

HAS THE INVISIBLE HAND SHAPED THE WOODEN SPOON?

I.T. POLICY IN NEW ZEALAND

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Introduction

For the past decade and a half New Zealand has been the test-bed of public policies characterized by sustained adherence to theory informed market-based public sector reform. As the title indicates, this article concentrates on the question of how well the policy of market reliance has served New Zealand specifically in the area of Information Technology (I.T.). Arguably, I.T. warrants special attention as a potent factor in all aspects of economic and social life, and a critical component of effective public sector governance and control.

Fifteen years after the first tidal wave of reform is a more than reasonable interval to make an appraisal of this kind of central government policy-initiative (Boston *et. al.*, 1996). In most countries for reasons of size and complexity, assessing policy outcomes is problematic but less so in New Zealand being an island nation with a small population. It should also be noted that the key characteristic of reforms in New Zealand has been the consistency of application of the reform principles and willingness of successive administrations to maintain the same policy directions. This constancy of policy direction in New Zealand contrasts sharply with the information revolution that has so dramatically changed the I.T. world-landscape.

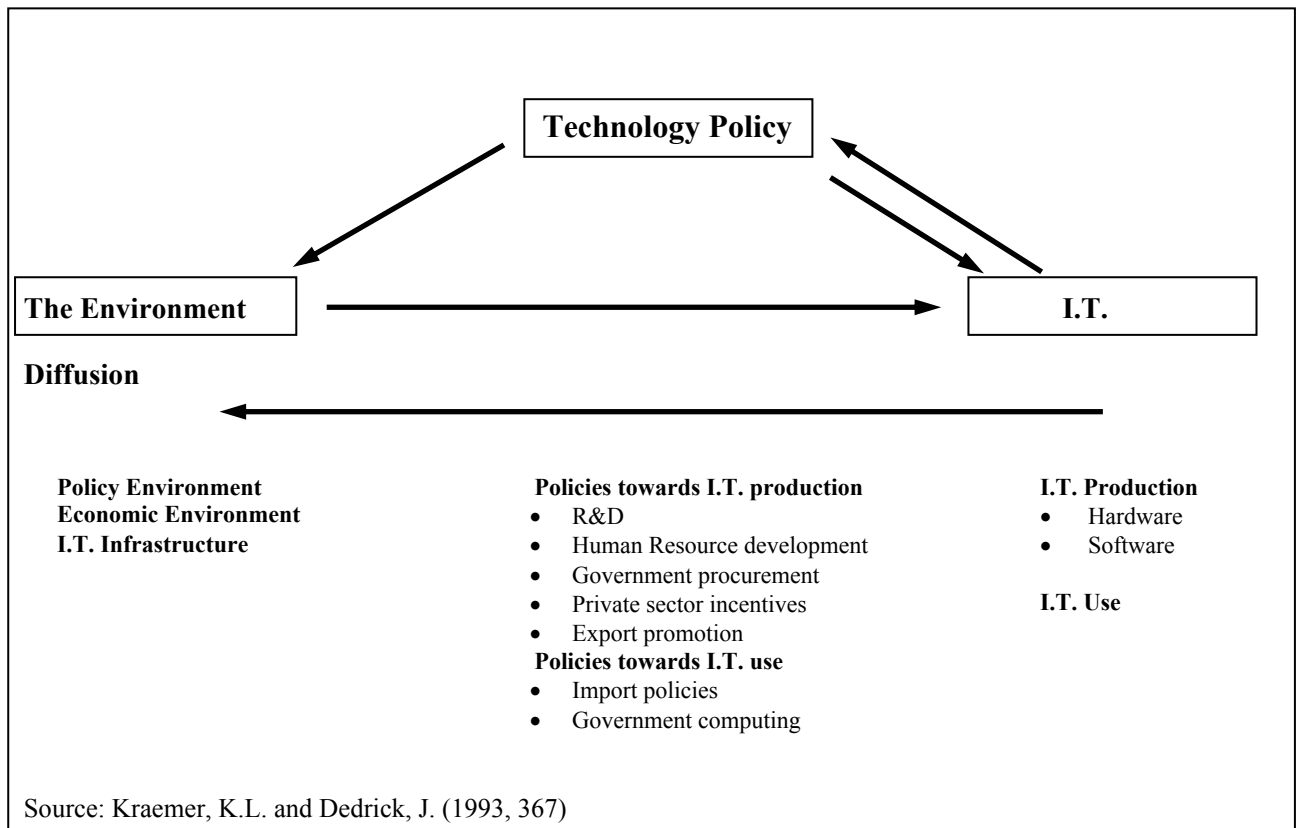
For many reasons this study has importance far beyond academic curiosity. I.T. is a major investment for government, work prospects for many are directly affected by I.T. substitution, productivity and computers are intertwined. Technology has a significant part to play in bringing about a transformation of knowledge in society and, thereby, promoting greater international competitiveness. Though by common consent highly important, "I.T. does not itself create transformations in society but is best regarded as a facilitator of knowledge creation in innovative societies." (OECD, 1996 cited in ITAG, 1999, 6)

