



# Developing the Future

2008

Challenges and opportunities facing the  
UK Software Development Industry –  
Summary Findings and Recommendations

DtF



## GORDON FRAZER

MANAGING DIRECTOR, MICROSOFT UK  
VICE PRESIDENT, MICROSOFT INTERNATIONAL

The last quarter century has seen an unprecedented transformation of the lives of individuals and the workings of business and government. It is easy to forget how different the world was in 1983, not just in geopolitical terms, but in how people kept in touch with friends and family, entertained themselves, shopped, looked for information, found directions, booked holidays, made new friends – and in many other aspects of daily life. Large and small organisations, whether in business or government, have also changed. Production lines are faster and more efficient; supply chains leaner and more flexible; employees more productive: all of which has contributed to nearly doubling the GDP per capita in the UK in real terms over this period. Much of this progress would have been impossible without smart software that exploited the ever increasing capacity and decreasing cost of computer hardware and digital communications.

**“CREATING MORE SUCCESSFUL SOFTWARE COMPANIES THAT CAN ACHIEVE GLOBAL IMPACT REQUIRES ENTREPRENEURS AND SOFTWARE DEVELOPERS WHO ARE DRIVEN BY VISION, CURIOSITY, INTELLIGENCE AND ENERGY.”**

At the time of writing, at the end of 2008, big challenges face humanity in many areas, including environment, energy, health, education, and not least global economic stability and prosperity. Our ability to address such issues will depend on new approaches and innovative solutions. These will build on existing knowledge and resources but also require new insights and inventions that deliver either significant breakthroughs on their own or many small improvements with a large cumulative effect. This means that today, more than ever before, our future depends on the development of smart software being created in universities, research labs, and commercial organisations of all sizes.

As this report shows, the UK has a very strong and innovative software industry today. However, over the next ten to twenty years there will be a generational shift in the IT profession as those who participated in the inception of the industry in the 1970s and 1980s start retiring and the reins are picked up by people who have never experienced anything other than a digital and connected world. It is very easy for this ‘digital generation’ to take the capabilities of technology for granted, and this may be a factor in the declining interest in STEM subjects.

This means that it is absolutely essential to harness children’s natural interest in how things work and encourage them towards science and mathematics at an early age. Although general and applied IT skills are clearly important, students, parents, and teachers also need to be made aware of how in-depth technical skills can open up opportunities across many different career paths. There are tremendous opportunities open to the new generation, if only we can inspire them to create as well as consume technology.

Creating more successful software companies that can achieve global impact requires entrepreneurs and software developers who are driven by vision, curiosity, intelligence, and energy to find new ways of addressing the needs of consumers, businesses and government. A thriving software industry is therefore highly dependent on world-class entrepreneurial and technical talent, but also requires a number of other factors to be present.

The global economic crisis currently unfolding can only be reversed by addressing a range of issues besetting individual, corporate, and government finances. But the real sources of long-term growth and prosperity are productivity improvements and innovations, which increasingly depend on software.

This third edition of the Developing the Future report, which Microsoft has commissioned in collaboration with BCS and Intellect, gives us an improved understanding of the factors that contribute to the success of the UK software industry. The introduction of the ‘Software Economy Barometer’ offers a more comprehensive picture of the environment that UK software companies operate in than has previously been available. In the present economic situation, the focus on the software industry is particularly important because its success has a disproportionate effect on the UK economy as a whole, as demonstrated in previous Developing the Future reports.

We should be aspiring to turn the UK into a world-leading software economy and this report is intended to stimulate debate on how we get there, and how we can strengthen an industry which has the potential not only to be a significant contributor to the growth of the UK economy, but also to be an engine of innovation that will help make the world a better place 25 years from now.

### DAVID CLARKE

CHIEF EXECUTIVE,  
BRITISH COMPUTER SOCIETY

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Optimism is in short supply in these times of economic crisis, but this report should reinforce our confidence in the UK's software sector as an engine for jobs, long-term growth, and as a key enabler of the competitiveness of the wider economy. There are challenges, but not only are we making progress in many areas, we collectively have the means to address the threats this report identifies. That is cause for optimism. I believe the UK software sector will emerge from the current economic downturn in an ideal position to generate and exploit the next wave of technological innovation.

'Promise' is the word that best describes our situation. The software and IT sector has a great deal of promise; potential for jobs and growth, for international leadership, but also as the means to effect positive change in much that is important to UK society. Our software industry will continue to have a huge impact on healthcare, education and security as well as having a part to play in restoring our financial services. In that sense, there are promises to be fulfilled, as a great deal relies upon our success.

As you read this report and study the recommendations, keep in mind as the challenges loom large that the opportunities are far greater than the problems. In the right environment, talent will flourish, innovation will take place and investment will be rewarded.

Creating that environment will require a new level of commitment and collaboration amongst industry, universities and government, but all of that is within our capability.

I am concerned that we continue to tackle the difficult issues around education and skills, while attracting and equipping the most talented individuals. I am concerned that we support small businesses better. We need to help them focus on innovation and growth, to make available the skills and investment they need, along with other tools and support. I am concerned that our international reputation, while strong, is also fragile. We need to keep promoting the UK as a great place for investment and ideas generation, and as a valuable partner in international ventures.

**“OUR SOFTWARE INDUSTRY WILL CONTINUE TO HAVE A HUGE IMPACT ON HEALTHCARE, EDUCATION AND SECURITY AS WELL AS HAVING A PART TO PLAY IN RESTORING OUR FINANCIAL SERVICES.”**

These needs and opportunities are at the top of our agenda at BCS. We will continue to work with our partners such as Microsoft and Intellect to help deliver on the promise of UK leadership in the global software economy. The next year will be an exciting journey for all of us.

