

the new
entrepreneurs

Seminar 1: Knowledge
Entrepreneurship

A seminar held on
Wednesday 19th May 1999
11 Downing Street, London



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Preface

The Smith Institute has been set up to look at issues which flow from the changing relationship between social values and economic imperatives. The Institute takes its lead from the belief of the late John Smith MP that social justice and economic progress can go hand in hand, and it currently centres its work on these themes.

This booklet is based on the presentations made by Edwin Moses, Tim Carrigan and Charlie Leadbetter during a seminar held on 19th May 1999 at 11 Downing Street. We have tried to reflect the debate which followed. Inevitably, in transforming a live event into print, some of the colour and the texture of the original have been lost. We hope, however, that those who attended the seminar will recognise much of what is included here, and that those who read it fresh will respond to the flow of good ideas which emerged during the morning.

Introduction

Wilf Stevenson

It is my pleasure to introduce the seminar today on knowledge entrepreneurs, which is the first of a series of three under the general rubric of the New Entrepreneurship.

This series is under the patronage of the Chancellor of the Exchequer and the Secretaries of State for Culture, Education and Employment, and Trade and Industry. We have representatives from all those departments here today. It is funded by the BBC, the ISTC, NESTA, the DTI, DCMS, Cap Gemini, Sun Microsystems and Sheffield Hallam University. This is a project we have been able to do with DEMOS and with the ICA which gives us great pleasure as well, because I believe that think tanks need to work where they can with others, to try to bridge across and find the best possible approach to many of the problems we face today.

Michael Wills MP

I am actually here instead of Gordon Brown and I am sorry that he can't be here, but he did ask me to send his apologies. I know he is very sorry, because this subject is very close to his heart – as indeed it was to that of John Smith, in whose memory the Smith Institute was set up and who has been very much in our minds this month as it is now the fifth anniversary of his sad and untimely death.

Gordon is going to be following these discussions with great interest. They are central to his concerns at the Treasury and they are central to our concerns at the DTI. I have to go and catch a plane to Belfast to talk to 1500 young entrepreneurs later today, so I hope that gives you a sense of how we are pursuing this agenda. But I would like to kick these seminars off by saying a few general words about entrepreneurship.

In the new economy that we are living through, we are, as a government, having to rethink our role fundamentally. Driven by extraordinary technological change, we are living through a period of change which is unprecedented in human history, in both its extent and speed. Some years ago it took seven years to get a car from the drawing board into the showroom. It took the Ford Puma eighteen months. A banking transaction which costs £1 in the branch, costs a penny on the internet, and successful economies and societies are only going to be those which are flexible enough and adaptable enough to meet the demands of this sort of change, and can carry on being flexible and adaptable in continuing to meet them.

Here is an example of what I mean by flexibility and adaptability. In 1961, the Hong Kong wig industry had one factory. By 1970 the industry employed 39,000 people, which was 5% of manufacturing workers in Hong Kong. It accounted for 8% of Hong Kong's exports – in other words, it was more important to Hong Kong's exports in 1970 than cars, or than North Sea oil is to British exports. But then, in the 1970s, the world market for wigs changed. It shifted from wigs made from human hair, for which apparently Chinese hair is particularly suitable, to those made from synthetic fibres, in which Hong Kong had no competitive advantage and had great difficulty in obtaining the raw materials. So from 1970 and 8% of its exports, in 1977 there were only 57 workers working in the Hong Kong wig industry. The others went on to new jobs in toys, electronics and so on, and the wig entrepreneurs were not daunted by this sudden shift in their markets, they turned all their wig making machinery over to fish scaling machinery. So in eighteen years or less you had a whole cycle of an industry going from virtually nothing, to being one of the most dominant industries in the economy of Hong Kong, to virtually nothing again. Maybe not knowledge driven in the way we are going to be discussing this morning, but certainly entrepreneurship. And entrepreneurship is going to be key if we are going to meet these challenges.

In many ways this country invented the concept of the modern entrepreneur with people like Josiah Wedgwood and Matthew Bolton, and today we know it is the key by which we can unlock the creative and commercial energies of our people. Many of you here today have shown just what can be done, but it is quite clear that we need to do more and we need to do better. We know that entrepreneurship can't flourish

outside a nourishing and nurturing environment, and that is the job of government.

All societies and economies tend to produce accumulations of reservoirs of power which reinforce themselves, creating new accumulations of reservoirs of power, wealth and opportunity. It is very easy to get locked into established ways of doing things, commercially, socially and economically. Now if we are going to realise our full potential, we have to be constantly vigilant against these accumulations and this ossification of the way that we approach things. In a sense, it is government's job to help break down those barriers. We can't do that by directing specific strategies for success. The world is moving too fast for that, but what we can do is create the culture in which entrepreneurship can flourish. Stability is the essential platform, and I know if Gordon Brown was here he would want to say a few words about this: it is macroeconomic stability that creates the secure environment for investment and responsible risk taking, and in which government can create and promote a nurturing culture for entrepreneurship. This means constructing a fiscal regime which rewards work and enterprise; investing in the raw materials of the knowledge driven economy, its human capital and its science base; and investing in the highest quality public services like education which are universally available so that everyone can fulfil their potential.

Now within this culture, government must act to remove the barriers to opportunity, reforming product, capital and labour markets, opening them up, making them more and more competitive. Of particular interest to me is that governments must construct a ladder of

opportunity for small firms, removing the barriers that prevent them moving up the ladder from rung to rung. It's small firms that provide the dynamism and the growth in this new economy, because they possess the adaptability and flexibility to succeed in fast moving markets. But many of them are also particularly vulnerable to the inertia and exploitation of existing and entrenched interests.

This can be particularly true in knowledge driven industries, which by definition are often pushing over the frontiers. Government, I think, has a particular responsibility to ensure that there's a level playing field. Not to penalise companies that have grown through success, but to create an environment in which all firms have an equal opportunity to succeed and grow. At every stage of growth, whether it's moving from employment or unemployment into self-employment, from self-employment into employing the first member of staff, from microbusiness to small business, all the way up the ladder from small business to large business, small businesses can face obstacles which are both practical and cultural. Our job is to help businesses overcome them. We can't make them succeed, but we can help remove those barriers. There should be no barrier to anyone realising the choices and the opportunities that can come from starting your own business. Regulations should be implemented only as far as necessary and should not specifically disadvantage small firms. Risk finance should be as widely available as possible from a financial industry which actually understands the demands and imperatives of starting a small business, and particularly knowledge driven small businesses. Access to the knowledge infrastructure should be as widely available as possible.