The OECD definition of I.T. will be used in this article namely "a new techno-economic paradigm affecting the management and control of production and service systems through the economy based on an interconnected set of radical innovations in electronic computers, software engineering, control systems, integrated circuits and telecommunications". (Review, 1993). As an exporting and tourism-reliant nation, I.T. is used extensively to support trade and to help foster social progress and economic growth.

The earlier reference to the singular policy stance of governments in New Zealand since the mid-eighties in relation to I.T. can be amplified yet in quite a simple way best described as "hands-off". Kraemer and Dedrick (1993) draw attention to this *laissez-faire* stance, likening it to I.T. in Hong Kong (Kraemer, Jarman and Dedrick, 1992).

Their conclusion is that New Zealand matches Hong Kong in a willingness to let the “invisible hand” of the market shape the path of development. As a basis for their studies in many countries of the process of I.T. innovation, Kraemer and Dedrick (1993, 367) have used the model (KDM) shown in Figure 1, to frame the technology policy, environment and diffusion relationships. In this article, KDM is used to provide structure for this review and a foundation on which to base the appraisal of the policy path that successive New Zealand governments have followed in the course fifteen years of reforms.

Figure 1: Model for Analysis of I.T. Policy Environment



A policy of “hands off” notwithstanding, these government administrations have set out to project New Zealand as a knowledge society in the global community, and to establish an I.T. climate inside and outside the public sector conducive to economic progress and sound government.

The purpose of this article is to prepare an assessment of achievement using these broad aims as a yardstick, essentially a matter of “being judged by intentions”. In other words, New Zealand governments of the past fifteen years are on trial to answer a charge that resolute adherence to “pure” reform practice has led to sub-optimal outcomes in the seminal field of I.T. Readers are cautioned not to expect categorical proof from this exercise in evaluation of policy, but rather a conclusion based on the balance of probability.

Information Technology Overview

The space constraints of an article limit the description of I.T. in New Zealand to a brief synopsis of the main component of KDM. The thrust of the general technology policy platform can best be described as, “hands-off, leave it to the market”. This should not be construed as a position of total disinterest in I.T. on the part of government. Rather, it is a way of emphasizing concentration on the task of shaping and refining the framework, in which, in terms of reform theory, I.T. enterprise in the private sector is expected to unfold and flourish. This is a belief that government has a duty to determine form and form alone, content being a purely market function.

This dichotomy gets blurred when Government tries to give effect to commitments to the expansion of IT use in the public sector. A recent statement from the State Services Commission commenced “Electronic government will harness people and technology to revolutionize the delivery of government services to New Zealanders. The new services will be tailored, inexpensive, easy to use, personal and friendly.” (State Services Commission, 1999a) Clearly this is both form and content. Given the importance of I.T. functions in all branches of government, this is far from being a trivial matter. The following statement underscores the important status of I.T. in administrative processes in New Zealand “One estimate suggests that state sector organizations (which include State Owned Enterprises (SOE) and Crown Research Institutes (CRI), and local government, account for 60% of all I.T. spending in New Zealand.” (Ministry of Commerce, 1993: 18)

Looking beyond the main branches of government, there are good reasons to include schools, universities and libraries as they occupy key positions at the core of the I.T. infrastructure. In addition, telecommunication linkages, both global and domestic, are provided by many New Zealand based companies, some of which are responsible for burgeoning internet and mobile traffic.