### ACKNOWLEDGEMENTS

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This summary document can be downloaded from  
[www.microsoft.com/uk/developingthefuture](http://www.microsoft.com/uk/developingthefuture)





# Introduction 7



# Introduction



**This is the third year that Microsoft has commissioned the Developing the Future report to provide an insight into the state of the UK software industry. The report takes a very broad view of the challenges and opportunities that face the industry and attempts to capture this in a 'Software Economy Barometer' which, together with the detailed research that underpins it, represents the most comprehensive insight into the UK software industry to date.**

The purpose of the report is to help decision makers and influencers across the education sector, industry, and government to understand the state of the UK software industry and highlight the areas where action is needed to secure the future of this important industry.

Software increasingly forms an integral part of modern life. This takes the visible form of personal computers, smart mobile phones, digital TV sets, video games consoles, and an ever-growing array of online services. It is software that drives the systems that enable people to be more effective and productive in all types of organisation, from the smallest start-up business to the largest enterprise – and in every sector, whether public or private. Software is also embedded in solutions and systems, and research that enable the continual advancement of everything from energy generation and transport, to medicine.

The benefit of a strong software industry in the UK does not arise merely from the number of people employed by the software companies or the revenue they generate. Local innovation is a catalyst for growth across all UK businesses and an important export revenue earner. In an increasingly digitised world, our software industry is not just becoming an integral part of how we enjoy our cultural heritage, but also how it evolves.

Raising the profile and awareness of the ubiquity and the transformative power of software, and the value of software development is important both to support the industry that supplies these innovations and also to attract the next generation of technology innovators in an era where technology is easily taken for granted. The UK has been very strong in what is still a very young industry, but many of the fundamentals that laid the foundation for this success are now either in decline or stagnant.

It is still too early to assess the full impact of the current credit crunch and spread of recession across the world's major economies on the UK software industry. The concern is that as the overall economy slows down, the markets for the products and services delivered by software companies will also contract. The financial services industry, for example, is an important market for the software industry, accounting for nearly 20% of business software revenues<sup>1</sup>. It is certainly noteworthy that while the dotcom bubble was bursting at the start of this decade, the UK software industry continued to grow in terms of employment and turnover, although many smaller firms disappeared. However, that bubble was inflated by over-investment in business models that turned out to be unsustainable. The resulting shake-out left the industry with much stronger, more profitable companies.

For some, the present crisis will offer new opportunities. The highly-skilled workers from finance and other sectors that come onto the job market will benefit the companies that are in a position to invest and grow; this will include those that offer products and services that enable their clients to cut costs and streamline their operations. Those that have the skills and capital to start a new venture and offer solutions that address market needs will benefit from the old maxim that 'The best companies get started in hard times because they are prepared for the worst and can only prosper in better economic times!'

Nevertheless, the immediate outlook is not encouraging. Many software companies have already issued profit warnings and struggle to confirm their forecasts. 2008 will also see the lowest level of software company Initial Public Offerings (IPOs) on the London Stock Exchange (LSE) for more than a decade.

So far, there has not been a significant impact on the level of venture capital investment, but there are concerns that funds will find it increasingly difficult to raise new capital and that they will become more reluctant to invest in new companies because their existing portfolios will require greater injections of cash.

To achieve a greater insight into the current state of this industry, and the trends that affect it, this report combines new research with analysis of existing reports and data sources covering three areas: Skills, Innovation, and Business Growth.

### SECTION 1. SKILLS: THE FOUNDATION OF THE UK SOFTWARE ECONOMY

Focuses on the role of Higher Education in supplying the industry not just with the intellectual horsepower to come up with new innovations, but also with the talent and skills that deliver the quality and productivity that has made the UK an internationally competitive place to develop software in the past.

Commentary on Section 1 is provided by Gerry McAlister, Director of the Subject Centre for Information and Computer Sciences at the Higher Education Academy and Ian Robertson, Chief Executive of the National Council for Graduate Entrepreneurship.

### SECTION 2. INNOVATION, ENTREPRENEURSHIP AND INVESTMENT: FEEDING THE UK SOFTWARE ECONOMY

Reviews the state of technology innovation and entrepreneurship in the UK and the Government initiatives designed to promote these activities. This section also provides an in-depth analysis of venture funding of software companies, including regional breakdowns for the UK and an international comparison with the rest of Europe. Finally, Section 2 surveys the role of university research in feeding the software innovation ecosystem through IP licensing and spin-out company creation.

Commentary on Section 2 is provided by Richard Anton, council member of the British Venture Capital Association (BVCA) and Chair of the BVCA Venture Capital Committee.

### SECTION 3. BUILDING ON THE STRENGTHS: THE GROWTH OF THE UK SOFTWARE ECONOMY

Investigates the trends in employment and turnover for different sizes of software companies over the last ten years, the role of offshore and outsourced development, and the overall trade balance in software. Section 3 reviews two particular areas of strength for the UK software industry, digital media technologies (MediaTech) and video games development, and examines the current challenges facing companies in these sectors.

Commentary on Section 3 is provided by Ian Livingstone, Entertainment & Leisure Software Publishers Association.

Three appendices to the report provide details of the methodology and data sources used, as well as an in-depth explanation of the Software Economy Barometer.

*It is still too early to assess the full impact of the current credit crunch and spread of recession across the world's major economies on the UK software industry.*



# The UK Software Economy Barometer <sup>11</sup>



# The UK Software Economy

The UK Software Economy Barometer is intended to give a high-level picture of all the key factors that have an impact on the success of software businesses in the UK. The barometer provides a model of the industry as a whole, divided into two parts. The 'outer framework' contains factors that are external to the software economy but directly affect it, such as tax, the legal system, ICT infrastructure, quality of life, economic indicators, education levels, and labour force. The 'inner framework' includes the measures of activity and success within the software industry itself and also the role of universities in supplying talent and intellectual property.

The UK Software Economy Barometer uses a total of 23 different indicators and provides a view of the current state and the trend for each one of them, as seen below.

