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What Good Looks Like

The seven criteria of a good innovator

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The Big Innovation Centre is an initiative of The Work Foundation and Lancaster University. Launched in September 2011, it brings together a range of companies, trusts, universities and public bodies to research and propose practical reforms with the ambition of making the UK a global open innovation hub as part of the urgent task of rebalancing and growing the UK economy, and with the vision of building a world-class innovation and investment ecosystem by 2025. For further details, please visit www.biginnovationcentre.com.

Executive Summary

The Big Innovation Centre believes it is important to celebrate the most innovative companies in our country, bring innovation into the mainstream media and the public eye, and create awareness of what it takes to succeed. Towards this end, we are launching a year-long column in *The Guardian* called *The Innovators*, aimed at showcasing and profiling a line-up of 'good innovators'. This will culminate with awards for the top three most innovative companies. The Column will seek to answer three broad questions on good innovators that we think will be of interest to the general public:

- Which innovative companies could be role models for those seeking inspiration?
- What does 'good' look like, in terms of a good innovator?
- How do we measure good innovators?

There are several credible league tables of innovative companies, each with its own reasoned methodology for determining the rankings. Priorities are nonetheless placed largely on either some objective financial measures or qualitative judgement of the impact across industry and society of recent innovations, with surveys of public opinion being a popular alternative. There are also awards aimed at celebrating innovative personalities instead of companies.

We believe, however, the criteria that underpin the selection of the most innovative companies should be:

- Broad enough to capture more than just financial metrics,
- Holistic enough to transcend traditional measures of innovation, and
- Inclusive enough to recognise innovation is a team effort.

In an attempt to combine established wisdom from various existing metrics for measuring innovation with the broader characteristics that we believe are essential to the constitution of a good innovator, we have set out seven key criteria that provide the basis for our Innovators Scorecard. No single company is expected to excel in all seven criteria; it is more likely that companies fulfil the seven criteria to varying degrees. The most innovative companies, however, are usually those whose all-round excellence is evident when all of the following seven criteria are taken into consideration:

Criteria 1: Product, service and/or technology innovation

How innovative and successful are the company's products, services and/or technologies?

Criteria 2: Business model and/or strategy innovation

How innovative and successful are the company's business model and/or strategy?

Criteria 3: Human, intellectual and cultural capital

How innovative and entrepreneurial are the company's people and culture?

Criteria 4: Agility and absorptive capacity

How capable is the company of adjusting to change, responding to opportunities and absorbing external ideas?

Criteria 5: Network exploitation and leverage

How effectively has the company leveraged and exploited its networks for innovation?

Criteria 6: Cost efficiency, margins and the bottom line

How innovative is the company in reducing costs and boosting margins, leading to improved financial performance?

Criteria 7: Wider impact on society and the economy

How impactful are the company's innovations on the wider society and the economy?

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Introduction: The Innovators Column

The Big Innovation Centre believes it is important to celebrate the most innovative companies in our country, bring innovation into the mainstream media and public attention, and create awareness of what it takes to succeed. Towards this end, we are launching a year-long column in *The Guardian* called *The Innovators*, aimed at showcasing and profiling a line-up of 'good innovators'. This will culminate with awards for the top three most innovative companies.

The Column's raison d'être is to answer three broad questions on good innovators that we think will be of interest to the general public:

- ***Which innovative companies could be role models for those seeking inspiration?***

To celebrate is to inspire. While there is much public discourse on the subject of innovation, and we even have a government department with a remit for innovation, there is currently little effort to publicly and unashamedly celebrate innovative companies. Many other rival economies do so. It should then not be entirely surprising that we trail the US, Korea, Japan and a host of other developed economies in fostering the nation's aspiration to innovate.

- ***What does 'good' look like, in terms of a good innovator?***

The Column will, however, achieve little if it serves *only* to put the most innovative companies on a public pedestal. To inspire and unlock the innovative potential of UK businesses and the wider economy, it is important that we learn from the most innovative companies what the critical success factors are and what key pitfalls should be avoided. Lessons distilled from good innovators can be invaluable as they are derived from practical experience, which cannot be taught by textbooks on entrepreneurship and innovation.

