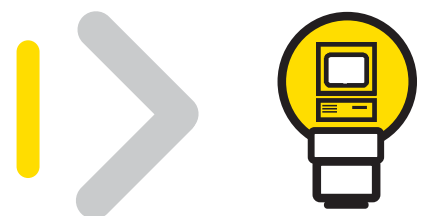


Glasgow Software Sector

SURVEY AND ANALYSIS





Chief Executive's Statement

Over the last 15 years our Software Team has worked closely with over 500 software product and services companies in Scotland, helping them with technology and commercial issues and championing their success.

The global future of the industry looks increasingly bright as software becomes pervasive and drives productivity. The growth of economies such as Ireland has been underpinned by the software sector which is responsible for nearly eight per cent of the country's GDP and nearly 10 per cent of exports. India, China and Israel are also proving to be countries that recognise the true importance of a healthy and competitive software sector.

Scotland produces some of the best computer scientists in the world and we believe that Scottish software companies can compete in the developing global market by providing innovative and niche solutions to customer needs.

However companies need a range of capabilities, competencies, and resources to successfully develop from one stage of product development excellence to the next. Our survey identifies some key barriers to success for early stage product companies:

- The scope and rigour of business plans needed to secure funding has changed significantly over the last few years and companies now need to take products to market and deliver revenue before investors have an exit opportunity.
- The size of the local markets and barriers to engagement with the public sector and larger corporate organisations mean that companies need to explore opportunities outside Scotland earlier.
- Partnerships with companies with channels to market are critical to exploiting ideas and technology globally but making partnerships and Joint Ventures work is hard and requires particular skills and experience.

Targeting Innovation has invested in this in-depth review of Glasgow's software sector to highlight the development issues and help companies understand strengths and weaknesses which can help build more focussed and viable businesses. It will also help improve the profile of the sector and better understand the support required to help businesses achieve their potential.

George Boag
Chief Executive

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executive summary

Targeting Innovation carried out this investigation of the Software and Computer Services (SCS) Sector in Glasgow during 2005 in order to update our own knowledge of the Sector and as an information resource for the public sector in implementing support initiatives and policy. We hope the findings will also be of interest to individuals and companies within the sector as well as to investors, banks, and the financial community in Scotland.

A summary of our main findings is set forth opposite

- Glasgow's Software and Computer Services (SCS) sector is comprised almost 50/50 by Software businesses and Computer Services businesses.
- Computer Services contributes more to total sector turnover (55/45). This gives Glasgow a relatively stronger contribution from Software when compared to figures for the UK as a whole, where CS dominates 80/20.
- Total turnover is £184m from 126 businesses (8% growth since 2002). Total profit is just over £9m (5%). The sector is more than twice as profitable as it was in 1997. The top ten most profitable companies in Glasgow's SCS sector are mostly packaged Software businesses.
- The sector employs just fewer than 2,000 people. This represents 20% growth since 2002, but is still more than 50% less than the figure reported in 1997, prior to the dot com collapse. Employment is growing by 20% per annum in the Software sub sector.
- Productivity for the sector is £95k per employee. Productivity is highest in the Computer Services sub-sector due to competitive pressures: £116k per employee.
- Only 15% of businesses in the SCS sector reported export sales, accounting for 8% of total sectoral turnover. All of the respondents which reported significant exports are Software businesses.
- Investment in R&D is relatively very high in SCS: 13% of sales. All but one of the top ten investors in R&D are Software businesses.

4 Key Trends:

Exceptional growth rate of Software sub-sector (20% per annum).

Software is volatile, but increasingly profitable (net margin 6%).

Employment is growing in the Software sub sector.

Software attracts significant investment in R&D.

context

1

2

methodology

methodology

The research for the Glasgow Software Survey was compiled through a combination of primary and secondary research undertaken by Targeting Innovation Ltd between November 2004 and September 2005. The aim of the survey was to gain a better understanding of the Glasgow software sector and to identify key trends. This information will be used to better inform our services to this community and as an information resource for the public sector in implementing support initiatives and public policy for the software sector in Scotland.

A previous internal study profiling Glasgow-based technology companies carried out on behalf of Scottish Enterprise Glasgow was used to identify a population for this survey. A total of 126 companies were identified as part of this work and were sent a questionnaire requesting information on product and services offered, company performance, markets and market penetration. The response rate from the questionnaire was 46%.

The data gathered from the survey was aggregated and analysed for statistical significance. The accumulated data was used to identify key trends on which to base the recommendations included in this report.

Further profiling of a representative selection of these companies was carried out through a combination of internet research, face-to-face and telephone interviews with senior level executives.

Desk research was undertaken in order to compare the findings gathered against figures for the UK industry as a whole. This focussed on reviewing other software industry surveys produced by the large research organisations (in particular, Gartner and Ovum) and the UK government. Although these comparisons are made throughout this report, we must stress that they should be taken in context. That is, figures for UK, Europe and the World tend to be dominated by a small number of companies: less than 20. The major caveat on any comparison between local and national figures must therefore be that we are simply comparing our SME's with Microsoft and IBM.

