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Lessons for effective government IT outsourcing: education and immigration in New Zealand

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Lessons for Effective Government IT Outsourcing:
Education and Immigration in New Zealand

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ABSTRACT

Information technology (IT) tends to be viewed as ancillary to core government functions. Consequently, IT is often outsourced to the private sector. Unfortunately, there is a long line of failed outsourced projects. This article uses two New Zealand case studies, the particularly public failure of the recent schools payroll system and the successful introduction of electronic immigration processing, to examine how the design and governance of outsourced government IT projects could be improved. It concludes that an awareness of historic trends is important for project success, that governments need to be more active in combating market based transaction costs and that contract management becomes a core government competency when projects are outsourced. It also argues that better change management and cognisance of design-reality gaps would positively impact the outcomes of future projects.

KEYWORDS

Contract Management, Design and Implementation, Government, Information Technology, New Zealand, Outsourcing, Path Dependency, Transaction Costs

1. INTRODUCTION

They've been overpaid, underpaid and not paid at all – now one teacher has been paid for being in two places at one time. (O'Callaghan, 2012)

That was the situation in November 2012. Three months earlier the New Zealand (*NZ*) Ministry of Education's (the *Ministry*) new, outsourced schools payroll systems – Novopay – went live. Novopay was, unfortunately, an immediate disaster. Payment errors occurred and the customer service function was underprepared and overwhelmed (Jack & Wevers, 2013). The Post Primary Teachers Association even took the Ministry to court for breaching its statutory obligations (Barback, 2013). Performance was so bad that eventually Ministerial responsibility was assigned to resolve the matter and the Ministry and Talent2 (the private provider) parted ways (Joyce, 2014; Key, 2013).

Information technology (*IT*) promises to provide governments with cost and time savings and with better service coordination and information management. It should also allow public services to be tailored to the needs of citizens (Oostveen, 2008). Government IT is often contracted out to

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the private sector. Contracting out, or outsourcing, is a core New Public Management principle used to introduce competition into the delivery of public services. Competition should, in theory, spur quality improvements and cost reductions. Additionally, outsourcing ancillary functions is said to allow government to focus on "core" public tasks. The outsourcing of IT systems has historically been justified by their being ancillary to core public functions (Dunleavy, 1994; Dunleavy, Margetts, Bastow, & Tinkler, 2006). Despite all this promise, the size, number and persistence of government IT failures are well documented (Controller and Auditor General, 2013; Gauld & Goldfinch, 2006; Oostveen, 2008; Small, 2000).

This paper examines how the design and governance of outsourced government IT projects might be improved. Three principal matters are tackled:

1. Path dependence in public services and the need to be realistic about what history means for service delivery and contracting out;
2. The importance of minimising transaction costs where the market is used to provide public services (or at least some public functions); and
3. The changing role of government – from producer to manager – when service functions are outsourced.

This paper adds to the body of public sector IT case studies by unpicking Novopay's failure in light of these matters. However, it also goes a step further and uses a comparative case study to place success alongside failure. SmartGate, the privately provided electronic passport control system used by the New Zealand Customs Agency (*NZ Customs*), is a recent example of a particularly successful outsourced government IT endeavour (Controller and Auditor-General of New Zealand, 2012). It provides a positive comparison throughout this paper. The intention is that by using comparative case studies and highlighting good practice (as well as bad) this paper will contribute to the existing literature in a constructive manner. It concludes by distilling five core principles that could contribute to the effectiveness of outsourced government IT projects.

2. THE CASE STUDIES

2.1. Novopay and the Schools Payroll[1]

Novopay was a fully outsourced (i.e. software and staff) payroll system to be provided by the private company Talent2. It replaced the (also fully outsourced) Datapay system.[2] The business case for Novopay was that Datapay was aging technology that posed too great a technology risk for the Ministry and that it was no longer fit for purpose. It was claimed that Novopay would offer greater functionality, a better user interface and more useful information about the schools payroll. Novopay was also a fully web based system, compared to the more manual Datapay system. After putting forward its initial business case in the early 2000s, the Ministry contracted with Talent2 (in 2008), intially for the provision of software only. However, encouraged by predicted savings of NZ$4.6 million per year, the Ministry moved to full outsourcing. The budget for Novopay was NZ$182.5 million for 10 years of service (Jack & Wevers, 2013).