It is clear from this picture that all of the external factors excluding education and entrepreneurship are either flat or in decline.

At a time when the overall economy is contracting and the stock market is subject to a global slowdown, there is an even stronger imperative to focus attention on the areas that government and industry can impact directly, such as taxation, legal frameworks and infrastructure investments.

The education system as a whole is delivering graduates with higher levels of qualifications than ever before. Despite this, there are insufficient applicants for the subjects that matter to the software industry, and there continues to be both a qualitative and quantitative gap between the graduate output and the requirements of recruiting companies. Obviously, the increase in graduate employment rates is welcome, but it also suggests that companies are finding it more difficult to recruit the right candidates. Addressing these issues requires a very long-term commitment to increase the participation in, and quality of, the teaching of science and mathematics at all levels of the education system, and to offer students

opportunities to acquire the skills demanded by industry.

Although the UK scores well in international comparisons of entrepreneurial activity and attitudes, it is surprising to find that, in stark contrast with the other segments of the software industry, the 'micro company' segment (companies employing less than 10 people) has not grown over the last decade. The indicators for other Small to Medium Enterprises (SMEs), large private companies, and R&D activity are all positive, indicating real strength at the heart of this industry. However, weak IPO activity, and the fact that companies struggle to stay independent and grow into international champions, adds to the glass ceiling experienced by the UK software industry. In addition to addressing the external industry factors mentioned above, consideration should be given to the segments of the UK software industry that can be competitive in the global marketplace and how to create an environment that allows them to flourish.

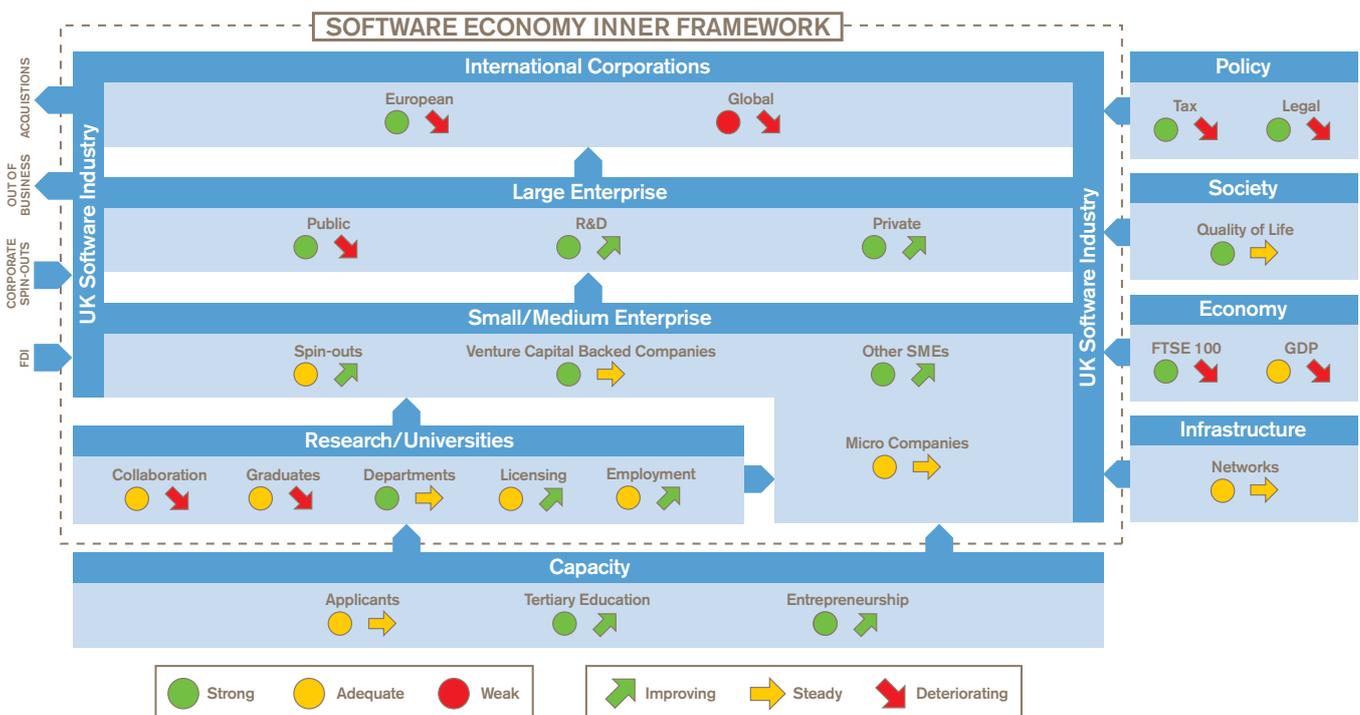


Figure 1 The UK Software Economy Barometer 2008

# Barometer

## CHARLES WARD

CHIEF OPERATING OFFICER,  
INTELLECT

If the question is 'is the UK software market an attractive place to play?' then the answer is yes. The UK exhibits a number of characteristics that make it a pretty exciting place. At a headline level the market growth has been consistently above European average. The UK is home to a fast growing digital economy, stimulated by consumers who are comfortable online and with a voracious appetite for new technology. The UK's leading industries, such as financial services, aerospace, pharmaceuticals, and the emerging games sector, are heavily reliant on software innovation. Finally, we have a government committed to the modernisation of delivery of services, which itself has contributed to the buoyancy of the UK market in recent years.

However, being a relatively attractive market for software does not necessarily equate to a healthy industry. The reality is that information technology is largely a foreign owned industry. The number of global scale UK tech businesses can be counted on the fingers of one hand and there is belief that £10m turnover is the milestone that European software companies have difficulty passing without being acquired. This could be as much a consequence of market dynamics in which the large powerful global players are forced to be predatory in order to achieve growth above market rate. Nonetheless, the UK has spawned some hugely successful software companies; some, such as Autonomy, are high profile brands; others, such as Lagan, are less well known but on steep growth paths and enjoying success in overseas markets. The common characteristic of the majority of highly successful UK software companies is that they are in niche markets or highly specialist.