- ***How do we measure good innovators?***

Each of the most credible lists currently available, such as Forbes.com, Fast Company and MIT Technology Review, has its own methodology for determining their rankings. We will introduce our unique Innovators Scorecard, comprising a comprehensive array of factors that we believe characterise good innovating companies, as a lens through which we filter the good from the also-rans. We believe innovators should be measured not just for their financial performance, or

the increase in shareholder value, but also on a wider range of issues that may impact on the workforce, the wider society and the economy.

The criteria set out in our Innovators Scorecard will be applied to select a sample of companies which will be showcased in the weekly Column, in both print and online formats. An expert panel will then be convened to select from this sample the top three good innovators that will be honoured in an award ceremony.

A Different Yardstick

Once upon a time, companies prided themselves mainly on their size and wealth. But bigger and richer are going out of fashion. In recent years, there has been a growing acknowledgement that market value and revenues alone aren't the be-all-and-end-all of the world's most admired and successful companies. Getting into Fortune 500, or Fortune Global 500, is still great, but companies are starting to also covet a place in another 'list', desiring to be measured by another metric. This is partly because there has been a shift in how society views successful companies – the yardstick by which success is measured and admiration ascribed is changing.

Companies now increasingly want to be seen as among the world's most innovative. Market value may be a marker of where a company **currently is**, while its revenues a measure of its past performance that **got it where it is**. The company's ability and potential to innovate is in many respects an indicator suggesting **where it might be** in the future.

In a world where there is a league table for almost anything worth measuring under the sun, there is no dearth of rankings for the most innovative companies.¹ Among the most credible lists in recent times are those published by Forbes.com, Fast Company, MIT Technology Review, and S&P/Bloomberg BusinessWeek.² While each of these has its own reasoned methodology for determining the rankings, priorities are nonetheless largely placed on either some objective financial measures or qualitative judgement of the impact across industry and society of recent innovations. Surveys asking respondents to name the companies they consider the most innovative are a popular alternative.

For example, the Forbes.com list³ looks at innovation premium, a measure popularised in *The Innovator's DNA* and defined as the proportion beyond a company's current

¹ These differ from some of the most prominent innovation indices published, which measure innovation on a national scale, usually with implications for innovation or economic policy. Some of these indices include INSEAD's Global Innovation Index (<http://www.globalinnovationindex.org>), the European Commission's Innovation Union Scoreboard (http://ec.europa.eu/enterprise/policies/innovation/facts-figures-analysis/innovation-scoreboard/index_en.htm), NESTA's Innovation Index (http://www.nesta.org.uk/areas_of_work/economic_growth/the_innovation_index), and the OECD's Measuring Innovation: A New Perspective (http://www.oecd-ilibrary.org/science-and-technology/measuring-innovation_9789264059474-en). All web links accessed on 10 Feb 2014.

² Discontinued effective 19 March 2012.

³ See <http://www.forbes.com/innovative-companies/>, accessed on 10 Feb 2014.

market value that investors have bid up based on expectations of future innovations.⁴ Consultants Booz & Co.'s list of Top 10 Most Innovative Companies is based on the results of a survey,⁵ while MIT Technology Review's editors compiled a list of 50 disruptive companies that have demonstrated original and valuable technology, are bringing that technology to market at a significant scale and are clearly influencing their competitors.⁶ S&P/Bloomberg BusinessWeek's Global Innovation Index is a composite of survey ranking and three financial measures: three-year earnings growth, three-year sales growth and R&D as a percentage of sales.⁷

Meanwhile, The Economist's well respected annual Innovation Awards celebrate individuals, not companies, whose innovations have been successful in the last decade. The innovative personalities are selected based on three criteria: revenues their innovation has made their company or its economic impact on a specific good cause or society in general, the effect their work has had on the marketplace or if it has created a whole new marketplace altogether, and the impact their innovation has had on a new type of science or technology.⁸

⁴ Dyer, J., Gregersen, H. and Christensen, C.M. (2011), *The Innovator's DNA: Mastering the Five Skills of Disruptive Innovators*, Harvard Business Review Press, Boston, MA.

⁵ See http://www.booz.com/global/home/what_we_think/global-innovation-1000, accessed on 10 Feb 2014.

