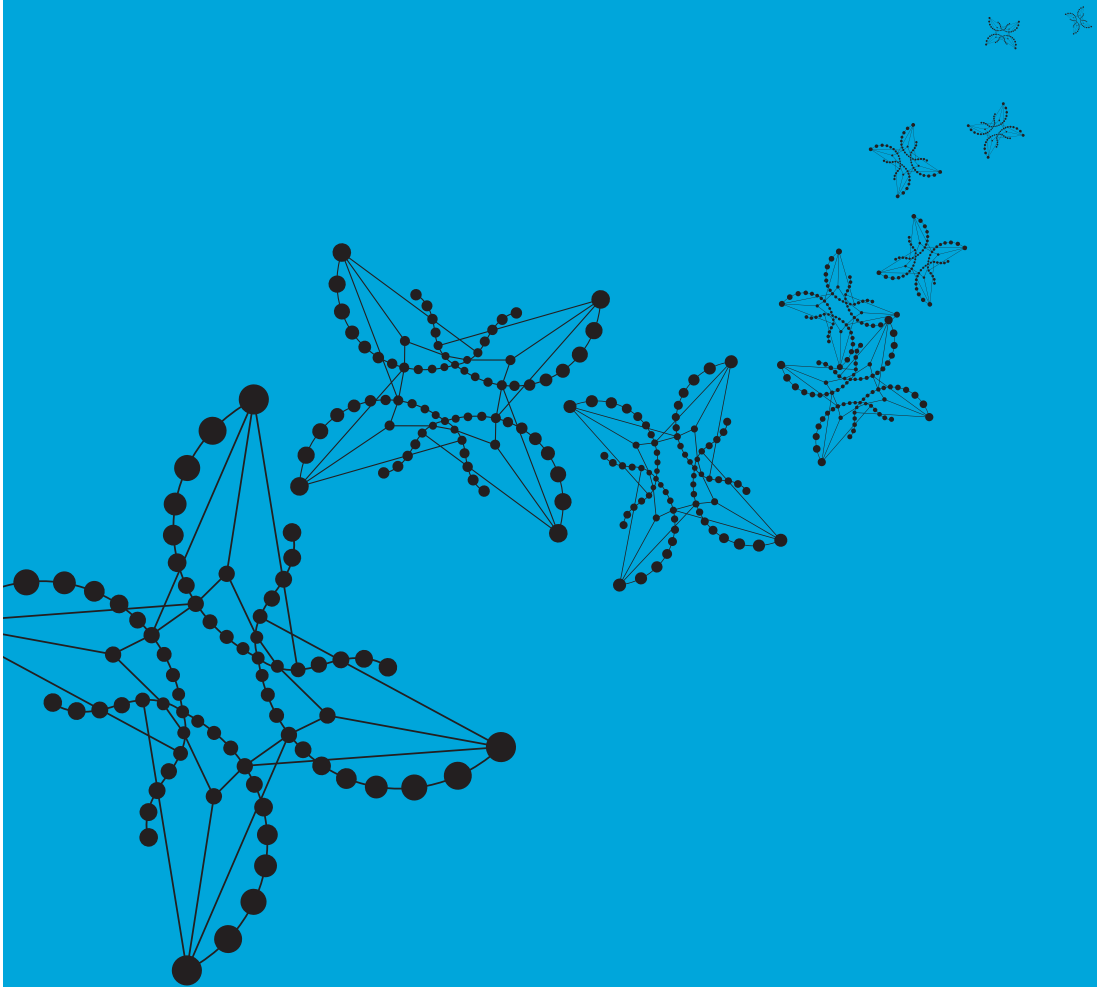


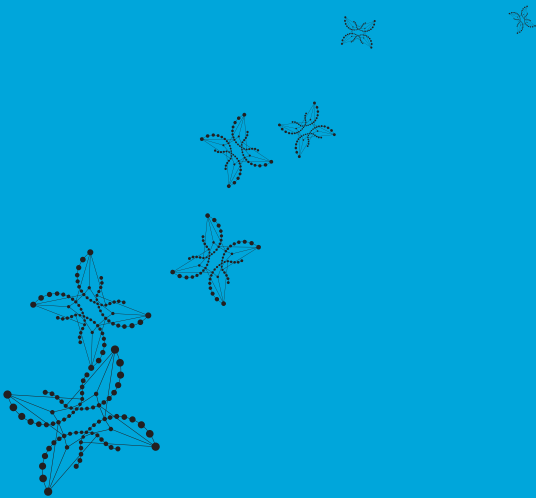
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NESTA Making
Innovation
Flourish

The Ten Habits of Mass Innovation

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NESTA is the National Endowment for Science, Technology and the Arts. Our aim is to transform the UK's capacity for innovation. We invest in early stage companies, inform innovation policy and encourage a culture that helps innovation to flourish.

