely good students – 5 out of 6 firsts were women. The "parallel processing" that women seem to have gave them innate project management skills.

There is a tendency to re-invent wheels and as a result, dissipate the skills available to us. Improvements in productivity can reduce the demand for skills. Best practice guidelines are needed for building systems and applying skills and organisations need to be persuaded to subscribe to them

Computer science is not primarily vocational. Courses are of a professional practitioner nature. However, it was an open profession and did not set given pre-requisites for inclusion. There is scope for making IT a more closed profession with standards and pre-requisites and guarantees of service.

Computing skills need not be closely associated with numerate disciplines. In the 1970's lots of arts graduates went in to computing, and the very best programmers had been theologians. Could this situation be re-created? Currently, computer science graduates are not rounded – they have technical skills but no business or personal skills. Compulsory subsidiary subjects such as management or psychology might help.

Of 15,000 computer science graduates, over 85% have jobs within 6 months (not necessarily in IT). Most of the courses that the BCS accredits include the soft skills that were discussed. The situation was not disastrous but has much scope for improvement.

Graduates often have too many specific skills and not enough networking abilities. Companies need people who can hit the ground running.

Many but not all the suggested elements were already part of computing courses. She did not feel that the problem was in course content, because their graduates were spoilt for choice with job opportunities, Therefore, as a product their courses were selling very well. They would therefore need compelling evidence to make radical changes to course content.

Some important funding sources had been withdrawn – funding for scholarships had gone and the year long conversion courses were no longer available.. Many chose to move into IT late in their careers so these reductions have a serious effect.

It would be helpful if graduates have more training in business skills. Also 70% of people did not choose to go into higher education and they should not be excluded from consideration.

Summary of key points

- **We need co-ordinated provision of access to Internet at all levels, rather than modest budgets to individual institutions and expect them to do it themselves**
- **We need to overcome the apparent demise of AISS as a framework for networking across the various bodies concerned with e-skills**
- **The ending of funding for conversion courses should be reviewed**
- **We need to learn from past initiatives on how to attract and retain more women**

6 Selection, Assessment and Quality Control Methods

The confusing miasma of qualifications and bodies needs pulling together into a comprehensible form.

Recruiting high calibre people will not solve everything – for good productivity people must be matched properly to jobs and training is not a substitute for aptitude. Psychometric testing was used successfully to gauge aptitude in the 70's and 80's but had fallen out of favour, probably because it had been used too much in isolation rather than as one of several tools. Tests are often incorrectly used, e.g. the same test being used for jobs such as systems analyst and programmer which require significantly different aptitudes.

Psychometric testing is not a panacea. It is also vulnerable to narrow management cultures looking for pre-defined sets of aptitudes.

Most ICT certification is vendor related. The A+ certification is vendor neutral and endorsed by Comptia (one of the main US ICT trade associations). Clients and training providers say that although A+ certification is often what was employers ask for, there is no funding to deliver because it is not an accredited programme within the UK.

The public sector contribution to ICT training (HE and FE) is relatively small and steady. We need to find the right way of combining the two so that the market can be harnessed to find broader solution.

It is one thing to take unemployed people and put them on a course but another to give them an employment record. Courses need to be related to the needs of local employers who also need to be involved in the selection and placement routines. The problem is that payment for most publicly funded courses is dependent on students getting an approved qualification. Individuals leaving the course before completion are regarded as failures even if they have moved into a well paid job that the training had made available to them

Another difficulty is organising professional accreditation when the technology it is concerned with is changing very quickly, often by the month.

Selection needs to be considered – but selection by whom? Employers, candidates and training providers have different perspectives. Funding is also an issue – decisions and delivery are increasingly based on funding and not the curriculum. We must keep in mind what gives qualifications their currency.

It was important to identify what is really being assessed. A range of assessment methodologies may be needed to ensure fitness for purpose. Measurements need to represent competencies or achievements that are not necessarily tied to examinations.

The problem with qualifications based on the current demands of industry rather than long established, generic qualifications is that the required skills sets were changing by the month.

Within the range of accredited IT qualifications the focus is on practitioner skills. On an educational basis ICT is both a profession and a key skill. ICT is being addressed in terms of practitioner routes but a problem is whether the teaching profession has the skills to deliver - there is often a dramatic mismatch between the expectations and skillsets of student and those of teachers.

The best way to keep current with rapidly changing skills was to follow the Greenwich model, regard academics as project managers and seek accreditation for courses on a meta-learning level, which is not too content-dependent. Most recent skills can be incorporated into the course just as real project managers have to do. A delivery time of 3 years is not an obstacle under these conditions.

