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The Supercluster Question
The Cambridge Cluster Report 2006

In association
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BDO Stoy Hayward



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"A cluster is a geographically proximate group of companies and associated institutions in a particular field, linked by commonalities and complementarities"

Michael F. Porter

"Supercluster - A cluster of clusters, a large grouping of smaller galaxy groups or clusters"

The Encyclopedia of Astrobiology, Astronomy and Spaceflight

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Sponsors' Foreword

There are many people for whom this report will make interesting reading; the venture capitalists and business angels who invest their capital, the business leaders who are the innovators and entrepreneurs, as well as the local and national government who want to help move the UK to the forefront of the world's knowledge-led economies.

For those involved in the investment into new businesses, the highlight of this report is straightforward: The number of businesses in the Cambridge Cluster succeeding to the point where professional investors reap substantial returns on their capital is highly encouraging.

For those involved in building their own business in the region, this report is great news: The number of businesses succeeding to the point where the builders of those businesses can reap capital rewards is noteworthy.

For those involved in the government of the region whose role is to support commerce and generate new wealth, new jobs and to attract investment, the highlight of this report is equally straightforward: The number of businesses succeeding to the point where longer term wealth generation can be assured, the number of new jobs being created and the volume of investment flowing into the region are truly impressive.

If all of that sounds too good to be true, think again - it is not. That isn't to say there are no problems or things that could be improved, but for a region which increasingly relies on the generation of wealth through its innovation and knowledge-based resources the story is an object lesson.

All of this should also be viewed within the context of UK plc, an economy which the Government of the day has declared should move toward significant wealth generation as fast as it can manage.

This report also raises the question of what next? As some businesses succeed, others are just starting out. As the professional investors get their returns from the cycle of investment, they will be looking to invest new funds in the next round of the cycle. Investors will invest in ideas and people they believe in. The trick is to make sure enough of these people fulfil their dreams and benefit from the resources and knowledge within the region to turn their ideas into reality. Putting in place the resources to achieve this will repay the investment many-fold and holds the key for the continuation and development of the Cambridge Cluster.

BDO Stoy Hayward and WilmerHale

Acknowledgements

We would particularly like to thank the management of all of the companies that have provided us with the data contained within the report for their time and effort in ensuring it is both timely and correct. We understand the time constraints that management teams in growing companies operate under and appreciate their participation.

We would also like to thank:

- WilmerHale and BDO Stoy Hayward for sponsoring this report.
- The individuals who took the time to participate in interviews and provided guidance:
 - Robin Bannister, Managing Director, Arakis
 - David Gammon, angel investor
 - Richard Green, Chief Executive, Ubisense Trading Ltd
 - Paul Johnson, CEO, Cyan Holding Plc
 - Richard Preston, Head of Network Management, Cambridgeshire County Council
- The members of the Library House team who have contributed:
 - John Au, Jonathan Bray, Darren Harper, Xiaobing Hu, Mike Moss, Jon Povah, Alexis Rideau, Shufan Lin, Stephen Siard, Richard Youngman

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Library House, September 2006

Highlights & Summary

This year's Cambridge Cluster Report identifies three key themes. Over the last two years, companies in the Cluster have delivered solid returns to their investors. At the same time it is concerning that the growth of the Cluster has stalled, the total number of innovation-based companies and the total amount of investment in them remain essentially unchanged. We postulate that in order to grow beyond its current size, the Cambridge Cluster will need to develop and strengthen its links with other innovation clusters nearby and become part of an innovation supercluster.

Companies in the Cambridge Cluster deliver solid returns to their investors

- Over the 18 month period to July 2006, the Cambridge Cluster has seen 12 of its companies list on public markets and a further 24 sold or merged with other businesses, generating over £1bn of value for shareholders and management teams.
- In total, the venture-backed companies that exited, including those that went out of business, generated a combined ROI of 2.27x and an IRR of 28 per cent to their investors.

The growth of the cluster has stalled

- Library House currently tracks 973 innovation-based companies in the Cluster. This compares to 988 companies 18 months ago, a net decrease of 1.5 per cent.
- During 2005, £125m was invested in companies in the Cluster compared to £154m and £133m in 2004 and 2003 respectively.

Cambridge forms part of a larger, disconnected innovation supercluster

- The Cambridge Cluster forms part of a larger geographic region of innovation, incorporating London, Oxford and parts of the Thames Valley. This combined area receives over half of the total venture investment in the UK.
- Transport links between these areas are at maximum capacity and patchy at best, in addition, there appear to be no significant plans for upgrading them.

The Supercluster Question

Cambridge companies perform at the level required to compete on a global stage, however geographic and infrastructure limitations now appear to be the limiting factors in the growth of the Cluster. If indeed growth is being strangled by the shortcomings of the local transport infrastructure, the solution may not lie solely in the immediate region. Are the ingredients for a larger, possibly more successful supercluster in place, with Cambridge, Oxford, the Thames Valley and London as the obvious initial components?

It is the Library House view that the Cambridge Cluster as an island is not a sustainable future. Rather, we believe its future lies as part of a larger region of innovation encompassing much of the Greater South East of England. We think it is through participation in this supercluster that Cambridge will be able to truly compete on a global scale with both developed and developing innovation clusters around the world.

The Cambridge Cluster Report

“The Supercluster Question” is the third in a series of reports produced by Library House. The Cambridge Cluster Report 2004 expanded on its predecessor and highlighted a number of key points regarding the Cluster.

Key Highlights from the 2004 Cambridge Cluster Report:

- The Cambridge Cluster weathered the downturn in investment better than the UK and the rest of Europe.
- The Cluster saw a number of strong exits, totalling more than \$500m in 2004.
- The number of innovation-based companies remained constant in 2004.

Since 2004, the Cambridge Cluster Report has continued to evolve, in line with the development of the responding to the growth of the Library House Private Company Intelligence database from which the information is derived. In addition, to the traditional investment and sector breakdowns, this report explores some of the problems facing the Cluster, and raises questions about its future.

This year’s Cluster Report sees a number of changes to the methodology and underlying datasets. Caution is, therefore, required when directly comparing this year’s figures with the 2004 Report:

- The taxonomy used by Library House has changed to fall in line with the Industry Classification Benchmark (ICB) taxonomy schema. A full list of sectors and sub-sectors can be found in the appendices.
- Library House has solely used data from its Private Company Intelligence database to form the underlying datasets for UK venture-backed investment.
- The geographical scope of the Cluster has been explicitly defined for the first time. Library House has adopted the geographical definition of the Cluster established by the Greater Cambridge Partnership. The boundaries are marked using postcode districts. Some companies from the 2004 report will therefore no longer be classified as a ‘Cluster’ company, while others now fall in scope.

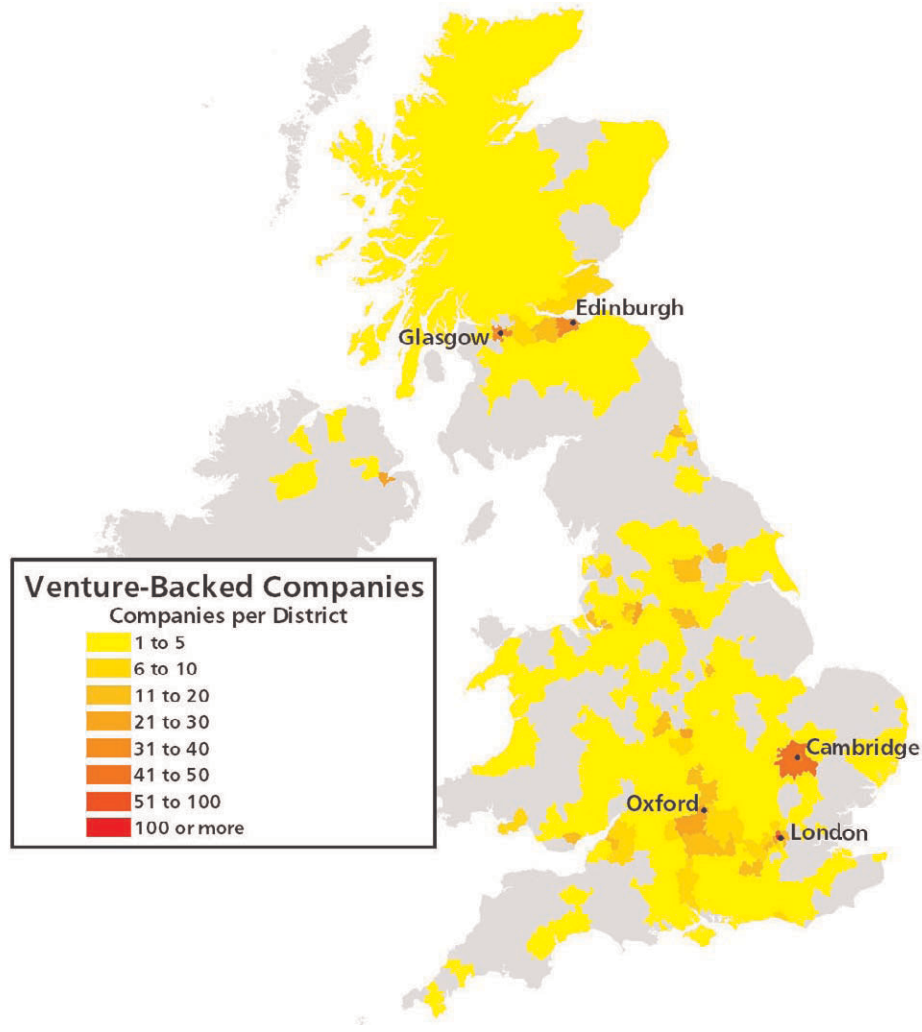
The report itself is structured into three stages; we first analyse the deals which have taken place in the Cluster since our last report, then revisit the overall growth of the Cluster, and finally take a look at the Cluster’s enablers and its future growth potential.

Transactions in the Cluster: Delivering Solid Returns

The Cambridge Cluster remains a key centre of innovation which sees significant deal activity. In this section we will show that:

- Since 2004 the majority of venture capital (VC) investment in the Cambridge Cluster has been in later stage deals. However, during the first quarter of 2006 there has been a shift back towards early stage investments.
- Funding raised in 2005 for Technology and Health Care companies was approximately equal.
- The Cluster has seen a number of significant exits in recent years; the quality of Cambridge Cluster companies has produced healthy returns for investors.

Figure 1
Distribution of Venture-Backed Companies by District



As identified in the 2006 Library House UK Venture-Backed Report, the venture-capital industry, in line with much of the rest of the financial services industry in the UK, is highly concentrated in London and the South East of England.

Outside of London, the Cambridgeshire unitary district has the highest density of venture-backed companies, a total of 64 companies. Other, smaller clusters in the UK are evident around Oxford, Glasgow and Edinburgh.

Since the 2004 Cambridge Cluster Report, Library House has tracked 66 venture capital deals in the Cluster, of which the majority have been follow-on funding rounds (e.g. Series B and beyond), mainly in the Health Care and Technology sectors. The relatively small number of companies receiving first round funding (Series A) suggests that the Cluster is experiencing the same changes to the investment pattern seen across the entire venture capital industry. The majority of companies that have received funding since the 2004 Report are companies that were incorporated during the high-growth

phase of the Cluster in 2000 and 2001.

Tables 1 and 2 emphasise the low level of first round funding going into the Cluster since the 2004 Report. In particular, first round funding (or institutional 1) has been exceptionally low in the Health Care sector.

