

eJournal of Tax Research

Volume 2, Number 2 2004

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Liane Turner and Christina Apelt

Globalisation, Innovation and Information Sharing in Tax Systems: The Australian experience of the diffusion and adoption of electronic lodgement

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Abstract

The aim of this research was to apply a new conceptual framework to describe and explain the factors that have enabled the diffusion, adoption and operationalisation of electronic lodgement within the Australian tax system. The uptake of electronic lodgement of tax returns by both tax agents and taxpayers has increased significantly since introduction. Electronic lodgement of tax returns is part of a burgeoning global trend by OECD members to engage in and broaden the implementation of e-government applications.

This research applied an eight factor framework to analyse the diffusion and adoption of electronic lodgement of tax returns within Australia. These eight factors were the circulation of ideas, national context, tax policy context, technological context, path of entry, effectiveness of champions, roles of key constituents and internal and external networks of support. The methodology comprised textual analysis and in-depth interviews.

This study revealed that a coalescence of factors and actors were pivotal in enabling the diffusion and adoption of electronic lodgement services within the Australian national context. Globalisation, information exchange and advances in technology in computer hardware and software were key drivers. Contemporary issues in the Australian tax administration system and the broader national context were also influential. This study highlights that Australia was amongst the countries championing the global phenomenon of use of electronic lodgement services within tax authorities. The framework provided a comprehensive means to analyse and explain the diffusion and adoption of electronic lodgement strategies within the Australian environment.

THE SEA CHANGE FROM PAPER TO ELECTRONIC LODGEMENT OF TAX RETURNS

In the early to mid 1980s, the concept of electronic lodgement of tax returns was being trialled in the United States. By 1987, the Australian Taxation Office (ATO) piloted the initial use of electronic lodgement services, heralding a potential sea change in the lodgement and processing of tax returns. By 2002/03, approximately 70% of Individual taxpayers lodged their tax returns via tax agents. Currently, it is estimated that 97% of tax agents use the Electronic Lodgement Service (ELS). In the same financial year, approximately 10% of Individual taxpayers lodged electronically through e-tax via the ATO website, with a further 1% using TaxPackExpress via Australia Post. By 2004, the suite of electronic lodgement services offered by the ATO has grown substantially.

The pervasiveness and rapidity with which this phenomenon has surged internationally is evident in the number of countries that have adopted this sea change

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of the increasing displacement of paper processing of tax returns through the implementation of differing types of electronic lodgement services. In the past two decades, the diffusion and adoption of electronic lodgement innovations by tax authorities has swept the globe with countries such as Australia, Canada, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Singapore, Sweden, Switzerland, United Kingdom and the United States offering these computer-based facilities to their taxpayers.

The extent of diffusion of electronic lodgement services in tax authorities both in Australia and internationally raises sociological questions. Such questions include what were the key drivers enabling the spread of this innovation, how did ideas pertaining to electronic lodgement services migrate globally, and who were the champions?

To date, a limited body of research has been conducted to explain the diffusion of electronic lodgement services in the Australian context. This literature consists primarily of historical and descriptive accounts chronicling events in the ATO in general and the implementation of Electronic Lodgement Service in particular (ATO, 2001, 1993). This study aims to further our understanding of this diffusion and adoption process.

THE FOCUS OF THIS STUDY

The aim of this research was to apply a new conceptual framework to describe and explain factors enabling the diffusion, adoption and operationalisation of electronic lodgement within Australia. This was achieved by examining three electronic lodgement modalities implemented by the ATO, namely Electronic Lodgement Service (ELS), TaxPackExpress and e-tax. This study is neither an evaluation of the effectiveness of the process of electronic lodgement diffusion and adoption within Australia, nor an exhaustive history tracing all events entailed in this process. The conceptual framework and methodology for this analysis are now outlined.

ON THE DIFFUSION OF INNOVATIONS

This research tests the applicability of employing a new framework for analysis of the diffusion and adoption of electronic lodgement in Australia specifically and of innovation in tax systems more generally. An earlier version of this study's conceptual framework was devised to describe and explain the diffusion into and within the Australian context of a health policy and technological innovation, namely Diagnosis Related Groups (Dregs)¹ (Turner: 2002). Used for information, management and funding purposes, Dregs were operationalised through the development and use of a range of financially oriented software products applied by governments, insurers and hospitals to calculate resources required by acute care inpatient services.

This conceptual framework is based on the work of sociologists Rogers (1962), Kimberly and de Pouvoirville (1993a), Kimberly (1993) and sociologists of translation (Callon, 1986, 1991; Latour, 1988, 1991). Rogers (1962) constructed a theory of the diffusion and adoption of innovations. For Rogers (1962: 13), an innovation is "an idea perceived as new by the individual" rather than one that is novel

¹ This casemix system predicts patients in each DRG will utilise similar amounts of healthcare resources.

as objectively measured by the duration of time since it was initially discovered or used. Building on the work of Rogers (1962), Kimberly and de Pouvoirville (1993b) constructed a six factor framework to analyse the diffusion of DRGs in Western Europe. These factors were the health policy context, technical context, path of entry, role of champions, roles of key constituents and internal and external networks of support (Kimberly & de Pouvoirville, 1993b). Each factor was found to have influenced the outcome of the DRG diffusion and adoption process by both governments and key stakeholders in nine countries studied. Path of entry by government officials was found to be pivotal in advancing the adoption of an innovation in government policy.

Kimberly (1993) identified the national context and the international circulation of ideas as additional factors which should be examined, as well as suggesting application of analytical strategies devised by sociologists of translation, so as to provide a more comprehensive understanding of the diffusion and adoption of an innovation. Furthering the work of Kimberly (1993), Turner (2002) devised a new eight factor conceptual framework that also integrates analytical insights from the sociology of translation to enable the analysis and explanation of diffusion processes for policy innovations which were operationalised through the use of computer-based technology.

The present study applies a modified version of Turner's (2002) conceptual framework to examine and explain the diffusion and adoption of electronic lodgement in Australia. The eight framework factors used to guide data-gathering and data-analysis phases of this research are the tax policy context, technical context, roles of key constituents, internal and external networks of support, effectiveness of champions, path of entry, country context and the larger context of the circulation of ideas in general.

This study applies definitions used in prior research. Emergence is defined as the process of invention by which innovations are created, and which occurs as "part of a larger pattern of social, political and economic activity" (Kimberly & de Pouvoirville: 1993b: 4). For Rogers (1962: 13), diffusion "is the spread of an idea from its source of invention to its ultimate users or adopters." Adoption is defined as, and evidenced by, the government's incorporation of an innovation in its policy (Turner, 2002).

This section outlines the characteristics of the framework factors, before delineating the analytical insights from the sociology of translation incorporated into the framework.

Tax policy context pertains to government actions, organisations, services and legislation that shape and constitute the tax system. This factor requires analysis of the basic contours of the country's tax system, issues of concern or policy debate, and the presence of government goals that could promote a policy climate conducive to change.

The attributes of the *technical context* include the types of data sets collected by a tax authority as well as the types of hardware, software and telephony technology that existed when electronic lodgement innovations were considered and trialed in Australia.

Next, the roles of *key constituents* are considered. ‘Key constituents’ are actors who are affected by the diffusion of electronic lodgement services in the pivotal roles of taxpayers, tax agents, policy makers, software developers and consultants. In this study, the terms key actors, key constituents and key participants are used interchangeably.

Analysis of *internal and external networks of support* requires identifying both the presence of, and roles played by, electronic lodgement support networks characterised as being either ATO specific (internal) or outside the ATO organisation either nationally or internationally (external) that are established or linked into by champions.

To determine the *effectiveness of champions* requires analysis of whether these actors are able to mobilise resources and support. ‘Champions’ are defined as people who are resolute supporters of an innovation, evident in their preparedness to “invest extraordinary amounts of personal time, energy, and reputation to ensure its implementation” (Kimberly & de Pouvourville: 1993b: 13-14).

The *path of entry* of electronic lodgement innovations into Australia will be determined by applying the Kimberly and de Pouvourville (1993b) typology of actors, namely government officials, academic researchers, business people and consultants.

Analysis of the *national context* requires consideration of the presence of pre-existing or concurrent public sector reforms and the nation’s economic and political circumstances.

Examination of the *larger context of the circulation of ideas* requires identification of emerging and dominant ideas, such as economic schools of thought, developments in the finance industry, and perspectives on government approaches to service delivery that were debated and influenced government policy at the time.

