

Book Reviews

The Oxford Handbook of Information and Communication Technologies

Robin Mansell, Chrisanthi Avgerou, Danny Quah and Roger Silverstone (Eds)

Oxford, Oxford University Press, 2007, xxi+620 pp., UK£85.00, ISBN 978-0-19-926623-4 hbk

This most impressive OUP Handbook contains the work of 39 authors, including many who have made substantial and lasting contributions to our understanding of the social science of information and communications technologies (hereafter, ICTs). The book brings together work from anthropology, economics, philosophy, politics, psychology and sociology, and from those working in cross-disciplinary fields such as: communication, ICT, information systems, media and technology policy.

The book is organised into four parts. In the first (edited by Quah), there are seven chapters on the knowledge economy and ICTs; in the second (edited by Avgerou), there are five chapters on organisations, strategy and ICTs; in the third (edited by Mansell), there are six chapters on governance, democracy and ICTs; and in the fourth (edited by Silverstone), there are six chapters on culture and literacy in new media.

Many of the chapters are fine papers in their own right but I can't do justice to each in a single review. Rather, my objective in this review is to assess how the four editors have organised the Handbook as a whole.

One of the editors, Professor Roger Silverstone, sadly died before the book was published, at the much too young age of 61. I was privileged to work with Roger in the 1980s as one of a group of economists and sociologists who were researching the social science of ICTs. That was my first experience of interdisciplinary work—having been a plain economist to that point. Roger was an outstanding colleague: amiable and generous. My abiding memories of conversations with him are the sheer fascination (and sometimes, the frustration) of comparing the economist's and sociologist's very different views of the world. Indeed, since the authors say the book's objective is to be 'explicitly interdisciplinary', it seems very appropriate to examine how well the book succeeds in achieving that objective.

The review is in two parts: first, a brief reflection on the purposes of interdisciplinary work; and second, an assessment of how well the book achieves those purposes.

First, let us remind ourselves of perhaps the key reason why we need interdisciplinary work. To introduce this, let me remind the reader that in 1899, when he published his great work *The Theory of the Leisure Class*, Thorstein Veblen¹ was also the editor of the *Journal of Political Economy*. The former could be described as one of the great works in the sociology of consumption; the latter is one of the leading mainstream economics journals. Today, the idea that someone could write a leading work in the sociology of consumption and edit the *JPE* at the same time would seem extraordinary. Today, these are different worlds! But in 1899, they were not. This is, of course, an example of the division of intellectual labour that has emerged within academic work as indeed it has emerged within business. From Adam Smith² (1776) onwards, we have been well aware of the role the division of labour plays in enhancing productivity and wealth creation. But, at the same time, we need to remember that many writers from Smith onwards—Carlyle, Ruskin and, notably, Durkheim³—have written of the hazards of the division of labour for intellectual development.

Sometimes, when I meet business people and tell them I work on the economics of innovation, this is met with laughter. How, they ask, can I justify such a narrow academic specialism? Is this not, they ask, just another instance of the chronic ‘Balkanisation’ of academic fields and disciplines? My answer is, ‘no!’ Such a degree of specialism requires no more justification than the intricate division of labour found in large complex organisations. Specialisation enhances productivity and understanding in academic work just as it does in business.

Occasionally, however, there is a much harder supplementary question. In business, I am reminded, the fruits of divided labour are combined to make a final product or service. What, they ask, is the ‘final product’ of the academic division of labour? That is a *much* harder question to answer satisfactorily.

To see how business manages this recombination of divided labour, consider, for example, the computer on which this review is being written. This very useful final product derives from an extraordinarily complex international division of labour. I can speculate on the wide variety of different sorts of expertise necessary to create this final product, but I just don’t know the full picture and indeed I don’t have to. The very different experts who worked together to produce this computer managed to solve all their interdisciplinary issues well enough to recombine their divided labour so that they could produce a marketable final product.

How different from attempts to re-combine divided academic labour—especially, perhaps, in the social sciences! For much of our time as researchers, any thought about the compatibility of our work with that of our colleagues is limited to our place within our discipline. The question of how, for example, radically different sociological and economic perspectives can be reconciled is something we generally put aside as too difficult to deal with. Indeed, my experience of trying to publish any sort of interdisciplinary angle in some journals is that any references to work outside my home discipline must be removed before the article can be published—if, indeed, the inclusion of such ‘rogue’ references was not already grounds for outright rejection.

Most academics treat interdisciplinary work as a very low priority. Many see no virtue in it. And even those who believe it is very important in principle, are reluctant to devote much time to it in practice, because such work will do little to enhance their job security and advancement. The book’s editors are disarmingly honest about this (p. vi): ‘We understand that a handbook chapter is not necessarily at the top of the list of papers waiting for completion’.

This is not how it should be. If we cannot resolve the question of how to recombine our divided academic labour, then how can we expect research users to do so? Imagine how we would feel if the vendors of a computer tried to sell us a package including various different components, an operating system and various pieces of application software, and then said:

I'm afraid the different components aren't really compatible with each other because the different teams have such different disciplinary backgrounds. So it's really up to you, the user, to try to configure the components, operating system and software in some way or other so that they work together as a computer.

I suppose a few of us might be equal to the challenge; the rest would walk away in dismay and find another vendor.

If we are to rebut the charge that our academic division of labour is not just chronic 'Balkanisation', then we need as a profession to make it a top priority that some people, at least, will gain professional recognition from recombining the fruits of that divided labour. For this reason, the 'explicitly interdisciplinary' OUP handbook coming from a distinguished collection of authors is very welcome.

Now I turn to the second question I set myself at the start. How well do they achieve the sort of recombination that I describe above? To answer that, I have found it helpful to identify eight different features of interdisciplinary work and ask, how well does the book achieve each one? In the list that follows I have tried to put them in increasing order of significance: the ones at the beginning are easier to achieve than the ones at the end. Some readers may disagree with the order below; and in any case, it is wrong to think of interdisciplinarity as a *one-dimensional* measure: the fact that a piece of interdisciplinary work scores well on criterion k does not necessarily mean it scores well on criteria 1, ..., $k-1$.

1. Collecting papers from different disciplines in one book.
2. Each author makes their chapter accessible to a multi-disciplinary audience.
3. Different chapters are grouped along *thematic* (not disciplinary) lines.
4. Over-arching editor(s) bring(s) together contributions from *all* disciplines.
5. Each author makes connections to other papers from other disciplines.
6. Some papers are co-authored by contributors from different disciplines.
7. Some authors make substantial use of ideas from 'foreign' disciplines.
8. Evidence of *creative marginality* between disciplines.

How does the OUP Handbook perform on these criteria? In what follows, I may sound critical but actually, that is not my intention. Rather, I want to impress on the reader just how hard it is to be 'explicitly interdisciplinary'.

Criterion 1 is obviously satisfied. As I said above, here we find contributions from the disciplines of anthropology, economics, philosophy, politics, psychology and sociology. We also find contributions from authors whose job titles refer to fields, not disciplines, including: communication, ICT, information systems, media, science and technology policy, and others. So by any standards, that is a healthy mix.