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What is the UK's One Liner?

Sitting in a plush hotel lobby in downtown Beijing, Li Gong, head of Microsoft's internet business in China, an alumni of Sheffield University, put the UK's national challenge this way: "China is the world's fastest growing economy. The US is the home of high-tech and Hollywood. What is the UK's one line pitch to the world?"

The following day a dispiriting answer was delivered by a group of students recently graduated from China's most prestigious university, Tsinghua, in an area of Beijing which alone hosts 50 universities (altogether the UK has 120) that together graduate 100,000 scientists and engineers each year. They revealed that the country that produced Newton and Shakespeare, Darwin and Dickens, the Beatles and Britart was largely known for Premiership football and rain, island isolationism and Mr Bean.

Those snapshots from a recent visit to China¹ reveal the way the world is shifting: not just goods and services but ideas and innovation are coming from many more places at low cost and high quality. Being vague about what the UK stands for is a luxury the country can ill afford. This Provocation argues that the answer must be to position ourselves as a society of mass innovation, a place where creativity and innovation are everyday activities, practised in many settings, by many people. Innovation as not just

something done *for* the masses but *by* the masses.

Our economic prosperity and society's well-being will not depend on mass manufacturing, military might, natural resources, cheap labour or financial capital. Our future will turn on how we develop, attract, retain and mobilise creativity from all sources within our society and apply creativity systematically in all walks of life, from health and education, to arts and business, science and industry.

People will turn to us not just for our fast growing creative industries – design, fashion, music and advertising – but for our outlook and values – tolerant, flexible, and irreverent – which make us good collaborators, adept problem solvers, open to ideas and willing to think afresh.

From the 19th into the 20th century, the UK became a society built around industrial production: mass production for mass consumption. In the century to come, we will have to become a society of mass innovation and especially in services. That, of course, poses a huge challenge to the way in which we think about innovation: who does it, where it comes from and how it is organised. As a result, we need to think about innovation policy (what it is, who it affects, where it is conceived) in a completely new way.

The Innovation Pipeline

Most policy thinking about innovation is still bedevilled by a closed, 'pipeline' model of innovation drawn from manufacturing. This pipeline model has several components.² Ideas get created in special places by special people: the boffins in the lab, the designers in their studio. Those ideas are embedded in physical products, which are then engineered, manufactured and distributed to consumers waiting at the other end of the pipeline. The implications of this pipeline view are that innovation starts with research and development and is focused on turning science and technology into tangible products. Innovation is a series of linked but discrete events – from invention through to eventual use – along a pipeline that connects inventors to users. The main measures of innovative activity are inputs – amounts spent on R&D, numbers of scientists employed – and formal outputs: scientific papers and patents. Innovation is made real when new scientific and technical knowledge is embedded in tangible manufactured products.

The pipeline account of innovation is then used by policymakers to identify weaknesses which public policy sets out to correct. The reservoir of research has been too shallow to feed the pipeline. In the 1980s too little was invested in public R&D. So in the 1990s the government pumped substantially more funding into

the science base. The pipeline itself has suffered from a number of bottlenecks, particularly where ideas are transferred from academia into commerce. The UK is good at inventing, poor at exploiting, goes the lament. Public policy is designed to correct these weaknesses through direct public funding of R&D, tax credits for R&D in some private companies, measures to bring business and universities closer together of the kind recommended in the Lambert review.³

That is all well and good, but there are two limitations to this pipeline view which will make it less and less useful a way to think about innovation policy. First, because it is based on innovation in manufacturing it leaves a lot out. There is little room in this account for the financial and service innovation that is at the heart of the City of London as a centre for financial services; our creative industries such as advertising and music; and vital social and public innovation, from NHS Direct and the BBC to the Open University. Nor does the pure pipeline view explain how entirely new domains of economic activity – new leisure sports like mountain biking or mobile communications – come into being through a combination of new technologies, consumer innovation and creative regulation. Innovation rarely rests on technology alone. Mountain biking, for example, involves not just new bikes but accessories, clubs, magazines and also new places to cycle, catered for by

specialist tour operators. The mountain bike is not just a physical innovation: it has helped to create a new leisure and lifestyle economy. New technologies are only brought to life when they become a part of new social practices.⁴

That brings in the second problem. Innovation rarely proceeds down an orderly pipeline from boffin to consumer. Innovation often involves changes to business organisation and consumer behaviour as much as science and technology. Many innovative organisations in the UK have no formal R&D capability: they innovate on the job, often through interaction with clients and markets. Often innovation is highly networked and interactive, involving a wide range of players, not least the ultimate consumers of products and services.