SOCIOLOGY OF TRANSLATION ANALYTICAL STRATEGIES AND INSIGHTS

Given the innovation of electronic lodgement of tax returns can be conceptualised as a policy and a technological innovation, this study draws on the analytical insights from the sociology of translation, also known as actor-network theory. Devised by Latour (1986, 1987) and Callon (1986, 1991) and their associates, this approach is applied to explain the emergence and spread of scientific and technological innovations.

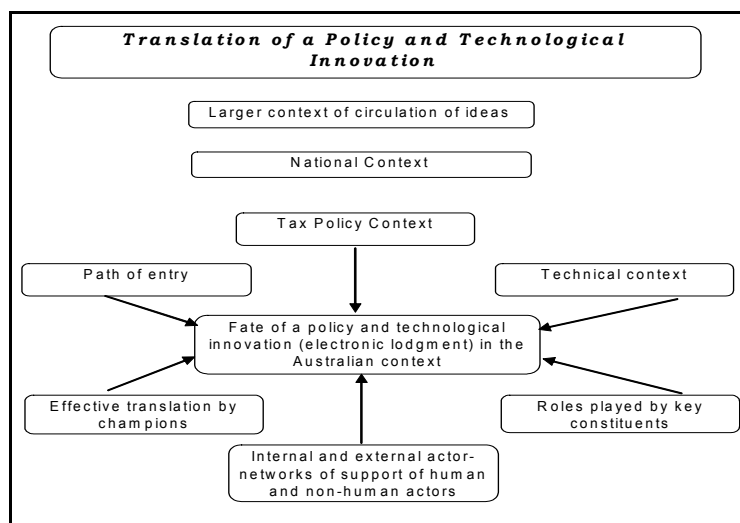
Challenging the notion that the diffusion of innovations is an inevitable process, sociologists of translation maintain that the spread of an innovation is dependent upon the roles played by, and resources obtained from, many actors (Latour: 1986) who assist its passage. The value of sociology of translation lies in its demonstration that the diffusion of an innovation can be understood more fully by attention to, and acknowledgement of, the roles played by both human and non-human actors which are examined, not as single entities, but in terms of network alliances or actor-networks (Callon, 1986, 1991; Law, 1992; Latour, 1988, 1991; Singleton & Michael, 1993). An actor can be a person, a machine, an organisation, a government or a text such as legislation.

Callon (1991) highlights the importance of the roles played by specific non-human actors, termed ‘intermediaries’, in enabling the diffusion of an innovation. Examples of intermediaries are texts, technical objects, skills and money.

Further, Latour (1988) revealed the significance of examining the roles played by trials of strength – consisting of pilot studies – in the spread and adoption of innovations. Pilot studies are used to establish credibility and to broaden the mobilization of allies, by convincing other actors of the benefits of using the innovation.

Of particular pertinence to this study, sociology of translation views innovations as both historical artefacts of a specific era and dynamic entities. This is achieved by revealing the nexus between science (knowledge production) and society (social, political and economic arrangements) that together provide the conditions to shape the formation and modification of innovations (Latour, 1991; Latour et. al, 1992; Scott 1992). To demonstrate this interrelationship, Latour (1991) analysed the emergence of the Kodak camera (technological innovation) and the mass market for amateur photography (social context/society). Subjected to modification enabled by technological advances and demanded by customers, each successive version of the Kodak camera was designed to increase interest in its adoption by highlighting its user friendliness and affordability. Latour illustrated that actor networks comprised of both humans (developers, researchers, technicians, investors and photographers) and non-humans (knowledge, skills, capital, paper, film plates, film rolls, patents, mass production methods and advertisements) were crucial in enabling the spread and adoption of this innovation.

Applying the sociology of translation, Chua (1995) and Turner (2002) revealed how the diffusion and adoption of DRGs in three New South Wales hospitals and in Commonwealth Government policy respectively was contingent on the roles played by human and non-human actors. Human actors included champions, researchers, public servants, hospital staff and consumers. Non-human actors included disciplinary knowledge, cost accounting practices, government departments, software companies, computers, software packages, pilot studies, files and research grants. The studies by Latour (1991), Chua (1995) and Turner (2002) reveal that the absence of any of the human or non-human actors could have caused the innovation to be a different entity, which could have influenced its diffusion and adoption. Figure 1 delineates the conceptual framework for the analysis of the diffusion and adoption of innovations.

FIGURE 1: TRANSLATION OF A POLICY & TECHNOLOGICAL INNOVATION

METHODOLOGY

Two methods of data collection were employed. Firstly, textual analysis was applied in order to examine reports, policy documents, media releases, journal articles, and other written material. Secondly, in-depth interviews were conducted with 15 key actors who participated in the diffusion, adoption and implementation processes of electronic lodgement innovation services in Australia. In-depth interviews were conducted to augment and corroborate material collected for the textual analysis. Data analysis for both textual material and records of interviews was guided through use of the study's eight factor conceptual framework. Further, thematic analysis² was applied to the data to ensure additional factors and emergent themes were identified for their influence on the diffusion and adoption of electronic lodgement services in the Australian tax system. The authors conducted both the data-gathering and data-analysis phases of this research.

THE AUSTRALIAN EXPERIENCE OF THE DIFFUSION OF ELECTRONIC LODGEMENT

This paper now presents the data from both texts and interviews that are pertinent to the implementation and adoption of electronic lodgement technology within the Australian Taxation Office. This section also reflects on the adoption of electronic lodgement technology internationally.

Prior to September 1942, under Australia's federal system of Government, both the Commonwealth and the states could levy Individual Income Taxes. As a consequence of World War II, the Commonwealth became the sole government responsible for the management of Personal Income Tax, initially on a trial basis in September 1942 and then permanently by 1946.

The Central (National) Taxpayer System came into operation in South Australia on 1 July 1975. It was the largest computer-based system in the Southern Hemisphere at

² Kellehear (1993:38) notes that thematic analysis is a method in which themes are sought "as these emerge from the narrative of the interview or written work or behaviours".

that time. Data from income tax returns was entered into the computer network and the edit programs eliminated a high proportion of taxpayer, assessor and keying errors. The corrected data was then transferred to a central computer complex in Canberra for further processing. The first stage of the national roll-out commenced in June 1976 when the system began processing the returns of taxpayers in New South Wales (NSW) and the Australian Capital Territory (ACT) (Interviewee 2, 2004; ATO Story, 2001).

In 1984, Trevor Boucher replaced William O'Reilly as Commissioner (ATO Story, 2001). One of Boucher's first actions was establishing the Assessing Review Group from which legislation for self assessment was enacted in 1986 (ATO Story, 2001). To operationalise self assessment, the ATO needed to support the taxpayer with service and tools that assisted compliance rather than just process returns and enforce taxation law (ATO Story, 2001; Interviewee 2, 2004). Self assessment mandated a paradigm shift in the way the ATO interacted with the taxpayer, triggering a massive re-organisation, including the redeployment of thousands of staff. It was planned that this would bring about an increase in the total tax revenue without a corresponding increase in costs.

During the late 1980s and early 1990s the Commonwealth pursued a micro-economic reform agenda aimed at enhancing efficiencies within the public service (King & Lloyd, 1993; Pusey, 1992; Rees, Rodley & Stilwell, 1993; Stilwell, 1993).

In 1987 Boucher took his Modernisation plan, outlining a massive investment to upgrade computer resources for the ATO, to the Government. It was planned that over time Modernisation would rationalise the ATO's data systems and business activities and staff would perform their tasks using an integrated set of computer-aided tools (ATO, 1990b). The Government agreed to fund the plan and the ATO made a commitment to cost the Government less over the following 10 years. This amounted to the implementation of a major workplace redesign process and an improvement in job processes for the ATO staff. Michael Carmody, then Second Commissioner in charge of the ATO's Revenue Collection and Taxpayer Audit functions, was charged with responsibility for the Modernisation program (ATO Story, 2001).

A large portion of the ATO Modernisation Program was premised on significant savings from automating its information-gathering processes, so at the coal face new workstation furniture and computers were installed. Additionally, LAN and computer rooms needed to be built to assist with the transitions in work processes and ready the ATO for a fundamental shift in terms of its internal focus (Interviewee 2, 2004). Computerisation within the organisation at this time was a major factor that enabled the continued swell of change initiatives that followed (Anon., 1994; ATO Story, 2001).