Co-operation between educational establishment and industry bodies can be very rewarding. Feedback from students who had obtained a certificate in information systems auditing (computer security in compliance with the law) as a result of industry co-operation had more to offer employers and this gave them a competitive advantage in the job market. Employers also got what they wanted – computer graduates with extra, relevant, qualifications.

On-line delivery will increase considerably and people need to feel confident in the accuracy and security of assessments. BSI (the national body for UK standards) is working on codes of practice and definitions for the use of information technology in such delivery. The aim is to get the draft standard out by the end of March 2001

While qualifications and certifications are important employers are also looking for experience, motivation and teamworking aptitudes.

The focus is too much on meeting today's needs today rather than those of tomorrow. Change is needed in the funding of short courses and training for proprietary qualifications. Progress has been made, in that skills requirements are being identified on a local basis and 10% of funding will be available to local skills councils to address local needs, but there is still room for improvement.

The age of teachers vs students was a factor. CPD is very important but there is insufficient funding in Universities for staff development. Staff become specialised and lose the overall spectrum of skills that the graduates have. Staff up to the age of 35 or 40 are very marketable and it is had to keep them in post. Older members actually don't the choice so the age gap between staff and students widens.

Targets for pre-16 state education mean that where ICT is embedded across the curriculum, the teacher may not have the skills to promote and develop ICT itself as a career route.

New opportunities are being created for employers to be involved in contributing to curriculum content at university level. Industry should take advantage of these openings. BCS is involved in the quality assurance of employer CPD schemes. Feedback fro employers is good but there was room for expansion

SMEs need people with product and vendor-specific qualifications. Efforts were being made to map an NVQ Mark 3 to Microsoft Accreditations to create a specific qualification.

Microsoft has already undertaken an exercise to map their qualifications to NVQs.

Much of the debate is on supply and demand and what employers wanted and needed was a cohesive framework or map of courses and qualifications. Then they could compare what employers would like to see vis a vis what is currently accredited.

The Curriculum and Qualifications Authority has been tasked with doing exactly that. The national Qualifications Framework includes setting out the framework for IT.

7 Financing Investment in skills

7.1 Chairman's Introduction

- How does an employer justify cost of training?
- How do training providers justify investment in facilities, courses, materials etc.?
- How does Government justify its numerous public provisions / cost?
- What mechanisms exist (tax breaks, loans, grants, apprenticeships etc.)?
- What mechanisms should exist?.

7.2 Points made in the course of discussion

What was needed was an action plan for skills. In the last year there were over 24,0000 applications to do computing at University - an increase in 68% since 1996. There were around 20,000 acceptances to those courses, an increase of 62% since 1996. The supply of university places is not keeping up with demand from applicants. One of the limiting factors was lack of good, qualified staff to teach. Some departments are pressured by University Vice Chancellors to expand rapidly at the expense of staff student ratios. It is highly unlikely that the Govt is going to allow differential funding for computer courses so HE establishments have to be realistic. The means of enhancing relationships and co-operation with industry need attention. About 8,000 students go out on IT related placements, which is one route. Closer links would be welcome but are proving hard to develop.

Another area for improvement is lecturer salaries to address the increasing problem in recruiting and retaining people on academic salaries. The increase in student numbers exacerbates this problem. Unless the situation can be improved the outlook is bleak..

More frameworks for learning like the E-Skills NTO would be welcome. Many people worked in computing successfully without formal computing qualifications and some kind or accreditation is desirable.

The Learning and Skills Council will have responsibility for £6bn of taxpayers money per annum to fund 5 million learners and people in training, going from a provider-driven market to one driven by the needs of employers and local economies. The councils will acts as a funding conduit to meet local needs. They will not be funding colleges or private training providers unless they come up with right programmes to meet local needs.

£6bn is not a lot when divided between 5 million learners. Access is via the local and national skills councils, preferably in partnership with employers, unions, community groups schools, HE institutes and national training organisations. Talked about increasing flexibility as part of new arrangements. The councils will be in much better position to fund flexible modules to meet the needs of individual learners. Bids for funding will certainly be more successful if they have inbuilt quality mechanisms. Programmes to encourage individual lifelong learning and social inclusion is part of the remit.

Central funding strategy is major problem. Treasury spend is often restricted to capital expenditure. This cripples the delivery of learning networks which are often excluded because the costs were service related. (capital spending is what the Telco does).

Large employers are often excluded from Government programmes because of their size. In most companies training is seen as a cost – and it is very expensive. From an SME point of view there are lots different funding programmes, most of them incredibly difficult to access because of the cost of finding out and bidding.