The issues that we are going to be discussing here this morning are absolutely essential to the unfolding public policy debate in government at the moment. The contribution that you are going to make today, we are all going to follow very carefully, and the continuing public policy debate that I think is going to unfold in the other seminars is going to be very important for all of us in government.

Let me just say thank you to the Smith Institute for promoting this debate and a particular thanks to Charlie Leadbeater for all the excellent work that he's doing.

Case Study 1

Edwin Moses

A Spin Off from Oxford University

I would like to begin by talking briefly about Oxford Asymmetry, to put in context what I'll say later. I'll pick out some of the lessons we have learned as we have developed the company over the past few years. We are a company that provides outsourcing services to the pharmaceutical industry. We are chemists. We help our clients make the chemicals that may be the blockbuster drugs of tomorrow. So we are enabling the pharmaceutical and biotechnology industry to develop drugs more quickly and more efficiently.

We began in 1992, as a spin off from Oxford University. We are the bright idea of an Oxford don who thought that he could make an interesting business and make some money by developing his skills in

chemistry. We have grown from four people then to about 230 today. 40% of our employees have PhDs, and 90 odd per cent have graduate degrees, so it is a very, very highly skilled and obviously knowledge based company. In terms of facilities, we have built from about 2,000 square feet of space back in 1992 to 150,000 square feet of very specialist laboratory and office space. We have gone from sales of £100,000 to £15m last year.

We are also a very profitable company. We have been profitable for the last four years. Very often in our industry, people have bright ideas, develop lots of technology, but you have to sell it to make money, and we made just under £4m profit last year. We were voted the sixth fastest growing company in the UK through the Virgin Fast Track 100 Sunday Times League, with compound growth in the previous three years of 150% in sales. We got initial funding from Business Angels, and I'll come back to them, because I think they are important in our sort of business. We then got venture capital money of about £5m, and we launched on the London Stock Exchange at a valuation of £120m last year. Today, after a turbulent year in the industry, we have increased our valuation by 30%.

That's the advertisement for the company. I should say as well, though, that as part of our contribution and our desire to improve our ability in knowledge management, we are currently investing very heavily in the whole area of knowledge management. Working with Cap Gemini is really changing our company and preparing it for three, four and five years ahead. We think we will do very different things in a very different way from the things we are doing today.

Knowledge and ‘Know-How’ Entrepreneurs

I just want to pick on a few things now when we talk about knowledge entrepreneurs and some of the experiences we have had. I think, simply, entrepreneurs are people who do things differently to get ahead. Very simple. I’m sure that the academics would tear that idea apart, but that’s the way I look at it. People prepared to take a chance, do it in a different way, to gain some form of advantage.

I can see two types of people when I look at our company. There are knowledge entrepreneurs, who in my view are primarily technical specialists. In our company they are chemists, they are the founding scientists, people who could develop new things, make things that have never been made before, or develop new ways to make things that are already in existence. They are different from pure inventors, because they tend to be applied in their entrepreneurship.

Then, very importantly, there are what I would call ‘know-how’ entrepreneurs. They are people with a much more generic set of skills, people who can’t make anything, who can’t invent a way to make new things, but who know how to market and sell a product in a new way, or can develop a new way to do that. They are people who can set up a research and development department in a brand new way, or who can develop a business or raise finance in a new way, or an entrepreneurial way. They are not just managers, because in our sort of business they have to do things very differently just to get started, let alone to succeed. It is often said that the UK has lots of inventors, lots of knowledge entrepreneurs. But what we don’t have enough of is these know-how entrepreneurs, compared with the United States, where they

have many more people who can think of developing a company in a new way, based upon a technical idea. I also think that Europe is far less rich in these people, so that's an advantage that the UK has.

To succeed, a business needs both those types of people, people with the specialist technical knowledge to invent brand new ideas, new products, new processes, and people with ideas on how to develop those into new types of business.

Business Awareness and the Willingness to Take a Chance

Turning to some of the things we'd like to see changed: first of all, the lack of business awareness, in terms of what profit and loss is, what a public or private company is, what share options are. Whether you look at graduates, PhDs, middle managers, senior managers, both outside our organisation and also within our organisation, the lack of understanding of basic business principles is quite amazing. In the United States, high school students would generally have a far better appreciation of general business than they do in the UK. How does that hurt us? One of the issues with our own company is the view of profits. The assumption is that if you make a profit, you must be screwing somebody. You are either screwing the customer, or the supplier, or the employee. If you make losses, then you are a bad manager; you're not screwing anybody. I think that can damage the way in which people think about the business.

We also find that in share options, for instance, we have had young people, 25 to 30 year old people, leave the company with hundreds of thousands of pounds of share options on the table to go for a couple of

thousand pounds worth of salary increase. Why do they leave? When you ask them, it's because they think it's just a piece of paper. They just don't value it. So after making huge efforts to introduce share options schemes, you suddenly realise it's cash you should be waving about. But of course cash doesn't give your employees or your partners the same incentive to grow the business, so it's a real dilemma. What we have to do is develop business education in our schools much more. People of 10, 11 or 12 in the United States would be thinking about business, thinking about companies in their schools. I would like to see much more of that in our schools and in the community.

The second thing we have noticed is what I think of as fear. Something which still staggers me is that I have no fear that anybody in our company, not a single one of our 230 employees, will go and set up another company tomorrow. It's absolutely amazing. In the United States, I would be anticipating every couple of months that one of these bright guys would spin off and set something up themselves. It doesn't happen. Why doesn't it happen? Because everybody thinks setting up a company is difficult. Nobody realises how easy it is. It is very, very easy to set up a company. A successful company is difficult, but a company is easy.

The other thing is the fear of failure which you hear constantly these days. People are afraid to fail. If you set up a company, there is a very high chance of failure, but you've got to be prepared to take that chance and for it not to be a stigma on you or your career in the future. In the United States, it isn't a stigma, it isn't something which is a big disadvantage. The problem in the UK is that there are very few people

with the guts to start up new companies and so you have a few so called serial entrepreneurs who are doing it again and again. That's fine, but the field is very limited. It's great they're doing it, but there's just not enough other people prepared to take the chance. So again, I think, it's an educational issue. It's pushing role models, pushing out the people who have done it, getting them to talk at schools, getting them to talk to young people to encourage them to understand and take away the complexity of it all and to reduce it to a very simple issue: how to start a business, how easy it is and how it isn't a problem if it goes wrong for the right reasons, because you are learning, so that you do better next time.