The pipeline view is too narrow to account for the myriad sources of innovation that feed UK society. We need a model of innovation policy designed for the 80 per cent of our economy which is in services, software, design and cultural products. And we need one that recognises that innovation will come from many more sources. We need an innovation policy for the rip, mix, burn generation that throngs to MySpace and sets up blogs, adds content and character to the computer games it plays and uses Garage Band and Sibelius to create its own music. The YouTube tribe does not just want to listen and watch culture wherever and whenever it wants; it also wants to create and distribute it. The Google generation increasingly seeks out knowledge and

ideas from wherever they come. The generation that grew up with MSN Messenger and social networking, is instinctively at home working creatively and collaboratively together in teams.

The Foreign Legion

No area of public policymaking has been more open to influences from abroad than innovation policy. That also has its limitations. In the 1980s policy-makers looked to Germany and Japan for lessons in high skills, productivity and quality.

The German economy, and in particular its most advanced regions such as Baden-Wurttemberg, seemed to offer a model of high quality production based on broadly spread technical skills, with large and medium sized companies working closely together, against the backdrop of long term relationships with banks. Bodies such as the Fraunhofer Institute allowed companies to transfer and share costs of learning about new technologies, feeding a constant process of upgrading. In the 1990s, however, the German model, weighed down by the burden of unification, became synonymous with slow growth and limited innovation. Japanese manufacturers soon became even more admired than their German counterparts, with high quality, just-in-time production, rapid product development and mass customisation, built on flexible networks of suppliers and life-time employment within the firm. Miti, the Japanese industrial development ministry, seemed to some to have magical powers to make long-term investment in innovation pay off. For a period in the 1980s Michael Heseltine, the former Tory industry secretary, toyed with the idea of a British Miti. The Japanese economy's

collapse into a long slough of low growth in the 1990s took the shine off all that, however.

In the 1990s, innovation policy became increasingly regionally focused. Policymakers sought to learn from successful regions in Europe, such as the highly collaborative networks of small companies that seemed to sustain regions like Italy's Emilia Romagna. But this regional focus was chiefly propelled by envy of the irresistible rise of Silicon Valley.

The Silicon Valley model, documented most thoughtfully by Annalee Saxenian,⁵ is based on networks of entrepreneurial firms; high velocity labour markets in which people change jobs frequently carrying ideas with them that then cross-pollinate; high levels of immigration with very large numbers of companies founded by Indian or Chinese entrepreneurs; a rich stock of venture capital funds and skills; the knowledge base of nearby universities, particularly Stanford and Berkeley. In the 1990s, places around the world started re-branding themselves as 'Silicon something' to mark their innovative ambitions: Silicon alleys, fens and wadis proliferated. However just as Silicon Valley was rising so was an alternative (European) model of the new economy – in Finland.

At the start of the 1990s, with the collapse of the Soviet Union, Finland

suffered one of the most severe economic recessions of any western democracy since 1945. Yet it rebounded, largely on the back of the success of Nokia and the mobile phone industry to become one of the fastest growing and most innovative societies in Europe. Finland's success stemmed from very different sources from Silicon Valley's.⁶ The foundations were laid in 1964 with the creation of the cross party Science and Technology Council which helped to sustain public funding for R&D. As a result, Finland's networked economy is not orchestrated by private venture capitalists and entrepreneurs: it revolves around public institutions such as Sitra and Tekes which bring industry and academia together with large companies like Nokia. With Sweden and Denmark also doing well, the Scandinavian innovation model was in fashion across Europe by 2004.

What stands out from this quick tour of the countries and regions that have gone in and out of fashion as models for innovation is just how difficult it is to borrow from other places. From Germany and Japan, to Silicon Valley and Finland, institutions have co-evolved together - banking and venture capital with entrepreneurship and labour markets, the role of technical universities and supplier networks. As a result it is very difficult to identify an easily separable ingredient that might be transplanted into the UK economy. Moreover many of these are regional innovation models, ill-suited for an entire country: Finland's population is five million, a twelfth of the UK's. And the lessons to be learned are bewilderingly varied: Silicon Valley's success rests

on high levels of skills immigration, Finland's on low immigration and ethnic homogeneity; wealth and income in Silicon Valley is highly unequal, in Finland it is very equal. The efforts to learn from Silicon Valley mean, moreover, that around the world many governments are now pursuing remarkably similar policies - promote venture capital, build links between universities and small companies, especially in high tech industries, attract talent from abroad. It is an irony that innovation policy seems to be driven mainly by imitation. Policymakers around the world are so busy emulating Silicon Valley that they end up sounding exactly alike.

