(*Prometheus*, forthcoming)

Productivity and Organisational Transformation: Optimising Investment in ICT

Ovum

Canberra, National Office for the Information Economy, 2003, 192 pp., ISBN 1 74082 019 3

Reviewing this publication is uphill work. Even finding who wrote the thing requires searching the Internet. It transpires that the authors are Steve Burden from the University of Technology Sydney, Dan Terrill from an organisation called TransTasman, and Ian Holmes from Ovum.[1] They should not languish in anonymity. An Ovum logo appears on the front page. There is no further mention of Ovum until p.111, and just what (or, conceivable, who) Ovum might be is never quite made clear. As the frontispiece declares this to be Consulting Study NCON/02/38 for the National Office for the Information Economy, the reader might deduce that Ovum is a consultancy and that this publication is a consultancy report. It is also Monash University Business Case Study 550, which may say more about that University's involvement in consultancy than about the academic merits of the publication.[2]

Just why this publication was commissioned remains a mystery, though terms of reference are provided in passing (p.11). These, however, are in conflict with Ovum's own press release, which declares that "the study was designed to identify the ways in which Small-to-Medium sized Enterprises (SMEs) optimise their Information and

[1] University of Technology Sydney, 'ICT key to future wealth', www.uts.edu.au/new/releases, June 2003, accessed July 2003.
[2] Monash University, Case Studies and Surveys Database, 'Case study ID550', February 2003, www.monash.edu.au/casestudies, accessed August 23003.

Communication Technology (ICT) investments"[3]. Odd; there is hardly a mention of SMEs in the publication, and they rate none at all in its version of the terms of reference. These are to show how to "optimise" investment in information and communications technology (ICT) and to demonstrate how ICT increases productivity. Objective, then, this publication is not. It is intended to persuade, which causes this reviewer to reflect on just why so many governments perceive a duty to encourage investment in ICT by disseminating propaganda. Given the size of this investment, it is hard to argue that market failure demands government intervention to encourage investment in ICT. No, policy to promote ICT tends to be driven by the canny observation that programmes to encourage what is happening anyway are guaranteed to succeed.

So, then, how seriously should this publication be taken? Its existence is a serious matter. But first to its contents, which surely are not. The bulk of the report consists of eighteen cases of Australian organisations into which ICT has been inserted. And what a difference it has made! Through the miracle of ICT, they thrive. Not much problem here with unrealistic expectations, with cost over-runs, with delayed computer projects that never work. Such things are unknown in the New Economy Australia. Not that these 18 cases are claimed as typical or average or anything like that. They are "exemplars", presented to show what can be done and how to do it. They demonstrate not "best practice", but something "better than average" (p.12). What they do not do is demonstrate failure, the real result of many ICT projects. Unrealistic investment and expectation of ICT has despatched many a firm, and especially many a small firm, to oblivion.

[3] Ovum, 'Consulting insight: Working with the Australian government', www.ovum.co.uk/go, 2003, accessed July 2003

Where to start with these cases? How about e-magine, a project from the 'Intelligent Isle'? Lest there be any doubt, the 'Intelligent Isle' is Tasmania, the call centre of the developed world. This reviewer defies anyone to make sense of the e-magine project.

> "e-magine's brief is to develop ICT to transform teaching and learning. This is an ongoing, long term brief. Its achievement will rely on the results from an accumulation of individual projects and the cultural change that they generate, and from the whole approach of immersion in ICT, linking to other Departmental goals, including the school reform agenda and encouraging and supporting a 'top down' and 'bottom up' approach " (p.24)

Whatever; at least Ovum would have known all about e-magine, having assisted the Tasmanian government with its ITC policy and programmes.[4] Indeed, Ovum seems to have been involved with several of the organisations that figure in the cases it has selected, a matter it has omitted from its criteria for selection (p.12). It would appear that at least some of these cases come from stock, trotted out whenever an ICT exemplar is required.[5] Then there is Explosive Entertainment, a fireworks company based in Sydney and responsible for staging fireworks displays at major events round the world, including, according to Ovum, the London Millennium celebrations. Now, would that be the occasion on which millions of folks turned out to see the Thames transformed into a river of fire? Nothing happened, a computer failure being responsible for that particular damp squib.

---

[4] *ibid*.

[5] e.g., 'Shared effort needed to bridge the digital divide', Australian Department of Communications, Information Technology and the Arts, media release, 27 November 2002.