Bureaucratic Obstacles and Recruitment from Abroad

Something like 80% of our sales are exported. We have made an effort to hire from abroad. 20% of our people are from outside the UK. Thirteen different nationalities in 230 people; we speak seventeen languages fluently. We believe in this because it creates international diversity, but it also allows us to communicate with our customers. How can we be an international business if we are all British, and can speak just one language?

However, the work permit restrictions for non-EU employees are still very difficult. We have a Japanese employee who is an expert in chemistry. If you look in our trade magazines, once every year you will see us advertise for Japanese speaking chemists with very specific qualifications. We have to do that every year because we get one applicant, the guy who's working for us, and on that basis we can extend his work permit here. Does that make sense? I don't think so, it's a waste

of our time, a waste of money whilst we are doing it. We also had a Malaysian employee with special skills who we wanted to employ, very early in the company's existence. We tried to hire him. He got refused a work permit. We had to go to our local MP and get that refusal overturned. It's a lot of time and effort. We don't want to do that. To be the best in the world at what we do - and that's what we're aiming to be - we have to be able to hire from around the world. We need that to be made easy. We are not hiring Malaysians or Japanese because it's cheaper, or to put British people out of work, but because they're the best at what they do. We must be allowed to do that.

I think the work ethic in the UK is excellent, from the point of view of those developing a knowledge based company, particularly compared with Italy and Germany, where employment laws are much more difficult for us to deal with. I know there they protect the individual, but they really do prevent start-up companies getting off the ground and having the flexibility they need in the early years. We are concerned about things like the Working Time Directive, about the maternity and paternity leave changes. Those things present a bureaucratic stranglehold on a company like ours. We understand the political nature of the desire to improve the lot of people who are working, but I would say that in our type of company, we are not all labourers. The majority of people in our company really enjoy what they do. For 60% or 70%, it's their hobby. They get paid for doing what their hobby is. Why should we try to protect and restrict the way in which employers like us work with our employees? Actually, 'employees' is not a word we use in our company: it doesn't make any sense. They are people who work with us. So I think the old style of approach, of protecting the employee from

the very large companies, doesn't really fit the type of companies we are developing, where we have fun doing what we do.

In terms of education, we are now choosing French graduates over British graduates when we have the choice, because they are better trained in the science we are involved in. We are finding that a lot of the graduates now coming out from the new universities are very poor (particularly graduates, not PhDs). We think we shall have to work much more closely with universities to make sure that these people are properly educated for the jobs that we want them to do. I should also say that if you look at chemists and the way they are trained, it's all about criticism. If I put a bright idea on the board, it is torn to pieces like piranha fish within seconds. They can tear it apart because that's what they're taught to do - they are not taught to build on it. It's a real deficiency in the education system, particularly for scientists. You see it very strongly in our sort of organisation. You have to force people to say two or three good things about an idea before you let them tear it apart and get on with what they really like doing. But we do have advantages that show up in the cultural mix. The Japanese won't openly contradict each other - that's a problem in an organisation like ours, because they just get steamrollered right over. And the Scandinavians look for consensus. We don't believe in waiting for consensus, we like to get on. You can wait forever for consensus. So I think we have a lot of advantages that have been very beneficial.

Financing the Knowledge Entrepreneur

In terms of government intervention, grants in my view don't do it. Grants support the weak and don't help the strong. They force you to

do things you don't want to do, force you to set up your businesses in places you shouldn't be setting them up. We are in Oxfordshire, we like being there, we don't get a single grant for being in Oxfordshire. We are encouraged to go to Northern Ireland, Wales, Scotland, but we don't want to go there, it's not the right place for us to be. We are given grants by the DTI to develop new pieces of technology in areas that we don't want to develop and our customers don't want, and then we are monitored and the bureaucracy sinks us. If you are going to give us money in grants, give it to us with as few bureaucratic encumbrances as possible. Allow us to make decisions about what to do with the money, because we will make the right decisions.

In terms of finance, as already mentioned the banks are basically witless. They have no idea what to do when you turn up with a business plan. Your local bank manager has no idea, and the structure of the organisation is such that he has no way of getting through. We currently bank with Coutts, a quite unusual bank for us, but the reason we bank with Coutts is that we could get to the decision makers. It's a smaller organisation; you can actually get to talk to people who can say yes or no. You talk to High Street banks who I won't name, you can't get to the decision maker. Or not for a long, long time.

Venture capitalists. I don't have a good word to say about them, except 3i who invested in us and who have been extremely good, but I think they're a problem in our particular industry in that it is a very incestuous group of people. I think they work together against the interests of companies like ours. They want to take advantage of you. They are not real venture capitalists. They want a certain idea and a

certain return. It still rings in my mind that we got refused venture capital by a company who told us that we weren't taking a big enough risk for his investors! We asked him to repeat that because we thought he said something that he didn't mean to say, but he said it again! Our returns, however, are much greater than the average returns they get from people who are taking risks, and of course we are still in business.

Finally, how do we set up an environment to nurture entrepreneurs? They are sensitive beasts, but why aren't more people drawn into this? Well, the reality is that if you do try to be an entrepreneur and it goes wrong, you lose everything and you're ridiculed and vilified. If it goes well, then on all the gain you make, you are taxed at 40%, and if you sell out, you are taxed at 30% or 40% of that. So if you look at it, the downsides of success are really quite high, and if you are unsuccessful, it is also a very high price to pay. It's not surprising that so many people just sit there and let other people create the wealth and the jobs, because there's too much danger and risk in being a real knowledge entrepreneur.

Case Study 2

Tim Carrigan

Starting Up in a New Market Sector

About five years ago, I started a business called NoHo Digital. I'm going to tell you a little bit about my business just to contextualise it, but before I do so, I just want to point out that the story I am going to tell is a very, very average story for the market sector in which I work.

NoHo is one of a new breed of companies. It operates in a market sector that didn't exist five or ten years ago. It's born out of the new digital communication technology. The bit of the market sector that we target is really helping large businesses, particularly large corporations and large brand owners, to understand the potential of the internet and other digital media technologies, and how they can use those technologies to gain competitive advantage in the market place.