Most innovation involves borrowing ingredients and blending them together in new ways. We need that approach to policymaking as well: borrow and learn lessons from these models of innovation and then blend them together to create something distinctive and appropriate.

The UK needs a distinctive innovation model - one that answers Li Gong's question - suited for the modern service-based economy, which is open to trade but where basic skills are poorly distributed and some regions still carry a heavy burden from the restructuring of traditional manufacturing industries. To answer Li Gong's challenge we need a simple but ambitious goal. This Provocation argues that the goal should be for the UK to become a society of mass social, service and software innovation based on ten habits.

The Ten Habits of Mass Innovation

One

Invest in creating very widespread capabilities for innovation in public and social sectors as well as commercial.

Making the pipeline model work more effectively still matters. Investment in research and development in public and private centres of excellence, not least to tap into global flows of scientific knowledge, will still be vital, as will transferring this knowledge into commercial applications.

However, just as important will be a high general level of basic education, so that people from all backgrounds can be participants in innovation. Investing in widely spread tools for creativity – software that amplifies people’s creativity – will be vital. We need to encourage a wider culture of ‘citizen innovation’ in which many more people see themselves, if only in small ways, as potential contributors to innovation.

Innovation was an elite activity when most of society was occupied with producing goods and services. In the industrial economy the line between thinking and doing was sharply drawn. We cannot afford that in future.

For example, the fastest growing group in the population are those more than 65 years old. To be an innovative society we need to innovate new ways to age. Older people are breaking new ground:

finding ways to live healthily well into their 90s. They are living new kinds of lives. If we want more for our old age than to be stored in a residential home or stuck in front of the television with the remote control, then we need a new wave of cultural initiatives taken forward by local cultural entrepreneurs – a Creative Partnerships programme for older people, playgrounds for the elderly for example – especially in areas of pensioner poverty.

And we will need to innovate new ways to provide care for older people who do not want to be dependent but whose family may be in another part of the country. As the population ages, so more children in their middle age will take on the responsibility for caring for older parents. We need a wave of social innovation to make their task easier. Care and ageing is one the biggest challenges we face as a society. No boffin in the lab will innovate a solution. Real issues like ageing should be central to innovation policy.

Two

Innovative societies are good at mingling: they encourage people and ideas to find one another and combine creatively.

Innovation frequently comes from combining two existing ideas to create a new mix. That means creativity is often highly conversational and so innovative societies need to be populated with spaces, real and virtual, where people

mix, publish, talk and debate. Innovation often comes from looking sideways, to seek ideas in adjacent fields or disciplines which when abducted into your own domain might yield a new insight or combination.

This process of creative combination often relies on people who span different cultures and disciplines and spaces where ideas and people mingle. Older institutions like museums, galleries and libraries will still be vital to providing those shared experiences.

An innovative society needs strong public platforms in which ideas can be published, debated, tested and then taken up. Without such public platforms society becomes Balkanised, sectarian, and divided. A society can be highly diverse without that leading to creativity. Creativity comes from interaction and dialogue between different ideas not just from diversity alone.

That means innovation and creativity should be central to our policies on community, cohesion and immigration. Our society feels increasingly like a mosaic of identities and traditions. That makes our large cities exhilarating but insecure to be in; we worry about the values that bind us together. We cannot start to address these questions fruitfully without culture. Through the arts we retell stories that bind communities together, marking out the rhythms of life and the year, through shared experiences of festivals and celebrations. The arts should help the nation tell its increasingly complicated story to itself from *My*

Beautiful Laundrette to *Brick Lane* and *Londonstani*. The UK will be a creative nation only if it is a comfortable place to explore and combine cultural difference to create new hybrids in music, film and literature. That means more investment in culture in the areas where ethnic minority populations are expanding fastest, often a long way from established cultural institutions. We need common languages through which to explore differences creatively. That is why our policies on immigration and security will have such a huge bearing on our long-term capacity for innovation.

Three

Education systems designed for the innovation economy not the industrial economy.

Mass creativity will thrive in societies with education systems that are curiosity-led, create high levels of self-motivation and promote collaboration between learners. An inflexible, top down, standardised curriculum may be a good answer to the industrial economy's demand for punctual, literate, diligent workers capable of following rules and procedures. An innovation economy requires more than that.