Criterion 2 is satisfied in most cases. I found all the papers outside my discipline quite accessible. One possible exception is Chapter 5. Some non-quantitative or non-economist readers might find the mathematics of growth accounting and the

econometrics in that chapter a bit daunting. Could that chapter have been written without the maths? Probably, yes. Would anything have been lost in the process? Definitely, yes.

Does the book achieve Criterion 3—grouping of chapters along thematic (*not* disciplinary) lines? Yes and no. The chapters *are* grouped on thematic lines *but also* on disciplinary lines. The first part is mostly written by economists and the second part is mostly written by scholars from information systems. The third and fourth parts (edited by Mansell and Silverstone, respectively) are more heterogeneous and that seems commendable given the interdisciplinary objectives of the Handbook. Now, it is arguable that this disciplinary structure is inevitable given the thematic headings. It is arguable, for example, that only economists write about the information economy. Well, yes, that is arguable, but I don't think it is correct.

The four editors make a brave attempt to satisfy Criterion 4 and bring together all the contributions from all disciplines in one summary chapter. I know from experience how hard it is to write such a chapter. What the editors provide is essentially a sequential summary of each part, and then within that, of each chapter. It is very approachable but not really a cross-cutting synthesis.

Success in meeting Criterion 5—by which each author makes connections to other chapters from other disciplines—is limited. Even within each block of chapters (Parts 1–4) cross-referencing is limited. Turning to Criterion 6, we don't find much evidence of papers co-authored by contributors from different disciplines. Out of 24 chapters, seven are co-authored and the rest are single-authored. Of the seven, only two (or at most three) could claim to involve interdisciplinary collaboration. These are all in Roger Silverstone's part of the book—on culture, community and new media literacies.

Turning, to Criterion 7, on the other hand, several authors achieve interdisciplinarity on their own. The most impressive example of this is in the chapter by Chris Freeman. The reader is not surprised to find this master, with his encyclopaedic knowledge of ICT, embracing all of the following in his short chapter (17 pp. plus references): classics, design, development economics, journalism, law, linguistics, management, policy, political economy, technology management, philosophy, science and technology policy, sociology and strategy.

Finally, what of Criterion 8: *creative marginality* between disciplines? This concept of creative marginality is due to Dogan and Pahre.⁴ They argue that marginal scholars, who work on the boundaries between adjacent disciplines and/or fields play an especially important role in intellectual invention. Indeed, they went as far as to argue that progress in academic endeavour is often concentrated at the margins, where there is cross-fertilisation from one discipline to another. This is surely the hardest to achieve and perhaps a Handbook is not the place to look for it. In my own work,⁵ I have argued that this is most likely to occur when a single scholar spends much time straddling the boundary between disciplines and fields and cultivates the paradoxes that are found in such a marginal existence. It is unlikely to occur from a one-off combination of scholars from different fields in preparing a handbook. But undoubtedly, the material in this handbook will provide some immensely valuable ideas to marginal scholars in their quest for creative marginality.

Notes and References

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China Shakes the World: A Titan's Rise and Troubled Future—And the Challenge for America

James Kynge

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The title, *China Shakes the World*, is taken from a remark by Napoleon: 'Let China sleep, for when she wakes, she will shake the world'. It is the first book from James Kynge, who is a former China Bureau Chief of the Financial Times in Beijing and has lived in China for more than 20 years. Indeed, Kynge could claim to be 'Mr China': he is fluent in Mandarin and has the successful journalist's gift for telling compelling stories that catch your attention. The book's novelty and charm owes much to a journalist's eye for a good story and the 'story behind the story'. In the course of nine chapters, Kynge travels across China and the globe—visiting 'China connected' places in Europe and America—to look beyond the familiar headline-grabbing statistics and unearth surprising aspects of China's explosive growth. Unsurprisingly, the book has become a bestseller. In October 2006, it won the Financial Times & Goldman Sachs Business Book of the Year Award.

Kynge begins in Germany, where a dozen excavators 'pawed ponderously' at a huge scar of ochre earth 'as if looking for something lost' (p. 1). And something had been lost: Dortmund's ThyssenKrupp steel mill used to be the biggest in Germany: it once employed about 10,000 people. But the death of a steel mill in Germany was a step towards its rebirth in China: 25,000 tonnes of steel mill had been taken apart and shipped east, along with 40 tonnes of documents that explained how to put the thing together again. Like any dedicated journalist, Kynge followed his story and, a few pages later, he found himself on the lower reaches of China's Yangtze River, admiring the steel mill's new home and trying to get an interview with the Shen Wenrong, whose company—Shagang, meaning 'Sand Steel' (as befits a steel mill situated on the Yangtze's windswept alluvium beds)—had moved a steelworks from one continent to another. In the process, Shen had become a local hero for establishing heavy industry in an area where peasant farmers flooded from their villages to find work at the equivalent of around 40 cents an hour (p. 7).

Attempts to make an appointment with Shen failed, so Kynge visited him unannounced and talked his way to an interview. Why had Shen moved the steel mill 5,600 miles from its original home? Because: 'I needed a horse that would run fast and not eat much hay' (p. 9). When the next crash in world steel prices comes, Shen reasoned, his competitors who bought more modern, but expensive, plants from abroad would be weighed down with debt. Compared to waiting three years, while an order for new equipment is produced, buying a second-hand plant is cheaper and quicker. In China, few firms have the technology to make automobile-grade steel. Shagang has the edge and, as China makes more cars, Shen's strategy makes more sense.

In Germany, former ThyssenKrupp workers mourned the loss of their way of life and many assumed that one of China's state-owned enterprises had vacuumed-up their steel mill. But Shen is a self-made entrepreneur and his 'rags to riches' rise from peasant farmer to leading industrialist reads as if it were the plot for a movie. Moreover, the hardwork and industriousness of nearly 1,000 Chinese workers, who were dispatched to Germany to dismantle the ThyssenKrupp plant, made it possible to complete the job a year ahead of the schedule and a full two years ahead of German estimates of how long the work would take. Whereas the Chinese had worked 12 hours a day, seven days a week, the German steelworkers had aspired to a 35-hour working week.

Kynge's powerful prose blends considerable detail about the people whom he meets and his impression of their surroundings—fine brushwork—with big headlines, daubed in primary colours. Chapter 2, 'The Future is the Past (Except When It Isn't)', begins with a quotation from *Time* magazine journalists, who wrote in 1946 about China's wartime capital, Chunking, or Chongqing, as it is now called, 2,500 kilometres up the Yangtze River from Shanghai. References to Western writers, such as H. G. Wells and Mark Twain, are blended with Kynge's keen observations of what he sees on the streets of Chongqing. For example, an extended family celebrating a birthday party in a hot pot restaurant sang songs that were 'high-pitched and nasal, and the tunes jaunty' (p. 26). This is not the stuff of an average business book. It has impact. And Kynge's punch lines keep on coming. Chongqing is a burgeoning industrial city that symbolises what mass migration to the city might mean for tomorrow's China. Factories equipped with twenty-first-century technology are operated by people whose wages are comparable to the purchasing power of workers in Britain's Industrial Revolution. Production levels are soaring as Chongqing adds 300,000 new inhabitants per year. It is growing eight-times faster than Chicago grew in the nineteenth century, when America's trajectory of increasing economic influence invoiced the rise of superpower.