The schools payroll is NZ's largest payroll – it distributes around NZ$4.6 billion annually to 120,000 staff. It is also a complicated payroll. The Ministry is responsible for providing payroll services, but individual schools (around 2,500 of them) are the employers for payroll purposes. Schools differ in terms of their size, their number and speciality of payroll administrators and the IT systems that they use. A combination of collective and individual employment agreements generate

up to 10,000 different pay permutations per pay cycle. Historic practices, such as receiving a single payslip (even when working across different schools – i.e. different employers), further complicate matters (Education Payroll Limited, 2016; Jack & Wevers, 2013).

Novopay was supposed to go live in September 2010, but was delayed until August 2012. Even then Novopay was not able to handle the schools payroll – there were software errors, user errors and customer support errors. This distracted schools from their primary purpose of education, as staff spent time chasing Novopay queries (O'Callaghan, 2012). By June 2013 an additional NZ$23.9 million had been spent trying to resolve the issues. The Ministerial Inquiry that followed highlighted a number of concerns. Despite being long and complicated, the contract between the Ministry and Talent2 was incomplete with respect to the system requirements. Subsequent scope creep (to deal with the practicalities of the schools payroll) increased the tension in an already strained contractual relationship. Customisation also led to a backlog of software errors. This squeezed timeframes, to the point that the intended pilot and phased implementation were abandoned in favour of a "Big Bang" rollout. The Ministry also displayed poor contract and project management practices (Jack & Wevers, 2013).

The Ministry ultimately took back payroll responsibility for Novopay when Talent2 was not prepared to spend more money to fix / improve services (the Ministry still licences Talent2's underlying software, but it owns all of the software customisation) (Joyce, 2014). Education Payroll Limited, a government owned company, now administers the schools payroll with performance continuing to improve (Education Payroll Limited, 2016; Joyce, 2015).

2.2. SmartGate and Border Control

Smart Gate is an electronic passport control system manufactured by Morpho, a private company. It uses biometric data stored on passports to identify travellers at the border. As a substitute for some manual passenger processing, SmartGate promised to increase the speed and decrease the average cost of passenger processing and to free up staff to deal (manually) with higher risk travellers (Controller and Auditor-General of New Zealand, 2012). NZ Customs introduced SmartGate in 2009 (Nicklin, 2015). The project had a modest initial budget of NZ$15.9 million, with annual operating costs of NZ$7.4 million (Nicklin, 2015). While smaller than Novopay in dollar terms, border control is a no less sensitive political issue.

The Australian Customs and Border Protection Service (*Australian Customs*) was already using Morpho's SmartGate. Before introducing SmartGate into NZ airports NZ Customs borrowed a SmartGate device from Australian Customs to test its functionality and its compatibility with NZ Customs' other IT systems. NZ Customs also monitored SmartGate's performance once it was introduced and worked hard to maintain collaborative relationships with both Morpho and other interested parties (for example, airlines) (Controller and Auditor-General of New Zealand, 2012).

SmartGate has been very successful. Public uptake has greatly exceeded expectations, the promised benefits have been realised and NZ Customs' reputation has been enhanced as a result of SmartGate's successful implementation (Line of Defence, 2016; Williamson M., 2010). In 2015 NZ Customs signed a new contract with Morpho for the provision of more, and next generation, SmartGates through to 2020. Reflective of the good relationship between the counterparties, the agreement also included terms for a Biometric Research Partnership (Safran, 2015).

3. PATH DEPENDENCY – HISTORY MATTERS

The theory of path dependency argues that the past has a strong influence over the present (David, 1985). This implies that institutions (and their practices) are relatively stable once they are established (Peters, Pierre, & King, 2005). However, critical junctures (external events) provide the chance to disrupt the status quo. Such junctures provide a window of opportunity to shift from the current path (Robinson & Acemoglu, 2012). In practice, there is often an important distinction between political

windows of opportunity and practical windows of opportunity. Path dependency can be significantly harder to dislodge at a practical level (Bevan & Robinson, 2005).