In an effort to provide other meaningful contexts for comparison, we have also made some reference to significant local industries, for example, setting SCS against Energy, Transport, Construction, etc., in Glasgow.

context

Software and Computer Services

The DTI casts a strong distinction between Software and Computer Services: “the software sub-sector and the computer services sub-sector are quite different from one another and [must] therefore be treated separately¹”. In broad terms, software extends to the production of applications and tools that can be sold to more than one user ('packaged', to use the industry term), while computer services includes custom services to create or integrate computer systems (both hardware and software) and the provision of outsourced computer services of many types, including the third party delivery of complete business processes.

Segmentation

Working from DTI and Gartner² analysis, we can cut the Software sector down into 3 segments: Applications (vertical, horizontal, content and productivity related, and consumer), Tools (for information and data management, access, development, deployment and middleware), and, thirdly, System Infrastructure (systems and network management, security, storage, networking and communications, and operating systems and server ware).

Computer Services can similarly be broken down into 3 sub-categories: consulting (on business processes and solutions, and on IT generally), system integration (bespoke application development, support for packaged applications, integration of packaged applications, hardware deployment and support, infrastructure systems integrations, and IT training and education) and, thirdly, Outsourcing (business process outsourcing (BPO), IS outsourcing, network and desktop outsourcing, application management, and infrastructure services).

The sector is evolving with the inclusion of new products such as digital content for mobile, and new players such as companies that sell software products initially produced for internal use, i.e. the commercialisation of internal intellectual property. This reflects a response to the diminishing returns found on the service side of the overall sector, where businesses are increasingly looking for increasing returns by innovating products to commercialise their IP.

Business Models and Economics

The two sub sectors of SCS have different business models and economics. Software can be a source of high gross margins, generating big returns to scale (often 80% and above) because of the licensing sales model, with many repeat sales from one initial investment.

Computer services providers tend not to experience these economies of scale and largely emulate a more conventional business model of diminishing, rather than increasing, returns. The Keynesian economics of computer services includes mid- to low gross margins, highly variable cost structures and a people-intensive, local delivery model.

It is also significant that the providers of software or / and computer services are not always separate companies. The fact is that many of the large software companies also have large services revenues, and most of the big services companies also produce packaged software products. Oracle, for example, derives more than 50% of its revenue from services.

¹ Sector Competitiveness Analysis of the Software and Computer Services Industry, DTI, 2004.
² Gartner Enquiry Service, September 2005

The Global Market

According to the DTI³ and Gartner⁴, the SCS sector generates turnover of £226bn (\$404bn) globally and £32.9bn in the UK.

The global consumption is split approximately 30/70 between Software and Computer Services.

Although still a promising sector, SCS growth slowed from the double digits of the dot com bubble to a more modest growth rate of 3 to 5% in the early years of the new millennium. Analysts expect this to remain sustainable and to increase to around 7% globally between 2005 and 2008.

Gartner⁵ indicates the following approximate annual growth forecasts for Software and Computer Services between 2004 and 2009:

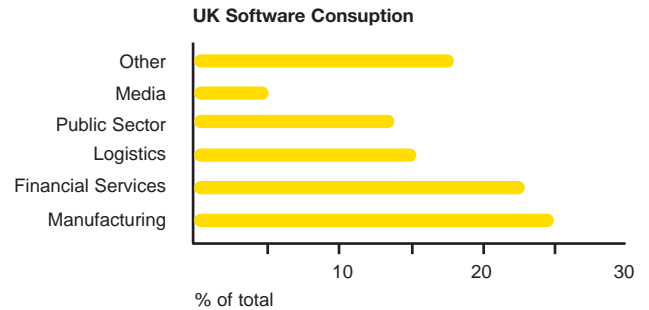
| | |
|--------------------------|-------------|
| Software | 7.1% |
| Computer Services | 6.0% |

The figure for the software sector is pushed up by key, high-performing segments: DBMS (14%), Security (16%) and e-learning (17%). The highest forecast in Computer Services is for the BPO segment (9%), but the sector overall is held down by low forecast growth in IT support (4%).

3 | context

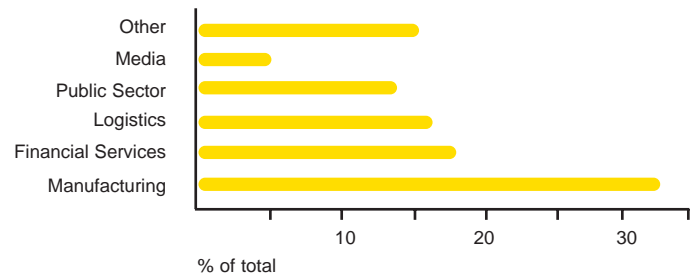
The UK Market

The DTI identifies the following key markets for Software consumption in the UK in 2003³:



There had been little change over the preceding years, 1999 – 2002.