Chapter 4, 'The Ties that Bind: China Goes to Europe', finds Kynge in Italy. To be precise, he is in Prato, which is an old town in northern Italy, not far from the historical city of Florence. In many ways, Prato is a typical Tuscan town; but 20,000 of its 180,000 inhabitants are Chinese. For 700 years, Prato was the centre of the European textile industry—until the Chinese arrived and Italian textiles went to China. Fifteen years ago, China's economic migrants were welcomed as a source of cheap labour. Even illegal stowaways were allowed to become part of the local community. And the Chinese immigrants were quick to learn what it took to compete in the textile industry. The Chinese in Prato learnt from their erstwhile employers and established their own organisations that sold in Europe, but produced in China—where lower labour costs dealt them a winning hand. Paradoxically, Communist China had 'trumped' Adam Smith's famous 'invisible hand' of free-market capitalism.

When Kynge went to Italy's beautiful lakeside town of Como, which—since Roman times—has been famous for its silk, he came across another community of Chinese immigrants with connections that stretched back to China. In Como's case, the link went to the small town of Shengzhou in Zhejiang province, where—in the last seven years—the number of computer-controlled looms, which once gave Como silk the advantage in quality control, has jumped from eight to 670. The looms run all day and all night. Como's silk industry is in terminal decline: almost half of the world's silk neckties are produced in Shengzhou (p. 87).

A chapter later, Kynge landed in America's Midwest. Rockford, Illinois was prominent in the Cold War because it made equipment that was crucial to the functioning of the US military. Along with New York and Washington, it seems that the Soviet Union's nuclear missiles were targeted at Rockford (p. 104). But in the post-Cold War world, the military threat has moved away from Rockford. And the new global order's lasting legacy to Rockford could be outsourcing to China; notably in machine tools, which had once been the bedrock of the local manufacturing sector. Although many of those who have been put out of business (by China's ability to compete effectively in global markets) call for protectionist policies, outsourcing to China and other low-labour cost countries fits with the business plans of America's multinationals.

Perhaps Rockford misunderstands China's contribution to America? At the end of the book, Kynge gives an account of standing outside Rockford's Wal-Mart asking passers-by if they would like to say 'thank you' to Chinese workers for cheap goods that reduced the price of their shopping. But the people whom Kynge met on the streets of Rockford did not appreciate the benefits that China had brought to their lives (p. 225). Similarly, Kynge suspects that the sheer scale of China's buying of US Treasuries, which has contributed to lower American interest rates, is under-appreciated.

Roughly speaking, the first five of Kynge's nine chapters sketch the colossal and far-reaching implications of China's rapid economic growth. China has the fastest growing economy in the world and its current economic boom is bigger than anything that has ever occurred in human history. While much of China remains rural with a substantial part of its population living on subsistence wages, the pace of urbanisation is astonishing. Commerce has helped China to climb the technology ladder by copying or buying technology, while inward investors, lured by the potential of China's market, can offer opportunities for local partners to learn quickly (p. 114). Meanwhile, eastern cities such as Beijing, Tianjin, Shanghai, Shenzhen, Qingdao, Dalian and Xiamen are incubating the characteristics of a 'post-industrial' society. Clearly, the geographical space of China supports several distinct economies at dramatically different stages of development. Unprecedented economic transformation within the world's most populous nation has profound implications that shake both China and the world.

From elementary school onwards, Chinese pupils are told that the area of China is 9.6 million square kilometres and has been abundant in natural resources. But decades of rapid economic growth and its environmental consequences, along with the mismatch in the size of its population and its resource base are barriers to further expansion. China knows from bitter experience that failure to secure essential resources can have catastrophic consequences. Such concerns are deeply ingrained in the psyche of the nation. And the government tries to drive home the message to the public with its 'Environmentally-Adjusted GDP Accounting Report' and the 'Green GDP' document, which deducts the cost of natural resource

depletion and environmental degradation from traditional GDP. In 2006, 256.78 billion RMB, accounting for 1.23% of GDP, was directed towards improving the environment. Some polluters are being closed and more attention is being directed to recycling, conservation, and clean fuels. But progress with such issues hinges on politics and economics.

While Kynge's capacity to weave a web of stories helps to put the reader in the picture, when it comes to making sense of the implications of China shaking the world, one might wonder when stories will give way to analysis. How are we to make sense of such a colossal and complex phenomenon? What does Kynge think will happen next? What is the nature of China's troubled future? Can America meet China's challenge? Or does the degree of uncertainty militate against reliable predictions?

Chapter 6, entitled 'Not Enough to go Around: Natural Resources and Environmental Catastrophe', begins by taking us to an area that was once famous for mining. And Kynge's storylines cascade through a series of serious issues, from the horror of subsidence caused by mining to the geopolitics associated with the struggle to secure natural resources, air pollution and greenhouse gases. As always, the firepower is impressive and Kynge's elegant prose fires shots in many directions. If there were a target, he would surely have hit it. Yet, the lack of an underlying narrative is starting to show through. What is the Grand Plan? Which way is Kynge heading?

Whereas the first part of Kynge's book got his storytelling plane in the air with effortless ease, the pastiche of stories stops short of tackling the big political and economic issues head on. Can China's challenge to America be specified? Does Kynge have a flight-plan? Will the master storyteller land his plane at his intended destination?

Throughout the book, the quality of Kynge's storytelling is masterful. With consummate skill, he opens Chapter 7, 'The Collapse of Social Trust', by connecting the Golden Age of Chinese philosophy to a tragic story about identity theft. In turn, that segues into a series of stories about the way in which the practice of power is evolving as China changes. Along the way, there is news of a woman who hires another woman to test the loyalty of her fiancé. And there is a tale of stunning heroism when we learn how a former IBM employee, Liu Chuanzhi, overcame adversity to head Lenovo: the Chinese computer company that bought the personal computer unit of IBM for \$US1.75 billion (pp. 172–8). Kynge picks and blends his stories in a way that urges the reader on: the business genre has been reborn as a page-turner. It is hard to imagine a more readable collection of stories. But where can we find the real James Kynge? What does Mr China think will happen next?

Chapter 8, 'Communism vs. Democracy', and Chapter 9, 'Can We be Friends?', mark Kynge's attempt to reflect on what it all means. By Kynge's standards, Chapter 8's opening sentence is unusually direct. It sounds like a conventional business text:

Many of the weaknesses and deficiencies [of China] described in the last two chapters can be traced back to China's overarching contradiction: that it tries to run an increasingly sophisticated, capitalist economy with a political system that was designed to issue crisp commands from a single source of authority, and to be obeyed.