Novopay's main problems had historic, path dependent roots. Accumulated education sector practices caused systemic inertia. Single payslips and the existence of complex pay permutations have already been mentioned. Additionally, 'banking staffing' (allowing schools to carry over staffing entitlements) and a high number of pay changes per pay cycle were the norm. Existing payroll practices also reinforced that inertia. Datapay was more manual and personal than the web based Novopay. Certain institutional norms had developed during the 10+ years that schools had used Datapay (Jack & Wevers, 2013). There was a working assumption among schools and payroll administrators that these practices would continue.

The political mandate to pursue a new payroll system was a critical juncture for the Ministry. However, that window of opportunity for change was let slip almost entirely. Not only did the Ministry fail to simplify the relevant education sector practices for its own purposes (the complex pay permutations and collective agreements are obvious examples of this failure), but it also failed to specify for Talent2 the system requirements that these complexities necessitated (Jack & Wevers, 2013; Seven Sharp, 2013).[3] It is, therefore, not surprising that scope creep occurred, errors mounted and project timelines became squeezed.

The Ministry also failed to prepare schools for the changes that it intended Novopay to bring about. Instead, of proactively preparing schools for the functional and support differences between Datapay and Novopay, the Ministry painted a simple, "rosy" picture of Novopay. At the same time, through customisation the Ministry essentially tried to recreate 'legacy processes and systems' within Novopay (Jack & Wevers, 2013, p. 37).[4] This is a classic example of deference to system scale economies (David, 1985). There were many thousands of school payroll administrators, but only one payroll system. So, the Ministry opted to try to change Novopay to conform to historic practices, rather than retrain payroll staff. The effect of this was that complex practices were digitised, rather than the underlying business processes being streamlined and simplified. In sum, the Ministry had an opportunity to simplify historic complexities and change existing practice. Instead of being realistic about what those changes required, the Ministry largely put its head in the sand and pursued a new system within an unchanged, and mismatched, environment.

SmartGate, by comparison, demonstrates how a public sector organisation can take bold steps while still being aware of (and utilising) existing path dependent aspects. Trans-Tasman collaboration between Australia and NZ dates back to colonial times. More recently, and formally, the Australia New Zealand Closer Economic Relations Trade Agreement of 1983 is a foundational document for joint border control efforts (Nicklin, 2015). Strong historic precedent for collaboration means that it is not surprising that NZ Customs chose to learn from Australia's lead in electronic passport control. It also provides some perspective on the decision of NZ Customs to use the same system (i.e. SmartGate) as Australian Customs – compatibility would aid integration. SmartGate has an intentional path dependent flavour about it.

However, SmartGate's success is also the result of a critical juncture. Three elements created that juncture. First, the National party was elected to office in 2008 and the then Prime Minister, John Key, took up the tourism portfolio (Nicklin, 2015). Secondly, in 2009 Key and the then Australian Prime Minister (Kevin Rudd) 'pledged renewed ambition' for Trans-Tasman economic integration (Key, 2009). Thirdly, New Zealand and Australia were jointly awarded the right to host the 2011 Rugby World Cup. This was expected to generate a peak in already growing passenger numbers (Controller and Auditor-General of New Zealand, 2012; Treasury, 2011). This juncture gave NZ Customs a window of opportunity. Notwithstanding, SmartGate did generate some political and operational opposition when it was introduced. However, political support from the then Prime Minister provided the leverage NZ Customs needed to introduce electronic border control (Nicklin, 2015; Stuff, 2009; Stuff, 2010).

To review, history matters in project outcomes. Yet far too often history receives too little attention and governments are not realistic about what it means for service delivery and outsourcing.

The Ministry wanted to change the schools payroll. However, it failed to effectively use its window of opportunity (i.e. the political mandate) to achieve practical change. As a result, Novopay was mismatched with reality and failed. Conversely, SmartGate shows awareness of historic trends. Even though its introduction was a bold and somewhat controversial step, it was broadly in line with existing collaborative practice, and NZ Customs took advantage of a window of opportunity of political support.