In Intellect's 2008 Presidents Report we asked our members, a sizeable proportion of whom are running software businesses, how they felt about their prospects and performance but also what needed to be done in order to improve the health of the UK tech sector. Notwithstanding the sudden brake now being applied across the economy as a result of the credit crunch, the mood at the time of the survey (early Q2) was cautiously optimistic. There was a high level of confidence that the sector delivers value to its customers and that their companies were innovative.

When asked 'what should be done to improve the health of the sector?', six key areas were seen as requiring attention: skills, standards of professionalism, trust and confidence, exploitation of innovation, improved communications infrastructure, and improving the relationship with other sectors. Unsurprisingly, most of these correspond with the indicators in this report but one area listed above is crucially important and often taken for granted: infrastructure.

The UK has the fastest growing market for broadband access, and the most extensive availability. What we lack is widespread deployment of fibre that can provide internet speeds of up to 100 mbps or plans for the equivalent wirelessly. The capability of the underlying communications infrastructure available to industry is a real competitive differentiator for the tech sector and a prerequisite for innovation and growth. Software is a 'footloose' industry. Work will go to where the best conditions prevail. The UK must not allow the absence of a competitive infrastructure to act as a deterrent to innovating businesses and highly-skilled individuals wanting to build their careers here.

**“THE UK IS HOME TO A FAST GROWING DIGITAL ECONOMY, STIMULATED BY CONSUMERS WHO ARE COMFORTABLE ONLINE AND WITH A VORACIOUS APPETITE FOR NEW TECHNOLOGY.”**



A man in a white shirt is leaning over a desk, writing in a notebook. A desk lamp is visible behind him. The background is a blurred office setting. The text 'Key Findings' is overlaid on the right side of the image.

# Key Findings

# Key Findings

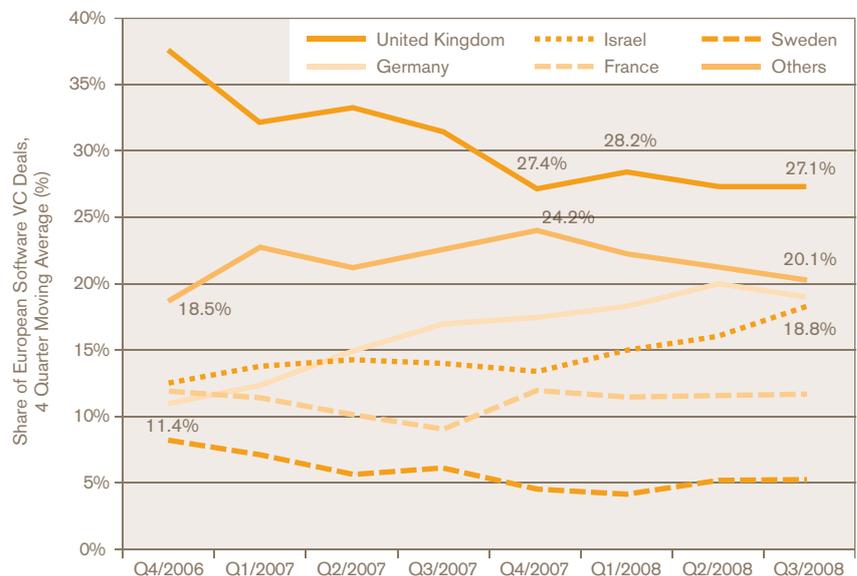
## THE UK'S POSITION AT THE TOP OF THE EUROPEAN SOFTWARE INDUSTRY IS UNDER THREAT

The UK, which accounts for 25% of Europe's largest software companies, is an international powerhouse for emerging software sectors like digital media and Web 2.0 and continues to produce some of the most innovative games developers. The UK also has the largest share of Venture Capital (VC) investment in software companies in Europe – at nearly one third of the total – which is another clear indication of the strength of the UK software industry. However, this rosy picture is threatened by a number of trends:

- The UK's share of European VC investment has been in decline in recent years as focused initiatives in countries like Germany and Israel have been driving faster growth than in the UK.
- Software companies in the UK are popular targets for acquisition by overseas companies and such exits are actively sought by many company founders and investors. Examples include a number of UK video games developers that have been acquired by foreign games publishers, and Web 2.0 companies, like Bebo and last.fm that have become part of US media conglomerates. Although this trend has brought increased investment and jobs, it has also resulted in fewer domestic companies with international ambitions.
- The UK tax system emerges favourably in international comparisons but the trend is in the wrong direction. For every negative news story regarding company and personal taxation, the perception of the UK as a favourable place to do business declines.

- Compared to countries such as France and Canada, which have introduced targeted incentives for video games development, the UK has become a less attractive place for establishing such firms.
- From growing in the 1990s and holding steady for most of the last decade, the number of software companies listed on the LSE has declined for the last four years. With only two IPOs by software companies between January and November 2008, this year will end a long way short of a typical year in which there are five to ten software IPOs.

All this suggests an industry which is not as healthy as it may first appear and needs increased focus from government, industry, universities, and other sectors interested in the long-term success of the UK as a hub for high-tech innovation.

