



Developing the UK ICT industry

Executive Summary

This paper proposes an economic development agenda to support UK SMEs in the Information and Communications Technology (ICT) industry. It starts from the basic assumption that, in the 21st century, the UK needs a Knowledge Economy to ensure its future prosperity.

By definition, the foundation of the knowledge economy is ICT, as they are technologies that help transfer knowledge between people. ICT is a huge and diverse industry both worldwide and in the UK. Apart from line of business applications to support all organisations, ICT also provides the tools for other knowledge intensive industries both established e.g. financial services and emerging e.g. bioscience.

One of the key characteristics of the industry is the rate and pace of change. The doubling of raw computing power every 18 months means that new applications become possible replacing existing products and processes. This creates new opportunities to generate Intellectual Property (IP) and wealth each year.

At a superficial level it seems like the UK ICT industry is healthy, however looking at it in more detail reveals fundamental weaknesses. Global multinationals dominate the industry, unfortunately, they do little research and development in the UK, what is done is under threat from Asia, and none has headquarters here. Therefore, there is an argument to say that they are a net drain on the UK's Knowledge Economy. In addition, the public sector's penchant for grandiose ICT projects, and aversion to reasonable risk on smaller ones, means that it is difficult for even the largest UK companies to get contracts. This is a significant issue as the public sector is the largest ICT market in the UK.

The good news is that there are a large number of innovative and enterprising small and medium size enterprises (SMEs) in the UK, particularly in the Thames Valley and around Cambridge. To generate and maintain the UK knowledge economy they need ambition, guidance and support to grow to dominate emerging global markets. This is too important to the UK economy to be left to an industry dominated by non-UK companies.

What is needed is an economic development programme covering at least the following:-

- **Ensure healthy ICT clusters exist** to get access to SMEs cost effectively and provide a environment for ICT SMEs and the other stakeholders to work together.
- **Research the industry properly** to develop reliable models and statistics. Learn the lessons from other countries, such as Finland.
- **Create a focussed organisational development programme**, including management training, specifically tailored to the ICT industry.
- **Re-define the criteria for “Implementing Best Practice”** and other existing training programmes to allow ICT SMEs that know what they need to get help immediately.
- **Pilot new commercialisation processes for software in academia.** There is significant ICT IP in academia that is not reaching the market.
- **Develop guidelines for “ICT SME friendly” public procurement** from pilots. This needs to include ensuring that SMEs can bid for the parts of large public projects that generate new IP.
- **Investigate barriers to private sector funding** to ensure that ICT SMEs have access to enough funding for them to realise their full potential.



The Issues

ICT is crucial

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Information and Communications Technology (ICT) describes technologies that help transfer knowledge between people. This knowledge transfer is both direct through, for example, video conferencing or email, and indirect through know how embedded into software, for example, how to do bookkeeping (Sage, SAP) or how to search for information (Google).

By this definition, there can be no more important sector in today's knowledge economy. Emerging knowledge industries including bioscience, nanotechnology and digital content all rely on ICT e.g. modelling the effects of new therapies. This also helps drive innovation in ICT. The companies that own knowledge in ICT are in a similar position to the people that sold spades in the gold rush or made machine tools in the industrial age, the ones that profit the most.

ICT is a truly global industry. This is as true for niche software products as it is for commodities, such as operating systems. The core reason for this is that ICT software and digital content is one of only a handful of industries where the exchange of value can be completely electronic i.e. you pay with a credit card and you use it immediately. It is worth noting that other industries where this is possible, e.g. finance, publishing and gaming, rely on ICT.

For people not familiar with the dynamics of the ICT industry, it is possible to see it as a mature market where economies of scale mean that only global multinationals can dominate. While it is true that ICT does have its commodity sub-markets e.g. PCs; these can be and are disrupted regularly e.g. the emergence of the Blackberry as an alternative to a laptop to access email on the move.

One of the reasons for this regular market disruption is a phenomenon known as "Moore's Law" i.e. raw computing power doubles every 18 months at little or no additional cost. This means that that if a particular application ICT is currently uneconomic for the mass market today, it will become economic within the space of a few years.

This exponential increase in the capability of ICT also has significant impact on traditional industries. Manufacturing in China would not be as attractive without the Internet, the publishing industry is rapidly moving away from paper and the music industry will never be the same.

Therefore, from an economic development perspective, it is critical to remember that real opportunities to generate significant wealth and high value employment open up each year; recent examples include Google and Ebay.

The UK ICT Industry

The UK's ICT industry has suffered since ICL's heyday in the 1980's. The UK's largest indigenous ICT service companies, such as Capita, RM, Logica and Morse are only medium size on a global scale. None comes close to the global leaders such as EDS, Fujitsu, CSC and IBM and all are now competing with emerging outsourcing giants from Asia, such as Wipro.