Figure 2 highlights the cyclical nature of investment in the Cluster. At the time of the bubble (around 2000), institutional 1 funding totalled around £147m with relatively little investment going into later stage investments. During the post-bubble period of 2001–2004, institutional 1 funding dropped significantly to £12m, with an increasing proportion of total funding occurring in follow-on rounds. By 2005, the Cluster saw a large number of mature companies receiving late stage funding (institutional 4 or higher), coinciding with a large number of exits in the Cluster via trade sale or flotation. The high proportion of late stage deals is a consequence of the funds raised in 2000 and 2001 nearing the end of their life, at which time venture capitalists typically invest in later stage deals. The first quarter of 2006 has seen

Table 1
The Number of Deals in the Cluster since the 2004 Cambridge Cluster Report

Sector	Sub Sector	Institutional Round				Total
		First	Second	Third	Further	
Basic Materials	Industrial Metals	1				1
Consumer Services	Travel & Leisure	1				1
Health Care	Health Care Equipment & Svcs	2	3	2	1	8
	Pharmaceuticals & Biotechnology	2	7	5	6	20
Industrials	Electronic & Electrical Eqpt			1	3	4
	Industrial Engineering		1			1
Oil & Gas	Oil Equipment, Svcs & Distribution		1			1
Technology	Software & Computer Svcs	2	6	3	2	13
	Technology Hardware & Eqpt	1	5	2	4	12
Telecommunications	Fixed Line Telecoms	1				1
	Mobile Telecoms	2			2	4
Total		12	23	13	18	66

Table 2
The value of deals in the Cluster since the 2004 Cambridge Cluster Report

Sector	Sub Sector	Institutional Round (£000s)				Total Value (£000s)
		First	Second	Third	Further	
Basic Materials	Industrial Metals	70				70
Consumer Services	Travel & Leisure	1,000				1,000
Health Care	Health Care Equipment & Svcs	557	8,620	9,200	1,000	19,377
	Pharmaceuticals & Biotechnology	2,250	8,068	9,150	33,959	53,427
Industrials	Electronic & Electrical Eqpt			5,100	4,113	9,213
	Industrial Engineering		80			80
Oil & Gas	Oil Equipment, Svcs & Distribution		5,500			5,500
Technology	Software & Computer Svcs	310	10,023	3,300	3,400	17,033
	Technology Hardware & Eqpt	310	10,023	3,300	3,400	17,033
Telecommunications	Fixed Line Telecoms	900				900
	Mobile Telecoms	4,600			11,480	16,080
Total		14,290	52,284	32,000	83,092	181,666

Figure 2
Distribution of Funding Raised in 2000-2006 (Q1)

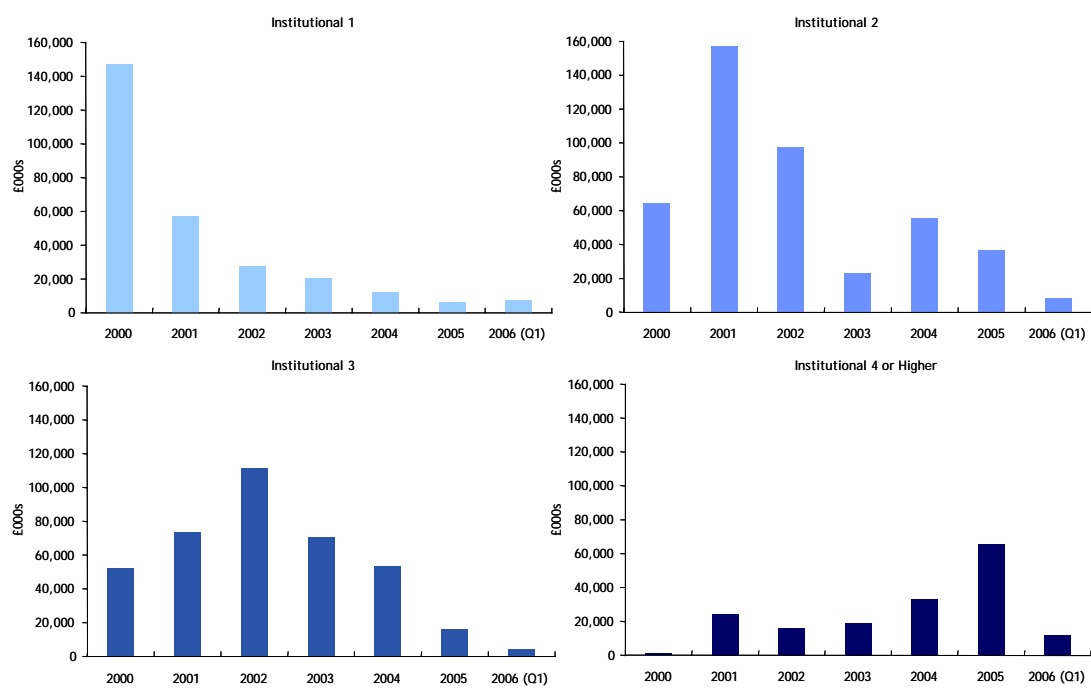
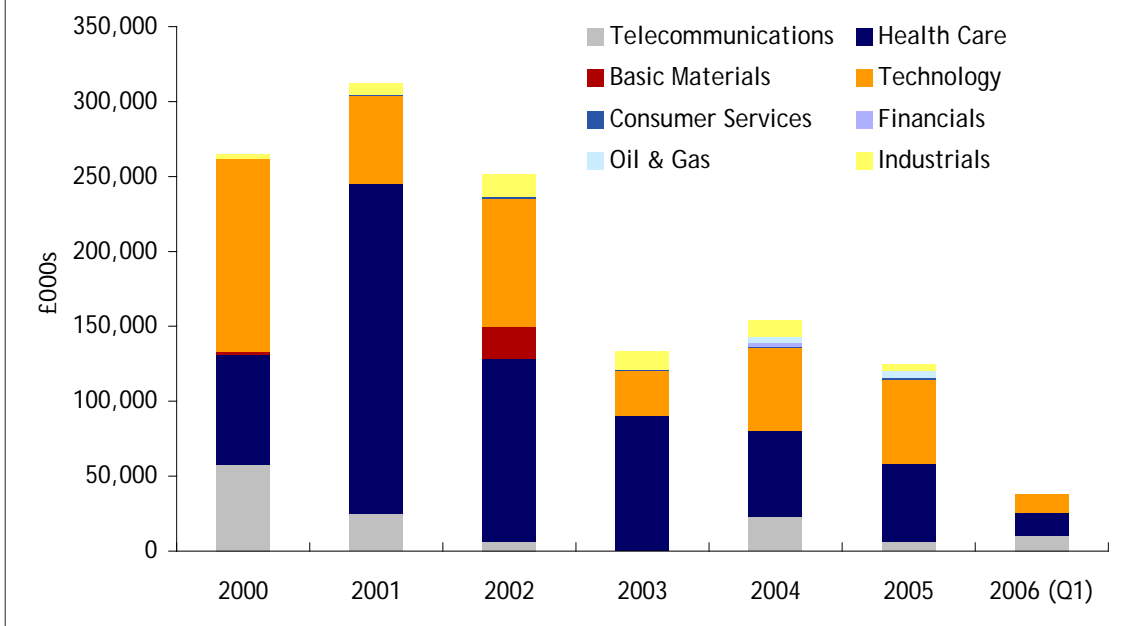


Figure 3
Funding Raised by Cluster Companies 2000 through 2006 (Q1)



a higher level of institutional 1 funding, already surpassing the total seen in 2005. This comes at a time when new venture capital companies and venture capital companies that survived the bubble are raising new funds. Generally, newly raised funds make more series A investments than older ones. The last years have seen several UK-based venture capital firms raise new funds. This includes local venture capital firm Amadeus Capital Partners. If this is the beginning of a new cycle of funding in the Cluster, 2007 will likely see an increase in institutional 2 funding, and 2008 will see a rise in institutional 3 funding.

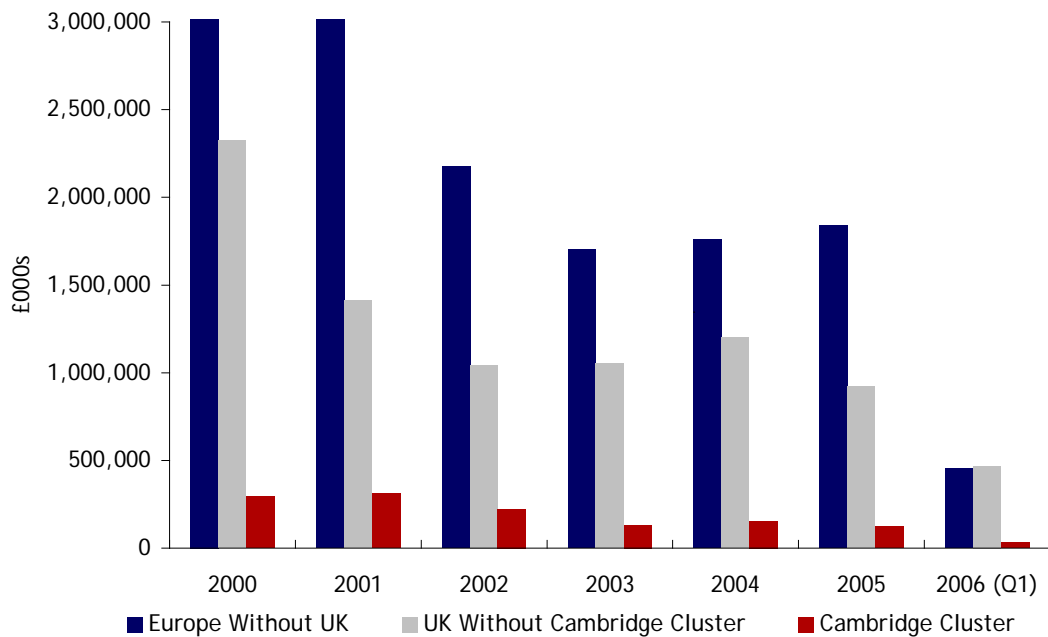
2005 was a poor year for the Cluster when considering only the total amount invested, with total venture-backed investment falling to £125m, down 19 per cent from 2004. This decline in investment was mirrored in the UK as a whole. The UK (excluding the Cluster) saw a drop of 23 per cent, meaning that the Cluster weathered this slump in investment better than the rest of the UK, repeating the experience of the 2004 Cluster Report. In 2005, the Cluster represented 12 per cent of all UK venture capital investment, as well as a significant proportion of money invested Europe-wide. This year's figures differ from the 2004 Report because we have used Library House figures for comparison, which are more complete than those of Dow Jones' Venture Source.

Figure 3 identifies that the Health Care sector has seen the largest drop in disclosed investments. In 2001, total deal value in the sector was £221m; by 2005 this figure had dropped to £51m. Investment figures in the Technology sector have remained more stable, resulting in 2005 seeing similar levels of investment in the Health Care and Technology sectors. The first quarter of 2006 has seen a significant proportion of investment in telecommunication companies, with three companies raising a total of £10.1m. Projecting investment ahead from quarter one 2006 suggests that total investment for the year will be similar to 2005. Health Care is expected to continue to fall behind, with only one institutional 1 deal recorded so far.

On a European level, the UK continues to perform well, with Cambridge holding its place. According to deal tracker company Tornado Insider, Cambridge is now in 5th place, trailing only London, Paris, Stockholm and Dublin.

Average disclosed deal size in the Cluster has dropped steadily from 2000; this trend is also mirrored in the rest of the UK. Between 2000 and 2005 the average disclosed deal size in the Cluster dropped over £2.6m from £6.1m in 2000 to £3.5m in 2005. The first quarter of 2006 has seen an increase in average deal size in the Cluster and the UK as whole.