The cases seem to be part of a wider arrangement. Thus, Hanimex is lauded for its use of ICT, which allows Hanimex to promote itself by trumpeting that it has been lauded for its use of ICT:

> "As a result of the growing impact of digital photographic services, Hanimex was selected as a case study for the report because of its extensive investment in networking technologies to accommodate retail customers." (Roger Crellin, Hanimex Digital Services General Manager, Australia)[6]

Ideas International, another one of the cases, has also turned its involvement in the publication to advantage.

> "It is pleasing to see that the efforts of our company's leading-edge software development efforts are showcased in this report. We often receive feedback from our customer base that our web interface technology is well ahead of that developed by other IT research analysts, including many of those that are much greater than us in size." (Ian Birks, CEO Ideas International)[7]

This mutual congratulation is very efficient: the organisation lends credibility to the publication, and the publication to the organisation. The dot.com bubble had similar foundations. Extraordinary that a publication so concerned with ICT investment in the late 1990s makes not a single reference to the dot.com bubble.

---

[6] 'Hanimex a proud part of Australian information and communication technologies (ICT) productivity boost', www.fujifilm.com.au, accessed 26 July 2003.

[7] 'IDEAS features as case study in government report on optimising the use of technology', media release, Tekrati AR Newsline, accessed 26 July 2003.

A publication relying on presentation has to be slick, and quite a bit of this publication is very glossy indeed. The maps and charts are pretty, the boxes make the text attractive, and a good deal of the economic argument is painstakingly and considerately presented. But reliance on presentation means that any blemish immediately captures the reader's attention. The slightest scratch in the veneer reveals the chipboard beneath. The surface of this publication is so gouged that it is almost impossible to concentrate on the parts that are intelligent and informed. The dead hand and numb brain of management education, evident in much of the publication's language, only accentuates the damage:

> "The aims of the project are to grow the business by expanding the range of services through online delivery, and to add value to clients through self-controlled delivery arrangements, leveraging from the individual client history and other information maintained on the data base." (p.108)

> "One unexpected benefit that has emerged came through the provision of a 24 x 7 x 365 help desk. Users have been considering how this could be leveraged …." (p.82)

> "To realise their vision, film makers are increasingly relying on visual effects …" (p.74)

And while sections of this publication flow fluent and faultless, other bits are barely literate:

> "The organisation had multiple data re-entry issues and significant amounts of re-work and reducing this was a significant expectation of the project, as was better quality information and decision making, all of which have been delivered." (p.91)

> "Reengineering of processes is still happening. For example, previously all client work was done in an interview room rather than, as now, with some at the front desk and some concurrently, such as interviewing and raising funds." (p.92)

Even at the most basic level, this publication is a mess. Has no one proof-read the thing? Take these joys from this eulogy to the use of ICT in Australia:

> "… which is perceived as being better in where telecommunications services may be poor" (p.29)
>
> "However they are must also work …" (p.147)
>
> "This study aims to better understand the how certain organisational forms …" (p.5)

Could it be that someone has placed too much reliance on the spellchecker? A more fundamental example of how not to use ICT would be hard to imagine.

Which brings the reader, probably mewling and puking, to the meat of this publication – calculating the increase in productivity consequent on investment in ICT. This heavy stuff has two sections (both long and seeming longer), the first analysing ICT and productivity in Australia, and the second comparing Australian performance with that of other countries. This is not the place to replicate such

horrendous calculations, especially as their results are unreliable anyway - as Ovum is quick to acknowledge. What Ovum does not acknowledge (except with one line on p.141 and half of page p.152) is that not so very long ago many economists could find no productivity increase at all arising from investment in ICT. The 'productivity paradox' they noted was that organisations seemed to have been investing in ICT for decades without any measurable increase in productivity.[8] Now, the same sort of data, the same models, and sometimes even the same individuals show just the opposite, at least for the second half of the 'nineties.

Explanations for a productivity paradox are actually consonant with at least some of the arguments presented in this publication. Ovum does mention, if only in passing, that ICT productivity is likely to be influenced by such factors as ineffective management, unable to prevent the benefits of investment spilling over to others, particularly customers (p.31). Indeed, it is, but evidence from the productivity paradox debate is that, if these factors are not right, there will be few productivity gains from ICT. The Ovum approach is slightly different: there will be masses of productivity gains anyway, and more still if the factors are right.

> "… later in my talk I will be releasing the latest study on ICT and productivity by independent consultant Ovum. The report confirms that Australia is a world leader in achieving productivity gains from ICT over the last decade. Further economic gains are there for the taking if ICT is more widely applied …"

[8] Stuart Macdonald, Pat Anderson and Dieter Kimbel, 'Measurement or management? Revisiting the productivity paradox of information technology', *Vierteljahrshefte zur Wirtschaftsforschung*, 4, 69, 2000, pp.601-17.