Similarly, for the UK Computer Services sector:



The significant difference is the huge importance of the financial services market for Computer Services.

The total market is worth £33bn annually, split approximately 20/80 between Software and Computer Services. This strongly reflects the global 30/70 split.

N.B.: Studies of the UK market, or any national or international SCS market, tend to be dominated by a small number of big businesses. For example, more than 50% of SCS turnover in the UK is accounted for by Microsoft, IBM Software, SAP and Oracle. We need to bear in mind, therefore, that any comparison between a cluster of local SME's and their "national market", is really, for all intents and purposes, a comparison between them and Microsoft, IBM and a handful of other global players. That is, not a like-for-like comparison.

³ Sector Competitiveness Analysis of the Software and Computer Services Industry, DTI, 2004.

⁴ Market Trends: IT Services, Europe, Middle East and Africa, 2002-2008, Gartner, 2004.

⁵ Gartner Enquiry Service, September 2005.

software and computer services in glasgow

software and
computer services
in glasgow

4

4.1

Sub-sectors and Activity Levels

Number of Businesses

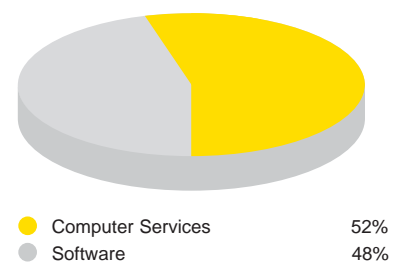
The Glasgow SCS sector is characterised by an almost 50/50 split in the number of Software businesses against the number of Computer Services businesses, defined in line with the aforementioned Gartner classification.

Number of businesses by Category

| | |
|-------------------|-----|
| Computer services | 65 |
| Software | 61 |
| Total | 126 |

Number of Software Businesses vs. Number of Computer Services Businesses in Glasgow

Prior to conducting this survey, Targeting Innovation carried out a scoping exercise during 2004 which identified approximately 500 separate businesses in the SCS sector in Glasgow. Scottish Enterprise's Software Observatory identified 2000 SME's in the SCS sector nationally at the end of 2004⁶. Glasgow therefore accounts for between 6 and 7% of the total number of SME businesses. (We subsequently reduced the population to exclude very small businesses with less than 5 employees for the purpose of this research).



⁶ Scottish Enterprise National: Software Observatory Statistics for 2004.

Turnover

Total turnover in Software and Computer Services in Glasgow in 2004 was £184m (half of 1% of the UK total).

| Turnover by Category 2004 | |
|---------------------------|-------------|
| Computer services | 97,574,834 |
| Software | 86,598,279 |
| Total | 184,173,113 |

Our report (as Services to Software) from 1997 indicates that in the years preceding the dot com bust, total turnover in the sector grew from £150m in 1995 to just over £200m in 1997, with forecasts approaching £500m for 1999⁷. So although the sector has almost the same turnover today as was reported for 1996, ten years ago, what we see today is actually a picture of recovery and renewal.

The slight dominance of CS over SW palely reflects the UK and global reality: 45/55 locally against 20/80 nationally. This seems to indicate that Glasgow has a relatively strong Software sector compared to the UK as a whole. (DTI reports £33bn UK SCS market split £7bn to Software and £26bn to Computer Services⁸).

| Turnover growth rates 2002 - 2004 | |
|-----------------------------------|-----|
| SCS | 8% |
| CS | -9% |
| SW | 39% |

Growth between 2002 and 2004 has been just over 8% overall, although this is a compound of 9% slip in Computer Services and an impressive 39% growth in Software Sales. Growth in the SCS sector is therefore entirely due to rapid growth in the Software sub sector. As reported earlier, Gartner's forecast global growth rates for SW and CS are 7% and 6% respectively.

This information supports a hypothesis that Glasgow has a relatively strong and growing Software sector, compared to the rest of the UK.

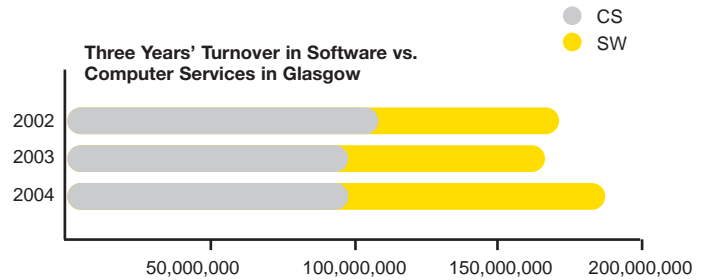
By comparison, the Computer Services sector behaves as a mature cluster of businesses which has crested its growth curve and reached a plateau.