At this time Trevor Boucher visited the United States and saw the experimental trial of an electronic lodgement facility being developed by the Inland Revenue Service. Boucher returned to Australia and injected the idea for the development of an electronic lodgement system into the ATO (Interviewee 11, 2004; Interviewee 6, 2004; Interviewee 5, 2004; Deuchar, 1989). Boucher set up a small project team to work directly under Michael Carmody (Interviewee 12, 2004). Carmody mobilised the necessary resources in the organization to make this project happen (Interviewee 1, 2004). ELS commenced with a small trial in South Australia where one tax agent lodged some 150 returns in 1987. Initially, only Individual (Form I) income tax

returns could be lodged. This trial was given support by Adelaide's Deputy Commissioner, Ron Kelton (Interviewee 10, 2004; ATO, 1993).

Internally, the ATO had some very clear business pressures to drive the development of an electronic lodgement system. ELS was the first Modernisation project and was seen to have a central role in the push towards modernising ATO business systems and achieving the increased efficiencies and improved job design promised by the Program (Interviewee 12, 2004; Interviewee 6, 2004; Deuchar, 1989; ATO, 1990b). Electronic lodgement by tax agents was central to the ATO shift away from being a paper processing organization with all of the associated job design benefits for staff and clients (Interviewee 1, 2004).

ELS involved the lodgement of income tax return information through the use of tax preparation software on the tax agent's own computer equipment. The transfer of the information from the tax agent to the ATO occurred electronically via telephone lines on the Telecom (now known as Telstra) Austpac network or on a floppy disk. It was form of Electronic Data Interchange (EDI). The Data Take-On machine validated that the data met ATO standards, either rejecting the tax return back to the tax agent for correction or forwarding it through to an electronic security break then to the ELS processing machine. The data then moved to the National Taxpayer System (NTS) for processing and then the Automated Document Despatch system that produced the assessment notice (ATO, 1993). The NTS (established in 1975) was an enabling factor. Its existence provided the ATO with the processing capability (including the algorithms) to process the tax returns received via ELS (Interviewee 2, 2004).

The entire process was automated and staff intervention was not needed unless an NTS edit error occurred (Interviewee 3, 2004; Interviewee 13, 2004; ATO, 1993). The closed user group security (CUG) facility provided by the Austpac network effectively restricted access to the ATO Data Take-On machine to those tax agents who had been formally approved by the ATO for electronic lodgement (Deuchar, 1989; Interviewee 3, 2004; Interviewee 13, 2004). In the early implementation of ELS tax agents could also lodge on floppy disk, rather than online through Austpac. The floppy disk was then read into the ATO systems (Interviewee 10, 2004).

Due to evidentiary requirements, the paper copy of the electronic information had to be printed and signed by the taxpayer and the tax agent prior to its transmission to the ATO. Under the standing operations of ELS at introduction, the signed paper was to be forwarded and received by the ATO before processing could begin. This was later amended so the tax agent held a hard copy of the return on file. The legislative change recognising the electronic return as furnished by the taxpayer was not made until much later, in 1997 (ATO, 1993; Interviewee 2, 2004).

Concurrent with the introduction of the ELS innovation into Australia was the start of a swell of technological developments (Interviewee 12, 2004). Several factors that existed in the wider technological arena enabled the development and adoption of ELS. A key factor was the emergence of Packet Switching Technology in the telecommunications world and this was in place for the trial of ELS technology in 1987. The Packet Switching Network was run by the Telecom X25 network and called Telenet. This was an international standard, and the precursor to the current Internet technology (Interviewee 5, 2004). Prior to Packet Switching, computers were networked with fixed point-to-point wires with leased landlines to each Branch Office. In the absence of Packet Switching technology it would have been necessary for each

tax agent to buy a dedicated line service from Telecom to connect to the ATO. The emergence of this technology made it much cheaper for tax agents to link to the ATO and adopt ELS (Interviewee 5, 2004).

At the same time, the PC revolution was putting personal and business computers within easy reach (Interviewee 5, 2004). The computerisation of business was happening rapidly and some tax agents had already recognised the growing business imperative to increase their familiarity with this technology and were using computers to assist them in preparing tax returns. The information on these forms was then re-keyed into ATO systems (ATO, 1993; Jones, 1998). Supporting this trend, software producers had begun developing and marketing programs designed specifically for tax return preparation and tax agents found these very attractive (Interviewee 6, 2004).

The ATO also needed to improve the quality of data gathered from income tax returns. The period for issue of assessment notices had extended up to 16 weeks and tax agents were under increasing pressure from their clients for faster refunds, and were in turn, putting pressure on the ATO to meet demand for a faster turnaround (Interviewee 1, 2004; James, 1998). Electronic lodgement dealt with this by 'error checking' at the point of transmission, that is, where it was lodged by the tax agent (Interviewee 1, 2004). ELS passed data keying and initial error management to the tax agent. Checks were at lodgement or at the ATO gateway and tax returns were able to be immediately corrected by the tax agent (Interviewee 7, 2004; Interviewee 1, 2004).

At a broader level, the ATO believed that the future business of banks, government agencies and tax agents would depend on electronic document interchange (ATO, 1990b). There was a sense of urgency about the ATO being at the cutting edge of this technological wave and utilising it to ensure the organisation was at the forefront of gaining the benefits (Interviewee 6, 2004). Self assessment, introduced the previous year, the Modernisation Program and the development and implementation of ELS in Australia produced a 'convergence of the planets' in relation to technology and policy going hand in hand and the ATO was in a position to ride the crest of the wave of the opportunities that this provided (Interviewee 2, 2004). ELS encouraged tax agents to purchase computers for their business and modernise their systems ready for the sea change in the way they communicated with the ATO (Interviewee 12, 2004).

The project team that so successfully developed, piloted and implemented ELS existed separately from the mainstream office structure (Interviewee 2, 2004). In the development phase approximately twenty to thirty people worked in the ELS project team directly under Michael Carmody and headed by Project Manager Mike Cebalo (Interviewee 1, 2004; Interviewee 2, 2004).

The ELS acronym originally stood for Electronic Lodgement System and was renamed to Electronic Lodgement Service when Cebalo's son, then aged nine years, suggested the 's' for system should stand for service (Interviewee 2, 2004; Interviewee 13, 2004; Interviewee 3, 2004). The emphasis on 'service', suggested by Cebalo junior was fundamentally embedded in this innovation.

Staff numbers increased as the project progressed into national implementation. The team consisted of technical people, Client Relations Officers (CROs), Business Implementation Managers (BIMs) and administration staff. There were many technical issues to overcome and the ELS project team was working from scratch,

with no useful precedents internally or externally (nationally or internationally) on which to call for examples or experience (Interviewee 6, 2004).

They worked closely with the Privacy Commissioner (Kevin O'Connor), Attorney-General's Department and the Defence Signals Directorate to establish the protocols and standards (encryptions and privacy keys) needed to operationalise ELS (Interviewee 2, 2004). The result of cooperation with external parties was the establishment of security measures for direct data transmission, which included a physical break between the Data Take-On machine, used to accept tax agent data, and the internal ATO processing machine, measures involving the use of passwords, network identifiers, tax agent registration and log-on codes and addresses (Deuchar, 1989).

In December 1989, the project changed focus from development activities to operationalisation. The role of the Client Relations Officers (CROs) was crucial as it entailed going onsite to the tax agents and providing training and information on ELS (Interviewee 13, 2004). The service ethic, internal drive and professionalism of the ELS project team who developed, implemented and ensured the diffusion of ELS is part of ATO mythology and was pivotal to the success of this project (Interviewee 2, 2004).

Critical to the successful implementation of ELS was the support and involvement of tax agents, tax agent software developers, systems vendors and the telecommunications people (Carmody, 1990). ELS implementation involved the staff and management in sixteen Branch Offices, the National Office, over 3,000 tax agents and their representative professional bodies (such as the Institute of Chartered Accountants members who participated in the pilots), Public Service staff associations, twenty-four software producers, Austpac and numerous vendors of systems software and hardware systems (Interviewee 2, 2004; ATO, 1990b; Deuchar, 1989).

The ATO worked closely with the software developers, supplying them with the specifications from which to devise the software applications tax agents would need to enable ELS. Developers then made their software application commercially available in the marketplace (Interviewee 12, 2004). The strength of this arrangement is that it retained the widest possible range of choice for the consumer, in this case, accountants and tax agents (Tebbutt, 1994).

