The Economist Intelligence Unit

A report from the Economist Intelligence Unit.

THE HYPERCONNECTED ECONOMY:

HOW THE GROWING INTERCONNECTEDNESS OF SOCIETY IS CHANGING THE LANDSCAPE FOR BUSINESS

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Contents

About this research

This report is the foundation of a three-stage research programme by The Economist Intelligence Unit, sponsored by SAP, which will assess the business impact of hyperconnectivity, how companies should adapt to them, and how executives must lead that transformation.

Based on interviews with some of the world's leading experts and drawing from their research, the report assesses the economic impact of hyperconnectivity so far. It examines how businesses have begun to adapt to the new economic environment and explores how customer behaviour is changing as well.

The Economist Intelligence Unit would like to thank the following interviewees for generously sharing their time.

- Charles Baden-Fuller, centenary professor of strategy, Cass Business School, City University London
- Rudolf van der Berg, economist and policy analyst, OECD
- Grant Blank, survey research fellow, Oxford Internet Institute
- Erik Brynjolfsson, Schussel Family professor of management science, MIT Sloan School of Management
- Michael Chui, partner, McKinsey Global Institute
- Stefan Haefliger, professor of strategic management and innovation, Cass Business School
- David Lancefield, global economics and media partner, PwC
- Alan Marcus, senior director, head of information technology and telecommunications industries, World Economic Forum
- Matthew Robinson, managing director of policy research, Accenture Institute for High Performance
- Davide Strusani, assistant director of TMT Economic Consulting, Deloitte
- Paul Zwillenberg, partner, Boston Consulting Group

The report was written by Michael Kapoor and edited by Pete Swabey.

Executive summary

Hyperconnectivity is a term that describes a defining feature of contemporary society. Thanks to the Internet, mobile technology and soon the Internet of things, people, places, organisations and objects are linked together like never before.

More than a technological trend, hyperconnectivity is a cultural condition to which businesses have no choice but to adapt. But what does is it mean for companies, industries and consumers?

This report, written by The Economist Intelligence Unit and sponsored by SAP, examines the economic impact of hyperconnectivity and how businesses are beginning to adapt to it.

Key findings include:

The Internet is worth more to the global economy than traditional industries such as agriculture or energy. That is testament to the vital role that hyperconnectivity plays in modern society.

Continued adoption of the Internet and mobile technology will benefit all economies, but will be especially valuable to developing countries. There is still a need for infrastructure investment in the developing world, but the rewards on offer are considerable.

The economic impact of the Internet of things has yet to be determined. While hyperconnectivity evidently drives economic growth, related innovations such as smart manufacturing instead may challenge employment in both developed and developing nations.

While good news on a macroeconomic scale, hyperconnectivity challenges individual businesses. The media and publishing industries have borne the brunt of its disruptive impact so far, but their example has shown other sectors that they need to think laterally in order to adapt.

Hyperconnectivity is accelerating globalisation. Multinational supply chains are no longer the preserve of large corporations. This is both an opportunity and a threat for companies the world over.

More than just a platform for economic activity, hyperconnectivity is a new cultural environment for all human behaviour. Its impact on that behaviour is still unfolding, and businesses must be sensitive to shifting social values and customer expectations as it continues to evolve.

1 Hyperconnected economics

Human beings are quintessentially social creatures, and technologies that allow us to connect with one another more effectively, more quickly and more extensively have always proved popular, from the book, to the telegraph, to the telephone.

In the last 20 years, though, the interconnectedness of people, organisations and objects has grown exponentially. First, the Internet allowed all computers to connect to one another on a common platform. More recently, developments in mobile technology have placed a sophisticated computer in the pockets of nearly 2bn people. And now the falling price of computing components and widespread network coverage mean that all manner of everyday objects are soon to be connected up as well.

It goes without saying that this "hyperconnectivity" has huge implications for businesses, for consumers and for the very structure of the global economy.

"It is a fundamental shift," says Alan Marcus, senior director at the World Economic Forum. Consumers can now compare prices and products from anywhere in the world and club together to pressure companies and governments into change. Companies can buy and sell internationally much more easily, and they receive a wealth of information to tailor products, production and marketing campaigns more exactly. Governments can use the growing amount of real-time information available not only to keep an eye out for terrorist threats, but also to improve everything from healthcare and education provision to traffic management.