The UK should be the best place in the world to grow up being creative. Children are intuitively imaginative and playful creators of stories, pictures, songs and dance. Yet that creative capacity is not developed in all of them through education. On the contrary the heavy regime of testing and accreditation,

especially in secondary schools, seems to drive it out of many of them.

Learning should develop every child's capacity for independent critical thinking and collaborative problem solving. Learning is more successful the more participative it is, allowing us to shape what we learn, communicate and explore. Learning has a lasting impact when it excites us to be curious: to go beyond answering the questions set for us and seek out questions that intrigue us. Where children are excited, motivated and inspired they are more likely to acquire new knowledge, skills and understanding.

Our current debates about education are all about the means: standards and testing, the creation of trust and specialist schools. Politicians need to dare to open up a debate about what education is for in a world in which tens of millions of Chinese and Indians will graduate from secondary school each year with a sound education in the basics, to be employed at a fifth of the cost of a comparable worker in this country.

The national curricula should be slimmed down to allow disciplined, purposeful and energetic creativity to be at the heart of what we offer in children's centres, primary and secondary education. Education needs to capture the creative imagination as much as *X Factor*. Every child should develop a creative portfolio that tells their story of their creative work, at school and beyond it. Schools themselves should be not just extended and rebuilt but rethought and remade for collaborative creativity. Schools are

factories for learning in an age when we need agility and self-motivation. Learning beyond the school, using new technologies and tools, will become as important as learning at school. Imagine an education system for the generation that grew up using eBay and Google, MySpace and Wikipedia: participative, personalised, collaborative, always available.

Creativity and innovation are not diversions from the main tasks of education: they must be the main task of education if the UK is to prosper. Information is everywhere; creativity is not.

Four

Mass innovation societies encourage ideas to be challenged and tested.

New ideas will only emerge if established elites associated with traditional ideas can be challenged and questioned. Highly consensual and inclusive societies in Asia and Europe often excel at sharing ideas and handing down techniques from teacher to pupil. But if there is no challenge to the status quo then consensus can fast become stasis and complacency. Innovation requires creative dissent.

'Challenger' ideas come from several different sources. Often they will be carried by rising social classes. A class-ridden, entrenched social structure will not be good for innovation. Social structures will breed innovation only if they are quite open to social mobility based on effort, ideas and

entrepreneurship. Immigrants bring new ideas to any society because of the cultural heritage they bring with them, but also because immigrants are often ignorant of established custom and practice. They do not necessarily play by the rules or follow custom and practice because they do not recognise them. People who are ignorant of established rules can think differently more easily. New ideas come from borrowing ideas from other places, looking abroad for inspiration. Creative cultures breed a sense of curiosity about the world, a desire to go and find out, rather than to retreat into apparent certainty.

Innovative societies will have a fluid and mobile social structure that encourages creativity. There is no single model but they will tend to be flat and non-hierarchical. That might come from being individualistic and highly socially mobile – the US model – or like Finland an egalitarian but no nonsense and democratic culture. Worst of all will be societies that are hierarchical, non-democratic and socially stagnant.

Many wealthy, ageing and conservative European societies seem content to retreat into their social, moral and intellectual certainties, living off their declining stock of cultural and intellectual capital. Vienna or Paris were among the most creative cities of the 19th and early 20th century. There is little sense of that now, in part because there seems little real curiosity about what the rest of the world has to offer. Confidence can quickly turn into closure and complacency. An everyday culture of democracy, debate

and dissent is essential for innovation. Societies that want widely spread innovation must tolerate a certain amount of mess and confusion. Creative cultures cannot be too orderly because they must encourage people to break the rules, in the name of creativity. Democracy and devolution, putting more people in charge of more of their lives, in the long run will be vital to mass innovation.

Five

Low barriers to entry make markets competitive and cultures creative.

When there are high barriers to entry into markets, competition is limited and innovation often restricted. Equally when cultures erect high barriers to entry, for example because culture is controlled by an elite, they can easily ossify and stagnate.

Open markets are vital to create spaces in which innovators thrive. Successful innovation is rarely a push activity that starts with a capability or technology that the entrepreneur then finds an application for. Far more often innovation starts with a problem that no one knows the answer to. The more opportunities there are, generated by open and competitive markets, the more likely it is that a society's innovative and entrepreneurial talents will be drawn out. If opportunities are few and far between then only the hardest or luckiest entrepreneurs will take them. If opportunities to create small and large organisations are widespread then entrepreneurship can become a mass activity.