However, for real economic value and high value employment, one needs to look at the knowledge powerhouses, software companies. When it comes to significant software development companies the UK, as a whole, struggles. Yes, there are global niche players such as Sage and Sophos, however none have grown to the point of commanding the massive economic benefits and influence like global multi-nationals, such as Oracle, SAP and Microsoft.

There is an argument that the UK ICT industry, particularly in the South East, is in rude health with the presence of European headquarters of the global multi-nationals. However, while they do generate employment that is currently well paid, there is little investment in research and development to create new intellectual property (IP),



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which is essential to keep a knowledge economy competitive.

The notable exceptions are IBM in Winchester and Microsoft in Cambridge, however there is limited recycling of the value from these investments inside the UK. In addition, there has to be a question mark over continued long-term investment from the global multinationals with the emergence of highly able technology graduates in China and India who are cheaper to employ.

It is also worth noting that existing products and customers dominate the culture of large companies. It is very difficult for them to generate the disruptive innovation necessary to create new knowledge and new markets. Innovation typically comes from small companies and start-ups that have little vested interest in the status quo.

What there is in the UK is a large number of micro, small and medium sized ICT companies. It is telling that there are few reliable statistics as to the numbers and capabilities of these companies. The information that is available, suggests that many are highly innovative but are struggling to grow. Again, detailed information on the reasons why growth is an issue is not available, however anecdotal evidence suggests that attitudes in the venture capital community, difficulty in getting access to buyers of major IT systems and organisational development needs, all play a part.

Some small UK ICT companies do develop significant intellectual property and make progress in marketing and sales. At this point, they become acquisition targets for the large global players, who know how to buy well. This means that the greater economic benefit from that innovation and knowledge moves offshore outside the UK. Again, information as to why this is the case is scarce; however, anecdotal evidence suggests that a combination of the effort of developing the organisation, differences in the protection of IP between the EU and US and the attitude of the venture capital community contribute to reducing the ambition of business owners and managers.

Public sector investment in ICT

The UK Public Sector makes huge investments each year in ICT. Projects such as the £6bn National Project for IT in Health have the objective of making day-to-day delivery of government more effective.

The issue is that most of the significant public sector projects are won by the global multinationals with the profits re-invested in their home economies or offshore research and development. This is a missed opportunity to develop the UK ICT sector and secure knowledge economy jobs for UK residents.

In many of these projects, the economies of scale and risk management needed to deliver good value can only come from a large player. However, much more could be done through “intelligent purchasing” i.e. looking at the projects and ensuring that smaller companies stand a realistic chance of winning projects or sub-projects, particularly where there is significant new intellectual property to be developed.

What can be overlooked is that the public sector also makes significant investment in academic research in and around ICT. This can be both direct, such as the development of grid computing, and indirect, such as the development of new computer modelling techniques for bioscience. However, the full value of this research is difficult to realise for 2 primary reasons.

- One of the problems with ICT is the fact that it is more difficult to protect the intellectual property in software in the EU than in the US, where they allow the patenting of “business methods”.
- The culture in and current commercialisation processes of academia, hinder the rapid engagement with the market that is crucial to success in software.

The combination of these factors makes it understandable that the technology transfer function of universities focuses its efforts on other disciplines such as



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bioscience and nanotechnology.

This is compounded by the fact that academia is, in general, not engaged with ICT SME's who could provide the entrepreneurial spark.

ICT and the Environment

ICT also has a huge positive impact to make on the environment e.g. virtual offices, hot desking, teleworking and home working reducing the number of car journeys. By definition, technology supported location independent working can be carried out anywhere there is connection to Voice and Data networks. Locating work in or near residential communities reduced travel and property costs and increases workforce flexibility. It can also help to regenerate local services such as shops pubs and post offices.

Summary of current position

- **The foundation of the Knowledge Economy is ICT.**
 - **An innovative and enterprising UK ICT industry is essential**, if one accepts that the UK needs a knowledge economy for current and future prosperity.
 - **Global multinationals are not the answer**, there are no UK ones, their UK profits are rarely recycled fully and they make little investment in UK based knowledge creation.
 - **UK ICT SMEs have potential**, there is already a pool of innovative and enterprising companies that could grow, create high value jobs and generate profit that would be recycled into R&D and local communities in the UK.
 - **UK ICT SMEs need help to develop and grow.**
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Proposals

A focussed programme

The ICT industry needs an economic development programme, it is too important to the UK knowledge economy to leave it purely to market forces. The global forces at work, in particular the current US dominance of the industry and the emerging expertise in Asia; mean that the industry needs the support of government for the benefit of the whole country.

The focus needs to be on the ICT SME community and helping them develop and grow. This growth will create high quality jobs and profits for reinvestment in the UK economy.

While the industry is national, there are big differences in the current state of the industry between regions. The programme needs the support of both regional development agencies and national government.

Model and understand the industry

One of the key issues is a lack of information about and a common model of the ICT industry and ICT SMEs in particular. What is available is fragmented and incomplete. What is needed is a detailed analysis of the industry to understand what assistance is needed and target that assistance in a timely way.