Figure 4
Cambridge Cluster Investment Levels Compared to UK and European Investment Levels



The distribution, size and frequency of deals in the Cluster has not only been determined by the natural cycle of venture capital investment, but also by the changes in the investment environment in the Cluster and the UK as a whole. The key points affecting investment in the Cluster can be summarised as follows:

- Large funds raised by venture capital firms during 2000 and 2001 are now nearing the end of their investment stage, more money is going into later stage deals at the expense of early stage investments, as is typical for the venture capital investment cycle.
- The UK saw few new venture funds being raised between 2001 and 2004, particularly life science specific funds. However, the last couple of years have seen several UK-based venture capital firms raise new funds. This includes local venture capital firms Amadeus Capital Partners and several London-based funds.
- AIM has grown in popularity and provides more mature companies an alternative means of raising finance.

Table 3
Average Disclosed Deal Sizes in the Cluster, the UK and Europe

Year	Cambridge Cluster (£000s)	UK without Cambridge Cluster (£000s)	Europe Without UK (£000s)
2000	6,157	7,844	2,973
2001	5,891	4,966	2,298
2002	5,129	4,091	2,296
2003	3,176	3,180	1,704
2004	3,284	3,128	1,985
2005	2,837	2,352	2,352
2006 (Q1)	3,517	4,773	3,144

Esprit Capital Partners

Cambridge spawns another major European VC

The vibrancy of the Cambridge start-up scene has helped a number of VC houses establish themselves locally and become major European venture finance players.

Esprit Capital Partners is the newest (and oldest) International VC to emerge from its roots in Cambridge. Formed from the merger between Prelude Ventures and Cazenove Private Equity, Esprit manages c.£290m of early and late stage venture funds, investing between £250k to £15m in the technology, new media, telecoms, software and health care sectors across Europe.

Prelude originally evolved out of Cambridge Consultants where founder Dr. Robert Hook was a Director, and raised its first venture fund in 1984. Prelude's second £8m LP fund returned £52m and they went on to raise £50m via the only quoted direct early stage VC investment trust in the UK, Prelude Trust PLC. In the last 21 years, Prelude has helped build a number of local businesses become international successes; companies such as Alphamosaic, Xaar, Acambis and many others.

Esprit's second link to Cambridge is through Simon Cook, formerly of Cazenove Private Equity. Mr. Cook was previously an Investment Director at 3i in Cambridge and has been an active investor locally for a decade, working with the boards and founders of Virata, nCipher, Cambridge Silicon Radio and Zeus amongst others.

One of the most active VCs currently investing, Esprit closed 14 transactions raising a total of £79m in the first half of 2006 for companies in the UK, Ireland, France and Scandinavia. Locally in Cambridge, Esprit recently led the £7m latest funding round for Newnham Research Inc alongside Benchmark and Atlas Ventures and co-led an £8m round with Fidelity Ventures into EnvironmentIQ Ltd.

Esprit brings together 21 years of seed investing by the Prelude team with the company building and financial markets expertise of the Cazenove team. Able to invest from seed through to pre-IPO, the merger makes an exciting addition to the VC market in Europe. With deep roots in Cambridge, Esprit will continue to be one of the leading investors in the region.

- The popularity and importance of angels and angel groups has increased; this is evident in the Cluster with companies such as Ubisense Trading Ltd opting for significant angel investment over venture capital investment.
- The UK has increasingly seen 'outsiders' investing in technology companies; this includes foreign venture capital, as well as private equity and hedge funds. An example may be Tudor's investment in Cluster company Hotxt Ltd.

These factors have led to the Cluster seeing a large number of exits in the last two years (see Tables 4 and 5), as well as more companies

choosing to use alternative forms of investment such as angel groups. Whatever the shape or form of investment, the Cluster continues to prove that the quality of its companies produces a superior return on investments.

Since January 2004, the Cluster has seen 24 exits via trade sale. Combined disclosed deals are valued at just under £1,340m, with two thirds of this deal value coming from just three exits, the largest being the acquisition of Cambridge Antibody Technology Plc by AstraZeneca Plc. 2005 saw the acquisition of Arakis Ltd by the Japanese bio-pharmaceutical company Sosei Co. for £106m. Arakis remains in the Cluster and now operates as a research arm of Sosei Co. AstraZeneca will combine the research and

development activities of Kudos Pharmaceuticals and CAT, which was acquired for a total of £763m.

When looking at IPOs coming out of the Cluster, Cambridge Silicon Radio is the biggest success story in recent years. The company raised over £47m from investors, and in approximately five and half years listed on the LSE with an initial market capitalisation of £240m. As of July 2006, the market capitalisation for CSR Plc

stood at over £1.5bn, a six-fold increase on its flotation value, creating very significant returns for any investors who retained shares in the company after flotation. However, flotations on the LSE's main market have not been the most notable exit route for investors.

The Alternative Investment Market (AIM) has grown rapidly in popularity as a means of exit in the UK. Since 2004, the number of companies listed on AIM has grown from 563 to

Table 4
Mergers and Acquisitions in the Cluster since January 2004

Company Name	Acquirer	Approximate Deal Date	Deal Value (£000s)
Cambridge Antibody Technology Plc	AstraZeneca Plc	May 2006	642,000
NeuroServe (Holdings) Plc	Lectus Therapeutics Ltd	April 2006	Undisclosed
KuDOS Pharmaceuticals Ltd	AstraZeneca Plc	January 2006	121,000
Lorantis Ltd	Celldex Therapeutics	October 2005	Undisclosed
Imerge Ltd	Nortec Inc	September 2005	Undisclosed
Arakis Ltd	Sosei Co	August 2005	106,500
UbiNetics Ltd	CSR Plc	August 2005	26,740
Ionix Pharmaceuticals Ltd	Vernalis Ltd	July 2005	12,500
Io Ltd	Ultra Controls Ltd	June 2005	Undisclosed
Inca Digital Printers Ltd	Dainippon Screen Mfg	June 2005	30,000
UbiNetics Ltd	Aeroflex Inc	May 2005	42,000
Molecular SkinCare Ltd/ York Pharma (R&D) Ltd	York Pharma Plc	May 2005	4,800
Apama Ltd	Progress Software Corporation	April 2005	13,580
Cambridge Biotechnology Ltd	Biovitrum AB	March 2005	30,000
NCorp Ltd	Autonomy Corporation	March 2005	Undisclosed
Amedis Pharmaceuticals Ltd	Paradigm Therapeutics Ltd	January 2005	Undisclosed
i2 Ltd	ChoicePoint Inc	January 2005	52,600
Trigenix Ltd	Qualcomm Inc	October 2004	20,040
Alphamosaic Ltd	Broadcom Communications	September 2004	69,000
Active Hotels Ltd	Priceline.com Inc	September 2004	90,000
Meridica Ltd	Pfizer Inc	September 2004	69,800
Primagraphics Ltd	Curtiss-Wright Controls Inc	May 2004	Undisclosed
Adprotech Ltd	Inflazyme	April 2004	8,300
Sirus Ltd	Arakis Ltd	March 2004	310
		Total	1,339,170

Cyan Holding Plc

Refinanced then exited

Cyan Holdings Plc, operating through the brand 'Cyan Technology', is a fabless semiconductor company that designs and develops multi-purpose flash microcontrollers designed for very low power consumption and high flexibility. One product is aimed at handheld and mobile communication device manufacturers.

Dr. Paul Johnson, CEO, explained the history of the company: "I worked for the original VC-funded Cyan as a consultant originally, after it was spun out of Cambridge Consultants in June 2000. After a period as a consultant I was offered the opportunity to join the company full time and later became a director. At the end of 2002 however the VCs originally backing the company would not provide follow-on investments. I then founded Cyan Holdings to buy the assets from the liquidator. I understood the significance of the product and also knew that it was ready to go to market, the VCs wanted out, but I felt it would have been a waste if we hadn't done something with the technology."

When asked what he did differently when he bought the assets, Dr. Johnson explained: "Myself, the CFO and the graphic designer are the only people from the old Cyan; we had the same business model but with different people. Dr. Johnson feels Cyan has a promising future ahead of it; "We believe we could be a major player in the microcontroller market, forecast to be worth over \$20bn in 2010." Commenting on the benefits of being based in Cambridge, he said: "It's a double-edged sword; you have very talented people; however there is lots of competition for them. Cambridge is a brand name now."

Cyan raised £3.2m of funding from private individuals after the asset purchase. "When it came to funding the company further I had no intention of looking for institutional investors pre-IPO," said Dr. Johnson, "Barry Muncaster, who led the investment, was instrumental in bringing in high net worth contacts from his Bioprogress days to help fund the company."

When asked about the advantages of being funded by angels as opposed to VCs, he said: "The founders get better value from angels as there is ultimately less dilution, no huge contracts and they don't take control of the company, which are things we experienced with VCs at the old Cyan. Also angels have business skills and understand the value of the proposition." Adding to that, he said: "We found that when recruiting, several people favoured Cyan because we are not VC backed. Some engineers prefer not to have VCs involved in the companies they work for; some even refuse to work for VC funded companies. This is a result of their previous bad experiences with unsuccessful VC-backed companies, such as the previous Cyan."

On the 7th of December 2005 Cyan listed on AIM, raising approximately £6m with a market capitalisation of about £18.5m. When asked about the intangible effects of a listing, Dr. Johnson explained: "Being a listed company has given us a lot of credibility with current and potential customers."

Table 5
IPOs in the Cluster since January 2004

Company Name	Listing Date	Market	Value of All Shares Offered (£000s)	Value of newly issued shares (£000s)	Market Cap at IPO (£000s)	Current Market Cap* (£000s)
Intercytex Group Plc	Feb-06	AIM	5,330	5,330	50,500	58,778
NextGen Group Plc	Dec-05	AIM	2,400	1,900	20,900	8,203
CMR Fuel Cells Plc	Dec-05	AIM	10,300	10,300	35,700	36,650
Cyan Holdings Plc	Dec-05	AIM	4,810	3,250	18,550	15,703
AbCam Plc	Nov-05	AIM	15,240	10,000	57,500	87,274
Screen Technology Group Plc	Aug-05	AIM	7,970	7,970	20,470	12,833
Bango Plc	Jun-05	AIM	11,032	7,000	35,050	33,204
ANT Plc	Mar-05	AIM	15,880	11,200	30,600	14,450
Sareum Holdings Plc	Oct-04	AIM	2,000	2,000	6,960	3,727
Brady Plc	Jun-04	AIM	2,500	2,500	20,570	6,772
Amino Technologies Plc	Jun-04	AIM	12,740	7,000	61,250	54,161
CSR Plc (Cambridge Silicon Radio)	Feb-04	LSE	78,740	78,740	240,000	1,514,230
Total			168,942	147,190	598,050	1,845,985

* At close of markets, July 13th 2006

1,434. In this period, as shown in Table 6, the Cluster has seen a significant uptake in AIM with eleven companies (of 35 known companies exiting) choosing to list, creating a total market capitalisation on flotation of £358m. Eight of the eleven AIM-listed companies that have listed since 2004 have seen their market capitalisation drop since flotation, creating a net drop of £30m. Only Intercytex Group Plc, Abcam Plc and CMR Fuel Cells have seen an increase in their market capitalisations since flotation. However, companies like Cyan Holdings are quick to point out the benefits of being a listed company, including increased credibility and new potential customers.

By combining all the known investment deals and all the known exit deal values in the Cluster, a picture can be generated as to the overall return on investment in the Cluster since 2004. Table 6 details all venture-backed exits since January 2004. The Cluster yields an ROI (ignoring exits where deal values are undisclosed) of 2.27x, and an IRR of 28 per cent. The highest returns were from investments in CMR Fuel Cells, which saw an estimated £4.6m institutional investment, resulting in an AIM listing in Q4 2005 with an initial market capitalisation

of £35.7m. From Table 6, it can be derived that IPOs in the Cluster provided greater returns on investments (average investment size has also historically been small) than trade sales, with a 2.7x ROI compared to 1.8x ROI. Obviously, these calculations exclude those companies that venture capitalists sometimes refer to as the "living dead": companies that have not exited, but which have been written off the books nonetheless. Overall, therefore, the total ROI and IRR is somewhat lower than the numbers suggest.