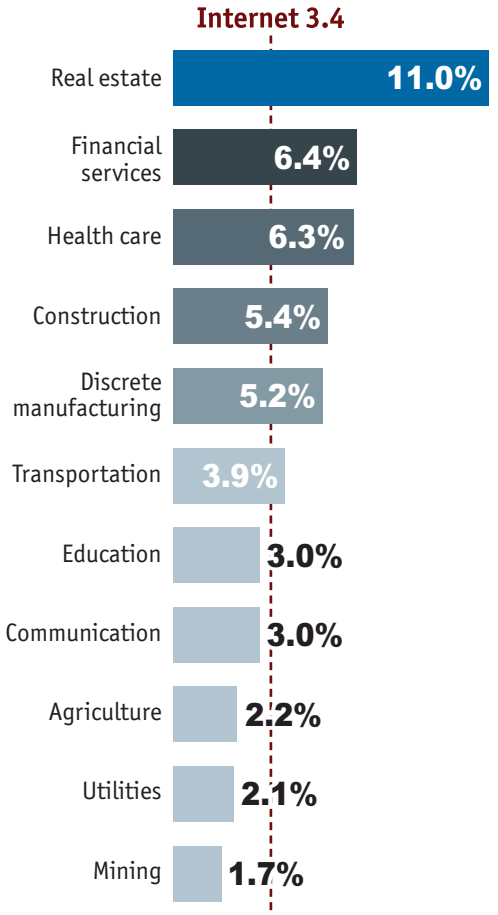
Despite these obvious effects, it is still difficult to quantify the overall impact of hyperconnectivity at this stage. Even the impact of the Internet, the first foundational wave of hyperconnectivity, "is too early to measure," says Rudolf van der Berg economist and policy analyst at the OECD, "although that hasn't stopped many companies from trying." He points out that the Internet has only really taken off in the past decade-and-a-half, meaning that there are few historical data to work with.

Still, the research that has been conducted to date points to a noticeable impact on productivity and economic growth. In a late-2011 study McKinsey, a management consultancy, calculated that the Internet was worth 3.4% of GDP in a group of 13 countries it examined, including the G8 major economies and large emerging markets such as Brazil, India and China. It accounted for more than 20% of their GDP growth in 2004-09. "Globally, it's worth more than sectors such as agriculture and energy," says Michael Chui, a partner at the McKinsey Global Institute.

The European Commission, meanwhile, says that information and communications technology (ICT) accounted for one-third of the EU's (admittedly modest) growth in 1995-2007, contributing 0.7 percentage points of the bloc's average annual GDP growth of 2.2%. Boston Consulting Group (BCG) calculates that the Internet accounted for 4.1% of GDP in the G20 group of major economies in 2010 and that it would double in size by 2016. "Spot checking suggests that it is growing as fast as we expected," says BCG partner Paul Zwillenberg.

Chart 1

Sector contribution to GDP, 2009
(% of all respondents)



Source: McKinsey.

So far, most of the economic benefits of Internet adoption have been felt by the developed nations, but in the future it is expected to boost developing countries in particular.

Well under half of the world's population has access to the Internet, and in some countries it is virtually non-existent—just 1.2% of Myanmar's population has access, according to the Internet Society, a non-profit organisation that promotes the development and use of the Internet. Even in some middle-income countries such as Turkmenistan the penetration rate is below 10%. By contrast, the most advanced countries, such as the US and the Netherlands, have Internet penetration rates of 70-90%. Companies such as Facebook have launched initiatives to increase Internet access in poorer countries and the effects could be dramatic, according to Davide Strusani, assistant director of TMT Economic Consulting at Deloitte.

According to Deloitte's research, if countries in Africa, Latin America and south and east Asia could raise Internet adoption to the level found in developed economies, it would boost long-term productivity by 25%, increase the GDP growth rate by 72% and create 140m new jobs. Arguably, the social benefits would be even greater. Deloitte predicts that average incomes would rise by US$600 per head, lifting 160m people out of extreme poverty; that Internet-based healthcare could save 2.5m lives; and that the education of some 640m children would be improved.

Matthew Robinson, managing director of policy research at the Accenture Institute for High Performance, says that preliminary results from an ongoing research project suggest that increased connectivity will have twice the impact on economic growth rates in emerging markets as in developed countries. But while the benefits of greater Internet penetration for emerging markets are clear enough, realising those benefits would require investment in basic telecoms and energy infrastructure, which may put a brake on adoption.