It is worth noting that seven of the top ten high earners are services companies.

Comparison with Scottish SCS SME Population

SE National's Software Observatory reports that, as of December 2004, Scotland has approximately 2,000 SME's active in the SCS sector, turning over approximately £1.1bn. In addition to this there are 45-50 large organisations active in the sector nationally which account for an additional £1.1bn⁹.

If we compare the Glasgow SME SCS sector to the national (Scotland) figures (removing the activities of the large global companies) we find that Glasgow accounts for 16% of total turnover.



⁷ Glasgow Software Sector Profiling Survey, Services To Software, 1997.

⁸ Sector Competitiveness Analysis of the Software and Computer Services Industry, DTI, 2004.

⁹ Scottish Enterprise National: Software Observatory Statistics for 2004

¹⁰ Glasgow Software Sector Profiling Survey, Services To Software, 1997.

Profit

Total profit in Glasgow's Software and Computer Services Sector was in excess of £9m. The sector report from 1997 by STS recorded a total net profit for that year of just over £4m¹⁰.

| Profit by category 2004 | |
|-------------------------|-----------|
| Computer services: | 4,025,483 |
| Software: | 5,328,931 |
| Total | 9,354,414 |

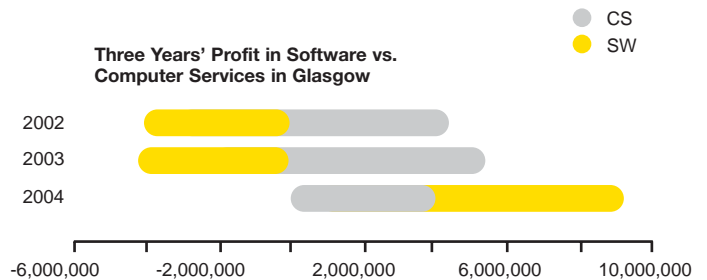
The profit margin is 5% in 2004, against 2% in 1997. The sector is therefore more than twice as profitable now, 5 years after the industry slumped in 2000, than it was 3 years before the crash, during the exponential growth phase of the dot com bubble.

These profits are, however, fragile: in 2002 and 2003 SCS in Glasgow made a loss which was entirely due to the Software sub-sector.

Profit margin overall is therefore 4.8%, although the Software sub sector shows a stronger 6%.

The volatility in the Software sector might well be attributed to the dramatic losses sustained in 2002 and 2003 by two software companies. The breakeven of one and reduced losses by the other enabled the Glasgow Software sector to get into the black in 2004. Without these two firms, the sector has still seen profit growth of 20% over the period.

Targeting Innovation found that seven of the top ten most profitable SCS companies are product-oriented Software businesses.

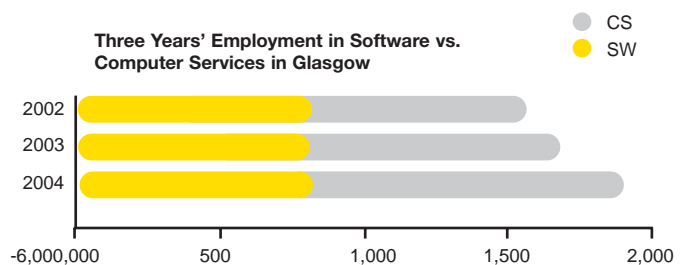


Employment and Productivity

Glasgow's Software and Computer Services Sector employs almost two thousand professional staff. This is a third down on the figure of three thousand reported in 1997. However, the trend has been upward since 2002, indicating some recovery from the dot com collapse in 2000.

| Employment by category 2004 | |
|-----------------------------|-------|
| Computer services: | 840 |
| Software: | 1,099 |
| Total | 1,939 |

These figures seem to mirror turnover, and support the hypothesis that Glasgow has a relatively strong software sector compared to the rest of the UK. Of particular interest is the relative growth rate in employment in Software set against Services:



| Employment growth rates 2002 - 2004 | |
|-------------------------------------|-----|
| SCS | 21% |
| CS | 2% |
| SW | 41% |

There is an even mix of Software companies and Computer Services companies in the list of top ten employers.

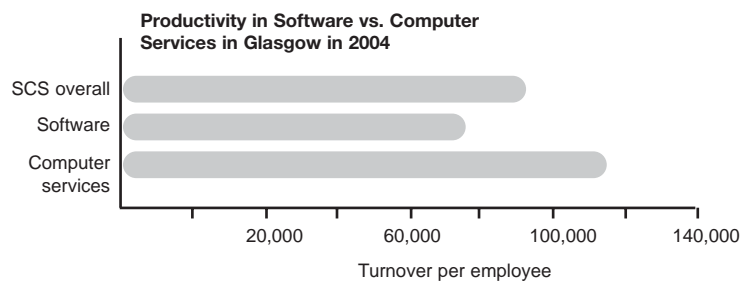
Glasgow Employee Jobs by Sector
(2003, Source: Glasgow Economic Monitor)

| Sector | Employees |
|----------------------------|-----------|
| Public services | 123,500 |
| Financial | 91,500 |
| Distribution | 78,900 |
| Engineering /Manufacturing | 25,700 |
| Transport | 21,100 |
| Construction | 9,500 |
| Energy / water | 3,700 |
| Other | 21,200 |

SCS therefore accounts for half of 1% of the Glasgow workforce, although with highly qualified and relatively well-paid people.