⁶ See <http://www2.technologyreview.com/tr50/2013/>, accessed on 10 Feb 2014.

⁷ See http://www.businessweek.com/innovate/NussbaumOnDesign/archives/2008/02/a_new_innovation_index--the_spbusinessweek_global_innovation_index.html, accessed on 10 Feb 2014.

⁸ See <http://www.economistinsights.com/technology-innovation/event/innovation-awards-2013/tab/2>, accessed on 10 Feb 2014.

What Makes a Good Innovator – Our Take

The methodology and rationale behind each league table or index of the most innovative companies have their own merits, but may also naturally skew the rankings in favour of one type of companies over another. For example, depending on the metrics employed, the ‘usual suspects’⁹ among the most innovative companies – the likes of Apple, Amazon, Facebook, Google, Microsoft, Samsung, General Electric – may or may not appear among the top-ranked companies. When innovation premium, an objective measure, is used as the main criterion in Forbes.com’s list, only ARM and Amazon are arguably the most recognised global companies among the top ten. The top three most innovative companies – Salesforce.com, Alexion Pharmaceuticals and VMware – are either less well known or virtually unknown outside the US. Google and Apple are ranked only 47th and 79th respectively!

But when survey, a subjective measure that is entirely dependent on respondents’ opinion, is the method used to determine the rankings, top-ranked companies usually more closely match popular opinion. Apple heads Booz & Co.’s list, while Google, Samsung, Amazon, 3M, General Electric, Microsoft, IBM, Tesla Motors and Facebook make up the top ten.

Although S&P/Bloomberg BusinessWeek’s composite index integrates both a qualitative measure, ie based on the annual BusinessWeek/BCG survey, and several quantitative measures, ie based on company financials, it is still heavily populated by the usual suspects. Perhaps only Hong Kong’s Byd (ranked 3rd) and Japan’s Fast Retailing Co. (11th) are the least universally known of the lot. This can be explained by the fact that the three objective measures considered – earnings growth, sales growth and R&D as a percentage of sales – usually favour large, established and well known companies, and as such compound the possibility of bias inherent in survey results.

The Economist’s Innovation Awards, which celebrate individual innovators rather than companies, are based on public nominations before final selection by a judging panel. Although public opinion may seem the most ‘democratic’ among various selection methods it is not markedly different from a survey. As the lists of past winners suggest,

⁹ This term implies popular opinion, but may not necessarily mean the most innovative by any metric.

personalities who are more widely known or enjoy greater public limelight are more likely to end up winners.

Although The Economist's criteria are among the most balanced in that they consider both financial (revenues) and non-financial (impact on marketplace, science and society) measures, we would argue that the idea of celebrating individuals alone is somewhat flawed. While core innovative ideas may have been the brainchild of an individual, it is highly unlikely the innovation will be capable of the achievements espoused in those financial and non-financial criteria without the vital contributions of others within the company.

Thus we believe the criteria that underpin the selection of the most innovative companies to be featured in The Innovators column should be:

- ***Broad enough to capture more than just financial metrics.***

A good innovator isn't just a profitable company, or a revenue-generating machine. Neither is it necessarily one that, thanks to a steady stream of exciting products, significantly and consistently increases shareholder value. As the Booz & Co.'s list shows, the most innovative companies aren't necessarily top R&D spenders either. While it is difficult to conceive of a top innovator as a company that is consistently in the red, or whose financial performance is so lamentable it destroys much shareholder value, there has to be more to innovation prowess than what can be reflected in a company's financial statements or balance sheet. If financials alone are a good barometer of innovation, oil and gas companies would have dominated the various league tables.¹⁰ Yet none appear among top innovators in any of the lists discussed above.¹¹ As such, in addition to for-profit companies, the Column will also consider organisations from the not-for-profit sector, so long as their financials are not in a deplorable state.