Information Technology for a Purpose

In the previous section attention was given to the extent to which policy had concentrated on form and infrastructure, in addition to managing its own very substantial I.T. environment. An appraisal of policy carries with it the need to establish whether overall the annual expenditure of nearly four billion dollars has generated “value for money”. There are several ways to make the assessment of cost benefit.

1. *A crude way of measuring return is to compare the ratio of hardware and software produced against the amount spent on annual I.T. purchases. Using comparative small country data (RER, 1999) (Dedrick Goodman and Kraemer, 1995: 23) New Zealand is grossly out of line by spending at least times more than the value of what it produces.*
2. *In the early part of the nineties overall expenditure on I.T. was what Dedrick Goodman and Kraemer (1995: 23) report as “an extraordinary 2.7% of GDP in 1992.” A large proportion of this outlay was in the public sector, where projects with a total budgeted cost of almost \$500 million have been reported.*
3. *While Ireland, Singapore, Finland in particular have massive hardware production achievements there has been scant progress in IT hardware*

manufacture in New Zealand by either multi-national (MNC) or local firms. Although part of the reason for making reforms in New Zealand was to establish conditions well suited to new business generation, to date no international enterprise has responded by setting up an I.T. hardware manufacturing facility. Consequently, exports are very low, and offshore providers of I.T. products and services have the whip hand over public and private sector I.T. users in New Zealand.

4. *Even in the area of software production, while New Zealand has maintained a world class competence over the past fifteen years, it is fair to say that it has not been able to “hit the jackpot” with a product of global importance. Having said this, current trends suggest there is potential for successful software exporting and local market import substitution (MacKenzie, 1999).*
5. *In response to restructuring and delegation, government departments in New Zealand engaged in a flurry of I.T. related purchases and introduction of new systems. As stated by Fancy and Matheson (1995), this large I.T. investment has not met all the needs of government, nor has much of this significant outlay been problem free.*
6. *In 1997, central Government was compelled to recognize the existence of significant problems in the level and quality of government investments in I.T. Examples included the education payroll system, failure of the National Library NDIS project, and the high cost and deadline slippage of the Police INCIS project. The problems of NDIS and INCIS were so severe that termination was the preferred solution.*
7. *A recent assessment by Government of its own activities (State Services Commission, 1999b) summarizes the problem with uncharacteristic candour:*

New Zealand makes huge investments in public sector IM & IT in an environment of piecemeal, agency-by-agency investment which exhibits unnecessary duplication of data/information holdings with unnecessary over-investment in information technology, and with diminishing public support.

In summary, the seven examples cited suggest that by its own standards New Zealand is failing badly to reach its potential in the field of knowledge enterprise.

Using internal measures alone is not enough to assess whether there has been a positive return to the nation, for the very large annual I.T. outlays. The acid test is how has New Zealand I.T. progressed when measured against comparable countries

This question can best be answered by giving attention to two aspects of peer appraisal namely (a) identifying appropriate countries to serve as benchmarks and (b) choosing relevant performance evaluation measures. Several recent papers that relate to both issues are discussed below.

New Zealand has a population of 3.5 million embracing a Western-style political and economic philosophy, with a well-developed information technology infrastructure. It has a well-articulated commitment to participate in the growing international electronic transformation of business and the public sector. Using these criteria, New Zealand's benchmark peers would include the Nordic States, Hong Kong, Ireland, Israel and Singapore. Dedrick, Goodman and Kraemer (1995: 21) define these “major minors”

(MM) as, "...small countries [that] have become major IT producers or sophisticated users."

One form of external benchmark test to apply to members of the MM group is the ratio of hardware production compared with annual hardware purchases. In the early nineties, hardware production in New Zealand was insignificant, certainly when compared with Singapore, Hong Kong, Ireland and Finland (Dedrick, Goodman and Kraemer 1995: 23). This adverse situation has continued up to the present. Moreover, forecasts suggest that while this key ratio for other MM countries is on average close to parity, New Zealand is currently spending four times more on hardware than the value of annual production. (RER, 1999). Bluntly, this trade imbalance in I.T. hardware shows more than most other measures how the policies of "hands off" and market reliance have left New Zealand trailing far behind comparable economies.