Is Kynge about to reveal his destination? Perhaps not, as his next sentence explains: 'This observation is not controversial, nor it is insightful; political scientists have

been pointing out as much throughout the era of reform since 1978' (p. 183). Rather than lead us to an answer, Kynge leads us to an expert.

In China, Cao Siyuan, who is also known as 'Mr Bankruptcy', is famous. Once again, Kynge draws the reader into his story. Personal details of Mr Bankruptcy abound. We learn what he looks like. We are told that he spent time in prison. And that he has achieved influence as one of the few people in China who were quick to appreciate what to do when capitalist models do not work. Moreover, Mr Bankruptcy, Kynge confides, has a taste for extremely expensive lobster—and, in the course of eating his lobster, Mr Bankruptcy offers the ultimate insight: 'When reform is too fast there is chaos' *but* 'When reform is too slow there is stagnation' (p. 186). China wants to have growth through reform *and* control. Yet, too much of the former comes at the expense of the latter. So there we have it: rapid growth and control are *not* mutually compatible. In changing China, yesterday is an unreliable guide to tomorrow. The complex forces that shape China's shaking of the world seem to make interpreting the challenge for America all but impossible. So, how will Kynge diagnose the challenge for America? Can America and China be friends?

In his now-familiar style, Kynge comes at the problem from an unexpected angle. He is in a taxi driven by a man from 'old Beijing': the radio is on and a comedian makes a joke at the expense of foreigners, but Kynge is not offended. Instead, he goes on to consider what 'being friends with China' might mean and reflects on the roles played by foreigners who have been treated as special 'friends of China'. And that leads to fresh topics, ranging from friction with Japan to grand opportunities—such as the Beijing Olympics—that enable China to present a friendly face to the world. Mr China's genius for demonstrating the multifaceted nature of changing China's interaction with a changing world is breathtaking. But he is strangely mercurial when it comes to alighting on the precise nature of China's troubled future and its challenge to America. What will the man who knows so much conclude? Ultimately, he ducks the challenge. Perhaps he is more Chinese than he cares to admit?

Kynge's vivid prose is dazzling. He has an uncanny ability to mix off-the-cuff observations with serious points. His obvious familiarity with everyday life in China gives him an insight that would be beyond the imagination of most outsiders. Chinese proverbs pop out of the text to add colour and credibility. The book deserves to be a bestseller—it is truly remarkable. Yet, the man who lives and breathes China chooses to hide behind the façade of his storytelling genius. What more might we have learned, if the narrator had dared to turn the spotlight on himself?

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Science, Technology Policy and the Diffusion of Knowledge: Understanding the Dynamics of Innovation Systems in the Asia Pacific

Tim Turpin and V. V. Krishna (Eds)

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China and India are seriously hunting down the USA as the world's premier economic superpower. Japan's economy, although in the doldrums for the past decade, is still extremely powerful, and other Asian-Pacific countries, even tiny Singapore, are running up growth rates that larger established economies consider with awe. The S&T basis of this growth is evidenced by the fact that China and the Asia-8 increased their US patents by 800% in the 14 years to 2003, and that, in 2000, Asia provided 30% of world R&D expenditure (p. 7).

The initial part of this growth, perhaps beginning with postwar Australia and Japan, and now latterly with China, was built on manufacturing growth. However, contemporary and sustained future growth must be tied to 'knowledge economy' industries such as ICT, nanotechnology, pharmaceuticals, and biotechnology. This book provides 12 case studies on the use of science and technology policies in the region. An odd omission was Taiwan given that the minnow Pacific Islands was included. The case studies are useful, although the quality is patchy, with some merely descriptive (usually written by government agency authors), while others provide significant analysis and description. Description includes data about R&D funding levels and sources, education outcomes, human resource levels, locations of research including universities and centres, published papers, and patents. There are 144 tables. Overall, the book provides a timely and thorough insight into the factors that produce economies capable of capitalising on the contemporary economic and technical conditions.

Fundamental to the book is the understanding that the national competitive approach to technology, innovation and development in the 1970s and 1980s is no longer appropriate. However, it is less clear what has replaced it. There is no single answer to this because historical development and contemporary conditions in different countries produce different optimum and actual outcomes. Despite the impact of increasing globalisation in innovation, finance, and dispersed production networks, it is evident that S&T policies are becoming more national.

The opening chapter provides a very useful overview of the Asian-Pacific situation. Firstly, the editors survey the S&T policies in the region since the 1950s including a description of the growth in Asian S&T output. Secondly, they consider the impacts of globalisation and global innovation. Significant among these is the tension between local intellectual property rights and the power of transnational business, and the tension between globalised knowledge systems and indigenous knowledge and needs (e.g. local plants and herbs in pharmaceuticals).

The most useful chapters are those dealing with Australia, China, India, and Malaysia. Australia, though representing itself as a globalised player in contemporary S&T, actually has a low level of S&T expenditure and of business expenditure on R&D, and an exceptionally high dependence on foreign technology, making it a low second tier innovation economy (p. 37). After the Labor governments of

1983–96 deregulated and privatised the economy, the following Howard government maintained an ideological commitment to low government involvement in the economy. Its policy was to provide ‘an economic climate in which innovation can thrive’, yet it reduced tax incentives for business R&D. Garrett-Jones concludes that the Howard government’s innovation policy was inconsistent and meagre. Its ideological commitment to small government has also weakened Australia’s science base, the pure research source of new technologies. In all, it appears that Australia’s new Labor government needs to seriously reconsider its education, science, and technological innovation policies if Australia’s performance is not to falter.

China, of course, has undergone the most dramatic transformation because of its transition to a market economy within a communist political state as it undergoes its industrial and postindustrial revolutions. Analyst, Zhang, concludes that the industrialisation success masks the fact that ‘China’s national capabilities are still relatively weak and fragmented’ (p. 188). Nonetheless, there appear to be hopeful signs. S&T funding has not only increased, but has shifted its source from central government to industry. As well, foreign direct investment is increasingly enhancing innovation. China’s science citations moved to 8th in 2001, although most of these are from the government sector. Still, Zhang concludes, this activity has not led to a significantly improved quality of innovation capabilities. The advice is that China needs to bridge the gap between the market and innovation resources, nationally integrate innovation resources, become more environmentally aware, develop regimes to protect IP, and enhance the quality of human resources.

In a sense, India is the Ireland of the Asian–Pacific region because it is now reaping the benefits of a culture committed to a strong educational base. This may seem an odd statement about a country with the largest number of illiterates (300 million) in the world and which is ranked 126th out of 177 countries in the Human Development Index (according to a 2006 UNDP Human Development Report). From the time of independence in 1947, India set about developing an infrastructure for S&T. A quarter of a century later, India re-thought its direction by considering indigenous technology capacities and the possibilities for the newly emerging biotechnology and ICT industries. Then, in the 1990s, adjusting to the new liberal economic order, India incorporated foreign direct investment and greater industry involvement into emergent industries, while moving away from its reliance on the advice of an older bureaucratic elite who had developed and implemented the previous policy. Although India has a substantial human resource base, its higher education sector surprisingly has not produced strong numbers of doctoral level R&D researchers and its citations have fallen relatively. Like the Irish, the Indians have produced an enormous intellectual diaspora. Because a major overseas location has been Silicon Valley and Route 128 in the USA, an informal socio-cultural S&T network is now in place. Although India’s political-economic framework has adjusted to the new neo-liberal framework, Krishna concludes that there is still an important role for state mediation.