- ***Holistic enough to transcend traditional measures of innovation.***

A good innovator isn't just about the innovations it spawns, usually in the form of new technology or products and services brought to market. While it may be useful to measure a company's innovation prowess by some traditional metrics such as the number of new ideas it successfully commercialises, improvement in the quality of ideas and the number of patents owned, these should not represent the be-all-and-end-all of innovation. If the number of patents is the best yardstick for innovation,

¹⁰ Oil and gas giants usually dominate the upper end of Fortune Global 500, measured by revenues and profits. See http://money.cnn.com/magazines/fortune/global500/2013/full_list/, accessed on 10 Feb 2014.

¹¹ This is despite oil and gas companies apply among the most innovative and sophisticated technologies to their upstream exploration and production as well as their downstream refining, products and petrochemicals businesses.

one might be tempted to simplistically and tenuously argue that companies in Cambridge should probably win hands down.¹² Being a good innovator is also about enabling the entire organisation and its stakeholders to innovate and achieve, in a way where the resulting success collectively contributes to enhancing the reputation of the company as a whole. 'Innovation' may also take the form of business models, processes or strategy – not just technology, products or services. The best innovators also set themselves apart by the impact their innovations have on the wider society or the economy, their agility to respond to opportunities and threats, their ability to exploit networks, and their operational efficiency that affects costs and margins.

- ***Inclusive enough to recognise innovation is a team effort.***

While inspirational and charismatic individuals may be either the originator or protagonists (or both) of innovative ideas that end up as hugely successful products or services, or that eventually shape markets and technological trajectories, none have thus far been capable of achieving success singlehandedly. Recognising only influential individuals, no matter how inspirational or 'innovative' they are perceived to be, is at best myopic and at worst insulting to the countless others in the company who have worked hard to innovate or whose own innovative capabilities have collectively been instrumental in successfully bringing the initial ideas to market. In most cases, a company becomes a good innovator when its entire outfit is innovative – and that includes its people and its institutional traits (eg systems, culture). We therefore celebrate companies, not just specific individuals.

¹² A Centre for Cities report shows that Cambridge has more patents approved per 100,000 residents than the next 10 most innovative cities combined. See Centre for Cities (2013), *Cities Outlook 2013*, Centre for Cities, London. 'Companies' in this context may include not-for-profit organisations, eg the University of Cambridge. Patents, as such, may be held exclusively by members of the University, or by enterprises within or around the city, or by members of the University who founded enterprises within or around the city.

The Seven Criteria of a Good Innovator

In an attempt to combine established wisdom from various existing metrics for measuring innovation with the broader characteristics that we believe are essential to the constitution of a good innovator, we have set out seven key criteria that provide the basis for our Innovators Scorecard.



No single company is expected to excel in all seven criteria. In fact, it is more likely that each company fulfils each of the seven criteria to varying degrees, depending possibly on the nature of its industry, its age and size, and the depth of its resources. However, having all seven criteria under one unified framework provides a holistic picture of what an innovative company might look like. The Scorecard's framework also enables companies to identify their own shortcomings, learn from companies that have found those missing pieces of the jigsaw puzzle, and seek to improve their capabilities to

innovate. The most innovative companies are usually those whose all-round excellence shines through when all seven criteria are taken into consideration.

Criteria 1: Product, service and/or technology innovation

How innovative and successful are the company's products, services and/or technologies?

Innovation is inevitably associated to a large extent with products and services. Dyson's bagless vacuum cleaner and its Airblade Tap; Apple's iPod and iTunes, and then the iPhone and iPad; Amazon's online bookstore, which gradually became a mammoth online retail site; and Southwest's low-cost airline – these are just a few popular examples. Products and services that are considered innovative are usually those that are novel to their markets or industries at the time of introduction. The rapid proliferation of digital music players has rendered the iPod a less innovative product today than it was a decade ago. Similarly, the wide availability of low-cost air travel means we do not necessarily view this service as innovative anymore. A company can be considered innovative if it has recently introduced novel products or services that served genuinely unmet or latent needs in the market. A company capable of continuously introducing a steady stream of novel products or services may also be deemed relatively more innovative than one that offers a 'flash in the pan'.