Trade sale remains the most common exit route for companies in the Cluster, with 13 companies exiting via acquisition. In 2005 the Cluster also saw multiple exits of venture-backed companies via AIM. Overall, an interesting picture emerges from this analysis. Of all venture-backed companies, only one floated on a main stock market: CSR. This flotation delivered the largest total amount of money back to investors. However, AIM and mergers and acquisitions have proven to be the far more frequently used option for exit. The real question this picture throws up is what impact this situation will have on the future of the UK venture capital industry. Since the overall downturn of

Table 6

Return on Investments for Exited Venture-Backed Companies in the Cluster

Name	Found- ed	Disclosed Investment (£000s)	Exit Type	Exit Date	Total Value created (£000s)	Value to sharehold- ers (£000s)	ROI	IRR %
NeuroServe (Holdings) Plc	2000	245	M&A	Q2-06	Undisclosed	Undisclosed	n/a	n/a
KuDOS Pharmaceuticals Ltd	1997	42,500	M&A	Q1-06	121,000	121,000	2.9	28
Intercytex Group Plc	1999	31,400	AIM	Q1-06	50,500	45,170	1.4	14
Lorantis Ltd	1998	44,200	M&A	Q4-05	Undisclosed	Undisclosed	n/a	n/a
CMR Fuel Cells Plc §	2003	4,610	AIM	Q4-05	35,700	25,400	5.5	531
NextGen Group Plc	2000	3,760	AIM	Q4-05	20,900	19,000	5.1	60
Cyan Holdings Plc †	2002	6,731	AIM	Q4-05	18,550	15,300	2.3	29
Flying Null Ltd	1996	1,000	OOB	Q4-05	0	0	-1.0	n/a
Imerge Ltd	1997	12,830	M&A	Q3-05	3,200	3,200	0.3	-30
Arakis Ltd	2000	49,265	M&A	Q3-05	106,500	106,500	2.2	38
Screen Technology Group Plc	1994	8,950	AIM	Q3-05	20,470	12,500	1.4	10
UbiNetics Ltd ‡	1998	64,000	M&A	Q3-05	68,740	68,740	1.1	2
Ionix Pharmaceuticals Ltd	2001	25,000	M&A	Q3-05	12,500	12,500	0.5	-24
Active RF Ltd	1998	3,600	OOB	Q3-05	0	0	-1.0	n/a
Bango Plc	1999	5,441	AIM	Q2-05	35,050	28,050	5.2	57
Inca Digital Printers Ltd	2000	4,600	M&A	Q2-05	30,000	30,000	6.5	52
Molecular SkinCare Ltd	2001	3,600	M&A	Q2-05	4,800	4,800	1.3	21
Apama Ltd	1995	10,000	M&A	Q2-05	13,580	13,580	1.4	10
NCorp Ltd	1999	5,000	M&A	Q1-05	Undisclosed	Undisclosed	n/a	n/a
Amedis Pharmaceuticals Ltd	1998	10,000	M&A	Q1-05	Undisclosed	Undisclosed	n/a	n/a
Cambridge Biotechnol- ogy Ltd	2001	10,470	M&A	Q1-05	30,000	30,000	2.9	61
ANT Plc	1993	11,890	AIM	Q1-05	30,600	19,400	1.6	11
Fastforward Data Sys- tems Ltd	1993	750	OOB	Q1-05	0	0	-1.0	n/a
Trigenix Ltd	2000	7,600	M&A	Q4-04	20,040	20,040	2.6	41
Active Hotels Ltd	1998	2,045	M&A	Q3-04	90,000	90,000	44.0	282
Alphamosaic Ltd	2000	21,390	M&A	Q3-04	69,000	69,000	3.2	84
Meridica Ltd	2001	10,000	M&A	Q3-04	69,800	69,800	7.0	79
CellFactors Plc	1997	6,850	OOB	Q3-04	0	0	-1.0	n/a
Adprotech Ltd	1997	23,700	M&A	Q2-04	8,300	8,300	0.4	-23
Polight Technologies Ltd	2000	3,580	OOB	Q2-04	0	0	-1.0	n/a
CSR Plc (Cambridge Silicon Radio)	1998	47,000	LSE	Q1-04	240,000	161,260	3.4	48
Sirus Ltd	1992	7,150	M&A	Q1-04	310	310	0.0	-68
Total (See Notes)		429,712*	-	-	1,099,540*	973,850*	2.27*	28*

Arakis

An exit is just the start of things

Arakis is a bio-pharmaceutical company that identifies new areas of therapeutic intervention for known drugs or drug templates, termed Performance Enhanced Medicines.

Arakis was founded in early 2000 and raised £49m (\$86m) in three venture capital funding rounds, which included 3i, Scottish Equity Partners and Merlin Biosciences. In August 2005, Arakis was acquired and is now a wholly-owned subsidiary of Sosei Co, a Japanese bio-pharmaceutical company.

Following completion of the transaction, Arakis, which will remain in Cambridge, became managed as an autonomous subsidiary of Sosei and is now responsible for worldwide research and development, outside Japan, for the Sosei Group. Arakis co-founders Dr. Robin Bannister and Dr. Julian Gilbert were appointed to serve on the management team of Sosei, Mr. Bannister is Managing Director of Arakis and Dr. Gilbert Chief Business Officer. "We had a healthy pipeline, a proven discovery platform, strong management and a significant cash position.

All this led to the acquisition by Sosei, and this is the first step in its growth with the aim of becoming one of the top ten pharmaceutical companies in the world." Says Dr. Bannister, he added: "Sosei hasn't exercised an overbearing hand and as a result most of the staff and operations have stayed the same."

Dr. Bannister explained how Arakis was different to other biotech companies in the area: "We differentiated ourselves at the product level competing on a product by product basis. Cambridge biotech companies are very good at, and often adopt a licensing model, however I think we need to have a good spread between licence-based and product focused companies."

Arakis is based at Chesterford Research Park, south of Cambridge. Commenting on the advantages of this, Dr. Bannister said: "Cambridge is absolutely the right place for our R&D activity. We are fortunate to have excellent staff that are not only creative and dedicated but are also passionate about their work; having access to London and the financial institutions has been convenient. Also the 'biotech community' provides an opportunity to share experiences and approaches with peers, and has been valuable. Cambridge is a most stimulating area and suits our business well; with larger companies setting up R&D facilities the profile of the area will inevitably be raised, and this is beneficial for everyone."

Notes to Table 6:

The total investment has been calculated using disclosed investments only; subsequently the true ROI and IRR may be lower than stated. For companies exiting via IPO, the value created is assumed to equal its market capitalisation on admission. The value to shareholders is subsequently calculated from the market capitalisation on admission less the value of newly issued shares.

Exit Type: AIM = IPO on the London Alternative Investment Market, LSE = IPO on the Main London Market, M&A = exit via merger or acquisition and OOB = out of business.

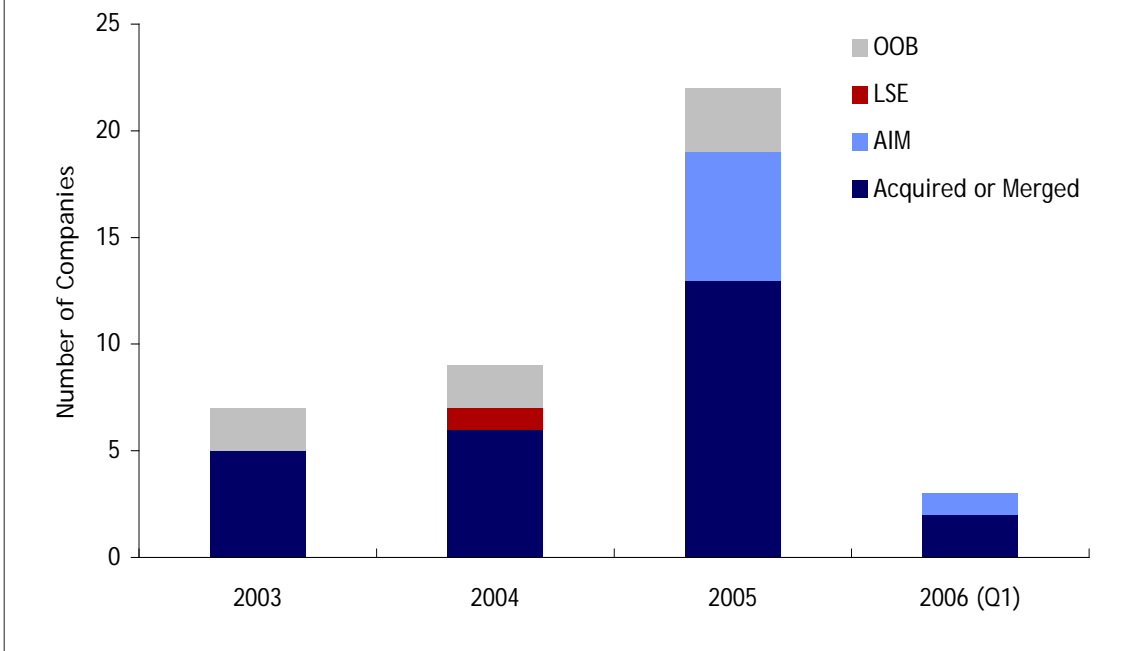
§ Total investment received by CMR Fuel Cells Plc is an estimate based on the company's known historical funding.

† Cyan Holdings Plc received funding, went into liquidation, refinanced, and exited on AIM. For simplicity, Library House has combined all known deals, pre- and post-liquidation.

‡ Ubinetics Ltd was broken up and sold in two different trade sales. For simplicity, Library House has combined these deals into one entry.

* Totals include only values for those companies with both disclosed investment and exit values

Figure 5
Exit Routes for Venture-Backed Companies in the Cluster



the industry following the end of the bubble, venture capitalists have found it increasingly hard to raise funds from limited partners. As a consequence, AIM and business angels, as well as other investors such as hedge funds, VCTs and the government via ECFs have stepped into the gap. Several venture capital firms which raised new funds in 2005 and 2006 now have

to compete to be able to make investments with alternative sources of funding.