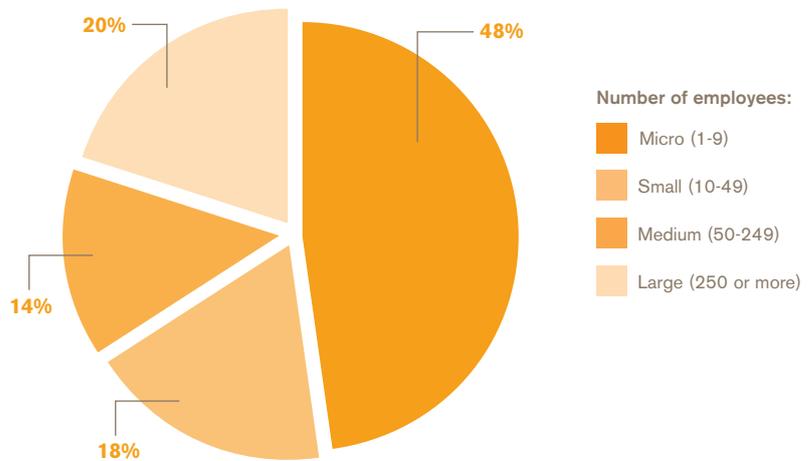


**Figure 2** Software Investment of Various Nations as a Percentage of European total (Source: Library House)

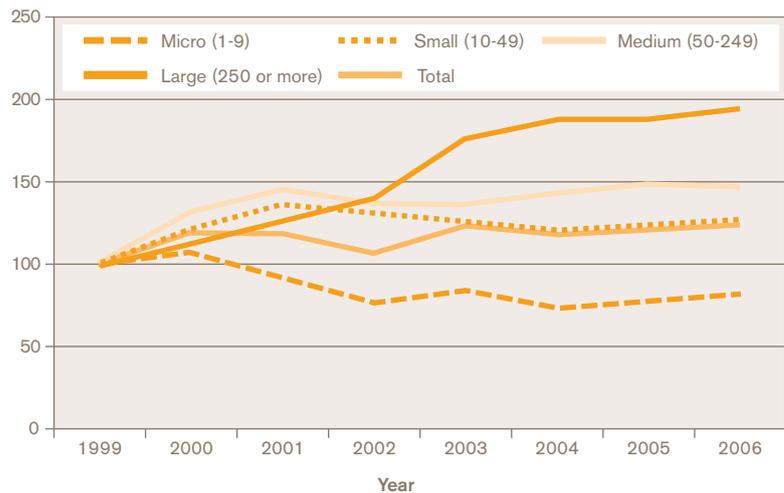
**THE SMALLEST COMPANIES HAVE BEEN LEFT BEHIND IN THE OVERALL GROWTH OF THE UK SOFTWARE INDUSTRY**

The period 1999-2006 has been very successful for the UK software industry, despite the bursting of the dotcom bubble in 2001. Small, medium, and large firms have all increased their turnover and employment, with the sector as a whole turning over more than £50 billion and employing around 430,000 people in 2006, based on the most recent data available from the ONS<sup>2</sup>. However, in the smallest segment of the industry – the ‘micro’ companies with less than 10 employees – there has been a significant contraction, in sharp contrast with the rest of the industry. Although the small company segment (10-49 employees) has grown, it has done so much more slowly than the medium and large segments.

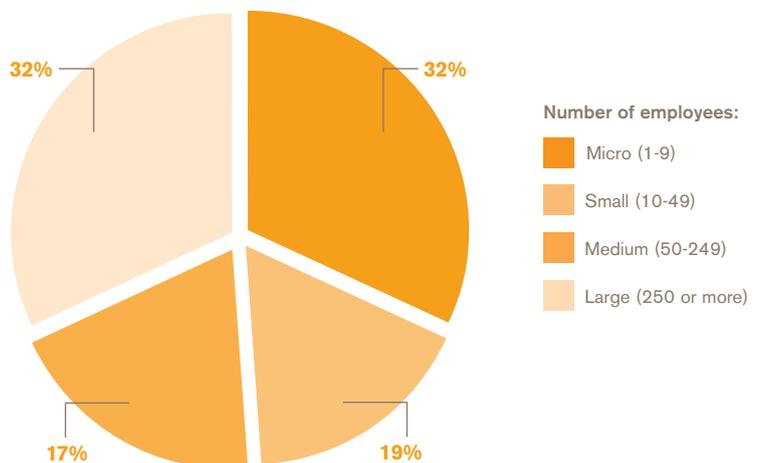
The micro-segment will always be subject to a high rate of churn, since such companies are more likely to either grow into the next segment, be acquired by a larger company, or go out of business. The strong growth in the medium and large segment is a very positive sign, and total employment in large software companies almost doubled between 1999 and 2006. However, the micro companies still represent a significant proportion of the industry and if this segment continues to shrink it will eventually impact on the growth of the software industry as a whole.



