

WHITE PAPER

Post Crisis: e-Skills Are Needed to Drive Europe's Innovation Society

Sponsored by: Microsoft

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IDC OPINION

This study, commissioned by Microsoft, is based on a survey of 1,370 organizations across the EU as well as in-depth interviews with almost 50 Microsoft business and training partners to explore the impact of the economic situation on key ICT skills issues and analyze the trend of digital competencies required for jobs of the future.

The study shows that the recent economic crisis has increased the urgency to address gaps between available ICT skills and what the market demands. This does not concern ICT professionals alone, as ICT skills are clearly needed for any individual to be a marketable and attractive participant in the European workforce, almost regardless of job role and industry sector. In fact, in five years, European employers expect less than 10% of jobs to be available to people *without* ICT skills. As the EU moves forward on its vision of being a leading innovation society, skills issues will become more urgent. Other key findings and conclusions include:

- ☒ The continued decrease in enrollment in science and math education has contributed to the lack of ICT professional skills in Europe. While this issue in itself needs to be addressed, ensuring that graduates enter the workforce with the most marketable skills and knowledge requires more attention. ICT graduates need to enter the workforce with much stronger business understanding and "soft" skills, as well as knowledge of leading-edge technology, such as cloud computing and Web 2.0. This requires close ongoing collaboration between the ICT industry and the education sector.
- ☒ To address the need for general ICT skills in the European workforce, the education sector in particular must create specific programs that are flexible enough to meet the demands of rapidly changing ICT and business environments, and therefore ensure employability of graduates. However, post-graduate training and life-long learning is also necessary for the current workforce and should be supported and encouraged from a government level.
- ☒ In order to meet the ICT skills demands of Europe's innovation society, governments, universities, and the private sector must work in concert to create education and skills development programs that will supply the market with qualified graduates and professionals, while being fluid enough to evolve with the increasing demands of technology developments and business needs. This issue has long been discussed, but ICT skills — for Europe's entire workforce — must be an urgent area of focus and investment in forthcoming EC policy statements. If ignored, the lack of ICT skills will be the bottleneck that prevents Europe from being competitive in the global economy and a leading innovation society.

In This White Paper

In August 2009, Microsoft commissioned IDC to conduct a study into the impact of the changing economic environment on the information and communication technologies (ICT) skills needed for ICT professionals but also for all other job roles within selected countries in the EU. The main objective of the study was to establish the impact of the economic situation on key ICT skills issues and analyze the trend of digital competencies required for jobs of the future, such as:

- ☒ Has the economic crisis accelerated the transformation to an innovation society in Europe?
- ☒ What is the impact on the need for digital competencies across all sectors and all jobs now and in the next five years?
- ☒ How will the skills agenda need to change from an education system perspective and within the current workforce to address the need for ICT skills to keep Europe competitive?

The study included a Web-based survey of 1,370 employers across Europe to explore the changing needs for ICT skills for non-ICT professionals, as well as in-depth conversations with almost 50 Microsoft business and training partners (in the same countries) to shed light on the changing skills demand for the ICT professionals. The surveys and interviews were conducted in September and October 2009 in 13 European Union countries:

- ☒ Belgium, Czech Republic, France, Germany, Hungary, Italy, Netherlands, Poland, Portugal, Romania, Spain, Sweden, and the U.K.

SITUATION OVERVIEW

Europe's economic future depends on its ability to become a leading knowledge economy and an innovation society; that is, it depends upon the capabilities of its workforce to be innovative and to work efficiently using new technologies to their best effect. The vision of creating a globally competitive, highly innovative society through use of ICT is at the heart of the European Commission's priorities for the post-i2010 information society strategy, which may be dubbed the EU2020. It is also at the core of the European Commission DG Enterprise and Industry's vision of how to shape the industrial future of the EU, called *Key Enabling Technologies for Europe's Innovation*. By the same token, for the very first time, DG Enterprise and Industry has further launched the idea of a European awareness raising campaign around e-skills and an EU e-Skills Week in 2010. Finally, the importance of skills for the innovation society has been highlighted several times by the President of the European Commission, Jose Manuel Barroso.