4. TRANSACTION COST ECONOMICS – MINIMISING DOWNSIDE EXPOSURE

Outsourcing is a decision to buy, rather than make, a good / service. Before choosing to outsource governments should consider the strengths and weaknesses of involving the market in public service provision (Williamson, 2000). As a starting point, using the market imposes costs in terms of finding a counterparty, negotiating a contract and monitoring that contract over time. These transaction costs need to be considered and should be economised (Coase, 1937). Williamson (1975; 1985; 2000) identifies a number of factors that impact the size of potential market transaction costs. These factors are as applicable to government entities as they are to private actors (Shleifer, 1998). The following of Williamson's factors are particularly relevant to the Novopay and SmartGate projects:

- **Bounded Rationality:** Neurological and language limits mean that it is often impossible to write a complete contract. Incomplete contracts expose counterparties to the possibility of costly future contingencies;
- **Information Impactedness:** Information asymmetries, that are too costly to overcome, can undermine contracts because counterparties have a knowledge discrepancy vis-à-vis the subject matter;
- **Complexity / Uncertainty:** Complex or uncertain circumstances aggravate bounded rationality and information impactedness by increasing the chance that:
  - A project cannot easily be reduced to writing;
  - It is not possible to identify all of a project's contingencies;
  - One counterparty has superior (and advantageous) knowledge and experience with the subject matter of the contract;
- **Asset Specificity:** Assets are said to be specific where they have only a limited number of useful purposes. This can create "lock in" effects, where counterparties depend on the supply of and the demand for particular assets;
- **Atmosphere:** Transactions occur within a wider context – the atmosphere. The atmosphere can produce additional transaction costs over and above what counterparties anticipate or expect.[5]

Novopay suffered from extremely high transaction costs. The contract between the Ministry and Talent2 was significantly bounded. The complexity of the schools payroll was likely to cause bounded rationality even if it was known by both counterparties. However, it was only known to the Ministry. Talent2 did not (and could not without incurring substantial costs) know of the payroll's true complexity. Consequently, Talent2 was at an information disadvantage, one which the Ministry did not act to remedy. The Ministerial Inquiry suggests that this mistake by the Ministry resulted from a lack of sufficiently expert staff (Jack & Wevers, 2013).

The impact of asset specificity is also clearly evident in the Novopay project. As Talent2 customised Novopay (at the Ministry's request), the Ministry altered the project's timeline to allow Talent2 to fix errors (for example, the Ministry abandoned testing and phased implementation). The Ministry could have invoked contractual breach provisions when Talent2 missed its milestones. Instead, and there is no indication of opportunism by Talent2, the Ministry continued to negotiate for improved performance (Jack & Wevers, 2013; Seven Sharp, 2013). This is classic lock in behaviour – the Ministry was (or felt) too committed to walk away, even as Novopay failed to perform. Once again, the Ministry was also its own worst enemy. It let its contractual contingency (to continue using Datapay) lapse, so that it became a 'Hobson's choice' to go live with Novopay (Jack & Wevers, 2013, p. 51).

Finally, Novopay's atmosphere was complicated. Payroll administrators and school staff, what Williams (1975) describes as the human factor, were expecting similar functionality, pay practices and support services to what Datapay provided. The Ministry did nothing to dispel that expectation and did not prepare them for the changes that were actually required. The transaction costs that the Ministry suffered were as much reputational as monetary – 'Novopay['s failures] have affected public trust and confidence in the Ministry of Education, and also the wider [NZ] public sector' (Jack & Wevers, 2013, p. 9). The Ministry was a passive counterparty who over exposed itself to market transaction costs. It paid a high price for its mistakes.

NZ Customs took a much more constructive approach to SmartGate's possible transaction costs. SmartGate, too, was a complex and uncertain proposition. The biometric software involved in the gates / kiosks was cutting edge and complicated. It was also uncertain whether SmartGate could be successfully integrated with other relevant IT systems – for example, the systems of Immigration NZ (Controller and Auditor-General of New Zealand, 2012). This meant that a bounded, incomplete contract was almost guaranteed. It also contributed to information impactedness. Morpho possessed specialist technical knowledge with respect to the biometric software and hardware, while NZ Customs had a much better understanding of the other relevant IT systems (Controller and Auditor-General of New Zealand, 2012; Line of Defence, 2016). These informational differences further increased the magnitude of the possible transaction costs.