This would be serious in a static situation, but given that world demand for I.T. hardware has quadrupled in the past five years (RER, 1999), failure on the hardware production front to secure a commensurate market share is a grave economic setback. Already under pressure to sustain a quality of life against a pattern of rising imports and falling returns from traditional primary products, New Zealand has missed a vital opportunity. Just how significant this was can be gauged by another benchmark, the annual World Economic Forum international economic competitiveness assessment that shows New Zealand having a marked progressive deterioration in rank order. According to this New Zealand has fallen in competitiveness to 13th in 1999 from a ranking of 3rd in 1996 (World Economic Forum, 1999). By contrast the comparable data for Ireland is a rise to 10th from 26th, and for Finland is a rise to 11th from 16th. A similar picture is reflected in the results of the IMD World Competitive Scoreboard (IMD, 1999) that shows New Zealand dropping 11 places to 20th since 1995.

Stepping back from the detail to make an overall progress assessment of the information technology situation, there are two dominant and contrasting impressions. New Zealand has matched its peers in form, i.e., I.T. infrastructure and framework, but efforts to gain economic returns from this investment have failed. Problems with computer projects in government departments add weight to these serious concerns.

After more than a decade of policy reforms (Kraemer and Dedrick, 1993), New Zealand finds itself "all dressed up with nowhere to go" in the huge, and growing, global knowledge market. In the same time period, peers notably Singapore, Ireland, Finland and Hong Kong have surged ahead, while others have held their own. With high dependence on I.T. imports and low exports, New Zealand holds a very small wooden spoon (World Competitiveness Yearbook, 1999) carefully shaped by the 'invisible hand'.

Table 1: New Zealand Economic Performance 1988-1998

| (Year to 31 Mar) | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Percentage Annual change Real GDP | 2.6 | -0.8 | 0.8 | -0.6 | -1.2 | 1.2 | 6.3 | 5.4 | 3.6 | 2.8 | 2.3 |
| Inflation % | 9.6 | 4.8 | 4.9 | 0.9 | 1.3 | 1.4 | 2.8 | 2.9 | 2.6 | 0.8 | 0.4 |
| Unemployment % | 5.6 | 7.1 | 7.8 | 10.3 | 10.3 | 9.5 | 8.2 | 6.3 | 6.1 | 6.5 | 7.2 |
| Current Account balance - NZ dollar (millions) | -2370 | -558 | -2815 | -1958 | -1881 | -1251 | -814 | -2644 | -2832 | -4520 | -6448 |
| Gross Domestic Product - NZ dollar (millions) | 61,641 | 66,454 | 70,773 | 72,248 | 72,277 | 74,578 | 80,876 | 86,577 | 91,739 | 95,816 | 98,247 |
| Productivity Index (1972 = 1.0000) | 1.0773 | 1.1127 | 1.0724 | 1.0667 | 1.0682 | 1.0776 | 1.1366 | 1.1563 | 1.1564 | 1.1763 | 1.1700 |

Sources: New Zealand Official Year Book 1998, 1999.
Measuring New Zealand's Productivity (D A Lawrence and W Diewert),
Treasury Working Paper 1999

Contrasting Policies, Outcomes and possible Explanations

Macro level explanations for different level of I.T. innovation and achievement by individual countries in South Asia and the South Pacific are outlined by Dedrick and Kraemer (1995: 49). An important finding is that most governments, with the exception of New Zealand and Hong Kong, have used a range of incentives and leadership actions to foster I.T. production and use. Looking at hardware production statistics, the link between positive government support, and manufacturing performance, seems plausible. In a similar vein, King et al (1994: 153) conjecture that, "Significant production or use of IT innovation requires serious and sustained institutional interventions for knowledge deployment."

The New Zealand government stand out determination not to engage in any form of pump priming or incentives is an anomaly further highlighted by the cases of Singapore and Ireland. Both of these countries have had policies and practices to actively promote electronics and I.T. manufacturing capacity. Both have been highly successful in attracting and sustaining beneficial MNC investment. By other means, Sweden and Finland have led the way into fast growing globally relevant hand telephone products market.

Although more research is needed to clarify the causes of success, these cases suggest that a proactive public policy stance is a positive element by contributing directly and indirectly to hardware production growth. Conversely, an absence of this form of underpinning, as in the case of New Zealand, makes it harder for firms to get started on a growth path.

