

Technology: A world to scale

By Peter Marsh

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Raising the game: UK companies such as Realtime Worlds have scored hits with games such as 'Crackdown', above, in which crimebusters enjoy special abilities that allow them to scale buildings or turn ordinary cars into supervehicles. Back in the real world the sector is struggling to convert creative prowess into big business

Inside the global development centre in Dundee of Realtime Worlds, which features the table-soccer machine obligatory at small creative technology companies, 300 mainly youthful software writers work on what they hope will be their next blockbuster computer game.

The eight-year-old Scottish company is a rising star in what some believe could be an important area of technology in the coming decade. A past success for its software team was *Grand Theft Auto*, a pioneering all-action epic game in which players take on the roles of gangsters. It has sold 50m copies.

Realtime Worlds is among a clutch of small, aspiring UK technology companies, many of them clustered around high-tech centres such as Cambridge, that seem to hold promise in a world where a country's economic success is seen as being closely linked to the exploitation of new ideas.

Methodology: Country comparison of technology sectors

But in an implicit comment on the UK's strengths and weaknesses in technology, the company has recently moved the centre of its commercial and sales operations to Boulder, Colorado.

"In Britain we're great at the creative end [of new technology]. But in terms of converting this into serious amounts of revenues, it appears that people in the US are a lot better than us," says Colin Macdonald, the Realtime executive in charge of the Dundee centre.

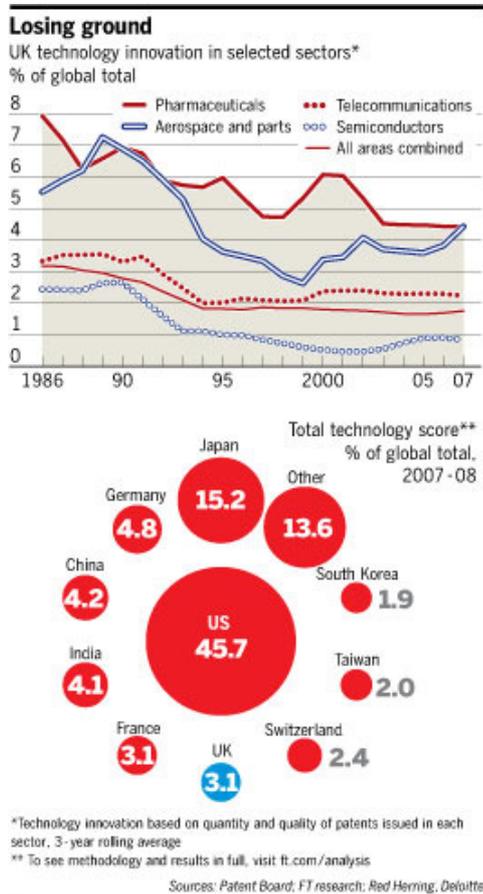
The failing perceived by Mr Macdonald has long been a cause of concern in the UK.

The country has won more than 100 Nobel science prizes, beating every nation apart from the US. British inventors have been behind barn-storming inventions from computers and fibre-optic cable to body scanners and carbon reinforced plastic. However, when it comes to maximising commercial rewards, in these and many other cases, they have been exploited primarily overseas. Of the world's 162 biggest technology companies, only four are in the UK, according to Financial Times analysis.

Mr Macdonald's remark also mirrors the debate in leading economies including the US, Japan, and Germany about their ability to exploit innovative technology, both through new businesses and existing ones.

Interest in trying to boost employment and wealth generation from new technologies is hardly novel. The efforts have **assumed heightened importance**, however, amid the need to find ways to revive a recession-hit global economy. Another factor has been worries in many developed countries about the challenges posed by emerging economies such as China and **India in new technologies**.

Recognising some of the problems, Lord Mandelson, the UK business secretary, has in recent months set out a series of programmes to try to stimulate new businesses and **strengthen existing ones** in fields such as **nuclear engineering**, plastic electronics and new materials. "Our 21st century economic growth needs to be built on innovation at the knowledge frontier," he said in a speech this month.



Lord Mandelson acknowledges the appeal of "[putting] the clock back" on the country's technology sector, skewed towards small and promising companies but lacking big ones, to the era of industrial and technology giants such as now defunct GEC in electrical goods, ICL in computing and ICI in chemicals. But he adds: "What matters for companies is not so much their size but capability. There is no reason why the existing stock of small UK technology companies cannot expand into large players."

In the case of the UK, central to the discussion is a healthy cadre of technology start-ups, which concentrate on the early development of ideas in fields from electronics to pharmaceuticals. The country also has a good stock of academic expertise in science and technology, as illustrated by the leading positions of science departments at universities such as Oxford, Cambridge and London.

The cluster of science-based companies around Cambridge – one of the world's densest concentrations of such businesses – is especially noteworthy. According to a study by the university's Institute for Manufacturing, the leading 1,000 companies in the city in 2008 registered combined sales of £4.3bn, making profits of £337m and employing 30,000 people. Even in those cases where the businesses have been bought by foreign companies, they invariably retain a strong development operation in Cambridge to take advantage of the expertise of UK scientists and engineers, points out Elizabeth Garnsey, a technology expert at the institute.

But for all these positive points, many observers are worried by the indications of UK weaknesses. Sir William Castell, chairman of the Wellcome Trust, a big funder of biosciences research, says Britain must do more to translate its efforts at the small-scale and creative end of technology disciplines into tangible wealth. Sir William, also a former senior executive at

General Electric of the US, adds: "Britain accounts for 3 per cent of global GDP and it's likely to go down to 1 per cent unless we do more to maximise the commercial spin-offs from science and technology."