Several studies have been conducted to identify the impact of ICT on European economies and societies, including Microsoft's Economic Impact study in October 2009, which established that European enterprises will have spent €305 billion on ICT in 2009. In the same period, ICT-related activities will generate €265 billion in tax revenues across the EU, showing that not only is the ICT industry important for Europe's future; but the direct impact on society is critical for Europe's ability to function and make necessary investments for the future.

Considering the size of its population, general levels of education, and history of innovation, Europe has the potential to play a strong role in the world economy; indeed, it is necessary for Europe to play a stronger role in order to keep up growth in the economy and quality of life for the population. Reaching this potential does not happen by itself; appropriate action needs to be taken to ensure that Europe stays at the forefront of technological development and in innovative deployment of technology. Europe's potential lies in the skills of its population, its workforce, and its organizations.

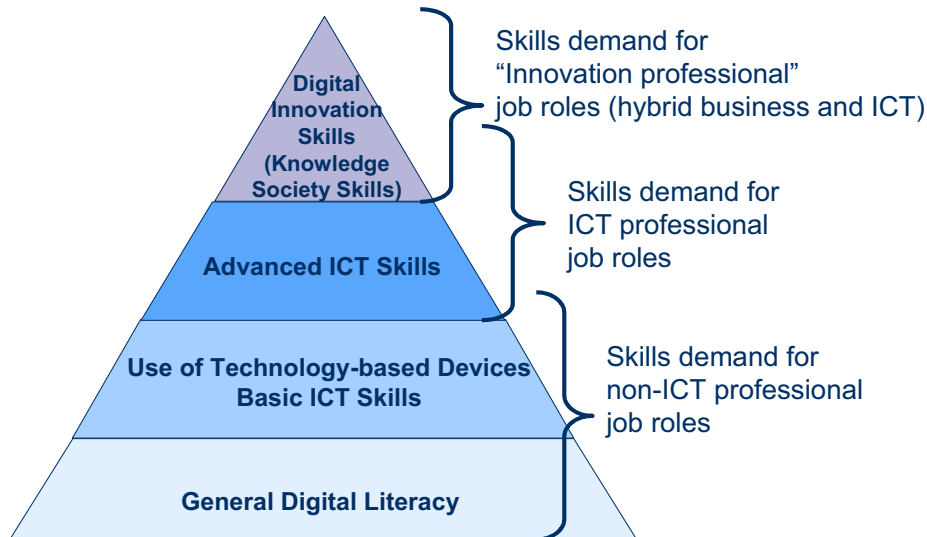
With a few remarkable exceptions, Europe historically has not produced dominant players in the ICT industry, but when looking at the deployment of technology to improve and innovate other industries, Europe has a strong tradition and major potential. The question is whether Europe will be able to realize this potential. President of the European Commission, Jose Manuel Barroso, has made innovation the *key* priority for Europe's future, and has pointed to the necessity of educating the European population in innovation.

ICT is widespread in Europe today, both for private use and in European businesses, and compared to other regions, the "ICT literacy" of Europe's populations is high. Nevertheless, to keep Europe competitive we need to increase both the number of professional ICT skills and e-skills to drive innovation. As we will discuss in detail, the European workforce will need to be increasingly flexible, and each person will need to cover a broader range of tasks. To do so, they will need ICT tools and the ability not only to learn quickly how to master the continuous stream of new tools, including technology-based devices, but also to understand ICT's role in the business, how systems interact, how business processes function, and how ICT supports all of this.

This challenges today's level of ICT skills. The younger generations that have entered the labor market recently and will do so over the coming 10–20 years, have largely grown up with ICT, and their need for training is different from that of the older generations. However, with the relatively smaller size of the younger generation, societies depend on keeping those parts of the workforce that are today 40, 50, and even 60 years old, in the labor market for many years, and therefore also need to train these generations. Requirements and tools will differ between age groups, but the necessity is strong in all groups.