The ATO engaged Prime Computers as the major hardware and software vendor to take the project national (Interviewee 12, 2004). They supplied four Data Take-On machines (Model 6150) and), fifteen ELS processing machines (Models 2755 to 6450), as well as a number of terminals (PT250) for development and operating consoles. Prime also provided the development and operating software: Primos, Prime Information, Info Basic, Prime Recovery and Prime Link. Austpac provided the public network facilities and support. Sixteen PC installations for tax agent floppy disk upload were supplied by NCR. ABC Computers supplied TurboTerm, software that connected the individual TaxLan workstations to the ELS processing machines (ATO, 1990b).

In 1988, volume increased to 27,000 returns lodged via ELS in Adelaide (ATO, 1993). From July 1 1989, the service was offered to all agents in South Australia and Darwin as well as a further small test in Melbourne (ATO, 1993). After these trials the

national implementation project was initiated in January 1989. Their task was to have ELS fully operational in all sixteen Branch Offices by July 1990 (ATO, 1990b).

In July 1990 the ATO officially announced the national release of the system. This represented several firsts for the ATO. These, included:

- a commitment to increase the payments in stages to achieve 'benchmarks' of 15 percent of the married rate of pension for children under 13, and 20 per cent of the married rate for older children, and then to index the payments. These benchmarks were reached in 1989;
- The on-line real time data base used for ELS was the first of its type installed in the ATO;
- For the first time external agencies could electronically exchange documents with the ATO; and
- The introduction of ELS was achieved co-operatively with internal and external parties involved (Interviewee 2, 2004, ATO, 1990b).

There were firsts internationally as well, which included:

- The use of Prime Recovery software package that enabled recovery of database information in the event of system failure; and
- Turboterm terminal software that connected individual PCs on a local network directly into the Prime minicomputer. Previously only single PCs could be linked in this way (Interviewee 2, 2004, ATO, 1990b).

Uptake was achieved using testimonials from tax agents who were involved in the pilot as key speakers at ATO arranged ELS seminars. In addition, the ATO provided a free advertising poster to each ELS registered tax agent announcing a '14 day turnaround'. The promise of a faster refund was an attractive incentive to taxpayers and the tax agents used this poster to attract clients, thus differentiating their 'premium' ELS service from their competitors. The posters enticed taxpayers with the 14 day turnaround and created market competition between tax agents, encouraging their adoption (Interviewee 1, 2004, Interviewee 2, 2004).

The premise was that this technology would be translated into basic savings for practitioners, by giving them faster and more accurate ATO service (Anon., 1994). This premise was fulfilled. ELS slashed turnaround times for taxpayer assessment and refunds and improved service to tax agents (James, 1998). It also paved the way for tax agents to achieve better cash flow management (ATO, 1993; Interviewee 11, 2004).

ELS was the biggest electronic tax administration network in the world (James, 1998; ATO, 1990b).

"The ATO was seen to be doing significant things, innovative things, practical and service friendly things" (Interviewee 6, 2004). Findings published in the Portfolio Evaluation of the impacts of the Electronic Lodgement Service Report (1993:3) concluded that: "...the performance of ELS surpassed expectations. ... ELS is widely regarded as a quality system which has delivered much more than it originally promised."

The ATO objective was that 80% of electronically lodged returns would be processed and assessments issued within 14 days. The result after the first year of operation was that 87% of electronically lodged returns were turned around in fewer than 14 days, while the average turnaround time for an ELS return was 9 days (ATO, 1993).

In its first year of operation (1990) 45% of ELS returns needed human intervention because the information did not meet the ATO standards. In preparation for its second year of operation (1991), the ATO tightened the ELS software specifications requiring the inclusion of additional data integrity checks (edit tests) in the agents' ELS software packages. The result was that in its second year only 29% of ELS returns required human intervention (ATO, 1993).

In 1991, the ATO was awarded the Technology Productivity Gold Award (for improvements to productivity, service and efficiency) for the implementation of ELS (Interviewee 2, 2004). Between July, 1991 and January 1992, 95% of ELS returns were assessed within 14 days and 87% within 10 days (ATO, 1993).

Under Michael Carmody, as Second Commissioner, the ATO worked with Australia Post during 1991 to implement the TaxPackExpress (or Fast Tax as it was originally called) initiative. The pilot was conducted in the ACT. Aware of the fact that ELS service was not available to people who could not access tax agents, the ATO staff sought to implement options to address this issue (Interviewee 11, 2004). An option already in existence was the ability for taxpayers to lodge electronically using commercially available software to generate a return that was saved on floppy disk which then was taken to an ELS registered tax agent for lodgement. A new innovation, namely TaxPackExpress was developed to enable taxpayers who did not go to tax agents to lodge electronically, thus providing consumer choice (Interviewee 13, 2004; Interviewee 3, 2004). Both options provided individuals with comparable turnaround time for Notice Of Assessment (NOA). "There was the imperative of the level playing field so that it wasn't just the tax agents that were advantaged, but technology was available for both tax agents and taxpayers directly" (Interviewee 1, 2004). People could take their tax return to Australia Post who would key and lodge the return electronically via ELS. There was a small charge for the service (Interviewee 11, 2004; Interviewee 1, 2004; Interviewee 12, 2004).

The ELS structure allowed other developments to occur progressively and new types of returns were converted to the ELS stream in 1992 (Interviewee 10, 2004). ELS was extended to cover business applications, including: partnerships, trusts, companies, superannuation funds, approved deposit funds, public trading trusts and corporate unit trusts (James, 1998).

In 1993, newly appointed Commissioner Michael Carmody announced the national release of TaxPackExpress.

By 1994 notable advances were being made in the software sector with the emergence of a new generation of workgroup and workflow products for tax agents – the 'groupware' phenomenon. These products build functionality between tax software and productivity tools such as e-mail and tax practice information software (Tebbutt, 1994). This reflected a growing technological sophistication by tax agents.

In 1997, the Prime Minister introduced the establishment of electronic service delivery (ESD) targets as part of the strategic plans for Information Age Government. Australia's ESD target was to have all appropriate Federal government services capable of being delivered electronically via the Internet by 2001 (United Kingdom Cabinet Office, 2000).

The Commissioner Michael Carmody had an interest in making electronic lodgement directly available to self-preparers who used TaxPack (Interviewee 9, 2004; Interviewee 10, 2004). He saw this as the way of the future and wanted products to take advantage of electronic solutions and make inroads into the community's electronic and Internet usage, which was increasing (Interviewee 10, 2004).

This Commissioner's imperative was operationalised through mobilising the resources needed to deliver an electronic version of the TaxPack, later known as e-tax (Interviewee 10, 2004). The stated aims of the e-tax project included:

- To match the Commissioner's undertaking to develop an electronic TaxPack;
- To encourage the lodgement of tax returns electronically, thereby reducing keying or imaging;
- To improve the quality of data in self-preparers' returns;
- To facilitate the process of completing a tax return, and thereby to encourage taxpayers with simpler tax affairs to view an electronic TaxPack as an easier alternative to using the paper TaxPack; and
- To offer a faster refund service compared to paper lodgement (ATO, 1996).

At the same time software was also becoming more sophisticated. This allowed the development of software that could step the individual through the TaxPack, masking the complexities of tax law (Interviewee 11, 2004). Also important at this time was the proliferation of the use of Microsoft Windows software, thus providing a cohesive standard of software and hardware that enabled tax agents to interact with ATO systems (Interviewee 7, 2004). This led to the disk version of the electronic TaxPack in 1997, initially this was not downloadable as there were still some authentication problems at that time (Interviewee 9, 2004).

Proof of identity was a key technical issue early in development and it was seen as critical that taxpayers had confidence that their information was transferred to the ATO in a secure environment. From this, the Public Key Infrastructure (PKI) method of digitally signing the return emerged (Interviewee 9, 2004). Digital certificates are produced by PKI to provide a high level of authentication using cryptographic techniques (ATO Connect, 2003). Late in 1997, a legislative amendment provided the basis that allowed the ATO to accept an electronic signature. This Act is cited as *Taxation Laws Amendment Act (No.4) 1997*/(174 of 1997), Schedule 7, Electronic lodgement and electronic funds transfer. (ATO Law, 2004).

The ATO's first website, *ATO assist* was established soon after in April 1998 and in its first year was the third most accessed government site in Australia (James, 1998). *ATO assist* provided access to all ATO publications and other public information products, including rulings, draft legislation and tools to support tax calculations (James, 1998). It also provided the technological facility for an electronic tax return. This enabled the change from floppy disk to website lodgement and was followed by a further trial of an electronic TaxPack in 1998.