Productivity, measured as turnover per employee, stands at £95k.

| Productivity 2004 (£turnover/employee) | |
|--|---------|
| Computer services | 116,161 |
| Software | 78,768 |
| SCS overall | 94,963 |



Computer Services is noticeably more productive. The probable explanation for this is an amalgamation of cost pressures, competition and the need to be efficient. Businesses in the Computer Services sub sector tend to have several or many local competitors. Software companies tend to need development staff who are not immediately or directly productive, since the returns from licensing and other software business models tend to come after a delay which may be months or even years.

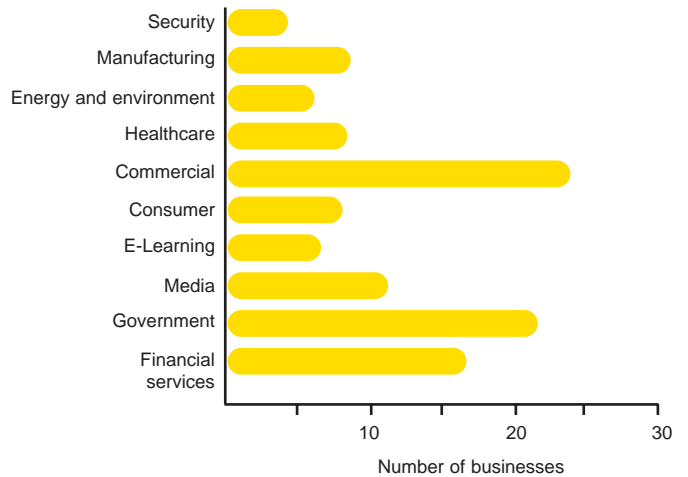
4.2

Markets

The leading three markets for Glasgow's Software and Computer Services sector are Business (commercial services and products), Government, and the Financial Sector. The three biggest markets for the UK sector are the Financial Sector, Manufacturing, and Logistics.

This is not so different from the UK figures, save for the relative importance of the public sector and the absence of Manufacturing from the top three markets. This reflects the general significance of the large public sector in the Scottish Economy.

Markets Targeted by Glasgow SCS Sector



Exports

Only a small number of Glasgow SCS companies reported significant sales outside the UK. Total exports were approximately £6.5m, representing 8% of the turnover in the sample.

Crucially, all of the companies reporting exports were Software companies. No Computer Services businesses reported exports. Also, half of these companies appeared in the top ten most profitable.

Ovum reports an average figure of export revenues as a percentage of total SCS sales for 1995 to 1999 as 18%¹¹, suggesting that the level reported in Glasgow may be significantly low.

A possible explanation for this is that UK SCS exports are substantially contributed to by a small number of large exporters, including SEMA, Sage,

Logica, Eidos, Admiral, and Mysys. Ovum also found that the top 20 exporters in the UK in the late 90's were almost all services companies focused on the US market.

Given the change in the market between those days and 2004/2005, it is extremely difficult to come to any conclusion about the relative state of Glasgow SCS exports. We can, however, say that the services businesses have a local market which is highly competitive. We can also re-emphasise that all of the sector's exports are licensed software products from businesses which are entirely focused on the development and commercialisation of these products.

¹¹ Defining and Developing a Strategic Export Strategy for the UK Software and IT Services Sector, Ovum Holway, 2001.

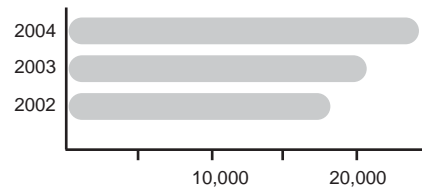
4.3

Innovation

Expenditure on Research and Development in Software and Computer Services in Glasgow is running at a much higher rate than in many other industries (where it is generally less than 5%). Moreover, investment in innovation is growing: from 11% of turnover in 2002 to 13% in 2004.

| | Investment in R&D / £,000 | As a percentage of sales |
|------|---------------------------|--------------------------|
| 2002 | 18310.3 | 11% |
| 2003 | 20477.5 | 12% |
| 2004 | 24111.4 | 13% |

Three Years R&D Investment in Software and Computer Services in Glasgow



All but one of the top ten innovators are product-oriented Software companies.