FIGURE 1

Skills for an Innovation Society



Source: IDC, 2009

ICT professionals see their jobs changing as well: from being only technical experts to increasingly having to act as consultants, interacting with users as well as decision makers, bringing a deep understanding of how ICT can support and help the business. The era of the nerd is over, as "nerd jobs" are increasingly moved to lower-cost countries, and ICT staff face the triple challenge of keeping up with rapid changes in technology while developing interpersonal skills, such as communication and project management skills, and understanding the business aspects much more clearly.

Europe has a good starting point for taking a leading role in the global economy, but also a substantial challenge ahead in adapting its education and training systems to face the new skills requirements. Ultimately, strong holistic, hybrid ICT and business skills will be demanded to translate and deploy technology and make Europe's businesses competitive in the global market; skills that are necessary for Europe to be able to fulfill President Barroso's vision of Europe becoming not only a "knowledge society" but an "innovation society".

Has the Recession Changed Everything – or Anything?

The economic events of the past two years have had major impact on businesses and societies across Europe, but has this impact also been a catalyst in the transformation of Europe to a knowledge society, which would as a consequence change job roles and skills demands? Through both our survey of employers and in-depth conversations with business and training partners, it is clear that the recession per se has not changed skills demands. The demand for new and more developed

ICT skills is the result of a more gradual change, which is technology driven, and one that will continue regardless of the economic situation moving forward.

However, the recession has added an extra component: with widespread redundancies, the remaining staff needs to cover broader ground and be more flexible. This in turn drives the need for more collaboration and use of ICT for efficiency purposes, adding to the requirement for new skills:

- ☒ 49% of European organizations say that they are increasing the use of technology to be more efficient moving forward as a result of the current economic situation.
- ☒ For 61% of European organizations, the increased use of new technologies means that more positions will require employees to have ICT skills and be able to use them for their daily jobs — *outside* IT department roles.

The recession has perhaps had more of an impact on demands for the skills of ICT professionals. Since the cost agenda is now so strong in European organizations, the skills of ICT professionals that can help improve efficiencies, using technologies around virtualization, for example, and can help understand and show what ICT can do for the business are in much higher demand. However, this trend was already underway before the recession. As one business partner stated: *"There is a drastic increase in demand for skills that understand what IT does for the business; who can combine the two. This is a long term trend"*.

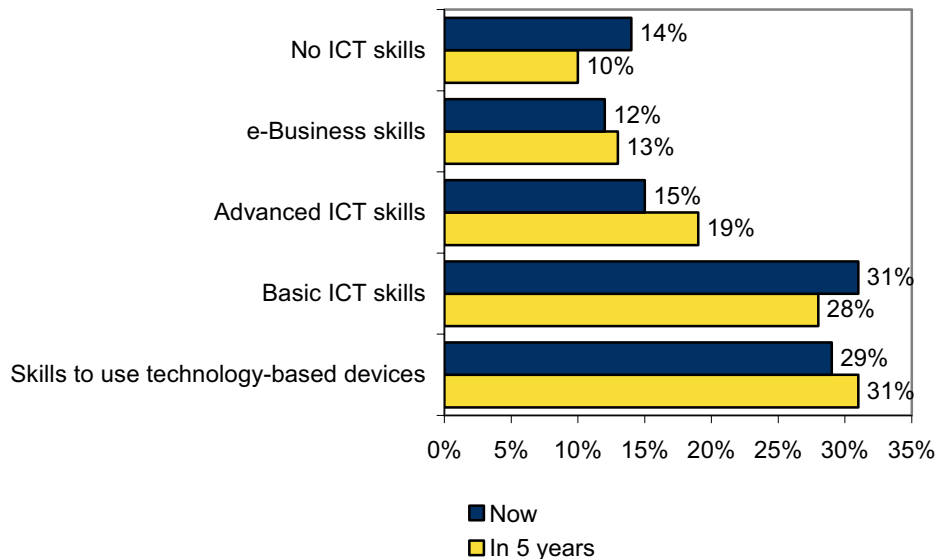
Although these changes point towards an increased need for ICT skills and consequently for training and reskilling of the workforce, the strong cost agenda brought about by the recession has led to a dramatic drop in the amount of money that companies spend on training of their employees, and the skills gap may therefore increase in the short term. Another effect has been that training is becoming more individualized and tailored to each need, and often delivered as online training or e-learning courses, as exemplified by this statement from a training partner: *"What we can say has changed, though, is the approach clients have towards education. They choose a similar set of training courses as before, but they are more focused on matching the type of training with an employee's needs."*