The technology allowed individuals to download the free software from the website, eliminating the use of a floppy disk or paper. This provided a faster, simpler and easier tax return solution for self-preparers (Interviewee 9, 2004).

The e-tax product delivers the data to the ATO in a form that feeds directly into the ELS. Error checks are performed at lodgement, that is, at the taxpayer's PC, before the data is sent, improving the quality of the data in self-preparers' tax returns (Interviewee 10, 2004). E-tax also introduced calculations embedded in the software to help taxpayers to understand what they needed to do and help them in a practical way to get it right, improving compliance (Interviewee 8, 2004; Interviewee 14, 2004). There is a major system update in June/July each year to incorporate legislative and functional changes. (Meeting of International Tax Agencies, 2002).

E-tax was developed by a relatively small team of people. The Project Manager was John McCarthy and Chris Mobbs was then Assistant Commissioner for Individuals – Non Business (INB), now called PTax, in charge of TaxPack, TaxTime marketing and telephone services (Interviewee 10, 2004; Interviewee 9, 2004). Around a dozen people developed the technical side of e-tax (Interviewee 9, 2004). A contract for the PC software was awarded to the successful tenderer, a consortium formed for this purpose. Interface specifications were borrowed from ELS (Interviewee 12, 2004; Interviewee 10, 2004).

E-tax was released nationally in 1999 with little or no advertising (Interviewee 14, 2004). Word of mouth and publicity in national newspapers and journals such as Australian Personal Computer and Business Review Weekly raised public awareness for the service (Interviewee 14, 2004). This alone was sufficient to generate initial taxpayer enthusiasm for the product (Interviewee 14, 2004).

The ATO was proactive in marketing e-tax in the media from 2000 onwards. (Interviewee 14, 2004). One of the marketing strategies implemented to raise awareness for the product was the use of well known media identity, financial advisor, Paul Clitheroe, in 30 second advertisements on radio stations (Interviewee 14, 2004). From 2002 onwards e-tax was actively promoted through TaxPack, TaxTime and the ATO website (Interviewee 11, 2004, Interviewee 14, 2004) as well as positive word of mouth.

E-tax adoption increased rapidly each year. It achieved 27,000 lodgements in 1999 and over 833,000 in 2003 (Interviewee 14, 2004). Internet use by Australians has similarly grown: in 1998 to a third (32%) of Australian adults had Internet access, by June 2003 this had grown to over half (59%) of the adult population (NOIE, 2003).

The new e-tax product for 2003 incorporated an improved security function where verification was incorporated into the e-tax software (previously performed on the e-tax website), an auto completion function where previous claim information (such as Baby Bonus) is automatically completed for the user, and a function that rolls over data (for many questions) from the previous year into the current return (ATO Connect, 2004a). In the future it will also handle tax return amendments (Meeting of International Tax Agencies, 2002).

The ELS and e-tax innovations were the forerunners of others. Commissioner Michael Carmody's commitment to realising the full potential of electronic lodgement was evident in his announcement in 1999 outlining the following points:

- The ATO is committed to the delivery of its services to the community in ways that make them low cost, easy to access and easy to use;
- To accomplish this goal we will exploit and emphasise electronic alternatives to traditional means of service delivery;
- We will work with the community and stakeholders to establish their needs and preferences; and
- Where necessary we will lead the community in the establishment and take-up of electronic services (Carmody, 1999).

July 2000 was the start of The New Tax System and earlier that year businesses began to register for an Australian Business Number (ABN) in preparation. From June 2002 the Australian Business Register (ABR) was upgraded to allow real time online processing of Australian Business Number (ABN) registrations (ATO Media Release, 1999; ATO Connect, 2004c).

The Easier, Cheaper, More Personalised approach that was embedded in the ideas of ELS in the 1980s, was formalised into an ATO strategic sub plan from July 2003 (ATO, 2003).

Currently it is estimated that 97% of tax agents use ELS (Interviewee 8, 2004). In the future web services for tax agents will replace ELS and vastly expand two way information flows (Meeting of International Tax Agencies, 2002). E-tax users are predicted to exceed one million in 2004 (Interviewee 8, 2004). Use of TaxPackExpress on the other hand, is declining with the expansion in electronic and telephone media lodgement methods (Meeting of International Tax Agencies, 2002).

The following section provides an insight into the global diffusion of the electronic lodgement innovation and describes the electronic experience in selected countries.

The ATO's continued participation in a range of international forums over the years has furthered information sharing on electronic lodgement innovations and other tax authority matters. The diffusion of electronic innovations globally stems from both considerable co-operation between countries in sharing ideas and a degree of competitiveness within the international community of tax authorities (Interviewee 1, 2004; Interviewee 2, 2004; Interviewee 4, 2004; Interviewee 12, 2004). For example, the ATO received worldwide recognition for the use of PKI technology to provide a high level of authentication for e-tax lodgements (Interviewee 14, 2004). Although other countries offered lodgement methods similar to e-tax, and were technologically advanced in some areas, all lacked the authentication security offered in the Australian system by PKI technology (Interviewee 14, 2004). Countries not using PKI were keen to look at the Australian experience and information was shared through visits, journal articles and attendance at international forums (Interviewee 14, 2004).

Australia is an active member of the following international forums:

- Forum on Tax Administration e-services sub-group;
- Pacific Association of Taxation Administrators (PATA), the US, Canada, Japan and Australia;
- Study Group on Asian Tax Administration and Research (SGATAR);
- Commonwealth Association of Tax Administrators (CATA); and

- Organisation for Economic and Cooperation Development (OECD).
(ATO, 2003; United Kingdom Cabinet Office, 2000).

Experience with electronic lodgement globally includes the following country examples:

United States of America

The Inland Revenue Service (IRS) in the US began trials of electronic lodgement prior to the development of the innovation in Australia (Deuchar, 1989). Adoption of electronic lodgement has been slowly and steadily increasing since trials in 1986. Taxpayers in 35 states and the District of Columbia can file federal and state taxes electronically. In 1997, nearly 16% of individual income tax returns were filed electronically rising to 50% in 2000 (Guttman, 1998). Commercial software companies offer a range of software packages to enable individuals to file taxes electronically; there is no 'free' IRS version. The IRS plans to roll out a new filing system for corporations in 2004. Signature and authentication solutions remain a challenge for them (Meeting of International Tax Agencies, 2002).

Singapore

The Inland Revenue Authority of Singapore (IRAS) piloted e-filing via the Internet around the same time as Australia's pilot of e-tax. It was available nationally in 1999 and recorded 270,000 lodgements. It was planned to achieve half a million participants by 2000. The Singapore government takes active steps to market electronic services and influence demand and take-up. (Meeting of International Tax Agencies, 2002).

Canada

The Canadian Customs and Revenue Agency (CCRA) introduced e-FILE, a third party tax filing system in 1990. This was followed by a pilot of NETFILE in 2000. This enables individuals to file tax and benefit returns via the Internet. The CCRA works closely with the software industry on commercial products that utilise NETFILE. Similar to the Australian experience, electronic confirmation of receipt is received in seconds and the tax return is processed in around 2 weeks. (Meeting of International Tax Agencies, 2002).

United Kingdom

The UK's Inland Revenue launched self assessment Internet filing for individuals in April 2000 and a service for the filing of electronic VAT returns (EVR) was launched in April 2001. Both of these services built on the electronic lodgement service to tax agents in operation since 1997. A variety of electronic services for employers, contractors and agents are available via Electronic Lodgement Service and Electronic Data Interchange (EDI). The service has been built to accept Public Key Infrastructure (PKI) arrangements, similar to Australia's. The IR provides free software to those using this service (Aplin, 2000; Meeting of International Tax Agencies, 2002).

Other Countries

In Norway, one third of returns are now filed electronically and they aim to have all individual returns filed electronically by 2004. The Ministry of Finance in Italy reports the initial pilot in March 2000 of Internet filing achieved 16% of lodgements for taxes for citizens and business through the UNICO 2000 system. Relevant software is downloaded to create the tax file which can then be submitted online.

Sweden's National Tax Board is also moving towards a basic e-file without schedules. They have plans to establish Internet filing of taxes by 2003 (Meeting of International Tax Agencies, 2002).