But perhaps what's more crucial when considering how innovative products and services are is the technology behind them. Technological innovation can bring about radical change to markets and industries, and usher in the Schumpeterian 'creative destruction' of old practices.¹³ It is capable of setting new trajectories and creating new markets, and thus spawning a whole new array of novel products and services. For example, digital photography technology has consigned the 35mm film to the annals of history, made the digital camera an innovative must-have gadget for the better part of the last decade, and now enabled smartphones with high-resolution cameras to further revolutionise photography. 3D printing is another technology that might well spawn innovative products and services in the near future. An innovative company may therefore be one that has introduced a new technology to the world, set new technological trajectories, and created new markets – or is on the brink of doing so.

¹³ Schumpeter, J.A. (1934), *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle*, Harvard University Press, Cambridge, MA; Schumpeter, J.A. (1939), *Business Cycles: A Theoretical and Statistical Analysis of the Capitalist Process*, McGraw-Hill, New York, NY.

Although patents and copyrights may be useful indicators of a company's innovative prowess, they may sometimes distort the perception of how innovative a company is. Dyson's Airblade Tap is covered by a staggering 210 patents¹⁴ – this may have boosted the company's impressive patent collection by that figure, but still represents just one innovative product introduced to the market. Hard intellectual property protection measures, such as patents and copyrights, should therefore be used very cautiously for assessing how innovative a company is.

Criteria 2: Business model and/or strategy innovation

How innovative and successful are the company's business model and/or strategy?

Innovation, however, isn't just about products, services and technologies. Senior executives and entrepreneurs sometimes wonder why their supposedly brilliant invention, as evidenced perhaps by an impressive collection of patents attached to it, struggles to succeed in the market. The best cutting-edge product, service or technology might not necessarily take off unless it is wrapped in an innovative business model. Xerox's revolutionary Model 914 copiers never took off until the company invented a clever leasing business model that we are familiar with today.¹⁵ Apple didn't invent the digital music player, but an innovative lock-in business model enabled the iPod and iTunes to take the world by storm. An innovative company can also be viewed as one whose business model enables it to more effectively create, deliver and capture value from its products, services and technologies. In other words, there is implied success attached to an innovative company's business model. There is little point in implementing a seemingly novel business model that eventually perishes the company. The all-business class airline model was considered innovative when launched, but had only succeeded in ushering the likes of Silverjet, MaxJet and Eos into oblivion.

Based on its business model, a company may also be able to adopt innovative strategies in order to better compete in the marketplace. The low-cost airline business model, for example, has led the way in innovative cost leadership strategies that have since proliferated across the airline industry. These include online ticketing, online check-in, unbundling of in-flight services and more robust fuel hedging. An innovative

¹⁴ Warman, M. (2013), "Dyson unveils latest invention: tap with built-in dryer", *The Telegraph*, 4 Feb, <http://www.telegraph.co.uk/technology/9848946/Dyson-unveils-latest-invention-tap-with-built-in-dryer.html>, accessed on 10 Feb 2014.

¹⁵ Chesbrough, H. and Rosenbloom, R. (2002), "The role of the business model in capturing value from innovation: Evidence from Xerox Corporation's technology spin-off companies", *Industrial & Corporate Change*, Vol.11 No.3, pp.529-55.

company may be one that has tweaked its strategy in a novel way so that its business model works better, or for its products and services to gain a larger market share.

Criteria 3: Human, intellectual and cultural capital

How innovative and entrepreneurial are the company's people and culture?

A company is only as good as its people. This old mantra is just as relevant to a company's ability and capacity to innovate, despite the possibility of harnessing 'external brains' through open innovation initiatives. Companies wishing to always push the boundaries of innovation and explore new opportunities, or trial new ideas, are unlikely to flood their payroll with predominantly play-by-the-book type of employees. Many are hiring the entrepreneurial type – those who are able to think outside the box, have a can-do attitude and are not afraid to try new ideas. In fact, some firms are also hiring not just for skills and aptitude but also for enhanced access to new recruits' stock of ideas.¹⁶ A company's intellectual capital, embedded mostly in its people but also encoded variously in knowledge management resources, is likewise central to its ability to learn and apply knowledge for innovation. A single knowledge worker contributes three times more to the firm's profit than other workers.¹⁷ In the early 1990s, about half of the value added at Siemens came from knowledge-intensive products and services, while in 2002 this had increased to between 60% and 80%, and was still growing.¹⁸ How innovative and entrepreneurial a company's people are is usually a good indicator of how innovative the company is.