In the past the assumption was that most big innovations would come from well-funded big companies, with big research budgets and the resources to translate ideas into products. Big companies, of course, remain vital sources of innovation. However it has become clear that in fast-moving industries, where technology is cheap and entry barriers low, innovation comes from small, often maverick companies that see opportunities big organisations overlook. Worse still, monopolists may have no incentive to innovate for fear of cannibalising their existing markets. Monopolists usually want to stifle disruptive innovation at all costs. Public policy should encourage disruptive, low-cost innovators in all fields. That means keeping markets open for small players to enter. In the past the mainstream – big corporations – used to define what were fringe and marginal activities. Now increasingly disruptive ideas start in the margins, among passionate Pro Am innovators or small companies. Ideas are moving from the margins – YouTube, MySpace, Wikipedia – to the mainstream faster than ever.

This is an area of British strength. We are better at regulating for innovation than many other European countries. The City of London for example rests on sound regulation which allows constant innovation within a solid framework of trust and accountability. Our open approach to stem cell research has enabled our science to be at the global cutting edge. We have had more open utility markets than many other European countries for longer. Relatively liberal

approaches to planning and licensing have had an impact on cultural sectors such as live music and performing arts. Across the board then the UK seems to be developing a capacity to regulate for innovation, to encourage emerging ideas and innovation. The pipeline view is that innovation starts with R&D at the base of the pipeline. But the pipeline could be turned on its head: market regulation kick starts innovation by opening up new spaces for innovators.

Six

Innovative societies are good at turning ideas into action.

The gap between thinking and doing needs to be narrowed. That does not mean an innovation society is anti-intellectual or has little time for people who think. In Finland for example there is a healthy respect for ideas and the people who pursue them. But Finland is also a deeply practical place. Intellectual endeavour is not just a talking shop. The people who are held in the highest regard are those that can bridge thought and action, turning ideas into products, services, organisations, programmes.

Practicality does not necessarily mean commerce. A purely commercial culture, which is strong on buying, selling, trading, will not necessarily be innovative unless it engages with ideas and intangibles. In Singapore, for example, the Economic Development Board says it is often difficult to persuade the best students to do a further degree because they cannot see the benefits of long-term study

compared with getting a job. Innovation will not take off unless people value intangible assets, mainly ideas, that might take on a commercial value later in their life.

If ideas are increasingly everywhere then having a good idea on its own will rarely be enough for a business to be successful. What is critical is how ideas are developed, applied and executed, turned into action. Those skills – shaping ideas and making them real – are really vital. Often our accounts of innovation lionise the original inventor, the architect of the original idea, at the expense of those who make it happen. We focus on the architects – Norman Foster, Richard Rodgers and Zaha Hadid – at the expense of the engineers – the likes of Ove Arup – who translate their ideas into reality. We need both.

The UK must be the best place in the world to take an idea and convert it into reality, to make a living from creativity and innovation. Entrepreneurship, in small and large ways, from young high tech entrepreneurs to families creating a community centre on an estate, must become a national pastime. Not something just for extraordinary risk-takers who become rich in the process, but something everyone can imagine doing even if only in very small ways.

Seven

Innovation is inescapably a public-private undertaking: public platforms often create the basis for a mass of private innovation.

We need a systematic way for innovators to take risks at all levels of activity, from small-scale angel investing through to high growth businesses. Most of the glamour goes to private sector venture capitalists in the mould of Silicon Valley. But what happens below that in a mass of small-scale angel investing is equally critical.

Private sector innovation often rests on a platform of public knowledge and research. Both have to be funded: getting the right mix of public and private funding is thus critical. Private venture capitalists are generally unwilling, knowingly at least, to fund major projects with low commercial returns but big public spill-overs. Venture capitalists may salivate over Google and its ilk, but the Internet started with heavy public funding. Moreover the US venture capital model is not the norm everywhere: public sector venture capitalists such as ITRI in Taiwan, the EDB in Singapore and Sitra in Finland, have played a more important role in leading innovation than their private sector counterparts. Public sector investors can take risks the private sector will not contemplate. That is no guarantee those risky investments will pay off. But without ambitious public investment a nation may not create the shared platforms that enable future innovation.

The way that resources are mobilised for innovation is crucially affected by the intellectual property regime. The traditional account is that if we want more innovation we have to provide the makers of products with more incentives to innovate. Manufacturers and service

providers will only invest in innovation if they stand to make a profit from their new offerings. But that means they must be able to protect their creations against imitators. The stronger the intellectual property protection – in the form of patents, copyrights or trademarks – the greater the incentive to innovate and so the more investment in innovation there should be.