On the positive side, the exits that the Cluster has witnessed have created an increased pool of more experienced and wealthier individuals, ready to go back into other start-ups. Overall, Library House considers that all these develop-

Figure 6
Planned Exit Routes for Companies in the Cluster

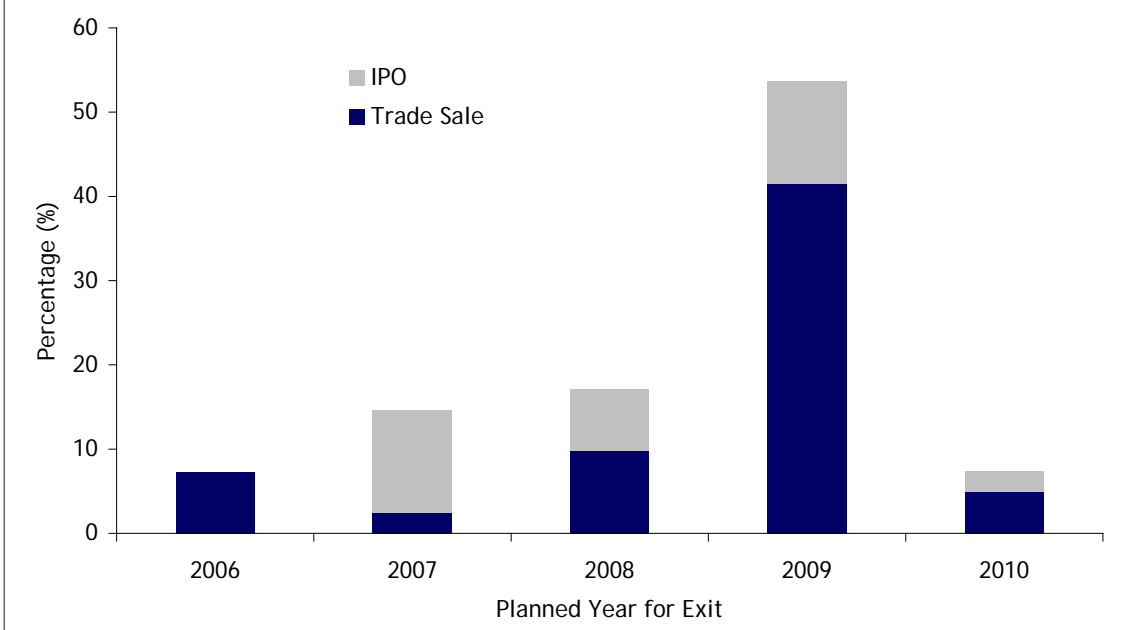
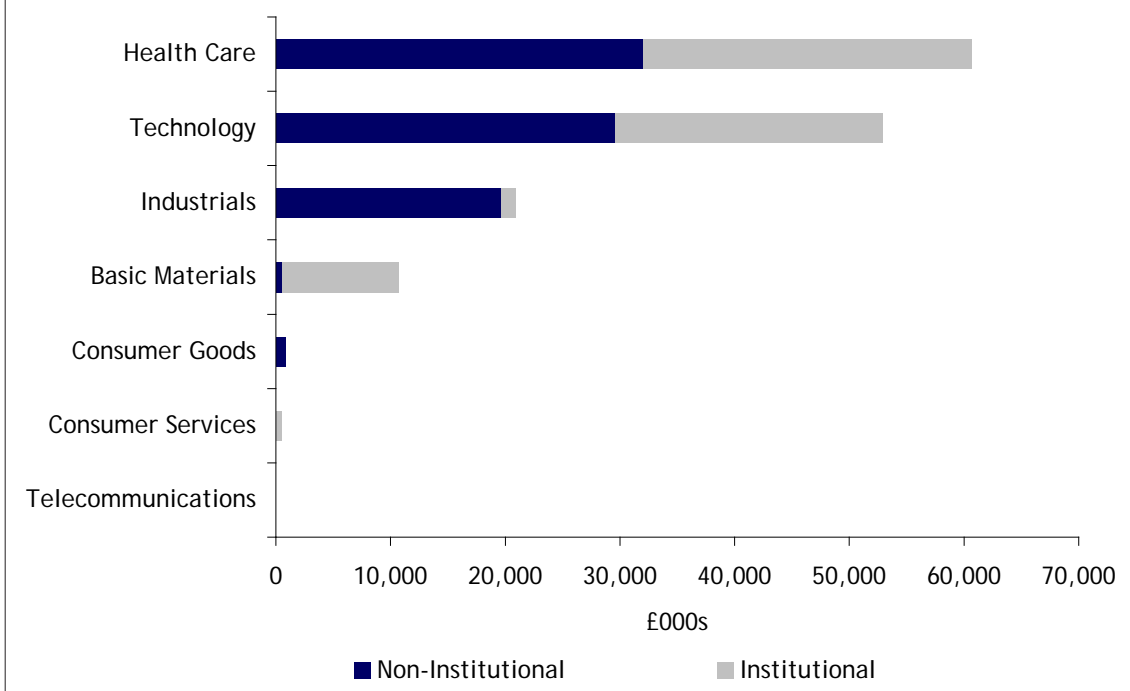


Figure 7
Disclosed Funding Requirements of Cambridge Cluster Companies (as at June 2006)



ments will have a positive impact on the continuing generation of new Cluster companies.

Figure 6 shows the planned exit routes of companies in the Cluster. These data are taken from a sample of companies with defined plans to seek an exit within the next five years. The sample suggests that exit via trade sale remains the preferred exit route, with 65 per cent of companies looking to exit in the next five years. Although the majority of companies are looking to exit via trade sale, 35 per cent of companies stated they are looking to exit via IPO.

Total disclosed funding requirements in the Cluster companies for 2006, shown in Figure 7, amount to approximately £150m, of which £61m is accounted for by the Health Care sector and £53m by Technology. 56 per cent of funding needed in the Cluster is for companies which are currently looking for first round funding (i.e. have not previously received institutional funding), indicating how the venture cycle has now swung back to early-stage investments.

*"It's a simple fact of life,
If you don't grow, you die!"*

*John Naisbitt
Futurologist*

Companies in the Cluster: Stalled Growth

The Cambridge Cluster is a dynamic environment, with new companies incorporating and more mature companies relocating, merging or going out of business. In this overview of the Cluster we will demonstrate that:

- The Cluster has not grown since 2004; in fact the Cluster has witnessed a period of slight contraction.
- The number of new companies incorporating or headquartering in Cambridge has steadily dropped since 2001.
- The Cluster has few very large companies, with only a small number of companies employing over 1,000 people.

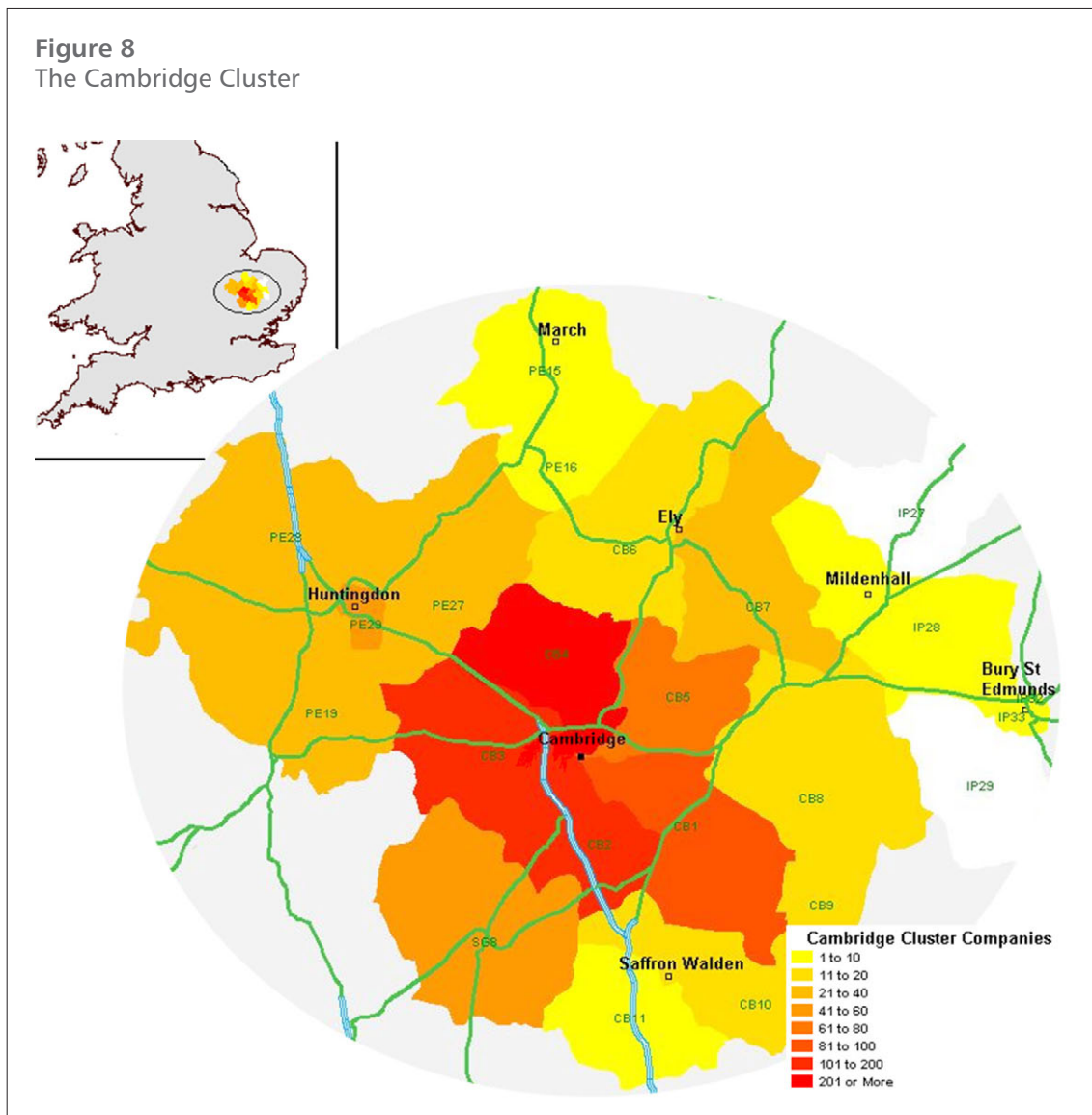


Figure 10
Changes in Company Composition

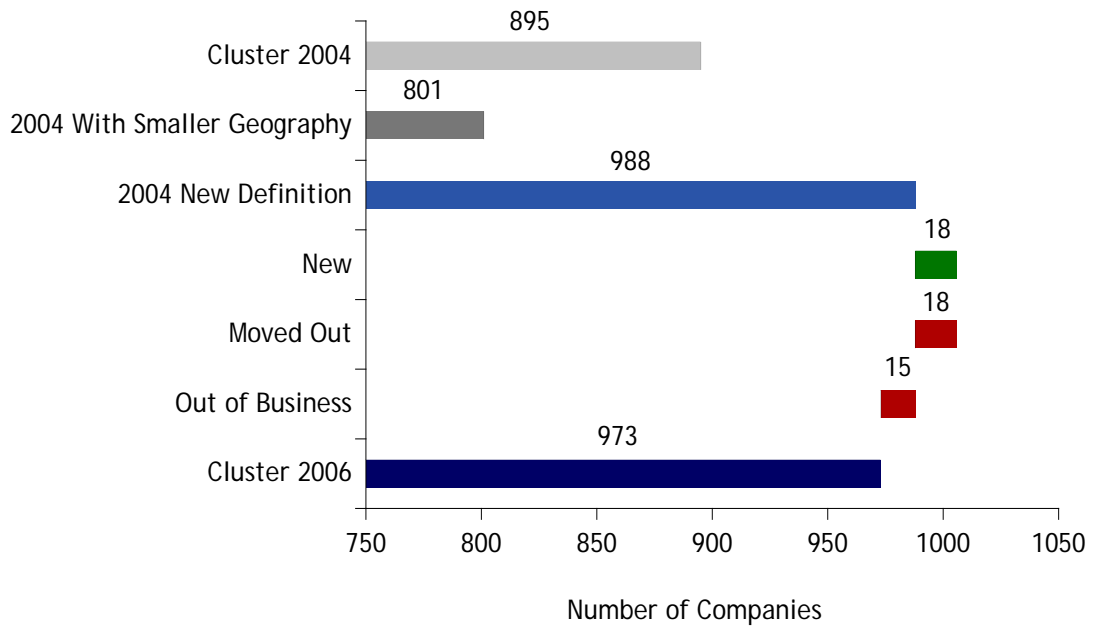
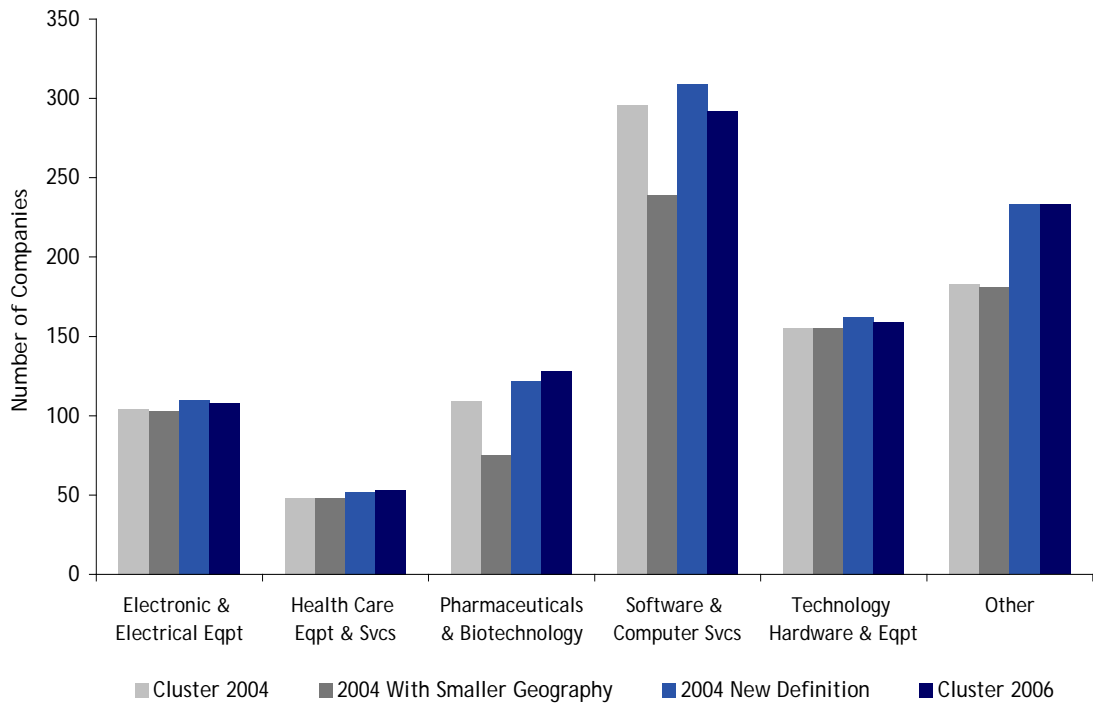