TABLE 1: KEY EVENTS IN THE AUSTRALIAN ELECTRONIC LODGEMENT EXPERIENCE

1946	Amendment to the Income Tax Assessment Act (1936) resulting in the Commonwealth being the sole government with the responsibility to levy personal income tax.
1984	Trevor Boucher appointed Commissioner.
1986	Self assessment legislation passed.
1987	ATO Modernisation Programme accepted by the Federal Government. Michael Carmody appointed Second Commissioner for Modernisation.
1988	ELS pilot with one tax agent in Adelaide.
1989	ELS pilot was expanded to include more tax agents in Adelaide and Darwin.
1990	ELS trial was expanded to Melbourne.
1991	July - National release of ELS. TaxPackExpress pilot conducted in ACT. ATO was awarded the Technology Productivity Gold Award (for improvements to productivity, service and efficiency).
1992	TaxPackExpress trial was expanded to NSW. ELS was extended to cover business applications, including: partnerships, trusts, companies, superannuation funds, approved deposit funds, public trading trusts and corporate unit trusts.
1993	Michael Carmody was appointed Commissioner. National release of TaxPackExpress.
1997	Nov 1997 - Legislative amendment. Taxation Laws Amendment Act (No.4) 1997/(174 of 1997). Schedule 7 Electronic lodgement and electronic funds transfer.
1998	Public Key Infrastructure (PKI) digital signatures emerged. Electronic TaxPack was trialed on the website. ATO website, ATO assist established.
1999	National release of Electronic TaxPack - called e-tax. ATOLaw made available to tax agents through ATO assist.
2002	ABR was upgraded to allow real time online processing of ABN registrations.
2003	E-tax identity verification is incorporated in the software. The Easier, Cheaper and More Personalised sub-plan became operational from 1 July.

ANALYSIS OF THE AUSTRALIAN EXPERIENCE OF ELECTRONIC LODGEMENT

This section now answers the study's research question regarding what factors enabled the diffusion, adoption and implementation of electronic lodgement within Australia by firstly applying the study's eight factor conceptual framework and then drawing on analytical insights from the sociology of translation.

Interview and textual material reveal that the path of entry of electronic lodgement of tax returns into the Australian Tax Policy domain occurred through government officials. ATO Commissioner Boucher had visited the United States where this innovation was being trialled in one state. The evidence reveals that the Commissioner facilitated the migration of the idea of electronic lodgement of tax returns through bringing the idea back into Australia and establishing a small project team to enable the transition of this innovation from an idea to implementation. In relation to e-tax,

the data evidences that Commissioner Carmody acted as the path of entry, championing the introduction of this innovation to honour a commitment to have an electronic version of TaxPack.

The evidence is now considered in relation to the factor, the *effectiveness of champions*. Interview and textual material highlighted the presence of a number of effective champions. Most notably, these were the successive Commissioners Boucher and Carmody and senior members of the Office who championed the operationalisation of ELS and e-tax, including Cebalo, Kelton, Mobbs and McCarthy. Together, these champions were pivotal in driving the diffusion and implementation of electronic lodgement innovations in the ATO. The personal commitment, credibility, standing, ability and ‘can-do attitude’ of these champions were critical in mobilising the requisite resources of people, skills, funds and hardware to build the momentum to effect the spread of electronic lodgement innovations in the Australian tax policy domain.

The *tax policy context* is now examined. There is considerable textual and interview material highlighting that this factor was critical in influencing the diffusion and adoption of electronic lodgement services within Australia. In terms of its basic contours, the Commonwealth Government was able to drive the national diffusion of electronic lodgement services of tax returns for Individuals as a consequence of the prior exclusion of the states from levying personal income tax. This occurred due to World War II, initially on a trial basis in September 1942, then permanently by 1946, with resultant amendments in those years to the *Income Tax Assessment Act (1936)*. The presence of Government goals of the Self Assessment System in 1986 and the Modernization Program in 1987 promoted a policy climate conducive to change that facilitated the adoption and implementation of electronic lodgement, in particular ELS in 1987. Two issues of concern prompted the adoption of electronic lodgement innovations. In relation to ELS, the issue was the length of time the ATO took to process tax returns. The importance of this issue lay in the fact that the majority of taxpayers lodged their returns on paper. With regard to the implementation of TaxPackExpress and e-tax, the issue pertained to the ATO’s goal of levelling the playing field to enable taxpayers who did not use the services of a tax agent to have access to electronic lodgement options.

With reference to the *technical context*, textual and interview material evidenced the ATO harnessed advances in computing hardware and software as well as telephony and later Internet capabilities to achieve its goals of implementing ELS, TaxPackExpress and e-tax. ELS was at the forefront of cutting edge technology, as at the time of its implementation, this innovation was the largest electronic tax administration network in the world, allowing tax agents across the nation to dial into the ATO. E-tax implementation was assisted by the prior implementation of ELS data processing capabilities. Through a series of extended pilots for ELS, TaxPackExpress and e-tax, the ATO successfully built the technical infrastructure and addressed issues of data security and community confidence to drive the adoption of these innovations by key constituents.

The influence of *internal and external networks* of support is now examined. The evidence substantiates that the ATO established internal networks of support consisting of dedicated project teams that built network relations with other departmental sections. Team members were highly expert and motivated. External networks of support consisted of software developers, computer hardware vendors and

key constituent groups, which in the case of ELS consisted of tax agent professional bodies, tax agents and their taxpayer clients. Interview data highlighted the importance of international networks. Data evidenced there is an admirable willingness to engage in information sharing amongst tax authorities in international forums and via international visits, on a range of matters including electronic lodgement innovations.

The evidence highlights the pivotal roles played by *key constituents* in the diffusion and adoption of an innovation. Through its use of pilot studies, the ATO enrolled key constituents in the use of these innovations. The positive reception accorded electronic lodgement innovations by tax agents and taxpayers influenced its rate of adoption. The data reveals that the initial take-up rate for ELS was 80% of tax agents. Market pressure was found to be a critical factor influencing tax agent adoption of ELS. Agents that used ELS could offer their clients refunds in 14 days. This commercial advantage encouraged agents to adopt this innovation or face losing clientele to their competitors who already had embraced ELS. Further, this study's findings highlight that the testimony of early adopters who advocate the use of an innovation such as tax agents in the case of ELS and taxpayers in terms of e-tax were pivotal in championing and driving its further diffusion and uptake by other potential users.

This study found that the *national context* was an important driver in relation to both ELS and e-tax. It is evident from texts that the Commonwealth Government was pursuing broad public sector reform aimed at achieving efficiency. Commonwealth departments were charged with making operational savings in the form of efficiency dividends. The ATO enacted changes to its work practices, such as the introduction of ELS, aimed at achieving efficiency goals. In regard to e-tax, the presence of ESD targets as well as other electronic innovations such as e-banking, e-commerce and e-government in the *national context* were concurrent factors influencing the diffusion of e-tax and its adoption by users.

Textual and interview data evidence the influence of the *larger context of the circulation of ideas* upon the diffusion of electronic lodgement within Australia. This is evident in the range of international forums in which the ATO participates. Further, there is both considerable co-operation in sharing ideas and a degree of competitiveness within the international community of tax authorities. For instance, the emergence of ELS in Australia stemmed from Commissioner Boucher's visit to the United States where he witnessed the trial of electronic lodgement. Also, the influence of globalisation evident in the emergence of ideas and practices associated with e-banking and e-commerce both influenced the diffusion and adoption of e-tax in Australia. This is apparent as well in the actions of numerous international delegations visiting Australia to acquire knowledge of electronic lodgement innovations implemented by the ATO. This study reveals the influence of globalisation and information sharing on the diffusion of ideas in terms of the number of countries that have implemented a range of electronic lodgement innovations in their tax authorities.