The above findings clearly show that the changing job roles and demand for ICT skills are fundamental, long-term changes that will affect the skills agenda in Europe and not just disappear when the economy bounces back. This is also highlighted by how European employers expect the ICT skills composition of their workforces to look in five years compared to now (see Figure 2).

FIGURE 2

ICT Skills Demand — Now and in 5 Years

Considering the ICT skills of your employees today, could you please estimate the proportions that have the following skills? What will be the proportions in 5 years' time?



N=1,372

Source: IDC, 2009

As shown in Figure 2, the vast majority of employees are already expected to have ICT skills of some kind, ranging from basic ICT skills and ability to use technology-based devices, such as handheld devices for meter readings or stock-taking, to advanced ICT and e-business skills. The proportions that will be expected to have these skills will only increase over the next five years. The fact that the demand for basic ICT skills is decreasing over the period is only because employers will increasingly expect the workforce to have more advanced ICT skills instead. What this means is that European employers are constantly raising the bar for what is considered *basic* digital skills.

The demand for, and importance of, ICT skills is strong across all industry sectors, and has increased since Microsoft and IDC examined this same topic in 2006. The manufacturing, transportation, and utility sectors have steadily increased the importance that they attach to skills for using technology-based devices, showing the strong growth in adoption of these technologies in business processes. On a scale of 1 to 5 (where 5 is very important), these three sectors have increased their importance rating by half a point to around 4 on the scale. This is a significant increase — and one that looks set to continue, considering the increased demand shown in Figure 2.

For the composition of the workforce in five years' time, as indicated in Figure 2, to be a reality, it is clear that there is a need to reskill or retrain some of the existing workforce. What it will certainly also mean is a need to evaluate the broader skills agenda in the EU if almost one fifth of the European workforce is expected to have

advanced ICT skills within the next five years. However, if this were to be the case, Europe would be making good progress towards having the skills to make the innovation society a reality.

FUTURE OUTLOOK

Skills for the Innovation Society

If European employers are correct in their predictions, then the implication is that in five years' time less than 10% of job roles will require no ICT skills at all.

In addition, as shown in Figure 3, in five years' time, more than half of European employers (51%) state that ICT skills will be required for more jobs than before, when they hire functionally experienced employees. Another 21% of employers say that in five years' time, no matter what the job, new functionally experienced staff will be required to have ICT skills.

These findings are particularly significant for the non-ICT professionals. The use of technology is now so ingrained in the way that organizations and business processes work, that even a functionally experienced employee will find it hard to perform the required tasks without being able to use ICT in some way. This is even the case in sectors that have typically been associated more with human interactions, such as the healthcare sector, where digital records, remote diagnostics, and increasingly advanced technical devices require healthcare workers to be much more technologically savvy than previously.