Malaysia doesn’t often figure in discussions about economic and S&T success. Yet, since independence in 1957, it has established itself as a strong middle income country. Its population of 24 million produced an average USD14,400 per head in 2007. In a sense, it has performed like Australia in trying to move from its natural advantage in resource exports (palm oil, oil, tourism) to a higher value-added technology based economy. It has strong foreign exchange reserves and little external debt. Its government is now trying to regionalise business investment to

help boost economic sectors. Its 2020 plan sets full industrialisation as its target. This impressive development has not been the result of laissez-faire economics, as Din and Krishna show, although the government has since 2001, particularly, adjusted to globalisation and liberalisation. Beginning in 1966, the Malaysian government has established a series of economic development plans. From the early 1990s, the government set out to strengthen technological capabilities and the pure science base with its Sixth Malaysia Plan, and then doubled its S&T funding in the Seventh Plan. However, there are still concerns about Malaysia's capacity to fully exploit its S&T potential requiring policy adjustments. These include increasing the modest level of investment in R&D; developing human resource capacity in R&D, estimated at 25% below the appropriate level, and management; increasing Malaysian companies' R&D investment; and incorporating bottom-up indigenous content.

There are, of course, interesting findings in other chapters apart from the ones highlighted. For example, the fact that the Philippines SMEs are largely family owned has not produced a culture that is conducive to R&D nor does it make them adaptive to global trends. A sub-theme throughout the book, not explicated by the editors, but occurring in four of the chapters is the significance of, what Nelson refers to as, the 'scientific commons'.¹ Essentially, Nelson argues that privatisation and markets are encroaching on the scientific commons, and that this will ultimately squeeze the source of university-based pure research. This is not an issue that has been addressed within the neo-liberal and neo-classical economic hegemony that we currently live in, but may be a source of future tension.

The authors draw a number of significant conclusions. First, globalised production networks and innovation hubs provide profound challenges for developing countries. Second, technology is developing not only with global scientific advance, but also local factors. Third, universities are becoming more integrated into national S&T development. Fourth, governments are moving from a 'pick winners' approach to an 'enabling technologies' approach. Finally, national innovation systems are both outward oriented in response to globalist pressures and inward oriented to develop productive technologies in particular national sites.

This is a timely and useful book because it provides a thorough insight into the factors underlying the success and occasional failure of Asia-Pacific countries in developing appropriate S&T policies within the context of our contemporary shifting political economic order.

Notes and References

1. R. R. Nelson, 'The market economy, and the scientific commons', *Science Direct*, 33, 2004, pp. 455–71.

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Getting to Big the Small Way

Frank Prestipino

New York, USA, McGraw-Hill, 2008, xi+322 pp., US\$24.95, ISBN-10: 007148440X, ISBN-13: 978-0071484404 hbk

High performing corporate stars often write books. Stellar nostrums surf on a *tsunami* of grand plans, great insights and gigantic changes. Everything is heroic and—if you accept advice from a hero like them—everything will be wonderful. Prestipino's book differs. His heroic feats do not appear centre stage; rather the seeds of success dwell in the detail of ordinary people's everyday thoughts and actions—the differences that 'make a difference' have small beginnings.

After introducing his pragmatic approach, Prestipino offers readers one chapter of simple, thoughtful and actionable activities that could, he suggests, be added to whatever planning a company already does. As the story unfolds, tactics for tackling the 'small' things that matter so much become apparent. The approach situates current research and known approaches with stories: it is easy-to-read and replete with examples of what works in practice—'small' comes first and 'big' is a relative concept.

Prestipino's book is of relevance to the readers of *Prometheus* for two interrelated reasons. First, Prestipino's frame of reference is both technical and technological. Second, his practical account is grounded in significant practical experience. He has been vice-president of Oracle's Global Enterprise Applications Strategy, UnicornHRO, a vice president of SAP and technical executive for Coca-Cola. In late 2007, he became head of a private Australian university. While his successes are recognized in numerous accolades, the significance of Prestipino's track record stems from his stamina in the face of adversity. He is not an itinerant guru who proclaims 'what ought to be' before departing for the next challenge, but a person who lives with the results of his actions. His contributions include 10-year stints in organizations; demonstrating a commitment in industries that are renowned for staff turnover, change and transition.

Sticking around long enough to live with longer term consequences of things done in the name of leadership seems to have nourished Prestipino's refreshing willingness to be sceptical about mainstream management theory and fashionable 'solutions'. From the outset, he refuses to accept that many issues facing senior executives are of 'strategic significance'. Such thinking can 'oversolve problems', bewitching the intelligence of bright people with a never-ending search for 'strategic fixes'. Fixes that might involve the wholesale slaughter of coherent thinking: the implementation of 'rip and replace' visions and recurrent launches of the next big idea. Fixes that fuel confusion, exhaustion and anxiety feed on the soul of what is precious. The proposed alternative is a focus on small changes to amplify and cultivate what already works.

Prestipino's point of departure rests on two observations about organizations. First, the process of discovery, to develop a business and gain financial return, usually entails little effort and cost. Second, deeper studies of radical corporate achievement reveal, he says, relatively small alterations that snowball. The book neither promises a 'one size fits all' set of solutions nor that big changes to core business areas will be, forever, out of the question. Rather, small changes 'eliminate a lot of unnecessary work that amounts to very little' (p. 2). Prestipino systemati-

cally addresses the ‘how’ of making small changes in an organization with the goal of achieving big results. Three recurrent themes are intertwined in the plot for big from small.

Three Themes: One Message

First, ‘small tactics’ oblige people to be intimate with practice. ‘Knowing when to engage’ (p. 29) involves a subtle mix of timing, problem apprehension by those ‘who are doing the actual work’, and their role delineation within a strategic frame (p. 33). The author promotes incremental change and improvement reminiscent of widely known total quality management approaches. Yet, the similarity ends there: the platform for *Getting to Big* is profitable growth *not* quality. Helpfully, Prestipino distinguishes his ideas with a parallel discussion of current practice, thinking and industry research, including, in this case, Six Sigma, TQM and *Kaizen*. With some 30 years business experience in Australia and America, the strategy and practice of small tactics resonate with largely individualistic organizational cultural configurations.

The second emergent thematic is that of permission. At different junctures, Prestipino questions conventional leadership’s quest for new horizons and emphasizes its unintended effects, such as fear, disempowerment and withdrawal. He suggests that to reverse stymied situations in organizations—involving blinkered, silent and partial engagement with the status quo of practice—members need permission from management to engage in the day-to-day creative achievement of corporate objectives:

I bet that if you asked 10 different people who work in your area to name something that they do that seems futile, protracted, or just plain nonsense and that they can’t justify ... you’d get an immediate answer from each (p. 177). ... They [employees] have the right and the authority to use their intuition and creative ability to make (p. 199) something work better (p. 200).