The atmosphere within which SmartGate was pursued was a delicate one too. SmartGate was being championed by the then Prime Minister and dealt with border security. The political stakes were therefore high. Border control is also often the first interaction that travellers have with NZ (Nicklin, 2015). Use of automated passenger processing risked reputational ramifications for NZ more generally.

NZ Customs effectively and constructively addressed the market based transaction costs that it faced. It did so in two notable ways. First, it tested SmartGate in a controlled enviroment before introducing it. Testing, and learning from Australian Customs' experience, reduced the level of complexity and uncertainty surrounding SmartGate (Controller and Auditor-General of New Zealand, 2012). In turn, this reduced the degree of information impactedness, reduced the boundedness of the contract and negated some of the possible negative atmospheric effects. Secondly, NZ Customs intentionally pursued a relational contract with Morpho and collaborative relationships with other interested parties (for example, Immigration NZ, Air NZ and Australian Customs). Both Coase (1937) and Williamson (1985) note the value of trust and reputations in supporting long term, complex and uncertain projects. NZ Customs consulted with interested parties and engaged with Morpho throughout. As a result, Morpho became invested in the success of SmartGate in NZ (Controller and Auditor-General of New Zealand, 2012). This strong relationship helped to offset remaining information impactedness and contractual incompleteness. The success of this relationship is evident in the new contract between NZ Customs and Morpho, which expressly includes a research partnership (Safran, 2015). NZ Customs astutely used testing / monitoring and relationship building to mitigate potentially large transaction costs when it introduced SmartGate to NZ's airports.

Outsourcing IT exposes government to potentially significant market based transaction costs. A comparison of Novopay with SmartGate demonstrates the importance of proactive mitigation of transaction costs. The pragmatic and engaged approach of NZ Customs could be held up as a "gold standard" for public sector contracting – it demonstrates what is required if the private sector is to be effectively utilised in public service provision.

5. COMMERCIAL AND CONTRACTUAL NOUS – CONTRACTS NEED MANAGING

Outsourcing is, broadly speaking, a form of privatisation – the "asset" that is privatised is the service contract (Goodman & Loveman, 1991; Vickers & Yarrow, 1991). Privatisation changes the role of government from being the producer itself to one of oversight and management. This new role demands

new skills from government. Government departments that contract out need high quality commercial and contract management skills to match their private sector counterparts and to effectively manage contracts to deliver desired outcomes (Controller and Auditor General, 2009; Controller and Auditor General, 2011). Unfortunately, the public sector often has skill deficits here. In addition, public sector projects often suffer from high staff turnover, causing a loss of institutional and project knowledge. This can lead to an over reliance on expensive (and usually temporary) external advisers. An inability to effectively manage commercial contracts often undermines government's ability to deliver desired outcomes (Controller and Auditor General, 2009; Controller and Auditor General, 2011).

Novopay is, quite simply, a model of how not to negotiate and manage an IT contract. It is a litany of poor practice. Most significantly, the Ministry:

- Erroneously believed that it had sufficient internal expertise on the schools payroll to manage an outsourced schools payroll contract;
- Lacked the necessary commercial and contractual nous to negotiate a complete contract (this is closely linked to the point above, in that the Ministry did not know what it wanted or needed from Novopay);
- Suffered from high turnover of senior staff members;
- Did not recognise deteriorating commercial conditions as they arose. The decision to negotiate with Talent2 when it failed to meet performance milestones is a good example of this; and
- Undermined its own position by allowing its contractual option to continue using Datapay (i.e. its contingency) to lapse (Jack & Wevers, 2013).

The Ministry did, at times, recognise its skill deficits and contract external support (Jack & Wevers, 2013). However, overall, Ministry staff lacked the commercial and contractual nous needed to manage a complex IT project. It is also worth making the link between poor commercial and contractual practices and transaction costs. Poor practices were a major reason why the Ministry found itself over exposed to the market based transaction costs identified in section four.