The Lambert Review reported in 2003 that Business R&D intensity (R&D expenditure as a percentage of value-add) was less than 2%¹². Although not suitable for direct comparison with our figures, this gives a sense of the extent to which the levels of investment in innovation by Glasgow SCS companies is exceptional.

¹² Lambert Review of Business-University Collaboration, HM Treasury, 2003.

4.4

Key Initiatives and Facilities

Prioritisation by Scottish Enterprise

Scottish Enterprise completed its Review of Priority Industries in October 2005 and intends to concentrate support within a framework in which Software is defined as an “enabling technology.” As such, it is seen as being represented by the Computer Services sub sector which provides tools and services to enhance the performance of businesses in other sectors. It is very reassuring that Software has retained some prominence at this strategic level.

SE Glasgow, Services to Software and Targeting Innovation

Since 1992, Scottish Enterprise Glasgow has provided advisory and financial support to Software and Computer Services via Services to Software Limited (specifically established for this purpose), and latterly Targeting Innovation Limited (incorporating Services To Software, Targeting Technology and Business Ventures).

Some of the services provided in this way are listed below:

- Tailored, impartial business advice;
- Account managed access to SE products and services;
- Assistance with funding applications;
- Access to finance;
- Access to European projects, including the Innovation Relay Centre;
- Assistance in the preparation of business plans;
- Access to market research skills and resources.

Incubators and Digital Business Parks

The Kelvin Institute is a recently established JV between Glasgow and Strathclyde universities and is supported financially by Scottish Enterprise. Its purpose is to identify academic projects, in information science and communication technologies, which have commercial potential and to support these to the point of proof-of-concept and commercial feasibility.

Accelerators

The Wireless Innovation Centre in Hillington currently offers business support to wireless and software companies. Glasgow itself does not offer such a resource to the software sector.

We are aware of Software firms leaving Glasgow because of a lack of suitable accommodation.

5

academia

academia

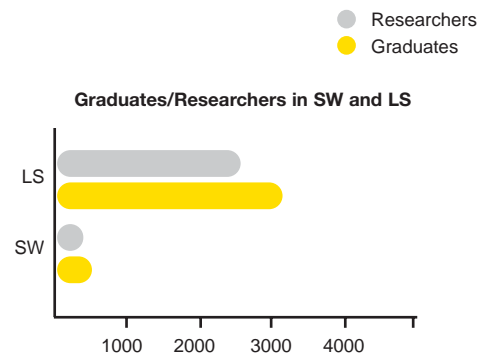
Glasgow has 3 universities: Strathclyde, Glasgow and Glasgow Caledonian. The output of these in terms of graduates, licenses and spinout companies in Software related areas during 2004, as well as an indication of research activity, is set forth in the table below:

| | Glasgow | Strathclyde | Caledonian | Totals |
|--|---------|-------------|------------|--------|
| Graduates in Computer Science-related subjects | 116 | 110 | 109 | 335 |
| Post-graduates in this area | 68 | 57 | 84 | 209 |
| Researchers | 37 | 40 | 27 | 104 |
| Spin-outs per year | 0.5 | 2 | 0 | 2.5 |
| Licenses per year | 0.5 | 4 | 0 | 4.5 |

These figures clearly represent a strong source of competent skills and labour for the SCS business-base, as well as indicating potential for greater commercialisation activities in the HEI's.

Compared against academic activities related to Life Sciences, however, these are not strong figures:

Figures are not available for turnover in the LS sector. These findings point to the fundamental difference between Software and Life Sciences, where the former sector is predominantly composed of businesses and the latter by activities in institutions.



The Kelvin Institute

As indicated in the previous section, the Kelvin Institute is a recently established joint venture between Glasgow and Strathclyde universities. The purpose of the initiative is to raise the number of successful spin-out businesses from these two institutions. The Kelvin Institute is charged with maximising the commercial potential of innovative university research in Information Science-related fields, working closely with partners to identify research projects on which exciting new commercial products and technologies can be based.

The Kelvin Institute brings researchers to the Institute to collaborate with in-house experts, combining their deep academic knowledge with rigorous commercial development standards and processes. The resulting products can be licensed to partners or support the generation of new spin-out companies.

The overall aim is to transform ground-breaking research taking place at Strathclyde University and Glasgow University today into high-value commercial innovative solutions. And deliver substantial benefits to everyone involved.

key trends

The information gathered for this survey and the subsequent analysis has highlighted a number of key trends and issues. Changes are continually taking place within the Software and Computer Services industry and the trends, challenges and opportunities that are relevant today may be different tomorrow and different again next year.

We have seen this for ourselves in recent times, and businesses have both suffered and benefited. It is essential to continually review these issues, how they are changing and how they relate to the role each of us has to play within the industry. We need to evaluate them, understand the impact they have on businesses and the economy and seek to develop an action plan that minimises the risk of failure and maximises the opportunity for growth.