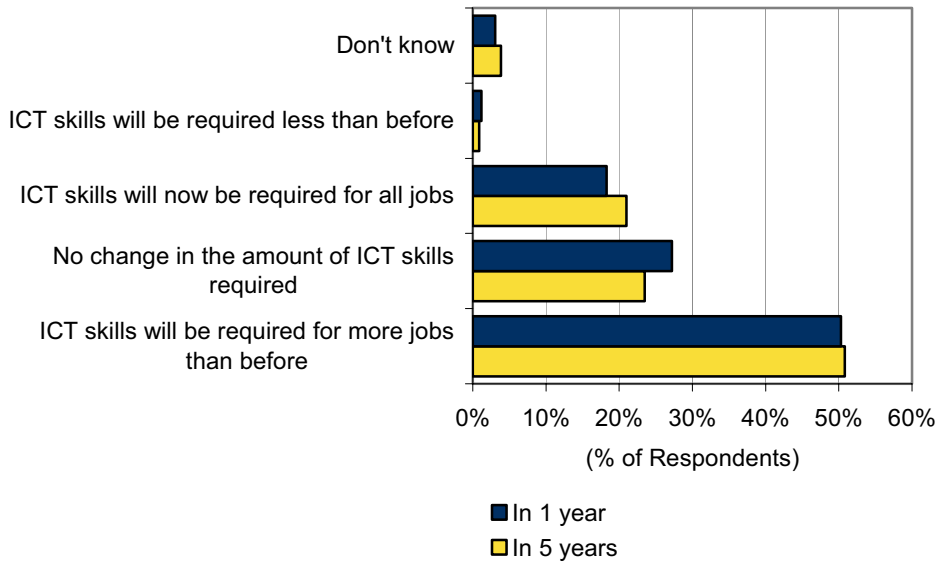
A logical consequence of the above should be that companies invest in providing their current workforce with the required ICT skills, which from the individual's perspective will provide them with better transferable skills in the job market. Currently, however, European countries are experiencing the highest unemployment rates for decades. There is a real risk that the currently unemployed, without ICT skills, will find it increasingly difficult to re-enter the active workforce. Many individuals are addressing this by taking IT training at their own initiative and some employers pay for training as part of a redundancy package, but these approaches far from cover the full need from society's perspective.

Future demand for graduates to have ICT skills follows a similar picture. While 37% of employers say that a graduate's candidacy will be greatly improved if they have ICT skills, this increases to 43% five years down the line. This result will place stronger demands on the education system to ensure that all students have ICT skills to increase their employability, regardless of the line of study. As one training partner put it: *"Graduates are educated but they are not trained in the commercial world of IT. They do not get certificates, nor do they have the latest and appropriate technology skills. They get a good foundation, but they do not get skills for the real market."*

FIGURE 3

ICT Skills Requirements in 1–5 Years

When we look beyond the economic crisis, how important will ICT skills be, when you hire new functional experienced employees in the near future, say in a year from now? And in 5 years?



N=1,372

Source: IDC, 2009

However, skills demands are also changing for the ICT professionals. The demand for pure ICT skills will continue to develop along with new technological developments. However, our conversations with business partners clearly show that a new "hybrid" of technology and business skill sets will need to be developed to facilitate much deeper understanding of how ICT can affect and support business objectives. This is almost a prerequisite for ensuring real innovation in the application of key enabling technologies. Incidentally, there is clearly also a strong demand for business degrees to include in the curriculum much stronger technology courses for future business leaders to fully understand the potential of ICT.

Skills in the Cloud – The Impact of Growth of IT as a Service

Cloud computing, whether public or private, will increasingly replace onsite server farms and private datacenters. Cloud services will be offered by service providers, and as a consequence there will be a concentration of staff with in-depth cloud skills in service provider companies, whereas non-IT companies will need different kinds of ICT skills that are broader and more strongly oriented towards business and IT architecture and integration combined with IT usage. One business partner in particular sees a need for: "A massive change in understanding of what an IT career is, that it is not today what it was traditionally perceived to be, i.e. the starting point is a change in attitude."

The majority of business partners interviewed for this study mentioned cloud computing as one of the key influencing trends that would influence changes to job roles and therefore skills demands in the future. As one business partner put it: *"ICT people need to understand how to build business solutions (as opposed to tech solutions) from cloud technologies. This does not mean understanding business in a broad sense, but rather understanding the environment the solution should support."*

Skills for Europe's Digital Agenda

The change in job roles discussed above, combined with today's gap between required skills and existing skills, creates an urgent need to address the issue — for individuals and for companies, but also for society as a whole.

As previously discussed, businesses need better-trained staff, but they hesitate to invest because of short-term economic concerns. This clearly shows that the issue of reskilling the workforce cannot be left to individual companies (particularly small and medium-sized companies, which may feel more of the "pinch"), but needs a stronger and more coordinated effort — particularly considering the importance ICT will play in Europe's future.