For the manager made nervous by free-for-all change at an employee’s discretion, control mechanisms are also discussed. Yet, control mechanisms gone wrong block the creative flow and lead to the ‘bottled up idea’.

Prestipino’s third theme suggests that organizations inadvertently cork the bottle of vibrancy that people bring to work. These ‘organizational stoppers’ stem the flow of initiative.

Employees today can bring a wealth of experience to their jobs, but they are sometimes hesitant to stray away from the instructions, procedures, and policies prescribed by legacy processes ... With job insecurity on the rise, employees are pulling back from making any suggestions for fear of sounding negative or going against proven methods or abandoning the Employee Handbook (p. 26).

Prestipino puts his point plainly: organizational stoppers have to be unstopped—but effective unstopping relies on the skilled judgement of those who are intimately involved in practice. Prestipino’s ‘small’ tactics specify the release of the organizational stopper at top, senior and mid-level management levels by the communication of strategic objectives and the corresponding enactment of

permission; those intimately involved in specialized practice make changes that will enhance performance objectives.

For those familiar with the principles of knowledge-based strategy, the notion that long run firm performance is derived from an internal focus on organizational resources, the weight of the three wise themes becomes manifest. Taken together, the three themes of the book could spell discomfort for the complacent: organizations are their own worst enemy. As top, senior, and mid-level management become obsessed with strategy, the opportunities for growth in the vital details of daily practice are variously neglected, overlooked or ignored.

Clearly, organizations depend on the skill, experience and expertise of their employees. Yet, vital aspects of what employees 'know how to do' is often *unknown* to those in top, senior, and mid-level management. So, how might those in charge secure the intelligent cooperation of those who 'do the doing'?

It's Obvious! To the Right Kind of Fish

Overlooking the obvious is easily done and a story encapsulates this idea with small thoughts that provide an example of big results. A fully loaded truck had become tightly wedged underneath an overpass. The vehicle blocked highway lanes as cranes and tow vehicles tried, unsuccessfully, to free it without further damage and delay, then:

After several hours, a 13-year-old boy ... yelled out to the engineers below, 'Let the tires down'. They did so and after the tires were deflated, the truck was able to roll gently and safely out from under the bridge and out of the way. This simple story captures the essence of what thinking small is all about. It is not about approaching a problem by looking for that groundbreaking revolutionary new idea that changes everything. It appears as a blinding flash of the obvious—but only after the fact (p. 61).

Of course, it is easy when you know how. But many businesses that get stuck cannot make sense of what is sticking and why. If only organizations could see things in simple terms—let their tires down, reverse and find another route. Metaphors might point the way to new possibilities: being able to see one thing in terms of another can make everything so much easier.

Perhaps it would help, Prestipino (p. 151) ponders, to consider the anablep: a Caribbean surface-dwelling mudskipper fish with unique, double-focus eyes that can see up into the air—where predatory birds might swoop—while looking down in the water for food. Compelling advantages might follow from organizational ontogenesis that allowed a double-focus on competitors *and* 'what the organization could do': a chance to feast and prosper without being eaten?

Prestipino's piscine perspective on people—and the need for business to constantly and creatively evolve and develop innovative practice—could, however, get a second outing with reference to the bioluminescence of non-tetrapod chordate fish, which can produce light where there is none. Deep-sea bioluminescent fish live in twilight oceanic regions, the abyssal and hadal zones, between 2,000 and 7,000 metres below the ocean's surface. Such fish create light in order to see in their pitch-black world. And similarly dark regions can emerge in the murky depths of organization—where bioluminescent individuals, who have the creative skill and will to 'see what matters', flourish.

A Wealth of Detail

But fish are merely one detail in the complex organizational picture. Chapter Eight of Prestipino's 10 chapters, catapults the preceding 202 pages into actionable steps for strategy. The clarity and flow of this chapter square off the author's experience with coaching and driving senior level management to devise and implement business strategy and planning. There may be little that is unique, conceptually; however, the tools and frameworks reflect rigour (metrics) and relevance (specificity) and their compilation is both creative and cohesive.

With the comprehensive vision of the anablep, Chapter Nine is holistic. Values in the organization and their expression in individual action are central to the discussion—as would be expected in a book that makes sharing knowledge demonstrably important. The chapter articulates a key to implementing the small tactics given in the book

The fundamental difference between making big changes and making small ones is that small changes come from the ground up and need to be managed from the middle (p. 251).

In this assertion, Prestipino echoes views such as Nonaka and Takeuchi's middle-up-down approach.¹ However, the common problem of mid-level management resistance in gaining greater participation at lower levels of the organization is not a part of the discussion (see, for example, a detailed treatment in Buckman²).

Chapter Ten continues the metric theme with 'the measure manage cycle'. Consistent with the activity focus on precise and measurable tactics in preceding chapters, there is a balanced scorecard formulated for small tactics. The chapter has simple step-by-step forms and sufficient explanation of each measure (financial, customer channel partner, knowledge sharing and business work flow) and component parts to allow implementation. To end the chapter and the book, Prestipino gives a detailed list of metrics that are specific to customers, sales to customers, marketing to customers and distribution channel partners with customers.

Brilliant Bioluminescence?

The book's contribution is in the practical steps to what is otherwise known as strategy for knowledge-based business; strategy in *Getting to Big the Small Way* is entirely demystified, made enticingly accessible and is complemented by an array of tools, frameworks and metrics. The book is quite long. It is neither repetitive nor meandering. Prestipino is a storyteller and, most of all, one who does not offer glib, trite quick fixes. What we do see, however, is that leadership is a set of skills that can be learned, practised and improved upon within a team where each member has a full part to play. In the dark art of management, Prestipino stands apart from the flashy but ephemeral world of guru-inspired fashions. Small is the oxygen of sustainable incandescence. It flows from many sources and bathes the creative in a glow of collective limelight.

Notes and References

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2. R. H. Buckman, *Building a Knowledge-Driven Organization*, McGraw-Hill, New York, 2004.

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Nylon and Bombs: DuPont and the March of Modern America

Pap A. Ndiaye (translated by Elborg Foster)

Baltimore, MD, Johns Hopkins University Press, 2007, US\$45:00, ISBN 978-0801884443 hbk

This splendid book sits in the 'Studies in Industry and Society' series, which is edited by Philip Scranton. It is published with the assistance of the Hagley Museum and Library and, for this entry in the series, the Center for the Study of the Book (part of the French Ministry of Culture). It is beautifully produced and presented, and fluently translated from its original French. Its organizational centre, DuPont (or E.I. du Pont de Nemours and Company), is a remarkable organization—founded at the instigation of Thomas Jefferson in 1802 to manufacture gunpowder, surviving through the nineteenth century as an artisanal producer, re-made in the late nineteenth and early twentieth centuries as a mass producer and chemical industry innovator, then grown into perhaps the most significant component of the US military-industrial-state complex. It is perhaps true that any organization that has survived more than 200 years is likely to be culturally significant, but DuPont has more claim than most to have affected our everyday lives, through its domestic products, managerial and accounting innovation, and its engagement with military technology. The analysis covers the internal operations of the company, responses to product markets, competitor interactions, interfaces with political and regulatory environments, and its presentations to society. DuPont is, according to this author, a 'huge production machine, a knowledge magnet, a circulator of information, and a center of gravity in the network structured around the two poles of the market and state' (p. 4). It also, as can be seen from its Internet presence (e.g. <http://heritage.dupont.com/>), intervenes in significant ways in organizational history making.