**Figure 3** Software sector employment by company size, 1999 (Source: Library House/ONS)

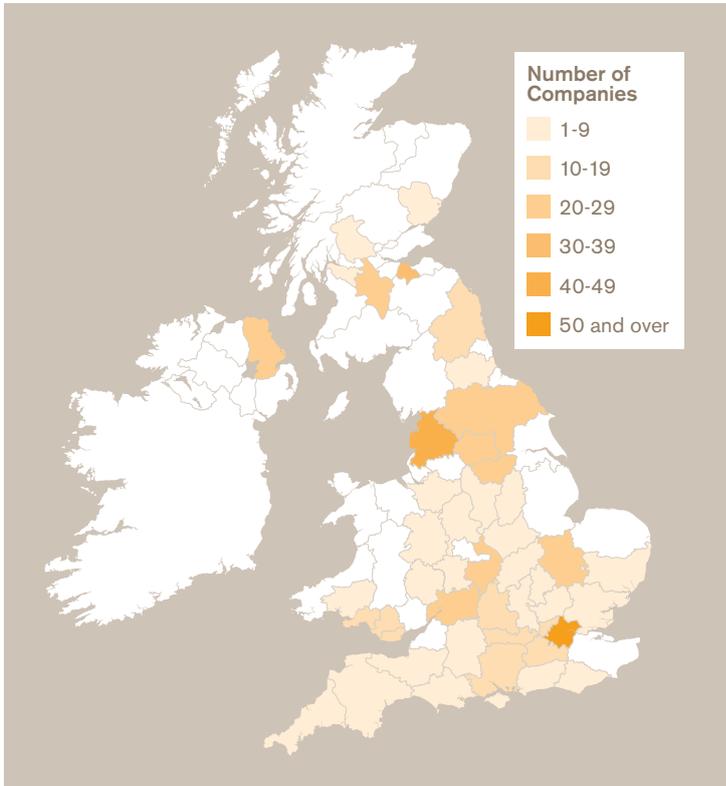


**Figure 4** Change in software sector employment by company size, 1999 = 100 (Source: Library House/ONS)

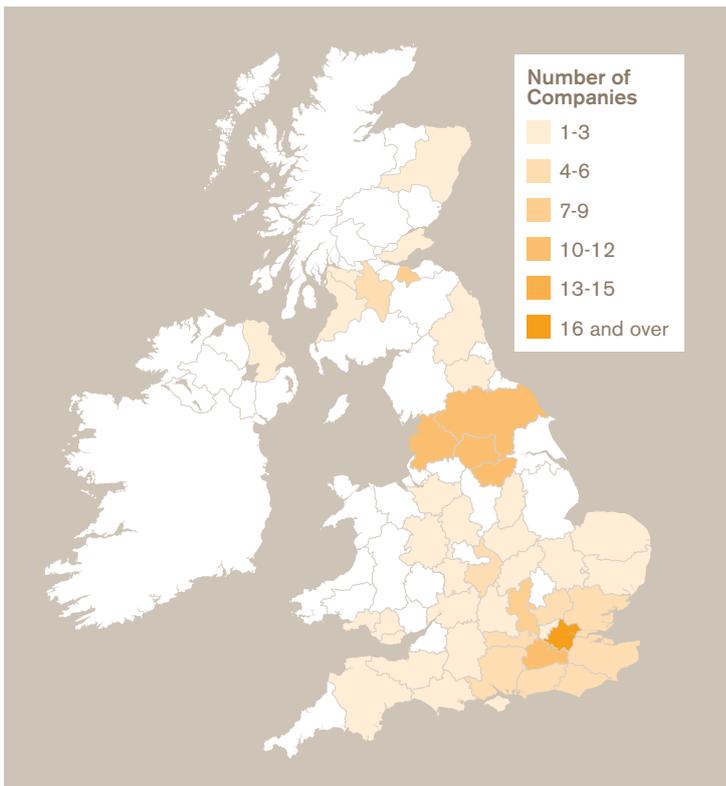


**Figure 5** Software sector employment by company size, 2006 (Source: Library House/ONS)

<sup>2</sup> The definition of the software industry used in this report is detailed in Appendix III



**Figure 6** Distribution of venture-backed software companies (Source: Library House)



**Figure 7** Distribution of software start-up companies in Microsoft's BizSpark programme (Source: Microsoft)

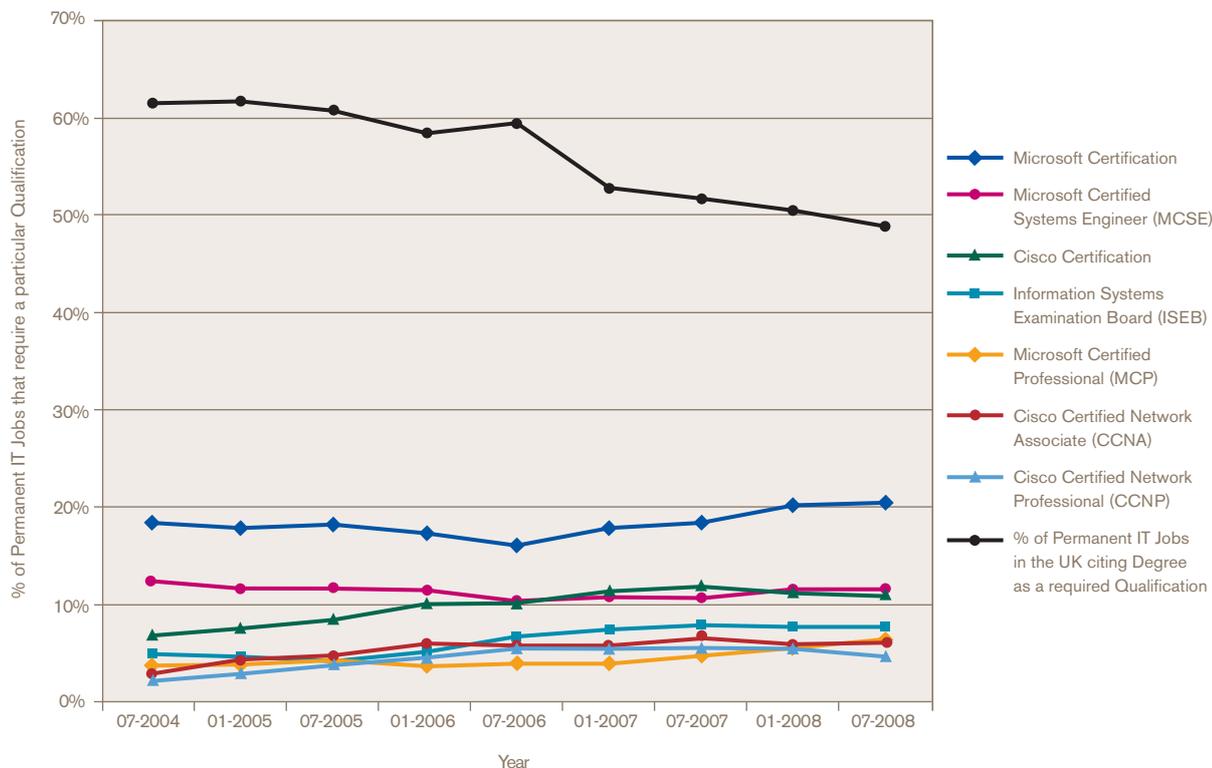
### SOFTWARE COMPANIES CONTRIBUTE TO REGIONAL DEVELOPMENT

An analysis of the geographical distribution of venture-backed software companies shows that although London and the South East are important, accounting for nearly 50% of these companies, there are several regional clusters of software companies, including Belfast, Birmingham, Cambridge, Edinburgh, Manchester, and Newcastle.