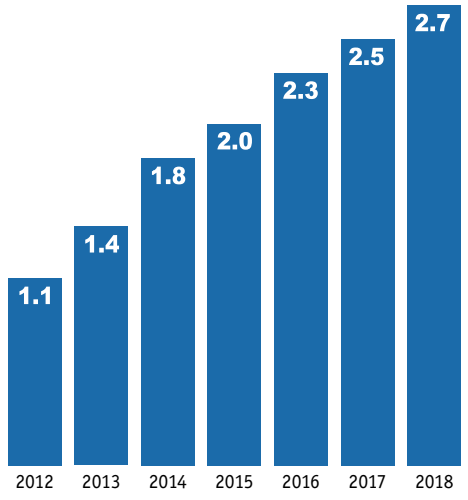
The benefits for developing economies are amplified by the growing adoption and sophistication of mobile technology. Mobile phones have already shown their worth in Africa, where mobile payment systems such as mPesa are helping people to overcome the absence of an established banking system, while doctors and teachers are using text messaging to reach more people in countries with poor communications. Now, the spread of smartphones promises to help make the Internet available to more people in these countries too, with Google launching a US$50 handset aimed at emerging markets at the start of 2015.

Some two-thirds of Americans currently use smartphones, but penetration is far lower in poorer countries. Google says that in India just 16% of the population have them, for example. Therefore the growth potential is massive as cheaper handsets become available in both rich and poor countries. The marketing research firm eMarketer projects that the number of people using smartphones globally will grow by 25% to 1.8bn in 2014, with more than one-third of the entire global population owning one by 2017. Currently, China is the biggest single market and the US the second, but by 2018 India will overtake America in terms of the absolute number of smartphone users. But again, this needs to be put in perspective. In 2012 some 60% of rural Indians lived on less than 60 US cents per day. Plenty of them will be unable to afford a US$50 phone for many years.

Nonetheless, the increasing numbers of smartphones and other portable, connected devices are having a perceptible impact on growth and productivity, in mature as well as developing economies. "It's become visible over the past five years because of smartphones, such as the Apple iPhone," says Deloitte's Mr Strusani.

Chart 2

Smartphone users worldwide
(bn)



Source: e-Marketer.

Deloitte's figures suggest that doubling the use of mobile data adds 0.5 percentage points to GDP growth per head. And if 10% of users switch from 2G to faster 3G connectivity, GDP per head grows by 0.15 percentage points.

After the Internet and mobile telephony, the next frontier for hyperconnectivity, it is widely believed, is the Internet of things (IoT), where electronic devices ranging from cars to coffee makers are connected to the Internet. The growth of these connected devices will be explosive. IT analyst company Gartner predicts that the number of IoT devices (which excludes PCs, smartphones and tablets) will surge from 900m in 2009 to 26bn in 2020, a 30-fold increase.

The IoT has the potential to dramatically reshape a wide range of industries – maybe all of them. Car makers are already installing hundreds of sensors in their latest models and collecting information that can be used in everything from customer service to product design. Insurance providers are offering customers telematics devices that monitor how well they drive and are tailoring policy prices accordingly. Sportswear brands such as Nike are selling wearable devices that monitor physical activity, and in so doing are becoming digital fitness advisers to their customer base. And manufacturers of all stripes are turning to data-driven "smart" manufacturing, embedding connectivity and data processing into industrial equipment to allow shorter, more customised and more automated production runs.

The transformational potential of this third phase of hyperconnectivity is immense, but the jury is out on how long that transformation will take. Professor Charles Baden-Fuller of Cass Business School points out that it took companies 20 to 30 years to switch over to electric power. The shift to smart manufacturing might take equally long, or at least much longer than the technology would allow. "Changing your business practices takes time," he says.

There is already convincing evidence that smart manufacturing can save money and improve reliability, for example. Companies including Germany's Bosch, General Electric (GE) and Johnson Controls in the US are all working on systems where machines predict failure and trigger maintenance automatically, without waiting for human intervention and costly production disruption. Toyota, the Japanese car maker, says that it has saved more than US$500,000 annually at its Alabama plant in the US through a similar system, with General Motors saying that introducing a standard network architecture across its plants has allowed it to set up a single troubleshooting team to deal with engineering problems globally. That has helped it to slash network downtime by around 70%.

But the cost and complexity—and indeed the perceived risks—of changing production systems mean that smart manufacturing is still only lightly used. A December 2013 survey by the American Society for Quality (ASQ, a knowledge-based global community of quality professionals) found that only 13% of US manufacturers use any smart manufacturing. Nonetheless, while some of these shifts may take longer to happen than predicted, the essential pattern of development is set. "The technology will change," says the World Economic Forum's Mr Marcus, "but we can already see where things are going."