Large companies can fund staff to work the system but have to create partnerships and find the right buttons and cannot always fit their training needs to Government targets.

Funding for training must be simplified and programme timescales must be lengthened from the current average of 6 - 8 months to stop these endless and time consuming bidding rounds and allow companies to make longer term commitments. Govt is too focused on hitting short-term targets that are not linked to the quality of training provided.

NCC data indicates an average spend on training of £2,500 p.a. per member of the ICT department falling to £750 in Health and Education.

We must identify where things are working and where they are not. Lots of training is being done at a significant cost to employers. If this is not enough, then new solutions must be found.

One is to make a contract between employee and employer regarding training. The latter pays for employees training but if the employee leaves within a certain time frame a premium must be paid to the original employer for the cost of the training, which they have not been able to make effective use of. This should overcome employer resistance to invest in training for staff who then leave because they have more marketable skills. A pilot is underway to look into this possibility.

Individuals who paid for training but have not found employment needed to know what employers really want.

The government will find it much easier to support the use of taxpayers money to address things where market have failed is there is evidence of real needs We need to extract and present such evidence.

Some form of commitment from an individual is fair exchange for the employer investment in training. This might help ease the log jam.

If shortages become acute, market forces will drive change so that employers train staff in new capabilities rather than recruit individuals with the right skills because the market will have made them too expensive. Market forces will eventually have an effect.

More people leave from lack of training and opportunity with their own employer than because they are given training.

This is not so true in the public sector where local authorities pay poor salaries but often offered good training

The benefit to all of investing in training is that in raises the ability of the skills pool.

The percentage of investment spent on digital on-line resources is not clear because it is granular, devolved into small chunks. Standards need to be applied to these chunks, including for interoperability (if you develop materials you want them to work everywhere). and re-usability. There is not enough understanding of what is the cost of developing and using to modules (including the cost in technology and in skilling deliverers who may also need to change their method of delivery. The business models are unclear UFI are now doing this so you have to conform to a complete array of specifications. CISCO have concentrated on their own learning environment which has broken things into chunks.

Although career development loans were available in the UK these depended on existing credit. In the US a 25 year training loan can be taken out by individuals who pay it off or top it up as need arises throughout their careers.

The recent budget speech identified a need to encourage employers to train those already in the work force and contained a reference to possibility of considering radical changes such as tax incentives.

The growing percentage of the workforce who are contractors will not benefit, since an employer will not feel the need to pay for their training.

The nature of the workforce is changing. People wanted flexibility to move around, taking charge of their own training and building up skills from job to job, and did not need the security of tenure that previous generations valued.

A project management approach is helpful but if learning materials are forced into rigid structures for administrative or other purposes then the pedagogical perspective was at risk.

Rapid staff turnover is more costly than training. Morale and motivation are vital – keeping employees interested is key. Training is an essential part of this.

7.3 Summary of key points

- **We need to work together on Action plans**
- **HE: 20000pa; +62% over 4 years, staff bottleneck**
- **Improve Industry links**
- **MSc Conversion Courses**
- **Learning and Skills Councils: £6bn, 5 million learners, 47 local programmes**
- **Funding must be simple and consistent**
- **Wide range of training spend – local government public sector better**
- **Loans? Transfer fees? Gov't to react to market failures**
- **Standards for learning resources, (objects)**
- **Training for contractors? Control of own careers**
- **High quality environment is best for retention**

8 Skills Partnerships

8.1) Chairman's Introduction

Much of the discussion has focused on the spectrum of accreditation right from product level to post graduate level. The actions taken by those who had identified market niches and were addressing them were therefore most welcome.

Funding must be simplified – this was a universal plea. The funding of initiatives across the skills and education spectrum was absurdly complex and wasteful.

The coalescing of skills and education should be a principal goal – this was the only way to produce the "rounded" people that were so much in demand.

8.2) Points Made in the Course of Discussion

Skills partnerships issues were key. Effective partnership were already operating between HE and industry and could be built on.

Most universities have industrial advisory boards which gave them the benefit of industry input in course planning and strategy and lets industry have a say in the graduate output. However, this generally involves large companies and mechanisms are needed to increase SME involvement.

Work experience placement programme are beneficial in de-risking recruitment and giving students industry experience.

Sponsorships are invaluable for conversion courses and masters which were high cost courses (average £11 –16,000 for a year's course)

Universities have a major role to play in continuous professional development programmes.

Should the salary scales for ICT lecturer/practitioner posts be inflated by 10-15% (as for clinical lecturers) to enable universities to retain the best without losing them to industry.

Should there be more effort to teach "entrepreneurship" (as in US institutions and some UK universities?