Figure 11
Changes in Composition by Sub-Sector



The labels are defined as:

- Cluster 2004 – this is the historical Cluster from the Library House 2004 Cambridge Cluster Report.
- 2004 with smaller geography – this is the historical Cambridge Cluster but amended to only include companies that fall geographically inside the new boundary.
- 2004 new definition – we have amended our definition of an “innovation-based” company slightly, in order to include companies such as heavily technology oriented consulting companies into our report; for example Cambridge Consultants. As a result, within the newly defined geography we found more companies.
- Cluster 2006 – the 2004 new definition adjusted to account for companies moving out of the Cluster, going out of business, and newly incorporated companies. These 973 companies make up the 2006 Cambridge Cluster.

Figure 10 essentially shows that the Cluster has contracted since the 2004 Report; there have not been enough new companies formed or moving in to the Cluster to offset the number of companies going out of business and mov-

ing out. This decline is largely accounted for by the Software & Computer Services sector, which, as shown in Figure 11, has seen a drop of 5.5 per cent since 2004. This decrease has been slightly offset by an increase in Pharmaceuticals & Biotechnology. Cumulatively the Cluster has seen a net loss. Other sectors, such as Electronic & Electrical Equipment and Technology Hardware & Equipment, have remained stable in terms of company numbers.

The Cluster has also seen a number of exits in the Pharmaceuticals & Biotechnology sector in the last couple of years. Names mentioned in the 2004 Report included Adprotech, which was acquired by Canadian Inflazyme Pharmaceuticals, and Sirius Pharmaceuticals, which was acquired by Arakis. The slight increase in the Pharmaceuticals & Biotechnology sector could be an early sign of a new wave of Health Care companies replacing these exited companies although it is currently still early days.

As first identified in the 2004 Cambridge Cluster Report, overall levels of company formation have decreased markedly over the last three years. Numbers for 2004 have dropped below the pre-bubble value, highlighting a sluggish period for the Cluster. Figures for 2005 and

Figure 12
Number of Cluster Companies (line denotes 4 year moving average)

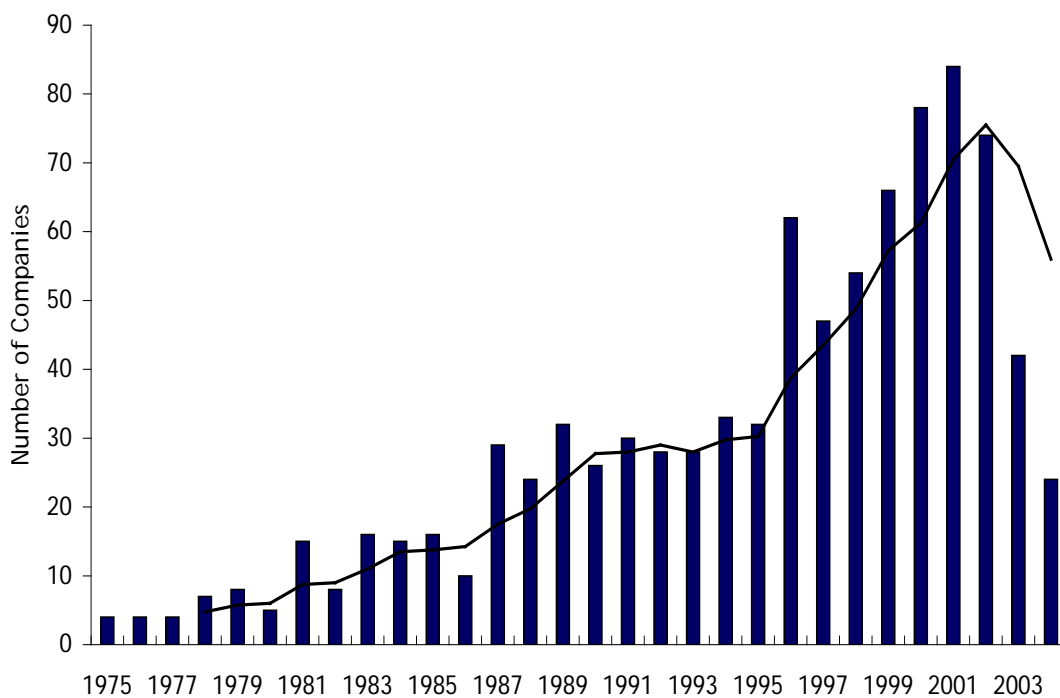


Table 7
Cluster Employment and Revenue Breakdowns by Sector

Sector	Sub-Sector	Number of Companies	Total Employees	Attributable Revenue (£000s)
Basic Materials	Chemicals	21	2,004	337,301
	Industrial Metals	3	42	5,750
	Mining	1	1,000	0
Consumer Goods	Automobiles & Parts	2	134	0
	Food Producers	6	72	9,026
	Household Goods	3	12	0
	Leisure Goods	2	37	0
	Personal Goods	4	37	2,293
Consumer Services	General Retailers	3	76	19,705
	Media	9	145	42,264
	Travel & Leisure	3	43	4
Financials	General Financial	2	12	163
	Real Estate	1	0	740
Health Care	Health Care Equipment & Svcs	53	1,267	156,400
	Pharmaceuticals & Biotechnology	128	3,598	728,960
Industrials	Industrial Support Svcs	4	52	18,903
	Aerospace & Defense	6	3,998	106,630
	Construction & Materials	6	0	90
	Electronic & Electrical Eqpt	108	2,910	305,330
	General Industrials	23	318	38,141
	Industrial Engineering	34	942	21,607
	Industrial Support Svcs	4	52	18,903
	Industrial Transportation	1	39	0
	Support Services	71	1,554	232,066
Oil & Gas	Oil & Gas Producers	1	3	0
	Oil Equipment, Svcs & Distribution	3	22	34
Technology	Software & Computer Svcs	292	4,990	470,055
	Technology Hardware & Eqpt	160	4,562	1,042,896
Telecommunications	Fixed Line Telecommunications	12	596	9,704
	Mobile Telecommunications	13	552	9,418
Utilities	Electricity	1	2	0
Total		973	29,019	3,557,479

Table 8
Cluster Revenue and Employment Breakdowns by Development Stage

Legal Status	Development Stage	Number of Companies	Total Employees	Attributable Revenue (£000s)
Private Limited - Independent	Early Stage	112	956	72,632
	Venture-Backed	95	1,736	40,677
	Growth	204	1,704	69,372
	Mature	276	5,480	447,929
	Sub- Total	687	9,876	630,610
Private Limited - Wholly Owned Subsidiary	Early Stage	15	999	196,073
	Growth	72	3,069	343,796
	Mature	121	6,510	820,602
	Sub- Total	208	10,578	1,360,471
Publicly Quoted	Early Stage	6	1,030	566
	Growth	22	1,471	474,548
	Mature	42	5,774	1,066,158
	Sub- Total	70	8,275	1,541,272
Other	Early Stage	6	27	0
	Venture-Backed	2	60	3,880
	Growth	2	202	21,246
	Mature	1	1	0
	Sub- Total	11	290	25,126
Grand Total		973	29,019	3,557,479

quarter one 2006 have been omitted to prevent misleading results arising from the inevitable lag between companies incorporating and Library House identifying them.

Overall, this drop in company formation to a level last seen ten years ago is worthy of further comment. Although we have not carried out any detailed research into the reasons for this decline, we believe it to be possible that these are the first signs that the Cluster has started to hit the limit set by regional conditions. Unless this number picks up significantly going forward, we believe that the long-term health of the Cluster may be at risk.

Revenues shown in Table 7 and Table 8 are based on the latest accounts filed with Companies House. Library House identified all legal entities where either:

- The Company is headquartered in the Cambridge Cluster; or
- A subsidiary is based in the Cluster and can be clearly identified as a separate legal entity.

In these cases, revenues from the most senior holding company located in the Cluster were selected. Equally, all companies were excluded, which, for example, are headquartered in London and account for all their activities in London, although the majority of employees work in the Cambridge Cluster.

Table 7 provides a breakdown of the Cluster by sector. The three main sectors are Industrials, Health Care and Technology, of which Technology is the second biggest, with an average revenue of approximately £3.3m per company. The biggest companies by attributable turnover in the Cluster are Cambridge Silicon Radio Plc,

Domino Printing Sciences Plc and Cambridge Antibody Technology Plc; together these companies generated in excess of £670m in 2005. One of the largest employers in the Cluster is the Marshall of Cambridge Group Plc, which reports a headcount in excess of 4,000.

Ten per cent of companies in the Cluster are venture-backed, accounting for approximately six per cent of employment in the Cluster and approximately one per cent of revenues. This revenue proportion for venture-backed companies is comparable to venture-backed companies in the UK as a whole.

The Cluster only counts 70 publicly quoted companies, seven percent of the total number of companies. These 70 companies account for a modest 43 per cent of attributable revenues in the Cluster and 28 per cent of employment. Arguably, these levels are significantly below what one would expect an established centre of innovation to produce. The Cluster appears to be unable to build, maintain and attract large and very large multinational companies. Factors in Cambridge such as poor transport infrastructure, expensive housing and distance to the financial services of London could partially or fully explain this pattern.