We will review the key trends in relation to those who have a role to play within the industry. The three important stakeholders we have selected for consideration are as follows:

- 1 The Investment Community – those seeking a good return on investments
- 2 Those with an interest in the economic development of Glasgow - The Scottish Executive, Scottish Enterprise, Glasgow City Council: Public Sector Economic Development bodies.
- 3 The Glasgow-based software and have participated in this survey and are responsible for driving software business in Glasgow: the local SCS Community.

First of all we will set forth the Four Key Trends which we have identified from our research.



6.1.1

Four Trends

Exceptional Growth Rate of the Software Sub Sector

The Software sub sector in Glasgow is relatively strong when set against UK performance. Software in Glasgow accounts for 45% of SCS turnover, as against 20% at a UK level and 30% globally. Regardless of any doubts regarding the appropriateness of UK market comparisons (i.e. because of the predominance of a few big companies), this is a significant ratio.

Glasgow's Software sub sector is growing at a rate of almost 20% per annum (39% increase in sales between 2002 and 2004). This is a great deal higher than the Gartner estimate of 7% for the global growth of the sub sector.

Within the Software sub sector, we identified digital content production as a key strength, with a cluster of businesses engaged in the development of avatars for Internet and Mobile platforms. Glasgow also has a very strong group of Computer Services companies, although the sub sector in the city appears to have matured.

16.1.2

Software: Profit and Volatility

The top ten Glasgow SCS businesses by revenue is dominated (70%) by Computer Services companies. However, in 2004 the Software sub sector made a greater profit than Computer Services: Software generated 55% of the profit on 45% of the turnover. The net margin was 6% (more than 1% above the SCS figure of 4.8%).

Software made a loss overall in 2002 and 2003, primarily as a result of relatively large losses sustained by two

firms. When those two firms are removed from the data, there is a trend of growing profitability. Nevertheless, we must conclude that the high profits from software also come with a health warning of high volatility.

The top ten SCS companies by quantum of profit is dominated by Software companies. This is a major trend: packaged products create wealth. The most probable explanation for this is the licensing business model of high gross margins, repeat sales and low overheads.

16.1.3

Employment Growth in Software Sub Sector

Our data shows 20% year on year growth in employment in Glasgow's Software sub sector between 2002 and 2004.

Overall employment growth in Software and Computer Services is 10% year on year over the same period, although Computer Services contributes only 1% of this.

It may also be relevant to note in this context that productivity is highest in Computer Services. This is possibly linked to the low growth in employment in the sub sector, with the common factor being high competition and local pricing pressure.

16.1.4

The Innovators are all Software Companies

Well, almost all. We found that 9 out of the top 10 investors in R&D were Software businesses.

We also found that the SCS sector overall displays levels of investment in R&D which are greatly in excess of national rates: growing from 11% of revenues in 2002 to 13% in 2004.

Implications for Stakeholders

16.2

Investors

From an investor's perspective, the Glasgow software market presents a significant opportunity. However, the risks need to be understood and managed effectively to ensure good return on investment. The task of selecting the companies that will provide a good return with minimum risk is common across every industry and a challenge for the investor. The Software and Computer Services industry has significant characteristics that demand scrutiny and effective due diligence. The prime factors are:

- **Market:** businesses which seek to bring packaged products to a global market offer the best opportunities for return on capital.
- **Technology:** Businesses with their own commercialised intellectual property and proprietary technology offer the best opportunities for return on capital. Investors need to differentiate between Software businesses and Computer Services businesses.
- **People:** in order to realise this return on capital, the business needs to have a strong management team, great internal organisation, and a visionary leader who understands the dynamic environment of the global software markets.
- **Finance:** the Software business model is characterised by low or no returns in the short term and increasing returns in the long term (completely inverting the classical model of decreasing returns). Investors must understand this if they are to benefit from the potentially high gross margins, lock-in and increasing returns of a software business. The great danger is that businesses are insufficiently capitalised and run aground on a cashflow crisis before reaching the payback point.

Against this frame of reference, investors can find several very stimulating metrics in the Glasgow Software sub sector, including:

- Average sales growth in excess of 20% per annum.
- Increasing net profits (average net margin is currently 6.15%).

Economic Development Bodies

High amongst the list of priorities of Economic Development bodies in Europe, the UK and Scotland are the following goals:

- Increased productivity and GDP;
- Increased utilisation of the working age population;
- Increased investment in Research and Development.

Put another way, these are three of the most significant economic factors in which Europe lags the rest of the developed world. Britain lags behind Europe on these axes, and Scotland lags behind the rest of the UK. In Scotland we have a situation of relatively low GDP, relatively high unemployment, and relatively low expenditure on R&D (figures from the Lambert Report, the UK Treasury statistics and the OECD all attest to this predicament).