However, we also found from the study that the formal education system is only providing graduates with skills to the most basic extent that businesses are seeking. In fact, 58% of European employers stated that they believe that ICT curricula need to be much stronger, even at primary and secondary education levels, to ensure that ICT skills requirements are met in the future. One business partner stated it clearly: *"Only 5% will need real technology understanding, the rest don't need it to a deeper level than they can learn by themselves. What they lack is day-to-day understanding, practical understanding of IT in the business. Academics can learn that, but it should be built into the formal education system. Until it is, the vendors will have to teach them the basics also."*

It is also generally recognized that in order for individuals, groups, or companies to be innovative and able to ask the questions that take the use of technology to a higher level, they need an understanding of their environment as well as tools to try out new things; that is, they need a variety of skills, similar to those discussed above. They need to understand enough technology to put it to use in the business perspective; they need to understand the correlation between IT and business; they need to be able to cooperate and communicate; and they need to be able to use their technological tools. All in all, not a small agenda for skills development.

Should there have been any remaining doubt, our research shows that ICT is no longer an isolated phenomenon. Neither ICT nor business models and processes can be developed in isolation, and the skills agenda for Europe must be a digital skills agenda, but not in a narrow sense; ICT must become an integrated part of all levels of education and training — as must interpersonal skills — to build the foundations for Europe's innovation society.

Developing More Marketable Knowledge in the Workplace

Today, most companies cannot hire graduates with the assumption that they have the technology knowledge needed to perform specific job duties. Therefore, companies would rather hire someone with a few years' experience in the market. To ensure that graduates better meet market requirements for skills, and to improve the graduates' employability, it will be necessary to change formal education systems and adapt

them to the changed requirements. A business partner put it this clearly: *"A much more conscious national education strategy needs to be in place. The government must be much more committed to support acquiring marketable knowledge. This involves a comprehensive restructuring of the education system."*

Education systems must continuously adapt to the needs of society and transformations in the workplace. However, it is widely recognized that the education system struggles to keep up with changes in technology. Therefore, what is more important is that students are trained at a more fundamental level to understand and use technology, as well as being trained in communication and business understanding. These changes are needed for both ICT and non-ICT degrees. While ICT students obviously need a deeper level of technology training, they should also be trained to understand what the business impact of ICT is, understand the language of the business, and develop what could be called "business empathy".

An important part of ensuring that graduates are equipped quickly to become efficient in the workplace (and therefore more marketable) is to give students access to up-to-date collaboration and productivity tools, and technology vendors can play a key role here. Education institutions tend to see this as less of a priority today because of restricted funding. However, as this study shows, the burden of developing the skills is then just pushed to the employers, and graduates are seen as less attractive as new employees. As one business partner stated: *"For IT professionals, we consider that the skills agenda is far from updated. Many of them are very poorly prepared for their future jobs, so most of the time, the company has to support the training cost."*

Education institutions need to cooperate much more closely with the business community to understand the skill types needed and adapt curricula. We have seen initiatives from vendors to "sponsor" certain universities as well as other sporadic initiatives driven from the ICT industry side. This analysis shows that although this is of value, it is insufficient: 41% of users responded that more collaboration between educational bodies and technology vendors is the best way forward.

Cooperation needs to happen not only between the ICT industry and the education system but also between the education systems and all parts of the business community. It needs to happen in a systematic way, driven by the institutions or ultimately supported by governments and the EU. Vendors can contribute, and key technology vendors should have a strong influence, but should not drive the process.

"I believe that the business world, universities and politicians need to work on this together. They need to supply the kind of education that the market is actually demanding," a training partner said.

"On [a] society level, there is a massive need for change of the education of the IT professionals. They spend too much time on useless technology skills, whereas the universities do not understand the need for business skills. Probably as a result of too little articulation of requirements from 'consumers of graduates' of what they actually need," a business partner said.

How Should ICT Training Change?

ICT training happens outside the formal education systems. It aims at keeping the workforce and graduates up-to-date with changes in their working environment, but also to teach skills that the workforce should ideally have acquired during their formal education. Thus, ICT training today also has to fill gaps created by the existing

education system. Training is currently undergoing significant changes as a result of the changes in job roles. Training companies typically have a closer relationship with the business community, as they depend on businesses sending their employees for training, but this relationship should be even closer.