"We must put people at the centre of everything we do"

*Kofi Annan
Secretary-General , United Nations*

Building the Future: The Cluster Enablers and Resources

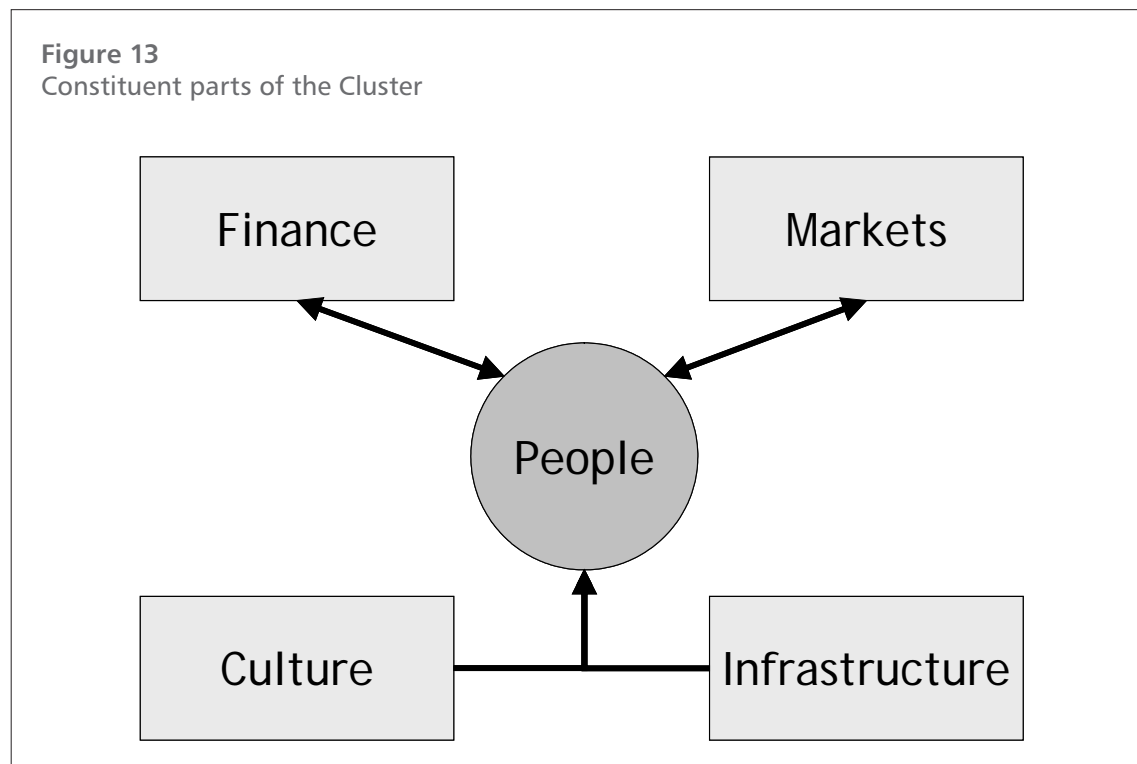
The Cambridge Cluster is a well-established centre of innovation, which accounted for 12 per cent of venture capital investment in the UK in 2005, and approximately five per cent of overall European VC investment (based on VentureOne published statistics). It has significantly developed over the last ten years, playing to its strengths, particularly utilising its high calibre labour pool.

Library House is frequently asked what, in our opinion, the Cluster needs in order to grow, expand and continue to be successful. This section touches upon what we believe is necessary to grow the Cluster going forward. Our view is based upon our understanding of innovation and clusters in general. In this section we explain our framework for cluster analysis, our view on the Cambridge Cluster, and conclude with our opinions of action points.

Components of Clusters

The framework shown in Figure 13 visualises our understanding of clusters and their interacting constituent parts. This view has built up over several years and is loosely based on work carried out by a significant number of other people, but as this publication is not an academic paper, we will simply present this framework as a stand-alone concept.

At the heart of all commercial activity, indeed any activities at all, are people. People build the companies that will later form clusters; they attract, train, inspire and retain other people.



People require four external factors to successfully build companies:

- Entrepreneurial and business-friendly culture.
- External infrastructure, including transport, education, general law and legal framework, tax regimes, etc.
- Access to markets, including customers, partners and suppliers.
- Access to finance, including stock markets, and private and public sector finance.

Aspects of this framework, as it relates to the Cambridge Cluster, are examined below. This report does not set out to review all aspects in detail, rather it focuses only on the most relevant key aspects.

Pool of Talented, Driven People and an Entrepreneurial Culture

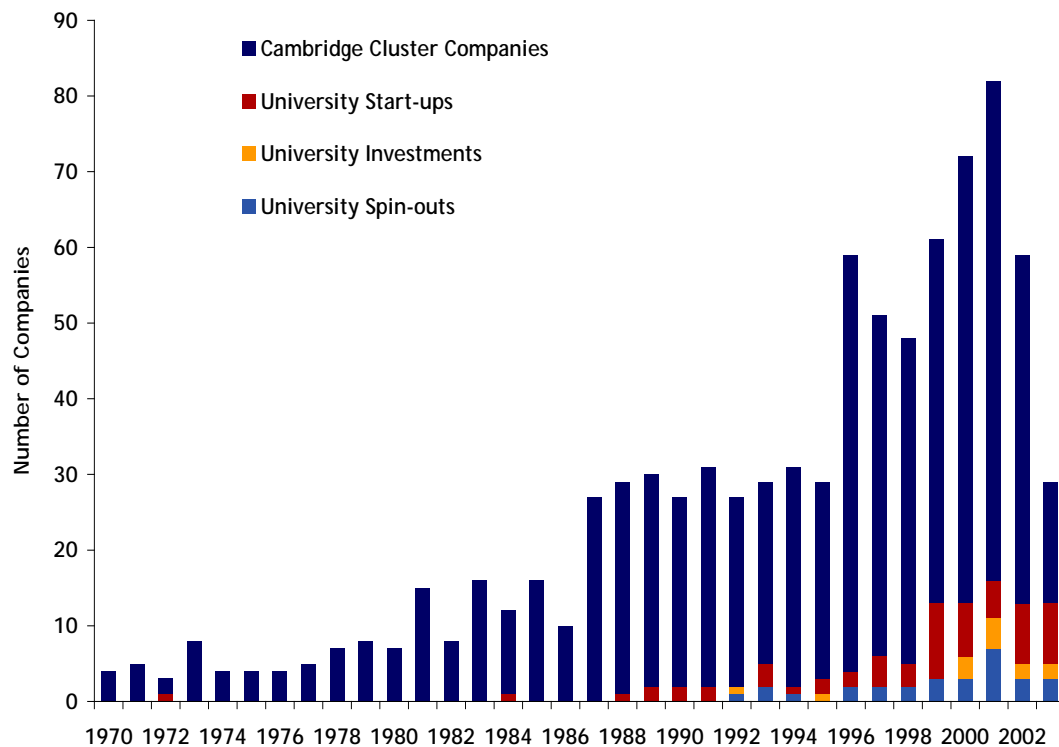
One of the significant attributes of the Cambridge Cluster is its established nature; Cambridge has acquired over the last decade a growing group of (serial) entrepreneurs, active angels and highly competent technology experts. History has shown that companies in

the Cluster, such as Arakis and CSR, which have had experienced entrepreneurs or business angels involved from an early stage, have had the greatest success. These people and their skills and experience are important factors supporting the Cluster's success, explaining why returns on investments are above European VC averages.

In many technology clusters, universities play a key role as providers of both people and technology. One of the greatest magnets for talented and driven people in the Cambridge Cluster is the University of Cambridge, ranked among the top three in various international university rankings, including the generally well-respected Shanghai Global University Ranking. Many of the original Cluster companies, such as Cambridge Consultants and its fellow technology consulting firms, were founded by Cambridge University graduates. Furthermore, a significant number of individuals who work at Cambridge Cluster companies graduated from the University.

More directly, the University of Cambridge plays a significant role in developing cutting-

Figure 14
Cambridge New Ventures and Cambridge Cluster Companies by Year of Incorporation



edge science and technologies, supporting an entrepreneurial environment and attracting and developing high calibre people in the Cluster. As seen in Figure 14, an increasing stream of university start-ups has originated from the people within the University. By now, the structured contribution of the University to the growth of the Cluster has become significant: arguably more than a quarter of all new start-ups in the Cluster are directly influenced by the University.

In recent decades, the culture of Cambridge University has been transformed from one that is largely business averse, to one that embraces entrepreneurial behaviour to a much greater extent. The next section on start-up finance will shed some light on how that impacts the financing of young companies.

Finance in the Cluster

The availability of finance is a key factor in encouraging new companies and supporting the growth of companies in the Cluster. The financing options available to companies in the Cambridge area have matured greatly over the years. When raising capital there are now the additional options of seeking angel funding and financing through AIM, complementing the VC investments.

The Cluster has witnessed strong evolution of the angel scene in Cambridge over the last few years, and it is arguable that the Cluster is now seeing more experienced angels with deeper pockets willing to make funds available for young companies. David Gammon, an active business angel and an investor in Bango Plc, commented: "We have seen angel investment activity amongst early stage companies in Cambridge grow in size as a result of different angel groups syndicating deals together. This has resulted in angel deal size increasing. For example, Ubisense, a three-year-old Cambridge-based company, has secured over \$7m of funding since April 2003 – all from private individuals. I think we will see more of this kind of activity in the future. Companies will realise that there are alternatives to the traditional venture capital investment model, with AIM, new VCT laws, ECFs, hedge funds and a growing angel scene. Hedge funds and angels could make a very potent future combination. I would expect to see several ground-breaking deals between angel syndicates and hedge funds in the next year."

Access to Markets and the Infrastructure of the Cluster

The debate about the infrastructure in and surrounding Cambridge has been a lengthy and frustrating one. In order to understand better where the Cluster stands today, we briefly review the history of the development of the Cluster, describe the current evolution plans, and conclude with our own thoughts.

In 1950, the Cambridgeshire County Council Planning Department, the (then) Borough Council, and the University produced the Holford-Wright report with the intention of keeping Cambridge's character as a University and market town. The report recommended that the growth of the city be halted and that industrial expansion throughout Cambridgeshire be discouraged.

As the 2004 Library House report on the Cambridge Cluster describes, the setting up of technology consultancies in and around Cambridge was a breakthrough in the formation of the Cluster. The consultancies recruited talented academics and taught them how to identify market opportunities, negotiate contracts and deliver commercial results, thereby creating experienced individuals who combine technical and commercial expertise. Many of these people became founders and senior managers in start-up companies in the Cambridge Cluster.

In the 1960s, people began to move away from the congested London region and many small factories moved to Cambridgeshire. During the period from the 1960s to the 1980s an increasing number of University graduates stayed in the area around Cambridge and founded a range of high-tech companies (mostly computer-related). This encouraged others to follow suit, and helped the Cluster expand and eventually reach critical mass.

The University set up a subcommittee of the Senate in 1967 to consider the planning aspects of the relationship between the University and science-based industry. The resulting document, known as the 'Mott Report', was published in 1969, and recommended a relaxation of the then current planning restrictions and the establishment of a science park.

The Cambridge Science Park was the first science park in England, founded under the guidance of Trinity College's then Senior Bursar, Dr.

Ubisense Trading Ltd

The power of angels

Ubisense is a Cambridge-based start-up company that develops and markets software-driven, precision 3D real-time location systems (RTLS) based on UltraWide Band (UWB) technology. It also provides consulting services to implement high-value location technology customer solutions.

The company's solutions deliver automatic and immediate 'location-aware' data that can be used to track thousands of people or assets in 3D, to within one foot of accuracy. The real-time element of the solutions means that Ubisense can provide a model of a space and an asset tracking system to support any event as it happens. Richard Green, Chief Executive, explained how the company was formed: "After the AT&T labs were closed in April 2002, Andy Hopper, Andy Ward and Pete Steggles were looking for a partner to help develop a new business. My management team and I had just sold our last business (Smallworld) to General Electric, and had set up Ten Sails as a vehicle to allow us time to think about the right technology to back. I met with the guys from the lab, and we decided that it would be a good idea to commercialise the research they had been doing in pervasive computing, so Ten Sails invested in Ubisense to get the company going."

Commenting on the team that has been working together for a long time, Mr. Green said: "We have established very strong relationships over time and now spot mistakes early. As much as it is important to bring in new people, I think it's fantastic that the Cluster recycles experienced people that have worked together before, and this helps enormously to the growth of companies." On the subject of Cambridge, Mr. Green added, "It is very easy to do business in Cambridge due to the density of the place, and there is something about the whole ecosystem that has a compound effect on companies."