We started in 1994. Two people founded the company. We had one employee and one freelance, and we bought a few computers. It cost us about £40,000 to start the business and we started with one contract. So, fairly humble beginnings really. Just a few people who had an idea that we could start in this emerging market.

From those fairly humble beginnings, we have grown the business, and I think a lot of people would say that we have done very well. We are now a multi-million pound turnover business, still privately owned. We are going to employ about 40 people this year, and obviously we employ a lot of freelancers and other people, so we contribute quite considerably in terms of employment. Over those five years I think you could say that we've done our fair share in contributing to the national statistics.

Why No Stellar Business Successes in Britain?

It would be easy to say that we are a great success and a fantastic business. But what I've been startled by over the five years I have been in business is seeing literally thousands of other businesses start very, very similarly to my own. Businesses that are started by a few guys

or a few women who get together, and typically they can bootstrap themselves up into small companies. There are literally thousands of these companies, I want to emphasise that. They are out there and they represent a billion pound industry employing many thousands of people. But what's striking about these businesses is that they are all in the £1m to £10m bracket. They find it easy to become £1m to £10m businesses and they find it easy to employ between 5 and 50 people.

If you contrast that to the last five years in the US market, you find some really astonishing things that haven't happened in Britain. One of the things that hasn't happened is that we haven't grown any stellar business successes. We don't have any Amazons and we don't have any Yahoos. It is easy to point at Amazon and Yahoo and these fantastic business successes and say, well they're rare, they're one or two companies that have succeeded. Those companies have been built in the last five years from nothing, but they are just the biggest fish in a very large sea and, in America, there are literally thousands of companies that have started in that five year period, in exactly the same market place that I operate in, whose market capitalisations are measured in hundreds of millions and who employ hundreds and maybe thousands of people.

The issue that I want to focus on today is to ask why it is that we in Britain don't produce those kinds of stellar business successes. What it comes to for me is that we have a business ecology in this country that is very, very comfortable with developing small businesses. Someone called Britain a nation of shopkeepers and you can still see that in the way we have approached this digital media technology. We are very

comfortable bootstrapping small businesses, creating lots and lots of very small businesses, but we are very, very poor at developing really, really big businesses. For a company like mine to become a Yahoo or an Amazon is very, very difficult in the climate that we have. Of these thousands of small businesses we have created, there are very few of them who seem to be able to scale the heights that some of our American counterparts do.

Need for a Virtuous Cycle of Success

One thing that is obvious to me when I talk to Americans (and I talk to them quite a lot, because a lot of them are coming round to acquiring businesses in the UK) is the difference in the market ecology in which they operate. Those stellar successes that have been produced in the American market over the past five years are key parts in the market ecology that actually create a culture in which other businesses can start to thrive. It's really startling, if you look at these, who their clients are. Their clients are often Amazon and Yahoo and Microsoft and Apple. Because our own market ecology doesn't have stellar business successes, it means that we don't have a feeder for other small businesses to grab hold of and grow into bigger businesses.

So we lack this kind of virtuous cycle of success here. That has really been brought home to me recently. I operate in an area of the market which is about developing websites. There are many thousands of businesses who started in a similar time frame, and most of those businesses that are now managing to break that £10m barrier have done so by taking partnership or capital from the US. The people who have done that all say, we would have liked to have found venture capital

support, or partnership, or other people to work with, in the UK or Europe, but when we talk to American investors, or American trade partners, or American acquirers, the way they value our business, the way they value the opportunity and their belief in the ability of these businesses to grow, far exceeds the opinion we get from UK investors or partners.

For an entrepreneur like myself, the bottom line is that the valuations they are getting from the Americans are much higher. So you now have a phenomenon in my market place where the best way for these companies to grow and succeed is to look outside Britain for capital partnership or acquisition. That is the really big issue I wanted to raise. My central reflection about entrepreneurialship in this country is that it is very, very easy, and there are very, very few barriers, for a small business to start up. I agree with all those comments about banks and so forth, but they are the kinds of problems that entrepreneurs all around the world would report. Dumb bankers exist everywhere, I'm sure. But what I am really startled by is that in this country we just can't seem to break that £10m barrier. I think that is an interesting question for us to discuss today.

An Overview

Charlie Leadbetter

Why Knowledge Entrepreneurs are Important

What I want to talk about is the results of the research we have been doing (generously and rather patiently funded by the Gatsby

Foundation) into Entrepreneurship in the Knowledge Intensive Industries, and so by implication into knowledge entrepreneurs. With my colleague Kate Oakley we have been looking at entrepreneurs in computer games, animation, internet services, electronics, biotechnology and other fields, to work out what this process is.

The first question is why entrepreneurship should matter in these industries. In the knowledge intensive industries, why is it that markets are not dominated by global companies with high R & D and global brands? There are two reasons, I think, why entrepreneurship matters increasingly in these industries.

The first is that the faster the rate of knowledge creation in an industry, the more new ideas come up, the more differences of opinion there are about the value of those ideas, and so the more opportunities there are for entrepreneurship. So if everyone in this room was in the bread industry, there wouldn't be that many new ideas, and even if there was a new idea, we would probably all agree about its value. You could drop some poppy seeds on the top, or maybe slice a loaf or what have you, but innovation in bread isn't very strong. But if we were all in the internet services business: there are 80 people in the room, and there are probably 300 ideas about how to make money out of the internet. None of them would work, but we would all have a go, probably several times.

So the more new ideas in an industry, the more opportunities there are for differences of opinion about their value, and the more opportunities for entrepreneurship. Chester Carlson invented the

photocopier at Kodak. He went to Kodak and said, “I’ve invented a photocopier” and they said, “That’s very good Chester, but we’re a photographic company and we don’t think anyone wants a photocopier”, so he set up Xerox. That process of disagreement about the value of the idea created Xerox. Then, two or three decades later, Steve Jobs came along to Xerox and said, “I’ve invented the personal computer” and Xerox said, “Well, we’re a photocopier company and we don’t think anyone’s interested in personal computers”, and after Steve Jobs had been to seventeen other companies, he finally set up Apple. So this process is really critical. That’s why entrepreneurs should be as critical.

The second thing is what Tim said, that in a lot of these industries, the barriers to entry are going down. There are still heavy barriers to entry, high barriers to entry in banking, but Standard Life has been selling a mortgage a minute for the last three months through its telephone and internet banking service. One of its telephone bankers does the business of eleven High Street branches. So the barriers to entry are falling, and that creates opportunities for entrepreneurship.