Other EU countries have focussed public sector investment into developing the knowledge economy. One example is Finland which is now acknowledged as a leading ICT economy, not just because of Nokia, but the also numerous innovative small ICT businesses in Helsinki and Tampere. We need to learn from and adapt the lessons from Finland and other countries.

Management and Organisational Development

The ICT industry has an interesting management development challenge because of the rapid pace of change generated by Moore's Law. To be effective in the ICT industry, an individual needs to be intelligent and highly skilled. Often general management techniques and best practice from other industries need enhancing if they are to work in the ICT industry. This all means that the generalist approach currently adopted by government agencies such as Business Links/Small Business Service and most business schools is frequently inadequate.

People with a technical background establish many ICT SME businesses; it is this technical competence that attracts customers, initially. To grow they need strategy, marketing and sales skills, to generate additional revenue, and change management expertise to develop the business to satisfy the additional demand. All of this requires techniques tailored specifically to technology industries, particularly for revenue generation activity.

A full programme of training and development specific to the ICT industry will take time to develop, as it will be dependent on the information gathering and modelling. It is possible that something similar to the Manufacturing Advisory Service will be appropriate.

However, an immediate impact can be made through re-defining the qualification criteria in existing programmes such as "Implementing Best Practice" and "Business Leaders" to reflect the priority on creating growth in knowledge economy enterprises. This will allow companies that have already identified development needs to get assistance.

Public Sector ICT investment

It is critical that ICT innovation in UK academia is commercialised. The current commercialisation processes work well for patentable ideas, but software is different. What is required is a new model for commercialisation from academia specific to software. A pilot programme to develop that model, possibly using the proposed knowledge transfer networks, needs to be set up as a priority.



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The issue of getting better access to public procurement opportunities is under active discussion; however, there is little real engagement with the key dilemma in local government, trying to balance the demands of the Gershon review with the SME Concordat. There seems to be little practical action being taken to identify the intellectual property elements of large projects and ensure that SMEs have a level playing field to win these tenders.

Again, what is needed here are pilot projects to demonstrate practical steps that government procurers can take to help the economic development agenda while still achieving good value for taxpayers. These should be developed into firm guidelines for all future ICT procurement activity.

Address the Venture Capital challenge

The UK is not short of capital for investment. What does appear to be the case is that UK venture capital does not invest in the same way as their American counterparts. There is much anecdotal evidence, from those looking for funding, to suggest that UK focussed venture capital, particularly early stage funds, take too long to make decisions. In addition, they appear to be averse to making large bets leaving those companies with global opportunities to look for overseas, typically American, funding.

This needs investigation because if true will hold back the development of a world-class ICT industry.

Encourage ICT SMEs to work together

There are many ways that the ICT SME community can help themselves by working together, learning from each other and joining forces to win business they could not individually. Some clusters started from DTI initiatives in the early 00's and, where they were properly supported e.g. in the West Midlands, they have had a significant impact.

Some of the common lessons from these initiatives are that clusters take time to develop, consistent commitment from funding bodies are required and active networking with government bodies is needed. This is all because successful collaboration needs trusted relationships to form.

For clusters to be effective from an economic development perspective, they need to sit between government and industry acting as "honest broker". For any organisation wanting to access a group of SMEs, clusters and trade associations are essential to reduce the costs and complexities of reaching the target audience.

It is in the interests of the programme to ensure that effective clusters are in place, particularly in key sub-regions for the ICT industry such as the Thames Valley and around Cambridge. This is likely to require additional funding and mergers between clusters to ensure that they can recruit sufficient membership to ensure sustainability.

Summary of action proposed

UK ICT SMEs need a focussed programme of economic development to help them develop. This includes:-

- **Ensure healthy ICT clusters exist** to get access to SMEs cost effectively and provide a environment for ICT SMEs and the other stakeholders to work together.
- **Research the industry properly** to develop reliable models and statistics. Learn the lessons from other countries, such as Finland.
- **Create a focussed organisational development programme**, including management training, specifically tailored to the ICT industry.
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- **Pilot new commercialisation processes for software in academia.** There is significant ICT IP in academia that is not reaching the market.
- **Develop guidelines for “ICT SME friendly” public procurement** from pilots. This needs to include ensuring that SMEs can bid for the parts of large public projects that generate new IP.
- **Investigate barriers to private sector funding** to ensure that ICT SMEs have access to enough funding for them to realise their full potential.

About the author

Jeremy Renwick, Founder of Kubernetes, is the Facilitator of the OxIT Cluster a SEEDA sponsored initiative to bring together the ICT community in Oxfordshire. He has 20 years international experience in the ICT industry with both SMEs and blue chips, such as Vodafone and ICL. His skills include project management, facilitation, strategy development, sales and marketing management. He has a B.Sc. in Applied Physics from University College, London and a MBA from Cranfield University.
