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# 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,



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 Pouvourville (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 Pouvourville, 1993b). Each factor was found to have influenced the outcome of the DRG diffusion and adoption process by both governments and key stakeholders in ninetsovergm8- -1a194g6es oeivotrnaoei.8e rlyadgm8- -(u).9



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.



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 Commissioni



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

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,

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:

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,

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

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





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 i3e1n 0 TD0.02is0--7nb(been)}werefederd-17.7497 - TD0TD0.

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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 . 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 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 . 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 , 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 pilrr(the ti)-18[process0 -13(hOcof E)-er)5.8(thEo)-4.t



**TABLE 2: FACTORS INFLUENCING ELS DIFFUSION, ADOPTION AND IMPLEMENTATION**

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

*Tax policy context*

- 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

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 [redacted] and [redacted]. [redacted] 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 [redacted], 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 [redacted], November 1997 legislative amendment, [redacted] 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. [redacted] 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,

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 by government officials and the 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 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 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 , 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 *Government's pursuit of broader public sector reform* 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 *Government's pursuit of broader public sector reform* 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 *Government's pursuit of broader public sector reform* 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 *Government's pursuit of broader public sector reform* findings by Callon (1991), Chua (1995) and Turner (2002) with regard to the importance of the roles played by intermediaries, such as *Government's pursuit of broader public sector reform* and *Government's pursuit of broader public sector reform* 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 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 from other countries and via international forums as well as events in their own to evidence and support the need to adopt and implement electronic lodgement innovations. Also, the and 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 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 . 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 within their . 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.



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