However, this distribution is at least partly a result of government intervention. Software company venture capital deals that were either wholly or partially funded by public sector investment represented 12% of the deals in the East of England, 17% in London and 21% in the South East of England, while the proportion in the North East of England and in Yorkshire was 88%.

Venture-funded companies constitute a very important segment of the industry, since they are typically very innovative and have high growth potential. However, they represent only about 0.5% of all software companies so the question is to what extent is this picture representative of the industry as a whole? The second chart shows the distribution of UK companies enrolled in Microsoft's 'BizSpark' programme in the first four weeks after the launch on the 5th November 2008. This programme is open to any privately held software company less than three years old and with less than £600k of annual revenues. Even with this small sample the similarity with the distribution of the venture-backed companies is striking.

The availability of broadband internet connectivity is clearly a major factor in enabling software companies to build and grow their business irrespective of location. Thus, investment in high-speed connectivity is at least as important as more traditional infrastructure for promoting regional development through the software industry.



**Figure 8** Percentage of Advertised Permanent IT Jobs which require a Degree or other Non-Degree Accreditations as a Qualification (Source: IT Jobs Watch)

**THE SOFTWARE INDUSTRY 'KNOWLEDGE GAP' IS NOT BEING CLOSED**

The issue with insufficient numbers of students choosing to study the 'cpSTEM' subjects (Computer and Physical Science, Technology, Engineering, and Mathematics) and the challenge this creates for high-tech industries in the UK has been recognised for some time. The drive towards wider access to university education has not led to a significantly greater uptake of these important subjects. Overall UCAS acceptance rates of around 100%, suggests that they are not attracting enough candidates. Employment prospects

for graduates in cpSTEM subjects have been improving steadily over the last few years but are still worse than the average for all students. Degree qualifications are now sought for nearly 50% of IT jobs, down from over 60% just four years ago, and employers increasingly look for industry qualifications and experience which are not delivered consistently by all cpSTEM degree courses.

*Investment in high-speed connectivity is at least as important as more traditional infrastructure for promoting regional development through the software industry.*

**UK UNIVERSITIES ARE INCREASINGLY TRANSFERRING SOFTWARE TECHNOLOGY AND KNOWLEDGE THROUGH SPIN-OUT AND LICENSING ACTIVITIES**

Over the last few years, there has been a marked increase in software technology and knowledge transfer from UK universities. The number of venture capital-backed university software spin-out companies formed each year has doubled, from an annual average of about 1.5 new spin-outs between 2001 and 2003 to an average of 3 per year from 2004 to 2007. Similarly, the number of software IP licences increased from 251 in 2002-03 to 874 in 2006-07.

However, this good news is not uniformly distributed. The number of software IP licences transferred to commercial companies has remained largely unchanged throughout this period while there has been a significant increase in the licences going to the non-commercial sector, such as public sector organisations and charities and, to a lesser extent, SMEs. This is also true for the total revenues obtained from software licences. From 2002-03 to 2006-07, the revenue from licences sold to SMEs increased by 90% and to non-commercial companies by 220%. Over the same period, the revenue from licences sold to commercial companies decreased by 30%.



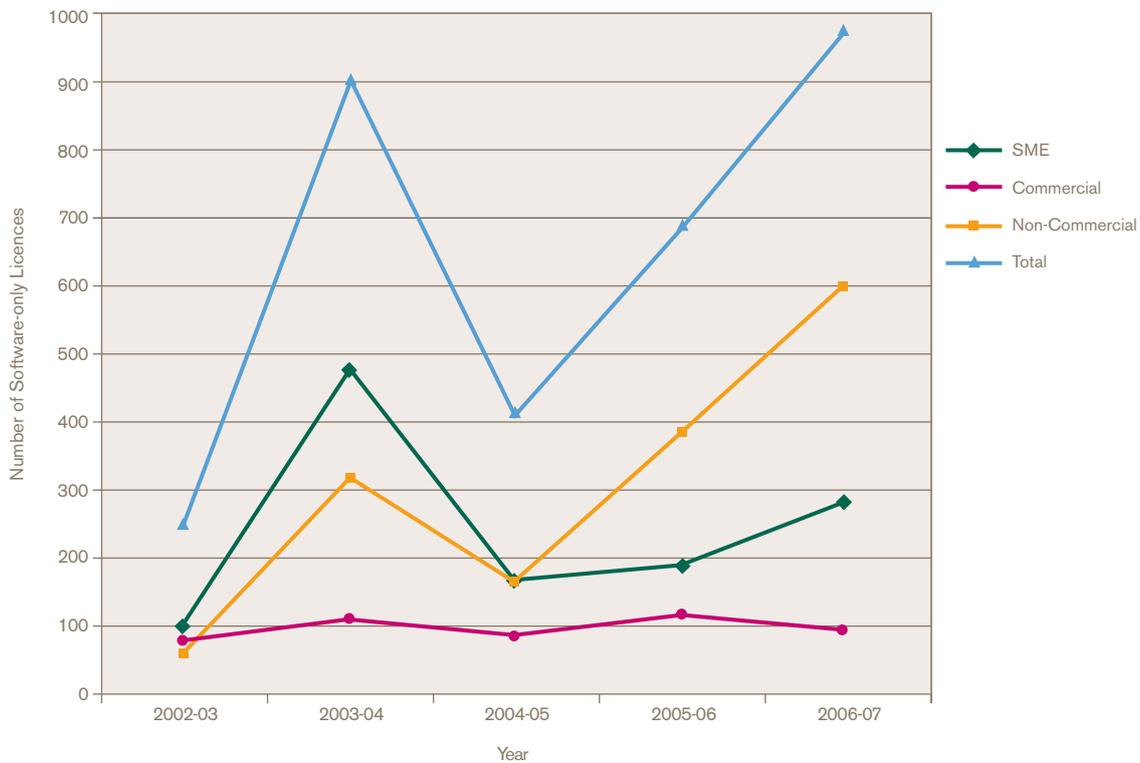


Figure 9 Number of Software-only Licences by Sector (Source: HE-BCI Survey)