A demand for a major policy reversal from Government, from “hands off” to a more “I.T. industry-friendly” stance came in a 1999 report from the I.T. Advisory Group (ITAG), made up of Chairmen and Managing Directors of New Zealand's leading IT companies. The report called clearly for the Government to show leadership, support research and development, expand educational offerings, enact legislation, encourage investment, liberalize immigration and adopt a partnership stance with the industry (ITAG, 1999). The previous government had not responded before its electoral defeat, and the incoming government has not yet addressed the question.

In review up to this point, the KDM framework and wide variety of cases outlined above have concentrated attention on macro level considerations, particularly matters of public policy. Though understanding the macro part of the whole I.T. innovation picture is essential, it is timely to examine I.T. use and barriers at the level of institutions and firms. The private sector is an important component of the larger dynamic model explaining the working relationships of the knowledge society. Among the parts that have thus far received less attention i.e decision-making at the level of the firm, organization strategy, risk management, and the like, there is much scope for cross disciplinary research and theory building.

Faced with evidence of New Zealand's failure to capitalize on opportunities, this is an inopportune time to dwell on modelling niceties. Instead, attention will be given to two other general yet associated matters, education and attitude. In the ITAG (1999) report, a strong recommendation is made to have the universities train more students in I.T. topics. On the surface this is a sensible step, on the premise that a barrier to progress is the less than adequate number of university graduates in I.T. related disciplines. Closer examination of the causes and effects of the slow rate of I.T. innovation, is likely to show that it is not only a matter of too few I.T. graduates, but also a case of too many entrants into the other business professions lacking essential computer skills.

The knowledge society is sprouting up everywhere in forms of disturbing and challenging diversity. This means that lawyers, economists, accountants and operations managers to name only a few, will also need to move into the work force in ‘wired’ up mode. Accelerated retraining in industry and commerce is also required if the country is to take seriously the search for niches in a highly competitive world market place.

The second general consideration is attitude; that latent set of opinions and beliefs that shape aspirations and impose limits on endeavours, something of particular concern in a remote country like New Zealand. New Zealand public sector reforms of the past decade and a half have fervently brought about an open unregulated economy. In textbook fashion a series of changes have been made with far reaching consequences for business and society. “Managerialism” is the keynote, characterized by privatization, contestability and accountability. The rapid pace and pervasiveness of the transformation has in large measure been due to the determined use of legislation by successive Governments to cement and extend the new financial and economic concepts¹. Significantly, the professions of financial management, economics and law have spearheaded the reformation. Whether as managers of reconstituted units of government, policy advisors or consultants, these have been the shock troops used to displace “old” ways and embed new concepts and vocabularies. Their status and influence has risen sharply, principally through the application of the reform theories that concentrate on form, i.e., follow the mandated governance approaches. In the

context of this article the salient fact is that training for these professions is with few exceptions naïve in matters of I.T. This bias is hardly good news for a small country like New Zealand looking for a future as a knowledge-based society in an intensely competitive fast-moving world.

Clearly, there is a need for New Zealand and many other small developing nations to understand the I.T. innovation process from top to bottom, in order to know when to push and when to prime, and how to judge the scale of investments. These vitally important actions must be co-ordinated and integrated if they are to have any chance to generate rapid and consistent economic and social returns from this new medium.

The 1999 election has brought to power a left wing coalition led by the Labour Party with the Alliance and Green parties as minor partners. What remains to be seen is the degree of influence the minor partners wield over certain factors which are likely to be key policy determinants. These include sustainable use of resources, ethical and constitutional recognition of rights and where appropriate a confirmation commitment to competition in all aspects of economic and social activity.

Conclusions

The New Zealand government "hands off" I.T. policy relied on the market, without apparently contemplating the consequences and cost to the country if the policy has failed. The policy also by definition accepted market failure but, it is debatable whether the proponents of the theories that underpin the public sector reforms in New Zealand ever contemplated that the policies might lead to failure of government I.T. systems. From the time it was introduced, New Zealand I.T. policy reflected a straightforward, easily applied ideological position, brooking no exceptions. As this review built around KDM has shown, the I.T. environment is complex, the knowledge economy very fast moving. Where orthodoxy rules, hazards abound. This brief accumulation of evidence supports the view that the policy followed by successive New Zealand governments since the mid-1980s of reliance on market forces to promote growth and progress in the IT sector has been detrimental when compared with other policies adopted by peers.

Notes

¹ In New Zealand there is neither an upper house nor any state governments to moderate legislative urgency on the part of the party controlling the Treasury benches.

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