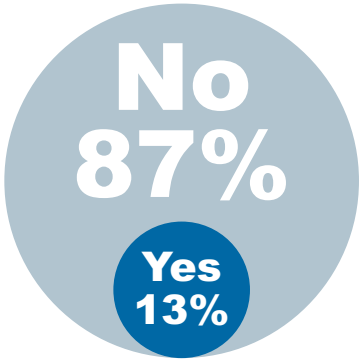
One implication of smart manufacturing is that although it may require fewer workers, they will need to be more highly skilled. As a result, emerging markets may lose the emphatic cost advantages they have enjoyed up to now. There are signs that this is already happening: computer maker Apple has thrived by designing high-end phones and computers at home in the US but having them manufactured in China. It recently opened a new manufacturing plant in Texas, but the move may be made cost-effective through massive automation.

Unlike the Internet and mobile technology, the growing automation of manufacturing may not be a rising tide that lifts all boats. Professor Erik Brynjolfsson of the Sloan School of Management at the Massachusetts Institute of Technology (MIT) says it will threaten an important source of growth and employment in developing economies but will not necessarily translate into better wages in the rich West.

He points out that productivity gains in the US are not being translated into better wages. Median wage levels have failed to rise in real terms as business investment is spent on machines, rather

Chart 3

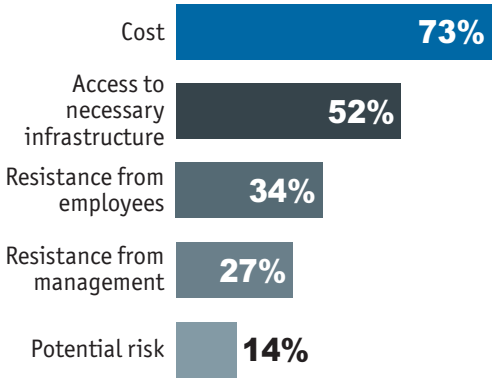
Q Do you use smart manufacturing systems at your organisation?
(% of manufacturers surveyed)



Source: American Society for Quality.

Chart 4

Q What were the challenges of implementing smart manufacturing technologies at your organisation?
(% of adopters)



Source: American Society for Quality.

than people, to improve productivity. Instead, the rewards have been concentrated in the hands of executives and investors.

Of course, economic metrics alone do not necessarily capture the total value created by hyperconnectivity. Professor Brynjolfsson points out that there are also benefits not caught by GDP and output figures—streaming a video or downloading a free book adds nothing to the economy but is a concrete benefit to consumers, for example. His research suggests that such intangible benefits add up to the equivalent of around one-quarter of a percentage point of GDP in the US—not an insignificant number in today's slow-growth developed economies.

Notwithstanding the as yet unpredictable economic impact of the Internet of things and smart manufacturing, on a macroeconomic level hyperconnectivity has been broadly good news. That will be scant compensation, though, to executives in industries that are being turned on their heads by the growing interconnectedness of everything.

2 Business and consumers in the hyperconnected economy

The list of industries that have been "disrupted" by hyperconnectivity is long and growing. The media, music and publishing industries have been at the sharp end of the trend. More than three-quarters of US consumers have switched to buying media online, either downloading from sites such as iTunes or buying physical books and DVDs from the likes of Amazon. A series of specialist retailers, from the music seller HMV to the movie rental chain Blockbusters, have hit trouble as a result.

Now the same threat of disruption is spreading to other industries.

The hotel sector is in currently in the cross hairs. The way travellers book hotels has been completely revolutionised by the Internet, with new middlemen such as Expedia and Hotels.com managing prices in response to demand. Meanwhile, new start-ups such as Airbnb, which allows private property owners to rent out their rooms to travellers, are challenging the very definition of hotel rooms altogether.

Established companies are looking to reshape themselves for the digital era. IHG, a global hotel group, is selling off its hotels and turning itself into a franchise operation, thereby capitalising on the value of its brand, rather than the property itself. The company is also working hard to find new ways to engage with online travel agents, who are increasingly the kingmakers in the industry. The example of the hotel sector shows that even industries that are solidly grounded in the "physical" realm are vulnerable to digital disruption. But it is not all doom and gloom: hyperconnectivity also allows companies to expand well beyond their traditional activities.