A Knowledge Base and a Knowledge Holder

What are entrepreneurs like and what’s the process of entrepreneurship like in these industries? Well the first thing is that you have to have a strong and distinctive knowledge base; you have to have something to draw on. So in Edwin’s case, it came from the science labs in Oxford. In Tim’s case, a background in the BBC provided the technical knowledge. In the case of CDT, it comes from Cambridge University, and in the case of Paul Drayson and Powderjet, from long research by Brian Bellhouse at Oxford. So you have to have a knowledge base which is strong. In

other words, it's not just one idea, it's a whole stream of ideas coming out, which can be developed. It must be commercially distinctive, in a way that allows you to make money out of it, or at least potentially.

The knowledge base can be formal, but it can also be informal. The computer games industry in this country is based on an entirely informal tacit knowledge base. There are no courses, no institutions, no professions, no qualifications, and yet in some ways we have a world class industry. It's almost a nineteenth century story of people inventing things in their rooms at home. Even when it is formal, it can be multi-institutional, it's not necessarily just in universities. So in biotechnology, it's multi-institutional: it's in hospitals, it's in research labs, it's in charities, it's in large companies, it's not just in the universities.

In all of these companies that we've looked at, especially companies like Edwin's and Tim's, and also companies like CDT and Powderjet, there is a critical role which is the knowledge holder, the brain if you like, and this person is really critically important. This person, who is often a scientist in hi-tech industries, is critical, because they provide credibility to investors. They know what they're talking about. They attract other bright people who want to work with this person. They set part of the culture of the seriousness and learning of the company and they have vision and passion. They are in it because they are really interested in the idea. In an entrepreneurial company, which is often going to go through some turbulent times, that vision and passion is critical to carry it through. So these knowledge holders, if you like, are absolutely critical.

But what is also true is that when they are also attempting to become entrepreneurs, it is often a disaster. That's partly because they lack commercial skills, but it is also because the knowledge holder often wants to keep the company organised around them, around their knowledge, around their ambition. So when a knowledge holder attempts to be an entrepreneur, or where you try to train scientists to become entrepreneurs, or hope they can combine both roles, it often leads to disaster.

The Background, Ethos and Role of the Knowledge Entrepreneur

The knowledge entrepreneur, as in Edwin's case, is often someone who isn't actually a knowledge holder, but they know enough about the technology and they have got enough of the commercial background to put the two together. That's why I think the knowledge entrepreneurs have these 'A' skills. They have enough knowledge about the technology, or the science, or the background of the company, and they have the commercial skills, and they can put them together, join up the technology and the commerce.

What kind of backgrounds do they have? Well, without wishing at all to be rude, they've often knocked around quite a bit. Edwin did not tell you that he worked for Amersham International; he has worked in several start-ups, some abroad, some here. Tim had a long background in computer journalism which allowed him to know what was going on in the industry. So often these people aren't young; they aren't in their twenties. They can be in computer games and the internet services, because in those industries they are often younger. But in the other industries, they are often in their thirties. They've had experience,

they've worked abroad, they've known how to run companies and they have a strong commercial background. They are confident. They are able to think globally.

But they are not flash and they are not status conscious. When you go to the car parks, they aren't full of flash cars. When you go to ARM, which is the semi-conductor company in Maidenhead, and you sit in reception, you don't know whether the guys walking through the door are going to work in the post room or whether they are PhDs designing the latest kind of chip. It's that kind of culture, and that is exactly the San Jose, Silicon Valley kind of culture. It is completely un-status conscious, it's about knowledge, performance, achievement and seriousness. So knowledge entrepreneurs of that kind are completely outside the mainstream of British corporate culture. They are not interested in expense account suits, big cars and all the rest of it.

Development Through Partnership

In these industries, and in Edwin's industry in particular, but also in Tim's, at the start-up stage of these industries, it's a global market. It is a global market both at the start-up stage and also at the big company stage, so we are competing, as Edwin said, to be a home for knowledge entrepreneurs, to attract them from around the world.

Entrepreneurship in these industries is often not about a single person, it's about at least a partnership and is often about a team. In the case of ARM, which is one of the most successful knowledge intensive companies, it was about a team of twelve people who came out of Acorn. And the role of the entrepreneur is to dynamically combine

those people and resources and know-how together, to get the right kind of environment.

Powderjet, the Oxford company which makes a painless form of injection using powder, has at its core the intellectual capital, but it has organised the exploitation of that through a series of partnerships. It is this ability to understand that the core of the business is the intellectual capital, the know-how, the people, but that the manufacturing, the distribution, the branding, the exploitation can be done through partnership, which is at the heart of these companies.

I don't think that finance has been terribly critical in many of these companies. I know there are a lot of complaints about venture capital, but I don't think finance is the big problem. Actually, these companies don't need lots of money. Often they work best when they don't have very much money, when they are up against constraints, when they have to work with few resources, when they have to be very nimble. But what is lacking in this country is the kind of venture capitalists that you get in Silicon Valley. In Silicon Valley, what happens is that when an entrepreneur emerges with an idea, the venture capitalist kind of attaches, almost like an amoeba, and the venture capitalist knows an accountant, who knows someone in a big company who can help with marketing and manufacturing, and they know a lawyer. Around the entrepreneur this network forms very, very quickly. In this country, too often when an entrepreneur emerges, all that happens is that they get a bit of money, but they don't get all these other things as well. It's too easy for that entrepreneur to get dispirited and to fail.

One of the most telling things that Edwin said was that there are no spin-outs out of Oxford Asymmetry. The founding force in Silicon Valley was Fairchild Semi-Conductor. It wasn't really Stamford or Berkeley, it was Fairchild which spun out all these companies which then became high-grade companies of the future. We have to create this spin-out culture, people being prepared to leave large companies in their thirties to create their own companies, and that means looking at pensions, looking at stock options, it means looking at incentives to create companies and create that kind of environment.

So as we've gone around doing this study, we have in many ways been pleasantly surprised by the scale of self-employment and entrepreneurship, particularly at a small-scale level. As Tim says, there are lots and lots of twenty year olds in this country working with a few computers in darkened rooms, hoping that they are going to be the next hit on the internet. And amongst a generation of twenty year olds, I think there is a new attitude towards entrepreneurship. But we lack critical mass. One of the reasons why it is so hard to get companies on the scale that Tim is talking about is the scale and size of the market, but it is also about the scale and size of the ambition. When you go to the States and Silicon Valley, they just think so big, and then want to do it very quickly. That's one of the things we lack.