Within the context of an economic development agenda, the following aspects of the SCS sector, in Glasgow at least, should be of interest:

- Average sales growth in excess of 20% per annum in the Software sub-sector.
- The Software sub-sector attracts Foreign Direct Investment.
- 20% annual employment growth in a highly qualified workforce.
- Levels of innovation which are well above the national UK average figures as reported by the Treasury and the OECD figures.

It may be relevant to note that SE has characterised Software as enabling technology in its recent review of key clusters. This may refer to Computer Services businesses which enable other industries to improve effectiveness and efficiency. As such, Computer Services plays an important role in local industry. However, the Software sub sector may represent an exceptional opportunity for Scottish Enterprise to leverage its developmental goals: pushing at an already opening door of increasing GDP, employment levels and investment in R&D.

Software and Computer Services Businesses

The important trends for the owners of Software and Computer Services businesses are as follows:

- Sales growth of packaged software products;
- Increasing profitability of packaged software products;
- Shrinking sales in Computer Services;
- Relatively high productivity and competition in Computer Services;
- Export market opportunities for Software.

The environment facing Glasgow's Software and Computer Services companies is one of increasing pressure and increasing opportunity. Those CS firms which can manage to productise their intellectual property and make the transition to a product-oriented business model will have greater opportunities for wealth creation and escaping the "running to stand still" syndrome in which so many are currently trapped. This is, however, a journey fraught with risk, requiring very high quality people, strong investment, excellent planning, vision and an element of good fortune to take the right technology to the right markets at the right time.

appendix 1:

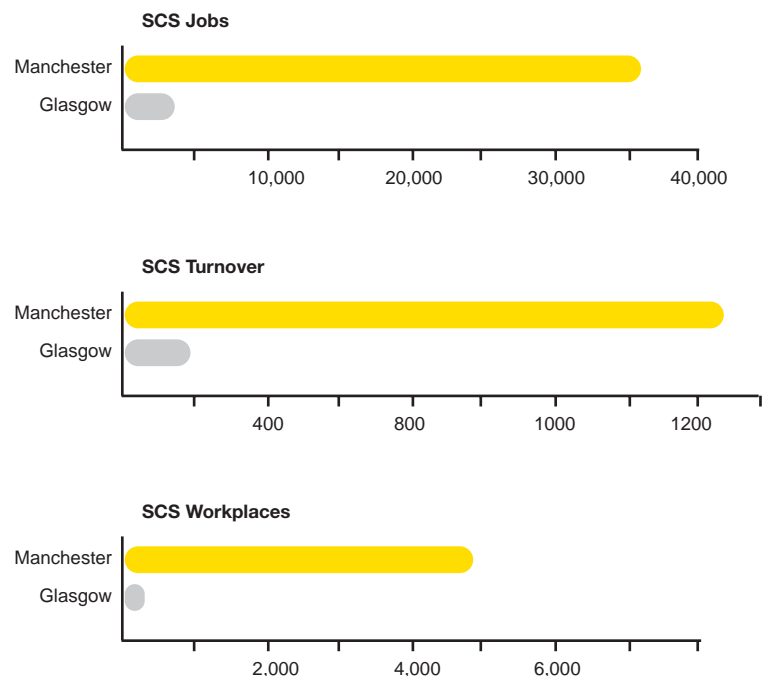
Comparison with Manchester

appendix 1

7

Manchester is a city roughly 7 times the size of Glasgow (a population of 7 million people within 30 miles of the city centre). According to a report produced in 2004 by the Policy and Research Team of Manchester Enterprises, Manchester benefits from a well-resourced and vibrant "ICT Digital" sector (Manufacture of computing and computing equipment, office machinery, software, IT consultancy, telecommunications and computer-related electronics. More than 90% of the sector composed of "micro-businesses")¹³.

Although their surveyed company base is broader than that used in our survey (including as it does hardware manufacturers and the local offices of large corporations which are not headquartered in Manchester, such as Fujitsu, BT and Siemens), they do state that the majority of the population is composed of SMEs and may, therefore, be useful, even to a limited extent and with a caveat, as a reference against which to measure aspects of the SCS sector in Glasgow.



Even if adjusted to per capita levels, the performance indicators for Glasgow would fall substantially short of Manchester's figures.

Reasons for this could include proximity to London and major infrastructure, the critical economic capacity that is only found in larger metropolitan areas, and relatively high levels of public sector support through development organisations, major initiatives and key facilities.

Manchester offers the following incubation and accelerator facilities for SCS businesses:

- Xpdia, a business accelerator which offers support and incubation services to wireless and mobile communication companies.
- Digital World Centre, a managed workspace targeted at technology businesses, with exhibition facilities and a digital auditorium.

- InfoLab21 Project, offering incubation, R&D support, and office space, targeted at technology start-ups and university spin-outs.

The key strengths identified by the Manchester survey were: ISPs, digital broadcasting, digital media, telecommunications, and software (production and consultancy), including games.

¹³ ICT Digital Sector Profile, Manchester Enterprises Policy and Research Unit.

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