A Need for Individualized Training

"Our career programs include training on how to influence people and gaining understanding of what matters to people — either into the IT course or as separate courses. Career students have business and social skills as part of their training, without that they wouldn't be pushed forward," a training partner said. He continued to describe how training is becoming individualized. Standard courses typically include a lot of content that is not relevant to all participants, and to avoid wasting time, companies increasingly prefer to tailor the content to either a group of employees or to selected key individuals. The cost of traditional classes is one aspect of this, but another aspect is that with the increased time pressure on employees to complete many tasks, it becomes increasingly difficult to leave the job for a week to attend training, and training methods need to adapt to this situation.

In general, public classroom training is on the retreat, especially because of the economic crisis, but almost all training partners say that the shift away from classroom training to a mix of many methods is a general trend. Training partners see enterprises requiring a mix of tailor-made, dedicated courses for their employees, combined with instructor supported e-learning and on-the-job-training in mentoring programs. This trend was also clear in our survey of European employers: 42% believe that the best approach to ICT training is on-the-job training and internal structured training was mentioned by 40% of respondents, indicating that organizations strongly prefer training courses adapted to their (and their employees') specific requirements in order to maximize value.

Other important factors influencing training methods are the age group and the level of ICT literacy of the individuals. With the 'iPod generation' entering the workforce, it is clear that the approach to learning and the general level of ICT user skills are quite different to training, say, a 50-year old in using technology-based devices. As a training partner said: *"Training methods are changing radically, and virtualization is coming at all levels. ...this new mix is "chaotic training", meaning it is less structured and more topical."*

However, with the need to keep older people active in a European workforce that increasingly demands ICT skills, there will continue to be a demand for slightly more "traditional" learning approaches, at least for a considerable time.

Certification Takes Center Stage

Experienced skills are highly sought after in the market and are documented through career and project participation. For an ICT professional, specific technology skills need specific documentation — for companies to ensure they hire staff with the right skills and for individuals to document their capabilities and increase their employability. A lot of the critical ICT training takes place outside the formalized education system, and certification is the means available to document both theoretical and practical skills with a particular technology. One Microsoft partner commented: *"With the chaotic training methods, certification becomes critical. It will be the only way to see that a person has a specific skill. And since IT is critical, and dependency on technology is growing, companies need proof of the IT person's skills."*

However, certification needs to be modernized to reflect the ICT skills needed in the market. A number of business partners said that certification has been inflated; there are too many different certificates, too many are handed out and they are not sufficiently practical. Today, certificates are viewed as too technical, and should be modified to include soft skills, such as language, management, and business acumen.

Vendors have a critical role in updating and modernizing certification, and reducing the jungle of certificates, but also in creating stronger awareness in the market of their certification programs, as well as the need for certification, not only for graduates.

Two-thirds of European employers see an increase in importance of certification. However, less than 20% see it as critical for existing employees. We assume that this is because certification is costly and takes time — and perhaps withholding training for certification is even seen indirectly as a means to retain the workforce: certification increases workforce mobility and an enterprise risks paying for certification from which it will not benefit. We believe this is a short-sighted and slightly double-standard approach, since companies want to hire experienced and certified employees, but as long as the attitude is so pervasive — and even more so in the economic crisis — it is an issue that needs to be addressed at a more general level.

CONCLUSION

Our study quite clearly shows that ICT skills are already crucial for an individual to be a marketable and attractive participant in the European workforce, but that they will be even more crucial in the future. This is almost regardless of job role and industry sector, and is not only a key issue for ICT professionals. As the EU moves forward on its vision of being a leading innovation society, these skills issues will become more urgent.