Yet innovation also stems from sharing ideas, often within tight knit communities. Open source approaches to innovation, drawing on traditions of peer review from science, will become increasingly important in future. Indeed complex scientific problems – for example to do with climate change or epidemics – are likely to be solved only through intense and open collaboration between many participants. No single innovator will have all the answers. (That was how the genetics of the SARS virus were unravelled.) Open source collaboration provides an alternative way to mobilise resources for innovation.

We need an intellectual property regime that explicitly recognises that as much innovation stems from openly sharing knowledge as it comes from inventors commercialising their inventions.

The UK should lead the world in creating new generations of public goods to support innovation by backing open source models of innovation.⁷ Many of the platforms for participation in digital culture embody public and collaborative values: Wikipedia, the online encyclopaedia is a prime example.

Collaborations like Wikipedia are creating a new kind of cultural commons: spaces where content can be shared, drawn upon, distributed for free. Open source style innovation based on shared platforms could have huge benefits in the developing world by allowing the costs of innovation to be shared.

Eight

Innovation needs to be about how products are used as well as how they are invented.

Too often innovation policy has been focused on the earliest stages of the process: the creation of new ideas and technologies.⁸ The biggest long-term gains from any technology come from its innovation and adaptation in use. That is when a technology becomes embedded in everyday life – social habits, organisations, and trading patterns change. Most histories of innovation and much of policy focuses on developing technologies, getting to them first, making the big breakthrough. However that often means insufficient attention is paid to the less glamorous but even more important aspects of diffusion and adaptation. Water mills were improved and used for at least sixty years after the invention of the steam engine, during which period steam power had a marginal impact on agricultural productivity. In our own time the Philippines has become the most advanced society in the world in the use of mobile phones, particularly the use of SMS messaging for payments and other services, mainly with standard cheap handsets and second generation

mobile networks. None of the mass innovation in Philippine mobile services has required fancy 3G technology. One of the most innovative public agencies in the world – Singapore’s National Library Board – which has overseen the dramatic expansion of the country’s libraries has an apt motto for all innovators: ‘one big idea, many iterations.’ Take a good idea, try it out in different settings and see how it is taken up, modified and adapted. Effective innovation thrives on innovation in use as much as invention.

Periods of rapid invention, when lots of technology is being created, rarely correspond with periods of rapid productivity growth. That usually comes much later – often thirty or forty years later – and because consumers in their millions have helped one another to work out what a technology is for and how we should organise ourselves to make best use of it. Innovation policy tends to focus on the supply-side: the creation of new breakthrough technologies. A balanced policy would also focus on how technologies are adapted in use: that is where most productivity gains come from.

Nine

That means consumers and markets need to be as much part of innovation policy as scientists and laboratories.

Manufacturers and service providers do not always have an incentive to innovate, especially when they face limited competition. Successful companies tend to be wary of innovating in the small, emerging and marginal markets that

often produce the biggest disruptive innovations. In those settings, creative consumers may be the only viable source of innovation. User-led innovation is a vital part of an effective competition policy. Monopolies can often head off competition from traditional sources, daunting smaller companies funded by venture capital. In those circumstances innovation from committed users may be the only alternative.⁹

Sophisticated consumers and competitive markets have long been acknowledged as vital parts of competitiveness strategy. Michael Porter, in his influential 1990 work, the *Competitive Advantage of Nations*, noted: “A nation’s firms gain competitive advantage if domestic buyers are, or are among, the world’s most sophisticated and demanding buyers for the product and service. Such buyers provide a window into the most advanced buyer needs... provided it anticipates buyer needs in other nations, other local demand for a product or service in a nation helps local firms to move sooner than foreign rivals.”¹⁰

A rounded innovation policy would promote innovation among users, through deregulating markets, lowering costs of entry, and a balanced intellectual property framework that ensures users have the freedom to adapt products. Most creativity in most fields comes from being able to borrow and blend existing ingredients to create new mixes. Overly stringent intellectual property controls will make this impossible and entrench a single, inadequate model of innovation.

More people than ever before can be involved in innovation. Thanks to the falling costs of technology, cheaper communications, rising educational attainments and longer life spans, more people have more time and capacity to be creative, if only in small ways, than ever before. Ideas do not just flow down the pipeline from the back room boys to consumers. Increasingly ideas are flowing the other way: consumers are increasingly a source of creativity. A modern innovation policy should be focused on mobilising the power of open innovation as well as R&D coming from boffins in the lab. The UK needs to be the leading economy for consumer innovation.

Ten

Innovation has to be central to the story the nation tells itself.