Universities could make more effort to integrate course modules into the national skills framework or the European skills transfer system.

Productivity is important and an important part of improving productivity is reducing waste. The current level of waste in ICT product development is enormous. Cutting this would have a dramatic effect on productivity. Real opportunities here but no short term fixes.

There is a need to improve student retention by the use of project teams and better partnerships between academia and industry including (for example) programmes enabling industry to employ students during term time on ICT work, so that rather than stack shelves in Sainsbury's they could do better paid, relevant work and at the same time supply much needed skills to industry. Even by the end of the first year their students were semi-skilled professionals, and had 8 out of the 10 most needed skills. Industry would then have input into the training of student.

Until we can define a skills framework for the information age the debate will remain unfocused. SFIA has been under development for 5 years and although it has limitations and needs updating is the

best available. The 8 strategic objectives of the e-skills NTO need significant sums of public money. The e-Skills NTO website is a useful source of further information until the SFIA becomes available.

What might make a difference? Suggestions included:-

- Transferable training loans
- Tax incentives
- Making the market operate more effectively
- Short intensive high quality transition courses.

Compared to flow of people coming in from education the increase in IT practitioners has been much greater from people coming in from other sectors. In 1998 120,000 new IT practitioners joined the industry but only 10,000 came from universities.

We need the kind of activity that worked in the "bugbuster" programme. In a short time some tens of thousands of people were made aware of the IT needs of SMEs. Public sector and private sector providers were really brought together . We now need to united them around these issues.

There was a warning against bottom up thinking without a target in sight. We need no more than half a dozen leading questions for an action plan, starting with:- What is our ambition, what do we want, where are we now? Once we have identified the desired state and the current state, then the difference can be measured by gap analysis.

Two things jump out immediately from the discussion:

- The need for accurate figures and statistics
- The polarisation of priorities by "market" position – the supply side and the mainstream corporate users have different perspectives on priorities for action.

Publicity is important to disseminate the action plan and to maintain focus and carry forward actions:.
Five point action plan

1. It is a national issue - the competitive ability of the nation depends primarily on skills and professionalism. We are pushing hard for an ICT skills minister. There must be central focus within Government to ensure things happen and private public partnerships are sanctioned
2. Investment in training – it is skipped in good times because there is no need, and in bad times because no one can afford it. A voluntary training levy on a name and praise basis is advocated
3. Image – How do we do it – partnerships, role models?
4. Bringing in under-used resources – women have skills, but need more flexible employers to enable them to return to work.
5. Rationalisation desperately needed of the 800 qualifications in IT that are currently in existence in the UK – nonsensical today.

A national strategy is needed to take stock and invest in the future.

Industry needs to work with universities, sponsoring professorships and working with students. However with an education team of 12 covering 33,000 schools we (Microsoft) are thinly spread. There are only a small number of large firms in the IT industry and they could only do so much. It might be more appropriate to provide on-line resources and content which would be accessible to many.

The e-skills NTO is the membership organisation of employers, recognised by government. It is in the process of publishing a strategic plan and setting up a charter initiative on best practice. New members are always welcome.

AISS is the partnership body of ICT Trade Associations and Professional Bodies intended to act as a project clearing house, to avoid overlap and gaps between different projects. It is focused on long term, deep seated structural issues.

There is no mystery about the skills gap. Getting more details statistics is not going to make much difference.

Much of the discussion has focused on large employers. But the real need is among SMEs who cannot afford £40,000 for a web developer. We need work placement schemes for students were set up with SMEs: the FE establishment is supplying the training and the SME is providing the work experience. SMEs need the help and support, people need the work placements and why not put them together. Training providers can do that and real results can be obtained.

The training frameworks of the major suppliers dwarf most UK-only programmes. For example the CISCO Networking Academy represents an investment of over $100 million in skills development for employees, customers and partners. Currently 50,000 students were registered in Europe and results were demonstrable with benefits extending to smaller companies in their supply chain.

NCC is launching a new initiative, the knowledge network, and members are identifying the top issues to address in collaboration. It was suggested that this be co-ordinated as part of the re-launch of AISS. If the same topics were being covered, meetings should be combined.

The University of Greenwich was interested in collaborating with city firms to provide short courses on the skills needed to address the security issues currently holding up e-commerce, perhaps based around BS7790.

The majority of placements from Brighton University were with SMEs, because these comprised the majority of firms in the area. Many students did not return, preferring to stay on. Problems were more likely to arise in micro companies which needed more support.

If we can map initiatives as well as skills onto an agreed multi dimensional skills model this could greatly improve debate. AISS and the E-Skills NTO have a very important role to play in any such exercise.

Philip Virgo
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