While the demand for more developed ICT skill sets has been a natural progression of technological advancement, the recent economic crisis has increased the urgency of addressing the gaps between available skills and what the market demands. The gap between documented skills demands and companies' lack of willingness/ability to pay for education means the gap increases in the short term, attempts to make Europe the leading knowledge society will fail unless urgent action is taken. Some of the key issues that need to be addressed include:

- ☒ The past decade has witnessed a diminishing status and interest in technical (science and math) education, which has contributed to the lack of ICT professional skills in Europe. Several steps can be taken to address this issue, including stimulating enrolment in technical studies through quotas and scholarships. However, regular assessment of study curricula is also urgently needed to ensure that graduates enter the workforce with the most marketable skills and knowledge. Not only should this include ensuring that ICT graduates are trained at the forefront of technology (e.g., cloud technologies, Web 2.0) but also that they have much stronger insight into the business impact of technology — what we previously referred to as business empathy. To do this requires close, *ongoing* collaboration between the ICT industry and the education sector. It will also be necessary to demonstrate attractive and interesting career paths in ICT to the coming generations. The EU e-Skills Week 2010, supported and spearheaded by the European Commission DG Enterprise and Industry, is a great example of such types of awareness-raising initiatives. We need more of

this kind and with close participation by the ICT industry, the education sector, and other stakeholders.

- ☒ However, the urgency to ensure ICT skills and ICT literacy for all of Europe's current and coming workforce is equally strong. With more than 90% of jobs in five years' time requiring ICT skills of some kind, regardless of job role, this issue needs to be addressed so as not to hamper the competitiveness of Europe's industries in the global economy.
- ☒ The education sector specifically must make systemic changes and create specific programs that are modernized and flexible enough to meet the demands of rapidly changing ICT and business environments (and therefore the needs of the graduates for employability). However, there is a limit to what you can expect of the formal education system and how flexible it can be. Post-graduate training and lifelong learning are necessary and should be supported and encouraged from a government level. This is the only way to ensure this happens and is not dependent on an individual employer's willingness — or otherwise — to pay because of a lack of short-term benefits (or lack of funding and time). This is particularly an issue due to the structure of Europe's business community, with half the workforce working in small companies. Public bodies must provide more than lip service in regards to the promotion of skills development in Europe. This could be in the form of subsidies to the private sector for training and reskilling purposes.

Finally, in order to meet the skills demands of Europe's innovation society, governments, universities, and the private sector must work in concert to create educational and skills development programs that will supply the market with more qualified graduates and professionals, as well as being fluid enough to evolve with the increasing demands of technology developments and business needs. The public consultation for the new information society strategy for the EU in October 2009 was strongly focused on how to use ICT for innovation, create a strong ICT infrastructure, promote user creativity through, for example, Web 2.0 technologies, and increase ICT research and innovation. However, there was not a strong focus on how to develop the skills to ensure that the EU's vision of an innovative powerhouse can be realized.

- ☒ The issue of developing ICT skills has been discussed for at least the past decade, but ICT skills — for professionals and non-professionals — must be a strong area of focus and investment in its own right in future EC policy statements.

APPENDIX — METHODOLOGY

In August 2009, Microsoft commissioned IDC to conduct a study into the impact of the changing economic environment on the information and communication technologies (ICT) skills needed for ICT professionals, but also for any other job roles within selected countries in the EU.

The study included a Web-based survey of 1,370 employers across Europe to explore the changing needs for ICT skills for non-ICT professionals. The survey was conducted in September and October 2009 in 13 European Union countries:

☒ Belgium, Czech Republic, France, Germany, Hungary, Italy, Netherlands, Poland, Portugal, Romania, Spain, Sweden, and the U.K. The surveys were distributed evenly across the countries.

The surveys were conducted among organizations with more than 10 employees, with the following distribution:

☒ 10–49 employees (20%); 50–99 employees (19%); 100–249 employees (19%); 250–499 employees (19%); 500–999 employees (14%) and over 1,000 employees (9%).

The industry sector distribution of the interviews was as follows:

☒ Manufacturing (30%), professional services (25%), public sector (19%), finance (8%), utilities and energy (6%), transportation and logistics (5%), retail/wholesale (2%), others (5%).

The in-depth interviews of Microsoft business partners (28 interviews) and Microsoft training partners (18 interviews) in the 13 countries mentioned above were undertaken by IDC's local analysts in the countries.

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