Innovation has to be a national pastime and part of the national identity. Innovation always involves a critical dialogue and interaction with the past, what you draw from it and what you seek to discard, what is revered and what adapted. Innovative societies are not careless of their past. They are not constantly attempting to start from scratch, to go back to year zero. They recognise that most innovation, including radical and disruptive innovation, can draw from the past. History is not a burden when it can be a storehouse of ideas that can be re-used, modified and adapted.

The UK's dominant story about innovation is a melancholy lament about

opportunities lost, brains drained away and inventions commercialised elsewhere. The Blair Government has made efforts to develop an alternative narrative of a young, dynamic and creative country. But the early rhetoric about the knowledge economy and the creative economy was sometimes confusing and ill understood by those telling the story as much as those listening to it. The most telling contrast is with Finland, where innovation has been central to a sense of national identity, embodied in Helsinki's modernist architecture, for example, for more than a century.

In Finland the embrace of modern ideas and technologies, often borrowed from abroad, has been vital to a sense of national purpose in the face of the looming power of Russia. Finns seem to see learning and innovating as almost a national duty, the only way tiny Finland could ensure its survival. The same story is being played out in different ways in other small and vulnerable countries; Singapore, Korea, Ireland, Israel, Taiwan, Iceland, and Sweden.

In the US a rhapsodic embrace of new technology has been essential to the American dream of a society constantly finding new frontiers to open up, from the 19th century railroad to the Apollo moon shots and latterly cyberspace.¹¹ By way of contrast, the Dutch tell themselves a far less heroic story of national innovation, one that focuses on everyday, evolutionary tools: dams, dykes, locks, bridges and simple modular buildings that serve a utilitarian purpose. Holland only exists through a combined, cumulative

act of communal innovation, to build a country out of swamp and sea. Holland tends not to laud individual, superstar designers. Holland encourages a constant, adaptive, incremental and functional approach to innovation.¹²

The Finns and other small nations have an underdog story: a small nation surviving through combined appetite for innovation. The US has a frontier story: innovation is part of seeking new frontiers in a society where the dream of social mobility is critical. The Dutch tell a modest and pragmatic story of collective adaptation to living below sea level.

The UK does not have a story that binds all of society around innovation.

Conclusion

In so far as we have developed a story of innovation in the last few years it has revolved around necessity: the necessity of competition and the pace of technological change means we have no choice but to innovate and change. The imperative for innovation is external.

Instead we need a story that comes from within and is intrinsic to what we stand for, not something forced upon us by the competition. It needs to be a story about what we can become as a nation.

First, it needs to be a story about community – the theme in Finland and Holland – about what we can achieve together. A test case will be our response

to climate change. We need a wave of environmental innovation to help tackle climate change, from alternative forms of energy to new approaches to transport and packaging. Environmental innovation might come in the form of technology, for example new energy systems. But regulatory changes to drive consumer and producer innovation will also be vital. Central to all of this will be a scheme to put a realistic price on our consumption of carbon. Once again innovation in regulation – this time carbon budgeting, trading and pricing – will be vital to kick-start innovation in technology, business offers and consumer behaviour. Innovation will be central to our collective response to climate change. Indeed, the UK already has an international reputation as a leader in innovative environmental regulation.

Second, the innovation story must be about freedom. The future of our society should not be to continue to extend the pleasures of consumerism ad infinitum. Our aim should be to become a society of adapters, contributors, participants and designers, with people having their say, making a contribution (often in small ways) to add to the accumulation of ideas and innovation. Participation and contribution should be the watchwords of such a society, rather than mere consumerism. A society of mass innovation offers access to a deeper story about freedom and self-expression that will distinguish us from many societies in Asia.

Choosing between different branded goods to buy is not the same as learning how to make yourself something, by

becoming a player not just a spectator. People learn how to be free not just through consumer choice but in a deeper sense of finding how to express themselves through creative work. That is also something those students in Beijing yearn for. They are hard-working, knowledgeable and ferociously competitive but they also want more for their lives than the choices currently on offer in China. One young girl put it this way: "I do not want to just choose

between the options the system offers me. I want to do something which expresses me." In China fulfilling that aspiration is still very difficult. In the UK it must become an everyday reality. A society of mass innovation and creativity offers a deeper story about freedom, one that Asian societies are never likely to match.

Innovation *by* the masses, not just *for* them: that must be our national purpose.

Endnotes

1. This research was undertaken as part of the Atlas of Ideas research programme, run by the think tank Demos and funded by a consortium including the Foreign and Commonwealth Office.
2. For an explanation of the 'pipeline' view of innovation and its shortcomings, please see NESTA (2006), *The Innovation Gap*, (NESTA, London).
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