NZ Customs, on the other hand, demonstrated sensible commercial practices when it introduced SmartGate.[6] It started with a clear understanding of its environment and its "business needs" – international passenger numbers were increasing, airport space was limited and processing times needed to be managed. This resulted in a solid business case for what was required from an automated processing system. NZ Customs also used its relationship with Australian Customs as a valuable commercial partnership, learning from what the Australians already knew about automated processing. NZ Customs then selected an "off the shelf" technology – SmartGate was an established product that met its needs – which limited the possibility of unforeseen complications. Finally, it rigorously tested and monitored SmartGate and established collaborative relationships with interested parties, including Morpho. As a result, NZ Customs transformed itself from "just another government agency" into an astute commercial counterparty who was well placed to manage and oversee a contract for an automated border control system. The recent partnership arrangement concluded with Morpho highlights the commercial repute that NZ Customs now has in this area (Controller and Auditor-General of New Zealand, 2012; Safran, 2015). It is obvious that developing a strong commercial presence helped shield NZ Customs from potential negative transaction costs.

Contracts do need managing. Outsourcing imposes upon governments the need for commercial and contract management skills. Often governments do not possess the necessary skills to begin with – neither the Ministry nor NZ Customs did. Where that is the case they need to be actively developed. NZ Customs' approach to SmartGate demonstrates that concerted and consistent efforts can build the required skill base, ultimately for the benefit of citizens.

6. COMPARATIVE DISCUSSION – CONTRACTING FOR IT SUCCESS

There is no doubt that IT has potentially large benefits for government. Not only operationally, but also politically, this makes IT projects attractive. However, as Novopay demonstrates, IT is actually critical, even in seemingly "ancillary" functions, such as payroll. Governments need to be under no illusion of this fact. In that sense, the first step to improving outsourced IT projects (big or small) is to be more respectful of the importance of IT as an enabler of the business of governing and service provision. Respecting IT means thinking carefully about what is outsourced and how it is outsourced. NZ Customs' approach to SmartGate is in line with this approach. On the surface SmartGate was simply a replacement for a manual stamp in a passport. Yet what NZ Customs recognised was the potential for much larger ramifications should things go wrong. Therefore, it carefully built up its familiarity with, and knowledge of, SmartGate before introducing it.

The Novopay and SmartGate case studies also demonstrate that policy makers are well advised to acknowledge path dependency in their projects – ignoring the past is not a good option. This does not mean that projects should not be initiated where they go against the grain of the past. That would stifle both innovation and opportunities to improve business processes. Rather, reality should shape action. In some instances, ambition may need to be scaled back or introduction phased.

IT projects tend to disrupt the status quo. In circumstances where major end user changes are required investment in change management is an important part of the implementation process. Responsible officials tend to be well intentioned. However, they also need to be realistic about the totality of what actually needs to be done to implement IT projects, and who will be responsible for doing it – government or private provider. Novopay was not a bad idea, and would likely have been more successful (and less costly) if the Ministry had been frank about the need to simplify the schools payroll and the required user changers. "Historic awareness" should be achievable too. A relatively high-level comparison of the present with the desired future should indicate what the main issues are likely to be, and therefore where to direct extra attention in implementation. Better use of business analysis and process mapping at the outset would serve as a valuable part of such an approach.

Contractual and commercial skills have been shown to be another big area for improvement. These skills are critical because they place government on an equal footing with private counterparties. However, and critically, competent contractual management and sound commercial judgment is also likely to reduce government exposure to market transaction costs.[7] NZ Customs mitigated many of the possible transaction costs that it faced by methodically developing its commercial understanding of SmartGate before introducing it and by devoting time and energy to the development of cooperative relationships. Conversely, the Ministry's approach with Novopay was closer to the "blind leading the blind", and was particularly unconstructive. Commercial and contractual skills are not usually easy to develop, nor do they tend to develop quickly, without intention. Case in point, the UK has introduced dedicated civil service training programmes and career tracks focused on improving contract and commercial skills (Controller and Auditor General, 2009). Another more short-term suggestion might be to implement retention pay for senior public staff that is tied to major projects. This would encourage targeted staff to see out the duration of a project, and therefore allow project specific expertise to accumulate.

IT projects also particularly struggle with 'design-reality' gaps (Heeks, 2006, p. 128). A design-reality gap exists where there is a significant difference between the assumptions on which an IT project is based and the current realities of the system into which that IT project will be introduced. Private providers will only ever provide what governments contract for. Therefore, it is critical that governments identify designs-reality gaps and specify solutions in outsourcing contracts.