A man with glasses and a green shirt is sitting at a table in a meeting room, gesturing with his right hand as he speaks to a group of people. A woman in a red blazer is seated to his left, and the back of a person's head is visible in the foreground. The room has large windows in the background, and a coffee cup is on the table.

# Recommendations

# Recommendations

## AMAR BHIDÉ

PROFESSOR OF BUSINESS, COLUMBIA UNIVERSITY  
INTERVIEWED BY LIBRARY HOUSE 2008

“Governments cannot transfer enthusiasm for technology. To the degree that government underwrites research, I think that there is a need to get away from hardware and producer-orientated support to recognise that today’s economies are largely service-orientated and that frequently the bottleneck to improving productivity of service sectors is not a physical artefact, it is the lack of effective use of artefacts. It is about know-how... determining the nuts and bolts of impediments to adoption of transfer technology represents questions private industry has been struggling with more or less on its own. However, they have not historically been part of the research agenda of engineering schools and research developments. Perhaps there is a way of rethinking what scientific or engineering research is and should be.”

Professor Bhidé’s views are perhaps controversial and there remains an important need for top-quality scientific research in many sectors of industry – research that will likely be the source of breakthroughs on the biggest challenges faced by humankind in areas like energy, environment, health and education. But in the new knowledge-based economy, innovation happens at many different levels. New ways of applying existing technologies and of monetising such developments are major sources of innovation and growth. In parallel with an increased focus on the academic excellence required in the search for scientific breakthroughs, we need to enable a future generation of innovators and entrepreneurs – in whatever field they choose.

### EDUCATION

Stronger links between the software industry and the STEM departments at universities are needed to help bridge the gap that currently exists between the industry’s needs and graduate capabilities. Initiatives such as internships, guest lecturers, incubators, industry qualifications and entrepreneurship classes are valuable and should be encouraged and expanded.

There is clearly a need for higher education institutions to teach concepts rather than skills, but more should be done to ensure that students have opportunities to experience a wide range of current technologies during their studies, as the ability to quickly pick up, learn and adapt to new technologies is in itself very valuable.

Industry placements have an important role to fill, but they require co-ordinated support from both universities and industry. The introduction of tuition fees may have created a deterrent to students considering taking up a placement as they are likely to be more anxious to finish their studies as soon as possible in order to repay their loans and avoid further debt. Additional research is needed to identify the best way to increase take up of industry placements, and specific incentives may need to be put in place for all parties concerned.

For the long-term success of the UK software industry, such initiatives need to be underpinned by a much stronger emphasis on basic literacy, numeracy, science, and technology skills throughout the education system. This should include not just the use of, but also the programming of computers, games, robots, and other

devices at an early stage to spark the natural curiosity and inventiveness in children and foster interest in the way software is created and employed in all aspects of modern life.

The proposed introduction of a GCSE in Computing and the revision of the ICT curriculum at A-level are important steps in the right direction. The negative public perception of technology careers continues to be a barrier – so making parents, children, and teachers aware of the quality and variety of interesting jobs the industry has to offer would be helpful in promoting a positive image of careers in technology.

### INNOVATION, ENTREPRENEURSHIP AND INVESTMENT

As shown in this report, universities play an important and ever-increasing role in feeding innovation into the software industry. Incubation facilities have proven successful in many universities and spin-out and IP licensing activity should be strengthened with more structured and consistent approaches.

However, companies are still responsible for the majority of the software research and development that is commercialised. The software industry is based on the creation of new and innovative products and solutions and the declining cost of computing power and communications

offers entrepreneurs the opportunity to go from idea to product with remarkably small capital investments.

The growth of the industry is dependent on the right environment and incentives for entrepreneurs and investors, and while the UK remains high in international comparisons, the trends are moving in the wrong direction. It continues to be difficult for small software companies to access benefits such as R&D tax credits, which could make a big difference to their chances of success.

The UK software industry is being challenged by initiatives in other countries, such as investment funds like the German High-Tech Gründerfonds, and tax incentives like those offered to video games companies in France and Canada. The Government should ensure that international trade agreements are adhered to, and if necessary, work towards strengthening such agreements to provide a level playing field. However, the competitiveness of the UK software industry does not come from direct government intervention, so the primary focus must be to create the right environment for innovators and entrepreneurs to thrive and their businesses to grow.



## BUSINESS GROWTH

The UK software industry has enjoyed a good period of growth over the past decade. However, as this report highlights, future growth prospects are much less certain and getting through the current crises will require new approaches. The current support for small businesses has clearly not had the desired impact on the software industry and needs to be made more relevant, more easily accessible, centralised where possible, and localised where necessary.

Government also has an opportunity to support small business through simpler procurement that is open to small business and rewards vendors based on results.

Companies need access, both as importers and exporters to global markets in resources, services and products. Education on the benefits of globalisation and off-shoring should be provided to counteract the sensationalist negative slant it often receives and to avoid the industry missing out on benefits.

The importance of a world-class infrastructure, such as high-speed broadband, cannot be overestimated and the framework that governs the open, competitive marketplace for such services must provide incentives for the companies to continue to make long-term investments.





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