Ndiaye's narrative is introduced with a sketch of how nylon signifies the high-water mark of US production and consumption in the 1950s, noting that 543 million pairs of nylon stockings were produced in 1952, providing every post-pubescent female in the country with between 9 and 10 pairs of stockings per annum. All of this, while protecting citizens from any overseas nuclear threat and set in a context of unprecedented social harmony. In short, the US had constructed the world's first large economy based on consumption and, being on a war footing, combined prosperity with security. Clearly, from our current historical position we are able to identify the seeds of subsequent difficulties that production and consumption would fuel through the 1960s and beyond, and the social harmony proved to be very fragile; but it is always worth emphasizing, as this book does, the remarkable optimism felt at that point in time.

In exploring how and why nylon and bombs underpinned the rise of the US as a global economy and military power, this book focuses on that single organization, DuPont. DuPont provides the perfect organizational and industrial setting for detailed examination of the cultural ramifications of mass consumption and the roots of what, thanks to President Eisenhower's farewell address in 1961, we have come to know as the 'military-industrial complex'. Ndiaye's account continually focuses on the interplay between DuPont as a commercial organization, DuPont as a marginal-yet-integral part of US and other governments, and DuPont as innovator and developer of military technology. While many of us are familiar with DuPont's synthetic fibres and non-stick coatings, fewer will be aware of the organization's involvement in producing dynamite, poison gas, and plutonium (the latter providing the foundations of the US-based Manhattan project in the 1940s). It is this gap, between everyday understandings of DuPont and its products and the profound involvement of the company in modern warfare, which provides the central discussion of Ndiaye's book.

The analysis also brings employees out of the shadows. As numerous historical accounts of key modern organizations demonstrate (Unilever and ICI being the most prominent British examples), it is all too easy to exclude actors below senior executive or managerial level. Ndiaye avoids this with ease, in particular through his account of the beginnings of DuPont and the importance of chemical engineers to the organization and its products. He argues that they brought their company into the public square, their professionalization (in large part through founding the American Institute of Chemical Engineers and working with universities to promote the nascent discipline, along with dismantling of the 'workshop culture' of previous generations of chemical industry employees in the US) in happy coincidence with technological development in the chemical industry. In so doing, the narrative traces the social and academic shifts that chemical engineering (initially 'industrial chemistry') underwent, moving from an apprenticeship-based empirical 'messing around in labs' model to a greater reliance on theoretical, university-based experiments.

This is an essentially linear chronological account, despite the occasional excursion. Sources and historiography are relegated to the Appendix, similar to accounts of methods in organizational ethnographies; hence, the book responds to both academic and slightly wider audiences. The story also reflects classical ethnographies in another way, in that it does not reflect post-structural or reflexive historiography in any way that I could find. The book moves towards its close with an account of DuPont's most dangerous moment, in the 1970s, when the organizations and its products experienced something of a fall from the grace and glory of the 1950s. According to the slightly caustic author, changes in perception of DuPont could be traced to the social realization that nuclear technology was in fact somewhat dangerous and nylon was not very comfortable or attractive.

Despite what might be seen as theoretical or historiographical conservatism, Ndiaye's book is an important contribution to re-visioning management and organization studies. As Bill Cooke argues in a key contribution to our collective understanding of management studies,¹ histories of management tend to exclude 'uncomfortable' or awkward aspects of the development of managerial techniques and ideas. Thus, Cooke demonstrates through presentation of a *prima facie* case and theoretical argument, slavery ought to be given significance in the establishment of what we understand today as management. The discomfort we feel with this must not preclude its recognition; indeed, acknowledging the sometimes

distasteful or unethical roots of techniques and ideologies in use today can help challenge denial or wrongful exclusion. Ndiaye's account of DuPont, while very different from Cooke's writings on slavery in both style and substance, may be seen as ensuring that we do not passively neglect or actively deny that the organization responsible for benign, useful products such as nylon and lycra, also bears responsibility for such 'miracles of science' as chloroflourocarbons (the CFCs that have done so much damage to the ozone layer) and numerous means of making war more 'efficient'. Overall, a highly recommended book for undergraduate, post-graduate and further research uses.

Notes and References

1. Bill Cooke, 'The denial of slavery in management studies', *Journal of Management Studies*, 40, 8, 2003, pp. 1895–918.

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Open Innovation: Researching a New Paradigm

Henry Chesbrough, Wim Vanhaverbeke and Joel West (Eds)

New York, Oxford University Press, 2006, xvii+373 pp., US\$125.00, ISBN 978-0-19-929072-7 hbk

Protecting ideas and technologies has come a long way since late-eighteenth-century moves in America to bolster the rights of individuals and businesses to protect their works of art and other innovations via patents. Despite periods of neglect, the past few decades have seen patenting come back with a vengeance, not just in the sheer volume of lodgings but also in the willingness of governments to assist in prosecution to protect those forging new research domains. The 1980s Polaroid vs. Kodak case (which saw a US\$900-million payout, along with an overnight monopoly for Polaroid and Kodak being forced to cease sales of 'Instamatic' type products that breached Polaroid's innovation boundaries) highlighted how Patent Law may play a powerful role in 'capturing' the rewards of innovation. Conversely, damage could arise from the inadequate specification of boundaries and sharing arrangements for knowledge and technology.

Enter into this field the notion of 'Open Innovation': a new research domain in its own right that Henry Chesbrough and his broader 'open network' of researchers are pioneering as a paradigm to explain some of the seismic shifts occurring in approaches to R&D and innovation. Open Innovation can broadly be defined as '... a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as they look to advance their technology' (p. 2). If R&D were outsourced in the way that manufacturing was 20 years ago, innovation might be more effective. The spectacular percentages of unused patents, along with other forms of intellectual property, sitting on dusty shelves of corporations could be seen not just as wasted opportunity, but also as

potentially damaging to the long-term health of the 'sub-optimal' innovating firm or institute. Open Innovation may be innovation on steroids—if handled effectively, it represents a distinct break from the traditional 'vertical integration' model, where innovative products or services are the result of internally developed business mechanisms stemming from the organization's internally driven and executed research.