But even the most innovative and entrepreneurial people will not flourish in a company whose culture stifles innovation. Culture permeates the entire organisation. An innovative company is always driven by an innovative and entrepreneurial culture, which manifests in the company's values and practices. A culture that encourages innovation can mean different things in different companies. In one company it may mean principally reward systems that are aligned towards innovation goals, while in another institutionalised practices that carve out space for new project ideation and innovation. A well known example of the latter is Google's '20% time', which has spawned

¹⁶ Singh, J. and Agrawal, A. (2011), "Recruiting for ideas: How firms exploit the prior inventions of new hires", *Management Science*, Vol.57 No.1, pp.129-50.

¹⁷ Guthridge, M., Komm, A.B. and Lawson, E. (2008), "Making talent a strategic priority", *McKinsey Quarterly*, Jan, pp.49-59.

¹⁸ Davenport, T.H. and Probst, G.J.B. (2002), "Siemens' knowledge journey", in Davenport, T.H. and Probst, G.J.B. (Eds.), *Knowledge Management Case Book: Siemens Best Practices*, 2nd ed., Publicis, Erlangen.

applications such as Gmail, Google News, Orkut and AdSense.¹⁹ Similarly, a ‘15% time’ rule developed at 3M in the 1950s can be credited as the factor that provided an enabling environment that led to the development of the masking tape and Post-it notes.²⁰ Yet in other companies, innovative cultures may also be those that promote openness in allowing ideas to flow in all directions (bottom-up, top-down and laterally across units), or that tolerate reasonable, honest failure.

Criteria 4: Agility and absorptive capacity

How capable is the company of adjusting to change, responding to opportunities and absorbing external ideas?

For an innovative company in our fast-changing modern day business landscape, it is not enough just to be resourced by innovative employees and driven by a culture that encourages innovation. Many companies have accumulated large stocks of valuable resources – including top-notch talent – and core capabilities, but still failed to innovate when conditions changed. Despite actually being a pioneer, Kodak was slow to join the digital photography bandwagon. Nokia missed a large chunk of the smartphone revolution, and as a result lost market share to more dynamic and faster-innovating rivals like Samsung and Apple.

Dynamism is increasingly becoming a required attribute of innovative companies.²¹ In other words, an innovative company is one that is agile and flexible enough to adjust to changing conditions, and quick enough to capture emerging opportunities. Useful internal indicators of these usually include how fluid and flexible, or bureaucratic and encumbered, the company’s decision-making processes are, and whether the company feels comfortable exploring business ideas and opportunities beyond its comfort zone. Externally, these manifest in whether a company is able to capture first-mover, or at least early-mover, advantages, and the extent to which a company has been successful in projects or initiatives in a different market, or sector, that require different skills and competencies. For example, IBM’s resurgence has been attributed in part to its ability to

¹⁹ Google’s ‘20% time’ philosophy enables engineers to spend one day a week working on projects that aren’t necessarily part of their formal job. For example, they can use the time to develop something new. See <http://googleblog.blogspot.co.uk/2006/05/googles-20-percent-time-in-action.html> and <http://www.eightypercent.net/Archive/2005/03/24.html>, both accessed on 10 Feb 2014.

²⁰ Collins, J. and Porras, J.I. (1994), *Built to Last: Successful Habits of Visionary Companies*, HarperCollins, New York, NY.

²¹ Teece, D.J., Pisano, G. and Shuen, A. (1997), “Dynamic capabilities and strategic management”, *Strategic Management Journal*, Vol.18 No.7, pp.509-33; Teece, D.J. and Pisano, G. (1994), “The dynamic capabilities of firms: An introduction”, *Industrial and Corporate Change*, Vol.3 No.3, pp.537-56.

quickly capture emerging business opportunities by leveraging its intellectual capital into businesses as diverse as life sciences, automotive and banking.²²

Companies wishing to innovate better and more quickly must also have adequate capacity to absorb external ideas. Gone are the days when innovation sprang almost exclusively from in-house R&D labs. Absorbing ideas from outside company boundaries to generate new insights and knowledge can be critical for innovation. The Ford Motor Company, PepsiCo and Southwest Airlines are among organisations that analyse postings about them on Facebook and Twitter to gauge the immediate impact of their marketing campaigns and changing consumer sentiments about their brands so that they can better tailor future products.²³ An innovative company is one that embraces open innovation in the form of integrating external ideas into its own innovation process. This can be done in many guises, by for instance involving partners, customers, competitors and suppliers in generating ideas that are then used for the development of the company's own technologies, products or services.