TABLE 2: FACTORS INFLUENCING ELS DIFFUSION, ADOPTION AND IMPLEMENTATION WITHIN AUSTRALIA

<i>Tax policy context</i> • Prior introduction of the self assessment system • Concurrent implementation of the Modernisation Program and Workplace design • Concurrent re-engineering of work processes within the ATO and tax agent practices • Increasing efficiency through reducing processing costs • Improving client service with 80% of returns processed in 14 days • Promote transition from paper to electronic lodgement processes • Improve data quality by reducing error rates in tax returns before receipt by ATO • Improving job opportunities for ATO staff by changing organisational focus from processing and verifying returns to service assisting taxpayers with self assessment
<i>Technical context</i> • Tax agents' adoption of computers due to easier availability through the PC revolution • Increasing availability of software programs in the market devised to assist tax agents with return preparation • Existence of the Austpac – Telecom (now Telstra) network for transferring data • Advances in electronic data transfer such as packet switching technology and Telnet • ATO enhancement of electronic capability through National Taxpayer System and concurrent implementation of the Modernisation Project and data-take on machines • Separation of data-take-on (receipt of tax returns from agents) and processing in ATO
<i>Path of entry</i> • Path of entry was governmental
<i>Role of key constituents</i> • High level departmental support • Participation by software/hardware providers, tax agents and tax agent professional bodies • Phenomenal adoption of ELS by tax agents and their taxpayer clients
<i>Effectiveness of champions</i> • Combination of champions who introduced and implemented ELS to effect its national diffusion, namely government officials, Commissioners Trevor Boucher and Michael Carmody as well as Ron Kelton and Mike Cebalo
<i>Internal and external networks of support</i> • Highly expert and motivated internal ATO team • Broad participation by ATO management and staff across national office, branch offices across 16 sites as well as tax agents, software developers, computer hardware vendors, Austpac, Privacy Commissioner, Attorney-General's Department and Defence Signals Directorate • A co-design process was pioneered by the ATO through ATO business analyst staff working closely with tax agents on this innovation • International tax forums including the OECD Tax Forum and access to technology libraries
<i>National context</i> • Efficiency in government operations as Commonwealth pursued public sector reform
<i>Larger context of circulation of ideas</i> • Electronic lodgement trial in US • Range of formal and informal international forums in which the ATO participates • Globalisation and the emergence of e-banking and e-commerce

TABLE 3 FACTORS INFLUENCING E-TAX DIFFUSION, ADOPTION AND IMPLEMENTATION WITHIN AUSTRALIA

<i>Tax policy context</i> • To fulfil the Commissioner's undertaking to develop an electronic TaxPack • To ensure electronic lodgement was available to all taxpayers, not just tax agent clients • To simplify the process of completing and lodging tax returns • To encourage use of electronic lodgement • To improve the quality of data in self-preparers' returns • To improve job satisfaction for ATO staff by reducing paper processing requiring keying • Legislative amendment enacted to recognise digital signature
<i>Technical context</i> • Prior existence of ELS • Development of Public Key Infrastructure (PKI) • Establishment of ATO assist • PC revolution with expanding availability and affordability of computers in the community • Increasing use of Internet by the community • The presence of Windows technology through Microsoft products
<i>Path of entry</i> • Path of entry was governmental
<i>Role of key constituents</i> • High level departmental support • Support of taxpayers evidenced in the pilot and in successive years post implementation
<i>Effectiveness of champions</i> • Combination of champions who introduced and implemented e-tax in the tax policy domain to effect the national diffusion of this innovation, namely – government officials, Commissioner Michael Carmody as well as Chris Mobbs and John McCarthy
<i>Internal and external networks of support</i> • Dedicated e-tax project team, internal IT expertise and e-tax help desk • ATO working with software development consortium as contractor • International tax forums including the OECD and Tax Administrators' Forums - PATA, SGATAR and CATA
<i>National context</i> • Emergence and implementation of e-commerce and e-government as well as ESD targets • Increasing community use of Internet technology
<i>Larger context of circulation of ideas</i> • E-banking, e-commerce and e-government • Range of formal and informal international forums in which the ATO participates • Ascendancy of notions of consumer choice in service delivery

Sociology of translation strategies now are applied to examine the data. Both textual and interview material reveals that the champions of electronic lodgement were successful in mobilising the resources to establish and maintain the actor-networks required to drive the adoption, implementation and national diffusion of ELS, TaxPackExpress and e-tax. These actor-networks were comprised of both human and non-human actors. In relation to ELS, a substantial actor-network was established. Human actors included ATO officers — Commissioners, senior management, the ELS project team, IT officers, Business Analysts and Client Relations Officers, as well as software producers, computer vendors, contractors, tax agents and their taxpayer clients. Non-human actors included software programs, computer hardware, tax files, packet switching, telephony lines, pilot studies, Austpac and government departments,

namely the Privacy Commissioner, Attorney-General's Department and Defence Signals Directorate.

With regard to e-tax, human actors included ATO officers — Commissioners, senior management, the e-tax team, software developers and taxpayers. Non-human actors included ELS, Internet, ATO web site, e-tax software program, computer hardware, tax files, telephony lines, pilot studies, legislation and government departments.

The data revealed key roles played by intermediaries, namely *technical objects*, *skills*, *texts* and *money*. *Technical objects* such as the differing software packages for tax agents devised by software providers varied in their functionality and cost, which in turn assisted the spread of this innovation by enhancing user friendliness and affordability for potential adopters. The ATO's non-provision of a free software package for tax agents prompted enrolment of software developers in the market place to drive the ELS innovation. This occurred through software developers competing against each other to devise software applications that captured market share amongst tax agents. Also, the alliance of *technical objects*, namely home computers, the Internet and e-tax software, was essential in enabling the broad scale adoption of e-tax by taxpayers.

Skills in programming applied by ATO staff members and consultants were pivotal for the implementation of ELS and e-tax. Computer literacy skills of tax agents and taxpayers were essential for the uptake of ELS and e-tax. Texts such as legislation and annual Individuals tax return forms played important roles as these contained tax rules, which software producers translated into software packages. Such texts provided the basis for ATO officers to devise specifications for e-tax software. The *Income Tax Assessment Act (1936)*, November 1997 legislative amendment, *Taxation Laws Amendment Act No. (4) 1997/(174 of 1997)* and Schedule 7 Electronic lodgement and electronic funds transfer were pivotal in formalising new practices embodied in the paperless lodgement of tax returns. *Funds* were critical to the adoption of ELS and e-tax to purchase hardware and fund project teams and contractors.

Textual and interview material demonstrated the significance of the roles played by a series of pilot studies in the Australian experience of diffusion and adoption of electronic lodgement innovations. Firstly, the 1987 trial of ELS in Adelaide with one agent evidenced that this innovation was credible and feasible. This outcome served to further mobilise resources resulting in the trial being extended in 1988 to include tax agents in Adelaide, and in 1989 to tax agents in Melbourne. Secondly, the success of the TaxPackExpress pilot conducted by the ATO in 1991 in the ACT resulted in its extension into New South Wales in 1992. The success of this pilot culminated in the launch of TaxPackExpress in 1993. Thirdly, the 1997 pilot of the forerunner of e-tax called Electronic TaxPack with 1,200 people using floppy disks to lodge their tax returns provided the basis for a further trial in 1998 also enlisting 1,200 taxpayers. However, this second trial differed markedly, as it harnessed Internet technology, demonstrating that this mode of electronic lodgement was faster and a better solution than its predecessor, prompting its national launch in 1999. These pilot trials were critical in enabling the ATO to identify and address technical infrastructure, as well as security and community confidence issues.

The sociology of translation views innovations as both historical artefacts of a specific era and dynamic entities. Each version of software offered by software developers to

tax agents and via the ATO web site to taxpayers through e-tax reveals the historicity of these innovations in terms of their link to specific legislative requirements and changes in particular years embodied in tax rules. The dynamic nature of these innovations stems from three drivers that each resulted in the modification of successive versions of software packages designed for tax agents. Firstly, the ATO devises specifications that software developers have to meet. Secondly, changes in legislation need to be incorporated into the software to ensure these packages are current for tax agents' purposes. Thirdly, competitive pressure within the market place amongst software developers led to the incorporation of technological advances such as edits, checks and calculation facilities, which were aimed at enhancing their market share amongst tax agents. Together, these changes facilitated the achievement of receipt of 'right' data at point of entry to ELS in the ATO.

REVIEWING FINDINGS ON THE DIFFUSION OF INNOVATIONS IN LIGHT OF THIS RESEARCH

The current study substantiated the findings of Kimberly and de Pouvourville (1993a) and Turner (2002) by demonstrating that a coalescence of factors were crucial in enabling the diffusion, adoption and implementation of a policy and technological innovation, that was operationalised through computer software and hardware. Similarly, the combination of these factors assisted in providing a means to analyse and describe the phenomenon of the adoption and diffusion of computer-based innovations.

This study substantiates earlier findings by Kimberly and de Pouvourville (1993a) and Turner (2002) that two factors, namely the *path of entry* by government officials and the *effectiveness of champions* located within government departments were both crucial factors that expedited the adoption and implementation of an innovation. These studies each found that presence of effective champions was pivotal in mobilising the resources of people, skills, funds and hardware necessary to build the momentum to effect the spread of an innovation and its uptake by key stakeholders.