So in other words, I think that in contrast to France, Germany, Italy and a lot of other European countries, we have a much greater opportunity to create a stronger entrepreneurial culture amongst younger people who want to make more of their talent, but we are still a long, long way off making that happen.

Discussion

Risk, Blame and Accountability

Kim Howells MP

Edwin put his finger on it when he said the main problems are lack of guts and lack of imagination. He also made out a very good case for doing away with the DTI! I don't think I've heard a single word this morning, apart from the Minister, which was any kind of justification for anything we do at the DTI.

Lord Puttnam of Queensgate

I want to take advantage of being here in this building, because I think it is very significant. What we are talking about is the need for a cultural shift. I'm not sure when or how, but we have developed an accountability culture which is based on blame, criticism and negativity. It starts for me with the attitude of the Public Accounts Committee and the National Audit Office. They seem to be set up as sort of rottweilers to savage anything interesting that might be going on and certainly to destroy any culture of risk.

Government has got to decide its main priority. Is it public accountability, or is it risk-taking, entrepreneurship and adventure, because you can't do both? The media add to the problem by looking for the savage destructive story, not the story of slow build up. It takes a long time to build up a business. It is likely to mean mistakes and sometimes failure. If you get leapt on and publicly vilified for failing, you are not going to risk it again, or you are going to go abroad.

A final point is that we live in a dividend culture as opposed to a growth culture. We'll never get anywhere until the financial sector understands that growth comes from reinvestment, not through dividend. The idea that a successful business or its investors are ones that think that profits are better off in their pockets than reinvested in the business is a piece of double think, one I've never got my head around. Change the dividend culture and change the accountability culture and you'll begin to get somewhere.

Knowledge workers and hierarchy

Paul Hermelin

I am French, and I'm on the management board of Cap Gemini, the European IT Consulting Service Company. I strongly agree with all the speakers, but I want to add that entrepreneurship also exists in large organisations, though it is far more difficult there. We have 40,000 people at Cap Gemini. The problem is combining the discipline of a large organisation with entrepreneurial initiative. Knowledge workers are the key, how to align their objectives with those of the company and still allow them some freedom. That is the critical challenge, because of the enormous premium attached to innovation in this market. You can set prices at the level you want when you are an innovator, so everyone is fighting to be in advance of the market.

A well known case in France was Renault's recent attempt to develop a car twice as fast as a traditional new model. It was done through a project that crossed all hierarchical lines. That is the key with

knowledge workers, overriding hierarchy, very difficult in a Latin culture because it is so Napoleon-centric and so hierarchical.

Too Much Tax and Too Few Good Entrepreneurs

Hermann Hauser

I want to follow up David Puttnam's points. Clearly dividends is not what we are about, but the City still has a dividend culture. That's why our young entrepreneurs look to NASDAQ not the London Stock Exchange, which is sad, because I am sure we can finance companies in this country as well. As to blame and failure, many of my colleagues in the USA will not back anybody who has not failed at least once! The CEO of one very successful software company will not hire anybody onto senior management who has not failed at least twice! It is seen as a way of getting your stripes.

The encouraging news is that in European terms, Britain has the best chance of making this go. The French especially face serious problems with culture and tax, particularly their attitude to share options. But there are still problems here with options - they are taxed when you exercise them not when you sell, which means you can pay a lot of tax by exercising options when the value is high. Valuations of hi-tech companies are on a roller-coaster, so if you pay tax at a high point and sell at a low point, you might have paid more in tax than you get back from selling. This makes no sense. There is also a very strong relationship between capital gains tax and the amount of money going into venture capital. It was halving capital gains tax in the US that

unleashed the flood of money into venture capital in the 1970s. We ought to do this as well. 3i has recently done a nice study showing that if it halved capital gains tax, government would increase its take considerably.

But the main bottleneck for a more entrepreneurial culture is not capital any more, it is the quality of our entrepreneurs. The pool of good entrepreneurs is tiny compared with the States. That's why I welcome the Treasury's initiative in setting up some entrepreneurial centres around the country.

Response: Charlie Leadbeater

Take the story of ARM. Robin Saxby gathered twelve engineers and scientists from Acorn eight years ago. He said, we are going to be a billion pound company, we are going to lead the world. They all shook their heads and wondered what he was talking about. But he's done it, in Maidenhead, with people he hired. I don't know how widely that kind of role model is known about.

When you talk to kids about business they think business is about men in grey suits, it's boring, it's fat cats, it's kind of mainstream. But these people represent a new business class, a new approach to what being in business amounts to. This is something government should take up, it should articulate this new sense of what being an entrepreneur is about. It's about being creative, having a go, being independent, so it plays to a lot of the values that young people most identify with. And it's also about potentially changing the world. That's often why people in Silicon Valley go into entrepreneurship, not just to make pots of money

but because they want to do something.

So having role models and building on them is really important. That's why companies like ARM, like Oxford Asymmetry, like CDT are so critical. I think for young people, the idea that you can set up your own internet company or you can set up a company like Powderjet and make a lot of money, but in the process do something really quite remarkable, is quite inspiring actually, and that those are the kind of role models we can get across.

Response: Tim Carrigan

I just wanted to emphasise what Lord Puttnam said. The cultural negativity really does feed into what I was talking about, our being very good at developing small business and low-risk propositions. Lots of companies you see in my market sector are people who secure a contract and think, I can get four people and bootstrap myself up from that and that lowers the risk of failure. I am really struck, as an Australian working in this country, that people see the risk but they don't see the upside, the possibility of success. That's why we have so few big ideas, or people who can launch a big idea, and that's why we have so few companies like ARM and so many little businesses. We are very scared of taking the big risk for fear of being ridiculed. You try and raise £10m with three people and a few computers and people will look at you as if you're an idiot. That's very deeply ingrained.

An Education System for Knowledge Entrepreneurs

Tom Bentley

A couple of points about the education system. 48% of 16-19 year olds say that running their own business is one of their major aspirations in life, so this point about youth is absolutely right. Actually, the role models are quite pervasive. In our work with young unemployed men, talking about what they want out of life, the role model they identify with almost universally is Richard Branson. It's a problem, because there aren't enough of him out there – and he may not be a particularly good role model.