Criteria 5: Network exploitation and leverage

How effectively has the company leveraged and exploited its networks for innovation?

In the modern economy, no company is an island. Companies exist in networks and ecosystems. Whether they know it or not, companies build networks over time. These may range from supplier and partner to customer (current and prospective) and even competitor networks. The difference, of course, is the scale, scope and strength of these networks. Networks offer the potential to share knowledge and facilitate learning, to share risks and achieve economies of scale and scope, and to shorten time-to-market through improved coordination.²⁴ An innovative company leverages and exploits its networks in two ways.

One, it makes good use of its networks to spawn innovative technologies, products and services. This can be done in a variety of ways. In business-to-business networks, for example, a number of pharmaceutical giants in the US pooled resources and effort to

²² The other reason commonly associated with IBM's resurgence is its new software and services business model. IBM moved away from mainframes in the 1990s to focus on software, services and business solutions. See O'Reilly, C.A., Harrell, J.B. and Tushman, M.L. (2009), "Organizational ambidexterity: IBM and emerging business opportunities", *California Management Review*, Vol.51 No.4, pp.75-99.

²³ Bughin, J., Chui, M. and Manyika, J. (2010), "Clouds, big data, and smart assets: Ten tech-enabled business trends to watch", *McKinsey Quarterly*, Aug.

²⁴ Anand, B.N. and Khanna, T. (2000), "Do firms learn to create value? The case of alliances", *Strategic Management Journal*, Vol.21 No.3, pp.295-315; Kogut, B. (2000), "The network as knowledge: Generative rules and the emergence of structure", *Strategic Management Journal*, Vol.21 No.3, pp.405-25.

form The Coalition Against Major Diseases to boost the discovery of new drugs and treatments for neurodegenerative diseases.²⁵ Recently there have been numerous tie-ups between mobile and technology companies to drive innovation in mobile computing and telephony. Nokia-Microsoft, Samsung-Google, LG-Google and Asus-Google are just several examples. In business-to-consumer networks, innovation can also be spawned through co-creation, as facilitated by open source and crowdsourcing techniques. Facebook recruited some 300,000 users to translate its site into 70 languages. Remarkably, it took just a day to translate the site into French. An innovative company is therefore one that harnesses the strengths of its networks, or ecosystems, in various ways to drive innovation.

Two, as and when appropriate, an innovative company exploits externalities in its customer networks to strategically create captive segments, mainly through lock-in effects and complementary products or services. Sony's determination to win the high-definition DVD standard war against Toshiba was motivated by the prize of creating a lock-in effect between hardware and software, and thereby the chance to build a critical mass among buyers.²⁶ A more common example is Microsoft's Windows operating system and Office software. They remain dominant, particularly in the business market, as a result of a deeply entrenched path chartered by a huge network of users built up early on. An innovative company should be able to boast of products, services or technologies that can be considered to have established, or is well placed to establish, a captive customer network.

Criteria 6: Cost efficiency, margins and the bottom line

How innovative is the company in reducing costs and boosting margins, leading to improved financial performance?

If only being innovative is about all the above regardless of the effect on the bottom line, the world will be inundated with endless streams of novel products and services built on state-of-the-art technologies and wrapped in clever business models. The reality,

²⁵ See Romero, K., De Mars, M., Frank, D., Anthony, M., Neville, J., Kirby, L., Smith, K. and Woosley, R.L. (2009), "The Coalition Against Major Diseases: Developing tools for an integrated drug development process for Alzheimer's and Parkinson's diseases", *Clinical Pharmacology and Therapeutics*, Vol.86 No.4, pp.365-7; Critical Path Institute website, <http://www.c-path.org/camd.cfm>, accessed on 17 Jul 2012.