As technologies and markets grow in complexity and size, the ability of successful firms to invest in, and keep up with, these shifts is 'increasingly dependent on the influence [they have] over assets outside [their] own boundaries' (p. 270). The problem, as identified by a contribution from Vanhaverbeke and Cloodt, is a lack of comprehensive framework and general guidelines about how to manage the process successfully. Their work looks across fields and business sectors to see where Open Innovation has succeeded, while reviewing what research has yet to be performed to more comprehensively understand and define this newly emerging field.

Chesbrough, Vanhaverbeke and West's edited book will appeal to, what could be called, 'innovation anthropologists' who research the subject, along with practitioners who craft and hone business plans and models with regard to a centre-of-stage focus on innovation—and perhaps those sceptical planners who relegate innovation to a back-stage role. The book itself suggests that its main contribution is to scholars looking at the domain of innovation, which somewhat meekly understates its use and value. Possibly, because of Chesbrough's own background, at the University of California at Berkeley's Haas School of Business and his earlier work on Open Innovation, the book has an authentic flavour that could be savoured by those who manage innovation. Its 'business academic' approach has a welcome focus on applicability and contrasts with overly theoretical treatments innovation—of the type that risk being overlooked by even the most intrepid theoretician. It builds on earlier works by Chesbrough and generates a tractable path into new territory that points the way to further research, while providing practical advice for managers.

There are 15 contributors, mainly from academic institutes based across North America, with some connection into European institutes (Technical University of Eindhoven, Rensselaer Polytechnic Institute, Helsinki University of Technology, Copenhagen Business School) and one contribution from the business field by a manager from Nokia Multimedia. Although already 'international' in nature, the addition of Asian contributors might have provided some of the missing links for supporting subsequent developments of the Open Innovation research agenda.

The book is designed as a compendium of ideas and authors and, quite understandably, jumps—from semiconductors and related IT to agribusiness and manufacturing—to chart diverse examples of Open Innovation in action. Chesbrough organizes the book with the help of a clearly articulated introduction, which includes his claim for a paradigm change in action, down to making Kuhnian allusions to resolving some 'anomalies' in innovation research ('spillovers' and intellectual property management should be explained more effectively). The book has a comprehensive bibliography and index that make it an easy-to-use reference document for those engaged in related research.

While firm-level successes outlined in this volume clearly confirm the case for Open Innovation being both alive and kicking and delivering tangible outcomes for firms and research institutes alike, more attention to failures might have been useful. Learning from failure could bolster the case for implementing Open

Innovation more effectively—for example, by drawing attention to the need for care, planning and a healthy degree of paranoia.

The book builds the case for a new paradigm. Reference to mergers and acquisitions and ‘shark attacks’ on smaller, innovative takeover targets by larger or better-resourced entities is part of the picture—thereby building on tactics might not have changed all that much since Genghis Khan was recruiting volunteers on the Mongolian plains. At the individual and firm level, the book explores business-planning’s use of patents, joint ventures, acquisitions, non-equity alignments, licensing and contracting, as well as ‘open standards’ utilized across industry sectors. Soft, cute things, such as innovation and chatroom websites (operated by organizations such as 3M, Procter and Gamble, and Intel) are akin to deep-sea dragnets harvesting all manner of digestible and thoroughly indigestible ideas and innovations. This ‘gathering’ sits side-by-side with ‘hunting’ activities, such as venture investments, university liaisons and ‘SME takeover targeting’—all of which could be powerful weapons in the arsenals of medium and larger firms that seek to survive and triumph on the innovation battlefield.

In mapping the territory for Open Innovation research, the book distinguishes different participants in the game, ranging from individuals and firms to ‘dyads and networks’ as well as regional and national/governmental agents that all can play either positive, neutral or negative roles in the future success of successful Open Innovation. This mapping process, along with the development of ‘value constellations’ and other new terms, reveal a new language and a new research field.

This book sketches out, and for some business sectors confirms, that there is more to being a significant player and leader than a simple reliance on the traditional principles of sound business. And those who do not take this point seriously risk being swallowed by organizations that have determinedly evolved behaviours that are developed from a fundamentally different genetic code. Establishing Chesbrough’s paradigm involves placing Open Innovation at the heart of the business model; it is not an optional, add-on after-thought. While some managers in the public domains, who are already comfortable with ‘open sourcing’ and the ‘innovation commons’, might scoff at the simplicity of this call to arms, a closer look may reveal that few institutions have truly heeded the lessons of Open Innovation.

A regular critique of the Open Innovation model suggests that its applicability is limited to the soft and high tech areas of ICT (Information and Communication Technologies), together with knowledge areas inherently based upon open and cross sharing arrangements between institutions or business units—which might be the case. Certainly, the best examples of Open Innovation appear to come from these sectors. Nevertheless, the book does attempt to forage further into some other fields (e.g. agribusiness and manufacturing) to highlight that the model has both a broader applicability and needs to be taken seriously by *all* business planners irrespective of their sector, lest they become prey to competitors who have taken the Open Innovation domain seriously.

Conceivably, the book achieves two outcomes for two separate but related audiences. Firstly, by providing case studies that sketch the dimensions of success, replete with details of the tools and techniques used by winning parties, it lays out a possible pathway for others to emulate or use as a basis for learning in their own circumstances and sectors. Caveat emptor being the optimal warning of course, as the terrain is both largely uncharted, unpredictable, and with no warranty that one’s move to Open Innovation practices will be better than persevering with a

‘non open’ innovative stance. Secondly, and specifically related to this very fact, the book has charted out a large swathe of unknown coastline, replete with small passage inland waters, swamps and reefs—future researchers should be fascinated for some years to come.

One of the greatest challenges is clearly to chart and understand new Open Innovation business sectors, such as manufacturing and the services sectors, where business models have traditionally been built on proprietary and exclusive approaches to maintaining the innovative lead in the sector. As pressures grow on such sectors to deliver massive projects, which dwarf the abilities of even the largest firms, Open Innovation may play a major role in rethinking business models. More research and carefully documented case studies might encourage even the least intrepid business manager to wade into waters once viewed as hostile to their realities and needs.

Open Innovation has noted shortcomings and the book’s regular references to ‘more research needed’ or ‘another research domain and need identified’ (the book after all did at the outset state that this was going to be the case) underscores the field’s young, evolving and very uncertain nature. Any innovator, manager of innovators, or researcher of the field recognizes this as par for the course. And the book’s tentative nature can not only be forgiven, but also recognized as part of the process of navigating crosscurrents in the torrential and unforgiving rivers of ideas that may eventually contribute to successful products and services. An eager audience must surely await a more researched, internationalized and finely honed addition to the Chesbrough canon.

Open Innovation is a brave new paradigm and there are challenges. Some sectors do not fit so comfortably with Open Innovation models. And open ideas might not diffuse so easily in some regions—for example, where government policies militate against openness. Innovation of course has never been for the weak hearted, nor the poorly resourced or networked, and this will equally hold for those who work on tomorrow’s innovations. But one gets a clear sense that, if Chesbrough and his broader network of innovation researchers have anything to do with the subject, innovation anthropologists and practitioners alike should definitely look forward to future instalments.

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