The conclusions of this study confirm findings of Kimberly and de Pouvourville (1993a) and Turner (2002) regarding the policy context. These studies found that *policy context* characteristics such as the implementation of government initiatives to modernise the public sector and the presence of issues of concern can combine to provide a conducive environment facilitating the adoption, implementation and diffusion of an innovation.

Consistent with prior studies by Kimberly and de Pouvourville (1993a), Kimberly (1993) and Turner (2002), the findings of this research highlight the pivotal roles played by the *technical context and internal and external networks of support* to enable the diffusion and implementation of a computer based innovation. The magnitude of the technical work that had to be undertaken did not act as a deterrent factor for an adopting organisation committed to the implementation of an innovation. Rather, these studies evidence departments that are successful in championing the diffusion of innovations also will have established internal and external networks of support devised to address technical and key constituent issues so as to achieve their organisational goals.

The findings of this study substantiate those of Kimberly and de Pouvourville (1993a), Kimberly (1993) and Turner (2002) in evidencing the roles played by *key constituents*, particularly early adopters, is crucial to the successful diffusion and adoption of an

innovation. Each study found that the uptake rate of an innovation by other potential users was advanced by the presence of early adopters in key constituent communities who took on the role of champions in advocating the invention's adoption.

The importance of the *national context* is now considered. This study found that Government's pursuit of broader public sector reform aimed at achieving efficiency influenced the adoption and diffusion of ELS. Further, this research revealed that the presence of other electronic innovations in the broader community such as e-banking, e-commerce and e-government raised taxpayers' familiarity with computer literacy, Internet and electronic transaction services, which in turn facilitated the uptake of e-tax by taxpayers. These findings are supportive of prior research (Kimberly, 1993; Turner, 2002) highlighting the need to examine the national context for its role in influencing the diffusion and adoption of innovations by governments and key constituents.

Similarly to the findings of Kimberly (1993) and Turner (2002), the current study highlights that *the larger context of the circulation of ideas* furthered the global diffusion and local adoption by specific countries of innovations. These ideas are circulated primarily through international forums, visits to other countries and texts.

This study substantiates research undertaken by sociologists of translation, finding that an inadequate explanation of an innovation's spread and adoption will result unless equal attention is given to the roles of both *human* and non-human actors (Callon, 1986, 1991; Chua, 1995; Law, 1992; Latour, 1988, 1991; Turner, 2002). This study found the diffusion and adoption of electronic lodgement innovations were contingent on the presence of human and non-human actors. Human actors included ATO officers — Commissioners, senior management, project teams, IT officers, software producers, computer vendors, contractors, tax agents and taxpayers. These human actors could not have achieved their goals without enlisting the contribution of crucial non-human actors such as self assessment system, software programs, computer hardware, tax files, packet switching, telephony lines, pilot studies, Austpac and a range of government departments.

The current study also substantiated *the* findings by Callon (1991), Chua (1995) and Turner (2002) with regard to the importance of the roles played by intermediaries, such as *money, texts, technical objects* and *skills* as essential to the diffusion of innovations.

Consistent with the studies by Latour (1988) and Turner (2002), this research highlighted the significance of the roles played by trials of strength — consisting of pilot studies — in the spread and adoption of innovations. These studies each demonstrated that pilot studies established and furthered the credibility of an innovation.

In common with sociology of translation research (Latour, 1991; Latour et. al, 1992; Scott 1992), this study found innovations are both historical artefacts of a specific era and dynamic entities evident in successive versions influenced by transformations in science (technological advances) and society (social, political and economic arrangements).

INSIGHTS ON THE SUCCESSFUL DIFFUSION AND IMPLEMENTATION OF INNOVATIONS

The success of ELS and e-tax is evident in the rapidity and extent of adoption of these innovations by key constituents. Therefore several insights can be garnered from this Australian experience to assist persons considering championing the diffusion, adoption and implementation of policy and technological innovations.

Firstly, this study highlights the benefits of examining the role of eight factors for their potential influence in facilitating or hindering the diffusion and adoption of innovations. It is evident from this study that the diffusion of an innovation is contingent on the *effectiveness of champions* who are willing to invest time and effort in procuring the resources of both human and non-human actors to achieve their goal. The findings reveal how champions harnessed opportunities afforded by *the larger context of ideas in circulation* from other countries and via international forums as well as events in their own *national context* to evidence and support the need to adopt and implement electronic lodgement innovations. Also, the *tax policy context* and *technical context* should be explored for opportunities to harness existing resources or recent changes that can be enlisted to provide additional support to facilitate the implementation of the innovation.

Further, this research evidences that successful diffusion, adoption and implementation of an innovation within the tax policy domain can be expedited if the *path of entry* is enabled through government channels, which is an internal mechanism. This has implications for members of tax authorities regarding organisational considerations, but also for entrepreneurs, consultants and researchers aiming to have their chosen innovation adopted through furthering network alliances.

Further, this study highlights the necessity for champions of establishing and maintaining *internal and external networks of support*. This research evidences that champions need to consider both the network resources required and the strategies to be devised to achieve the enlistment of such resources. Further, attention needs to be given to the constituent elements of the actor-network alliances regarding the enrolment of both human and non-human actors. Champions must be mindful to implement strategies to enlist and maintain *key constituents* within their *internal and external networks of support*. The possibility of such enrolment is heightened through revealing the benefits of the adoption of an innovation to the key constituents. In turn, this minimises resistance that may hinder the diffusion and adoption process.

CONCLUSION

The present study contributes to the body of knowledge on the diffusion of innovations within Australia, both conceptually and in terms of specific findings.

This study found that use of this framework enabled a more comprehensive analysis of the diffusion of electronic lodgement innovations in Australia, than would have been possible by only examining the eight factors and/or focusing on the roles of human actors alone. Use of sociology of translation strategies ensures that the pivotal roles played by non-human actors in the process of the diffusion and adoption of innovations were not overlooked. Further, this study reveals that the diffusion and adoption of electronic lodgement innovations within the Australian tax system were contingent on a coalescence of factors. Changes in any one of these factors may not have prevented this diffusion and adoption process; however, it is possible that the process and outcome may have been different and was not inevitable.

This study contributes to existing knowledge by demonstrating that the path of entry of ELS and e-tax into the Australian tax policy domain occurred by government channels. The findings of this research highlight that the larger context of the circulation of ideas apparent in the influence of both globalisation and information sharing amongst tax authorities has facilitated the sea change of an increasing number of countries adopting and implementing electronic lodgement innovations in their tax authorities.

The conclusions of this study also reveal insights into factors that can be harnessed by champions considering driving the diffusion and adoption of innovations.

This study evidences that Australia was a world leader in implementation of this cutting edge technology, particularly with regard to ELS. A comprehensive comparative analysis of electronic lodgement services of tax returns in Australia specifically and internationally more generally was beyond the scope of this study. Therefore, further research is merited on this topic.

ACKNOWLEDGEMENTS

This research would not have been achievable without the contribution and support of many people who gave generously of their time, recollections, ideas, encouragement and support. We wish to thank Mr Michael Carmody, Mr Mike Cebalo, Ms Carlene Chandler, Mr Greg Dark, Mr Jim Davidson, Mr Robert Deuchar, Mr Howard Dickinson, Ms Jennie Granger, Mr Rod Hadfield, Mr Richard Highfield, Mr Chris Mobbs, Mr Ken Underwood, Ms Raelene Vivian, Mr Nghia Vu, Ms Chris Wakefield, Mr Darren Wilson, Mr Richard Wood. Most of the aforementioned persons were active participants in the processes of diffusion, adoption and/or implementation of electronic lodgement innovations in the Australian tax system. We appreciate the contribution of the 15 interviewees who took time out of their busy schedules to share their recollections and insights, as well as send us textual material, web site links and suggest other persons to interview. We would also like to extend thanks to members of the ATO Library Staff and members of the PTax Knowledge and Information Management Team — Ms Bronwen Arthur, Ms Sunita Barker, Mr Ross Barns, Ms Audrey Colen, Ms Cheryl Crick, Ms Jacqueline Giddy, Mr Peter Howard and Ms Jo Zangl. We extend thanks to each and all of the above named individuals for their invaluable assistance and support, without which this research would not have reached fruition, nor been so enjoyable.

We would also like to thank members of our family, Kerry and Callum Apelt and Frank Turner as well as our friend Dr Bill Nichol for their ongoing support and encouragement during the researching and writing of this paper.

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