In the summer of 2005, Ubisense started the search for \$2–3m from a corporate partner to accelerate its growth. As Mr. Green explained, "After three or four months of looking I decided that the process was taking too long. That's when we approached a large set of angels, knowing some were going to invest anyway, to see if we could fund the company ourselves. I think fundraising can be very distracting from the core business objectives and funding from angels saves a lot of time as the process is much easier. The time between the release of an Information Memorandum and the receipt of payment was 45 days (including a Christmas and New Year break), which is quite something considering funding from VCs typically takes six months." Ubisense managed to raise \$3m (£1.79m) from some Cambridge Angels and the Cambridge Capital Group. This brings the total amount of funding raised to over \$7m (£4m), all from private individuals, not a single institutional investor, which is very rare in the UK.

Looking to the future, Mr. Green estimates that Ubisense is 12–15 months ahead of its competition: "The main challenges facing us in the future will be to continue to innovate and stay ahead of the competition. If we manage this and enable the business to scale we will be in a good position to float in the not too distant future."

John Bradfield. The first company, Laser-Scan moved in to premises in the park in Autumn 1973. By 2005, the Park was home to 71 high-tech companies, which provided 5,000 jobs. Napp Pharmaceuticals was one of the first com-

panies to move into the Science Park in 1979, and now employs 700 people.

In the 1980s, venture capitalists first came to the Park to be at the epicentre of the evolving

Cambridge Cluster. The St. John's Innovation Centre was established in 1987 by St. John's College. This provides office and laboratory space as well as business support for early stage companies. The Cluster continues to attract leading corporations and many start-up companies. In addition to the two original science parks, a number of further science and business parks have been set up around Cambridge, reflecting the demand for office and laboratory space and facilities.

Overall, the history of the infrastructure development in and around Cambridge illustrates the interaction of two opposing forces in the Cluster: the group of people who wish to maintain a 'market town character' and those who want to build a leading international 'technology cluster'.

The physical infrastructure is undoubtedly a key constraint on the ability of the Cambridge Cluster to grow. Not only is it important for businesses to be able to set up facilities and offices required for their operations, but they also need to make themselves accessible to the wider UK and global markets. It is a broadly shared view that this is one of Cambridge's weaknesses, and possibly a critical limitation that it will struggle to overcome. An important feature of the infrastructure is to be able to accommodate enough people so that companies can be safe in the knowledge that housing will not be an issue for their employees.

A key proposal to support the new housing is to build a 'Cambridge Guided Busway' (due to open in October 2008). Buses will travel away from congestion on a purpose-built guide way along the route of the disused railway line between St. Ives and Cambridge Science Park, then join normal roads into Cambridge city centre and the railway station, before rejoining the guide way through to Addenbrooke's Hospital and Trumpington Park & Ride, carrying local users on an estimated 20,000 trips per day within ten years of opening.

When asked about the impact current road links within Cambridge have on businesses, Richard Preston, Head of Network Management for Cambridgeshire County Council commented: "This is a threat and opportunity for businesses. We are looking to make subtle changes locally; however, looking at the wider infrastructure we are not looking to upgrade the A14. The local road improvements we are

looking to make are to provide additional road capacity to the area. Cambridge has a certain character and culture and we never want to undermine that; however, we must evolve due to several pressures."

Evidently, the current development strategy struggles to accommodate both of the two major forces mentioned above. It is probably fair to say that although there appears to be some strategy for supporting the Cluster going forward, the resultant plan is neither fish nor fowl. We believe as a consequence of the current strategy, Cambridge is unlikely to develop into a world-leading technology cluster in its own right that could really rival the world's leading clusters, such as Silicon Valley. We rather believe that Cambridge is currently developing into an innovation outpost of the 'London Cluster', with Oxford and Reading being the other two significant 'outposts'. A number of elements are already pointing in this direction. Venture capital funds investing in Cambridge-based companies operate increasingly from London as many firms have scaled back their regional presence and now maintain only London offices. Life science companies that prior to 2000 had a tendency to locate directly in Cambridge, now favour remaining located in or around London. The rail link between London and Cambridge is now among the most crowded in the country, according to recent official statistics, reflecting the increasingly linked nature of the two clusters.

With the centre of gravity shifting to London, the transport infrastructure connecting Cambridge with the West of London, and also enabling access to Oxford, Reading and Heathrow airport, will become increasingly important. Arguably, the current transport infrastructure plans are at best short-sighted. Dependent on the time of day, it currently takes between two and three hours to drive from Cambridge to Oxford, Reading, or Heathrow and the journey by train requires numerous changes and is rarely any quicker. These locations are all less than 100 miles distance to Cambridge, and the journey time arguably much longer than it should be.

Conclusions

The Cambridge Cluster has no shortage of driven entrepreneurs, early stage finance, or experienced business people. The University of Cambridge is a magnet for attracting new talent into the area, and in addition develops some of the world's finest technology. However, these resources can only be put to limited use if they are not effectively connected to the key nearby innovation regions.

The major way in which national and regional government could support the growth of the UK innovation economy and the Cambridge Cluster as a part of it, is by improving the transport infrastructure around London and bringing both Cambridge and Oxford within easy reach of both London and each other.

We believe that, once connected, Cambridge, Oxford, Reading, and London at their centre, could grow into a technology cluster that would be second to none on a global scale.

Combined, this cluster attracts more than 50 per cent of all venture capital invested in the UK and would have all of the required ingredients to become the major global innovation region. In addition to the required underlying legal and cultural infrastructure within the UK, the region can boast four major international airports and a number of other international transport links, both via rail and sea.

Of specific relevance for innovation cluster formation, the combined region would contain:

- Large corporations; the headquarters of a large number of major international companies are based within the area, providing a potential source of experienced personnel and new start-ups as well as acting as customers and acquirers for more developed companies.
- A world leading financial centre; capable of providing financing for all stages of company development.
- Leading universities; the three main universities within the region, as well as the number of smaller research and teaching establishments, would provide a large continually replenished pool of talent within the region.
- Entrepreneurs; the previous successes within the area, as well as the large number of innovation-based companies currently operating within the region has built a number of local concentrations of experienced entrepreneurs capable of building successful future companies given the right support.

The combined supercluster would be one of the few places in the world to have all of the required ingredients in a sufficient concentration to effectively compete with expected future rivals, of which Shanghai is currently among the leading contenders.

However, in order to utilise the resources available to their full potential it is essential that the existing islands of technology clusters are connected.

"We should not fear a world which is more interacted"

*George W. Bush
President, USA*

Appendices

Library House Research Methodology

The contents of this report are based upon the Library House Private Company Intelligence Online database which holds information on over 5,000 companies potentially of interest to investors or others interested in UK private companies. The information in this report is correct to the best of our knowledge as of April 30th 2006. The information in our database is updated continuously and is subject to change without notice.

Where possible the information contained in the database has been verified by a member of the senior management team of the company concerned. Where a company has been unable or unwilling to provide information we have made attempts to verify information independently where possible.

Library House Definitions

Which companies are included:

Library House defines a Cambridge Cluster company as an active innovation-based/driven company with either its headquarters or a significant business operation (e.g. a research and development arm) located within the Cluster area. The geographical area of the Cluster has been defined using the same criteria as the Greater Cambridge Partnership.

What is an innovation-based/driven business/company?

A company whose primary aim is to exploit an innovation for commercial gain. This excludes businesses that solely provide support, installation, contract services or advice on technology to innovation-based/driven companies.

What are early, growth and mature development stages?

Library House defines a company as 'early stage' if it was incorporated less than five years ago. Companies incorporated between five and ten years ago are described as being in the 'growth stage', and companies that are older than ten years are described as being at the 'mature stage'.

Which companies are considered venture-backed?

Library House defines the UK venture-backed portfolio as including all active, independent and unquoted UK headquartered companies which have received venture funding from an investment company.

The venture-backed portfolio does not include:

- Private equity buyout activity;
- Companies which have been acquired or gone public even if the venture capital investors retain a stake; or
- Companies not headquartered in the UK.

Sector/Sub-Sector

All sector breakdowns utilise the Industry Classification Benchmark (ICB) taxonomy with two levels of granularity, which for the context of this report are referred to as sector (e.g. Health Care) and sub sector (e.g. Pharmaceuticals & Biotechnology). For a full list of sectors see below.

The ICB Taxonomy

Key Sector	Sub-Sector
Oil & Gas	Oil & Gas Producers
	Oil Equipment, Services & Distribution
Basic Materials	Chemicals
	Forestry & Paper
	Industrial Metals
	Mining
Industrials	Construction & Materials
	Aerospace & Defence
	General Industrials
	Electronic & Electrical Equipment
	Industrial Engineering
	Industrial Transportation
	Support Services
Consumer Goods	Automobiles & Parts
	Beverages
	Food Producers
	Household Goods
	Leisure Goods
	Personal Goods
	Tobacco
Health Care	Health Care Equipment & Services
	Pharmaceuticals & Biotechnology
Consumer Services	Food & Drug Retailers
	General Retailers
	Media
	Travel & Leisure
Telecommunications	Fixed Line Telecommunications
	Mobile Telecommunications
Utilities	Electricity
	Gas, Water & Multi-utilities
Financials	Banks
	Non-life Insurance
	Life Insurance
	Real Estate
	General Financial
	Equity Investment Instruments
	Non-equity Investment Instruments
Technology	Software & Computer Services
	Technology Hardware & Equipment

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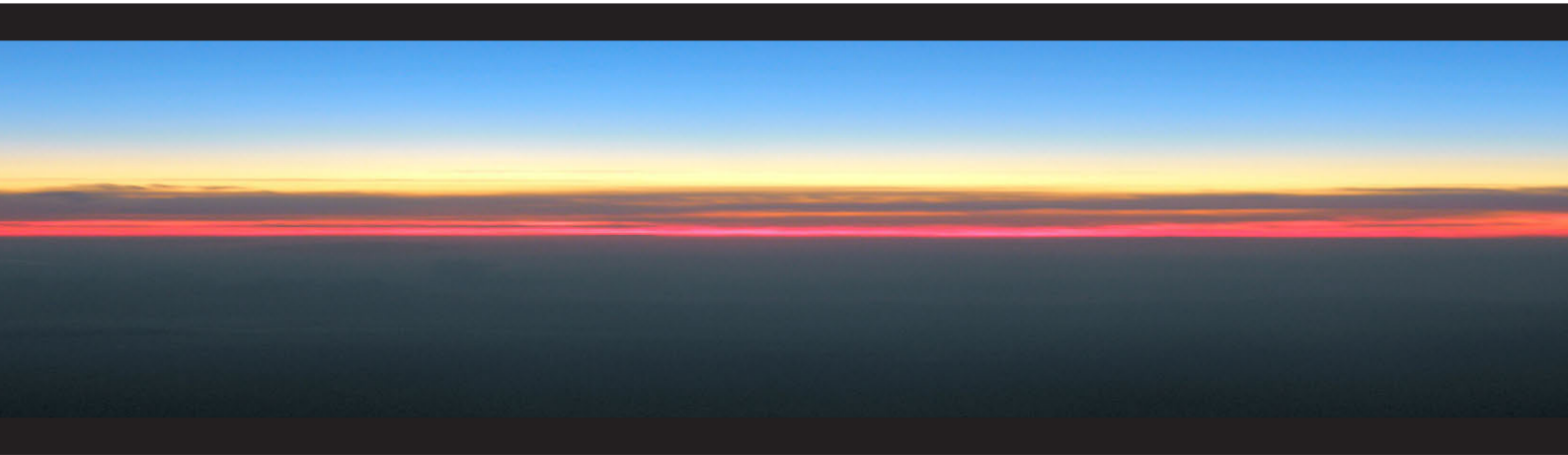
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