(Richard Alston, Minister for Communications, Information Technology and the Arts)[9]

This publication simply ignores any argument that might impede its bouncing enthusiasm. Even Paul David, the sage if ICT productivity, the Paul David who speculated that it might take as long to realise productivity increases from ICT as it had to realise productivity increases from electricity (about four decades)[10] - that Paul David - is omitted in favour of soul-less number-crunchers. True, Oliner and Sichel, a major paper in this area, is cited, but as if it were no more than an accountant's spreadsheet. Key arguments are overlooked; for example, Oliner and Sichel observed that ICT investment of 2% of nominal net stock of business capital in the US in 1993 hardly compared with 18% in railways in 1890, and that ICT had a long way to go before its influence could be expected to be as pervasive.[11] Many of the factors pertinent to the productivity paradox reflected on management skills or, rather, the lack of them. Ovum makes the same point, but – once again – arguing not that without these skills there is likely to be little productivity increase from ICT, a stance for which there is some evidence, but that these skills will produce even more productivity from ICT, a position supported by less evidence. In its extreme form, the Ovum argument would seem to be that even the most indolent and incompetent of managers will not prevent ICT increasing productivity. That should be a comfort.

[9] Richard Alston, 'Transformation and the new economy', speech to Committee for Economic Development of Australia, Sydney, March 2003.
[10] Paul David, 'The dynamo and the computer: A historical perspective on the modern productivity paradox', *American Economic Review Papers and Proceedings*, 1, 2, 1990, pp.355-61.
[11] S. Oliner and D. Sichel, 'Computers and output growth revisited: How big is the puzzle?', *Brookings Papers on Economic Productivity*, 2, 1994, pp.273-333.

The publication uses the growth accounting system developed by Robert Solow for its calculations, the Robert Solow who once declared that the impact of computers could be seen everywhere except in the productivity statistics.[12] Growth accounting may choke the life out of people who have got one, but it provides both comfort and sustenance to econometricians. Enough here to understand that new technology can contribute to economic growth just like the conventional factors of production, capital and labour. Growth accounting measures the contribution to GDP of labour and capital inputs. The contribution unexplained by these is assumed to have come from technology. The value of this residual is then divided by the cost of the technology to give a measure of productivity. Convinced? Well, the explanation has to be read at speed. Such input-output exercises are usually conducted at the macro level, but Ovum goes micro. To this end, it has used a general equilibrium model from Tasman-Global. Tasman-Global?

Perhaps to give the reader a break from the heavy stuff, the text suddenly diverts from its theme to provide a rapid run-down of computer use in Australia. Maps appear, Figure 5.7 revealing that:

> "A strong spatial correlation exists between population density and extent of computer use. Areas with the highest population density have the highest proportion of computer users." (p.145)

Nothing earth-shattering in that, but the map produced by another unexplained outfit, Tasman Economics (Is there some sort of tax concession in Australia for having 'Tasman' in the name?), clearly shows that computer saturation is greatest in the

[12] Robert Solow, 'We'd better watch out', review of S. Cohen and J. Zysman, *Manufacturing Matters: The Myth of the Post-Industrial Economy*, *New York Times Book Review*, 12 July 1987.

outback and much lower in the metropolitan areas. Figure 5.8 is a similar, Tasman Economics map, but this time of Australian Internet users. The text claims that "the capital cities and areas of high population have the highest proportion of Internet users" (p.146) while the map quite clearly shows just the opposite. By far the highest concentration of Internet users in Australia appears to be in the Nullarbor Desert. In itself, this sort of silliness is not important, but it does illustrate just how blinkered those whose primary interest is numbers can be. The satisfaction lies in the crunching, and whether the answer makes sense can be quite incidental. (Tasman Economics, it transpires, is the product of the amalgamation of Tasman Asia Pacific and London Economics (Australia). Tasman Economics seems to have subsequently merged with ACIL Consulting to become ACIL Tasman and to work with Ovum on another project for NOIE, this one on the impact of ICT on economic growth to 2010[13]).