John Fisher, a managing director of San Francisco venture capital group Draper Fisher Jurvetson, says: "Britain has got a good entrepreneurial culture and is the best place in Europe to find new technology businesses" but "the dearth of large [technology] businesses in the UK is a handicap".

According to Francis Narin, adviser to US innovation consultancy The Patent Board, one way of assessing countries' innovation capabilities is to look at patent statistics that measure not just patent volumes but also how useful they are, as indicated by the number of times each patent is cited by other researchers publishing new patents. Data from The Patent Board show the UK is losing ground in most areas of technology, including pharmaceuticals, semiconductors and telecommunications.

ENDORISING THE FRENCH MODEL

Lord Mandelson is a changed man. While Britain's business secretary used to scorn many aspects of French industrial policy – which he once saw as a byword for state meddling and protectionism – he has become the champion of a more interventionist approach in the UK, writes George Parker.

The former European Union

The UK is by no means the only leading country to see its position in innovation slip as other nations – including not just China and India but also Taiwan and South Korea – catch up. However, Britain “needs to be worried” by evidence of a substantial relative failing, Mr Narin says; its score in a technology innovation ranking published by The Patent Board has fallen from 3.2 per cent in 1985 to 1.9 per cent in 2007.

According to FT analysis of countries’ overall technology strengths, using Patent Board data plus other figures related to the numbers of small and big technology companies, the UK’S “total technology score” for 2007-08 was 3.1, placing it in joint sixth position with France. But it is behind both China and India, as well as Japan and Germany, while the US is the clear leader, with a score of more than 45.

The relative lack of large technology businesses in Britain is not just a problem in its own right but also creates difficulties for smaller companies in the sector, says David Halstead of Deloitte, the accountancy firm. He says that if there were more large UK companies, they would form partnerships or hand out contracts to the small fry, aiding their development. “Ideally we need an ecosystem where we have a good mix of both small and big companies,” he says.

Explanations for the relative dearth of big players start with basic facts of economics and geography: small technology companies in the UK, especially if they show signs of success, are likely to want to expand in the US, the biggest market for many of their products.

Alastair Mitchell, chief executive of Huddle, a London-based company that uses the internet to help businesses collaborate using “virtual work spaces”, says: “The UK is a good place to start technology businesses. But inevitably the market in Britain isn’t big enough for them. When they look outside the UK in expansion efforts, they inevitably start with the US – which is one reason they end up moving to the US or being acquired by an American company.”

Indeed, of the 1,700 companies in the Cambridge tech cluster, many of the most promising have been bought by US groups. The acquisition value of 17 businesses based in the city bought by mainly US companies in the past 10 years totals £4.2bn.

Lack of ambition is another reason many small UK companies fail to reach the scale that some believe is achievable, according to Kate Craig-Wood, managing director of Memset, a computer networking business in Surrey, south-east England. “A lot of companies in fields such as mine are happy to reach annual sales of about £5m, and then sell out. I am about the only person I know who wants to be the next Bill Gates,” she says.

Arnoud De Meyer, director of Cambridge university’s Judge Business School, says he is disappointed not to see “more persistence and follow-through” in UK companies, which would enable them to increase sales and take on more employees rather than remain stuck as small businesses.

Although these points of view seem gloomy, a more upbeat perspective is also possible. Tim Barrows, general partner in Matrix, a Massachusetts venture capital group, says the UK should “celebrate” the fact that it has a lot of small tech businesses, on the grounds that they have positive economic value in their own right.

Patrick Chung of New Enterprise Associates, a California venture capital company, says he has been “very impressed” by the numbers of small UK businesses in the computing, media and internet-based collaboration fields – which in many cases are “teaching companies in other countries about new ways of using technology”.

Robert Salomon, an expert on innovation at New York University’s Stern School of Business agrees that the UK’s strength in small tech-based companies is an asset that should not be undervalued. “I think the UK is doing just fine when it comes to deriving value from its basic science,” he says.

In Dundee, the young creative artists at Realtime Worlds enjoy decent incomes. A good number may find themselves sufficiently enthused to start businesses of their own – and if some of these make it big on the global stage, so much the better.

Either way, as Britain contemplates its economic role in the 21st century, the existence of companies such as Realtime Worlds – however they end up – offers grounds for hope.

trade commissioner, who spent four years in Brussels promoting the merits of unfettered markets, even went so far this week as to praise Paris for the way it has saved or nurtured its high-tech industrial giants.

Lord Mandelson’s approach has been partly informed by the recent crash and his recognition that Britain needs “less financial engineering and more real engineering” as it tries to rebuild its economic base.

That means he wants to foster a climate where companies in sectors such as green technology, pharmaceuticals and advanced engineering can be given a helping hand by government, even at a time of depleted public coffers.

“We need to rethink the frameworks governments put in place within which the private sector is free to take its decisions,” he announced in November 2008, setting out his new industrial strategy.

The business secretary wants to avoid the impression that the Labour government wants to turn back the clock to an era when the party tried to underpin industrial champions with state support, producing creaking companies like British Leyland, the now defunct car manufacturer.

Gordon Brown, prime minister, has explained the new policy thus: “We don’t want to be picking winners, which is so often picking losers. But we don’t want a *laissez faire* approach.”

This week Lord Mandelson singled out French state support for [Alstom](#), the energy company, and [Areva](#), the nuclear generator, as examples of [how public support can help produce successful cutting-edge companies](#).

The chronic shortage of public funds – Lord Mandelson’s department is facing cuts of 15 per cent or more – places obvious constraints on the extent to which he can realise his ambition, which is broadly shared by the Conservative opposition.

So too do the restraints imposed by EU state aid rules, which were relaxed during the financial crisis but are in the process of being tightened up again. Although start-up companies, green technology and other areas are already subject to “carve outs” from the state aid regime, Lord Mandelson this week urged a review of the Brussels rules.

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