My first point is to do with failure. For young people passing through the education system in Britain at the moment, the main objective is at all costs to avoid any brush with failure. In many ways, that produces the wrong experiences and the wrong aspirations. For those who are supposedly the best and the most successful, the primary goal is to succeed by standards and frameworks that other people have set for them. That's not a very good model either.

That links to the second point. When we think of education reform, our idea is often to pre-programme the system so that it delivers the objectives and outcomes we say we want. But the major characteristic of the businesses we have been hearing about this morning is that they combine new knowledge in new ways. It is a matter of allowing the education system to support that kind of experience for students, not of tweaking the content or structure, or redesigning the delivery mechanisms, so that some preconceived outcome will be injected into every

young person. We need to pay much more attention to the new models of knowledge creation, and the systems of learning, actually being invented by the kind of enterprises we are talking about.

Steve Bowbrick

I am on my third internet business since 1994. Two of them have failed, so I obviously qualify in some way! The education point is very important. I think there is a disconnection in this country between creativity and value creation. People who are creative don't consider themselves as creating value, or vice versa. On a related topic, those of us in these industries are not helping towards building the role models, because so often, when we are heard, we come across as whingeing.

On funding, my experience in 1999 is that there is a real hunger to fund ideas, especially in my sector, the internet. The problem is that speed is so vital, but you almost always leave the first meeting with a terribly leaden weight on your shoulders. Faced with a six to eighteen month process full of hurdles and - nightmare! - due diligence, it's as though the whole thing was going to roll on for the rest of your life. Speed is absolutely vital, but it's more an industry issue than a Government issue. We need to boost our own readiness to move very quickly and perhaps set aside some of our worries about due diligence and so on.

The Spirit of Adventure

Danny Chapchal

CDT has been mentioned so many times, I felt I had to get up. I also

think we must stop being negative. First of all, there's an incredible amount of good in this country. I have lived and worked in the States, and in Australia, France and Germany, and I came back here. When I came back to take over CDT, I was running a subsidiary of Siemens, and most people thought I was absolutely insane. They started with "You've got a pension, you're made for life, you don't have to worry any more". I was also bored to death! CDT offered a challenge. It is a fantastic example of how to do it wrong to start with, but then get it right.

The two inventors were not in the company when I got there, so I brought them in and I am very proud of this. I then went to the shareholders and said, "We need some options for these guys." You know what I was told, "They have founder shares, surely that's enough". So I explained, "They get founder shares for being founders, they get options for helping me make something of this company." "Oh, no, no, no, they have founder shares!" Fortunately, I am a lucky person by nature and CDT has been a roller-coaster and it has been very successful. My Chairman, Lord Young, decided to go and ask for more options for me and he was told, and I quote, "If we'd ever thought it would be worth that much, we wouldn't have given him that many options." Now in the States they actually start with, "You'll get 5% if it gets to \$50m and you'll get 10% if it gets to \$100m." So we do have a kind of 'profit is a dirty word' attitude here which we need to get out of. But change is happening and I think we have got to stop being negative. Yes, risk was a dirty word, and failure was a dirty word and profit was a dirty word, but we are getting an awful lot better.

As one of the oldest people here, I can honestly say I have lived through

it. I went to live in the States in the 70s because I thought this country was dead and buried, finished. But I did come back of my own accord. I have started two companies, and I have sold two companies very successfully, and yes, there is a little bit of people saying, “You did it for the money, you got out, etc. etc.” But if you look at the current state of CDT, I have spent the last year talking about refinancing, not because it has taken a year to do but because – I hate to say this – the American venture capitalists have been fighting over us. You will read in the papers in the next few days about a round of financing at a valuation that is inconceivable amongst venture capitalists here. If I do have a criticism about England, it is that venture capital is not about venture capital in this country, it is about capital, not about venture. Venture or adventure is a word they have never heard of, with the possible exception of Hermann Hauser, of course, because he is sitting next to me.

Releasing Ambition

Peter Johnson

There is a tremendous dilemma in the UK when it comes to ambition. You can put forward business plans and seek large amounts of funding, but you are very conscious of the need to bridge the credibility gap. If you ask for what you are really sure you can deliver, you may get it, but if it then turns out to be less than you could use, you are trapped into a situation where you cannot develop as fast as you would like.

I also want to mention some recent Harvard research. It shows that the constraints on the development of new businesses are much more to do

with a lack of entrepreneurs than with financial incentives, government policy, etc. So how do we get more entrepreneurs? There are educational changes we can make, but I wonder if there isn't some sort of market failure, because there is no obvious way to match would-be knowledge entrepreneurs with opportunities – no systematic clearing-house or route to find those opportunities. I have spoken to quite a few people over the years who would like to get into this kind of field, but who find the route is just not straightforward. They tend to go and talk to venture capital firms, or to industry specialists, but they have generic skills which are hard to match up to a specific set of industry circumstances and constraints.

Peter Molyneux

I'm an entrepreneur who started up a computer games software house back in the early 1990s and took it to a certain size, around the £10m to £20m turnover, and found it very hard to go to the next level. What we need in Britain are the entrepreneurs who can take small companies, which we are very good at creating, to the next level. That's what they do in America, they think big. We need an education system that teaches people that it is not a frightening thing to take a company from £10m turnover to £40m or £100m. In the end, we sold our company to an American company who have taken it from 40 to 200 employees. In the computer games industry, that has happened time and time again in Britain. All those opportunities have been lost. We need to help the entrepreneurs who have started the companies towards thinking really big, not leave it just up to companies to seek the next level.

Intellectual Property

Clive Bradley CBE

In my private capacity I have been trying to raise venture capital for a start-up operation for electronic books, on an international basis. The automatic response I get is, “Don’t come to me for start-up money, but can you point your way to acquisitions or mergers or management buy-outs we can finance, so that we can acquire the successful people who are trying to exit from their particular operation?”

But my main point, particularly addressed to Dr Howells, is to ask for more support on intellectual property. The EU and the government are constantly telling us that private sector investment is essential for the knowledge economy to take off – and the intellectual property system is essential to justify that private investment. Copyrights and patents are not a restriction on what people can do (as so often they are seen to be), they are the trading system in which we operate. This is high on the agenda at the moment in the EU and UK. The public sector and the entrepreneurs are debating just how permissive the system should be. The telecoms industries, for example, are looking for the knowledge economy to be extremely permissive. A lot of industry negotiations are going on, but it will take enormous help from the government and from the EU to make the intellectual property system work internationally in a way that encourages both innovation and investment, including external investment.