Back to the grind. Ovum notes the productivity gains from ICT in a number of recent studies in Australia and elsewhere. Ovum has worked out the average of these and it comes to 0.84% per annum (p.151). Here we might pause to consider the bandwagon effect in publishing. When the idea that ICT boosts productivity is fashionable, as it is at the moment, there is lots of interest in funding, commissioning and publishing studies that show ICT boosting productivity. Studies that show anything less attract little interest. The heights of fashion are scaled by finding even more productivity than anyone else. Ovum has simply taken the average of these competing papers. Interesting that all the studies that Ovum selects are published by or through institutions. Studies in the academic literature are much less prominent - even the latest Oliner and Sichel and the latest Parham - not Parnam (p.183) - make no

[13] ACIL Tasman, *General Equilibrium Modelling Capabilities*, Melbourne, April 2003, p.5.

contribution[14] - and those suggesting that ICT may have had but a small part to play in the Australian productivity miracle; indeed, that miracle may be nothing more than mirage, seem to have been omitted altogether.[15] But to ignore McKinsey, the consultant that has worked for the same NOIE paymaster exploring the limited potential of the Australian ICT sector,[16] is bold. McKinsey promotes the scurrilous notion that very little indeed of US productivity growth in the late 1990s is attributable to ICT.[17]

Re-enter the Tasman-Global "dynamic general equilibrium global model" (p.159), a monstrous input-output affair "discussed more fully in Attachment B" (p.154) (meaning Attachment A). Many years ago, this reviewer, with others, took issue with the ability of the IMPACT model to determine the effect of technological change on the economy.[18] Then, as now, technology was a residual that contributed to the growth of all sectors of the Australian economy. We hoped that our efforts would demonstrate the need for care and thought in the application of such models. We underestimated the political mendacity available in Australia to support models that showed technological innovation to be a good thing in the early 1980s, and ICT to be just as good a thing twenty years later. IMPACT may have died, but ORANI, son of

---

[14] S. Oliner and D. Sichel, 'The resurgence of growth in the late 1990s: Is information technology the story?', *Journal of Economic Perspectives*, 14, 4, 2000, pp.3-22; Dean Parham, 'Australia's 1990s productivity surge and its determinants', paper delivered to National Bureau of Economic Research 13th Annual East Asian Seminar on Economics, Melbourne, June 2002.

[15] E.g., S. Dowrick, The resurgence of Australian productivity growth in the 1990s: Miracle or mirage', paper presented to the 29th Annual Conference of Economists, Canberra, July 2000; C. Bean, 'The Australian economic 'miracle': A view from the North' in D. Gruen and S. Shrestha (eds), *The Australian Economy in the 1990s*, Reserve Bank of Australia, July 2000; John Quiggan, 'The Australian productivity 'miracle': A sceptical view', *Agenda*, 8, 4, 2001.

[16] 'Report shows Australia can win in the global ICT industry', Australian Department for Communications, Information technology and the Arts, media release, 17 April 2003.

[17] www.mckinsey.com/knowledge/mgi/feature/index.asp, accessed August 2003.

[18] Thomas Mandeville, Stuart Macdonald and Don Lamberton, 'The fortune-teller's new clothes. A critical appraisal of IMPACT's technological change projections to 1990/91', *Search*, 11, 1-2, 1980, pp.14-17; *idem*, 'The wisdom within the fairytale – Towards a happy ending?', *Search*, 11, 6, 1980, pp.183.

IMPACT, lives on within the Tasman-Global modelling system. Nothing, short of a stake through the heart, seems capable of eliminating it.

Enough nostalgia. Concentrate for the calculations. Recall that Ovum had derived a figure of 0.84% as an average from other modelling, and recall also the Ovum argument that, though ICT will increase productivity anyway, it will increase productivity even more with the right management. But how much more, and just what is the right management? Well, re-enter the cases, which the reader might have assumed had no other purpose than to suggest at least some contact with reality. The cases are to be put to another use altogether. Apparently the eighteen of them have an average productivity increase attributable to ICT of over 5% per annum (pp.155-7). Rather puts 0.84% in the shade, does it not? And the calculations to support this contention? Well, there are a few figures dotted about the cases, but basically we are to take these calculations on trust. Thank goodness at least a few Australians are not given to blind trust:

> "If you ask a small software development firm whether their IT investment is beneficial (two of the 18 companies are software firms) and they know the results will be made public, are they likely to say that their decisions were poorly based, the investments poorly managed and the results disappointing?"[19]

Now Ovum is quick to concede that these 18 organisations are not typical of all Australian firms, but if these exemplars can achieve 5% per annum, then the rest ought to be capable of boosting their productivity from ICT by, say, 25%. What the

[19] Paul Chapman, 'The numbers game', ccrg,eleceng.adelaide.edu.au, 25 April 2003, accessed August 2003.