²⁶ Sony learned from its mistake in a similar videotape format war in the 1980s, which its Betamax lost to JVC's VHS despite boasting of superior technology. See Edgecliffe-Johnson, A. and Palmer, M. (2008), "Betamax memories erased as Blu-ray triumphs", *FT.com*, 19 Feb, <http://www.ft.com/cms/s/0/11a94e68-df26-11dc-91d4-0000779fd2ac.html#axzz25gvH9GEH>, accessed on 6 Sept 2012; and Cusumano, M.A., Mylonadis, Y. and Rosenbloom, R.S. (1992), "Strategic maneuvering and mass-market dynamics: The triumph of VHS over Beta", *Business History Review*, Vol.66 No.1, pp.51-94.

however, is that companies need to cut their coat according to their cloth. What sets innovative companies apart from the rest is their ability to enhance the size and quality of their 'cloth', thus enabling them to cut larger and smarter 'coats'. The more efficient they are in cost management, or the more innovative they are in boosting margins, the more they will have in the coffers to be reinvested in future innovation. As emphasised earlier, it is unlikely a company can be considered innovative if its financial position is consistently in a deplorable state. The all-business class airline example above illustrates this.

Cost reduction and margin enhancement may well reflect how innovative a company's operations are. While strategically choosing the most innovative form of governance, eg deciding when and how to internalise and to outsource operations, can lead to cost efficiency,²⁷ modern technology has also enabled companies to configure their operations more innovatively to lower costs and boost margins. By using digital technologies that enable remote control and monitoring from its corporate offices, technology centres and hubs, UPS has developed a number of innovative programmes to help drivers optimise delivery routes and their vehicles operate at optimal levels with better fuel economy.²⁸ Increased efficiency and margin enhancements can also be realised in many other innovative ways, for example, retailers using digital technologies to widen market reach and reduce overheads associated with physical stores, and to better coordinate inventories so as to reduce storage costs. An innovative company may therefore be seen as one that is innovative in improving operational efficiency to keep costs low and boost margins. No matter how novel its products and services are, the extent to which a company's costs affect its profitability may be a good indicator of how innovative its operations are.

Criteria 7: Wider impact on society and the economy

How impactful are the company's innovations on the wider society and the economy?

Although innovation, in and of itself, is something to be celebrated, not every innovation has the same impact on a company's customers, let alone the wider society and the economy. Gmail and Google Translate are two undoubtedly very useful innovative applications by Google that are widely used all over the world. Between the two,

²⁷ Coase, R. (1937), "The nature of the firm", *Economica*, Vol.4 No.16, pp.386-405; Williamson, O.E. (1975), *Markets and Hierarchies, Analysis and Antitrust Implications: A Study in the Economics of Internal Organization*, Free Press, New York, NY.

²⁸ "UPS uses technology and operational efficiencies to reduce fuel consumption and emissions", UPS website, <http://www.pressroom.ups.com/Fact+Sheets/ci.UPS+Uses+Technology+and+Operational+Efficiencies+to+Reduce+Fuel+Consumption+and+Emissions.print>, accessed on 10 Sept 2012.

however, the former's impact on society and the economy is arguably greater than that of the latter's. The impact of a company's innovations on the wider society and the economy, however, can only be relative to those of another company's. Dyson's inventions have made everyday life – and chores – easier for millions of people and households, and have also created jobs and economic spill-over effects. But so have Microsoft's software and applications for hundreds of thousands of business and private users. Comparing the two is not unlike comparing apples with oranges. In addition, telling the difference can often be arduous. Which has greater impact on society and the economy: the Raspberry Pi for its contribution to encouraging schoolchildren to take up programming, or ARM's processors for powering energy-efficient mobile computing through tablets and smartphones?

Despite the unique impact of a company's innovations, several indicators may help us make informed, albeit subjective, judgement. An innovative company may be seen as one whose products, services or technologies have considerably or substantially changed the way people work, live or play – or all of these. They may also have made people's lives better, or safeguarded society's wellbeing perhaps through ethical practices in their development and production. On the economy, an innovative company's products, services or technologies may have contributed to the creation of new jobs, markets or growth sectors; the revival of declining industries; the generation of new investments; and the increase in exports.

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