Indeed, according to David Lancefield, global economics and media partner at PwC, hyperconnectivity is blurring the boundaries between traditionally distinct business activities. A classic example of this is Nike Plus, the website and online services that complement the company's wearable fitness devices. The site and accompanying mobile apps allow customers to track activities such as how far they have run and join games encouraging them to exercise. In so doing, Nike is becoming a lifestyle adviser, not simply a clothing manufacturer.

For smaller companies and developing countries, the impact could be equally transformational. McKinsey's Mr Chui comments on the formation of "micro-multinationals", small and mid-sized companies that now have access to international suppliers and markets that were once the preserve of big firms. US-owned Bowers & Wilkins is a mid-sized company which makes fancy audio speakers, for example. It has been able to use the new connectivity to produce designs from its UK headquarters at a plant in China, allowing it to introduce a range of much cheaper speakers. Globalisation has become a reality for smaller, niche producers like this, in a way that would have been difficult even a decade ago.

In developing countries, information transmitted over mobile phones has allowed useful improvements to agricultural productivity, often the single biggest economic sector, as well as giving farmers and businesses a means of payment despite unreliable banking systems. In Ghana, for example, Esoko (formerly Tradenet)

collects data on everything from market prices to inventory levels and pushes them back through mobile phones to thousands of smallholders. This allows them to buy supplies more cheaply and sell their produce for the best price.

Examples such as this show that there are many new and exciting operating models for companies functioning in the hyperconnected economy, and that they do not necessarily require the most sophisticated technology. What they do require, however, is a sophisticated understanding of how hyperconnected customers behave.

Underneath any major economic trend lies a shift in human behaviour. For businesses that wish to navigate the hyperconnected economy, it is therefore essential to assess how that behaviour is changing.

Hyperconnectivity has not affected our social lives as much as one might expect. According to Grant Blank, a survey research fellow at the Oxford Internet Institute, there is no evidence that the new connectedness means that people have more friends or even a wider social circle. In fact, for all of the frantic networking via social media sites such as Facebook, academic research suggests that the average person still enjoys fewer than ten very close relationships and that the extent of their wider social circle has remained unchanged since medieval times.

There are some other major changes that few would have predicted more than a decade ago, however. For example, in just five years the Internet has become the main way of finding a date among people above university age, says Dr Blank.

Other behaviours that impact businesses more directly have clearly been shaped by hyperconnectivity. The obvious choice is the way we shop – the Internet has supercharged the market for home-delivered goods.

However, this should not be overstated. Shopping over the Internet is growing quickly in many countries, but it is still small compared with "bricks-and-mortar" retail. In the UK, one of the most developed e-commerce markets in the world, only three sectors have seen the Internet take more than half of the market, according to Statista, an online statistics portal: music and video, where the Internet had an estimated share of sales above 80% last year; books; and electrical. Other countries have been slower to embrace the net, and penetration rates can be surprisingly low: just 8% of US shopping is done online, for example, and the figure for some European countries such as Germany is even lower than that. In particular, people remain wary of using the net for groceries, one of the biggest retail sectors.

This is changing, and fast: a June 2014 report by Kantar Worldpanel predicts that the e-commerce market for fast-moving consumer goods will grow by 47% to US$53bn by 2016, by which time it will account for 5.3% of the global market (up from just 3.7% today). But the relatively small size of the market compared with traditional retailing is a sobering reminder that people will not change their behaviour immediately just because they can.

The impact of hyperconnectivity on commerce is not limited to the purchasing transaction itself, however. Not only are consumers in closer contact with business, they are also more connected to one another, thereby growing the bargaining power of the customer base. "People are forming Internet communities that have the clout to affect decision-making," says Stefan Haefliger, professor of strategic management and innovation at Cass Business School.

The effect of this growing collective bargaining power can be seen in the positive response by fast-food chain MacDonald's to online petitions requesting that it make its offerings healthier. It has subtly changed the nature of the relationship between companies and their customers and has changed the cultural environment in which all businesses now operate.

These changing dynamics of control also apply to the exchange of data. Data are the very stuff of the hyperconnected economy, but just as businesses are waking up to their potential value, consumers are becoming increasingly wary of how and with whom they share information about themselves.