hell; say 50%. At 50%, the 0.84% zooms up to 1.26% (p.159). Feed the model with the assumption of 25% and then 50% increase in ICT productivity inspired by the cases and out churns higher gross domestic product (GDP), wages, exports, investment and generally sweeties for everyone. At 25%, an extra $2.68 billion is created in 2003; at 50%, an extra $5.31 billion. This is the sort of thing government ministers like to hear, and the responsible minister was unsurprisingly eager to take what the *Australian Financial Review* calls a "bullish interpretation of the report".[20]

> "Australia has led the world in productivity gains from information and communications technology (ICT) over the last decade, according to Communications Minister Richard Alston. Senator Alston said case studies showed Australian industries were using ICT to transform processes and business practices … almost half of forecast growth in GDP in 2002 could be attributed to ICT."[21]

The final section of this memorable publication plods through OECD data to show how Australia is already streets ahead of anyone, except perhaps the US, in the use of ICT.

> "… the study compares ICT productivity in Australia with that of overseas countries and supports the view that Australia, along with the USA, is a world leader in achieving productivity gains from ICT usage." (p.5)

But why be second best? We can say that ICT contributes more to labour productivity growth in Australia than it does in the US. Someone made the claim in a speech to the

[20] David Crowe, 'Evidence stacks up that ICT creates productivity gains', *Australian Financial Review*, 1 May 2003.
[21] 'Alston says Australia leads world in tech gains', Australian Department for Communications, Information technology and the Arts, media release, 31 March 2003.

Committee for Economic Development of Australia so it must be true.[22] Actually, this author acknowledges that even a CEDA audience must find his results "far-fetched", supported by "fairly heroic" assumptions, and definitely to be treated with "some suspicion".[23] And once again, Ovum adopts its technique of warning that arguments and figures should be treated with caution (p.171), and then using them anyway (p.172), as if the health warning somehow purifies and makes respectable. Conversely, assertions that demand explanations are simply ignored. It may well be that most European countries are unable to squeeze much productivity from ICT, but why? Why does ICT manufacturing make no apparent contribution to ICT productivity in Japan of all places (p.174)? Perhaps, just perhaps, the difference between productivity from ICT in Australia and that in many other countries is not unassociated with the approach of those who try to measure it. All appreciate the problems inherent in measurement, but elsewhere these problems suggest the need to err on the side of caution. In Australia, the same uncertainty provides only an irresistible opportunity to be positive, to add on a bit for good measure.

> "However, measuring the productivity growth in services is not an easy task and one not particularly suited to the growth accounting methodologies typically used. It is likely that many of the quantitative analyses that suggest low productivity gains may focus on rather narrow aspect [sic] of ICT benefits. Such methodologies fail to capture the flow on economic effects of ICT investment and use." (p.173)

The overall conclusion of this publication is that Australia has achieved huge productivity gains from ICT, all without much contribution from a tiny ICT

[22] David Gruen, 'Australia's strong productivity growth: Will it be sustained?', contribution to the CEDA/Telstra Economic and Political Overview, Sydney, February 2001.
[23] *ibid*., p.67.

manufacturing sector. So, Australians must be clever indeed in their use of ICT. And as cleverness is well known to be a bottomless resource in Australia, use of ICT would seem set fair to produce infinite increases in productivity. Follow this, if you can:

> "…. The essence of the argument is that a knowledgeable population tends to make more people more informed. More informed people tend to feel they make more rational decisions, and more rational decisions tend to be more efficient decisions. And, as any economist will testify, more efficient decisions by more people can make us all better off." (p.134)

Well, perhaps not any economist. Perhaps not economists interested in making decisions with imperfect information (which is how all decisions have to be made),[24] and perhaps not economists struggling with the problem of information overload.[25] In fact, it may be that only the economists at Ovum would testify to such arrant nonsense.

Surely a more mature approach to this subject is now possible in Australia. Much more important than frenzied self-congratulation on how well everything is going is mature reflection that also embraces what may be wrong and how this may be put right. The current approach to ICT in Australia is nicely exemplified in this extraordinary publication, with its determination to present the situation in the best possible light. One cannot but wonder just how much of the knowledge economy in Australia is similar spin, the venal impressing the gullible. "… high Heaven rejects

[24] e.g., Herbert Simon, Rationality as process and product of thought', *American Economic Review*, 68, 2, 1978, pp.1-16.
[25] e.g., *ibid*., 'Bounded rationality and organizational learning', *Organization Science*, 2, 1, 1991, pp.125-34.

the lore of nicely-calculated less or more". It is high time Australia rejected the ICT forecasts of its politicians and their hirelings in the Tasman modelling industry.

Stuart Macdonald

University of Sheffield