A Modern Approach to Public Accountability

Professor Sue Richards

One thing we are hearing from the discussion today is the impediments imposed on entrepreneurship by our institutional framework. David Puttnam mentioned the accountability system. We could fall into the trap – which I think the last government fell into – of ignoring the institutional side of accountability and policy-making and just driving hard for developing the industry. But this would neglect the extent to which the institutional framework creates the public culture that is one of the sources of the problems we have been talking about. I have been quite disappointed in the last two years at the limited modernising of the processes of public accountability. This has been neglected as an issue, pushed to one side and regarded as not that important, but it seems to me vitally important.

We have a public accountability system that delivers the values that were in place when it was developed and designed. So its values are about avoiding corruption, about checking how inputs are used. We don't have a system that's about the delivery of outcomes. We badly need it if we are going to achieve outcome-based policies in the entrepreneurship area that has been discussed today. So I would like to argue strongly, not for less public accountability, but for a modern public accountability that seeks and searches out and explores the outcomes we are trying to achieve.

Social Responsibility or Work as Fun: A Clash of Cultures?

Polly Toynbee

I fear I am going to say exactly what you might expect me to say, coming from the Guardian and a non-business background. I feel I have been to a lot of meetings like this where people talk about the lack of an entrepreneurial culture in this country, as Edwin did so well, without any sense of the quid pro quo of what you might do to foster that culture.

We live, right across Europe, in social democratic nations, where a sense of social responsibility is part of the culture. When you hear someone like Edwin saying he is worried about the Working Time Directive, it is hardly draconian: 48 hours unless you want to work more than 48 hours. Or maternity pay extended to the very low paid women who don't get it now. These are not appalling draconian things, they are something that a civilised society ought be able to accommodate as well as the spirit of entrepreneurialism. You say how terrible it is to pay 40% tax: well, anyone who is remotely successful in this country pays 40% tax. It's a lot lower than in many other countries. Again, it's not appalling or dreadful. If you want to create a culture where people feel that business is also a part of the society in which we all live, it isn't helped by saying rather rebarbative things of that sort. It's not inclusive and it's not working with the grain of the country we live in. These things do have to work together; the culture comes from both sides, not just from one side.

Response: Edwin Moses

Yes, I guess it is what we might expect you to say! You say that things like the Working Time Directive and maternity issues are no problem, but try working in a small company where you actually have to follow through those directives, communicate their meaning to your staff and follow the letter of the law. Saying it's a good thing and protects employees is one thing, but to actually work with it and manage it in a small organisation is something quite different. It is a burden placed upon us and forces us to hire extra people just to manage the bureaucracy.

You talked about 40% tax rates. What we are saying is mainly about capital gains. You are taking a risk when you make the initial investment as a start-up company. If it all goes south and you lose that money, there is no protection at all. However if you are successful, 40% is taxed from you. Someone gave the comparison with the United States: what we are saying is not a foolish "Don't let's pay tax", but the US is a very good example of where, if you lower the CGT rate, the government actually gathers more taxes and you might encourage more people to take a risk. I'm not saying, "Do away with taxes", I'm not saying, "Do away with employment laws", I'm saying be careful with the burdens you place on people if they have a negative impact on developing an entrepreneurial approach.

A general point we haven't heard this morning is the fun we have in entrepreneurial companies. That's different to being a Siemens' person. One of the things we sell to employees as they come in the door and we try to attract them to our company is not just the salary and all the rest of it, but that we laugh more. We expect them to laugh more in our company than they would in their previous company. Now that sounds

very glib, but you hear laughing a lot in the company, and that's not because they are not professional, it's because we can have a good time working. It relates back to my previous point, that in our companies it's not bosses and workers, it's not a place you go to serve out the eight hours a day until you rush out the door at 5 o'clock and escape. It's a place where you enjoy what you do, where you get tremendous satisfaction from what you do, in the same way as you do from anything you do outside of work. It's the reason we rail against some of the regulations imposed upon us, because these derive from attitudes that come from 20 to 50 years ago. These are not the cultures and the feelings that exist within the sort of companies we work in. I think people like you might do well to come and be in our company for a while to get a feeling of what it's like.

Wilf Stevenson

Polly Toynbee will be on the next train down to see you, but before she sets off, can I also press you about the trade-off between the pleasure, the laughter, you are able to get from your work and the responsibility to stand up and be counted and to say OK, these may be difficult regulations, but in the round, we can understand the general culture points they are making.

Edwin Moses

I think we are saying we would like more responsibility to be given to employers. I think that we are very sincere in our approach, and that we don't need government directives to stop us taking advantage of our employees. We want to work with our employees. The only way the knowledge-based industries will succeed is by respecting the people they work with, not having a 'them and us' situation. If we don't work like that, we are simply not successful.

Sue Birley

Hooray! I've heard a very important word, which is 'fun'. It's hard starting businesses, but if it's not fun, what's the point of doing it?

Five years ago in Imperial College, I was depressed. The general view was that you can't trust a bunch of academics to get involved in this business world. Then we had an entrepreneurial vice-chancellor and he said, "Well, why can't we trust a bunch of academics to do this, why can't we help them to get their intellectual property into the market place?" And once he said that, once he opened the floodgates, they came flooding through, and we now have more members of faculty, more students, more doctoral students coming forward with ideas than we can almost manage, and that really is exciting.

Of course there are issues. The issue of intellectual property is very, very real for scientists. Scientists understand risk. They understand failure – that's what they do every day, don't they? Experiments fail every single day. They understand that. They want to get their ideas through into the market place. They are very happy to be helped. They are very happy to work in teams. But there is an issue of intellectual property. Who owns it? How do we manage it? What do we do with a project that's ten years old, that's had twenty or thirty people involved in it, many of whom have left? What do we do with research councils or research institutes who say, "And by the way, attached to your grant these days we require that we get some of the equity from the business if you float it." Those are very real issues. Not 'problems', because we can deal with them. But they are very real issues that we have to think through and deal with if we are going to start some of the very exciting science-based opportunities that we have. It is exciting and, by the way, it's not just the young. Some of the people who are starting some of the big exciting ventures in Imperial have grey hair!