A June 2014 survey of 15,000 people across 15 countries by EMC Corporation found mixed attitudes among consumers to privacy. More than nine in ten (91%) said that they valued the easier access to information brought by the Internet, but little more than a quarter (27%) said that they were willing to trade some privacy for greater convenience and ease. There were also some hints of concern about making their own personal data available. More than eight in ten (81%) expected their privacy to be eroded over the next five years, and just 41% said that governments were committed to protecting their privacy.

In fact, there is growing demand among consumers for the right to control what data any organisations might hold about them.

According to PwC's Mr Lancefield, over time people will demand more control over who has access to their data, when they can access them and for what purpose. "Digitally savvy consumers, particularly those in the 'net generation', are keen to capture and protect their data in one place," he says.

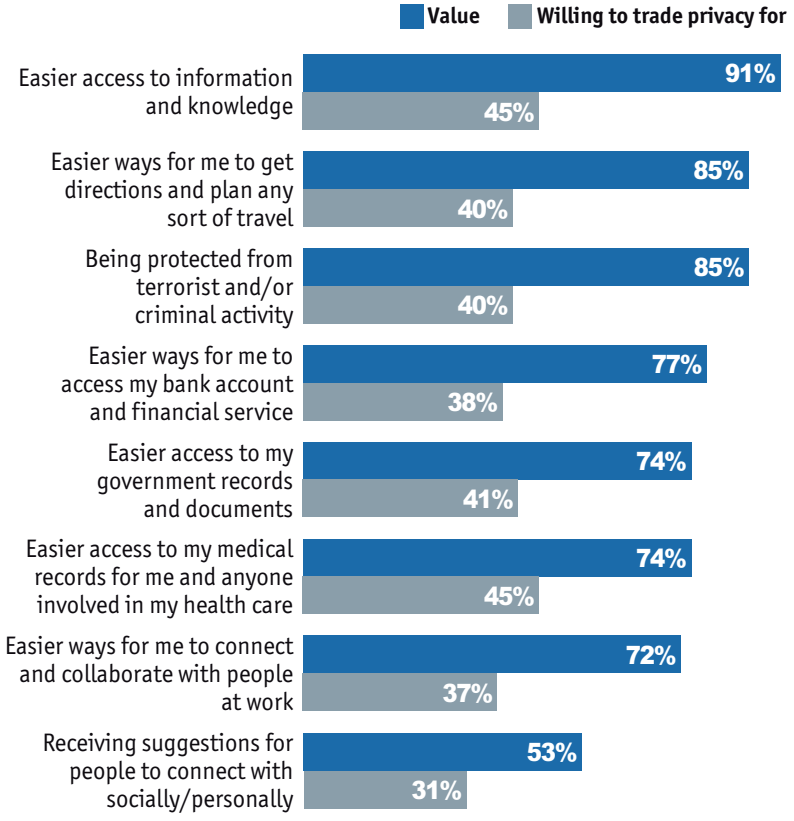
So-called "personal data stores", such as MyDex and Locker Project, are being developed to answer this demand and might allow consumers to redefine their relationship with sellers. That, in turn, will fuel a debate over who owns what data and how access should be regulated. Who owns the information from a car-tyre pressure sensor, for example? The car owner? The car manufacturer? The tyre maker?

This is a cultural evolution that is in progress. Social norms governing the use of data in business are being established today that may set the precedent for years to come, or they may continue to shift as technology advances. It suffices to say that companies must be sensitive to this evolution, as hyperconnectivity is not simply a technology trend – it is the cultural environment in which humanity will reside from here on out.

Chart 5

The value people place on convenience and their willingness to trade privacy in return

(% of survey respondents)



Source: EMC.

Conclusion

It is too early to accurately quantify the economic impact of the Internet, but there is no question that it has been and will continue to be enormous. The growing adoption of smartphones and the much-predicted Internet of things will only compound that impact. On the macroeconomic front this is generally good news, as hyperconnectivity looks likely to drive GDP growth in future. But for individual businesses, hyperconnectivity represents a new and unfamiliar environment in which they must operate, and there is a growing list of companies which have failed to adapt and foundered as a result.

That said, the example set by the unfortunate canaries in the coal mine, such as the media and publishing industries, has made it clear to businesses in all sectors that adapt they must. We have seen how sportswear brands and hotel chains are beginning to think laterally about their place in this new environment.

One thing that is increasingly evident is that hyperconnectivity is changing the power dynamics of the business-customer relationship. Where the balance will eventually lie, if indeed a balance is ever struck, cannot be predicted. For now, the challenge for businesses is to find their place in this new technological, economic and social milieu.

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