A key reason that IT projects struggle to bridge design-reality gaps is the relative intangibility of IT. Prisons and roads are material things. Compared to IT, it is easier to see how they will work in practice. Interestingly, part of SmartGate's success has been attributed to its tangibility – physical

kiosks and gates that actually let people enter NZ (Nicklin, 2015). Most IT systems, by contrast, are more "elusive" from a user's perspective – users see only a computer interface. For many, virtual interfaces are less intuitive than tangible objects. This makes IT projects particularly vulnerable to user error / interaction issues. This was certainly the case with Novopay. More attention, therefore, needs to be given by government to specifying in contractual terms the socio-technical interface for IT projects (Maguire, 2014) and to making sure that interfaces meet real users' needs. This is particularly so because contracting out introduces an additional link in the supply chain – users themselves are one step removed from the private providers. This separation needs to be countered if the design-reality gap is to be bridged. Early (and detailed) specification of end user requirements, along with strong change management processes and product testing, can help to effectively connect private developers and users.

Finally, the scale and integration of IT projects are important considerations. Large IT projects tend to be driven from the top down and often get preoccupied with technical elements at the expense of solving real public service problems and increasing user readiness (Gauld & Goldfinch, 2006). In other words, political vision tends to trump practical requirements. This, unfortunately, widens the design-reality gaps in larger projects. This was certainly the case in Novopay. An alternative, and preferred approach, is to scale up solutions that are developed at a grass roots level. With grass roots development project focus revolves squarely around solving existing (and actual) challenges. This shrinks design-reality gaps by allowing iterative learning to take place (Heeks, 2006). SmartGate, with its emphasis on testing and organisational learning, illustrates the fruits of this approach.

7. CONCLUSION

Governments often choose to outsource IT projects. This is because IT systems are considered to be ancillary to the public functions they help deliver. Case in point, coordinating teachers' pay is (or at least was) not considered to be central to the delivery of education in NZ. However, a large number of outsourced government IT projects fail. Indeed, Novopay was a very public failure. Using the Novopay and SmartGate case studies, this paper has discussed important design and governance issues when outsourcing government IT projects.

Drawing on the preceding analysis and comparative discussion, five positive principles for outsourced government IT projects are proposed:

1. Government should recognise and consider carefully the interconnections between all parts of public services before outsourcing – public services are not easily divided up for the purposes of writing a contract;
2. Government should acknowledge historic impacts at the outset and should match the level of attention and resource that is devoted to change management to the degree of change required from the status quo;
3. Government should expect market based transaction costs, making allowances in both time and resource for them and actively working to minimise them;
4. Government should, as manager rather than producer, intentionally develop the contract and commercial skills that will allow it to effectively service its citizens;
5. Government should allocate more time to the design-reality gaps of IT projects, so that real people know how to solve real problems using IT's (often intangible) functionality.

SmartGate demonstrates that positive outsourced IT outcomes are most definitely achievable. Focusing on the principles above could contribute to improving the outcome of future outsourced government IT projects.

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ENDNOTES

1 As a point of grammar, it is noted that the "schools payroll" refers to the payroll system of New Zealand's schools, which is external of the schools themselves (so there is no possessive apostrophe).

2 The Ministry moved to the Datapay system in 1996. Prior to that it had provided payroll services itself using its own software (Jack & Wevers, 2013).

3 Ironically, the very same practices had also caused problems when the Ministry moved to the Datapay system (Jack & Wevers, 2013).

4 Interestingly, and as an example of poor commercial practice in its own right, Talent2 did not push back against the Ministry's scope creep (Jack & Wevers, 2013).

[5] Williamson identifies small numbers (of producers) and / or counterparty opportunism as reasons for market transaction costs too (Williamson, 1975; Williamson, 1985). However, these factors are less relevant for the analysis in this paper and are therefore not discussed further.

[6] There is limited publicly available information regarding the contract between NZ Customs and Morpho (this is probably because nothing significant has gone wrong, so the contract has not been subjected to public scrutiny).

[7] Market based transaction costs cannot be completely eliminated. In pursuing market solutions, the government must accept at least *de minimis* exposure.

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